PACIFIC SALMON COMMISSION
JOINT CHINOOK TECHNICAL
COMMITTEE REPORT

ANNUAL EXPLOITATION RATE ANALYSIS AND MODEL CALIBRATION

REPORT TCCHINOOK (03)-2

November 28, 2003

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LIST OF ACRONYMS WITH DEFINITIONS

AABM	Aggregate Abundance Based Management
ADF&G	Alaska Department of Fish & Game
AEQ	Adult Equivalent
AI	Abundance Index
AWG	Analytical Working Group of the CTC
BC	British Columbia
CBC	Central British Columbia Fishing area – Kitimat to Cape Caution
CDFO	Canadian Department of Fisheries & Oceans
CLB	Calibration
CNR	Chinook Nonretention
CR	Columbia River
CRITFC	Columbia River Intertribal Fish Commission
CTC	Chinook Technical Committee
CWT	Coded Wire Tag
ER	Exploitation Rate
ESA	U.S. Endangered Species Act
EV	Environmental Variant
FI	Fishery Exploitation Rate Index
FP	Fishery Policy
FRAM	Fisheries Resource Assessment Model
GS	Strait of Georgia
IDFG	Idaho Department of Fish & Game
IDL	Interdam Loss
ISBM	Individual Stock Based Management
MRP	Mark-Recovery Program
MSY	Maximum Sustainable Yield for a stock, in adult equivalents
NA	Not Available
NBC	Northern British Columbia – Dixon Entrance to Kitimat including Queen Charlotte Islands
NCBC	North Central British Columbia - Dixon Entrance to Cape Caution
NM	Natural Mortality Rates
NMFS	National Marine Fisheries Service
NOC	Oregon Coastal North Migrating Stocks
NWIFC	Northwest Indian Fisheries Commission
ODFW	Oregon Department of Fish & Wildlife
OR	Oregon
PFMC	Pacific Fisheries Management Council
PS	Puget Sound
PSC	Pacific Salmon Commission
PSMFC	Pacific States Marine Fisheries Commission
PST	Pacific Salmon Treaty
QIN	Quinault Indian Nation
RT	A method used to estimate the number of CNR mortalities in the chinook model
SEAK	Southeast Alaska – Cape Suckling to Dixon Entrance
SPFI	Stratified Proportional Fishery Index
SSRAA	Southern Southeast Regional Aquaculture Association
TBR	Transboundary Rivers
U.S.	United States
USFWS	U.S. Fish & Wildlife Service
WA	Washington
WA/OR	Ocean areas off Washington and Oregon North of Cape Falcon
WCVI	West Coast Vancouver Island - excluding Area 20
WDFW	Washington Department of Fisheries and Wildlife

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

EXECUTIVE SUMMARY

This report contains the results of the Chinook Technical Committee (CTC) annual exploitation rate assessment and the final pre-season chinook model calibration for 2003 (CLB 0308). Results include the Abundance Indices (AIs) for the Aggregate Abundance Based Management (AABM) fisheries and Individual Stock Based Management (ISBM) Indices for each party, and a summary of pre-season forecast methods by stock.

AABM Abundance Indices and Associated Catches

The AIs for the three AABM fisheries, i.e., Southeast Alaska All Gear (SEAK), Northern British Columbia Troll and Queen Charlotte Islands Sport (NBC), and West Coast Vancouver Island Troll and Outside Sport (WCVI)), are presented in Table 1. The 1999 Agreement specified that the AABM fisheries were to be managed through the use of the AIs. Pre-season AIs are used to set allowable catch limits for management for the upcoming fishing season. Subsequently, post-season AIs (from the following year's calibration) are used to track overage and underage provisions. Each calibration provides the first post-season AIs for the previous year and the pre-season AIs for the current year. The first 2002 post-season AIs, and the 2003 pre-season AIs have now been finalized.

Table 1. Abundance Indices for 1999 to 2003 for the SEAK, NBC, and WCVI AABM fisheries.

	SEAK		NBC		WCVI	
Year	**Pre-season**	**Post-season**	**Pre-season**	**Post-season**	**Pre-season**	**Post-season**
1999	1.15	1.12	1.12	0.97	0.60	0.50
2000	1.14	1.10	1.00	0.95	0.54	0.47
2001	1.14	1.29	1.02	1.22	0.66	0.68
2002	1.74	1.82	1.45	1.63	0.95	0.92
2003	1.79	-	1.48	-	0.85	-

In general, the AIs for 1999 through 2001 are low compared to AIs in the late 1980s and early 1990s but values have increased in 2002 and 2003. The AI values in 2002 are comparable to the higher values in the time series. The Agreement specifies an allowable catch for each AI for each fishery. The specified Treaty catch by fishery and year and the actual (observed) catches are shown in Table 2.

Table 2. Observed catches and post-season allowable catches for 1999 to 2002, and pre-season allowable catches for 1999 to 2003, for AABM fisheries.

Year	Pacific Salmon Treaty Allowable and Observed Catches								
	SEAK			NBC			WCVI		
	Pre-season Allowable Catch	Post-season Allowable Catch	Observed Catch	Pre-season Allowable Catch	Post-season Allowable Catch	Observed Catch	Pre-season Allowable Catch	Post-season Allowable Catch	Observed Catch
1999	192,750	184,200	198,842	145,600	126,100	92,899	128,300	107,000	36,413
2000	189,900	178,500	186,493	130,000	123,500	31,900	115,500	86,200	101,438
2001	189,900	250,300	186,838	132,600	158,933	43,500	141,200	145,500	117,670
2002	356,500	371,933	357,100	192,700	237,805	137,775	203,200	196,799	165,036
2003	366,132	-	-	197,067	-	-	181,825	-	-

The 1999 Agreement specifies that overage/underage provisions apply to both AABM and ISBM fisheries. However, in a February 12, 2002 letter to the Pacific Salmon Commission (PSC), the CTC identified major technical obstacles and policy concerns for adjusting harvest levels in response to overage and underages. The major problem identified for AABM fisheries is the confounding of forecast and management error in assessing overages and underages. The pre-season estimates of abundance used to set management goals can be substantially different than the estimates (Tables 1 and 2) due to forecast error. Pre-season allowable catch levels used to guide managers in setting harvest efforts thus can be quite different from the allowable harvest derived from the first post-season calibration (Table 2). As a result, management precision during the fishery differs from the precision of attaining the target. For example, in SEAK, the observed catch has been within –1.8% to +3.2% of the pre-season target, but has ranged from 25.3% below to 7.9% above the post-season target.

Until an approach for full implementation has been developed and accepted by the PSC, the Commissioners have instructed the CTC to track overages and underages relative to agreed-upon harvest objectives. Table 3 shows the differential in AABM fisheries between the post-season allowable catch and the observed catch for 1999–2002, and the cumulative differential for those years. All three AABM fisheries have cumulative underages. In SEAK, observed catches have been below final allowable catches for two of four years; the cumulative differential is –5.7%. In NBC, observed catches have been below the final allowable catches in all four years; the cumulative differential is –52.6%. In WCVI, observed catches have been below allowable catches for three of four years; the cumulative differential is –21.5%.

Table 3. Differences between observed Treaty catch and the post-season Treaty allowances as number of fish and percentages of allowable catch for AABM fisheries in 1999 to 2002.

Year	SEAK		NBC		WCVI	
	Number of Fish	Percent Difference	Number of Fish	Percent Difference	Number of Fish	Percent Difference
1999	+14,642	+7.9%	-33,201	-26.3%	-70,587	-66.0%
2000	+7,993	+4.5%	-91,600	-74.2%	+15,238	+16.0%
2001	-63,462	-25.3%	-115,400	-72.6%	-27,830	-19.1%
2002	-14,833	-4.0%	-100,030	-42.1%	-31,763	-16.1%
Cum.	-55,560	-5.7%	-340,231	-52.6%	-114,942	-21.5%

ISBM Indices

The Agreement specifies that until agreed escapement objectives for the stock groups listed in Attachments I to V have been achieved, Canada and the United States will reduce base period exploitation rates by 36.5% and 40.0%, equivalent to ISBM indices of 0.635 and 0.60, in their respective ISBM fisheries that affect those stock groups. This requirement is referred to as the 'general obligation' and does not apply to stock groups that achieve their CTC agreed escapement goals. Estimated ISBM fishery indices are shown in Table 4 for Canadian fisheries and Table 5 for United States (U.S.) fisheries. Both tables present Coded-Wire Tag (CWT)-based indices for 2001, and chinook model-based indices for 2003. The agreement specifies that the ISBM indices be forecasted pre-season and evaluated post-season for each escapement indicator stock listed in Attachments I to V of the Chinook Chapter.

CWT-based Indices in 2001

All Canadian ISBM indices from the CWT-based estimates for 2001 show that exploitation rates were reduced more than required under the agreement for all stocks or stock groups. Four of the 16 U.S. ISBM indices for the CWT-based estimates for 2001 were reduced more than required under the agreement. Of the 12 U.S. CWT-based ISBM indices that exceeded 0.60, five have agreed escapement goals and all five exceeded their goal in 2001.

Predicted ISBM Indices for 2003

Seven of the 20 predicted model-based ISBM indices for 2003 based on outputs from calibration 0308 are above the allowable value of 0.635 for Canadian ISBM fisheries. None of the seven have agreed escapement goals. Thirteen of the 23 predicted model-based indices for 2003 are above the allowable limit for U.S. ISBM fisheries. Seven of these 13 stocks have agreed escapement goals.

Table 4. ISBM Indices for Canadian fisheries, CWT-based for 2001, and the predicted indices for 2003 from the PSC Chinook Model.

		Canadian ISBM Indices	
Stock Group	Escapement Indicator Stock	CWT Indices for 2001	Model Indices for 2003
North / Central B. C.	Yakoun, Nass, Skeena, Area 8	NA	0.689
West Coast Vancouver Island Falls	WCVI (Artlish, Burman, Kauok, Tahsis, Tashish, Marble)	0.060	0.744
Fraser Early (spring and summers)	Upper Fraser, Mid Fraser, Thompson	NA	0.661
Fraser Late	Harrison River[2]	0.090	0.352
Upper Strait of Georgia	Klinaklini, Kakweikan, Wakeman, Kingcome, Nimpkish	0.040	0.649
Lower Strait of Georgia	Cowichan Nanaimo	0.260 0.260	0.490 0.498
North Puget Sound Natural Springs	Nooksack, Skagit	0.040 NA	0.251 0.251
Puget Sound Natural Summer / Falls	Skagit Stillaguamish Snohomish Lake Washington Green River	NA 0.145 NA NA 0.350	0.436 0. 513 0.435 0.508 0.508
Washington Coastal Fall Naturals[4]	Hoko, Grays Harbor, Queets, Hoh, Quillayute	NA	0.292
Columbia River Falls[3]	Upriver Brights Deschutes Lewis[2]	NA NA NA	0.686 0.686 0.515
Columbia R Summers[3]	Mid-Columbia Summers[2]	NA	0.352
Far North Migrating OR Coastal Falls[3]	Nehalem[2], Siletz[2], Siuslaw[2]	NA	0.689

[1] NA means not available because of insufficient data (lack of stock specific tag codes, base period CWT recoveries, etc).
[2] Stock or stock group with agreed escapement goal.
[3] Stock group not in Annex Table IV.

Table 5. ISBM indices for U.S. fisheries, CWT-based for 2001, and the predicted indices for 2003 from the PSC Chinook Model.

		U.S. ISBM Indices	
Stock Group	Escapement Indicator Stock	CWT Indices for 2001	Model Indices for 2003
North / Central B. C. [3]	Yakoun, Nass, Skeena, Area 8	NA	NC
West Coast Vancouver Island Falls [3]	WCVI (Artlish, Burman, Kauok, Tahsis, Tashish, Marble)	NA	0.658
Fraser Early (spring and summers) [3]	Upper Fraser, Mid Fraser, Thompson	NA	0.277
Fraser Late	Harrison River [4]	0.310	0.981
Upper Strait of Georgia [2]	Klinaklini, Kakweikan, Wakeman, Kingcome, Nimpkish	NA	NC
Lower Strait of Georgia [3]	Cowichan, Nanaimo	11.350 11.350	0.452 0.452
North Puget Sound Natural Springs	Nooksack Skagit	0.040 NA	0.121 0.119
Puget Sound Natural Summer / Falls	Skagit Stillaguamish Snohomish Lake Washington Green R	NA 0.890 NA NA 1.180	0.406 0.184 0.072 0.768 0.263
Washington Coastal Fall Naturals	Hoko Grays Harbor Queets Hoh Quillayute	NA 0.860 1.440 1.660 1.480	0.682 0.494 1.063 1.208 1.292
Columbia River Falls	Upriver Brights Deschutes Lewis [4]	1.350 0.520 0.580	1.022 0.561 0.851
Columbia R Summers	Mid-Columbia Summers [4]	5.320	0.794
Far North Migrating OR Coastal Falls	Nehalem [4] Siletz [4] Siuslaw [4]	1.940 1.190 2.180	2.346 1.302 2.856

[1] NA means not available because of insufficient data (lack of stock specific tag codes, base period CWT recoveries, etc).
[2] NC means that the current model assumes the stock is not caught in U.S. ISBM fisheries.
[3] Stock group not in Annex Table V.
[4] Stock with agreed escapement goal.

Stock Forecasts

Generally, the model can replicate the agency forecasts with more accuracy than the agency forecasts predict the post-season estimate. These agency forecasts suggest that chinook abundance in 2003 will be less than in 2002 but higher than observed in 2001.

Stock Escapements

The detailed description of trends in escapement has been summarized in the CTC Catch and Escapement report, covering data through 2002 (CTC 2003). The escapement review includes 51 naturally spawning escapement indicator stocks/stock aggregates. Biologically based escapement goals have been accepted by the CTC for 17 of the 51 escapement indicator stocks/stock aggregates. For 11 of these stocks, the agreed escapement goal is defined as a range; for the remaining 6 stocks, the escapement goal is the point estimate of S_{MSY} (escapement producing maximum sustained yield). In 2002, escapements were within the goal range for 6 stocks, above the range or S_{MSY} point estimate for 10 stocks, and below the goal range for 1 stock.

1. INTRODUCTION

The annexes of the Pacific Salmon Treaty (PST), dated June 30, 1999, changed the way chinook salmon fisheries were managed by the Pacific Salmon Commission (PSC). Fisheries are no longer designated as "ceiling" or "pass through," but as Aggregate Abundance Based Management (AABM) or Individual Stock Based Management (ISBM) fisheries. AABM fisheries are managed according to the abundance of chinook salmon in each fishery. ISBM fisheries are managed to control impacts on individual stocks. Pre-season allowable catch in each AABM fishery (Southeast Alaska All Gear (SEAK), Northern British Columbia Troll and Sport (NBC), and West Coast Vancouver Island Troll and Outside Sport (WCVI)) is determined through an Abundance Index (AI) calculated from an agreed pre-season calibration of the Chinook Technical Committee (CTC) chinook model (see Table 1 of Chapter 3 in the Agreement). This same calibration is also used to compute the post-season AIs for the previous year. Under the Agreement, annual aggregate impacts in Canadian and U.S. ISBM fisheries on specified stocks or stock groups are to be reduced by 36.5% and 40.0%, respectively, from the average of those in the base period (1979–1982). Such reductions will remain in effect until these fisheries can be managed to achieve escapement at Maximum Sustained Yield (MSY) or some other biologically based escapement goal. Pre-season and post-season indices are also calculated for ISBM fisheries using the chinook model.

This annual report describes the methods and results of 1) the cohort analysis used to estimate exploitation rates from coded-wire tag (CWT) data, and 2) the chinook model calibration. The results of the 2003 pre-season calibration (CLB 0308) are based on completion of the CWT exploitation rate analysis for indicator stocks through 2001 fisheries, coast-wide data on catch, spawning escapements and age structure through 2002, and forecasts of chinook returns expected in 2003. The report includes:

- estimates of the abundance indices for the years 1979 through 2002 and a projection for 2003 for the AABM fisheries,
- estimates of the non-ceiling indices, referred to as the ISBM indices in this report, for 1999 to 2002 and projections for the 2003 ISBM fisheries,
- estimates for 1979 through 2002 and a projection for 2003 of stock composition in the AABM and other fisheries,
- the distribution of landed and total fishing mortality in all fisheries for the indicator stocks,
- estimates of harvest rates (fishery indices) in the AABM fisheries,
- forecast methods and results for selected stocks, and
- survival indices for selected stocks.

2. METHODS

The Exploitation Rate assessment is performed through cohort analysis, a procedure that reconstructs the exploitation history of a given stock and brood year using CWT release and recovery data (CTC 1988). The procedure produces a variety of statistics, including total

exploitation rates, age fishery specific exploitation rates, maturation rates, pre-age 2 recruitment survival indices, and annual distribution of fishery-related mortalities. Estimates of age and fishery-specific exploitation and maturation rates from the cohort analysis are combined with data on catches, escapements, non-retention, and enhancement to complete the annual calibration of the CTC Model. The calibration procedure estimates pre-age 2 recruitment survivals for the stocks included in the model.

Results from the annual pre-season calibration of the chinook model are used to calculate: (a) AIs for the three AABM fisheries to determine the allowable 2003 catch of Treaty chinook; (b) the post-season AIs for the previous year; and (c) pre-season and post-season ISBM indices.

Projected AIs for 2003 are used to determine preseason allowable catches for AABM fisheries. The post-season AIs are used to determine postseason allowable catches and to evaluate compliance for AABM fisheries.

For the ISBM fisheries, the Agreement specifies that Canada and the United States will reduce the exploitation rate from the 1979–1982 base period by 36.5% and 40.0%, respectively, on stocks that have not achieved their CTC agreed escapement goals. The ISBM Index is used to estimate the annual reduction in exploitation rates relative to the base period. Post-season ISBM indices for 2001 are computed using results of the exploitation rate analysis. Forecasts of the 2003 ISBM indices are computed using the CTC model. The Agreement specifies that the ISBM indices estimated through exploitation rate analysis (CWTs) will be used for final post-season assessment.

2.1. Exploitation Rate Assessment (Through Calendar Year 2001)

The Exploitation Rate (ER) Assessment relies on CWT release and recovery data from a set of exploitation rate indicator stocks to estimate: (1) brood year exploitation rates, (2) the distribution of catch and total mortality among fisheries, (3) survival rates to ocean age 2 by brood year; (4) trends in fishery harvest rates, and (5) maturation rates and AEQs. Statistics reported in the Exploitation Rate Assessment are based on cohort analysis. Cohort analysis simply reconstructs the production of a CWT group by starting with the escapement, catch, and incidental fishing mortality of the oldest age class and working backwards in time to calculate the total abundance of ocean age 2 chinook prior to any fishing-related mortality. These re-constructions are based on estimated CWT recoveries by stock, brood year, and age in fisheries and escapements.

The CTC currently monitors 37 exploitation rate indicator stocks with CWTs, but only 33 were used for analyses in this chapter (Table 2.1). An exploitation rate indicator stock is not used in the exploitation rate analysis if the number of CWT recoveries is very limited or there is no quantitative estimate of tags in the spawning escapement (see footnotes in Table 2.2). Those used for exploitation rate analysis and the type of analysis performed for each are shown in Table 2.2. The relationship between the exploitation rate indicator stocks, model stocks, and PST Annex stocks are shown in Appendix A. A list of tag codes used for each exploitation rate indicator stock is provided in Appendix B. Extrapolation of results to similar stocks and/or generalizations about fishery impacts will only be appropriate to the extent that the exploitation rate indicator stocks are representative of the array of stocks harvested in the fisheries or the stock groups they represent.

Table 2.1. The 37 exploitation rate indicator stocks monitored by the CTC and their location, run type, and smolt age. Stocks in bold, italic text were not used for analysis in this chapter.

