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FISH RELEASES IN 1982 FROM BRITISH COLUMBIA SALMONID ENHANCEMENT OPERATIONS FACILITIES

by

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ABSTRACT

Cross, C.L. and E.A. Perry. 1985. Fish releases in 1982 from British Columbia Salmonid Enhancement Operations Facilities. Can. Data Rep. Fish. Aquat. Sci. 528:86 p.

The number of salmonids released in 1982 from each Salmonid Enhancement Program (SEP) Enhancement Operations facility is presented in this report, together with the marking information and plans and rationale for assessment studies directed at chinook, coho, chum and pink salmon. Data are summarized by stage at release and production area. Projected returns using release data and SEP biostandards are calculated and data handling methods described. Production targets for contributing brood years are also included.

Key Words: SEP, juvenile release, hatchery, salmonid, spawning channel

RÉSUMÉ

Cross, C.L. and E.A. Perry. 1985. Fish releases in 1982 from British Columbia Salmonid Enhancement Operations Facilities. Can. Data Rep. Fish. Aquat. Sci. 528:86 p.

Le présent rapport porte sur le nombre de salmonidés mis en liberté en 1982 à chaque installation où sont menées des activités de repeuplement dans le cadre du Programme de mise en valeur des salmonidés (PMVS), ainsi que sur des données de marquage, les plans et l'objet des évaluations visant les saumons quinnat, coho, kéta et rose. Les données sont résumées selon le stade au lâcher et la zone de production. Les retours prévus sont calculés à l'aide des données sur les lâchers et les normes biologiques du PMVS; de plus, les méthodes de traitement des données sont décrites. Les objectifs de production pour les années de génération sont aussi inclus.

Mots-clés: lâcher de juvéniles, écloserie, salmonidé, frayére artificielle

I. INTRODUCTION

In 1982 the Facility Operations group operated 17 hatcheries, six spawning channels (two of which were at Fulton River) and three pilot projects as part of the Salmonid Enhancement Program. These facilities are located throughout B.C. (Figure 1) and utilize a variety of enhancement techniques and rearing strategies (Table 1). Various combinations of the five species of Pacific salmon (*Oncorhynchus spp.*) are cultured, as well as steelhead (*Salmo gairdneri*) and cutthroat (*Salmo clarki*) trout.

The majority of the facilities are Federal government owned and operated. Loon Creek Hatchery is an exception as it is a B.C. Fish and Wildlife facility and produces chinook salmon in cooperation with SEP. This arrangement is similar to one whereby steelhead and cutthroat trout are produced in federal hatcheries. Other exceptions include Little Qualicum, a SEP facility operated by Underwood McLellan Ltd. under contract, and Chemainus, a private hatchery which also operates under contract to the Federal government.

This report summarizes the 1982 releases of juvenile salmonids from SEP Facility Operations projects by facility (Table 4), geographical area of release (Tables 5-10), and stage at release. Table 4 also includes production strategies and descriptions of studies designed for assessment of chinook, coho, chum and pink production. Assessment studies and production strategies for steelhead and cutthroat production are the responsibility of B.C. Fish and Wildlife Branch, and are not described in this report. Projected returns by species and catch areas are tabulated in Tables 12 and 13.

Releases by other B.C. agencies (Int. Pac. Sal. Fish. Comm., B.C. Fish and Wildlife) and the Special Projects Unit of SEP are not included in this report. These agencies should be contacted directly for information on their 1982 releases.

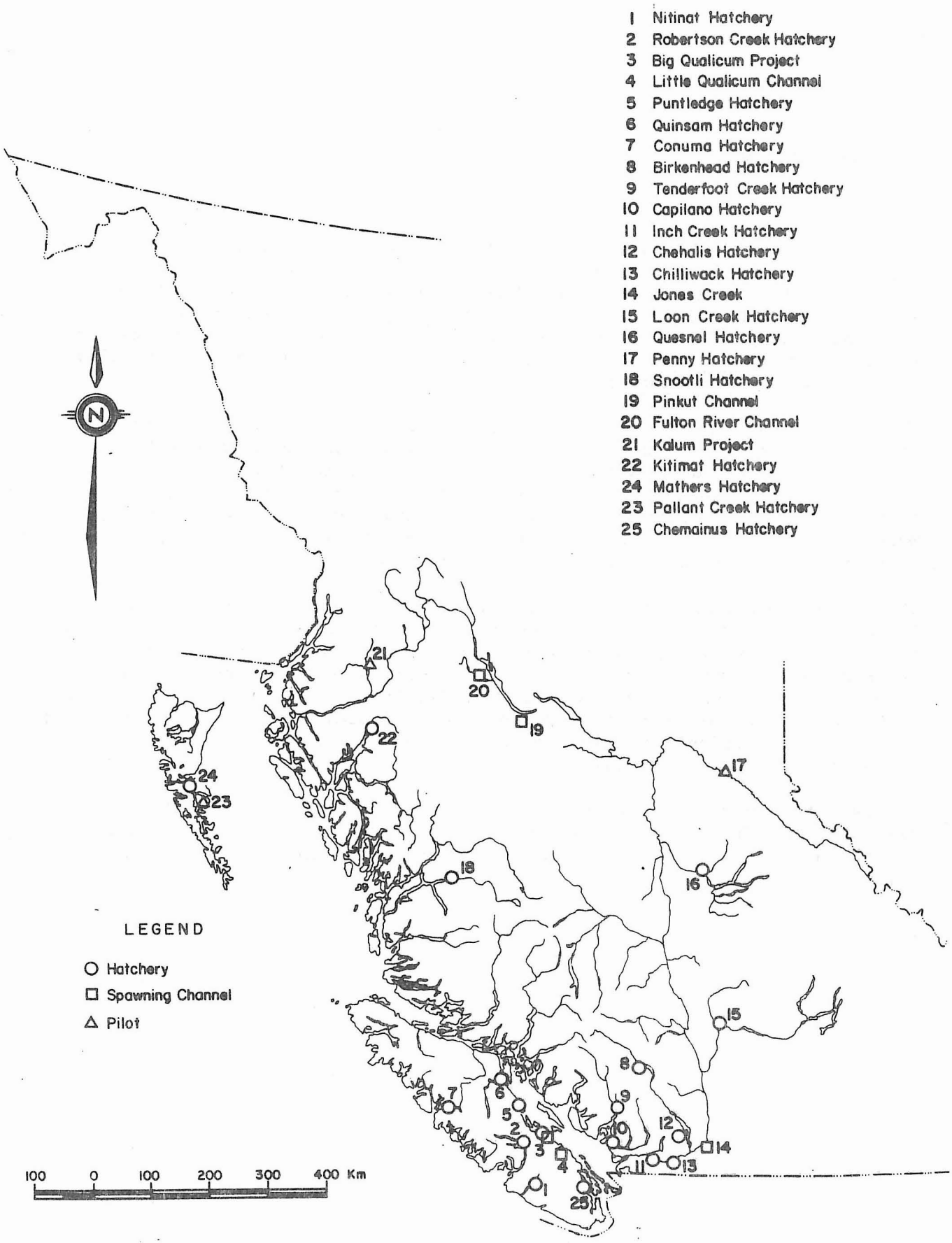

Figure 1. Location of SEP Enhancement Operations Facilities

Table 1. Summary of incubation and rearing technologies for fish released in 1982.

Facility	Species	Incubation Technology	Rearing Technology	Release Stage: Fry	Fed Fry	Smolt	*Yearling Smolt
Big Qualicum	chinook	vertical-stacked	earth channels			+	
			concrete raceways			+	
	coho	vertical-stacked	earth raceways		+	+	
	chum	spawning channel	----	+			
		river flow control	----	+			
		freestyle & deep gravel	floating raceways		+		
		matrix boxes, vertical-stacked	earth channels		+		
	steelhead	vertical-stacked	circular tubs		+		
			Burrows ponds			+	
Birkenhead	chinook	vertical-stacked	Capilano troughs			+	
			circular tubs			+	+
Capilano	chinook	vertical-stacked	Capilano troughs/ Burrows ponds			+	+
	coho	vertical-stacked	Capilano troughs/		+		
			Burrows ponds		+	+	
			----	+			
	steelhead	vertical-stacked	Capilano troughs/ concrete raceways		+		
Chemainus	chinook	vertical-stacked	Capilano troughs			+	
	coho	vertical-stacked	Capilano troughs		+		

* refers to chinook only

Table 1 (cont'd.)

Facility	Species	Incubation Technology	Rearing Technology	Release Stage: Fry	Fed Fry	Smolt	*Yearling Smolt
Chilliwack	chinook	vertical-stacked	Capilano troughs/ concrete raceways			+	
	coho	vertical-stacked	Capilano troughs/ earth channels			+	
	chum	mod. Atkins boxes/ keeper channels	concrete raceways		+		
	steelhead	vertical-stacked	Capilano troughs/ earth channels			+	
Conuma	chinook	vertical-stacked, mod. Atkins boxes/ keeper channels	earth raceways			+	
	coho	vertical-stacked	Capilano troughs/ earth/concrete raceways		+		
	chum	mod. Atkins & freestyle boxes/ keeper channels	earth channels		+		
			concrete raceways		+		
			Capilano troughs		+		
Fulton	sockeye	spawning channel	----	+			
		controlled river flow	----	+			
Inch Cr.	coho	vertical-stacked	Capilano troughs/ concrete raceways		+		
	chum	mod. Atkins boxes/ keeper channels	concrete raceways		+		

* refers to chinook only

Table 1 (cont'd.)

Facility	Species	Incubation Technology	Rearing Technology	Release Stage: Fry	Fed Fry	Smolt	*Yearling Smolt
Jones Cr.	pink	spawning channel	----	+			
Kalum	chinook	vertical-stacked	Capilano troughs		+		
Kitimat	chinook	vertical-stacked	Capilano troughs			+	
	coho	vertical-stacked	Capilano troughs		+		
	chum	vertical-stacked	Capilano troughs		+		
	steelhead	vertical-stacked	Capilano troughs		+		
Little Qualicum	chinook	supplied as fry	earth ponds			+	
	chum	spawning channel	----	+			
			floating raceway		+		
	steelhead	supplied as fingerlings	earth ponds			+	
Loon	chinook	vertical-stacked	Capilano troughs		+		
Mathers	chum	vertical-stacked, deep matrix gravel boxes	modular above-ground raceways		+		
Nitinat	chinook	vertical-stacked	concrete raceways			+	
	chum	mod. Atkins & freestyle boxes/keeper channels	concrete raceways		+		

*refers to chinook only

Table 1 (cont'd.)

Facility	Species	Incubation Technology	Rearing Technology	Release Stage: Fry	Fed Fry	Smolt	*Yearling Smolt
Pallant	coho	vertical-stacked	Capilano troughs/ concrete raceways		+		
	chum	vertical-stacked, deep matrix gravel boxes	concrete raceways/ seapens		+		
	steelhead	vertical-stacked	concrete raceways		+		
Penny	chinook	vertical-stacked	Capilano troughs		+		
Pinkut	sockeye	spawning channel	----	+			
		controlled river flow	----	+			
Puntledge	chinook	vertical-stacked	Capilano troughs/ concrete raceways			+	
			earth channels			+	
	coho	vertical-stacked	Capilano troughs/		+		
			earth raceways			+	
	chum	mod. Atkins boxes/ keeper channels, deep matrix gravel boxes	concrete raceways		+		
	pink	mod. Atkins boxes/ keeper channels, deep matrix gravel incubators	seapens	+	+		
	steelhead	vertical-stacked	Capilano troughs/ circular tubs/		+		
			earth channels			+	

* refers to chinook only

Table 1 (cont'd.)

Facility	Species	Incubation Technology	Rearing Technology	Release Stage: Fry	Fed Fry	Smolt	*Yearling Smolt
Quesnel	chinook	vertical-stacked	Capilano troughs/ concrete raceways			+	
Quinsam	chinook	vertical-stacked	Capilano troughs/ Burrow's ponds			+	
	coho	vertical-stacked	Capilano troughs		+		
			Burrow's ponds			+	
	chum	deep matrix gravel boxes	Capilano troughs		+		
	pink	deep matrix gravel boxes	-----	+			
			seapens		+		
	steelhead	vertical-stacked	Capilano troughs/ circular tubs		+	+	
Robertson Cr.	chinook	vertical-stacked freestyle boxes/ keeper channels	Capilano troughs/ earth/concrete raceways			+	
	coho	vertical-stacked	Capilano troughs/ earth channels			+	
	steelhead	vertical-stacked	Capilano troughs/ circular tubs/ earth/concrete raceways		+	+	

Table 1 (cont'd.)

Facility	Species	Incubation Technology	Rearing Technology	Release Stage: Fry	Fed Fry	Smolt	*Yearling Smolt
Snootli	chinook	vertical-stacked	Capilano troughs/ concrete raceways			+	
	coho	vertical-stacked	Capilano troughs/ concrete raceways		+		
	chum	mod. Atkins boxes/ keeper channels	concrete raceways		+		
	steelhead	vertical-stacked	circular tubs		+		
Tenderfoot Cr.	chinook	vertical-stacked	Capilano troughs/ concrete raceways			+	
Tsolum	pink	false-floored keeper/ keeper channels	Seapens		+		
			----	+			

* refers to chinook only

II. DATA COLLECTION AND STORAGE

For assessment purposes, each group of fish released is considered to be one of three types; unmarked (i.e. unrepresented by a mark), represented by a wire tag code, or represented by a fin clip. For each release type, there is a unique release report format which includes information on release site, size, date, and number, as well as tagging data, if applicable (Tables 2a, 2b, and 2c). Upon release of a group of fish, the hatchery staff will fill out the appropriate version of the release report and return it to the assessment section of the Facilities Operations group for data verification and entry into the release data base. Copies of the CWT and finclip forms are then forwarded through the Mark Recovery Group to the Pacific Marine Fisheries Commission for inclusion in the Pacific coast release summary.

Methods for enumerating unmarked and total release numbers for release reports vary from facility to facility. As a general rule, CWT groups are enumerated during the tagging operation using the Quality Control Device count adjusted for double counts and subsequent mortalities. Finclip release groups are enumerated during clipping using tally counters, with totals again adjusted for mortalities. Total releases are usually calculated from a book balance (number of eggs taken minus cumulative incubation and rearing mortality) or estimated by a Petersen mark-recapture. Any questions regarding specific inventory methods or numbers should be referred directly to the pertinent hatchery. Addresses and phone numbers are listed in Appendix 1.

All 1982 release data in this report were stored using the DB Master data management system and an Apple II+ microcomputer. Copies of the data discs and brief documentation on field layouts are available to interested parties upon receipt of two blank 5 1/4" floppy diskettes. You must have a DB Master disk available to access the data.

Table 1 (cont'd.)

Table 2A

AGENCY_____

CODED-WIRE TAG RELEASE REPORT

For each tag code used, please provide the following information and return to:
Please double-check all figures ACCURACY IS IMPORTANT

BIO PROGRAM COORDINATOR
5th FLOOR
1090 W PENDER STREET
VANCOUVER, B C
V6E 2PI

TAG CODE			SPECIES	BROOD YEAR	STOCK	HATCHERY SITE	RELEASE SITE	PERIOD OF RELEASE		NUMBER RELEASED				TAG LOSS		NO. FISH/ LB.	P W E*	COMMENTS
AGENCY	DATA 1	DATA 2						FIRST DAY, MONTH, YEAR DD MM YY	LAST DAY, MONTH, YEAR DD MM YY	NO. TAGGED	NO. ADIPOSE ONLY	NO. UNMARKED	TOTAL NO RELEASED	%	DAYS			

* P - Production W - Wild E - Exberimental

Table 2B

AGENCY_____

FINCLIP RELEASE REPORT

For each fin clip used, please provide the following information and return to:

Please double-check all figures ACCURACY IS IMPORTANT

BIO PROGRAM COORDINATOR
5th FLOOR
1090 W PENDER STREET
VANCOUVER, B C
V6E 2P1

FIN CLIP(S) specify	SPECIES	BROOD YEAR	RECOVERY M, I, S*	STOCK	HATCHERY SITE	RELEASE SITE	PERIOD OF RELEASE FIRST DAY. MONTH. YEAR DD MM YY	LAST DAY. MONTH. YEAR DD MM YY	NUMBER RELEASED WITH: GOOD MARKS	PARTIAL CLIPS 1st FIN specify	2nd FIN specify	BOTH FINS	TOTAL NO. RELEASED MARKED AND UNMARKED	NO. FISH/ LB.	P W E*	COMMENTS

* M - Marine I - Intertidal S - Stream

Table 2C

UNMARKED FISH RELEASE REPORT

AGENCY_____

For each unmarked release group please provide the following information and return to:
Please double-check all figures ACCURACY IS IMPORTANT

BIO PROGRAM COORDINATOR
5th FLOOR
1090 W PENDER STREET
VANCOUVER , B.C. V6E 2P1

SPECIES	BROOD YEAR	STOCK	HATCHERY SITE	RELEASE SITE	PERIOD OF RELEASE start ddmmyy	finish ddmmyy	TOTAL NO. RELEASED	NO. FISH/ LB	P W E	COMMENTS

III. DESIGN OF MARK RELEASE/RECOVERY STUDIES

Marking studies are designed to determine survival and contribution of a particular group of fish to the fisheries and escapement or to determine the relative performance of experimental groups of fish (Table 3). A key feature of SEP Operations' marking is that a large scale program is necessary solely for facility assessment. In order to generate maximum benefit from this fundamental, costly requirement, we direct much effort to the design of experimental releases such that they may be rolled up to provide basic assessment data. For example, we may mark 150,000 chinook juveniles with one tag code to evaluate production from a total release of 1,500,000 fish on June 15. On the other hand, we may uniquely mark three groups of 50,000 fish each and release the first group among 500,000 fish on June 1, the second group among 500,000 fish on June 15, and third group among 500,000 fish on June 30. The latter approach provides information on the effect of release date and/or size on subsequent survival so that our future release strategies can be optimized. In addition, by accumulating recovery data for all three release groups we have statistically sound data for determination of catch and escapement from the total release.