Area	Exploitation Rate Indicator Stocks	Location	Run Type	Smolt Age
S.E. Alaska	Alaska Spring	Southeast Alaska	Spring	Age 1
British Columbia	Kitsumkalum	North/Central BC	Summer	Age 1
	Atnarko[1]	***North/Central BC***	***Spring/Summer***	***Age 0***
	Kitimat River[1]	***North/Central BC***	***Summer***	***Age 0***
	Robertson Creek	WCVI	Fall	Age 0
	Quinsam	Georgia Strait	Fall	Age 0
	Puntledge	Georgia Strait	Summer	Age 0
	Big Qualicum	Georgia Strait	Fall	Age 0
	Cowichan	Georgia Strait	Fall	Age 0
	Chehalis (Harrison Stock)[1]	Lower Fraser River	Fall	Age 0
	Chilliwack (Harrison Stock)	Lower Fraser River	Fall	Age 0
Puget Sound	South Puget Sound Fall Yearling	South Puget Sound	Summer/Fall	Age 1
	Squaxin Pens Fall Yearling	South Puget Sound	Summer/Fall	Age 1
	University of Washington Accelerated	Central Puget Sound	Summer/Fall	Age 0
	Samish Fall Fingerling	North Puget Sound	Summer/Fall	Age 0
	Stillaguamish Fall Fingerling	Central Puget Sound	Summer/Fall	Age 0
	George Adams Fall Fingerling	Hood Canal	Summer/Fall	Age 0
	South Puget Sound Fall Fingerling	South Puget Sound	Summer/Fall	Age 0
	Nisqually Fall Fingerling	South Puget Sound	Summer/Fall	Age 0
	Elwha Fall Fingerling	Strait of Juan de Fuca	Summer/Fall	Age 0
	Hoko Fall Fingerling	Strait of Juan de Fuca	Summer/Fall	Age 0
	Nooksack Fall Fingerling	***North Puget Sound***	***Summer/Fall***	***Age 0***
	Skagit Spring Yearling	Central Puget Sound	Spring	Age 1
	Nooksack Spring Yearling	North Puget Sound	Spring	Age 1
	White River Spring Yearling	South Puget Sound	Spring	Age 1
Washington Coast	Sooes Fall Fingerling	North Wash. Coast	Fall	Age 0
	Queets Fall Fingerling	North Wash. Coast	Fall	Age 0
Columbia River	Cowlitz Tule	Columbia R. (WA)	Fall Tule	Age 0
	Spring Creek Tule	Columbia R. (WA)	Fall Tule	Age 0
	Columbia Lower River Hatchery	Columbia River (OR)	Fall Tule	Age 0
	Columbia Upriver Bright	Upper Columbia R.	Fall Bright	Age 0
	Hanford Wild	Upper Columbia R.	Fall Bright	Age 0
	Lewis River Wild	Lower Columbia R.	Fall Bright	Age 0
	Lyons Ferry[3]	Snake River	Fall Bright	Age 0
	Willamette Spring	Lower Columbia R.	Spring	Age 1
	Columbia Summers	Columbia R. (WA)	Summer	Age 1
Oregon Coast	Salmon River	North Oregon Coast	Fall	Age 0

1 These stocks are CWT-tagged, but there is no quantitative CWT escapement data, useful for distribution only.
2 Tagged PSC indicator stocks with too few recoveries for analysis.
3 Subyearlings have been CWT-tagged since brood year 1986, except for brood years 1993 through 1997.

Table 2.2. CWT exploitation rate indicator stocks used in this year's exploitation rate analysis for fishery, ISBM and survival indices, brood exploitation rates (brood exp), and stock catch distribution (Distn) with quantitative escapement estimates (esc) and tagging during the base period years 1979–1982.

Exploitation Rate Indicator Stocks	Fishery Index	ISBM Index	Brood[1] Exp	Survival Index	Distn	Esc	Base Tagging
Alaska Spring	yes	—	Total	yes	yes	yes	yes
Kitsumkalum	—	—	Total	yes	yes	yes	—
Robertson Creek	yes	yes	Ocean[1]	yes	yes	yes	yes
Quinsam	yes	yes	Total	yes	yes	yes	yes
Puntledge	yes	—	Total	yes	yes	yes	yes
Big Qualicum	yes	yes	Total	yes	yes	yes	yes
Cowichan	yes	yes	Total	yes	yes	yes	—
Chilliwack (Harrison Fall Stock)	—	yes	Total	yes	yes	yes	—
South Puget Sound Fall Yearling	yes	[2]	[2]	yes	yes	yes[3]	yes
Squaxin Pens Fall Yearling	—	[2]	[2]	yes	yes	yes[3]	—
University of Washington Accelerated	yes	[2]	[2]	—	yes	yes[3]	yes
Samish Fall Fingerling	yes	—	Ocean	yes	yes	yes[3]	yes
Stillaguamish Fall Fingerling	—	yes	—	—	yes	—	—
George Adams Fall Fingerling	yes	[2]	[2]	yes	yes	yes[3]	yes
South Puget Sound Fall Fingerling	yes	yes	Ocean	yes	yes	yes[3]	yes
Nisqually Fall Fingerling	—	—	—	—	yes	—	yes
Elwha Fall Fingerling	—	—	—	—	yes	—	—
Hoko Fall Fingerling	—	—	—	yes	yes	yes	—
Skagit Spring Yearling	—	—	—	yes	yes	yes[3]	—
Nooksack Spring Yearling	—	yes	—	yes	yes	yes[3]	—
White River Spring Yearling	—	—	—	yes	yes	yes[3]	yes
Sooes Fall Fingerling	—	—	—	yes	yes	yes	—
Queets Fall Fingerling	—	yes	—	—	yes	—	yes
Cowlitz Tule	yes	—	[2]	yes	yes	yes	yes
Spring Creek Tule	yes	—	[2]	yes	yes	yes	
Columbia Lower River Hatchery	yes	—	[2]	yes	yes	yes	yes
Upriver Bright	yes	yes	Both	yes	yes	yes	yes
Hanford Wild	—	—	—	yes	yes	yes	—
Lewis River Wild	yes	yes	Both	yes	yes	yes	yes
Lyons Ferry	—	—	—	yes	yes	yes	—
Columbia Summers	yes	yes	—	yes	yes	yes	
Willamette Spring	yes	—	[2]	yes	yes	yes	yes
Salmon River	yes	yes	Ocean	yes	yes	yes	yes

1 For stocks of hatchery origin and subject to terminal fisheries directed at harvesting surplus hatchery production, ocean fisheries do not include terminal net fisheries. Otherwise, total fishery includes terminal net fisheries.
2 Hatchery stock not used to represent naturally spawning stock.
3 Only hatchery rack recoveries are included in escapement.

2.1.1. Assumptions of the Analyses

Assumptions used in the cohort analysis and other procedures used in the Exploitation Rate Assessment are summarized below. Detailed discussions of assumptions and parameter values have been reported previously (CTC 1988). The analysis is necessary to calculate the fishery indices for the AABM fisheries and the non-ceiling index for the ISBM fisheries.

The primary assumptions of the cohort analysis are:

1) CWT recovery data are obtained in a consistent manner from year to year or can be adjusted to make them comparable. Many of the analyses rely upon indices that are computed as the ratio of a statistic in a particular year to the value associated with a base period. Use of ratios may reduce or eliminate the effect of data biases that are consistent from year to year.

2) For ocean age 2 and older fish, natural mortality varies by age but is constant across years. Natural mortality rates (NM) applied by age are: age 2, 40%; age 3, 30%; age 4, 20%; and age 5 and older 10% (i.e., after fishing mortality and maturation of the age 4 cohort, 10% of the remaining immature fish die due to natural sources before becoming age 5 fish and the commencement of fishing the next year).

3) All stocks within a fishery have the same size distribution for each age and the size distribution at age is constant among years.

4) The spatial and temporal catch distribution of sublegal-size fish of a given age from a stock is the same as legal-size fish of a given age of that stock.

5) Incidental mortality rates per encounter are constant between years. The rates vary by fish size (legal or sub-legal) and fishery and are those published by the CTC (1997) for troll and sport fisheries.

6) The procedures for estimating the mortality of CWT fish of legal size during periods of chinook non-retention (CNR) assume that the stock distribution in any year remains unchanged from the period of legal catch retention in the same year. However, gear and/or area restrictions during CNR fisheries are believed to reduce the number of encounters of legal-size fish. To account for this, the number of legal encounters during the CNR fishery was adjusted by a selectivity factor. A factor of 0.34 was used for the WCVI and Strait of Georgia (GS) troll fisheries. This value is the average selectivity factor calculated from 3 years of observer data in the Alaska troll fishery. A factor of 0.20 is used in the North Central British Columbia (NCBC) troll fishery. This factor corresponds to the proportion of fishing areas that remain open during non-retention periods. A selectivity factor is not required for the SEAK troll fishery since an independent estimate of legal and sublegal encounters has been provided annually.

7) Maturation rates for brood years in which all ages have not matured (incomplete broods) are equal to the average of completed brood years. Maturation rates are stock specific.

8) Recoveries of age 4 and older chinook in ocean net fisheries are assumed to be mature fish (ocean terminal catches).

In addition, when using the fishery indices as a measure of the change in fishery harvest rates between years, the temporal and spatial distribution of stocks in and among fisheries and years is assumed to be stable.

For AABM fisheries, the fishery indices are presented for both reported catch (same as landed catch) and total mortality; only total mortality indices are presented for the ISBM fisheries. The difference between reported catch and total mortality is incidental mortality, which includes the mortality of legal-size fish in CNR fisheries and the mortality of sublegal-size fish in both retention and CNR fisheries. Management strategies have changed considerably for fisheries of interest to the PSC since 1985. Regulatory changes have included size limit changes, extended periods of CNR in troll fisheries, and mandatory release of chinook caught in some net fisheries. Estimates of incidental mortality are crucial for assessment of total fishery impacts, yet they cannot be determined directly from CWT recovery data. There are four categories of incidental mortality that are estimated in the chinook model and the CWT cohort analysis. Legal and sublegal fishery specific mortality rates are applied to the following types of chinook encounters:

1. Shakers: chinook below the legal size limit that are encountered, brought to the boat, and released during a chinook retention fishery.

2. Sublegal CNR: chinook below the legal size limit that are encountered, brought to the boat, and released during a chinook non-retention fishery. The mortality rate per encounter applied to sublegal CNR is the same applied to shakers.

3. Legal CNR: chinook above the legal size limit that are encountered, brought to the boat, and released during a chinook non-retention fishery.

4. Drop-off: Chinook above or below the legal size limit that are encountered but are lost from the gear before they reach the boat during either retention or non-retention fisheries. Drop-off mortality is assumed the same for legal and sublegal fish, but can vary by gear type.

There are several methods used to estimate the number of CNR mortalities in the model and the CWT cohort analysis. The ‘season length’ method uses the relative length of the chinook retention and non-retention periods. This is usually expressed in days or boat-days. Agencies can also provide direct estimates of CNR encounters for use with the method. The CWT cohort analysis can also use a method based on catchability coefficients where no associated chinook retention period exists for the fishery. The ’season length’ method as used in the exploitation rate assessment has been previously described in CTC (1988). The chinook model also can use a method, known as the ‘RT’ method, based on the difference between base period exploitation rates and the current year exploitation rates, and current cohort sizes. In both the season length and RT methods, the stock composition of the legal CNR encounters is assumed to be the same as the stock composition of the legal catch. The stock composition of the shakers and sublegal CNR encounters is estimated using the non-vulnerable portions of the cohorts for stocks that contribute to the landed catch. The procedures used to estimate incidental mortality in the

chinook model have been previously described by the CTC Analytic Work Group (AWG) (1991).

For some fisheries or years, CWT recoveries are either lacking or cannot be used in certain analyses of this exploitation rate assessment. In some of these situations the model can be used for ER assessment.

2.1.2. Brood Year Exploitation Rates

Brood year exploitation rates provide the best measure of the cumulative impact of fisheries upon all age classes of a stock. The rates are computed as the ratio of adult equivalent (AEQ) total fishing mortality to AEQ total fishing mortality plus escapement. The AEQ factor represents the proportion of fish of a given age that would, in the absence of fishing, subsequently leave the ocean to return to the terminal area on the spawning migration. The numerator may be partitioned into components for AEQ reported catch and AEQ incidental mortality, with each component occurring in either ocean fisheries or freshwater fisheries.

The exploitation rate on an indicator stock may differ from the exploitation rate on the wild stock it represents if the indicator stock is of hatchery origin and subject to terminal fisheries directed at harvesting surplus hatchery production. In the case of the brood exploitation rate, this difference was addressed by computing a rate for ocean fisheries and a total for all fisheries. Ocean fisheries were defined to include marine sport and troll fisheries, and CWT recoveries of ocean age 2 and age 3 fish in all non-terminal net fisheries. By partitioning the fisheries in this way, the most appropriate measure of brood exploitation rates on wild stocks could be selected. The method selected for each exploitation rate indicator stock is given in Table 2.2. If broods are incomplete but have data through age 4, then average maturation rates are applied to predict the completed brood value.

The brood year exploitation rate is calculated as:

$$BYEXP_{BY,F} = \frac{\sum_{a=Minage}^{Maxage}\left(\sum_{f\in\{F\}} TotMorts_{BY,a,f} * AEQ_{BY,a,f}\right)}{\sum_{a=Minage}^{Maxage}\left(\sum_{f=1}^{Numfisheries} TotMorts_{BY,a,f} * AEQ_{BY,a,f} + Esc_{BY,a}\right)}$$

The Adult Equivalent (AEQ) rate is calculated as:

$$AEQ_{BY,a-1,f} = MatRte_{a-1,BY} + (1 - MatRte_{a-1,BY}) * Surv_a * AEQ_{BY,a,f}$$
$$AEQ_{BY,Maxage,f} \equiv 1.0$$

See Table 2.3 for a description of notation.

2.1.3. Brood Year Survival Rates and Indices

The brood year survival of CWT-tagged smolts after release is calculated for most exploitation rate indicator stocks (Table 2.2). This survival rate is frequently referred to as the marine survival of the tag group but also includes any mortality occurring in freshwater following release. Interpretation of this survival rate is stock specific. Two measures of survival indices or patterns are computed: survival to the age 2 cohort based on CWT recoveries, and the "environmental variate" (EV) determined from the calibration of the chinook model (described in the following section). The CWT-based estimate is our most direct measure of a brood's survival but this measure is not available until the brood is complete (i.e., all ages have returned to spawn). The model EV parameter, however, provides a more current measure of the survival rates expected in brood years contributing to present and future fisheries. For CWT data, the survival rate for a stock and brood year is the estimated age 2 cohort (from the cohort analysis) divided by the number of CWT fish released.

Table 2.3. Parameter definitions for all equations except those used for SPFI in SEAK.

Parameter	Description
a =	age class
A =	set of all ages that meet selection criteria
$AEQ_{BY,a,f}$ =	adult equivalent factor in brood year BY, age a, and fishery f (for terminal fisheries, AEQ = 1.0 for all ages)
$Age2CohSurv_{BY}$ =	cohort survival of CWT fish to age 2 (pre-fishery) for brood year BY
$AvgMatRte$ =	average maturation rate
$Bper$ =	base period years (1979 through 1982)
$BYEXP$ =	brood year AEQ exploitation rate
$BPISBMER$ =	average base period ISBM exploitation rate
BY =	brood year
CY =	calendar year
$CYDist_{CY,F}$ =	proportion of total stock mortality (or escapement) in a calendar year attributable to a fishery or a set of fisheries
CY_{end} =	end year for average
CY_{start} =	start year for average
$Esc_{BY,a}$ =	escapement past all fisheries for brood year BY and age a
$ER_{s,a,f,CY}$ =	landed catch (or total mortality) at age a divided by cohort size at age a for stock s in fishery f in year CY
$EV_{n,BY}$ =	the stock productivity scalar for iteration n and brood year BY
f =	a single fishery
$f \in \{F\}$ =	a fishery f within the set of fisheries of interest
F =	ocean, terminal or other sets of fisheries or spawning escapements
$FI_{f,CY}$ =	fishery exploitation rate index for fishery f in year CY
$FP_{a.s.CY,f}$ =	ratio of $ER_{s,a,f,CY}$ to BPISBMER
$MatRte_{a-1,BY}$ =	maturity rate at next younger age by brood year
$Maxage$ =	maximum age of stock (generally age 6 for stream type stocks, age 5 for ocean type stocks)
$Minage$ =	minimum age of stock (generally age 3 for stream type stocks, age 2 for ocean type stocks)
$Morts_{CY,a,f}$ =	landed or total fishing mortality in year CY and age a in fishery f
NM_a =	annual natural mortality prior to fishing on age a cohort
$Numfisheries$ =	total number of fisheries
RT_{CY} =	ratio of the catch quota in the current year to the catch that would be predicted given current abundance, current size limits, and base period exploitation rates
s =	a particular stock
S =	set of all stocks that meet selection criteria
SC_{BY} =	ratio of the estimated terminal run and model predicted terminal run for brood year BY
$Surv_a$ =	survival rate ($1-NM_a$) by age
$TotMorts_{BY,a,f}$ =	total fishing related mortality for brood year BY and age a in fishery f
$TotCWTRelease_{BY}$ =	number of CWT fish released in the indicator group in brood year BY

$$Age2CohSurv_{BY} = \frac{Cohort_{BY,2}}{TotCWTRelease_{BY}}$$

where $Cohort_{BY,2}$ is calculated recursively from the oldest age down to age-2 using:

$$Cohort_{BY,a} = \frac{\sum_{f=1}^{Numfisheries} TotMorts_{BY,a,f} + Esc_{BY,a} + Cohort_{BY,a+1}}{1 - NM_a}$$

If ocean age-5 is absent, the age-4 cohort size is estimated using the following formula:

$$Cohort_{BY,4} = \frac{\sum_{f \in Preterminal} TotMorts_{BY,4,f} + \frac{Esc_{BY,4} + \sum_{f \in Terminal} TotMorts_{BY,4,f}}{AvgMatRte_4}}{1 - NM_4}$$

2.1.4. Stock Distribution Patterns

Brood year exploitation rates can indicate the fisheries that exploit a stock and the rates that occur on a specific brood, but do not indicate the exploitation pattern on a stock during one calendar year (across broods). Stock mortality distributions (reported catch or total) in a calendar year are calculated over all ages in the fisheries (if at least three brood years contribute to recoveries).

$$CYDist_{CY,F} = \frac{\sum_{a=Minage}^{Maxage} \sum_{f \in \{F\}} Morts_{CY,a,f} * AEQ_{BY=CY-a,a,f}}{\sum_{a=Minage}^{Maxage} \left(\sum_{f=1}^{Numfisheries} Morts_{CY,a,f} * AEQ_{BY=CY-a,a,f} + Esc_{CY,a} \right)}$$

It should be noted that catch distributions may not indicate the relative distribution of an indicator stock. For example, closure of a fishery would result in no reported catch but this would not necessarily indicate zero abundance of the stock in that fishing area.

2.1.5. Fishery Indices

When the PST was negotiated in 1985, catch ceilings and increases in stock abundance were expected to reduce harvest rates in fisheries. The Fishery Index (FI) provided a means to assess performance against this expectation. Relative to the base period, an index less than 1.0 represents a decrease from base period harvest rates while an index greater than 1.0 represents an increase. While the determination of allowable catch for AABM fisheries in the 1999 Agreement is different from the original PST catch ceilings, these fishery indices continue to provide a useful index of change in harvest rates in these fisheries. Fishery indices are used to measure relative changes in fishery harvest rates because it is not possible to directly estimate the fishery harvest rates.

Fishery indices are computed in AEQ for both reported catch and total mortality (reported catch plus estimated incidental mortality). The total mortality index provides a consistent means of representing changes in reported catch and incidental mortality, including those associated with regulatory measures such as minimum size limits and CNR periods. Equations used to define the index are shown below.

$$ER_{s,a,f,CY} = \frac{TotMorts_{s,a,f,CY} * AEQ_{s,BY=CY-a,a,f}}{Cohort_{s,BY=CY-a,a} * (1 - NM_a)}$$

$$FI_{f,CY} = \frac{\sum_{s\in\{S\}}\sum_{a\in\{A\}} ER_{s,a,f,CY}}{\left(\frac{\sum_{BPER=79}^{82}\sum_{s\in\{S\}}\sum_{a\in\{A\}} ER_{s,a,f,BPER}}{4} \right)}$$

For AABM fisheries, indices are presented for troll gear only although the catch limitations also apply to recreational fisheries and net fisheries in SEAK and the recreational fisheries in NBC and WCVI. As in past years, recoveries from the troll fishery were used because the majority of the catch and the most reliable CWT sampling occur in these fisheries. In addition, there are data limitations in the base period for the sport fisheries. Because the allocation of the catch among gear types has changed in some fisheries (e.g., the proportion of the catch harvested by the sport fishery has increased in the SEAK and NCBC fisheries), the indices may not represent the harvest impact of all gear types.