Single mark group studies to assess survival and contribution are designed to provide 95 percent confidence with a 10 percent confidence interval in the estimated catch of all (not each) age classes. Multiple mark group studies to assess relative survival of experimental lots are designed to demonstrate 25 percent differences in survival at confidence levels of 95 percent for Type 1 and Type 2 errors and a 10 percent confidence interval. Differences of this magnitude (25 percent) were chosen as a level at which changes from current practise might be pursued. If differences between experimental and control lots were, for example, only 10 percent the benefits of change may not justify the added marking costs to achieve the required level of precision to demonstrate such a small increment.

Equations we use to calculate marking requirements are based on the hypergeometric distribution. Inputs in addition to statistical criteria include anticipated survival rates (Table 11) and sample rates in the fishery or escapement. Programs for this analysis are available on the Apple II+ microcomputer as a component of the Fishculture Information System for Hatcheries package designed by SEP Enhancement Operations.

In reality, it is not always possible to mark ideal numbers of fish due to logistical or cost constraints. In many cases we decide to proceed with reduced marking programs on the grounds that information in which we have 90 percent confidence, or even 80 percent confidence is better than no information.

Table 3. Rearing/release studies for fish released in 1982 from Enhancement Operations facilities.

Study Type	Species	Location
Imprinting at release/homing	chinook coho	Penny, Snootli Chilliwack
Date of release	chinook chum coho pink	Big Qualicum, Capilano, Puntledge Conuma, Nitinat, Pallant, Puntledge Robertson Creek Puntledge, Quinsam
Size at release	chinook chum pink	Capilano Big Qualicum, Little Qualicum, Conuma, Nitinat Puntledge, Quinsam
Time and size at release	chinook coho	Quinsam Capilano
Pre-migrant release	chinook coho	Loon Creek, Penny Capilano, Inch, Pallant, Puntledge, Snootli
Transplant	chinook	Chilliwack
Clipped fin regeneration	chum pink	Chilliwack, Snootli Puntledge, Quinsam
Grading during rearing	coho	Capilano
Impact of cataract on survival	coho	Quinsam
Diet evaluation	chinook	Robertson
Comparison of alternative hatchery water supplies	chinook chum	Kitimat Mathers
Heritability of adult traits	chinook coho	Quesnel Puntledge

IV. FACILITY OPERATIONS 1982 RELEASES, ASSESSMENT PLANS AND PRODUCTION STRATEGIES

Release numbers, dates, fish size and release location for each facility and stock are listed in Table 4. Facilities are arranged alphabetically.

A description of assessment studies for salmon species is included for each hatchery and stock immediately following the tabulated release information. Steelhead and cutthroat assessment studies are not described; information regarding these species may be obtained from the B.C. Fish and Wildlife Branch. Production strategies are also included to provide some insight into the rationale for stock selection, if not obvious, as well as production levels attained versus targetted and techniques, where appropriate.

When using Table 4, the following notes explain codes and abbreviations which are not obvious.

Notes

A. General Notes

1. Release column abbreviations

LV	Left ventral
RV	Right ventral
AD	Adipose
LMAX	Left maxillary
RMAX	Right maxillary
NONE	No finclip applied

Each finclip abbreviation is immediately followed by a letter/number combination. These are used to uniquely identify the finclip release groups for searching and sorting the data base; they have no other significance.

2. Species Abbreviations

CHIN	chinook
SOCK	sockeye
STHD	steelhead
SSTH	summer steelhead
WSTH	winter steelhead
CUTT	cutthroat

3. All CWT groups are designated by AD AGD1D2 where;

AD	Adipose
AG	2 digit agency code
D1	2 digit data code
D2	2 digit data code

4. Number released
   Marked - number of valid adipose clipped wire tagged fish for CWT groups
   - number of fish with valid finclips for finclip groups

   Incomplete - number of adipose only fish for CWT groups
   - number of incomplete clips for finclip groups

5. GWG stands for Geographic Working Group. There are three GWG's: North Coast; South Coast; and Fraser River, Northern B.C., Yukon. They consist of representatives from the Department of Fisheries and Oceans and the B.C. Fish and Wildlife Branch who share a wide variety of responsibilities, including the review of SEP production targets.

B. Explanations of specific abbreviations

Page	Abbreviation	Column	Explanation
18 & 38	Bg Qualicum	Stock	Big Qualicum
18	Var. Lakes	Site	Various lakes
18	Mundie's Chn	Site	Mundie's channel
18	Chase/Mill	Site	Chase & Millstream Crks.
21 & 22	Up. Watrshed	Site	Upper watershed
26	Dol. Varden	Site	Dolly Varden
28	Htd Incub Water	Comments	Heated incubation water
30	Fulton Ch.	Site	Fulton channel
32	Upr. Siddle	Site	Upper Siddle Cr.
32	Nicomen Sl.	Site	Nicomen Slough
32	Brun/Marshal	Site	Brunette & Marshall Crks.
35	Ced/Clr	Stock	Cedar & Clear Rivers
36	Kitimat Trib	Site	Kitimat tributaries
38	CWT121708 incld	Comments	Includes two codes; 121707 & 121708
38	Lt Qualicum	Site	Little Qualicum
40	Up. Nicola Rel.	Comments	Upper Nicola release
40	Low. Nicola Rel.	Comments	Lower Nicola release
40	Bonapart	Site	Bonaparte R.
40	Up. Bonap. Rel.	Comments	Upper Bonaparte release
40	Low. Bonap. Rel.	Comments	Lower Bonaparte release
42	Rel. unrep.	Comments	Release unrepresented
44	Mosq. Lk. Rel.	Comments	Mosquito Lake release
44	Mosq. Cr. Rel.	Comments	Mosquito Creek release
44	Up. Pallant Rel.	Comments	Upper Pallant release
47	Pinkut Ch.	Site	Pinkut channel
48	Punt-Fall	Stock	Puntledge fall - run
48	Punt-Summer	Stock	Puntledge summer - run
48	Exp. Substr. Grp	Comments	Experimental substrate group
48	Upr. Punt.	Stock	Upper Puntledge R.
48	Lt. Spwn. Progny	Comments	Late spawners' progeny
48	Mid. Spwn. Progny	Comments	Middle spawners' progeny
48	Ear. Spwn. Progny	Comments	Early spawners' progeny

B. Explanations of specific abbreviations (continued)

Page	Abbreviation	Column	Explanation
53	Upr. Quinsam	Site	Upper Quinsam R.
53	Mid. Quin. Rel.	Comments	Middle Quinsam release
53	Camp. Estury	Comments	Campbell R. estuary reared
56	Rb. Late Htch.	Comments	Robertson late hatchery stock
56	Rb. Early Htch.	Comments	Robertson early hatchery stock
56	Rb. Late Wild	Comments	Robertson late wild stock
56	Robrtsn. Cr.	Site/Stock	Robertson Creek
58	Noos/Sall	Site	Noosgulch & Salloomt
58	Snoot/Nuhlk	Site/Stock	Snootli & Nuhalk
58	Necleet.	Site/Stock	Necleetsconnay
58	L. Bel. Coola	Comments	Lower Bella Coola release
58	Fish/Air	Site/Stock	Fish Cr. & airport side-channel
60	Inc/rrd at Cap.	Comments	Incubated and reared at Capilano hatchery

Table 4. 1982 releases, assessment plans, and production strategies

BIG QUALICUM

PAGE 1

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHIN	BG QUALICUM	BG QUALICUM	81	AD 022223	50866	1682	0	52548	9.1	21-06-82	22-06-82	LATE RELEASE
CHIN	BG QUALICUM	BG QUALICUM	81	AD 022306	51307	1696	3341277	3394280	6.9	11-06-82	14-06-82	PRODUCTION
CHIN	BG QUALICUM	BG QUALICUM	81	NONE5	0	0	19960	19960	5.5	12-06-82	12-06-82	DIET STUDY
TOTALS FOR CHIN					102173	3378	3361237	3466788				
CHUM	BG QUALICUM	BG QUALICUM	81	RV10	84771	7662	2063120	2155553	1.0	06-05-82	13-05-82	FED FRY RELEASE
CHUM	BG QUALICUM	BG QUALICUM	81	ADRV11	245977	13855	43026086	43285918	0.3	27-04-82	12-05-82	FRY RELEASE
TOTALS FOR CHUM					330748	21517	45089206	45441471				
COHO	BG QUALICUM	BG QUALICUM	80	AD 022239	51984	1608	1129154	1182746	18.6	19-05-82	31-05-82	....
COHO	BG QUALICUM	HUNTS CR	81	NONE10	0	0	346950	346950	1.6	24-05-82	08-06-82	....
COHO	BG QUALICUM	CRAIG CR	81	NONE11	0	0	10000	10000	9.0	31-12-82	31-12-82	....
COHO	BG QUALICUM	NILE CR.	81	NONE9	0	0	150000	150000	1.5	18-05-82	28-07-82	....
TOTALS FOR COHO					51984	1608	1636104	1689696				
STHD	ENGLISHMAN	ENGLISHMAN	81	AD 121608	8885	468	1714	11067	41.9	20-05-82	20-05-82	....
STHD	ENGLISHMAN	ENGLISHMAN	81	AD 121609	9320	489	1797	11606	41.9	20-05-82	02-06-82	....
STHD	WILD-BQR	BG QUALICUM	81	AD 121812	24388	1283	0	25671	67.9	17-05-82	17-05-82	....
STHD	BG QUALICUM	MUNDY'S CHN	81	AD 121828	792	408	0	1200	15.0	22-05-82	22-05-82	....
STHD	BG QUALICUM	VAR.LAKES	82	NONE62	0	0	22684	22684	5.6	17-05-82	17-05-82	COLONIZATION
STHD	BG QUALICUM	CHASE/MILL	81	NONE7	0	0	22648	22648	68.9	01-06-82	01-06-82	....
TOTALS FOR STHD					43385	2648	48843	94876				
GRAND TOTALS					528290	29151	50135390	50692831				

Table 4 (cont'd.)

BIG QUALICUM

Assessment:

chinook - 2 CWT release groups to evaluate effect of release date on survival (fish released late larger than fish released early)
- early June release avoided due to probable predation by birds
- returns from unmarked feed study groups will be estimated from survival data for CWT 02-23-06
- CWT 02-23-06 is most representative of "production"

chum - unfed fry marked (AdRV) to determine survival of channel and river fry to catch and escapement
- fed fry marked (RV) to evaluate effect of rearing on post-release survival

coho - single CWT group to determine survival of released smolts
- coho fry outplants not assessed

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	No. Juveniles Released
Chinook	Big Qualicum	1981	Smolt	3,000,000	3,466,788
Chum	Big Qualicum	1981	Fry	55,000,000	43,285,918
Chum	Big Qualicum	1981	Fed Fry	1,800,000	2,155,553
Coho	Big Qualicum	1980	Smolt	1,000,000	1,182,746
Coho	Big Qualicum	1981	Fed Fry	500,000	506,950

Chinook: Smolt release as planned. Additional chinook production transferred to Little Qualicum rearing facility as fry.

Chum: Production was as planned but lower than expected fry numbers due to below average survival in the spawning channel.

Coho: Smolt production as planned. Transplant of coho fry to Hunt's, Thames, Nile, Annie, Beach and Craig creeks was approved by Geographic Working Group (GWG). Hatchery staff transplanted to Hunt's, Craig and Nile creeks only; other streams were considered adequately stocked or were enhanced through the Public Involvement Program.

Table 4 (cont'd)

BIRKENHEAD

PAGE 1

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHIN	BIRKENHEAD	BIRKENHEAD	80	AD 021915	8291	1463	0	9754	44.7	30-04-82	30-04-82	EXTENDED REARNG
CHIN	BIRKENHEAD	BIRKENHEAD	81	AD 022340	35050	909	0	35959	3.5	30-04-82	25-08-82	.....
TOTALS FOR CHIN					43341	2372	0	45713				
GRAND TOTALS					43341	2372	0	45713				

BIRKENHEAD

Assessment:
- single CWT group to determine survival of yearling 1980 brood smolts for comparison to subyearling release in 1981
- single CWT group to determine survival of subyearling 1981 brood smolts

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	Released
Chinook	Birkenhead	1980	Yearling smolt	15,000	9,754
Chinook	Birkenhead	1981	Subyearling	93,000	35,959

Chinook: Extended rearing of chinook to yearling stage was continued (initiated with 1979 brood year) in response to concerns that fish released as subyearlings may overwinter in fresh water and have a low rate of survival to catch and escapement. Production was less than target due to low escapement numbers.

Table 4 (cont'd)

CAPILANO

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHIN	CAPILANO	CAPILANO	80	AD 021809	31575	2177	0	33752	41.3	14-04-82	14-04-82	YEARLING SMOLT
CHIN	CAPILANO	CAPILANO	81	AD 022308	40025	1016	297884	338925	3.8	14-05-82	14-05-82	EARLY RELEASE
CHIN	CAPILANO	CAPILANO	81	AD 022309	42546	601	294072	337219	3.9	28-05-82	28-05-82	MID RELEASE
CHIN	CAPILANO	CAPILANO	81	AD 022310	42626	275	273951	316852	5.3	11-06-82	11-06-82	LATE RELEASE
TOTALS FOR CHIN					156772	4069	865907	1026748				
COHO	CAPILANO	CAPILANO	80	AD 022112	19632	1224	46097	66953	17.5	02-06-82	02-06-82	NOT GRADED
COHO	CAPILANO	CAPILANO	80	AD 022212	18226	2642	42340	63208	21.6	02-06-82	02-06-82	LARGE;GRADED
COHO	CAPILANO	CAPILANO	80	AD 022213	16228	4620	53936	74784	18.2	02-06-82	02-06-82	MEDIUM;GRADED
COHO	CAPILANO	CAPILANO	80	AD 022214	18245	3193	50739	72177	14.4	02-06-82	02-06-82	SMALL;GRADED
COHO	CAPILANO	CAPILANO	80	AD 022234	20936	0	15346	36282	18.1	25-05-82	25-05-82	EARLY RELEASE
COHO	CAPILANO	UP WATRSHED	81	AD 022406	50464	2542	213147	266153	3.0	01-09-82	30-09-82	FED FRY RELEASE
COHO	CAPILANO	CAPILANO	81	AD 022407	51380	2352	3105	56837	3.0	07-10-82	08-10-82	FED FRY RELEASE
COHO	CAPILANO	CAPILANO	80	AD 081615	3711	399	0	4110	12.6	07-05-82	07-05-82	TIM&SIZ 1ST REL
COHO	CAPILANO	CAPILANO	80	AD 081656	3763	404	0	4167	13.0	07-05-82	07-05-82	TIM&SIZ 1ST REL
COHO	CAPILANO	CAPILANO	80	AD 081657	4024	432	0	4456	13.3	07-05-82	07-05-82	TIM&SIZ 1ST REL
COHO	CAPILANO	CAPILANO	80	AD 081658	3860	415	0	4275	15.6	07-05-82	07-05-82	TIM&SIZ 1ST REL
COHO	CAPILANO	CAPILANO	80	AD 081659	4157	446	0	4603	16.2	07-05-82	07-05-82	TIM&SIZ 1ST REL
COHO	CAPILANO	CAPILANO	80	AD 081660	3244	348	0	3592	16.2	07-05-82	07-05-82	TIM&SIZ 1ST REL
COHO	CAPILANO	CAPILANO	80	AD 081661	4175	448	0	4623	18.9	07-05-82	07-05-82	TIM&SIZ 1ST REL
COHO	CAPILANO	CAPILANO	80	AD 081662	4160	447	0	4607	18.9	07-05-82	07-05-82	TIM&SIZ 1ST REL
COHO	CAPILANO	CAPILANO	80	AD 081663	3673	395	0	4068	19.7	07-05-82	07-05-82	TIM&SIZ 1ST REL
COHO	CAPILANO	CAPILANO	80	AD 081702	4501	41	0	4542	12.6	28-05-82	28-05-82	TIM&SIZ 2ND REL
COHO	CAPILANO	CAPILANO	80	AD 081703	3848	35	0	3883	12.3	28-05-82	28-05-82	TIM&SIZ 2ND REL
COHO	CAPILANO	CAPILANO	80	AD 081704	4518	41	0	4559	12.6	28-05-82	28-05-82	TIM&SIZ 2ND REL
COHO	CAPILANO	CAPILANO	80	AD 081705	4435	40	0	4475	16.8	28-05-82	28-05-82	TIM&SIZ 2ND REL
COHO	CAPILANO	CAPILANO	80	AD 081706	4390	40	0	4430	16.8	28-05-82	28-05-82	TIM&SIZ 2ND REL
COHO	CAPILANO	CAPILANO	80	AD 081707	4122	37	0	4159	16.2	28-05-82	28-05-82	TIM&SIZ 2ND REL
COHO	CAPILANO	CAPILANO	80	AD 081708	4526	41	0	4567	20.6	28-05-82	28-05-82	TIM&SIZ 2ND REL
COHO	CAPILANO	CAPILANO	80	AD 081709	4591	42	0	4633	19.7	28-05-82	28-05-82	TIM&SIZ 2ND REL
COHO	CAPILANO	CAPILANO	80	AD 081710	4381	40	0	4421	20.6	28-05-82	28-05-82	TIM&SIZ 2ND REL
COHO	CAPILANO	CAPILANO	80	AD 081711	4473	73	0	4546	14.6	09-07-82	09-07-82	TIM&SIZ 4TH REL
COHO	CAPILANO	CAPILANO	80	AD 081712	4462	73	0	4535	14.2	09-07-82	09-07-82	TIM&SIZ 4TH REL
COHO	CAPILANO	CAPILANO	80	AD 081713	4272	69	0	4341	13.8	09-07-82	09-07-82	TIM&SIZ 4TH REL
COHO	CAPILANO	CAPILANO	80	AD 081714	4460	73	0	4533	18.9	09-07-82	09-07-82	TIM&SIZ 4TH REL
COHO	CAPILANO	CAPILANO	80	AD 081715	4462	73	0	4535	19.7	09-07-82	09-07-82	TIM&SIZ 4TH REL
COHO	CAPILANO	CAPILANO	80	AD 081814	4028	65	0	4093	18.9	09-07-82	09-07-82	TIM&SIZ 4TH REL
COHO	CAPILANO	CAPILANO	80	AD 081815	4243	69	0	4312	21.6	09-07-82	09-07-82	SIZ&TIM 4TH REL
COHO	CAPILANO	CAPILANO	80	AD 081831	4245	69	0	4314	21.6	09-07-82	09-07-82	TIM&SIZ 4TH REL
COHO	CAPILANO	CAPILANO	80	AD 081915	4587	75	0	4662	22.7	09-07-82	09-07-82	TIM&SIZ 4TH REL
COHO	CAPILANO	CAPILANO	80	AD 082037	4524	97	0	4621	13.3	18-06-82	18-06-82	TIM&SIZ 3RD REL
COHO	CAPILANO	CAPILANO	80	AD 082038	4428	95	0	4523	13.3	18-06-82	18-06-82	TIM&SIZ 3RD REL
COHO	CAPILANO	CAPILANO	80	AD 082039	4182	90	0	4272	13.8	18-06-82	18-06-82	TIM&SIZ 3RD REL
COHO	CAPILANO	CAPILANO	80	AD 082040	4514	97	0	4611	18.1	18-06-82	18-06-82	TIM&SIZ 3RD REL
COHO	CAPILANO	CAPILANO	80	AD 082041	4526	97	0	4623	18.9	18-06-82	18-06-82	TIM&SIZ 3RD REL
COHO	CAPILANO	CAPILANO	80	AD 082042	4282	92	0	4374	18.9	18-06-82	18-06-82	TIM&SIZ 3RD REL

Table 4 (cont'd)

CAPILANO

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
COHO	CAPILANO	CAPILANO	80	AD 082043	4599	99	0	4698	21.6	18-06-82	18-06-82	TIM&SIZ 3RD REL
COHO	CAPILANO	CAPILANO	80	AD 082044	4556	98	0	4654	22.7	18-06-82	18-06-82	TIM&SIZ 3RD REL
COHO	CAPILANO	CAPILANO	80	AD 082045	4264	91	0	4355	21.6	18-06-82	18-06-82	TIM&SIZ 3RD REL
COHO	CAPILANO	CAPILANO	80	NONECC4	0	0	73362	73362	18.8	07-06-82	07-06-82	.....
COHO	CAPILANO	UP WATRSHED	81	NONECC5	0	0	216430	216430	3.0	30-06-82	08-07-82	FED FRY RELEASE
COHO	CAPILANO	UP WATRSHED	81	NONECC6	0	0	90000	90000	0.5	07-05-82	07-05-82	UNFED FRY REL.
COHO	CAPILANO	UP WATRSHED	81	NONECC7	0	0	263090	263090	0.7	30-04-82	06-05-82	FED FRY RELEASE
TOTALS FOR COHO					348297	22159	1067592	1438048				
CUTT	CAPILANO	UP WATRSHED	82	NONECC8	0	0	1281	1281	1.5	07-10-82	07-10-82	.....
TOTALS FOR CUTT					0	0	1281	1281				
SSTH	CAPILANO	UP WATRSHED	82	NONE16	0	0	13650	13650	3.0	15-11-82	15-11-82	.....
TOTALS FOR SSTH					0	0	13650	13650				
WSTH	CAPILANO	UP WATRSHED	82	NONE17	0	0	3097	3097	2.4	10-11-82	10-11-82	.....
TOTALS FOR WSTH					0	0	3097	3097				
GRAND TOTALS					505069	26228	1951527	2482824				

Table 4 (cont'd.)

CAPILANO

Assessment:

chinook - single CWT group release of yearling 1980 brood (CWT 02-18-09) to evaluate effect of extended rearing, partially under artificial lighting, on survival to catch and escapement
- 3 CWT groups to determine the effect of release date on survival of subyearling smolts.
- CWT groups 02-23-09, 10 are most representative of "production"

coho - 36 CWT groups to determine the effect of time and size at release on survival, age at maturity, etc., (T. Bilton)
- 4 CWT groups to determine the effect of grading on survival, age at maturity, etc.
- 1 CWT group representing smolts released early (CWT 02-22-34) to reduce hatchery loads
- 2 CWT groups representing fed fry plants (1981 brood) above and below Cleveland dam
- contribution of unmarked 1981 brood fry releases will be calculated based on survival of marked 1981 brood fed fry releases at Capilano and releases of smaller fry at other locations
- CWT 02-21-12 is most representative of "production"

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	No. Juveniles Released
Chinook	Capilano	1980	Yearling smolt	-	33,752
		1980	Subyearling smolt	1,300,000	992,996
Coho	Capilano	1980	Smolt	500,000	545,538
		1981	Fed Fry	300,000	802,510
		1981	Unfed Fry	-	90,000
Pink	Capilano	1981	Fed Fry	100,000	0
Chum	Capilano	1981	Fed Fry	140,000	0

Chinook: Smolt release lower than planned due to shortfall in available eggs. Fish released in 1982 were all progeny of adults returning to Capilano from previous transplants of Big Qualicum stock. Extended rearing of some 1980 brood chinook was not originally intended but was added on an opportunity basis.

Coho: Smolt production as planned. Fry releases exceeded plan as a result of excessive egg-take (partially in anticipation of aquaculture demand for eggs that did not materialize). Fry plants are intended to ensure adequate adult escapement (approximately 2,000 fish) if total loss of the hatchery population should occur during rearing. Fry release targets are based on producing returns of this or greater magnitude rather than on estimated carrying capacity of the upper watershed.

Chum: Low level enhancement targets were added in response to very poor stock conditions. Adults were to be captured in the lower river and tributaries (primarily Brothers Creek) but none were taken.

Pink: See chum.

Table 4 (cont'd)

CHEMAINUS

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHIN	CHEMAINUS	CHEMAINUS	81	NONE19	0	0	13723	13723	5.5	28-05-82	10-06-82	.....
TOTALS FOR CHIN					0	0	13723	13723				
COHO	CHEMAINUS	CHEMAINUS	81	NONE18	0	0	26296	26296	4.6	01-06-82	12-06-82	.....
TOTALS FOR COHO					0	0	26296	26296				
GRAND TOTALS					0	0	40019	40019				

CHEMAINUS

Assessment:
- chinook and coho - no marking; numbers of fish insufficient for marking studies
- assessment will be based on returns of unmarked fish

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	Released
Chinook	Chemainus	1981	Smolt	150,000	13,723
Coho	Chemainus	1981	Fed Fry	125,000	26,296

Chinook: Target was 150,000 smolts if all eggs were taken from Chemainus run. If full Chemainus target was unavailable, egg-take could be supplemented with transplanted Cowichan chinook eggs (crossed with Chemainus chinook milt) to a total of 140,000 smolts. Cowichan stock was used to supplement production in the 1979 and 1980 brood years. Escapement to Chemainus was poor and eggs were not available from Cowichan.

Coho: First year of coho production at Chemainus. Production was limited by brood stock availability.

Table 4 (cont'd)

CHILLIWACK RIVER

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	RELEASE DATE END DD-MM-YY	COMMENTS
CHIN	CHILLIWACK	CHILLIWACK	81	AD 022128	4638	28	309	4975	3.8	31-05-82	31-05-82	.....
CHIN	PITT	PITT R.	81	AD 022157	48299	1001	0	49300	4.0	08-04-82	08-04-82	.....
CHIN	PITT	CHILLIWACK	81	AD 022159	48188	3156	6500	57844	8.7	10-05-82	19-05-82	.....
CHIN	HARRISON	CHILLIWACK	81	AD 022163	74018	1280	281090	356388	5.3	02-06-82	02-06-82	.....
CHIN	PITT	CHILLIWACK	81	NONECC9	0	0	2521	2521	2.0	01-05-82	01-05-82	PINHEADS
TOTALS FOR CHIN					175143	5465	290420	471028				
CHUM	CHILLIWACK	CHILLIWACK	81	LV8	49442	0	870469	919911	1.1	29-04-82	29-04-82	.....
CHUM	CHILLIWACK	CHILLIWACK	81	RV7	107264	0	1997314	2104578	1.1	29-04-82	29-04-82	.....
CHUM	CHILLIWACK	CHILLIWACK	81	ADLV9	48874	0	860469	909343	1.1	29-04-82	29-04-82	.....
TOTALS FOR CHUM					205580	0	3728252	3933832				
COHO	DOL. VARDEN	DOL. VARDEN	80	AD 021818	5008	0	0	5008	25.2	12-05-82	14-05-82	HELD 3 DAYS
COHO	DOL. VARDEN	DOL. VARDEN	80	AD 021902	10096	0	0	10096	25.2	14-05-82	14-05-82	HELD 0 DAYS
COHO	POST CREEK	POST CR	80	AD 021905	14575	420	0	14995	25.2	07-05-82	07-05-82	HELD 0 DAYS
COHO	SALWEIN	SALWEIN CR	80	AD 022114	19821	261	0	20082	25.2	17-05-82	17-05-82	HELD 0 DAYS
COHO	SALWEIN	CHILLIWACK	80	AD 022231	19916	161	2000	22077	25.2	11-05-82	11-05-82	HATCHRY RELEASE
COHO	POST CREEK	CHILLIWACK	80	AD 022232	19884	427	2000	22311	25.2	11-05-82	16-05-82	HATCHRY RELEASE
COHO	DOL. VARDEN	DOL. VARDEN	80	AD 022233	15069	137	100	15306	25.2	02-05-82	14-05-82	HELD 13 DAYS
COHO	DOL. VARDEN	CHILLIWACK	80	AD 022245	14865	105	0	14970	25.2	11-05-82	16-05-82	HATCHRY RELEASE
COHO	SALWEIN	SALWEIN CR	80	AD 022246	20542	187	0	20729	25.2	05-05-82	05-05-82	HELD 1 DAY
TOTALS FOR COHO					139776	1698	4100	145574				
WSTH	CHILLIWACK	VEDDER R	81	AD 121703	11833	4647	0	16480	115.2	10-05-82	10-05-82	.....
WSTH	CHILLIWACK	SLESSE	81	AD 121811	12871	3737	0	16608	100.9	13-05-82	13-05-82	.....
WSTH	CHILLIWACK	FOLEY CR	81	AD 121917	15452	1163	0	16615	111.2	11-05-82	11-05-82	.....
WSTH	CHILLIWACK	CHILLIWACK	81	AD 121918	10479	6207	0	16686	103.6	12-05-82	12-05-82	.....
WSTH	CHILLIWACK	CENTRE CR.	82	NONECC1	0	0	10655	10655	2.0	30-08-82	30-08-82	FED FRY RELEASE
TOTALS FOR WSTH					50635	15754	10655	77044				
GRAND TOTALS					571134	22917	4033427	4627478				

Table 4 (cont'd.)

CHILLIWACK RIVER

Assessment:

chinook - single CWT group per stock released from the hatchery to evaluate contribution to catch and escapement and particularly to discriminate early-run Pitt and Chilliwack stocks
- an additional group of Pitt River chinook were CWT marked and returned to the Pitt

chum - planned early (RV) and late (AdLV and LV) releases each of 100,000 marks to determine the effect of release date on survival
- plan disrupted by disease outbreak among late group
- RV group was poor quality at release; AdLV and LV groups were average quality at release
- comparison of AdLV versus LV marked returns will provide data on regeneration of clipped ventral fins

coho - 9 CWT release groups to determine homing behaviour and survival in relation to release strategy
- release of all 3 stocks from both hatchery and in homestream; in addition some Dolly Varden and Salwein coho were held in homestream prior to release

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	No. Juveniles Released
Chinook	Chilliwack	1981	Smolt	28,800	4,975
	Pitt	1981	Smolt	54,000	60,365
	Pitt	1981	Fed Fry	54,000	49,300
	Harrison	1981	Smolt	360,000	356,388
Chum	Chilliwack	1981	Fed Fry	3,750,000	3,933,832
Coho	Dolly Varden	1980	Smolt	169,000	45,380
	Salwein	1980	Smolt	84,000	62,888
	Post	1980	Smolt	84,000	37,306

Chinook: Chilliwack stock egg target was as many as possible but low production was expected due to weak stock strength. Escapement was extremely low. Pitt river chinook were identified as a high priority enhancement target and as a probable source of eggs for establishing an early-run Chilliwack stock. Egg-take was permitted from one-third of the escapement to a maximum of 30 females. Juveniles were to be released in equal numbers to the Pitt and to the Chilliwack. The Pitt release was at the fed fry stage at the request of management biologists. Harrison chinook were selected as the major chinook production stock for Chilliwack Hatchery until an early-run stock, strong enough to utilize hatchery capacity, could be identified and approved for transplant.

Chum: Fed fry production as planned.

Coho: Production was directed at the three major tributary stocks as planned. Egg-takes were less than expected due to brood stock availability.

Table 4 (cont'd)

CONUMA RIVER

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHIN	CONUMA	CONUMA	81	AD 022203	64484	9721	77795	152000	2.5	12-06-82	15-06-82	.....
TOTALS FOR CHIN					64484	9721	77795	152000				
CHUM	SUCWOA	SUCWOA	81	LV14	32645	0	992355	1025000	0.9	26-04-82	26-04-82	MID RELEASE
CHUM	SUCWOA	SUCWOA	81	RV12	32728	2860	496312	531900	0.7	12-04-82	12-04-82	EARLY RELEASE
CHUM	CANTON	CANTON CR	81	AD 022206	97738	5252	314610	417600	1.4	16-04-82	16-04-82	.....
CHUM	SUCWOA	SUCWOA	81	AD 022255	28995	6023	478582	513600	1.9	11-04-82	11-04-82	HTD INCUB WATER
CHUM	SUCWOA	SUCWOA	81	AD 022256	26919	2794	1967287	1997000	0.9	17-05-82	17-05-82	LATE RELEASE
CHUM	TLUPANA	TLUPANA	81	ADRV13	97241	4050	274209	375500	1.7	23-04-82	23-04-82	EARLY RUN
CHUM	CONUMA	CONUMA	81	NONE21	0	0	1578000	1578000	1.2	23-04-82	24-04-82	.....
CHUM	CONUMA	CONUMA	81	NONE22	0	0	2503000	2503000	1.1	27-04-82	28-04-82	.....
CHUM	DESERTED	DESERTED L.	81	NONE55	0	0	3782200	3782200	1.0	28-04-82	30-04-82	.....
TOTALS FOR CHUM					316266	20979	12386555	12723800				
COHO	CONUMA	CONUMA	81	RV15	50868	513	0	51381	1.1	23-04-82	23-04-82	UP.RIVER REL.
COHO	CONUMA	CONUMA	81	NONE20	0	0	49000	49000	15.3	07-09-82	07-09-82	HATCHRY RELEASE
TOTALS FOR COHO					50868	513	49000	100381				
GRAND TOTALS					431618	31213	12513350	12976181				

CONUMA RIVER

Assessment:

chinook - single CWT group to determine survival to catch and escapement

chum - all chum marking studies designed with consideration given to determination of rates of straying

Sucwoa chum

- planned to release 5 mark groups as follows:
  - April 5 - accelerated production (35,000 CWT)
  - April 5 - production (35,000 RV)
  - April 20 - production (35,000 LV)
  - April 20 - production (35,000 CWT)
  - May 5 - production (35,000 CWT)

  to determine effect of release date on survival; effect of size of fish released April 5 on survival; and to provide data on fin regeneration (LV versus CWT released April 20)
- release dates selected to encompass wild fry timing peak
- study disrupted since production fish were too small to be tagged for mid-April release and late release group went off feed and suffered significant mortality. Late release group was eventually tagged (CWT 02-22-56) but fish were poor to average quality.
- Sucwoa stock is the production index for Tlupana Inlet off-site fry plants

Canton chum

- single CWT group to determine survival to catch and escapement
- Canton stock was not marked in previous years of hatchery operation

Tlupana chum

- single mark group to determine survival to catch and escapement

Deserted and Conuma chum

- survival of unmarked stocks will be estimated from survival rates for similar marked release groups (probably Sucwoa CWT 02-22-56; Sucwoa LV; Canton CWT 02-22-06 but will depend on observed survival rates)

coho - marked (RV) upriver fed fry plant to evaluate contribution to escapement
- unmarked fall hatchery release will not be assessed

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	No. Juveniles Released
Chinook	Conuma	1981	Smolt	144,000	152,000
Chum	Sucwoa	1981	Fed Fry	2,160,000	4,067,500
	Canton	1981	Fed Fry	360,000	417,600
	Tlupana	1981	Fed Fry	360,000	375,500
	Conuma	1981	Fed Fry	2,160,000	4,081,000
	Deserted	1981	Fed Fry	4,000,000	3,782,800
	Total			9,040,000	12,723,800
Coho	Conuma	1981	Fed Fry	72,000	100,381

Chinook: Capacity was 2,000,000 eggs (1,440,000 smolts) but production constraints were expected due to low escapement levels.