2.1.5.1. Modifications of SEAK Troll Fishery Index

The CTC uses fishery indices to reflect changes in fishery impacts relative to the base period (1979–1982). The form of the fishery index limits inclusion of stocks to those with adequate tagging during the base period, but fishing patterns for some fisheries have changed substantially since then. One example of this is the SEAK troll fishery where the catch during the winter season has increased, the spring fishery has been largely curtailed, and the summer season has become markedly shorter. Because stock complexes are dynamic throughout the year, stock specific impacts of the SEAK fishery have likely changed over time as season structure has been altered. To incorporate changes in stock composition and to include stocks without base period data, the CTC examined alternative derivations of fishery indices (CTC 1996).

The CTC determined that a useful fishery index should reflect both changes in harvest rates and stock distribution. Three general, desirable characteristics were identified:

1) the index should measure changes in fishery harvest rates if the distribution of stocks is unchanged from the base period;

2) the index should have an expected value of 1.0 for random variation around the base period fishery harvest rate, cohort size, and stock distributions; and
3) the index should weight changes in stock distribution by abundance.

After exploring several alternatives, the CTC concluded that the best estimate for a fishery index would consist of the product of a fishery harvest rate index and an index of stock abundance weighted by average distribution (i.e., the proportion of a cohort vulnerable to the fishery). This assessment supported the application of the stratified proportional harvest rate index adjusted for untagged stocks (SPFI), as presented by Alaska Department of Fish and Game (ADF&G). Computation of the SPFI is discussed below.

Initially the CWT harvest rate ($h_{t,cy}$) must be set to an arbitrary value between 0 and 1. Then, the distribution parameter ($d_{t,s,a}$) is calculated, and the result is substituted into the second equation below to recursively recalculate $h_{t,cy}$ and subsequently $d_{t,s,a}$. The largest stock-age distribution parameter in a stratum is then set to 1 to create a unique solution. See Table 2.4 for notation description.

$$d_{t,s,a} = \sum_{CY} r_{t,CY,s,a} \Big/ \sum_{CY} \left(h_{t,CY} * n_{CY,s,a} \right)$$

$$h_{t,CY} = \sum_{s} \sum_{a} r_{t,CY,s,a} \Big/ \sum_{s} \sum_{a} \left(d_{t,s,a} * n_{CY,s,a} \right)$$

The resulting unique solution is inserted into the following equations.

$$H_{t,CY} = \left[\left(\frac{\sum_{s} \sum_{a} c_{t,CY,s,a}}{\sum_{s} \sum_{a} r_{t,CY,s,a}} \right) * \left(C_{t,CY} - A_{t,CY} \right) \right] \Big/ \left[\left(C_{t,CY} - A_{t,CY} \right) / h_{t,CY} \right]$$

$$H_{.CY} = \sum_{t} \left[\left(\frac{\sum_{s} \sum_{a} c_{t,CY,s,a}}{\sum_{s} \sum_{a} r_{t,CY,s,a}} \right) * \left(C_{t,CY} - A_{t,CY} \right) \right] \Big/ \sum_{t} \left[\left(C_{t,CY} - A_{t,CY} \right) / h_{t,CY} \right]$$

$$S_{t,CY} = H_{t,CY} \Big/ \sum_{CY=1979}^{1982} H_{t,CY}$$

$$S_{.CY} = H_{.CY} \Big/ \sum_{CY=1979}^{1982} H_{.CY}$$

Table 2.4. Parameter definitions for equations used for SPFI in SEAK.

Parameter	Description
$A_{t,CY}$ =	Alaska hatchery origin catch by strata *t*, year *CY*
$c_{t,CY,s,a}$ =	adult equivalent CWT catch by strata *t*, year *CY*, stock *s* and age *a*
$C_{t,CY}$ =	catch by strata *t*, year *CY*
$d_{t,s,a}$ =	distribution parameter by strata *t*, stock *s* and age *a*
$h_{t,CY}$ =	CWT harvest rate by strata *t*, year *CY*
$H_{.CY}$ =	harvest rate by year *CY*
$H_{t,CY}$ =	harvest rate by strata *t*, year *CY*
$n_{CY,s,a}$ =	CWT cohort size by year *CY*, stock *s* and age *a*
$r_{t,CY,s,a}$ =	CWT recoveries by strata *t*, year *CY*, stock *s* and age *a*
$S_{.CY}$ =	SPFI by year *CY*
$S_{t,CY}$ =	SPFI by strata *t*, year *CY*

2.1.6. ISBM Indices

In previous reports, the CTC (1996) proposed a non-ceiling fishery index as a measure of the pass-through provision in the 1985 PST. This index compares an 'expected' AEQ mortality (assuming base period exploitation rates and current stock abundance) with the observed AEQ mortality on a stock within a calendar year, over all non-ceiling fisheries of a party (Table 2.5). Index values less than 1.0 indicate that the exploitation rates have decreased relative to the base period. Under the new Agreement, the CTC is required to continue to use the ISBM indices to measure the performance of ISBM fisheries. Paragraph 4, chapter 3 states:

"4. The Parties agree that in respect of ISBM fisheries:

(a) their intent is that the fisheries shall be managed over time to contribute to the achievement of MSY or other agreed biologically-based escapement objectives;

(b) until such times as the ISBM fisheries are managed to meet those escapement objectives, and unless otherwise recommended by the CTC, the non-ceiling index defined in TCChinook (96)-1 (February 15,1996) will be used to measure performance of ISBM fisheries;

(c) the non-ceiling index for ISBM fisheries will be computed pre-season based on forecasted abundance and fishing plans and evaluated post season for each of the escapement indicator stocks listed in Attachments I to V to this chapter;

(d) for the purposes of this paragraph, until agreed escapement objectives for the stock groups listed in Attachments I to V to this Chapter have been achieved, Canada and the United States shall reduce by 36.5 and 40 percent respectively, the total adult equivalent mortality rate, relative to the 1979-82 base period, in their respective ISBM fisheries that affect those stock groups. The reduction identified in this sub-paragraph shall be referred to as the "general obligation"."

Table 2.5. Fisheries included in the ISBM Index by nation.

Fisheries Included in ISBM Index	
United States	**Canada**
Washington/Oregon/California Ocean Troll Puget Sound Northern Net Puget Sound Other Net Washington Coastal Net Washington/Oregon/California Ocean Sport Puget Sound Northern Sport Puget Sound Southern Sport Freshwater Terminal Net Freshwater Terminal Sport	West Coast Vancouver Island Net Strait of Juan de Fuca Net Johnstone Net Fraser Net Strait of Georgia Troll, Net, and Sport North BC mainland sport, and Central BC Sport North and Central BC Net Central BC Troll Freshwater BC Net and Sport

The formula proposed by the CTC in 1991 and referred to in CTC (1996) for a stock/country combination is:

$$ISBMIdx_{CY} = \frac{\sum_{f \in \{F\}} \sum_{a=Minage}^{Maxage} \left(TotMorts_{CY,f,a} * AEQ_{BY=CY-a,a,f} \right)}{\sum_{f \in \{F\}} \sum_{a=Minage}^{Maxage} \left(BPISBMER_{f,a} * Cohort_{BY=CY-a,a} \right)}$$

$$BPISBMER_{f,a} = \frac{\sum_{BPER=79}^{82} \frac{\left(TotMorts_{BPER,f,a} * AEQ_{BY=BPER-a,a,f} \right)}{Cohort_{BY=BPER-a,a}}}{4}$$

Direct application of the CTC model alone or CWT data alone was not possible in the computation of all ISBM indices since fisheries required a finer resolution than the CTC model currently provides or, in some cases, there are terminal fisheries which make the estimated CWT-based exploitation rate not representative of the untagged stocks.

In those instances the following methods were used:

1) For 2002, two pre-season models, the Fisheries Resource Assessment Model (FRAM) and the Columbia River Harvest Model, were used to predict stock-specific impacts in inside fisheries (Puget Sound net and sport, and the Columbia River net and sport fisheries respectively). These estimated impacts were then used to compute the chinook model fishery policy (FP) scalars for the corresponding CTC model fisheries.

2) For 2002 many ISBM fisheries or stock/fishery combinations had no pre-season predictions of harvest rates and in some cases, no prediction of abundance. In those cases, a repeat of 2001 harvest rates, or a repeat of 2000 rates if estimates of 2001 were also unavailable, was assumed.

3) In 1999, 2000, and 2001, external estimates of impacts in terminal ISBM fisheries were used to generate FP scalars (for model generated estimates) or to modify estimated CWT recoveries (for CWT-based estimates) for many stocks. This was necessary because terminal impacts on some CWT exploitation rate indicator stocks were not representative of the fishery impacts on the untagged stock of interest.

4) For the CWT-based estimates, some indicator stocks did not have 1979 – 1982 base period recoveries. For these stocks, base period exploitation rates for the model stock associated with the wild stock were used, if available.

Tables 2.6 and 2.7 show which model stock or CWT exploitation rate indicator stock (Table 2.7) was used to represent each wild stock. Also the tables summarize the methods (if any) used to compute the FP scalars for the model stocks or to adjust the CWT data for exploitation rate indicator stocks for the computation of the ISBM indices.

Table 2.6. Methods used to compute FP scalars for input into the CTC Chinook Model to produce ISBM Indices (see pg. 14-15 for descriptions of stock specific methods).

Stock Group	Escapement Indicator Stock	Model Stock	Stock Specific Method	
			1999–2002	2003
Lower Strait of Georgia	Cowichan	GST	3	2
	Nanaimo		3	2
Fraser Late	Harrison	FRL	3	1, 2
North Puget Sound Natural Spring	Nooksack Spring	NKS	3	1, 2
	Skagit Spring		3	1, 2
Upper Strait of Georgia	Klinaklini Kakweikan Wakeman Kingcome Nimpkish	GSQ	Model defaults	Model defaults
Fraser Early (springs and summers)	Upper Fraser Mid Fraser Thompson	FRE	3	2
West Coast Vancouver Island Falls	Artlish Burman Kauok Tahsis Tashish Marble	RBT	3	2
Puget Sound Natural Summer/Falls	Skagit	SKG	3	1
	Stillaguamish	STL	3	1
	Snohomish	SNO	3	1
	Lake Washington	PSN	3	1
	Green River	PSN	3	1
North/Central BC	Yakoun Nass Skeena Area 8	NTH	Model defaults	Model defaults
Washington Coastal Fall Naturals	Hoko	WCN	3	2
	Grays Harbor		3	2
	Queets		3	2
	Hoh		3	2
	Quillayute		3	2
Columbia River Falls	Upriver Brights	URB	3	1
	Deschutes	URB	3	2
	Lewis	LRW	3	1
Columbia River Summers	Mid-Columbia Summers	SUM	3	2
Far North Migrating Oregon Coastal Falls	Nehalem	SRH	3	2
	Siletz		3	2
	Siuslaw		3	2

Table 2.7. Methods used to adjust CWT data for computation of the ISBM indices (see pg. 14-15 for descriptions of stock specific methods).

Stock Group	Escapement Indicator Stock	Exploitation Rate Indicator Stock	Stock Specific Method
Lower Strait of Georgia	Cowichan Nanaimo	Cowichan Big Qualicum River	4 3
Fraser Late	Harrison	Chilliwack (Harrison Fall Stock)	Not needed
North Puget Sound Natural Spring	Nooksack Spring Skagit Spring	Nooksack Spring N/A	4 N/A
Upper Strait of Georgia	Klinaklini Kakweikan Wakeman Kingcome Nimpkish	Quinsam	Not needed
Fraser Early (springs and summers)	Upper Fraser Mid Fraser Thompson	N/A	N/A
West Coast Vancouver Island Falls	Artlish Burman Kauok Tahsis Tashish Marble	Robertson Creek	3
Puget Sound Natural Summer/Falls	Skagit Stillaguamish Snohomish Lake Washington Green River	N/A Stillaguamish Fall Fingerling N/A N/A South Puget Sound Fall Fingerlings	N/A Not needed N/A N/A Not needed
North/Central BC	Yakoun Nass Skeena Area 8	N/A	N/A
Washington Coastal Fall Naturals	Hoko Grays Harbor Queets Hoh Quillayute	Queets Queets Queets Queets Queets	3 3 Not needed 3 3
Columbia River Falls	Upriver Brights Deschutes Lewis	Upriver Bright Upriver Bright Lewis River Wild	Not needed 3 Not needed
Columbia River Summers	Mid-Columbia Summers	Columbia Summers	Not needed
Far North Migrating Oregon Coastal Falls	Nehalem Siletz Siuslaw	Salmon River Hatchery Salmon River Hatchery Salmon River Hatchery	3 3 3

2.2. Model Calibration

This section describes the calibration data and procedures. For reference, a list of stocks and fisheries in the model is provided in Appendix C. Estimation of the model base period parameters is discussed in detail in the model documentation (Analytic Work Group 1991). For 2003, the model used was the same as used during the Pacific Salmon Treaty negotiations (CLB 9812) but with the exception that the actual catches, escapements, and other data through 2002 were added. In addition, CTC-accepted escapement goals were used where available and the form of the Ricker production function was adjusted for those stocks with newly accepted goals (e.g. Harrison River fall white chinook).

2.2.1. Calibration Data

The first step in the annual calibration process is to gather new or revised data and update the appropriate model input files. The frequency of updates depends on the frequency of data changes made by the reporting agencies, the magnitude of the change, and the significance of the change to the current model application. For example, the file containing run size data is updated as pre-season forecasts and post-season estimates become available since model predictions are sensitive to pre-season forecasts and post-season estimates of terminal runs. Months in which forecasts are made for each stock, and the month the final return estimate becomes available, are presented in Table 2.8.

The model is recalibrated annually to incorporate observed data from the previous year and available abundance forecasts for next year. In addition, recalibration may also occur when significant changes in one or more of the following model input files are made.

BSE (base). This file contains basic information describing the structure of the model, including, but not limited to, the number of stocks, age classes and fisheries, the names of fisheries and the proportion of each age class that was not vulnerable to the gear during the base period, identification of terminal fisheries, stock names and production parameters. This file may be modified annually to incorporate productivity parameters that correspond to new CTC agreed escapement goals.

CEI (ceiling). This file contains historical catch data for the 19 fisheries that are modeled as ceiling or catch quota fisheries (as opposed to fisheries modeled solely through control of exploitation rates) through the most recent fishing season.

CNR (chinook nonretention). Data used by the model to estimate mortalities during CNR periods are read from the CNR file. The data in the CNR file depends on which method is used to calculate CNR mortality. It may include direct estimates of encounters during the CNR period or indicators of fishing effort in the CNR period relative to the retention period.

ENH (enhancement file). This file contains productivity parameters and smolt production for 13 hatchery stocks and one natural stock (Lower Georgia Strait Naturals) with supplementation. Smolt production is expressed as the deviation from the average production during the model

base period; as a result, values in the ENH file can be negative if releases in a given year are less than the average reported for the model base period. Additional discussion of the productivity parameters may be found in the model documentation (Analytic Work Group 1991).

FCS (forecast). Estimates of terminal run sizes or escapements and agency supplied pre-season forecasts (Table 2.9) are included in the FCS file. Age-specific information is used for those stocks and years with age data.

Table 2.8. Months that pre-season forecasts of abundance are available from agencies for the next fishing year.

Model Stock	Month Final Return Estimate Available	Month(s) Forecast Available
Alaska South SE	January	None
North/Central BC	November	None
Fraser Early	January	None
Fraser Late	February	February
WCVI Hatchery	January	February
WCVI Natural	January	February
Upper Strait of Georgia	January	None
Lower Strait of Georgia Natural	December	None
Lower Strait of Georgia Hatchery	December	None
Nooksack Fall	June	February
Puget Sound Hatchery Fingerling	June	February
Puget Sound Natural Fingerling	June	February
Puget Sound Hatchery Yearling	June	February
Nooksack Spring	June	Not Used
Skagit Wild	June	February
Stillaguamish Wild	June	February
Snohomish Wild	June	February
Washington Coastal Hatchery	June	None
Upriver Brights	April	February, April
Spring Creek Hatchery	April	February, April
Lower Bonneville Hatchery	April	February, April
Fall Cowlitz Hatchery	April	February, April
Lewis River Wild	April	February, April
Willamette River Hatchery	June	December
Spring Cowlitz Hatchery	June	December
Columbia River Summer	September	March
Oregon Coast	February	February
Washington Coastal Wild	June	None
Snake River Wild Fall	April	April
Mid-Columbia River Bright	April	February, April

FP (fishery policy). This file contains year-fishery-stock-age-specific scalars to be applied to base period fishery exploitation rates. The FPs are used to scale fishery exploitation rates relative to the model base period and can be used for a variety of purposes. For example, in the Ocean areas off Washington and Oregon North of Cape Falcon (WA/OR) troll fishery, the FPs are used to model the differential impacts on Columbia River and Puget Sound stocks as the proportion of the catch occurring in the Strait of Juan de Fuca varies. The source of the FPs is generally the reported catch fishery index computed from CWT data in the annual exploitation rate analysis or the ratios of harvest rates computed from terminal area run reconstructions.

IDL (interdam loss). The IDL file contains stock-specific conversion factors for the Columbia River Summer, Columbia Upriver Bright, Spring Creek Tule, and Snake River Fall stocks provided each year by Columbia River fishery managers. The factors represent the fraction of the stock that can be accounted for after mainstem dam passage in the Columbia River; losses can be attributed to direct mortality at the various dams, mortality in the reservoirs between dams, fall-backs, tailrace spawning, and other factors. The interdam loss factor is equal to one minus the conversion factor.

IM (changes in incidental mortality rates). The IM file contains the incidental mortality rates by fishery for legal and sublegal fish that differ from those used in the base period due to alterations in gear, regulations, or fishery conduct.

MAT (maturity and adult equivalent factors). Estimates of annual maturation rates and adult equivalent factors for the 11 stocks are represented in the MAT file. The file is updated each year with rates obtained from the annual exploitation rate analysis. The average value is used for years beyond the last year for which estimates are available (due to incomplete broods and the one year lag for completion of the annual exploitation rate analysis).

PNV (proportion nonvulnerable). A PNV file is created for each fishery for which a size limit change has occurred since the model base period. Each file contains age-specific estimates of the proportion of fish not vulnerable to the fishing gear or smaller in length than the minimum size limit. The PNVs were estimated from empirical size distribution data; in some instances, independent surveys of encounter rates were used to adjust the PNV for age 2 fish to account for the proportion of the cohort that was not vulnerable to the fishing gear.

STK (stock). This file contains the stock and age-specific starting (base period) cohort sizes, the base period exploitation rates on the vulnerable cohort for each model fishery, maturation schedules, and adult equivalent factors. This file is updated if new stocks or fisheries are added, new CWT tag codes are used to represent distribution patterns of existing model stocks, or a re-estimation of base period data occurs. Modification of this file will result in a model different from that used in the negotiations (CLB 9812).

The calibration is controlled through a file designated OP7.

Table 2.9. Methods used to forecast the abundance of stocks in PSC Chinook Model: Externally provided forecast type codes are S = sibling; R = return rate; C = model internally estimated projection.