Chum: Original design was for 3,600,000 fed fry release per stock, except Deserted, which was to be a fed fry release of 2,160,000 (total capacity of 16,600,000 fed fry). Decision to increase Deserted, at least during the rebuilding phase, was based on the fact this stock migrates later and could be fished discretely. Release targets in 1982 reflect this approach and the expected brood stock numbers. Canton, Tlupana and Deserted production was close to expectation whereas Sucwoa and Conuma production was about double pre-season forecast. Total production was still only about 75% of design capacity.

Coho: 1982 was the first year of hatchery coho releases. Plans were to release 72,000 fed fry to the upper river to rebuild the stock and to help compensate for interceptions during the chum fishery. Subsequent evaluation suggested upriver release targets were too high, therefore a pre-summer release of small fry was made above the falls to utilize inaccessible habitat while the remainder were released below the falls in the fall. It was assumed fall-released fry would interact less with wild fry than would earlier released fry.

Table 4 (cont'd)

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                                                FULTON RIVER                                              PAGE 1

                                                                                          RELEASE DATE
                     RELEASE     BROOD                          NO. RELEASED           SIZE    START     END
SPECIES  STOCK       SITE        YEAR   MARK       MARKED  INCOMPL.  UNMARK    TOTAL  (GRAM) DD-MM-YY DD-MM-YY  COMMENTS

 SOCK    FULTON      FULTON CH.   81   NONE57         0         0 65600000 65600000    0.1   15-04-82 07-06-82  ...............
 SOCK    FULTON      FULTON R.    81   NONE58         0         0 72700000 72700000    0.1   15-04-82 07-06-82  ...............

- - - - - T O T A L S FOR  SOCK - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                      0         0 138300000 138300000
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


- - - - - - - - - - - - - - - - - - - - - - - - - - G R A N D   T O T A L S - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                      0         0 138300000 138300000
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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FULTON RIVER

Assessment:

sockeye - project contribution to catch will be estimated based on escapement counts, stock timing data and total Skeena catch

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	No. Juveniles Released
Sockeye	Fulton	1981	Fry		
			Chan. 1	15,000,000	12,300,000
			Chan. 2	72,000,000	53,300,000
			River	27,000,000	72,700,000
			Total	114,000,000	138,300,000

Sockeye: Production targets were based on estimated spawning area and required area per female. Channel 1 egg deposition was lower than projected. Channel 2 egg deposition was slightly higher than expected but survival to fry was low (26.9%). River deposition was about twice that expected and survival to fry was high (24.0%) resulting in very high fry output.

Table 4 (cont'd)

INCH CREEK

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHUM	BLANEY CR	BLANEY CR	81	AD 022160	34324	3395	836148	873867	1.5	09-03-82	31-03-82	LATE RELEASE
CHUM	BLANEY CR	BLANEY CR	81	AD 022224	39311	1504	904780	945595	1.5	09-03-82	31-03-82	EARLY RELEASE
CHUM	INCH	INCH CR	81	NONE1	0	0	1284194	1284194	1.0	28-04-82	17-05-82	.....
TOTALS FOR CHUM					73635	4899	3025122	3103656				
COHO	SIDDLE	UPR.SIDDLE	81	AD 022249	32879	1069	5535	39483	3.7	06-07-82	08-07-82	.....
COHO	NICOMEN	SIDDLE CR.	81	AD 022251	33535	352	7226	41113	3.4	06-07-82	08-07-82	.....
COHO	INCH	INCH CR	81	NONE2	0	0	10095	10095	3.4	07-07-82	07-07-82	.....
COHO	NORRISH	NORRISH CR.	81	NONE3	0	0	4695	4695	2.7	07-07-82	07-07-82	.....
COHO	SQUAKUM	SQUAKUM CR	81	NONE4	0	0	1000	1000	2.3	17-06-82	17-06-82	.....
TOTALS FOR COHO					66414	1421	28551	96386				
CUTT	INCH	NICOMEN SL.	81	LMAXCC3	10191	0	0	10191	72.8	05-28-82	06-01-82	.....
CUTT	INCH	STAVE R.	81	LMAXCC4	4523	0	0	4523	94.9	03-11-83	03-11-83	.....
CUTT	INCH	BRUN/MARSHAL	81	LMAXCC5	5000	0	0	5000	55.0	04-06-82	04-06-82	.....
TOTALS FOR CUTT					19714	0	0	19714				
GRAND TOTALS					159763	6320	3053673	3219756				

Table 4 (cont'd.)

INCH CREEK

Assessment:

chum - Inch stock
- planned to CWT 3 groups of 35,000 for release on different dates
- not done due to manpower constraints
- assessment will be based on return of unmarked fish

chum - Blaney stock
- planned to CWT 3 groups of 40,000 representing different release strategies
- plan abandoned due to increasing fry mortality during marking
- released 2 groups on different dates
- release dates represent beginning and end of a trickle release

coho - all stocks
- marked only Bell and Nicomen coho; other populations too small
- purpose to evaluate contribution of fed fry plants
- contribution of unmarked stocks will be estimated from that of marked stocks

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	No. Juveniles Released
Chum	Inch	1981	Fed Fry	1,440,000	1,284,194
	Blaney	1981	Fed Fry	1,440,000	1,819,462
	Stave	1981	Fed Fry	1,440,000	0
	Total			4,320,000	3,103,656
Coho	Inch	1981	Fed Fry	73,000	10,095
	Nicomen	1981	Fed Fry	36,000	41,113
	Siddle	1981	Fed Fry	61,000	39,483
	Norrish	1981	Fed Fry	16,000	4,695
	Squakum	1981	Fed Fry	16,000	1,000
	Total			202,000	96,386

Chum: Plan was approximately equal enhancement of the Inch, Blaney and Stave stocks but with the option of reduced production of Blaney stock and increased production of Stave stock. No Stave stock was taken due to manpower restrictions.

Coho: All coho stocks identified by the GWG were enhanced but production fell short of target due to low escapement levels and manpower restrictions.

Table 4 (cont'd)

JONES CREEK

PAGE 1

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHUM	JONES	JONES CR	81	NONE26	0	0	251400	251400	0.4	25-03-82	10-06-82	.....
T O T A L S FOR CHUM					0	0	251400	251400				
PINK	JONES	JONES CR	81	NONE27	0	0	1572400	1572400	0.3	09-04-82	10-06-82	.....
T O T A L S FOR PINK					0	0	1572400	1572400				
G R A N D T O T A L S					0	0	1823800	1823800				

JONES CREEK

Assessment:

chum, pink

- no marking
- assessment will be based on return of unmarked fish
- chum are incidental to pink production

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	Released
Chum	Jones	1981	Fry	168,000	251,000
Pink	Jones	1981	Fry	1,200,000	1,572,000

Chum: Production in the spawning channel is incidental to pink production.

Pink: Production as planned.

Table 4 (cont'd)

KALUM

PAGE 1

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHIN	CED/CLR	CEDAR CR	81	AD 022149	16204	163	12433	28800	1.9	27-04-82	28-04-82	UNHEATED WATER
CHIN	CED/CLR	CLEAR R.	81	AD 022311	18937	191	8872	28000	1.8	20-04-82	22-04-82	HEATED WATER
CHIN	KALUM	KALUM R	81	AD 022312	23234	235	6781	30250	1.4	05-05-82	06-05-82	UNHEATED WATER
CHIN	KALUM	KALUM R	81	AD 022313	29459	298	40643	70400	1.4	05-05-82	06-05-82	HEATED WATER
TOTALS FOR CHIN					87834	887	68729	157450				
GRAND TOTALS					87834	887	68729	157450				

KALUM

Assessment:

chinook - planned to release 4 CWT groups with 30,000 marks per group to evaluate benefits of heating water for chinook rearing as follows:

Clear River stock - large (heated water) versus small (ambient water) release size

Kalum River stock - large (heated water) versus small (ambient water) release size

- plan disrupted due to inadequate water heating system (therefore no significant size differences were achieved within each stock), and many fish did not reach taggable size early enough to tag planned numbers
- for evaluation CWT 02-21-49 and 02-23-11 will be combined and CWT 02-23-12 and 13 will be combined

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	Released
Chinook	Cedar	1981	Fed Fry	72,000	56,800
	Clear	1981	Fed Fry		
	Kalum	1981	Fed Fry	72,000	100,650

Chinook: The original plan was to take a total of 100,000 eggs with release of 72,000 smolts. This was increased to 200,000 eggs in discussion with the GWG. The eggs were to be 50% upriver (Cedar, Clear) stock and 50% Kalum stock. Upriver fish were desireable because they are early (resulting in larger smolts released from the hatchery) and adult returns could be easily monitored using inexpensive fences. The lower river stock, Kalum, was a larger stock from which to take eggs and offered an opportunity to release smaller smolts at the same time as the upriver stocks were released. Since the intent of the pilot was to compare growth and post-release survival of chinook reared at ambient and heated water temperatures, the potential size differences and the ability to monitor escapement were important considerations.

Table 4 (cont'd)

KITIMAT

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHIN	KITIMAT	KITIMAT	81	AD 021961	10205	155	68000	78360	4.4	04-06-82	07-06-82	PILOT 2
CHIN	HIRSCH	HIRSCH R	81	AD 022137	19313	1307	0	20620	5.4	13-05-82	14-05-82	PILOT 1
CHIN	KITIMAT	KITIMAT	81	AD 022222	42110	8390	9990	60490	6.5	10-05-82	13-05-82	PILOT 1
TOTALS FOR CHIN					71628	9852	77990	159470				
CHUM	KITIMAT	KITIMAT	81	NONE29	0	0	30345	30345	2.7	28-03-82	18-04-82	PILOT 2
TOTALS FOR CHUM					0	0	30345	30345				
COHO	KITIMAT	KITMAT TRIB	81	NONE30	0	0	54000	54000	1.6	18-05-82	21-05-82	PILOT 2
TOTALS FOR COHO					0	0	54000	54000				
STHD	CHIST	KITIMAT	82	NONE28	0	0	25600	25600	1.5	01-10-82	01-10-82	PILOT 1
TOTALS FOR STHD					0	0	25600	25600				
GRAND TOTALS					71628	9852	187935	269415				

KITIMAT

Assessment:

chinook - Hirsch and Kitimat mainstem stocks marked discretely to evaluate stock integrity and contribution
- Kitimat stock reared at two different pilot sites marked discretely to evaluate relative survival

chum - no assessment

coho - no assessment

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	No. Juveniles Released
Chinook	Kitimat	1981	Smolt	100,000	138,850
	Hirsch	1981	Smolt		20,620
Chum	Kitimat	1981	Fed Fry	36,000	30,345
Coho	Kitimat	1981	Fed Fry	36,000	54,000

Chinook: Top priority for the pilot operation was continued production of Kitimat system (includes Hirsch) stocks. Kitimat mainstem and Hirsch stocks were kept separate through the fish culture process and were released to the stream of origin. Two pilot sites were operated.

Chum: Minor egg-takes were approved to provide background data using the Pilot 2 site in preparation for large-scale production when the major hatchery became operational.

Coho: Minor egg-take as for chum.

Table 4 (cont'd)

LITTLE QUALICUM

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHIN	BG QUALICUM	LT QUALICUM	81	AD 022419	81112	1068	1328977	1411157	7.0	11-06-82	11-06-82	.....
- - - - - T O T A L S FOR CHIN - - - - -					81112	1068	1328977	1411157				
CHUM	LT QUALICUM	LT QUALICUM	81	LV17	91392	8164	2648253	2747809	0.7	07-05-82	14-05-82	FED FRY RELEASE
CHUM	LT QUALICUM	LT QUALICUM	81	ADLV16	230069	21648	1195160	1446877	0.4	15-04-82	01-05-82	FRY RELEASE
- - - - - T O T A L S FOR CHUM - - - - -					321461	29812	3843413	4194686				
STHD	WILD-BQR	LT QUALICUM	81	AD121707/8	17964	837	6811	25612	54.3	07-04-82	07-04-82	CWT121708 INCLD
- - - - - T O T A L S FOR STHD - - - - -					17964	837	6811	25612				
- G R A N D T O T A L S -					420537	31717	5179201	5631455				

LITTLE QUALICUM

Assessment:

chinook - single CWT group to determine survival to catch and escapement
chum - unfed fry marked (AdLV) to determine survival of unfed channel fry
- fed fry marked (LV) to evaluate effect of rearing on post-release survival

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	No. Juveniles Released
Chinook	Big Qualicum	1981	Smolt	1,500,000	1,411,157
Chum	Little Qualicum	1981	Fry	13,000,000	1,446,877
		1981	Fed Fry	5,000,000	2,747,809

Chinook: Smolt production from fry transplanted from Big Qualicum as planned. Proposal to double chinook production was approved by GWG but facilities were not expanded to handle increased numbers.

Chum: Spawning channel capacity is 75,000,000 eggs but we projected natural spawning would contribute only 15,000,000 eggs due to low escapement and avoidance of the channel. A lower river egg-take of 10,000,000 eggs with transfer of eggs to the channel was planned to supplement natural egg deposition. As expected, channel fishway avoidance was a problem and although large numbers of adults accumulated below the fence, most migrated upriver when high flows eroded a channel around the fence. The supplementary egg-take was a failure (only 92,000 eggs were taken) due to low escapement and flooding. We projected (pre-season) 19,000,000 fry would be produced in the channel from a 25,000,000 egg deposition (natural spawning plus egg-take) and 6,000,000 fry would be transferred to rearing pens. In fact, egg deposition was very low, and only 4,219,000 fry were produced. Of these 2,772,126 were transferred to rearing pens and reared with final release of 2,748,000 fed fry. Chum rearing facilities were not expanded to handle 5,000,000 fed fry as originally intended as a result of the low egg deposition.

Table 4 (cont'd)

LOON CREEK

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	RELEASE DATE END DD-MM-YY	COMMENTS
CHIN	NICOLA	NICOLA R	81	AD 022415	23280	720	0	24000	3.3	26-04-82	30-04-82	UP.NICOLA REL.
CHIN	NICOLA	NICOLA R	81	AD 022416	7050	450	6800	14300	1.3	26-04-82	30-04-82	LOW.NICOLA REL.
CHIN	BONAPARTE	BONAPART R	81	AD 022417	29100	900	0	30000	2.7	26-04-82	30-04-82	UP.BONAP.REL.
CHIN	BONAPARTE	BONAPART R	81	AD 022418	15360	640	0	16000	2.7	26-04-82	30-04-82	LOW.BONAP.REL.
CHIN	BONAPARTE	BONAPART R	81	NONECW2	0		6500	6500	1.0	26-04-82	30-04-82	LOW.BONAP.REL.
TOTALS FOR CHIN					74790	2710	13300	90800				
GRAND TOTALS					74790	2710	13300	90800				

LOON CREEK

Assessment:

Bonaparte and Nicola chinook

- 2 CWT release groups per stock to evaluate upper and lower stocking sites in each river system
- returns from 6500 unmarked Bonaparte stock which were too small to tag may be estimated from relative survival rates of CWT 02-24-15 versus 02-24-17 and 02-24-18 applied to CWT 02-24-16
- planned to mark 30,000 fish per CWT group but inadequate number of fish

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	No. Juveniles Released
Chinook	Bonaparte	1981	Fed Fry	150,000	52,500
	Nicola	1981	Fed Fry	-	38,300

Chinook: Target production at the Provincial facility was 150,000 fed fry release of Bonaparte stock. The GWG agreed to supplementation of the egg-take to capacity using Nicola and Deadman stocks as required with return of these stocks to their homestream at the time of release.

Table 4 (cont'd)

MATHERS

PAGE 1

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHUM	MATHERS	MATHERS	81	LV19	40869	2412	396316	439597	0.7	24-05-82	26-05-82	SURFACE WATER
CHUM	MATHERS	MATHERS	81	RV18	40324	352	38279	78955	2.4	14-05-82	14-05-82	GROUND WATER
TOTALS FOR CHUM					81193	2764	434595	518552				
GRAND TOTALS					81193	2764	434595	518552				

MATHERS

Assessment:

- 2 mark groups to evaluate effect of groundwater incubation and rearing versus surface water incubation and rearing on post-release survival

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	Released
Chum	Mathers	1981	Fed Fry	320,000	518,552

Chum: Pilot capacity is approximately 1,000,000 eggs but projected egg-take was only 500,000 due to low population level. Incubation and rearing were on both ground and surface water as planned but most fish were on surface water.

Table 4 (cont'd)

NITINAT

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHIN	NITINAT	NITINAT	81	AD 022204	86435	1109	404080	491624	5.3	13-06-82	19-06-82	.....
TOTALS FOR CHIN					86435	1109	404080	491624				
CHUM	NITINAT	NITINAT	81	LV20	72092	1025	6747461	6820578	1.0	07-04-82	14-04-82	
CHUM	NITINAT	NITINAT	81	RV24	74214	574	6632358	6707146	1.4	25-05-82	25-05-82	
CHUM	NITINAT	NITINAT	81	ADLV23	74305	1053	2229478	2304836	1.2	15-05-82	15-05-82	
CHUM	NITINAT	NITINAT	81	ADRV21	71327	1032	6767525	6839884	0.7	15-04-82	15-04-82	
CHUM	NITINAT	NITINAT	81	NONEFC22	0	0	4506088	4506088	1.1	06-05-82	06-05-82	REL UNREP.
TOTALS FOR CHUM					291938	3684	26882910	27178532				
GRAND TOTALS					378373	4793	27286990	27670156				

NITINAT

Assessment:

chinook - single CWT group to determine survival to catch and escapement

chum - planned to release fish of similar size on four different dates to evaluate effect of time of release on survival
- dates for release selected to encompass wild fry timing peak
- study disrupted due to water supply failure which necessitated premature release of release group 2
- unmarked, unrepresented release group survival will be estimated from survival of most similar marked release group

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	No. Juveniles Released
Chinook	Nitinat	1981	Smolt	360,000	491,624
Chum	Nitinat	1981	Fed Fry	7,200,000	27,178,532

Chinook: Capacity is 1,500,000 eggs but an egg-take of 500,000 was projected based on low escapement levels. Production slightly exceeded expectations.

Chum: Hatchery capacity is 28,000,000 eggs (20,160,000 fed fry) but egg-take was slightly greater than design capacity (29,522,000) and survival to release was extremely high with the resultant release of over 27,000,000 juveniles. This is the largest single Canadian hatchery release in history. We expected, incorrectly, that production would be limited by brood stock availability. Over-capacity rearing populations were to be managed through sequential releases and this was done, but the release schedule was disrupted due to a major water supply failure.

Table 4 (cont'd)

PALLANT CREEK

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHUM	PALLANT	DEER BAY	81	AD 022144	30286	307	362669	393262	2.9	05-05-82	05-05-82	.....
CHUM	PALLANT	DEER BAY	81	AD 022146	24521	1296	371832	397649	2.9	13-05-82	13-05-82	.....
CHUM	PALLANT	DEER BAY	81	AD 022148	6112	325	0	6437	2.9	13-05-82	13-05-82	.....
CHUM	PALLANT	DEER BAY	81	NONE37	0	0	1648122	1648122	1.1	05-05-82	05-05-82	.....
CHUM	PALLANT	DEER BAY	81	NONE38	0	0	807235	807235	1.1	12-05-82	12-05-82	.....
CHUM	PALLANT	DEER BAY	81	NONE39	0	0	403058	403058	1.0	21-04-82	21-04-82	.....
CHUM	PALLANT	DEER BAY	81	NONE40	0	0	1350371	1350371	0.7	13-05-82	13-05-82	.....
CHUM	PALLANT	DEER BAY	81	NONE41	0	0	811712	811712	1.0	14-04-82	14-04-82	.....
CHUM	PALLANT	DEER BAY	81	NONE42	0	0	588074	588074	1.8	25-04-82	25-04-82	.....
CHUM	PALLANT	DEER BAY	81	NONE43	0	0	801469	801469	1.1	29-04-82	29-04-82	.....
TOTALS FOR CHUM					60919	1928	7144542	7207389				
COHO	PALLANT	MOSQUITO	81	AD 022402	31282	557	36184	68023	4.9	24-06-82	26-06-82	MOSQ.LK.REL.
COHO	PALLANT	MOSQUITO	81	NONE44	0	0	32689	32689	2.9	22-06-82	24-06-82	MOSQ.CR.REL.
COHO	PALLANT	PALLANT	81	NONE45	0	0	45571	45571	3.5	25-06-82	27-06-82	HATCHRY RELEASE
COHO	PALLANT	PALLANT	81	NONE46	0	0	46574	46574	3.2	21-06-82	25-06-82	UP.PALLANT REL.
TOTALS FOR COHO					31282	557	161018	192857				
STHD	PALLANT	PALLANT	81	RMAX25	4171	0	957	5128	1.7	22-07-82	23-07-82	.....
TOTALS FOR STHD					4171	0	957	5128				
GRAND TOTALS					96372	2485	7306517	7405374				

Table 4 (cont'd.)

PALLANT CREEK

Assessment:

chum
- planned to release 3 CWT groups each 40,000 tags on 3 different dates selected to encompass wild fry timing peak to evaluate the effect of release date on survival
- study disrupted due to slow fry growth which reduced time available to tag fish prior to specified release dates
- contribution of unmarked, unrepresented release groups will be estimated based on survival of marked release groups' total escapement, and accumulated observations from Pallant and other projects on the relative survival of fish released at different sizes and dates

coho
- planned to release 2 CWT groups each 40,000 marks to evaluate effect of release areas on survival but marking was disrupted due to high water temperatures
- survival of unmarked, unrepresented groups will be estimated based on total escapement and observed survival for previous releases relative to release sites

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	No. Juveniles Released
Chum	Pallant	1981	Fed Fry	1,440,000	7,207,389
Coho	Pallant	1981	Fed Fry	216,000	192,857

Chum: Plan was to take as many as possible to 7,000,000 eggs but a shortfall was expected (2,000,000 egg-take) due to low escapement. Production exceeded expectations.

Coho: Fed fry plants were intended to utilize upper Pallant and Mosquito Lake habitat. About 25% of the fry were released from the hatchery due to signs of high temperature stress in the lake-planted population and because we wished to seed the lower river.

Table 4 (cont'd)

PENNY

PAGE 1

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHIN	SLIM	SLIM CR	81	AD 022317	26287	1530	3524	31341	1.6	29-07-82	29-07-82	NO HOLDING
CHIN	SLIM	SLIM CR	81	AD 022318	26533	680	8504	35717	1.3	29-07-82	29-07-82	7 DAYS HOLDING
CHIN	BOWRON	BOWRON R	81	AD 022319	34017	1234	5302	40553	1.2	23-07-82	23-07-82	7 DAYS HOLDING
CHIN	BOWRON	BOWRON R	81	AD 022320	31851	485	11546	43882	1.2	23-07-82	23-07-82	NO HOLDING
TOTALS FOR CHIN					118688	3929	28876	151493				
GRAND TOTALS					118688	3929	28876	151493				

PENNY

Assessment:

Slim and Bowron chinook

- 2 CWT groups per stock to evaluate effect of holding (5-7 days) versus no holding at time of release in homestream on survival and homing

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	Released
Chinook	Slim	1981	Fed Fry	72,000	67,058
	Bowron	1981	Fed Fry	72,000	84,435

Chinook: This pilot program to evaluate fish culture success using cold water supplies, was expanded in 1981. Original plans were to produce Torpy and Morkill chinook at Penny, and Bowron and Slim chinook at Quesnel hatchery. However, because of constraints at Quesnel hatchery and the excessive costs associated with obtaining Torpy and Morkill broodstock, plans were amended to produce Slim and Bowron chinook at Penny.

Table 4 (cont'd)

PINKUT CREEK

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
SOCK	PINKUT	PINKUT CH.	81	NONE59	0	0	57700000	57700000	0.1	15-04-82	07-06-82	.....
SOCK	PINKUT	PINKUT CR	81	NONE60	0	0	42000000	42000000	0.1	15-04-82	07-06-82	.....
TOTALS FOR SOCK					0	0	99700000	99700000				
GRAND TOTALS					0	0	99700000	99700000				

PINKUT CREEK

Assessment:

sockeye - project contribution to catch will be estimated based on escapement counts, stock timing data and total Skeena catch

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	Released
Sockeye	Pinkut	1981	Fry		
			Channel	45,000,000	57,700,000
			River	3,000,000	20,400,000
			Upper river	-	21,600,000

Sockeye: Targets are based on available spawning area and expected egg-to-fry survival. Egg deposition in the channel was less than capacity (69,600,000 versus 90,000,000) but survival was exceptionally high (82.9%). Over-escapement to Pinkut Creek resulted in very high egg deposition (81,800,000 versus 27,000,000 optimum) but survival to fry was good (24.9%). The above production and survival estimates for the creek are complicated by transport of sockeye adults to the river above the falls, where they spawned. We planned to airlift 50,000 adults if escapement was excessive; in fact we transferred 91,000 adults. Resultant fry mixed with the lower river fry above the counting fence. It was assumed survival during incubation was equal above and below the falls.

Table 4 (cont'd)

PUNTLEDGE RIVER

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHIN	PUNT-FALL	PUNTLEDGE	81	AD 022263	42100	275	22218	64593	4.6	15-06-82	15-06-82	LATE RELEASE
CHIN	PUNT-FALL	PUNTLEDGE	81	AD 022301	41952	338	0	42290	4.0	01-06-82	01-06-82	EARLY RELEASE
CHIN	PUNT-SUMMER	PUNTLEDGE	81	AD 022302	50383	1211	148412	200006	6.3	14-06-82	14-06-82	.....
TOTALS FOR CHIN					134435	1824	170630	306889				
CHUM	PUNTLEDGE	PUNTLEDGE	81	AD 022252	37278	568	649169	687015	0.6	30-04-82	30-04-82	EARLY RELEASE
CHUM	PUNTLEDGE	PUNTLEDGE	81	AD 022253	34885	603	699548	735036	1.0	12-05-82	12-05-82	MID RELEASE
CHUM	PUNTLEDGE	PUNTLEDGE	81	AD 022254	36116	0	865225	901341	0.9	28-05-82	28-05-82	LATE RELEASE
CHUM	PUNTLEDGE	PUNTLEDGE	81	NONECC2	0	0	45686	45686	0.8	05-06-82	05-06-82	EXP.SUBSTR.GRP.
TOTALS FOR CHUM					108279	1171	2259628	2369078				
COHO	PUNTLEDGE	PUNTLEDGE	80	AD 022235	20802	732	303021	324555	21.4	07-05-82	07-05-82	LT.SPWN.PROGNY
COHO	PUNTLEDGE	PUNTLEDGE	80	AD 022236	18835	1202	321675	341712	20.2	07-05-82	07-05-82	MID.SPWN.PROGNY
COHO	PUNTLEDGE	PUNTLEDGE	80	AD 022237	17694	1665	315635	334994	18.9	06-05-82	06-05-82	EAR.SPWN.PROGNY
COHO	PUNTLEDGE	CRUICKSHANK	81	AD 022362	38034	0	459374	497408	2.5	08-06-82	15-06-82	FED FRY RELEASE
COHO	PUNTLEDGE	COMOX LAKE	81	AD 022363	33541	339	1627868	1661748	2.5	15-06-82	21-06-82	FED FRY RELEASE
COHO	PUNTLEDGE	UPR.PUNT.	81	AD 022401	34759	351	423787	458897	2.5	18-06-82	25-06-82	FED FRY RELEASE
COHO	PUNTLEDGE	UPR.PUNT.	81	NONE34	0	0	122134	122134	2.5	13-06-82	20-06-82	FED FRY RELEASE
COHO	PUNTLEDGE	BEVAN CR	81	NONE35	0	0	20510	20510	2.5	15-06-82	15-06-82	FED FRY RELEASE
TOTALS FOR COHO					163665	4289	3594004	3761958				
PINK	TSOLUM	TSOLUM	81	ADLVCC1	59529	562	538799	598890	0.2	14-03-82	14-04-82	FRY RELEASE
PINK	TSOLUM	COMOX BAY	81	ADRVCC1	26800	2813	0	29613	0.6	18-05-82	18-05-82	ESTUARY REARED
PINK	TSOLUM	COMOX BAY	81	LVCC1	53859	2479	0	56338	0.6	05-05-82	05-05-82	ESTUARY REARED
PINK	PUNTLEDGE	PUNTLEDGE	81	NONE32	0	0	50404	50404	0.2	28-03-82	01-04-82	FED FRY RELEASE
PINK	PUNTLEDGE	PUNTLEDGE	81	NONE33	0	0	50176	50176	0.9	18-04-82	18-04-82	ESTUARY REARED
PINK	TSOLUM	COMOX BAY	81	NONE63	0	0	26890	26890	0.9	18-04-82	18-04-82	ESTUARY REARED
PINK	PUNTLEDGE	PUNTLEDGE	81	NONECC3	0	0	819718	819718	0.2	28-01-82	01-04-82	FRY RELEASE
PINK	TSOLUM	COMOX BAY	81	RVCC1	23031	6582	0	29613	0.6	18-05-82	18-05-82	ESTUARY REARED
TOTALS FOR PINK					163219	12436	1485987	1661642				
SSTH	PUNTLEDGE	PUNTLEDGE	81	AD 121948	22259	4209	0	26468	39.8	27-05-82	29-05-82	.....
SSTH	PUNTLEDGE	PUNTLEDGE	82	NONE31	0	0	20436	20436	1.0	15-06-82	15-06-82	.....
TOTALS FOR SSTH					22259	4209	20436	46904				

Table 4 (cont'd)

PUNTLEDGE RIVER

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
WSTH	PUNTLEDGE	PUNTLEDGE	81	AD 121949	38390	569	0	38959	46.3	23-05-82	23-05-82	.....
TOTALS FOR WSTH					38390	569	0	38959				
GRAND TOTALS					630247	24498	7530685	8185430				

PUNTLEDGE RIVER

Assessment:

chum
- 3 CWT groups to evaluate effect of date of release on survival for fry of similar size
- release dates selected to encompass wild fry timing peak

coho
- smolts: 3 CWT groups representing timing of parental maturation
- fed fry: 3 CWT groups representing 3 major upriver colonization areas
- survival of unrepresented fed fry release groups will be estimated from survival of marked fed fry
- coho smolts were good quality at release despite minor incidence of cataract

Tsolum pink
- mark release designed to compare survival of unfed fry (AdLV) versus fed fry (all other clips); effect of date of release on survival of fed fry (LV versus RV and AdRV); and to provide some data on ventral fin clip regeneration (RV versus AdRV)
- LV group suffered minor early rearing disease problem (not identified); other pink groups were healthy

Puntledge pink
- no marking
- survival will be estimated from survival of Tsolum pink releases

fall chinook
- 2 CWT groups to evaluate effect of release date on survival
- both CWT groups are representative of "production"

summer chinook
- single CWT group to determine contribution to catch and escapement

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	Released
Chinook	Puntledge				
	Fall-run	1981	Smolt	360,000	106,883
	Summer-run	1981	Smolt	1,440,000	200,006
Chum	Puntledge	1981	Fed Fry	6,000,000	2,369,078
Coho	Puntledge	1980	Smolt	550,000	1,001,261
		1981	Fry	5,600,000	2,760,697

Pink	Puntledge	1981	Fry	320,000	819,718
		1981	Fed Fry	80,000	100,580
	Tsolum	1981	Fry	3,000,000	598,890
		1981	Fed Fry	250,000	142,454

Chinook: Fall-run chinook design capacity is 4,000,000 smolts but expected production was only 360,000 due to low escapement levels.

Summer-run chinook design capacity is 1,000,000 smolts. Targets were increased to a maximum 2,500,000 smolts with an expectation of 1,440,000 smolts (based on projected brood stock availability) to partially offset low fall chinook production levels.

Both chinook runs were very poor.

Chum: There were uncertainties as to whether the hatchery could support eggs and fry to yield 6,000,000 reared fish but final consensus was that the target was reasonable. Production was less than planned due to low adult escapement.

Coho: Targets reflect design rearing capacity but the balance between smolt and fry releases was to remain flexible until coho egg-takes reached full capacity (7,000,000). Smolt production of about 1,000,000 fish would continue until numbers of fry available for planting in the upper watershed reached 5,600,000. This was feasible since the coho rearing channels were capable of supporting more than the design target of 550,000 smolts. Fry released to the upper watershed were reared to 2.5 g before release to increase their subsequent survival and to further compensate for lower than target release numbers. Rearing of coho fry prior to release upriver is possible only as long as fall chinook production is less than capacity.

Pink: Release target numbers reflect capacity, but full Tsolum production was dependent on using raceways at the Tsolum site for incubation that were designed for rearing. Previous attempts to raise pinks were not very successful, particularly during freshwater rearing, but also during incubation. For this reason a number of strategies were planned including: incubation of Tsolum stock at Tsolum and Puntledge (to investigate poor incubation results at Puntledge); freshwater rearing of Tsolum stock at Puntledge and Tsolum (to investigate poor results obtained rearing Puntledge stock); saltwater rearing of both Tsolum and Puntledge stocks; fry release of both stocks. Puntledge pink egg-take was close to target but Tsolum egg-take was low due to poor escapement. Puntledge fry were released directly to the river (819,718); reared in freshwater (50,404); or reared in seapens (50,176). Tsolum eggs were incubated to the eyed stage at Puntledge then incubated to the fry stage at Puntledge or Tsolum. Tsolum fry produced at Puntledge were either released unfed to the Tsolum or seapen-reared then released. Tsolum fry produced at Tsolum were released directly without rearing or seapen-reared then released.