Model Stock	Forecast Characteristics			Comments
	Forecast Type	Pre-season Age- Specific	Post-season Age- Specific	
Alaska South SE	C	-	Yes	Calibrated to escapement
North/Central BC	C	-	No	Calibrated to terminal run
Fraser Early	C	-	No	Calibrated to terminal run
Fraser Late	S	Yes	Yes	Combined forecasts for Harrison River and Chilliwack Hatchery
WCVI Hatchery + Natural (RBH and RBT model stocks)	S	Yes	Yes	Robertson Creek Hatchery forecasts plus expansion for other WCVI stocks based on ratio of terminal run sizes
Upper Strait of Georgia	C	-	Partial	Calibrated to escapement
Lower Strait of Georgia Natural	C	-	Yes	Calibrated to escapement to Cowichan and Nanaimo Rivers
Lower Strait of Georgia Hatchery	C	-	Yes	Calibrated to escapement to GSH hatchery systems and Squamish River
Nooksack Fall	R	No	No	2001-2002 return rate
Puget Sound Hatchery Fingerling + Yearling	R	No	No	Age-specific forecasts not available for all components
Puget Sound Natural Fingerling	R	No	No	Calibrated to terminal run
Nooksack Spring	C	Partial	No	No data since 1987
Skagit Wild	S	Yes	Yes	Cohort return rate
Snohomish Wild	R	No	No	Recruits per Spawner
Stillaguamish Wild	R	No	No	Recruits per Spawner
Washington Coastal Hatchery	C	No	No	Calibrated to terminal run
Washington Coastal Wild	R	No	No	Calibrated to terminal run
Upriver Brights	S	Yes	Yes	Run reconstruction used to estimate Columbia River mouth return
Mid-Columbia River Bright	S	Yes	Yes	Run reconstruction used to estimate Columbia River mouth return
Spring Creek Hatchery	S	Yes	Yes	Run reconstruction used to estimate Columbia River mouth return
Lower Bonneville Hatchery	S	Yes	Yes	Run reconstruction used to estimate Columbia River mouth return
Lewis River Wild	S	Yes	Yes	Run reconstruction used to estimate Columbia River mouth return
Spring Cowlitz Hatchery	S	Yes	Yes	Prediction is to mouth of tributary streams.
Willamette River Hatchery	S	Yes	Yes	Prediction is to mouth of Willamette River
Columbia River Summer	S	No	No	Changed in 2001 to 5-year average
Oregon Coast	S	Yes	Yes	Weighted average age composition from four index rivers
Snake River Wild Fall	C	-	No	Calibrated to escapement to Lower Granite. External forecast is sometimes available.

2.2.2. Calibration Procedures

The objective of the calibration is to estimate stock and brood year specific environmental variant (EV) scalars. The calibration uses an iterative algorithm to estimate the EV scalars for each brood year and model stock to account for annual variability in natural mortality in the initial year of ocean residence. EV scalars are applied to production resulting from brood year escapements and the base period spawner-recruit function to produce the age 1 abundance by stock. Fishing impacts and natural mortalities are then applied through model processes. EVs also adjust for biases resulting from errors in the data or assumptions used to estimate the base period parameters for the spawner-recruit function.

EVs are estimated through the following steps for stocks calibrated to age-specific terminal run sizes:

(1) Predicted terminal runs are computed for each year using the input files discussed above and with values of all stock productivity scalars (EVs set equal to 1).

(2) The ratio of the estimated terminal run and model predicted terminal run (SC_{BY}) is computed for each brood year. For example, if the estimated and model predicted terminal runs for the 1979 brood were 900 and 1,500 age 3 fish in 1982, 4,000 and 4,500 age 4 fish in 1983, and 1,000 and 1,500 age 5 fish in 1983, the ratio would be computed as:

$$SC_{BY} = \frac{\sum_{a=Minage}^{Maxage} (EstimatedTerminalRun)_a}{\sum_{a=Minage}^{Maxage} (ModelPredictedTerminalRun)_a}$$

$$SC_{BY} = \frac{900 + 4000 + 1000}{1500 + 4500 + 1500}$$

In the absence of age-specific estimates of the terminal run, the components are computed by multiplying the total terminal run by the model predictions of age composition.

(3) The stock productivity scalar for iteration n and brood year BY is computed as:

$$EV_{n,BY} = EV_{n-1,BY} * SC_{BY}$$

(4) Steps 1–3 are repeated until the absolute change in the stock productivity scalars for all stocks is less than a predetermined tolerance level (currently set at 0.05).

Several options for the calibration are provided in the OP7 control file. The options include the brood years for which the stock productivity scalars are estimated in each iteration and the type of the convergence test. For the 2003 calibration, stock productivity scalars were estimated for

each brood year in each iteration. Convergence was defined to occur when the absolute value of the difference in stock productivity scalars between successive iterations did not exceed 0.05.

Stock-specific calibration options are specified in the FCS file and discussed below:

Minimum Number of Age Classes. Data for all age classes will not be available when the stock productivity scalars are estimated for recent broods. Since considerable uncertainty may exist in a single data point, application of the calibration algorithm can be restricted to cases in which a specific minimum number of age classes are present.

Minimum Age. Considerable uncertainty often exists in the estimates of terminal runs or escapements for younger age classes, particularly age 2. The minimum age class to include in the calibration algorithm is specified in the FCS file.

Estimation of Age Composition. Age-specific estimates of the terminal run or escapement may not be available. An option is provided to estimate the age composition using base period maturation and exploitation rates.

The forecasts provided by the management agencies typically represent terminal runs or escapements without adjustments for changes in ocean fisheries. Since the forecasts implicitly include exploitation in pre-terminal fisheries, the expansion of the forecasts to total cohort size should be made using the average exploitation rate for the period of years in the forecast database.

The 2003 calibration was completed in two stages to facilitate computation of the average exploitation rates and incorporation of the agency forecasts. The Stage 1 calibration provided initial estimates of exploitation rate scalars for fishing years 1979 through 2002 using updated catch and escapement data through 2002. Average exploitation rate scalars were then computed and used as input values for 2002 fisheries in the Stage 2 calibration, except for the WCVI and Fraser Late (FRL) stocks whose forecasts already account for changes in the ocean fisheries.

The average exploitation rate scale factors ($\overline{FP}$) for each model fishery were obtained from the Stage 1 calibration using the following formula:

$$\overline{FP}_{a,s,CY,f} = \frac{\sum_{CY=CY_{start}}^{CY_{end}} RT_{CY} * FP_{s,a,CY,f}}{(CY_{end} - CY_{start})}$$

The range of years used to compute the average varied between stocks and was fishery and age-specific.

The input files used in the Stage 2 calibration were identical to those used in Stage 1 with two exceptions:

(1) the average exploitation rate scale factors for each fishery were inserted into the FP file for 2003; and
(2) the Stage 1 EVs were used as starting values for the Stage 2 calibration.

To determine the acceptability of a calibration by the CTC (i.e., whether an annual calibration is deemed final by the CTC), several results are examined:

(1) accuracy of the reconstructed catches in the fisheries (these values will consistently differ from the actual catches if the calibration is not able to recreate exactly the actual catches in the years 1979 through 1984, the model years prior to implementation of the ceiling algorithm);
(2) accuracy of model predicted terminal runs or escapements relative to the data used for calibration of each stock;
(3) comparison of model predicted age structure in terminal runs or escapements with data used for calibration (consistent biases in age structure are addressed by changing maturation rates);
(4) patterns in the stock productivity scalars compared with marine survival patterns generated by the annual exploitation rate analysis;
(5) comparison of CWT and model estimates of fishery harvest rate indices;
(6) comparison of model estimates of mortality distributions for individual stocks to those generated from the annual CWT-based exploitation rate analysis; and
(7) comparison of model estimated AIs with those AIs estimated by model CLB 9812.

Calibration usually involves an iterative process until a judgment is made by the CTC that an acceptable fit to all the data was achieved. This decision usually involves an inspection and trial-and-error process. The determination of whether or not further calibrations are necessary is based principally on the significance of deviations from observed or estimated values for stocks and fisheries most relevant to the issues to be evaluated and on the time constraints established for completion of the calibration.

2.2.3. Changes from Previous Calibration Procedures

2.2.3.1 Program Changes

A number of new program versions were used or tested against previously used versions as part of this year's analyses. These were:

1. A new Visual Basic version of 'MakeC', the C-file generation program (programmed by Wostmann & Associates, Inc. through contract to ADFG), was tested against the previously used Fortran version and will be used exclusively in 2003. One major benefit of this program is that all estimated CWT recoveries in escapements are provided in one auxiliary file rather than entered manually into the individual C-files by different individuals.

2. A new Visual Basic version of the cohort analysis program was tested last year against the previously used Quick Basic version and used exclusively to perform the exploitation rate analysis this year. Benefits of this new version include the capability of simultaneously

running all four variants of the cohort analysis, easily accessible help files, and improved format of some of the key outputs. The program also now automatically checks whether recoveries occurred for at least one tag code from a given brood. Any brood with zero recoveries is excluded from the analysis. Individual tag codes with zero recoveries, however, are not excluded as long as recoveries occurred for at least one tag code representing a brood.

3. A new Visual Basic version of the Chinook Coastwide Model was tested against the previously used Quick Basic version and will be used exclusively in 2003/04.

2.2.3.2. Data Changes Involved in the Exploitation Rate Analysis

1. The agreed PSC data format used for CWT recoveries in the Coastwide Database (RMIS) was updated from version 3.2 to 4.0. This update permits increased flexibility in coding for harvesting method and specifically enables separation of gear type and fishery type. The benefit of this change is a more appropriate calculation of catch sample expansion factors. With this year's analysis, numerous AK troll and net recoveries were separated by harvest code and expanded by different (and more appropriate) catch sample expansion factors than used in the past. A catch unsample factor was also correctly applied to several traditional and terminal fisheries whereas this was not possible for past exploitation rate analyses.

2. Some previously unreported CWT recoveries sampled in the Albion Chinook Test Fishery in the Lower Fraser River from 1995, 1996, and 1998-2000 were added to the Coastwide Database. The Chilliwack River Hatchery stock is the only CTC exploitation rate indicator for which there were additional recoveries.

3. Certain CWT data for the Spring Creek Hatchery stock were found to be missing from the RMIS database (i.e., recoveries from escapements, ocean fisheries and terminal in-river fisheries). In addition, terminal fishery and escapement data prior to 1997 were determined to be inaccurate. Missing and inaccurate data were reconstructed from C-files used in previous exploitation rate analyses.

4. Some escapement recoveries for the Queets Fall Fingerling stock were found to be biased high. Previous exploitation rate analyses were used to develop replacement escapement recoveries and these were manually entered into the C-files. The expansion factors are under review and may be modified again for next year's analyses.

5. The algorithm used to generate the expansion factors for CWT recoveries in Canadian sport fisheries was updated to account for the increased numbers of 'no-pins' (sampled heads containing no CWT) resulting from the current abundance of mass-marked chinook. The awareness factor calculated by the previously used algorithm resulted in over-expansion of CWT recoveries. The update to the algorithm affects chinook recoveries after the year 1999.

6. Two additional tag codes were included in the 2003 ERA for each of the 1994 (635324 and 635838) and 1996 (636054 and 636323) broods of the Columbia River Summers (SUM) doubling the number formerly used for each brood. It is not clear why these tag codes were excluded from previous analyses.

7. Tag code 630166 from brood 1999 was included for the Skagit Summer Fingerlings (SSF).

8. Tag code 630604 from brood 1997 was included for the Nooksack Spring Fingerlings (NKF). Formerly, it was incorrectly associated with the Nooksack Spring Yearlings (NKS).

9. IDL values for SUM were updated for all return years. IDL values for URB and LYF were updated for the 1979-1985 return years. The updates will affect the escapement estimates generated for the years with updates.

10. Terminal sport recoveries for the Willamette Springs (WSH) were recoded from 'TCOL R' sport to 'TRIB' sport.

2.2.3.3. Coding Changes to the C-File Generation Program

1. The terminal sport definition for the Big Qualicum Hatchery stock was modified. The former terminal sport definition included only CWTs recovered in the Big Qualicum River starting in statistical week 82. The modified definition expands the previous definition to include marine areas, specifically statistical subareas 14-1 to 14-12 in western Georgia Strait. The result of this change is that more CWT recoveries are categorized as terminal sport and fewer as Georgia Strait sport. Output from cohort analyses revealed a maximum decrease in the exploitation rate on the Big Qualicum River stock in Georgia Strait sport of about 8% (age 4 fish caught in 1997) and a maximum increase of about 30% in terminal sport (age 2 fish caught 1984). Maturation rates and adult equivalent rates changed only marginally.

2. Through implementation and testing of the new C-file generation program, a number of previously unrecognized problems concerning incorrect exclusion of certain recoveries and inconsistent or incorrect mapping of other recoveries were at least identified and in some cases, rectified. These issues are detailed here and noted as fixed where appropriate.

Issues Relating to Jurisdictions

All Jurisdictions

During testing of the new C-file generation program numerous examples were discovered of recoveries that were being unnecessarily excluded. This was mainly due to the fact that a small number of recoveries for certain stocks were occurring in unexpected locations and are currently unmapped to any C-file fisheries. This issue will be reviewed in the future and any locations at which valid CWT recoveries occur will be included in C-file fisheries.

Canada

1. A small number of troll recoveries that were caught in US fisheries (southeast Alaska and Puget Sound) and landed in Canadian ports were previously being incorrectly expanded and included in US C-file fisheries. The catch expansion factor calculated for these recoveries (always equal to 1) was incorrect. These recoveries should have been excluded from the C-files previously and the new version of the C-file generation program now does so.

2. A small number of net recoveries of Robertson Creek Hatchery Falls in southern US terminal areas were formerly incorrectly binned in the true terminal net C-file fishery. These recoveries are now excluded.
3. The birth date of Oct 1 for aging of troll recoveries was implemented for all Canadian troll fisheries starting with recoveries from 1998. The former version of MakeC applied this birth date only to the northern troll, and northwestern and southwestern troll fisheries of Vancouver Island.

Washington/Oregon

1. The troll fisheries of 'WA/OR North of Falcon' and 'Juan de Fuca Strait' should include recoveries from statistical area 4B only during May - September and during January - May and October – December, respectively. Currently, date is not used to assign recoveries in 4B to the troll fisheries and all are being included with WA Area 4 troll.
2. A number of changes have been made in the mapping of recoveries to C-file fisheries with implementation of the new C-file generation program. The following table gives the list of changes in the mapping of some recoveries that were formerly binned in one C-file fishery but are now binned in another. Note that not all recoveries from the list of C-file fisheries from which recoveries have been removed (see table below) have necessarily been reassigned.

Former C-file fishery	Current C-file fishery
Puget Sound South Net	Puget Sound 7 Net
Puget Sound 7 Net	Puget Sound Other Net
Puget Sound North Sport	Puget Sound Other Sport
Puget Sound 7A Net*	Puget Sound 7 Net
Washington Coastal Net	Puget Sound 7 Net
Washington Troll	Oregon Troll

* All Puget Sound 7A N recoveries will now appear as Puget Sound 7 N recoveries.

Issues Relating to Indicator Stocks

1 Alaska Springs

1. Some seine recoveries from statistical areas 107, 110, 111 that were formerly excluded from the C-files are now included because unsample factors can be used to calculate appropriate expansion factors.
2. Many troll and net recoveries have changed due to the fact that the unsample expansions have been modified. The former unsample factors resulted in all troll fishery catches being lumped together (fishery codes 10-19). The new system uses only fishery code 10. Similarly for the net gears, the former seine unsample factors used codes 25 and 26. The new system uses only fishery code 25. The former gillnet unsample factors used the codes 20 and 28. The new gillnet unsample factors uses only fishery code 20.
3. The few Southern US recoveries of the Alaska stock that exist were all formerly placed in the Washington troll C-file fishery regardless of the capture location south of the BC/WA border. These are now placed in the appropriate C-file fishery according to capture location.

4. Some recoveries from terminal troll recoveries for one SEAK hatchery were not getting mapped by the former Alaska MakeC program but this issue has been corrected in the new program.
5. The 'birth date' of October 1 for incrementing the age of fish caught in the SEAK troll fishery formerly applied to all recoveries. This has been changed to apply to only those identified by fishery code 10.

2 Big Qualicum Falls

Some terminal sport recoveries are currently mapped as Georgia Strait sport recoveries because the recovery file extracted from RMIS for use in the new C-file generation program did not have the new Canadian location information that would allow for the correct mapping of all terminal recoveries. This will be corrected by next year's analysis.

3 Salmon River Hatchery

A large portion of the escapement recoveries from the early brood years need to be generated for the auxiliary data file to match numbers in C-files used in previous years.

4 Columbia Upriver Brights

Some individual recoveries were being expanded by a factor greater than 50 and therefore, exceeding the CTC-agreed maximum expansion rule of 50. These recoveries are now capped at the maximum expansion of 50.

5 Columbia Upriver Summers

IDL values for SUM were updated for all return years. IDL values for URB and LYF were updated for the 1979-1985 return years. The updates will affect the escapement estimates generated for the years with updates.

6 Lyons Ferry

IDL values for SUM were updated for all return years. IDL values for URB and LYF were updated for the 1979-1985 return years. The updates will affect the escapement estimates generated for the years with updates.

7 Willamette Springs

The escapement and terminal sport data are under review and will likely be substantially revised prior to the next calibration.

Additional discrepancies in estimated recoveries noted for particular stocks in comparing C-files generated by the new program compared to former program can be traced to the following changes in the mappings of certain locations. In addition, a number of previously unmapped locations have been included in some C-file fisheries. These are detailed in the following table. The acronyms under the column 'Stocks Affected' are: BQR - Big Qualicum River Falls, GAD - George Adams Fall Fingerlings, SPS - South Puget Sound Fall Fingerlings, ELW - Elwha Fall Fingerlings, CWF - Cowlitz Fall Tules, URB - Columbia Upriver Brights, and WSH - Willamette River Springs.

Table 2-10. Corrections to location mapping.

PSC Location Code	Old Program	New Program	Stocks Affected
3M11106 872146	Missing	PG SD N Sport	BQR
3M11208 872179	Missing	PG SD OT Sport	BQR
3M10706	Missing	WASH CST Net	BQR
3M11105	Missing	WASH OCN Sport	BQR
3M10707	Missing	PG SD 7 Net	BQR
3M11107	Missing	PG SD N Sport	BQR
3M32303	Missing	WASH Troll	BQR
3M10107X2 X7B	Missing	PG SD 7 Net	BQR
3M10510 A	SPS Net	10-11 Net	GAD, SPS, ELW
3M* CANADAR18	Missing	SWVI Troll	GAD
5F33209 R2 13	Missing	Terminal Net	GAD
2MS03C 000	Missing	WA 4 Troll	GAD
3M112082 872529	8-1 Sport	8-2 Sport	GAD
2MS01120	Missing	NWVI Troll	GAD
2MS01025 000	Missing	NWVI Troll	GAD
3M10744X2 X4B	WA Cst Net	WA JDF Net	GAD, SPS
3M10107X1 X7B	Missing	NK/SM Net	GAD
6MO BGCB	Missing	S of Falcon Sport	GAD
2MS02023 059	Missing	SWVI Troll	GAD
2MS03C 000	Missing	WA 4 Troll	SPS
3M167 X1 X6	Missing	WA Cst Net	SPS
3M10746X1 X4B	Missing	WA Cst Net	SPS
3M10308 D	Terminal Net	Stl/Sno Net	SPS
5M2220201O0201 10	WA 2 Troll	OR 3 Troll	SPS, CWF, URB, WSH
2MS24020 020-000	Missing	WA 5 Sport	SPS
3M112082 872057	8-1 Sport	8-2 Sport	SPS
2MS21021 379	SWVI Net	Missing	SPS
3M11413 872375	Missing	13 Sport	SPS
3M354 X2 X4B	JDF Troll	WA 4 Troll	SPS
5M2222401O2401 10	Missing	OR 4 Troll	SPS
3M10806 D	Missing	6B-9 Net	SPS
5M2220202O0202 11	Missing	WA 1 Sport	ELW
3M11106 872134	Missing	WA 6 Sport	ELW
3M32404	Missing	WA 4 Sport	ELW
3M10706 C	Missing	WA JDF Net	ELW
3F10806 180272 H	Missing	Escapement	ELW
2MS20025 000	SWVI Net	Terminal Net	ELW
5M2220202O0202 10	WA 1 Troll	OR 3 Troll	CWF, URB
3M21902	PG SD OT S	WA 2 Sport	CWF
5M2223205O3205 10	OR 5 Troll	OR 4 Troll	URB
5M2220204O0204 10	OR 4 Troll	OR 3 Troll	WSH

2.2.3.4. Changes to the Input Data for the Chinook Model

1. The Snake River wild (LYF) forecast for 2003 was not available for inclusion in the model calibration.

2. Maturation rates were set to the long-term averages in the maturation rate file for stock-brood year combinations that exhibited unusual maturation rates and low numbers of CWT recoveries for the brood. The following stocks and brood years were set to the long-term average maturation rates for the stock:

RBT – 1992
LRH – 1986, 1991, 1992, 1995
CWF – 1994
GSH – 1992
LRW – 1996
SPR – 1983, 1984
WSH – 1982

3. The age-specific maturation rates used in this years' analysis of the Fraser Late stock (FRL) consisted of a weighted average of the values derived from cohort analysis of CWT recoveries from the Chilliwack Hatchery stock and newly estimated rates for the Harrison River wild fall chinook. Averages were weighted by the respective estimated abundance of each age class in the total escapement.