Table 4 (cont'd)

QUESNEL RIVER

PAGE 1

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHIN	QUESNEL	QUESNEL	81	AD 021903	5592	212	5000	10804	2.2	03-05-82	03-05-82	RED/WHITE CROSS
CHIN	QUESNEL	QUESNEL	81	AD 022247	24456	929	0	25385	5.0	03-05-82	03-05-82	WHITE
CHIN	QUESNEL	QUESNEL	81	AD 022248	25529	894	0	26423	4.3	03-05-82	03-05-82	RED
TOTALS FOR CHIN					55577	2035	5000	62612				
GRAND TOTALS					55577	2035	5000	62612				

QUESNEL RIVER

Assessment:

chinook - 3 CWT groups to evaluate whether red and white-fleshed chinook are discrete stocks and whether flesh colour must be considered for brood stock collection and enhancement

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	Released
Chinook	Quesnel	1981	Smolt	54,000	62,612
	Quesnel	1981	Yearling Smolt	50,000	0
	Cariboo	1981	Smolt	54,000	0
	Horsefly	1981	Smolt	54,000	0
	Blackwater	1981	Smolt	54,000	0
	Cottonwood	1981	Smolt	54,000	0
	Willow	1981	Smolt	54,000	0
	Slim	1981	Smolt	54,000	0
	Bowron	1981	Smolt	54,000	0

Chinook: Original plans to enhance a number of stocks using Quesnel Hatchery were disrupted due to late operational startup and budget constraints. Operations were contracted to a private firm. Bowron and Slim production was transferred to the Penny facility. Quesnel chinook were divided into three groups - red fleshed, white fleshed and hybrids.

Table 4 (cont'd)

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHIN	QUINSAM	QUINSAM	81	AD 022303	49802	150	130221	180173	8.2	14-05-82	14-05-82	EARLY RELEASE
CHIN	QUINSAM	QUINSAM	81	AD 022304	49953	251	208029	258233	7.9	04-06-82	04-06-82	LATE RELEASE
CHIN	QUINSAM	QUINSAM	81	AD 082119	6740	470	0	7210	2.2	05-05-82	05-05-82	TIM&SIZ 1ST REL
CHIN	QUINSAM	QUINSAM	81	AD 082120	9215	212	0	9427	2.4	05-05-82	05-05-82	TIM&SIZ 1ST REL
CHIN	QUINSAM	QUINSAM	81	AD 082121	8782	220	0	9002	2.2	05-05-82	05-05-82	TIM&SIZ 1ST REL
CHIN	QUINSAM	QUINSAM	81	AD 082122	9761	256	0	10017	2.7	05-05-82	05-05-82	TIM&SIZ 1ST REL
CHIN	QUINSAM	QUINSAM	81	AD 082123	10070	178	0	10248	2.9	05-05-82	05-05-82	TIM&SIZ 1ST REL
CHIN	QUINSAM	QUINSAM	81	AD 082124	10108	164	0	10272	3.2	05-05-82	05-05-82	TIM&SIZ 1ST REL
CHIN	QUINSAM	QUINSAM	81	AD 082125	9539	867	0	10406	3.7	05-05-82	05-05-82	TIM&SIZ 1ST REL
CHIN	QUINSAM	QUINSAM	81	AD 082126	9754	667	0	10421	3.7	05-05-82	05-05-82	TIM&SIZ 1ST REL
CHIN	QUINSAM	QUINSAM	81	AD 082127	9622	675	0	10297	3.8	05-05-82	05-05-82	TIM&SIZ 1ST REL
CHIN	QUINSAM	QUINSAM	81	AD 082128	9434	708	0	10142	5.3	26-05-82	26-05-82	TIM&SIZ 2ND REL
CHIN	QUINSAM	QUINSAM	81	AD 082129	9590	581	0	10171	5.2	26-05-82	26-05-82	TIM&SIZ 2ND REL
CHIN	QUINSAM	QUINSAM	81	AD 082130	9072	865	0	9937	5.5	26-05-82	26-05-82	TIM&SIZ 2ND REL
CHIN	QUINSAM	QUINSAM	81	AD 082131	10184	186	0	10370	6.9	26-05-82	26-05-82	TIM&SIZ 2ND REL
CHIN	QUINSAM	QUINSAM	81	AD 082132	10302	160	0	10462	6.9	26-05-82	26-05-82	TIM&SIZ 2ND REL
CHIN	QUINSAM	QUINSAM	81	AD 082133	9776	213	0	9989	6.7	26-05-82	26-05-82	TIM&SIZ 2ND REL
CHIN	QUINSAM	QUINSAM	81	AD 082134	10205	100	0	10305	8.4	26-05-82	26-05-82	TIM&SIZ 2ND REL
CHIN	QUINSAM	QUINSAM	81	AD 082135	10394	106	0	10500	8.1	26-05-82	26-05-82	TIM&SIZ 2ND REL
CHIN	QUINSAM	QUINSAM	81	AD 082136	10169	0	0	10169	8.2	26-05-82	26-05-82	TIM&SIZ 2ND REL
CHIN	QUINSAM	QUINSAM	81	AD 082137	9478	653	0	10131	8.4	16-06-82	16-06-82	TIM&SIZ 3RD REL
CHIN	QUINSAM	QUINSAM	81	AD 082138	9763	610	0	10373	7.8	16-06-82	16-06-82	TIM&SIZ 3RD REL
CHIN	QUINSAM	QUINSAM	81	AD 082139	9400	559	0	9959	7.3	16-06-82	16-06-82	TIM&SIZ 3RD REL
CHIN	QUINSAM	QUINSAM	81	AD 082140	10022	207	0	10229	10.4	16-06-82	16-06-82	TIM&SIZ 3RD REL
CHIN	QUINSAM	QUINSAM	81	AD 082141	10417	181	0	10598	9.6	16-06-82	16-06-82	TIM&SIZ 3RD REL
CHIN	QUINSAM	QUINSAM	81	AD 082142	9739	229	0	9968	8.9	16-06-82	16-06-82	TIM&SIZ 3RD REL
CHIN	QUINSAM	QUINSAM	81	AD 082143	10602	0	0	10602	11.2	16-06-82	16-06-82	TIM&SIZ 3RD REL
CHIN	QUINSAM	QUINSAM	81	AD 082144	10119	0	0	10119	12.3	16-06-82	16-06-82	TIM&SIZ 3RD REL
CHIN	QUINSAM	QUINSAM	81	AD 082145	10059	90	0	10149	10.5	16-06-82	16-06-82	TIM&SIZ 3RD REL
CHIN	QUINSAM	QUINSAM	81	AD 082146	9074	734	0	9808	10.2	07-07-82	07-07-82	TIM&SIZ 4TH REL
CHIN	QUINSAM	QUINSAM	81	AD 082147	9249	881	0	10130	9.8	07-07-82	07-07-82	TIM&SIZ 4TH REL
CHIN	QUINSAM	QUINSAM	81	AD 082149	9578	171	0	9749	13.4	07-07-82	07-07-82	TIM&SIZ 4TH REL
CHIN	QUINSAM	QUINSAM	81	AD 082150	6859	129	0	6988	12.8	07-07-82	07-07-82	TIM&SIZ 4TH REL
CHIN	QUINSAM	QUINSAM	81	AD 082152	9704	0	0	9704	16.5	07-07-82	07-07-82	TIM&SIZ 4TH REL
CHIN	QUINSAM	QUINSAM	81	AD 082153	9206	0	0	9206	15.7	07-07-82	07-07-82	TIM&SIZ 4TH REL
T O T A L S FOR CHIN					415741	11473	338250	765464				
CHUM	QUINSAM	QUINSAM	81	NONE25	0	0	71565	71565	0.9	09-06-82	09-06-82	ESTUARY REARED
T O T A L S FOR CHUM					0	0	71565	71565				
COHO	QUINSAM	QUINSAM	80	AD 022227	19501	118	246935	266554	25.2	18-05-82	02-06-82	1 EYE GOOD
COHO	QUINSAM	QUINSAM	80	AD 022228	18835	152	234947	253934	23.3	18-05-82	02-06-82	1 EYE GOOD
COHO	QUINSAM	QUINSAM	80	AD 022229	19050	173	200916	220139	23.3	18-05-82	02-06-82	1 EYE GOOD

Table 4 (cont'd)

QUINSAM PAGE 2

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	RELEASE DATE END DD-MM-YY	COMMENTS
COHO	QUINSAM	QUINSAM	80	AD 022230	18852	145	516207	535204	24.0	15-05-82	02-06-82	BLIND
COHO	QUINSAM	UPR QUINSAM	81	NONE61	0	0	263000	263000	10.0	15-09-82	17-09-82	COLONIZATION
- - - - - T O T A L S FOR COHO - - - - -					76238	588	1462005	1538831				
PINK	QUINSAM	CAMP.ESTURY	81	LV4	30022	0	62266	92288	0.5	30-04-82	30-04-82	LATE RELEASE
PINK	QUINSAM	CAMP.ESTURY	81	RV3	60394	0	66600	126994	0.3	16-04-82	16-04-82	EARLY RELEASE
PINK	QUINSAM	CAMP.ESTURY	81	ADLV5	30124	0	0	30124	0.4	30-04-82	30-04-82	LATE RELEASE
PINK	QUINSAM	QUINSAM	81	ADRV6	60525	0	3232817	3293342	0.2	23-03-82	20-04-82	FRY RELEASE
PINK	QUINSAM	BEAR R	81	NONE56	0	0	1819812	1819812	0.2	02-05-82	13-05-82	TRANSPLANT
- - - - - T O T A L S FOR PINK - - - - -					181065	0	5181495	5362560				
STHD	QUINSAM	QUINSAM	81	AD 121950	17405	184	0	17589	77.8	18-04-82	25-05-82	.....
STHD	QUINSAM	UPR QUINSAM	82	LMAX2	14060	0	14060	29200	5.1	15-09-82	15-09-82	.....
STHD	SALMON R.	SALMON R.	82	NONE23	0	0	44613	44613	0.8	28-07-82	28-07-82	.....
STHD	QUINSAM	QUINSAM	82	RMAX1	15000	0	3000	18000	5.1	15-09-82	15-09-82	MID.QUIN.REL.
- - - - - T O T A L S FOR STHD - - - - -					46465	184	61673	109402				
- G R A N D T O T A L S -					719509	12245	7114988	7847822				

QUINSAM

Assessment:

chinook - 33 CWT groups to determine the effect of time and size at release on survival, age at maturity, etc. (T. Bilton)
- 2 CWT groups representing production releases of similar size smolts at different dates to evaluate effect on survival (considered good opportunity to obtain production-scale data to compare with Bilton's pilot-scale study data)
- CWT 02-23-04 is most representative of "production"

chum - no assessment

coho - studies in progress during rearing (eg. time and size at release) disrupted due to high incidence of cataract
- 3 CWT groups represent the bulk of production (1980 brood) - fish in these groups were selected randomly and had at least one good eye
- 1 CWT group (02-22-30) represents fish with cataracts in both eyes selected from all ponds
- hatchery contribution will be estimated applying survival rates for "normal" and "blind" marked fish to the estimated numbers of normal and blind fish in the population at the time of release
- CWT groups 02-22-27, 28, 29 are most representative of "production" (1980 brood)
- fed fry planted upstream in 1982 were not marked - contribution will be estimated based on survival data for earlier broods

pink - mark release designed to compare survival of unfed fry (AdRV) versus fed fry (all other clips); effect of release date on survival (RV versus LV and AdLV); and to provide some data on ventral fin-clip regeneration (LV and AdLV)
- in addition Quinsam pink were transplanted as fry to Bear River (Amor de Cosmos River) in an attempt to establish an odd-year run to the Bear
- assessment will be based on escapement of unmarked adults

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	No. Juveniles Released
Chinook	Quinsam	1981	Smolt	1,000,000	765,464
Chum	Quinsam	1981	Fed Fry	-	71,565
Coho	Quinsam	1980	Smolt	1,000,000	1,275,831
		1981	Fed Fry	400,000	263,000
Pink	Quinsam	1981	Fry	2,000,000	3,293,342
		1981	Fed Fry	500,000	249,406
		1981	Fed Fry	1,600,000	1,819,812

Chinook: Production was less than target due to low egg availability.

Chum: Pilot production to evaluate fish culture methods for chum. No plans for major enhancement.

Coho: Smolt production slightly in excess of target but compensated by high cataract incidence. Fed fry plants to the upper watershed were reduced from the original target reflecting estimated rearing capacity. Fry were released to a number of local streams through the Public Involvement Program.

Pink: Quinsam fry releases were in excess of original plan. This was possible due to expanded incubation facilities. Seapen releases were half of target due to shortage of pens. Transplant of Quinsam fry to the Bear River was done in an attempt to establish an odd-year run. Fry were held in the Bear River for two to four days before release.

Table 4 (cont'd)

ROBERTSON CREEK

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHIN	ROBRTSN. CR	ROBRTSN. CR	81	AD 022202	23396	118	1389223	1412737	3.8	09-06-82	11-06-82	.....
CHIN	NAHMINT	KANYON CR	81	AD 022238	15555	318	802	16675	5.8	05-06-82	05-06-82	.....
CHIN	ROBRTSN. CR	ROBRTSN. CR	81	AD 022354	16374	342	795	17511	4.5	08-06-82	08-06-82	10% CORN OIL
CHIN	ROBRTSN. CR	ROBRTSN. CR	81	AD 022355	15953	383	875	17211	4.5	08-06-82	08-06-82	10% HERRING OIL
CHIN	ROBRTSN. CR	ROBRTSN. CR	81	AD 022356	18549	249	815	19613	4.6	08-06-82	08-06-82	5,5%CORN&HERRNG
CHIN	ROBRTSN. CR	ROBRTSN. CR	81	AD 022405	51797	896	6322549	6375242	5.1	31-05-82	11-06-82	.....
TOTALS FOR CHIN					141624	2306	7715059	7858989				
COHO	ROBRTSN. CR	ROBRTSN. CR	80	AD 022240	48299	2196	52502	102997	24.2	13-05-82	14-05-82	LATE RELEASE
COHO	ROBRTSN. CR	ROBRTSN. CR	80	AD 022241	48606	2456	705545	756607	22.6	10-04-82	16-04-82	EARLY RELEASE
COHO	ROBRTSN. CR	ROBRTSN. CR	80	AD 022242	47837	3590	80231	131658	24.8	27-04-82	04-05-82	MID RELEASE
TOTALS FOR COHO					144742	8242	838278	991262				
STHD	ROBRTSN. CR	SOMASS R	81	AD 121702	27227	2368	0	29595	54.7	04-05-82	04-05-82	EARLY WILD
STHD	ROBRTSN. CR	SOMASS R	81	AD 121806	9809	99	2268	12176	66.8	04-05-82	05-05-82	RB. LATE WILD
STHD	ROBRTSN. CR	ROBRTSN. CR	81	AD 121810	37342	1556	7793	46691	56.8	26-04-82	13-05-82	RB. LATE HTCH.
STHD	ROBRTSN. CR	ROBRTSN. CR	81	AD 121946	24601	249	21883	46733	56.0	26-04-82	13-05-82	RB. EARLY HTCH.
STHD	SOMASS	SOMASS R	81	AD 121947	23482	479	0	23961	52.2	05-05-82	05-05-82	SOMASS WILD
STHD	ROBRTSN. CR	ELSIE L	82	NONE54	0	0	170224	170224	2.0	14-07-82	14-07-82	COLONIZ.
STHD	ROBRTSN. CR	ROBRTSN. CR	81	NONECW1	0	0	62653	62653	45.9	28-04-82	13-05-82	GRADE-OUTS
TOTALS FOR STHD					122461	4751	264821	392033				
GRAND TOTALS					408827	15299	8818158	9242284				

Table 4 (cont'd.)

ROBERTSON CREEK

Assessment:

Nahmint chinook

- single CWT group to identify stock in fishery
- adults were captured in Nahmint, eggs were incubated and reared at Robertson, smolts were returned to the Nahmint

Robertson chinook

- planned to mark 75,000 representing production on earth channel and 50,000 representing production in concrete raceways
- CWT 02-24-05 was applied as planned, but tagging of earth channel production (CWT 02-22-02) was discontinued because fish were smolting and stressed due to handling
- for this reason unmarked groups were reassigned representation to CWT 02-24-05 regardless of pond type since this group of marked fish was most similar to the unmarked groups at the time of release in terms of fish size
- 3 CWT groups to evaluate the influence of body-lipid composition on ocean survival (D. Higgs)
- CWT 02-24-05 is most representative of "production"

Robertson coho

- planned to release 3 CWT groups to evaluate heretability of adult migration timing
- plan was disrupted due to fish leaks between rearing groups
- revised release strategy to determine effect of release date on contribution to catch and escapement
- "production" is best represented by combining returns for the 3 CWT groups

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	No. Juveniles Released
Chinook	Robertson	1981	Smolt	9,000,000	7,842,314
	Nahmint	1981	Smolt	70,000	16,675
Coho	Robertson	1980	Smolt	1,000,000	991,262

General: Facilities were expanded for coho (increase from 500,000 to 2,000,000 smolts) and for steelhead in 1980, but the GWG opposed coho production increases (after construction was in progress) on the basis that there would be pressure to have a terminal coho fishery during September. This could cause mixed stock fishery problems for Sproat chinook and steelhead stocks. A compromise solution was to increase coho production to 1,000,000 instead of 2,000,000 smolts and to increase production of chinook from 6,000,000 to 9,000,000 smolts. Rearing facilities were adequate for this species shift but there has been an ongoing problem incubating the increased number of chinook eggs. Further it was agreed to determine if coho adult migration timing was heritable. If so, it may be possible to primarily enhance the early run coho so they could be fished at the same time as Robertson Creek chinook. Depending on the outcome of these studies, coho might then be increased to the original design target of 2,000,000 smolts.