4. All Hanford Wild (HAN) stock maturation data were replaced with age-specific rates calculated for the Columbia Upriver Bright (URB) stock (i.e., Priest Rapids stock). This decision was made because low numbers of HAN recoveries in some years resulted in highly skewed maturation rates from the cohort analysis.

5. The LRH (Oregon Tule Stocks) and CWF (Washington Tule Stocks) were separated in the forecast file due to differences between the maturation rates for these two stock groups. Previous year's calibrations fit these two stock groups as an aggregate of Columbia River Tules using a single EV scalar. This resulted in unreasonable age compositions in the escapement for these stocks due to the disparate maturation rates. The modification made to the structure of the data supplied to the model for this year's calibration resulted in more appropriate EV values and maturation rates for each of the two groups.

6. The Ricker alpha value for the Southeast Alaska (SEAK) stock in the BSE file was found to be incorrect and was changed to the correct value. In addition, the maximum escapement value (1/B) was corrected and changed from 12,663 to 23,457.

7. Historical catch numbers in the ceiling file were updated for several fisheries. The Alaska troll, net and sport catch levels were changed due to updated commercial fish ticket information, updated statewide sport harvest survey information and updated Alaska hatchery add on contribution estimates. These changes occurred in nearly all years. The WA/OR sport fishery had changes to the 2001 catch level. The Puget Sound North Sport had changes to the 1999 and 2001 catch levels. Puget Sound South Sport had changes to the 1999-2001 catch levels. The Puget Sound North Net had changes to the 1999-2001 catch levels.

8. There were several changes to the CNR data in the CNR file. The Alaska troll CNR data was modified for nearly all years. The Alaska net CNR data was updated for 1985 and 2001. The Puget Sound North and South sport CNR data was updated for 2001.

9. IDL values for SUM were updated for all return years. IDL values for URB and LYF were updated for the 1979-1985 return years. The updates will affect the escapement estimates generated for the years with updates.

10. Enhancement data in the ENH file was updated for SPR and BON for years 2001 and onward

11. Further updates to the enhancement data were scheduled for this year, however, it was found that much of the historical data for certain stocks could not be recreated. Updates to the enhancement file were deferred until after this year's calibration. The issues of whether the enhancement data could be used more effectively by the Chinook Model and the need for standardization across life history stage at release from the hatchery will also be re-examined.

2.2.3.5. Coding Changes to the Chinook Model

A problem with the calculation and stock-specific allocation of shaker mortality rates was found in the subroutine 'CalcEncRte' through the process of converting the former Quick Basic version of the Chinook Model to the current Visual Basic version. The code in the subroutine was a mixture of two methods that had originally been considered for allocating shaker mortalities but was not correct for either. The two methods differed according to how stock composition in the fisheries was derived. Method 1 was selected for implementation in the code because Method 2 was found to produce anomalous results when large differences in age-specific cohort sizes of individual stocks were observed. Method 1 has been implemented in the new program but correction of the problem will have some affect on results from previous calibrations. Impacts are expected to be minor for critical outputs such as the abundance indices since the total shaker loss will be identical and differences in the distribution of shakers among stocks and ages should be small.

2.3 General Forecast Methods

For those stocks with externally provided forecasts of abundance in 2003, management agencies used three general methods to predict terminal returns or escapements:

Sibling Models. Empirical relationships between abundance (commonly measured as terminal run size) of age *a* fish in calendar year *CY* and the comparable abundance of age *a+1* fish in year *CY+1* are used to predict abundance in 2003 from data collected in previous years (forecast type S in Table 2.9).

Average Return Rate Models. Return rates of adults by age from smolts or parents are averaged over past brood years, then these averages are used to discount abundance of smolts or parents for brood years that will be exploited in 2003 (forecast type R in Table 2.9).

A more detailed description of the forecast methods used for specific stocks is found in Appendix D.

3. RESULTS

3.1. Exploitation Rate Analysis

3.1.1. Brood Year Exploitation Rates

Brood year exploitation rates for 13 stocks were computed (Appendix F, Figures F.1–F.16). These figures are presented as cumulative bar graphs: landed catch plus incidental mortality (non-landed catch mortality due to fishing) summing to the total mortality for each brood year. Figures labeled as ocean mortality exclude terminal fishery mortality, while total mortality indicates ocean plus terminal fishery mortality. In general, exploitation rates for these 13 stocks have declined from the base period years.

3.1.2. Survival Indices

Estimated total brood year survival from CWT exploitation rate analysis and EV scalars from the model are presented for 30 of the index stocks in Appendix E. In general, recent brood year survivals are lower than in earlier years of the time series for completed brood years. For some stocks, survivals for recent incomplete broods have been increasing. Correlation coefficients (*r* values) were computed as a measure of association between the two indices of survival (Table 3.1). A correlation approaching 1.0 indicates a strong linear relationship and provides evidence that the EV is predictive of the final cohort survival. Conversely, a correlation approaching 0 indicates little relationship between the EV scalar and final cohort survival. The degree of correlation varied substantially among stocks. Of the 30 stocks, 19 had *r* values that were significantly different from zero ($P < 0.05$). Correlation coefficients for these 19 stocks ranged from 0.47 to 0.80.

Table 3.1. Correlation coefficient (*r*) between total brood year survival estimated from CWTs and EV scalars for 30 stocks. *N* is the number of brood years with survival and EV data; *P* is the probability that the true *r* is equal to 0. A low *P* value indicates a significant correlation.

Exploitation Rate Indicator Stock	*N*	*r*	*P*
Alaska Spring	18	0.40	0.100
Kitsumkalum	16	0.38	0.148
Robertson Creek	23	0.71	<0.001
Quinsam	22	0.73	<0.001
Puntledge	23	0.45	0.030
Big Qualicum	23	0.48	0.020
Cowichan	11	0.46	0.156
Chilliwack	16	0.68	0.004
Skagit Spring Yearling	11	0.03	0.930
Nooksack Spring Yearling	10	0.75	0.012
South Puget Sound Fall Yearling	13	-0.12	0.692
South Puget Sound Fall Fingerling	21	0.47	0.030
George Adams Fall Fingerlings	18	0.58	0.011
Samish Fall Fingerling	15	0.69	0.005
Squaxin Pens Fall Yearling	8	0.09	0.840
Hoko Fall Fingerling	10	-0.09	0.812
Elwha Fall Fingerling	9	0.51	0.158
White River Spring Yearling	19	-0.18	0.462
Queets Fall Fingerling	17	0.52	0.034
Sooes Fall Fingerling	10	-0.17	0.629
Cowlitz Tule	20	0.82	<0.001
Spring Creek Tule	23	0.68	<0.001
Columbia Lower River Hatchery	21	0.44	0.045
Lewis River Wild	17	0.55	0.021
Columbia Upriver Brights	22	0.56	0.006
Hanford Wild	11	0.78	0.005
Lyons Ferry	9	-0.52	0.150
Columbia River Summers	17	-0.07	0.786
Willamette Spring	21	0.66	0.001
Salmon River	18	0.66	0.003

3.1.3. Stock Distribution

Tables in Appendix G provide the distribution of a stock's catch mortality among fisheries, as well as escapement, for both reported catch and total mortality in a calendar year. The distribution is shown as a percentage of the annual production; values within a year sum to 100%.

3.2 Model Output

3.2.1. AABM Abundance Indices and Associated Catches

Beginning with the 1999 fishing season, the Agreement specified that the AABM fisheries be managed through the use of the AIs, where specific allowable harvest corresponds to a given AI for each fishery. In 1999, 2000, and 2001 the CTC calibrations produced AIs that were used to set fishing plans with management harvest targets. In addition to the AIs, the Agreement also provided that the AIs could be adjusted in season using CTC approved methodologies. Although the AIs are used to set fishing plans (management targets) annually, the Agreement specified that the first post-season calibration will be used to the set final allowable catch, and to track overage and underage provisions. However, the CTC did not produce a final calibration in 2000, thus the 2001 calibration (CLB 0107) was used to generate final AIs for both 1999 and 2000. The 2003 CTC calibration (CLB 00308) provided AIs for 1979 through 2003 (Appendix H). The AIs from 1999 to 2002 are now final, while the AI for 2003 is preliminary, being used to set pre-season catch allowances for this year (Table 3.2).

Table 3.2. Abundance Indices for 1999 to 2003 for the SEAK, NBC, and WCVI troll fisheries.

Year	SEAK		NBC		WCVI	
1999	1.15[1]	1.12[3]	1.12[1]	0.97[3]	0.60[1]	0.50[3]
2000	1.14[2]	1.10[3]	1.00[2]	0.95[3]	0.54[2]	0.47[3]
2001	1.14[3]	1.29[4]	1.02[3]	1.22[4]	0.66[3]	0.68[4]
2002	1.74[4]	1.82[5]	1.45[4]	1.63[5]	0.95[4]	0.92[5]
2003	1.79[5]		1.48[5]		0.85[5]	

[1] From CTC Chinook Model Calibration #9902.
[2] From CTC Chinook Model Calibration #0021.
[3] From CTC Chinook Model Calibration #0107.
[4] From CTC Chinook Model Calibration #0206.
[5] From CTC Chinook Model Calibration #0308.

In general, the AIs for 1999 and 2000 are low compared to AIs in the late 1980s and early 1990s but values have increased in 2002 and 2003. The AI values in 2002 and 2003 are comparable to the higher values in the time series.

The Agreement specifies an allowable catch for each AI for each fishery. The specified treaty catch by fishery and year and the actual (observed) catches are shown in Table 3.3. The 2003 AI for the SEAK troll fishery is 1.79, for the NBC troll it is 1.48, and for the WCVI troll is 0.85.

Table 3.3 Observed catches and post-season allowable catches for 1999 to 2002, and pre-season allowable catches for 1999 to 2003, for AABM fisheries.

	PST Treaty Allowable and Observed Catches								
	SEAK (T, N, S)			NBC (T, S)			WCVI (T, S)		
Year	Pre-season Allowable Catch	Post-season Allowable Catch	Observed Catch	Pre-season Allowable Catch	Post-season Allowable Catch	Observed Catch	Pre-season Allowable Catch	Post-season Allowable Catch	Observed Catch
1999	192,750	184,200	198,842	145,600	126,100	92,899	128,347	107,000	36,413
2000	189,900	178,500	186,493	130,000	123,500	31,900	115,513	86,200	101,438
2001	189,900	250,300	186,838	132,600	158,933	43,500	141,200	145,500	117,670
2002	356,500	371,933	357,100	192,700	237,805	137,775	203,217	196,799	165,036
2003	366,132			197,067			181,825		

The Agreement specifies that overage/underage provisions apply to both AABM and ISBM fisheries. However, the CTC identified in a February 12, 2002 letter to the PSC major technical obstacles and policy concerns for adjusting harvest levels in response to overage and underages. The major problem identified for AABM fisheries is the confounding of forecast and management error in assessing overages and underages. The estimates of abundance used to set management goals can be substantially different than the estimates (Table 3.2) due to forecast error. Allowable catch levels that may be used to guide managers in setting harvest efforts thus can be quite different from allowable harvest derived from the first post-season calibration (Table 3.3). As a result, management precision during the fishery differs from the precision of attaining the target.

Until an approach for full implementation has been developed and accepted by the PSC, the Commissioners have instructed the CTC to track overages and underages relative to agreed-upon harvest objectives. Table 3.4 shows the difference between the post-season allowable catch and the observed catch in AABM fisheries for 1999–2003, and the cumulative differential for those years. All three AABM fisheries have cumulative underages. In SEAK, observed catches have been below final allowable catches for two of the four years; the cumulative differential is –5.7%. In NBC, observed catches have been below the final allowable catches in all four years; the cumulative differential is –52.6%. In WCVI, observed catches have been below allowable catches for three of the four years; the cumulative differential is –21.5%.

Table 3.4 Deviations in numbers of chinook salmon and percentages from final (first) catch targets for Pacific Salmon Treaty AABM fisheries in 1999 to 2002.

	SEAK (T, N, S)		NBC (T, S)		WCVI (T, S)	
Year	Treaty Numbers	Treaty Percent	Treaty Numbers	Treaty Percent	Treaty Numbers	Treaty Percent
1999	+14,642	+7.9%	-33,201	-26.3%	-70,587	-66.0%
2000	+7,993	+4.5%	-91,600	-74.2%	+15,238	+16.0%
2001	-63,462	-25.3%	-115,400	-72.6%	-27,830	-19.1%
2002	-14,833	-4.0%	-100,030	-42.1%	-31,763	-16.1%
Cum.	-55,560	-5.7%	-340,231	-52.6%	-114,942	-21.5%

3.2.1.1. Stock composition of AABM fisheries, 1979-2003

There are 30 stocks used in the model. However, the majority of catches in AABM fisheries are often composed of only a few major stocks (Figures 3.1 through 3.3). The relative abundance for each major stock is shown in the graphs. Abundance estimates for each of the 30 model stocks in each AABM fishery are included in Appendix J.

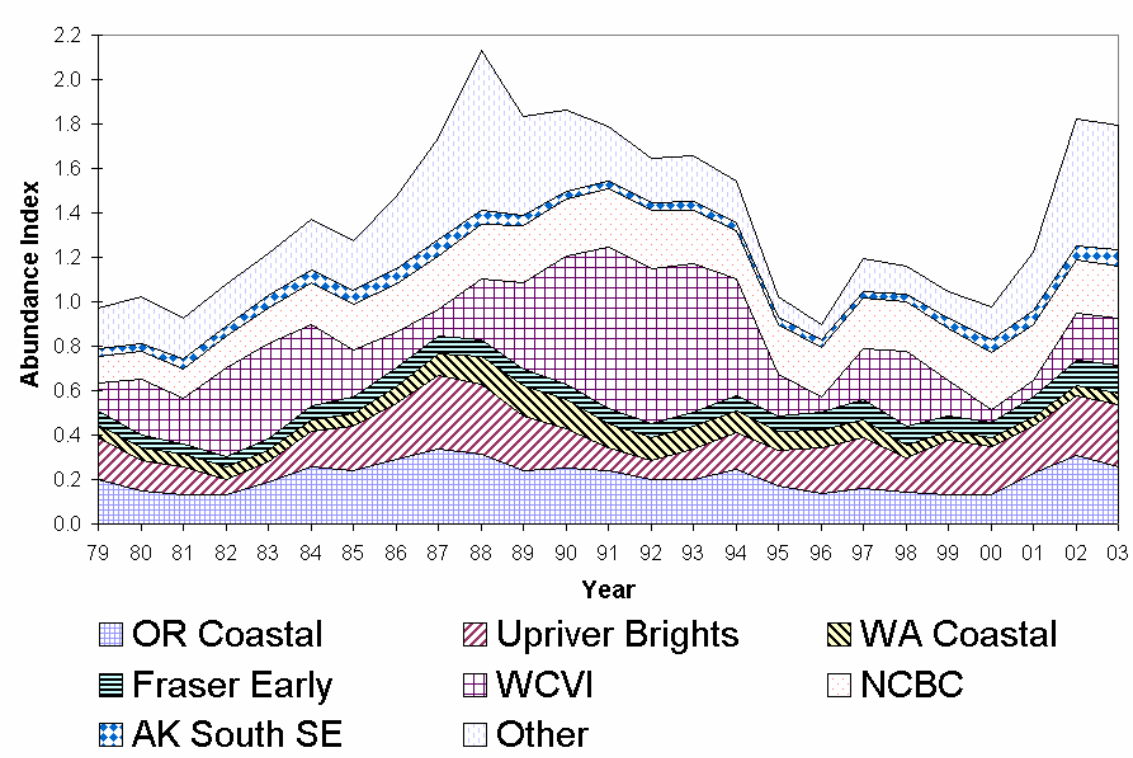

Figure 3.1. Total abundance indices for the Southeast Alaska troll fishery with annual stock composition indicated by abundance indices for major model stocks from CLB 0308.

The major model stocks contributing to the SEAK AIs, on average, are: WCVI Natural and Hatchery, Upriver Brights, North/Central BC, and Oregon Coastal (Figure 3.1). The forecasted stock composition for 2003 is very similar to the 2002 post-season assessment, with all major model stocks predicted to be similar in abundance to that seen last season. Similar to 2002, the relatively high 2003 forecast is also a result of expected higher production from stocks in the "Other" category, primarily Upper Georgia Strait, Columbia River Summers and Mid Columbia River Brights (see Appendices I and J).

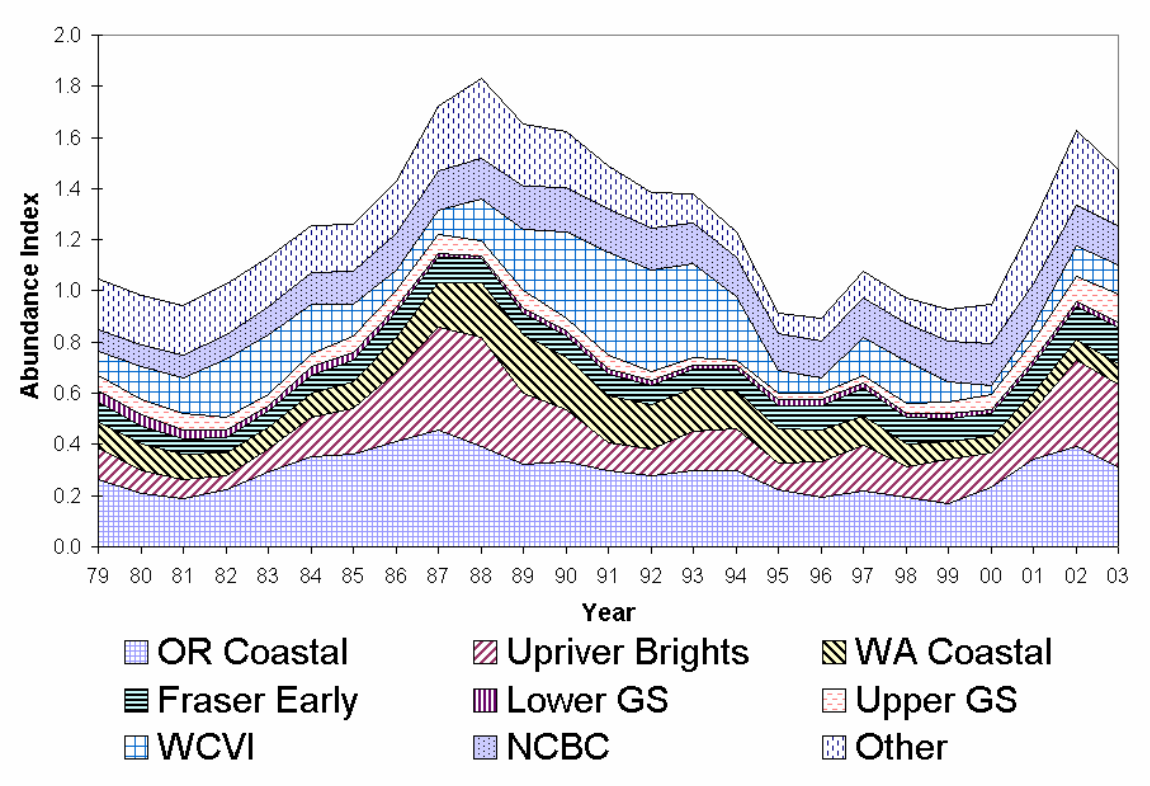

Figure 3.2. Total abundance indices for the Northern BC troll fishery with annual stock composition indicated by abundance indices for major model stocks from CLB 0308.

The major model stock groups in the NBC AABM fishery are WCVI Natural and Hatchery, Upriver Brights, Oregon Coastal, North/Central BC, and Washington Coastal Wild and Hatchery (Figure 3.2). The model stock composition for 2003 is similar to the 2002 post-season assessment, and the AI is slightly lower because of expected decreases in Oregon Coastal, Upriver Brights and Willamette (Other) model stocks (see Appendices I and J).