Chinook: Production of Robertson Creek chinook was slightly below expectation. Nahmint chinook enhancement was initiated to rebuild this stock which is perceived as genetically unique by management biologists. Long-term plans call for a higher exploitation rate on the Robertson chinook stock by moving fishing boundaries to the west. Such a boundary shift would threaten the Nahmint stock. Production was limited by brood stock availability.

Coho: Production numbers were as planned. Eggs were taken from different segments of the adult migration to evaluate heritability of timing but the study was disrupted during the rearing process (fish leakage between parallel rearing channels). For this reason the heritability study was discontinued and the ponds were released on different dates to evaluate the effect of time of release on survival.

Table 4 (cont'd)

SNOOTLI

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	NO. RELEASED MARKED	INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHIN	ATNARKO	ATNARKO	81	AD 022154	34703	963	0	35666	1.6	27-05-82	06-06-82	10 DAYS HOLDING
CHIN	ATNARKO	ATNARKO	81	AD 022155	32041	889	6000	38930	1.0	31-05-82	06-06-82	NO HOLDING
CHIN	ATNARKO	NOOS/SALL	81	NONE53	0	0	20100	20100	2.0	12-07-82	18-07-82	COLONIZATION
- - - - - T O T A L S FOR CHIN - - - - -					66744	1852	26100	94696				
CHUM	FISH/AIR	FISH/AIR	81	LV32	35150	350	209628	245128	0.7	25-03-82	29-03-82	.....
CHUM	SALLOOMT	SALLOOMT	81	RV33	99100	1000	484105	584205	0.7	30-03-82	31-03-82	.....
CHUM	FISH/AIR	FISH/AIR	81	ADLV31	34250	700	206381	241331	0.7	25-03-82	29-03-82	.....
CHUM	NECLEET.	THORSEN	81	ADRV30	50050	1550	390045	441645	0.7	22-03-82	24-03-82	.....
CHUM	SNOOT/NUHLK	SNOOT/NUHLK	81	NONE49	0	0	620667	620667	0.8	24-03-82	07-04-82	.....
- - - - - T O T A L S FOR CHUM - - - - -					218550	3600	1910826	2132976				
COHO	L BEL COOLA	L BEL COOLA	81	AD 022136	19703	236	36661	56600	1.4	15-07-82	17-07-82	.....
- - - - - T O T A L S FOR COHO - - - - -					19703	236	36661	56600				
STHD	SNOOT/NUHLK	SALLOOMT	82	NONE47	0	0	49100	49100	0.4	16-08-82	16-08-82	FED FRY
STHD	SNOOT/NUHLK	HOTNARKO	82	NONE48	0	0	24000	24000	0.2	16-08-82	16-08-82	FED FRY
- - - - - T O T A L S FOR STHD - - - - -					0	0	73100	73100				
- G R A N D T O T A L S -					304997	5688	2046687	2357372				

Table 4 (cont'd.)

SNOOTLI

Assessment:

chum
- 3 stocks were marked (Fish-Air, Salloomt, Necleetsconnay) for evaluation of hatchery contribution
- Salloomt was previously selected as the index stock for satellited production in the Bella Coola system
- Fish-Air stock marking was split 50% AdLV and 50% LV to provide data on regeneration of clipped ventral fins
- contribution of unmarked stocks will be estimated directly from contribution of marked stocks within limits set by total catch and escapement
- Necleetsconnay chum were released in the lower Bella Coola due to budgetary constraints

coho
- single CWT group to evaluate survival of fed fry release

chinook
- 2 CWT groups released into Atnarko River to evaluate the effect of instream holding on homing behaviour and survival
- plans to tag lower Bella Coola colonization group were cancelled due to poor fish health

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	No. Juveniles Released
Chinook	Atnarko	1981	Fed Fry	72,000	94,696
Chum	Bella Coola	1981	Fed Fry	1,440,000	0
	Salloomt	1981	Fed Fry	432,000	584,205
	Snootli/Nuhalk	1981	Fed Fry	360,000	620,667
	Noosgulch	1981	Fed Fry	72,000	0
	Klonnick	1981	Fed Fry	72,000	0
	Fish	1981	Fed Fry	72,000	486,459
	Necleetsconnay	1981	Fed Fry	360,000	441,645
	Total			2,736,000	2,132,976
Coho	Bella Coola	1981	Fed Fry	72,000	56,600

Chinook: GWG approval to start enhancing Atnarko chinook was based on decreasing run size and on our agreement to tag released fish. Further it was agreed a portion could be released into the Salloomt River on the lower Bella Coola system.

Chum: Unlike some other river systems, every minor stock on the Bella Coola is viewed as discrete and enhancement is done on a stock by stock basis. This presents some difficulties in that fish captured in the mainstem (mainstem Bella Coola "stock") or captured at or near mainstem - tributary confluences may be enroute to tributaries. Therefore, in some cases, captured fish that are assumed to be a particular stock may actually be passing through to other spawning grounds. Regardless, our intended strategy is to maintain stock separation as much as practical until the question of stock discreteness is resolved through straying studies and related genetic studies.

No eggs were taken from the "mainstem stock" because of the above cited complications and logistical considerations.

There was insufficient escapement into the Noosgulch and Klonnick to proceed with egg-takes. Our contingency plan was to take Nuhalk/Thorsen and Fish chum eggs if Noosgulch and Klonnick did not produce - this was done. Necleetsconnay fry were to be released at 4 Mile in the lower Bella Coola but were accidentally released into Thorsen Creek.

Coho: Enhancement of lower Bella Coola stocks was initiated due to decreasing escapement levels. It was agreed fish would be planted as fry and tagged.

Table 4 (cont'd)

TENDERFOOT CREEK

SPECIES	STOCK	RELEASE SITE	BROOD YEAR	MARK	MARKED	NO. RELEASED INCOMPL.	UNMARK	TOTAL	SIZE (GRAM)	RELEASE DATE START DD-MM-YY	END DD-MM-YY	COMMENTS
CHIN	SQUAMISH	TENDERFOOT	81	AD 021946	59983	1224	10801	72008	5.5	27-04-82	29-04-82	INC/RFD AT CAP.
TOTALS FOR CHIN					59983	1224	10801	72008				
GRAND TOTALS					59983	1224	10801	72008				

TENDERFOOT CREEK

Assessment:
chinook - single CWT group to determine survival to catch and escapement

Production Strategies:

Species	Stock	Brood Year	Stage at Release	No. Juveniles Target	No. Juveniles Released
Chinook	Squamish	1981	Smolt	167,000	72,008

Chinook: Eggs were taken to Capilano hatchery for incubation and rearing since Tenderfoot hatchery was still under construction during fall/winter 1981/82. Egg-take was limited by brood stock availability and 20,000 fish were lost during transport from Capilano to Tenderfoot.

Table 5. Total 1982 chinook releases by production area, stock and stage at release.

Production Area	Facility	Stock	Unfed fry	Fed fry	Subyearling Smolts	Yearling Smolts	Total
Upper Fraser	Birkenhead	Birkenhead			35,959	9,754	45,713
	Loon	Bonaparte		52,500			52,500
		Nicola		38,300			38,300
	Penny	Bowron		84,435			84,435
		Slim		67,058			67,058
	Quesnel	Quesnel			62,612		62,612
		Sub-total		242,293	98,571	9,754	350,618
Lower Fraser	Capilano	Capilano			992,996	33,752	1,026,748
	Chilliwack	Chilliwack			4,975		4,975
		Dolly Varden					
		Harrison			356,388		356,388
		Pitt			109,665		109,665
		Post					
		Salwein					
	Inch	Siddle					
		Inch					
		Nicomen					
		Squakum					
		Norrish					
		Blaney					
	Jones Cr.	Jones					
	Tenderfoot	Cheakamus			72,008		72,008
		Sub-total			1,536,032	33,752	1,569,784

Table 5 (cont'd.)

Production Area	Facility	Stock	Unfed fry	Fed fry	Subyearling Smolts	Yearling Smolts	Total
Georgia/ Johnstone St.	Big Qualicum	Big Qualicum			3,466,788		3,466,788
		Englishman					
	Chemainus	Chemainus			13,723		13,723
	Little Qualicum	Big Qualicum			1,411,157		1,411,157
		Little Qualicum					
	Puntledge	Puntledge			306,889		306,889
		Tsolum					
	Quinsam	Quinsam			765,464		765,464
		Salmon					
		Sub-total			5,964,021		5,964,021
West Coast Vanc. Is.	Conuma	Canton					
		Conuma			152,000		152,000
		Sucwoa					
		Tlupana					
		Deserted					
	Nitinat	Nitinat			491,624		491,624
	Robertson Cr.	Nahmint			16,675		16,675
		Robertson			7,842,314		7,842,314
		Somass					
		Sub-total			8,502,613		8,502,613

Table 5 (cont'd.)

Production Area	Facility	Stock	Unfed fry	Fed fry	Subyearling Smolts	Yearling Smolts	Total
Central Coast	Snootli	Atnarko		94,696			94,696
		Fish/Air					
		Lower Bella Coola					
		Necleetsconnay					
		Salloomt					
		Snootli					
		Sub-total		94,696			94,696
North Coast	Kalum	Cedar/Clear		56,800			56,800
		Kalum		100,650			100,650
	Kitimat	Chist					
		Hirsch			20,620		20,620
		Kitimat			138,850		138,850
	Mathers	Mathers					
	Pallant	Pallant					
		Sub-total		157,450	159,470		316,920
Upper Skeena	Fulton	Fulton					
	Pinkut	Pinkut					
		Sub-total					
		TOTAL		494,439	16,260,707	43,506	16,798,652

Table 6. Total 1982 coho releases by production area, stock and stage at release.

Production Area	Facility	Stock	Unfed fry	Fed fry < 2g.	Fingerlings 2-5 g.	Fingerlings > 5g.	Smolts	Total
Upper Fraser	Birkenhead	Birkenhead						
	Loon	Bonaparte						
		Nicola						
	Penny	Bowron						
		Slim						
	Quesnel	Quesnel						
		Sub-total						
Lower Fraser	Capilano	Capilano	90,000	263,090	539,420		545,538	1,438,048
	Chilliwack	Chilliwack						
		Dolly Varden					45,380	45,380
		Harrison						
		Pitt						
		Post					37,306	37,306
		Salwein					62,888	62,888
	Inch	Siddle			39,483			39,483
		Inch			10,095			10,095
		Nicomen			41,113			41,113
		Squakum			1,000			1,000
		Norrish			4,695			4,695
		Blaney						
	Jones Cr.	Jones						
	Tenderfoot	Cheakamus						
		Sub-total	90,000	263,090	635,806		691,112	1,680,008

Table 6 (cont'd.)

Production Area	Facility	Stock	Unfed fry	Fed fry < 2g.	Fingerlings 2-5 g.	Fingerlings > 5g.	Smolts	Total
Georgia/ Johnstone St.	Big Qualicum	Big Qualicum		496,950		10,000	1,182,746	1,689,696
		Englishman						
	Chemainus	Chemainus			26,296			26,296
	Little Qualicum	Big Qualicum						
		Little Qualicum						
	Puntledge	Puntledge			2,760,697		1,001,261	3,761,958
		Tsolum						
	Quinsam	Quinsam				263,000	1,275,831	1,538,831
		Salmon						
		Sub-total		496,950	2,786,993	273,000	3,459,838	7,016,781
West Coast Vanc. Is.	Conuma	Canton						
		Conuma		51,381		49,000		100,381
		Sucwoa						
		Tlupana						
		Deserted						
	Nitinat	Nitinat						
	Robertson Cr.	Nahmint						
		Robertson					991,262	991,262
		Somass						
		Sub-total		51,381		49,000	991,262	1,091,643

Table 6 (cont'd.)

Production Area	Facility	Stock	Unfed fry	Fed fry < 2g.	Fingerlings 2-5 g.	Fingerlings > 5g.	Smolts	Total
Central Coast	Snootli	Atnarko						
		Fish/Air						
		Lower Bella		56,600				56,600
		Coola						
		Necleetsconnay						
		Salloomt						
		Snootli						
		Sub-total		56,600				56,600
North Coast	Kalum	Cedar/Clear						
		Kalum						
	Kitimat	Chist						
		Hirsch						
		Kitimat		54,000				54,000
	Mathers	Mathers						
	Pallant	Pallant			192,857			192,857
		Sub-total		54,000	192,857			246,857
Upper Skeena	Fulton	Fulton						
	Pinkut	Pinkut						
		Sub-total						
		TOTAL	90,000	922,021	3,615,656	322,000	5,142,212	10,091,889

Table 7. Total 1982 chum releases by production area, stock and stage at release.

Production Area	Facility	Stock	Unfed fry	Fed fry (freshwater)	Fed fry (saltwater)	Total
Upper Fraser	Birkenhead	Birkenhead				
	Loon	Bonaparte				
		Nicola				
	Penny	Bowron				
		Slim				
	Quesnel	Quesnel				
		Sub-total				
Lower Fraser	Capilano	Capilano				
	Chilliwack	Chilliwack		3,933,832		3,933,832
		Dolly Varden				
		Harrison				
		Pitt				
		Post				
		Salwein				
	Inch	Bell				
		Inch		1,284,194		1,284,194
		Nicomen				
		Squakum				
		Suicide				
		Blaney		1,819,462		1,819,462
	Jones Cr.	Jones	251,400			251,400
	Tenderfoot	Cheakamus				
		Sub-total	251,400	7,037,488		7,288,888

Table 7 (cont'd.)

Production Area	Facility	Stock	Unfed fry	Fed fry (freshwater)	Fed fry (saltwater)	Total
Georgia/ Johnstone St.	Big Qualicum	Big Qualicum	43,285,918	2,155,553		45,441,471
		Englishman				
	Chemainus	Chemainus				
	Little Qualicum	Big Qualicum				
		Litte Qualicum	1,446,877	2,747,809		4,194,686
	Puntledge	Puntledge		2,369,078		2,369,078
		Tsolum				
	Quinsam	Quinsam		71,565		71,565
		Salmon				
		Sub-total	44,732,795	7,344,005		52,076,800
West Coast Vanc. Is.	Conuma	Canton		417,600		417,600
		Conuma		4,081,000		4,081,000
		Sucwoa		4,067,500		4,067,500
		Tlupana		375,500		375,500
		Deserted		3,782,200		3,782,200
	Nitinat	Nitinat		27,178,532		27,178,532
	Robertson Cr.	Nahmint				
		Robertson				
		Somass				
		Sub-total		39,902,332		39,902,332

Table 7 (cont'd.)

Production Area	Facility	Stock	Unfed fry	Fed fry (freshwater)	Fed fry (saltwater)	Total
Central Coast	Snootli	Atnarko				
		Fish/Air		486,459		486,459
		Lower Bella Coola				
		Necleetsconnay		441,645		441,645
		Salloomt		584,205		584,205
		Snootli		620,667		620,667
		Sub-total		2,132,976		2,132,976
North Coast	Kalum	Cedar/Clear				
		Kalum				
	Kitimat	Chist				
		Hirsch				
		Kitimat		30,345		30,345
	Mathers	Mathers		518,552		518,552
	Pallant	Pallant			7,207,389	7,207,389
		Sub-total		548,897	7,207,389	7,756,286
Upper Skeena	Fulton					
	Pinkut					
		Sub-total				
		TOTAL	44,984,195	56,965,698	7,207,389	109,157,282

Table 8. Total 1982 pink releases by production area, stock and stage at release.

Production Area	Facility	Stock	Unfed fry	Fed fry (freshwater)	Fed fry (saltwater)	Total
Upper Fraser	Birkenhead	Birkenhead				
	Loon	Bonaparte				
		Nicola				
	Penny	Bowron				
		Slim				
	Quesnel	Quesnel				
		Sub-total				
Lower Fraser	Capilano	Capilano				
	Chilliwack	Chilliwack				
		Dolly Varden				
		Harrison				
		Pitt				
		Post				
		Salwein				
	Inch	Bell				
		Inch				
		Nicomen				
		Squakum				
		Suicide				
		Blaney				
	Jones Cr.	Jones	1,572,400			1,572,400
	Tenderfoot	Cheakamus				
		Sub-total	1,572,400			1,572,400

Table 8 (cont'd.)

Production Area	Facility	Stock	Unfed fry	Fed fry (freshwater)	Fed fry (saltwater)	Total
Georgia/ Johnstone St.	Big Qualicum	Big Qualicum				
		Englishman				
	Chemainus	Chemainus				
	Little Qualicum	Big Qualicum				
		Litte Qualicum				
	Puntledge	Puntledge	819,718	50,404	50,176	920,298
		Tsolum	598,890		142,454	741,344
	Quinsam	Quinsam	5,113,154		249,406	5,362,560
		Salmon				
		Sub-total	6,531,762	50,404	442,036	7,024,202
West Coast Vanc. Is.	Conuma	Canton				
		Conuma				
		Sucwoa				
		Tlupana				
		Deserted				
	Nitinat	Nitinat				
	Robertson Cr.	Nahmint				
		Robertson				
		Somass				
		Sub-total				

Table 8 (cont'd.)