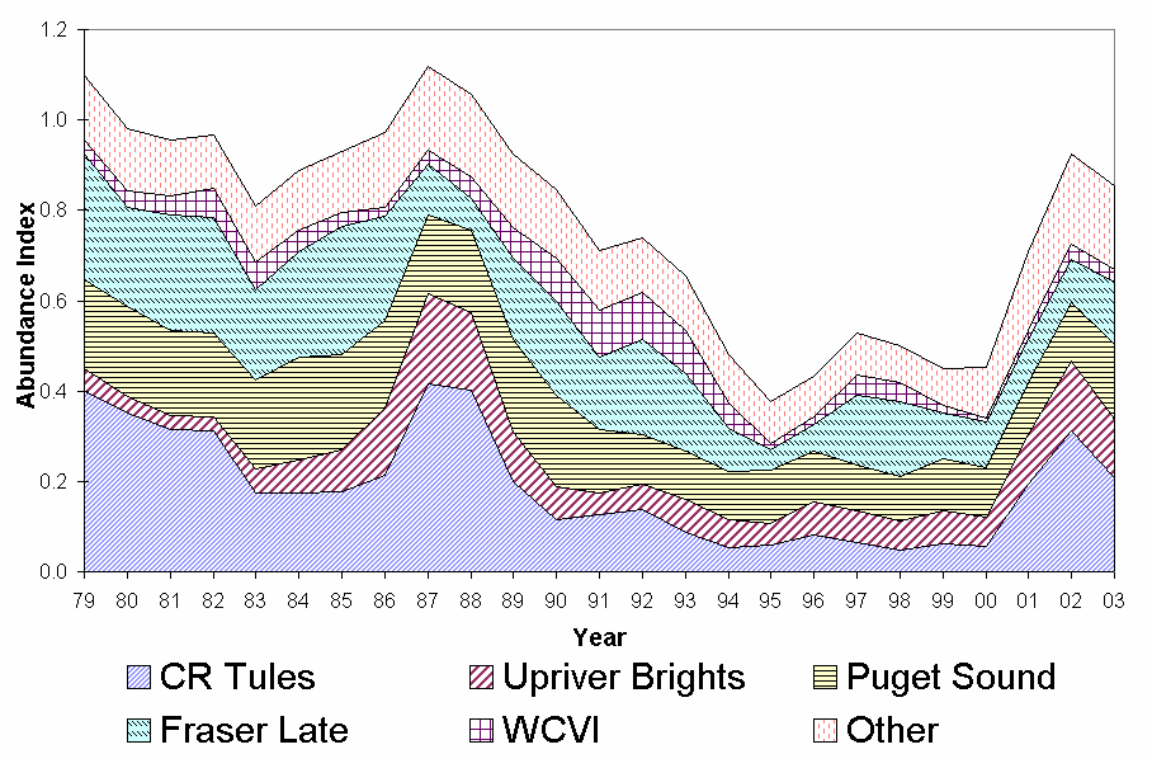

Figure 3.3. Total abundance indices for the WCVI troll fishery with annual stock composition indicated by abundance indices for major model stocks from CLB 0308.

The major model stock groups in the WCVI fishery are: Fraser Late, Puget Sound, Upriver Brights, and Columbia River Tules (Figure 3.3). The forecasted stock composition in 2003 is dissimilar to the 2002 post-season assessment, with expected increases in Fraser Late and Puget Sound model stocks and a decrease in Columbia River Tules. The slight decrease in the 2003 AI is primarily due to a predicted decrease in Columbia River Tules. The abundance of stocks in the "Other" category is similar in both years and is comprised primarily of Columbia River Upriver Brights, Mid Columbia River Brights and Oregon Coastal fish (see Appendices I and J).

3.2.2. ISBM Indices by Stock

For ISBM fisheries, the Agreement specified that Canada and the United States would reduce base period exploitation rates on specified stocks by 36.5% and 40%, equivalent to ISBM indices of 63.5% and 60% percent, respectively. This requirement is referred to as the 'general obligation' and does not apply to stocks that achieve their CTC agreed escapement goal. Estimated ISBM fishery indices are shown in Table 3.5 for Canadian fisheries and Table 3.6 for U.S. fisheries. Both tables present CWT-based indices for 2001, and chinook model-based indices for 2003. The agreement specifies that the indices for post-season assessment (e.g. 2001 in Tables 3.5 and 3.6) be assessed using the CWT-based estimates. CWT-based indices for 1999-2001 and model-based indices for 1999-2003 from CLB 0308 are presented in Appendix B.

3.2.3. CWT-based Indices in 2003

All Canadian ISBM indices from the CWT-based estimates for 2001 show that exploitation rates were reduced more than required under the agreement for all stocks or stock groups. Four of the 16 U.S. ISBM indices for the CWT-based estimates for 2001 were reduced more than required under the agreement. Of the 12 U.S. CWT-based ISBM indices that exceeded 0.60, five have agreed escapement goals and all five exceeded their goal in 2001.

3.2.4. Predicted ISBM Indices for 2003

Seven of the 20 predicted model-based ISBM indices for 2003 based on outputs from calibration 0308 are above the allowable value of 0.635 for Canadian ISBM fisheries. None of the seven have agreed escapement goals. Thirteen of the 23 predicted model-based indices for 2003 are above the allowable limit for U.S. ISBM fisheries. Seven of these 13 stocks have agreed escapement goals.

Table 3.5. ISBM Indices for Canadian fisheries, CWT-based for 2001, and the predicted indices for 2003 from the PSC Chinook Model.

		Canadian ISBM Indices	
Stock Group	Escapement Indicator Stock	CWT Indices for 2001	Model Indices for 2003
North / Central B. C.	Yakoun, Nass, Skeena, Area 8	NA	0.689
West Coast Vancouver Island Falls	WCVI (Artlish, Burman, Kauok, Tahsis, Tashish, Marble)	0.060	0.744
Fraser Early (spring and summers)	Upper Fraser, Mid Fraser, Thompson	NA	0.661
Fraser Late	Harrison River[2]	0.090	0.352
Upper Strait of Georgia	Klinaklini, Kakweikan, Wakeman, Kingcome, Nimpkish	0.040	0.649
Lower Strait of Georgia	Cowichan Nanaimo	0.260 0.260	0.490 0.498
North Puget Sound Natural Springs	Nooksack, Skagit	0.040 NA	0.251 0.251
Puget Sound Natural Summer / Falls	Skagit Stillaguamish Snohomish Lake Washington Green River	NA 0.145 NA NA 0.350	0.436 0. 513 0.435 0.508 0.508
Washington Coastal Fall Naturals[4]	Hoko, Grays Harbor, Queets, Hoh, Quillayute	NA	0.292
Columbia River Falls[3]	Upriver Brights Deschutes Lewis[2]	NA NA NA	0.686 0.686 0.515
Columbia R Summers[3]	Mid-Columbia Summers[2]	NA	0.352
Far North Migrating OR Coastal Falls[3]	Nehalem[2], Siletz[2], Siuslaw[2]	NA	0.689

[1] NA means not available because of insufficient data (lack of stock specific tag codes, base period CWT recoveries, etc).
[2] Stock or stock group with agreed escapement goal.
[3] Stock group not in Annex Table IV.

Table 3.6. ISBM indices for U.S. fisheries, CWT-based for 2001, and the predicted indices for 2003 from the PSC Chinook Model.

		U.S. ISBM Indices	
Stock Group	Escapement Indicator Stock	CWT Indices for 2001	Model Indices for 2003
North / Central B. C.	Yakoun, Nass, Skeena, Area 8	NA	NC
West Coast Vancouver Island Falls [3]	WCVI (Artlish, Burman, Kauok, Tahsis, Tashish, Marble)	NA	0.658
Fraser Early (spring and summers) [3]	Upper Fraser, Mid Fraser, Thompson	NA	0.277
Fraser Late	Harrison River [4]	0.310	0.981
Upper Strait of Georgia [2]	Klinaklini, Kakweikan, Wakeman, Kingcome, Nimpkish	NA	NC
Lower Strait of Georgia [3]	Cowichan, Nanaimo	11.350 11.350	0.452 0.452
North Puget Sound Natural Springs	Nooksack Skagit	0.040 NA	0.121 0.119
Puget Sound Natural Summer / Falls	Skagit Stillaguamish Snohomish Lake Washington Green R	NA 0.890 NA NA 1.180	0.406 0.184 0.072 0.768 0.263
Washington Coastal Fall Naturals	Hoko Grays Harbor Queets Hoh Quillayute	NA 0.860 1.440 1.660 1.480	0.682 0.494 1.063 1.208 1.292
Columbia River Falls	Upriver Brights Deschutes Lewis [4]	1.350 0.520 0.580	1.022 0.561 0.851
Columbia R Summers	Mid-Columbia Summers [4]	5.320	0.794
Far North Migrating OR Coastal Falls	Nehalem [4] Siletz [4] Siuslaw [4]	1.940 1.190 2.180	2.346 1.302 2.856

[1] NA means not available because of insufficient data (lack of stock specific tag codes, base period CWT recoveries, etc).
[2] NC means that the current model assumes the stock is not caught in U.S. ISBM fisheries.
[3] Stock group not in Annex Table V.
[4] Stock with agreed escapement goal.

3.2.5. Overages and Underages

The Agreement specifies that overages be accounted for in ISBM fisheries, as well as in AABM fisheries. Pre-season ISBM forecasts for 2003 provide a caution to management agencies for pre-season planning, but there can also be considerable uncertainty associated with them. In 2001, the CTC developed several options for implementing overage/underage provisions in both AABM and ISBM fisheries, and presented the options to the PSC commissioners. The commissioners directed the CTC to monitor and report the indices, and the PSC commissioners will evaluate them. The number of stocks without CTC-accepted escapement goals emphasizes the need for agencies to provide biologically-based escapement goals and supporting documentation for CTC review.

3.3. Model Calibration Evaluation

The model catches and stock escapements or terminal runs estimated by CLB 0308 were summarized by calculating the average deviations of the model estimates from the observed values (Table 3.7 for the fisheries that are modeled as operating under catch ceilings or quotas for past years, and Table 3.8 for terminal run size/escapements by model stocks).

The model does not estimate catches with equal accuracy in every fishery. This may reflect inadequate representation of the stocks by base period tag data, incomplete representation of the fishery by model stocks, or errors in the estimation of initial stock abundances used to initiate the model. This has been a consistent problem for certain fisheries and cannot be corrected without a base period recalibration. The effect of these deviations depends on the direction of the error (over- or under-estimation), magnitude of the catches, and the stocks contributing to each fishery.

The model catch as a proportion of the true catch is determined by comparing the 1979–1984 model estimated catches by fishery with the actual catches for those years. It is a measure of what proportion of the total catch in the fishery can be explained by stocks in the model. This proportion is only calculated by the model for fisheries that occur in the ceiling file.

Table 3.7. Average proportion of observed catch by CLB 0308 for PST fisheries.

Model Fishery	Model Catch as Proportion of Observed Catch
Southeast Alaska Troll	0.833
Northern BC Troll	1.066
Central BC Troll	1.327
WCVI Troll	1.070
Washington/Oregon North of Falcon Ocean Troll	1.297
Strait of Georgia Troll	0.983
Southeast Alaska Net	0.608
Northern BC Net	0.676
Central BC Net	1.230
Puget Sound North Net	0.809
Southeast Alaska Sport	0.781
QCI Sport	1.702
WCVI Sport	0.497
Washington/Oregon North of Falcon Ocean Sport	0.987
Puget Sound North Sport	0.937
Puget Sound South Sport	0.621
Strait of Georgia Sport	1.355

The ability of the model to estimate escapements and terminal run sizes varies between stocks. The last four columns of Table 3.8 present summary statistics on the fit achieved by CLB 0308. The column entitled “Avg. Fit” represents the 1979–2002 average ratio between the model-generated estimate and reported escapement or terminal run size. On average, the model accurately estimates the observed terminal run or escapements used in the calibration process.

Table 3.8. Comparison of model calibration results with estimated terminal run sizes or escapements from 1979 to 2002. For most stocks (or stock groups) included in the model calibration, n = 24 years, except for Nooksack Springs, (n = 8, years 1980–1987) and the Mid-Columbia River Bright Hatchery group (n = 22, years 1981–2002).

Model Stock	Ratio of:	Average	SD	Min.	Max.
Alaska South SE	Escapement	1.035	0.212	0.739	1.522
North/Central BC	Term. Run	1.016	0.109	0.800	1.270
Fraser Early	Term. Run	1.015	0.097	0.850	1.172
Fraser Late	Escapement	1.003	0.136	0.733	1.225
WCVI Hatchery & Natural	Term. Run	1.023	0.182	0.720	1.637
Upper Strait of Georgia	Escapement	1.080	0.302	0.737	2.120
Lower Strait of Georgia Natural	Escapement	1.030	0.187	0.746	1.399
Lower Strait of Georgia Hatchery	Term. Run	1.013	0.169	0.689	1.491
Nooksack Fall	Term. Run	1.027	0.146	0.772	1.279
Puget Sound Hatchery Fingerling & Yearling	Term. Run	1.034	0.140	0.830	1.410
Puget Sound Natural Fingerling	Term. Run	1.035	0.142	0.815	1.347
Nooksack Spring	Escapement	1.060	0.216	0.862	1.539
Skagit Wild	Term. Run	1.045	0.267	0.721	1.819
Stillaguamish Wild	Escapement	1.059	0.217	0.738	1.698
Snohomish Wild	Term. Run	1.015	0.283	0.721	1.819
Washington Coastal Hatchery	Term. Run	1.042	0.181	0.817	1.462
Upriver Brights	Term. Run	1.015	0.127	0.795	1.264
Spring Creek Hatchery	Term. Run	1.022	0.098	0.893	1.269
Lower Bonneville Hatchery & Cowlitz Fall Hatchery	Term. Run	1.014	0.157	0.766	1.339
Lewis River Wild	Term. Run	1.016	0.152	0.831	1.376
Willamette River Hatchery	Term. Run	1.004	0.128	0.798	1.317
Cowlitz Spring Hatchery	Term. Run	1.024	0.168	0.631	1.340
Columbia River Summer	Escapement	1.024	0.188	0.676	1.542
Oregon Coast	Escapement	1.019	0.185	0.714	1.384
Washington Coastal Wild	Term. Run	1.027	0.137	0.823	1.400
Lyons Ferry	Escapement	1.120	0.496	0.700	2.821
Mid-Columbia River Bright	Term. Run	1.026	0.171	0.770	1.479

The variability in these annual ratios of model predictions to observed estimates ranges among model stocks. The variability tends to be greatest in less abundant model stocks or in those with highly variable marine survivals. Since the variability is not consistently related to specific stocks, the most likely impacts are annual variations in age-specific survival rates (i.e., random error in estimates of abundance).

The columns entitled “Min” and “Max” are the extreme ranges of annual fits from 1979 through 2002 and represent the smallest and largest ratios between the agency supplied value and the model estimate, respectively. The significance of these deviations depends upon the questions being evaluated. For example, a large deviation for a stock during the first few years of the calibration or for a stock that has a minor impact on a fishery of concern may not necessitate further attempts at model calibration.

Fishery mortality indices generated by CLB 0308 can be compared to the CWT-based exploitation rate analysis. Model and CWT-based fishery mortality indices use the same equation, but the former are derived from model estimates of catch for all model stocks instead of CWT recovery data from specific exploitation rate indicator stocks.

The CWT fishery mortality indices are considered to be the most accurate, and a comparison of these estimates with those derived from the model provides one measure of how well the model represents fisheries. Two types of fishery indices are presented; reported catch and total mortality. Correlation coefficients between the CWT and model estimates for each type of index for the three AABM troll fisheries (Table 3.9) were all significant ($P<0.01$; $n = 23$ years). The model results are closely associated with the CWT-based indices and changes in fishery exploitation rates as indicated in Figures 3.4 through 3.9.

Table 3.9. Correlation coefficients between CWT and model fishery indices for landed catch and total mortality in the AABM troll fisheries.

	AABM Troll Fishery		
	SEAK	**NBC**	**WCVI**
Landed Catch Mortality	0.901	0.873	0.918
Total Mortality	0.819	0.864	0.926

The model fishery mortality index for SEAK closely follows the trend of the CWT derived estimate from 1979 through 1987 for both landed and total mortality (Figures 3.4 and 3.5). However, after 1987, the model estimate of both landed catch and total mortality indices is less than the CWT-derived estimates for most years. The model estimates also show less fluctuation from 1990 to 2001 compared to the CWT-derived indices.

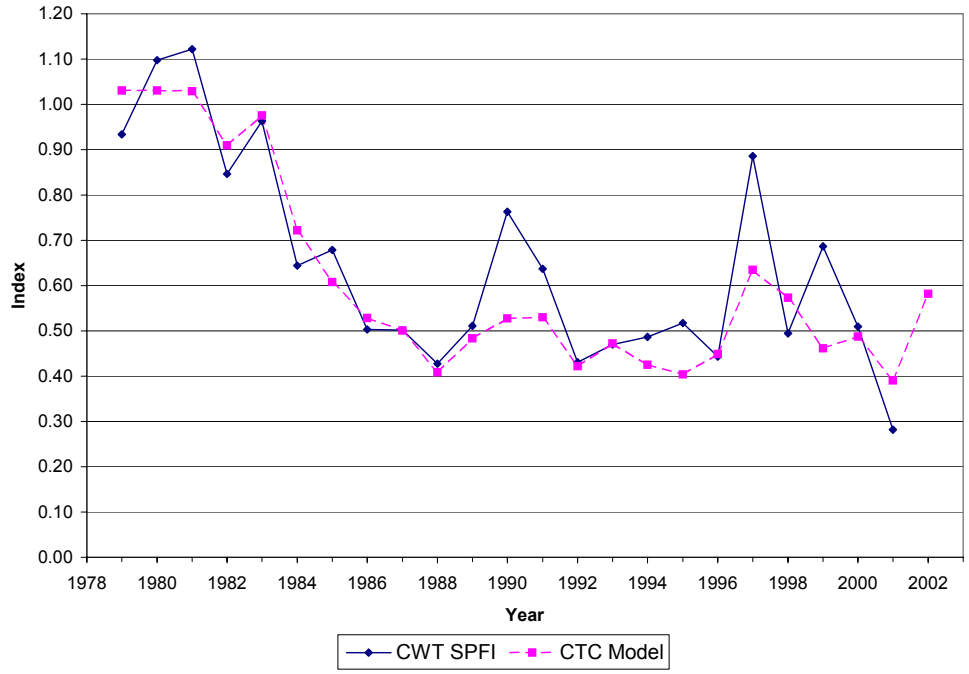

Figure 3.4. Estimated CWT (through 2001) and model landed catch fishery indices (though 2002) for SEAK troll fishery.

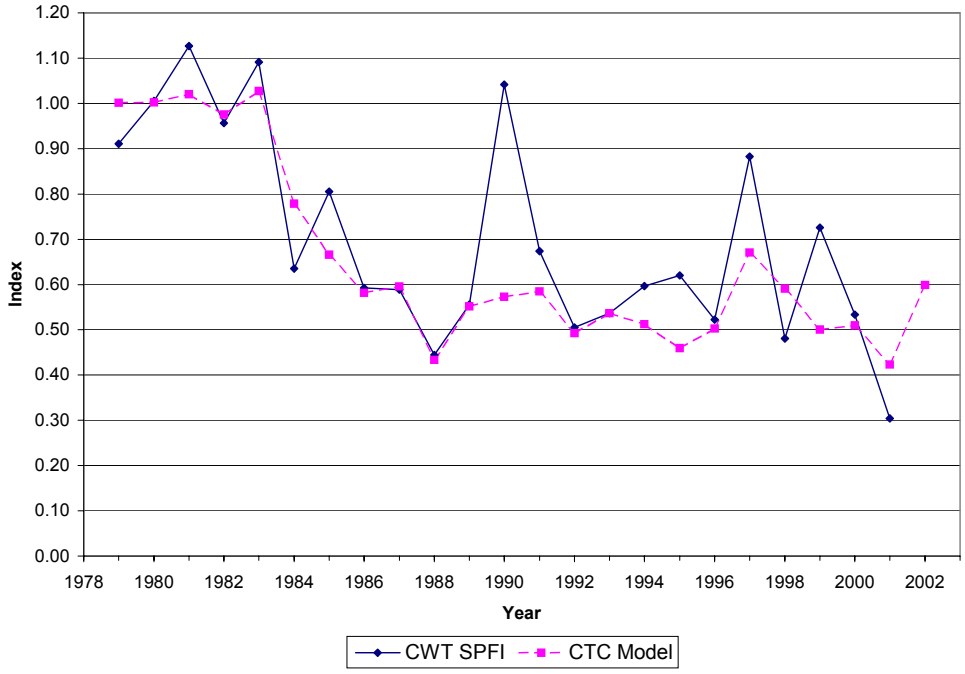

Figure 3.5. Estimated CWT (through 2001) and model total mortality fishery indices (through 2002) for SEAK troll fishery.