Production Area	Facility	Stock	Unfed fry	Fed fry (freshwater)	Fed fry (saltwater)	Total
Central Coast	Snootli	Atnarko				
		Fish/Air				
		Lower Bella Coola				
		Necleetsconnay				
		Salloomt				
		Snootli				
		Sub-total				
North Coast	Kalum	Cedar/Clear				
		Kalum				
	Kitimat	Chist				
		Hirsch				
		Kitimat				
	Mathers	Mathers				
	Pallant	Pallant				
		Sub-total				
Upper Skeena	Fulton	Fulton				
	Pinkut	Pinkut				
		Sub-total				
		TOTAL	8,104,162	50,404	442,036	8,596,602

Table 9. Total 1982 sockeye releases by production area, stock and stage at release.

Production Area	Facility	Stock	Unfed fry	Total
Upper Fraser	Birkenhead	Birkenhead		
	Loon	Bonaparte		
		Nicola		
	Penny	Bowron		
		Slim		
	Quesnel	Quesnel		
		Sub-total		
Lower Fraser	Capilano	Capilano		
	Chilliwack	Chilliwack		
		Dolly Varden		
		Harrison		
		Pitt		
		Post		
		Salwein		
	Inch	Bell		
		Inch		
		Nicomen		
		Squakum		
		Suicide		
		Blaney		
	Jones Cr.	Jones		
	Tenderfoot	Cheakamus		
		Sub-total		

Table 9 (cont'd.)

Production Area	Facility	Stock	Unfed fry	Total
Georgia/ Johnstone St.	Big Qualicum	Big Qualicum		
		Englishman		
	Chemainus	Chemainus		
	Little Qualicum	Big Qualicum		
		Litte Qualicum		
	Puntledge	Puntledge		
		Tsolum		
	Quinsam	Quinsam		
		Salmon		
		Sub-total		
West Coast Vanc. Is.	Conuma	Canton		
		Conuma		
		Sucwoa		
		Tlupana		
		Deserted		
	Nitinat	Nitinat		
	Robertson Cr.	Nahmint		
		Robertson		
		Somass		
		Sub-total		

Table 9 (cont'd.)

Production Area	Facility	Stock	Unfed fry	Total
Central Coast	Snootli	Atnarko		
		Fish/Air		
		Lower Bella		
		Coola		
		Necleetsconnay		
		Salloomt		
		Snootli		
		Sub-total		
North Coast	Kalum	Cedar/Clear		
		Kalum		
	Kitimat	Chist		
		Hirsch		
		Kitimat		
	Mathers	Mathers		
	Pallant	Pallant		
		Sub-total		
Upper Skeena	Fulton	Fulton	138,300,000	138,300,000
	Pinkut	Pinkut	99,700,000	99,700,000
		Sub-total	238,000,000	238,000,000
		TOTAL	238,000,000	238,000,000

Table 10. Total 1982 steelhead and cutthroat releases by production area, stock and stage at release.*

Production Area	Facility	Stock	Unfed fry	Fed fry < 2g.	Fingerlings 2-5 g.	Fingerlings > 5g.	Smolts	Totals
Upper Fraser	Birkenhead	Birkenhead						
	Loon	Bonaparte						
		Nicola						
	Penny	Bowron						
		Slim						
	Quesnel	Quesnel						
		Sub-total						
Lower Fraser	Capilano	Capilano			16,747			16,747
	Chilliwack	Chilliwack			10,655		66,389	77,044
		Dolly Varden						
		Harrison						
		Pitt						
		Post						
		Salwein						
	Inch	Bell						
		Inch						
		Nicomen						
		Squakum						
		Suicide						
		Blaney						
	Jones Cr.	Jones						
	Tenderfoot	Cheakamus						
		Sub-total			27,402		66,389	93,791

* see end of table for cutthroat releases

Table 10 (cont'd.)

Production Area	Facility	Stock	Unfed fry	Fed fry < 2g.	Fingerlings 2-5 g.	Fingerlings > 5g.	Smolts	Total
Georgia/ Johnstone St.	Big Qualicum	Big Qualicum				22,684	51,576	74,260
		Englishman					22,673	22,673
	Chemainus	Chemainus						
	Little Qualicum	Big Qualicum					23,555	23,555
		Little Qualicum						
	Puntledge	Puntledge		20,436			65,427	85,863
		Tsolum						
	Quinsam	Quinsam					17,589	17,589
		Salmon		44,613	47,200			91,813
		Sub-total		65,049	47,200	22,684	180,820	315,753
West Coast Vanc. Is.	Conuma	Canton						
		Conuma						
		Sucwoa						
		Tlupana						
		Deserted						
	Nitinat	Nitinat						
	Robertson Cr.	Nahmint						
		Robertson			170,224		197,848	368,072
		Somass					23,961	23,961
		Sub-total			170,224		221,809	392,033

Table 10 (cont'd.)

Production Area	Facility	Stock	Unfed fry	Fed fry < 2g.	Fingerlings 2-5 g.	Fingerlings > 5g.	Smolts	Total
Central Coast	Snootli	Atnarko						
		Fish/Air						
		Lower Bella Coola						
		Necleetsconnay						
		Salloomt						
		Snootli		73,100				73,100
		Sub-total		73,100				73,100
North Coast	Kalum	Cedar/Clear Kalum						
	Kitimat	Chist		25,600				25,600
		Hirsch						
		Kitimat						
	Mathers	Mathers						
	Pallant	Pallant		5,128				5,128
		Sub-total		30,728				30,728
Upper Skeena	Fulton	Fulton						
	Pinkut	Pinkut						
		Sub-total						
		TOTAL		68,877	234,171	22,684	469,013	894,745
* Cutthroat		Capilano		1,281				1,281
		Inch					19,714	19,714
		TOTAL		1,281			19,714	20,995

Table 11. Post-release survival estimates for enhanced juvenile salmonids to catch and escapement*

Species	Production Area	Stage at Release	Post-Release Survival (%) to Catch and Escapement
Chinook	Coastal	Smolt (0+)	3.0
	Upriver	Smolt (0 + migrant)	2.25
		Fed fry (1 + migrant)	0.75
		Smolt (1 + migrant)	4.0
Coho	All	Smolt	15.0
		Unfed fry	1.2
		Fed fry (spring release)	1.5
		Fed fry (fall release)	3.0
Chum	All	Unfed fry (artificial incubators)	0.8
		Unfed fry (Qualicum spawning channels)	0.63
		Fed fry (freshwater rearing)	2.0
		Fed fry (marine rearing)	2.5
Pink	All	Unfed fry	2.5
Sockeye	Skeena	Unfed fry	0.99
Steelhead	All	Smolt (winter)	4.0
		Smolt (summer)	3.0
		Fry (0.5 g)	0.64
		Fry (2.0 g)	1.0
Cutthroat	All	Smolt	10.0

* Estimated survival rates are based on SEP biostandards (Draft #5 - September 20, 1982) or site specific information.

Several rearing/release strategies different from those listed above are being tested. We anticipate increased survival but standard values are used to project returns for the purpose of this report. These comments apply to release of yearling chinook smolts from coastal hatcheries and rearing of pink salmon fry in salt water prior to release.

Projected returns from coho outplants to the upper Puntledge and upper Capilano rivers are downgraded to 30 percent normal survival for Puntledge and to 50 percent normal survival for Capilano reflecting turbine and spillway mortality respectively.

Table 12. Projected catch plus escapement and mark rate for all species released in 1982.

Production Area	Species	Projected Catch Plus Escapement	Number Released Marked	Unmarked*	Total	% Marked
Upper Fraser	chinook	4,425	292,396	58,222	350,618	83.4
	coho	0				
	chum	0				
	pink	0				
	sockeye	0				
	steelhead	0				
	cutthroat	0				
Lower Fraser	chinook	46,892	391,898	1,177,886	1,569,784	25.0
	coho	112,094	554,487	1,125,521	1,680,008	33.0
	chum	143,264	279,215	7,009,673	7,288,888	3.8
	pink	39,310	0	1,572,400	1,572,400	0.0
	sockeye	0				
	steelhead	2,930	50,635	43,156	93,791	54.0
	cutthroat	1,881	19,714	1,281	20,995	93.9
Georgia/Johnstone Straits	chinook	177,968	733,461	5,230,560	5,964,021	12.3
	coho	547,437	291,887	6,724,894	7,016,781	4.1
	chum	433,246	760,488	51,316,312	52,076,800	1.5
	pink	175,603	344,284	6,679,918	7,024,202	4.9
	sockeye	0				
	steelhead	7,857	168,463	146,210	315,753	53.3
	cutthroat	0				

* includes unmarked fish and incomplete marks

Table 12 (cont'd.)

Production Area	Species	Projected Catch Plus Escapement	Number Released Marked	Unmarked*	Total	% Marked
West Coast Van. Is.	chinook	255,077	292,543	8,210,070	8,502,613	3.4
	coho	150,931	195,610	896,033	1,091,643	17.9
	chum	798,048	608,204	39,294,128	39,902,332	1.5
	pink	0				
	sockeye	0				
	steelhead	10,574	122,461	269,572	392,033	31.2
	cutthroat	0				
Central Coast	chinook	947	66,744	27,952	94,696	70.5
	coho	849	19,703	36,897	56,600	34.8
	chum	42,660	218,550	1,914,426	2,132,976	10.2
	pink	0				
	sockeye	0				
	steelhead	468	0	73,100	73,100	0.0
	cutthroat	0				
North Coast	chinook	5,966	159,462	157,458	316,920	50.3
	coho	3,703	31,282	215,575	246,857	12.7
	chum	191,163	142,112	7,614,174	7,756,286	1.8
	pink	0				
	sockeye	0				
	steelhead	307	4,171	26,557	30,728	13.6
	cutthroat	0				

* includes unmarked fish and incomplete marks

Table 12 (cont'd.)

Production Area	Species	Projected Catch Plus Escapement	Number Released Marked	Unmarked*	Total	% Marked
Upper Skeena	chinook	0				
	coho	0				
	chum	0				
	pink	0				
	sockeye	2,356,200	0	238,000,000	238,000,000	0.0
	steelhead	0				
	cutthroat	0				

* includes unmarked fish and incomplete marks

Table 13A. Anticipated returns to selected fisheries and mark rates for chum salmon released in 1982.

Fishing Area	Contributing Enhanced Stocks	Mark Type	% Marked at Release	Projected Total Returns (Marked & Unmarked)* in 1984	1985	1986
Queen Charlotte Is. (East)	Pallant	Ad-022144	7.7	3,441	5,899	492
		Ad-022146	6.2	3,479	5,965	497
		Ad-022148	94.9	56	97	8
		None	0.0	56,088	96,152	8,013
	Mathers	LV	9.3	3,077	5,275	440
		RV	51.1	553	947	79
	Kitimat	None	0.0	212	364	30
Bella Coola GN	Snootli/Nuhalk	None	0.0	4,345	7,448	621
	Necleetsconnay	AdRV	11.3	3,092	5,300	442
	Salloomt	RV	17.0	4,089	7,010	584
	Fish/Air	LV	14.3	1,716	2,942	245
	Fish/Air	AdLV	14.2	1,689	2,896	241
Johnstone Str.	Big Qualicum	RV	3.9	15,089	25,867	2,156
		AdRV	.57	96,051	164,660	13,722
	Little Qualicum	LV	3.3	19,235	32,974	2,748
		AdLV	15.9	4,051	6,945	579
	Puntledge	Ad-022252	5.4	4,809	8,244	687
		Ad-022253	4.8	5,145	8,820	735
		Ad-022254	4.0	6,309	10,816	901
		None	0.0	320	548	46
	Quinsam	None	0.0	626	1,073	89

Table 13A (cont'd.)

Fishing Area	Contributing Enhanced Stocks	Mark Type	% Marked at Release	Projected Total Returns (Marked & Unmarked) in 1984	1985	1986
West Coast Vancouver Is.	Sucwoa	LV	3.2	7,175	12,300	1,025
	Sucwoa	RV	6.2	3,723	6,383	532
	Canton	Ad-022206	23.4	2,923	5,011	418
	Sucwoa	Ad-022255	5.7	3,595	6,163	514
	Sucwoa	Ad-022256	1.4	13,979	23,964	1,997
	Tlupana	AdRV	25.9	2,629	4,506	376
	Deserted	None	0.0	26,475	45,386	3,782
	Conuma	None	0.0	28,567	48,972	4,081
	Nitinat	LV	1.1	47,744	81,847	6,821
		RV	1.1	46,950	80,486	6,707
		AdLV	3.2	16,134	27,658	2,305
		AdRV	1.0	47,879	82,079	6,840
		None	0.0	31,543	54,073	4,506
Fraser GN **	Chilliwack	LV	5.4	6,439	11,039	920
		RV	5.1	14,732	25,255	2,105
		AdLV	5.4	6,365	10,912	909
	Inch	None	0.0	8,989	15,410	1,284
		Ad-022160	3.9	6,117	10,486	874
		Ad-022224	4.2	6,619	11,347	946
	Jones	None	0.0	880	1,508	126

* Groups with mark type "none" are not directly represented by a mark.
** Assumes no exploitation in Johnstone/Georgia Straits.

Table 13B. Anticipated returns to selected fisheries and mark rates for pink salmon released in 1982.

Fishing Area	Contributing Enhanced Stocks	Mark Type	% Marked at Release	Projected Total (Marked & Unmarked) Return
Johnstone Strait	Jones	None	0.0	39,310
	Puntledge	None	0.0	23,007
	Quinsam	AdRV	1.8	82,334
		ADLV	100.0	753
		LV	32.5	2,307
		RV	47.6	3,175
		None	0.0	45,495
	Tsolum	LV	95.6	1,408
		RV	77.8	740
		AdLV	9.9	14,972
		AdRV	90.5	740
		None	0.0	672

Appendix 1. Addresses and telephone numbers of SEP facilities.

SOUTH COAST UNIT
A/Head, B.C. Pearce
1090 West Pender - 5th Floor
Vancouver, B.C.
V6E 2P1
604-666-3909

Big Qualicum Project
R.R. #3
Qualicum Beach, B.C.
VOR 2TO

Grant Ladouceur - SEO
604-757-8412

Chemainus River Hatchery
Mgmt - Seaspring Salmon Farm
P.O. Box 870
Chemainus, B.C.
VOR 1KO

Doug Harpham - Contractor
604-246-9191

Conuma River Hatchery
Box 247
Tahsis, B.C.
VOP 1XO

Iain MacLean - SEO
Van. radio 0711
N710-215 on chan. 7
sched. time: 0915-0930

Little Qualicum Channel
c/o B.C. Pearce
604-666-3090

Nitinat Hatchery
P.O. Box Q
Franklin River, B.C.
VOR 3LO

Colin Harrison - SEO
Campbell River radio
N692766 Bamfield chan.
sched. time: 1200-1230

Puntledge Hatchery
Box 3111
Courtenay, B.C.
V9N 5N3

Harry Genoe - SEO
604-338-7444

Quinsam Hatchery
Box 467
Campbell River, B.C.
V8W 5C1

Jim VanTine - SEO
604-287-9564

Robertson Creek Hatchery
Box 1118
Port Alberni, B.C.
V9Y 7L3

Don Lawseth - SEO
604-724-6521

NORTH COAST UNIT
A/Head, C.J. West
1090 West Pender - 5th Floor
Vancouver, B.C.
V6E 2P1
604-666-2948

Fulton River Channel
Box 9
Granisle, B.C.
VOJ 1WO

Stu Barnetson - SEO
604-697-2314 or
604-697-2424

Kalum Pilot
(c/o Kitimat Hatchery)

Kitimat Hatchery
Box 197
Kitimat, B.C.
V8C 2G7

Dave McNeil - SEO
604-632-5188 warehouse
604-639-9888 hatchery

Mathers Creek
c/o Pallant Creek

Pallant Creek Hatchery
Box 225
Sandspit, B.C.
VOT 1CO

Pat Slobodzian - SEO
Pr. George Radio Op.
N690080 on the Trutch chan.
or 604-666-3575

Pinkut Channel
c/o Fulton River

Snootli Hatchery
Box 95
Bella Coola, B.C.
VOT 1CO

Russ Hilland - SEO
604-982-2522

FRASER R., NBC & YUKON UNIT
Head, C.N. MacKinnon
1090 West Pender - 5th Floor
Vancouver, B.C.
V6E 2P1
604-666-0197

Birkenhead Hatchery
P.O. Box 343
Pemberton, B.C.
VON 1LO

Bill Foye - SEO
Dave Celli - ASEO
604-894-6044 or call Inch Cr

Capilano Hatchery
4500 Capilano Park Rd.
North Vancouver, B.C.
V7R 4L3

Eldon Stone - SEO
604-987-1411

Chilliwack Hatchery
Chilliwack Lake Road
R.R. #8
Chilliwack, B.C.
VOX 1YO

Don Buxton - SEO
604-858-7227

Inch Creek Hatchery
P.O. Box 61
38620 Bell Road
Dewdney, B.C.
VOM 1LO

Bill Foye - SEO
604-826-0244

Loon Creek Hatchery
c/o Gordon Berezay
604-666-8646

Quesnel Hatchery
P.O. Box 4711
Williams Lake, B.C.
V2G 2V7

Robin Dickson - SEO
604-790-2266

Stuart River Hatchery
c/o Don MacKinlay
604-666-3520

Tenderfoot Creek Hatchery
Box 477
Brackendale, B.C.
VON 1HO

Bill Foye - SEO
Dave Celli - ASEO
604-898-3320 or call Inch Cr

SEO - Stock Enhancement Officer
ASEO - Assistant Stock Enhancement Off