The model-derived fishery mortality indices for NBC generally follow the same trend as CWT-derived indices (Figures 3.6 and 3.7). However, since 1988, the model-based estimates have exceeded the CWT-derived estimates in all but four years for both landed catch and total mortality indices.

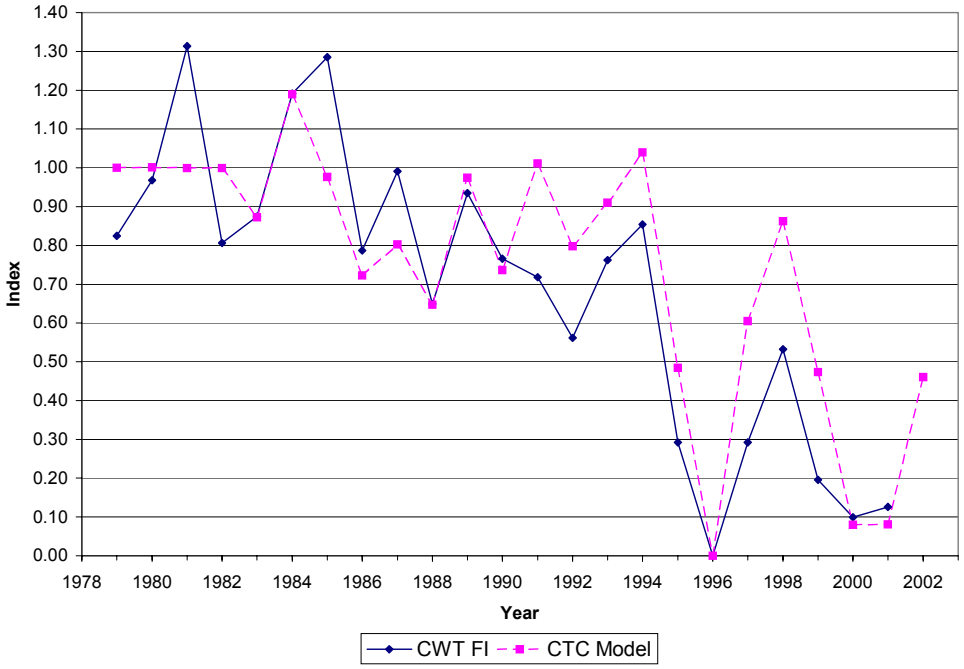

Figure 3.6. Estimated CWT (through 2001) and model landed catch fishery indices (through 2002) for the NBC troll fishery.

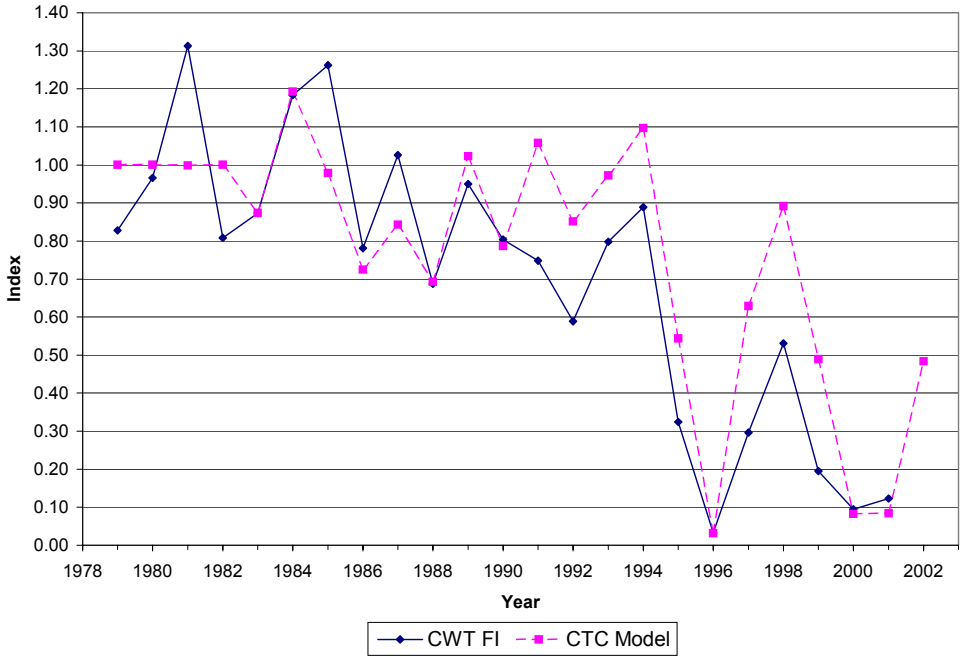

Figure 3.7. Estimated CWT (through 2001) and model total mortality fishery indices (through 2002) for the NBC troll fishery.

Since the base period, the model derived reported catch fishery index estimates and trends for the WCVI troll fishery have been similar to those derived from CWTs. However, from 1987 through

1995, the model estimates are consistently greater than the CWT-based estimates (Figures 3.8 and 3.9).

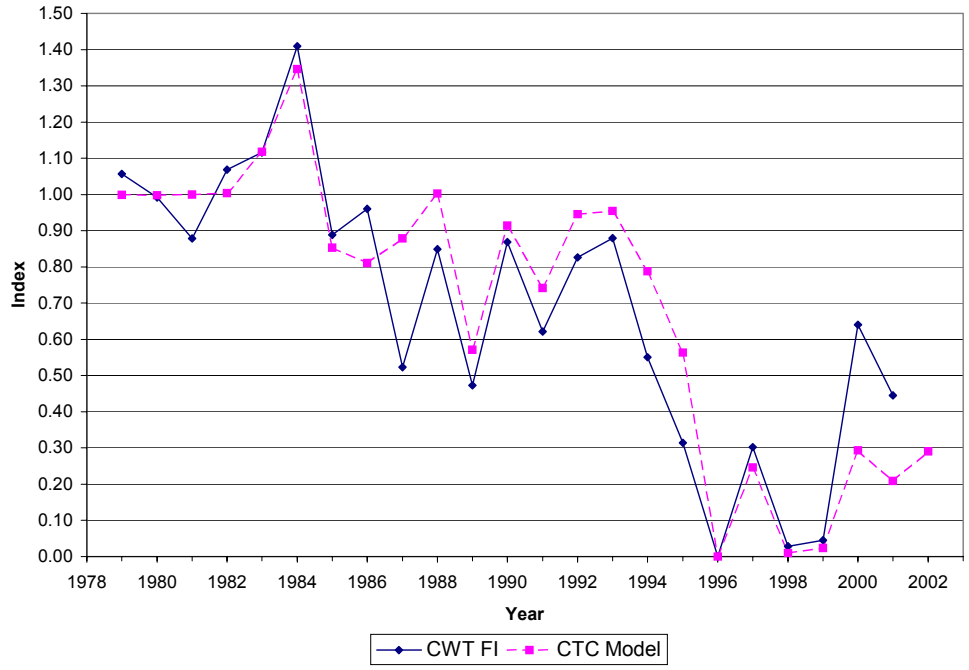

Figure 3.8. Estimated CWT (through 2001) and model landed catch fishery indices (through 2002) for the WCVI troll fishery.

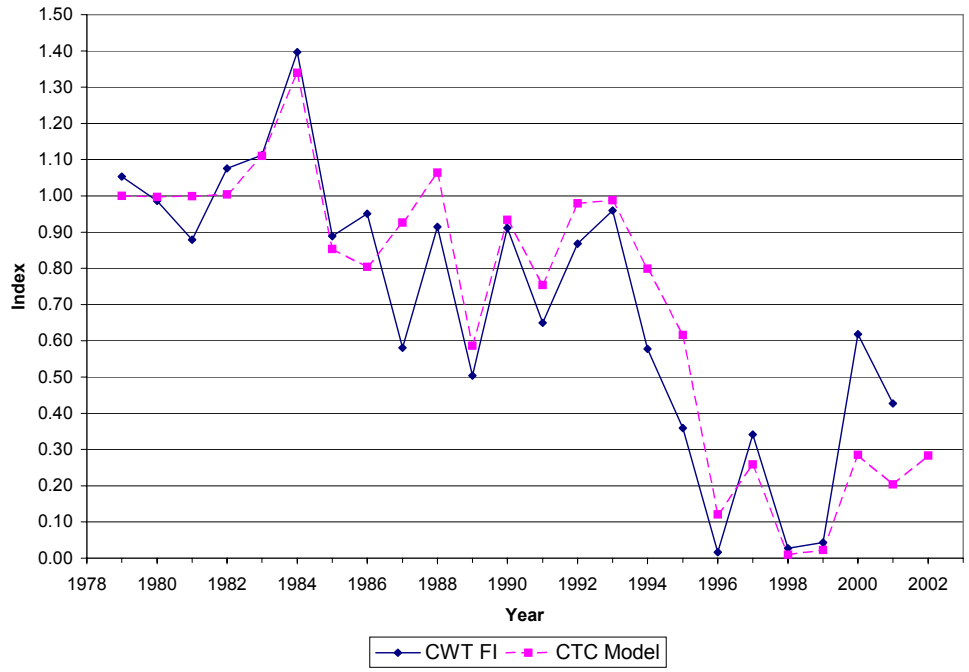

Figure 3.9. Estimated CWT (through 2001) and model total mortality fishery indices (through 2002) for the WCVI troll fishery.

3.4. Summary of Agency Stock Forecasts Used in the Model

A summary of recent forecasts for 19 stocks used in the CTC model calibration indicates that agency forecast accuracy of individual stock/year forecasts have ranged from -92% to 72% over the 1999-2002 period (Table 3.10). Forecasts for the major production stocks suggest that chinook abundance in 2003 will be less than that reported in 2002 but greater than observed in 2001.

3.5. Summary of Escapement Relative to the Goals

Paragraph 9 of the Agreement defines criteria for identifying stocks of concern and escapement levels in those stocks that would trigger additional management action (footnote 3, page 40 of the Agreement). Of the 17 escapement indicator stocks with CTC agreed escapement goals (Table 3.11), only the Blossom stock failed to meet its escapement goal in 2002. This stock has not met the lower range of its goal since 1993.

Table 3.10. Comparison of pre-season forecasts with post-season estimates for various PSC model chinook stocks.

	1999					2000					2001				
Model Stock	Model Forecast	Agency Forecast	Model / Agency [1]	Agency Post-season	Agency Postseason/ Agency [2]	Model Forecast	Agency Forecast	Model / Agency [1]	Agency Postseason	Agency Post-season/ Agency [2]	Model Forecast	Agency Forecast	Model / Agency [1]	Agency Postseason	Agency Post-season/ Agency [2]
Oregon Coast	65,249	72,084	9%	66,039	-9%	61,457	63,259	3%	52,889	-20%	58,062	66,412	13%	100,548	34%
Willamette River Hatchery	46,181	49,875	7%	55,801	11%	57,202	61,211	7%	55,900	-10%	59,207	59,600	1%	84,000	29%
Cowlitz Spring	3,363	3,950	15%	4,801	18%	4,922	6,050	19%	5,598	-8%	3,684	4,849	24%	5,508	12%
Columbia River Summer	21,653	20,900	-4%	20,318	-3%	27,214	33,300	18%	30,700	-8%	27,029	24,500	-10%	76,400	68%
Upriver Brights	173,712	147,500	-18%	166,100	11%	212,317	208,200	-2%	155,900	-34%	150,973	127,200	-19%	232,500	45%
Spring Creek Hatchery	63,203	65,800	4%	50,100	-31%	17,335	26,900	36%	20,100	-34%	56,089	56,600	1%	125,000	55%
Lewis River Wild	3,068	2,600	-18%	3,400	24%	4,053	3,500	-16%	10,200	66%	16,574	16,700	1%	15,700	-6%
Nooksack Hatchery	27,206	27,000	-1%	41,186	34%	21,277	19,000	-12%	33,588	43%	33,974	36,450	7%	36,450	0%
Skagit Wild	8,967	7,600	-18%	4,924	-54%	6,988	7,300	4%	16,843	57%	9,064	9,183	1%	14,005	34%
Stillaguamish Wild	1,303	NA	NA	1,098	NA	1,370	1,500	9%	1,457	-3%	1,328	1,360	2%	1,360	0%
Snohomish Wild	5,804	5,600	-4%	4,832	-16%	5,997	6,000	0%	6,000	0%	5,876	5,760	-2%	5,760	0%
WCVI Natural and Hatchery	77,836	68,400	-14%	98,410	30%	21,040	15,040	-40%	37,055	59%	33,702	30,633	-10%	86,787	65%
Fraser Late [3]	84,686	82,650	-2%	184,099	55%	187,970	220,400	15%	120,744	-83%	141,745	131,800	-8%	141,196	7%
Puget Sound Hatchery	66,260	69,285	4%	116,204	40%	67,306	69,800	4%	76,777	9%	102,899	105,955	3%	105,955	0%
Puget Sound Natural	28,536	28,400	0%	31,104	9%	10,000	15,364	35%	20,050	23%	19,938	18,900	-5%	18,900	0%
Bonneville Tules	26,112	34,800	25%	37,300	7%	17,095	23,700	28%	27,000	12%	28,732	32,200	11%	94,200	66%
Mid Columbia River Bright	37,951	38,300	1%	50,800	25%	53,460	50,600	-6%	37,100	-36%	45,055	43,500	-4%	66,400	34%
Washington Coastal Wild	42,107	43,780	4%	24,785	-77%	34,741	NA	NA	27,615	NA	34,563	35,306	2%	27,978	-26%
Lyons Ferry Hatchery	523	NA	NA	905	NA	1,243	NA	NA	900	NA	733	734	0%	2,652	72%

-continued-

Table 3.10 (Page 2 of 2).

	2002					2003		
Model Stock	Model Forecast	Agency Forecast	Model / Agency [1]	Agency Post-season	Agency Post-season/ Agency [2]	Model Forecast	Agency Forecast	Model / Agency [1]
Oregon Coast	73,055	73,914	1%	149,649	51%	124,429	85,483	-46%
Willamette River Hatchery	73,151	77,434	6%	127,200	39%	134,854	112,521	-20%
Cowlitz Spring	5,534	6,800	19%	9,910	31%	11,153	11,700	5%
Columbia River Summer	70,290	77,700	10%	129,900	40%	103,249	87,600	-18%
Upriver Brights	249,721	273,800	9%	276,900	1%	285,759	280,400	-2%
Spring Creek Hatchery	153,070	136,000	-13%	160,900	15%	169,841	96,900	-75%
Lewis River Wild	18,910	18,700	-1%	24,900	25%	23,494	24,600	4%
Nooksack Hatchery	50,361	54,420	7%	53,310	-2%	50,084	45,750	-9%
Skagit Wild	12,635	13,455	6%	19,807	32%	15,081	11,348	-33%
Stillaguamish Wild	1,372	1,449	5%	1,588	9%	1,711	2,050	17%
Snohomish Wild	6,524	6,700	3%	7,245	8%	6,539	5,450	-20%
WCVI Natural and Hatchery	128,068	107,727	-19%	155,402	31%	118,113	105,801	-12%
Fraser Late [3]	132,946	160,100	17%	165,245	3%	131,757	114,780	-15%
Puget Sound Hatchery	114,889	124,608	8%	70,757	-76%	99,790	133,850	25%
Puget Sound Natural	20,008	19,801	-1%	21,477	8%	23,294	26,600	12%
Bonneville Tules	100,401	137,600	27%	71,487	-92%	72,450	52,975	-37%
Mid Columbia River Bright	102,085	96,200	-6%	108,300	11%	103,054	104,800	2%
Washington Coastal Wild	33,902	33,489	-1%	NA	NA	34,197	NA	NA
Lyons Ferry Hatchery	2,066	NA	NA	NA	NA	2,602	NA	NA

[1] = (model forecast – agency forecast) / agency forecast * 100
[2] = (agency forecast – post-season estimate) / post-season estimate * 100
[3] = sum of Harrison and Chilliwack hatchery forecasts

Table 3.11. Escapement estimates for 1999 to 2001 for escapement indicator stocks with CTC agreed escapement goals.

Escapement Indicator Stock	Area	Agreed Goals	Point Estimate	1999 Escapement	2000 Escapement	2001 Escapement	2002 Escapement
Situk	SEAK	500–1,000	600	1,461	1,785	656	1,000
Alsek (Klukshu)	SEAK	1,100–2,300	1,100	2,166	1,363	1,738	2,282
Taku	SEAK	30,000–55,000	35,938	20,545	30,014	41,179	48,848
Stikine	SEAK	14,000–28,000	17,368	19,947	27,531	63,523	50,875
King Salmon	SEAK	120–240	150	300	137	147	153
Andrew Creek	SEAK	650–1,500	850	1,210	1,380	2,108	1,752
Unuk (index)	SEAK	650–1,400	800	680	1,341	2,109	897
Chickamin (index)	SEAK	450–900	525	492	801	1,010	1,013
Blossom (index)	SEAK	250–500	300	212	231	204	224
Keta (index)	SEAK	250–500	300	276	300	343	411
Fraser Late (Harrison)	BC	75,100-98,500	75,100	107,016	77,035	94,683	89,968
Columbia River Summers	Columbia River	17,857	17,857	24,088	27,898	67,221	127,449
Columbia Upriver Bright	Columbia River	40,000	40,000	44,867	62,675	86,908	116,387
Lewis	Columbia River	5,700	5,700	3,184	8,718	13,900	16,380
Nehalem	NOC	6,989	6,989	8,063	5,257	9,459	18,089
Siletz	NOC	2,944	2,944	4,166	4,982	10,582	14,054
Siuslaw	NOC	12,925	12,925	29,610	12,999	29,748	91,058

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APPENDICES

Appendix A. Relationship between exploitation rate indicator stocks, escapement indicator stocks, model stocks, and additional management action stocks identified in the PST annex.

LIST OF APPENDIX A TABLES

Table A.1. Indicator stocks for Southeast Alaska and Transboundary Rivers.

Area	Annex Stock Group[1]	Annex Indicator Stocks	Run Type	Escapement Indicator Stock	Escapement Objective	Model Stock	Escapement Goal in Model	Exploitation Rate Indicator Stock	CWT Acronym
SEAK/TBR			Spring	Taku	30,000–55,000	Alaska South SE	9,110	NA	AKS
				Stikine	14,000–28,000			NA	
Yakutat				Situk	500–1,000			NA	
				Alsek	1,100–2,300			NA	
SEAK Northern Inside				Chilkat				NA	
				King Salmon	120–240			Alaska Spring	
SEAK Central Inside				Andrew Creek	650–1,500			(Little Port Walter, Neets Bay Hatchery, Whitman Lake Hatchery, Carroll Inlet Releases, Deer Mountain Hatchery, Crystal Lake Hatchery)	
SEAK Southern Inside				Unuk	650–1,400				
				Chickamin	450–900				
				Blossom	250–500				
				Keta	250–500				

[1] SEAK fisheries will be managed to achieve escapement objectives for Southeast Alaska and Transboundary River chinook stocks.

NA = not available

Table A.2. Indicator stocks for Canada.

Area	Annex Stock Group	Annex Indicator Stocks	Run Type	Escapement Indicator Stock	Escapement Objective	Model Stock	Escapement Goal in Model	Exploitation Rate Indicator Stock	CWT Acronym
NBC-Area 1	North / Central British Columbia	Yakoun	Summer	Yakoun	Escapement goal range by stock	North / Central BC	117,500	Kitsumkalum	KLM
NBC-Area 3		Nass	Spring/Summer	Nass					
NBC-Area 4		Skeena		Skeena					
CBC-Area 8			Spring	Dean					
CBC-Area 9			Spring/Fall	Rivers Inlet					
WCVI	West Coast Vancouver Island Falls	Artlish, Burman, Gold, Kauok, Tahsis, Tashish, Marble	Fall	WCVI Aggregate (Artlish, Burman, Kauok, Tahsis, Tashish, Marble)	Escapement goal range for aggregate	WCVI Natural	42,734	Robertson Creek	RBT
						WCVI Hatchery	6,472		
Fraser River	Fraser Late	Harrison River	Fall	Harrison River	75,100-98,500	Fraser Late	75,100	Chilliwack	CHI
	Fraser Early	Upper Fraser Mid Fraser Thompson	Spring	Fraser Spring-run Age 1.2	Escapement goal range by stock	Fraser Early	93,700	NA	
				Fraser Spring-run Age 1.3					
			Summer	Fraser Summer-run Age 1.3					
				Fraser Summer-run Age 0.3					
Upper Strait of Georgia	Upper Strait of Georgia	Klinaklini, Kakweikan, Wakeman, Kingcome, Nimpkish	Summer/ Fall	Upper Strait of Georgia (Klinaklini, Kakweikan, Wakeman, Kingcome, Nimpkish)	Escapement goal range for aggregate	Upper Strait of Georgia	23,300	Quinsam	QUI
Lower Strait of Georgia	Lower Strait of Georgia	Cowichan, Nanaimo	Fall	Lower Strait of Georgia (Cowichan / Nanaimo)	Escapement goal range for aggregate	Lower Strait of Georgia Natural	21,935	Cowichan	COW
								Big Qualicum	BQR
			Summer/ Fall			Lower Strait of Georgia Hatchery	5,318	Puntledge	PPS

NA = not available

Table A.3. Indicator stocks for Puget Sound.

Area	Annex Stock Group	Annex Indicator Stocks	Run Type	Escapement Indicator Stock	Escapement Objective	Model Stock	Escapement Goal in Model	Exploitation Rate Indicator Stock	CWT Acronym
Hood Canal	Not an Annex stock		Fall					George Adams Fall Fingerling	GAD
Juan de Fuca	Washington Coastal Fall Naturals	Hoko	Fall	Hoko				Elwha Fall Fingerling	ELW
								Hoko Fall Fingerling	HOK
North/ Central Puget Sound	North Puget Sound Natural Springs	Nooksack	Spring	Nooksack	Escapement goal range by stock	Nooksack Spring	4,000	Nooksack Spring Yearling`	NKS
		Skagit		Skagit spring				Skagit Spring Yearling	SKS
								Skagit Spring Fingerling	SKF
	Puget Sound Natural Summer/ Falls		Fall		Escapement goal ranges by stock	Nooksack Fall	11,923	Nooksack Fall Fingerling	NKF
								Samish Fall Fingerling	SAM
		Stillaguamish	Summer/Fall	Stillaguamish		Stillaguamish Wild	2,000	Stillaguamish. Fall Fingerling	STL
		Snohomish		Snohomish		Snohomish Wild	5,250	NA	
		Skagit group		Skagit sum/fall		Skagit Wild	9,778	Skagit Summer Fingerling	SSF
		Lake Washington	Fall	Lake Washington Falls		Puget Sound Natural Fingerling	16,966	NA	
		Green River		Green River					
								Nisqually Fall Fingerling	NIS
								Univ. of Washington Accelerated Fall	UWA
South Puget Sound	Not an annex stock		Fall			Puget Sound Hatchery Fingerling	24,769	South Puget Sound Fall Fingerling	SPS
						Puget Sound Hatchery Yearling	9,136	South Puget Sound Fall Yearling	SPY
								Squaxin Pens Fall Yearling	SQP
			Spring					White River Spring Yearling	WRY

NA = not available

Table A.4. Indicator stocks for the Washington Coast.

Area	Annex Stock Group	Annex Indicator Stocks	Run Type	Escapement Indicator Stock	Escapement Objective	Model Stock	Escapement Goal in Model	Exploitation Rate Indicator Stock	CWT Acronym
WA Coast	Washington Coastal Fall Naturals	Grays Harbor	Fall	Grays Harbor Fall	Escapement goal range by stock	Washington Coastal Wild	21,500	NA	
		Queets		Queets Fall				Queets Fall Fingerling	QUE
		Hoh		Hoh Fall				NA	
		Quillayute		Quillayute Fall				NA	
								Sooes Fall Fingerling	SOO
	Not an annex stock		Fall			Washington Coastal Hatchery	6,703	NA	
	Not an annex stock		Spring	Grays Harbor Spring				NA	
	Not an annex stock		Spring/ Summer	Queets Spring/Summer				NA	
				Hoh Spring/Summer				NA	
	Not an annex stock		Summer	Quillayute Summer				NA	

NA = not available

Table A.5. Indicator stocks for Columbia River and Oregon Coast.

Area	Annex Stock Group	Annex Indicator Stocks	Run Type	Escapement Indicator Stock	Escapement Objective	Model Stock	Escapement Goal in Model	Exploitation Rate Indicator Stock	CWT Acronym
Columbia River	Columbia River Falls	Upriver Brights	Fall	Columbia Upriver Bright		Columbia River Upriver Brights	40,000	Columbia River Upriver Bright	URB
								Hanford Wild	HAN
		Deschutes		Deschutes River Fall				NA	
		Lewis River		Lewis	5,700	Lewis River Wild	5,700	Lewis River Wild	LRW
						Lyons Ferry Hatchery	3,430	Lyons Ferry	LYF
						Mid Columbia River Brights	12,500	NA	
						Spring Creek Hatchery	7,000	Spring Creek Tule	SPR
						Lower Bonneville Hatchery	26,200	Columbia Lower River Hatchery	LRH
						Fall Cowlitz Hat.	8,800	Cowlitz Tule	CWF
	Columbia River Summers	Mid-Columbia Summers	Summer	Mid Columbia Summer	17,857[1]	Columbia River Summer	17,857	Columbia Summers	SUM
	Not an Annex stock		Spring			Spring Cowlitz Hatchery	2,500	NA	
						Willamette River Hatchery	13,500	Willamette Spring	WSH
North Oregon Coast	Far North Migrating OR Coastal Falls	Nehalem	Fall	Nehalem	6,989	Oregon Coast	62,382	Salmon River	
		Siuslaw		Siuslaw	12,925				
		Siletz		Siletz	2,944				
Mid-Oregon Coast	Not an Annex stock		Fall	Umpqua				NA	
				Mid South Oregon Coastal Falls				NA	

NA – not available

[1] Interim goal for modeling based on stock recruitment analysis of model data.

Appendix B.1 ISBM Indices for Canadian fisheries, from 1999 through 2002, both from CWT-based and the chinook model, and the predicted indices for 2003.

All estimates are from CLB 3208 and/or the 2003 exploitation rate analysis.

Stock Group	Escapement Indicator Stocks	Canadian ISBM Indices							
		CWT Indices[1]			Model Indices				
		1999	2000	2001	1999	2000	2001	2002	2003
North / Central B. C.	Yakoun, Nass, Skeena, Area 8	NA[2]	NA[2]	NA	0.245	0.282	0. 442	0.219	0.689
West Coast Vancouver Island Falls	WCVI (Artlish, Burman, Kauok, Tahsis, Tashish, Marble)	0.290	0.060	0.060	0.622	0.189	0.175	0.633	0.744
Fraser Early (spring and summers)	Upper Fraser, Mid Fraser, Thompson	NA	NA	NA	0.151	0.141	0.128	0.179	0.661
Fraser Late	Harrison River[3]	0.170	0.080	0.090	0.297	0.179	0.193	0.275	0.352
Upper Strait of Georgia	Klinaklini, Kakweikan, Wakeman, Kingcome, Nimpkish	0.040	0.070	0.040	0.209	0.152	0.195	0.172	0.649
Lower Strait of Georgia	Cowichan	0.370	0.166	0.260	0.345	0.296	0.333	0.364	0.490
	Nanaimo[5]	0.370	0.155	0.260	0.265	0.153	0.188	0.311	0.498
North Puget Sound Natural Springs	Nooksack, Skagit	0.030	0.010	0.040	0.257	0.151	0.721	0.200	0.251
		NA	NA	NA	0.257	0.151	0.721	0.200	0.251
Puget Sound Natural Summer / Falls	Skagit	NA	NA	NA	0.228	0.131	0.480	0.198	0.436
	Stillaguamish	0.150	0.160	0.145	0.409	0.253	1.030	0.324	0. 513
	Snohomish	NA	NA	NA	0.233	0.133	0.457	0.196	0.435
	Lake Washington	NA	NA	NA	0.404	0.212	0.767	0.342	0.508
	Green River	0.170	0.160	0.350		0.212	0.767	0.342	0.508
Washington Coastal Fall Naturals[4]	Hoko, Grays Harbor, Queets, Hoh, Quillayute	NA	NA	NA	0.310	0.215	0.701	0.279	0.292
Columbia River Falls[4]	Upriver Brights	NA	NA	NA	0.219	0.190	0.239	0.175	0.686
	Deschutes	NA	NA	NA	0.219	0.190	0.239	0.175	0.686
	Lewis[3]	NA	NA	NA	0.059	0.081	0.087	0.064	0.515
Columbia R Summers[4]	Mid-Columbia Summers[3]	NA	NA	NA	0.246	0.151	0.552	0.153	0.352
Far North Migrating OR Coastal Falls[4]	Nehalem[3], Siletz[3], Siuslaw[3]	NA	NA	NA	0.087	0.115	0.122	0.086	0.689

[1] The CWT-based estimates, not the model estimates, are to be used in post season assessments.
[2] NA means not available because of insufficient data (lack of stock specific tag codes, base period CWT recoveries, etc).
[3] Stock or stock group with agreed escapement goal.
[4] Stock group not in Annex Attachment IV.
[5] Indices for this stock are calculated from CWT recoveries for Cowichan; differences between stock indices are due to differences in terminal harvest.

Appendix B.2. ISBM indices for U.S. fisheries, 1999 through 2002, both from CWT-based and the chinook model, and the predicted indices for 2003.

All estimates are from CLB 3208 and/or the 2003 exploitation rate analysis.

Stock Group	Escapement Indicator Stocks	US ISBM Fisheries							
		CWT Indices[1]			Model Indices				
		1999	2000	2001	1999	2000	2001	2002	2003
North / Central B. C.	Yakoun, Nass, Skeena, Area 8	NA[2]	NA	NA	NC[3]	NC	NC	NC	NC
West Coast Vancouver Island Falls[4]	WCVI (Artlish, Burman, Kauok, Tahsis, Tashish, Marble)	NA	NA	NA	0.459	0.377	0.498	0.523	0.658
Fraser Early (spring and summers)[4]	Upper Fraser, Mid Fraser, Thompson	NA	NA	NA	0.061	0.091	0.093	0.169	0.277
Fraser Late	Harrison River[5]	0.750	0.190	0.310	0.736	0.450	0.538	0.675	0.981
Upper Strait of Georgia[4]	Klinaklini, Kakweikan, Wakeman, Kingcome, Nimpkish	NA	NA	NA	NC	NC	NC	NC	NC
Lower Strait of Georgia[4]	Cowichan,	3.990	3.560	11.350	0.253	0.260	0.429	0.342	0.452
	Nanaimo	3.990	3.560	11.350	0.253	0.260	0.429	0.342	0.452
North Puget Sound Natural Springs	Nooksack	0.260	0.010	0.040	0.241	0.269	0.134	0.064	0.121
	Skagit	NA	NA	NA	0.241	0.269	0.179	0.147	0.119
Puget Sound Natural Summer / Falls	Skagit	NA	NA	NA	0.265	0.179	0.816	0.311	0.406
	Stillaguamish	0.110	0.130	0.890	0.252	0.221	0.397	0.213	0.184
	Snohomish	NA	NA	NA	0.080	0.078	0.484	0.135	0.072
	Lake Washington	NA	NA	NA	0.564	0.587	0.625	1.282	0.768
	Green R	0.620	0.880	1.180	0.564	0.587	0.634	0.375	0.263
Washington Coastal Fall Naturals	Hoko	NA	NA	NA	0.434	0.292	0.431	0.527	0.682
	Grays Harbor	0.570	0.440	0.860	0.670	0.892	0.895	0.478	0.494
	Queets	0.880	0.100	1.440	0.861	0.158	0. 702	1.406	1.063
	Hoh	1.160	0.360	1.660	1.326	1. 341	1.195	1.154	1.208
	Quillayute	1.020	0.230	1.480	1.100	0.801	1.246	1.239	1.292
Columbia River Falls	Upriver Brights	1.45	2.240	1.350	1.060	1.002	0.793	0.962	1.022
	Deschutes	0.690	0.500	0.520	0.681	0.576	0.506	0.535	0.561
	Lewis[5]	0.050	0.320	0.580	0.209	0.184	0.651	1.386	0.851
Columbia R Summers	Mid-Columbia Summers[5]	1.330	0.780	5.320	0.479	0.289	0.422	0.662	0.794
Far North Migrating OR Coastal Falls	Nehalem[5]	1.030	1.030	1.940	1.707	1.742	1.975	2.309	2.346
	Siletz[5]	1.870	0.820	1.190	1.135	1.110	1.180	1.276	1.302
	Siuslaw[5]	0.730	1.130	2.180	1.223	2.080	2.396	2.856	2.856

[1] The CWT-based estimates, not the model estimates, are to be used in post season assessments.
[2] NA means not available because of insufficient data (lack of stock specific tag codes, base period CWT recoveries, etc).
[3] NC means that the current model assumes the stock is not caught in U.S. ISBM fisheries.
[4] Stock group not in Annex Attachment V.
[5] Stock with agreed escapement goal.
[6] ID means insufficient data available to estimate stock specific impacts.

Appendix C.1 Stocks used in the exploitation rate analysis.

Stock Acronym	Stock Name	Jurisdiction
AKS	Alaska Spring	AK
BQR	Big Qualicum River Falls	CA
CHI	Chilliwack River Falls	CA
COW	Cowichan River Falls	CA
CWF	Cowlitz Tule	OR
ELW	Elwha Fall Fingerling	WA
GAD	George Adams Fall Fingerling	WA
HAN	Hanford Wild	OR
HOK	Hoko Fall Fingerling	WA
KLM	Kitsumkalum River Summers	CA
LRH[1]	Columbia Lower River Hatchery	OR
LRW	Lewis River Wild	OR
LYF	Lyons Ferry	OR
NIS	Nisqually Fall Fingerling	WA
NKF	Nooksack Spring Fingerling	WA
NKS	Nooksack Spring Yearling	WA
PPS	Puntledge River Summers	CA
QUE	Queets Fall Fingerling	WA
QUI	Quinsam River Falls	CA
RBT	Robertson Creek Falls	CA
SAM	Samish Fall Fingerling	WA
SKF	Skagit Spring Fingerling	WA
SKS	Skagit Spring Yearling	WA
SNO	Snootli River Summers	CA
SOO	Sooes Fall Fingerling	WA
SPR	Spring Creek Tule	OR
SPS	South Puget Sound Fall Fingerling	WA
SPY	South Puget Sound Fall Yearling	WA
SQP	Squaxin Pens Fall Yearling	WA
SRH	Salmon River	OR
SSF	Skagit Summer Fingerling	WA
STL	Stillaguamish Fall Fingerling	WA
SUM	Columbia Summers	OR
URB	Upriver Bright	OR
UWA	University of Washington Accelerated	WA
WRY	White River Spring Yearling	WA
WSH	Willamette Spring	OR

1.LRH is an aggregate of two stocks, Stayton Ponds (Lower Bonneville Hatchery, i.e., BON, in the previous analyses) and Big Creek Hatchery used for the first time in the 2002 exploitation rate analysis.

Appendix C.2 Stocks and fisheries included in the chinook model.

STOCK #	MODEL STOCK	FISHERY #	MODEL FISHERY
1	Alaska South SE	1	Alaska Troll
2	North/Central BC	2	North Troll
3	Fraser Early	3	Central Troll
4	Fraser Late	4	WCVI Troll
5	WCVI Hatchery	5	WA/OR Troll
6	WCVI Natural	6	Strait of Georgia Troll
7	Upper Strait of Georgia	7	Alaska Net
8	Lower Strait of Georgia Natural	8	North Net
9	Lower Strait of Georgia Hatchery	9	Central Net
10	Nooksack Fall Fingerling	10	WCVI Net
11	Puget Sound Hatchery Fingerling	11	Juan De Fuca Net
12	Puget Sound Natural Fingerling	12	Puget Sound North Net
13	Puget Sound Hatchery Yearling	13	Puget Sound South Net
14	Nooksack Spring Yearling	14	Washington Coast Net
15	Skagit Wild	15	Columbia River Net
16	Stillaguamish Wild	16	Johnstone Strait Net
17	Snohomish Wild	17	Fraser Net
18	Washington Coastal Hatchery	18	Alaska Sport
19	Columbia UpRiver Brights	19	North/Central Sport
20	Spring Creek Hatchery	20	WCVI Sport
21	Lower Bonneville Hatchery	21	Washington Ocean Sport
22	Fall Cowlitz Hatchery	22	Puget Sound North Sport
23	Lewis River Wild	23	Puget Sound South Sport
24	Willamette River Hatchery	24	Strait of Georgia Sport
25	Spring Cowlitz Hatchery	25	Columbia River Sport
26	Columbia River Summer		
27	Oregon Coast		
28	Washington Coastal Wild		
29	Lyons Ferry		
30	Mid Columbia River Brights		

Appendix D. Detailed description of external stock forecasts.

APPENDIX D TABLE OF CONTENTS

Oregon Coastal North Migrating

Forecasts of spawning escapements are made for an aggregate of chinook salmon populations from seven major river systems on the North Oregon Coast (NOC). River systems in the aggregate include: Nehalem, Tillamook, Nestucca, Siletz, Yaquina, Alsea, and Siuslaw. Annual escapement estimates are made from expansions of fish density indices (peak live + dead fish per mile) observed at standard survey sites in each river basin. These river specific indices are adjusted for observation efficiency and for bias. The abundance for each river is then estimated by multiplying the index by the assumed length of spawning habitat in the river. A three-year-moving-average of escapement is used as the forecast for each river in the forthcoming year. The NOC escapement forecast is the sum of the seven river forecasts.

The 2002 forecast is 73,914.

Columbia River Stocks

The UpRiver *Brights* (URB) and Lower River Wild (LRW) are primarily naturally produced stocks while the Spring Creek Hatchery stock (SCH) is *tule*. The *tule* stocks generally mature at an earlier age than the *bright* stocks and do not migrate as far north in the ocean. Minor stocks include Lower River *brights* (LRB).

Willamette Spring

The current year forecast was made from a mix of average age-specific run sizes and age-specific linear regressions of cohort returns. The recent 5-year average age-3 run size was used as the age-3 forecast. The regressions of age 4 on age 3 and age 5 on age 4 were used to forecast age 4 and 5 return, respectively. The preliminary forecast for 2003 ocean escapement is 109,800, compared to the 2002 return of 121,700.

Cowlitz Spring

The forecast is the sum of predicted tributary mouth returns of the Cowlitz, Kalama, and Lewis river spring chinook stocks. In turn, each tributary forecast was the aggregate of age-specific linear regressions of historical cohort returns, i.e. age 4 was predicted from age 3 and age 5 was predicted from age 4. The preliminary forecast for 2003 ocean escapement is 11,600, compared to the 2002 return of 6,700.

Upriver Summer

The current year forecast was based on a relationship between jacks and adult returns at the Columbia River mouth. The preliminary forecast for 2003 ocean escapement is 87,600, compared to the 2002 return of 129,000.

Upriver Brights

The current year forecast was the sum of 22 individual forecast, i.e. 6 stocks X 4 age groups less two exceptions (Lower River Hatchery (LRH) age 6 and Bonneville Pool Hatchery (SCH) age 6). The six stocks were LRH, LRW, SCH, URB, Bonneville Upriver Brights (BUB), and Pool Upriver Bright (PUB). The four age groups were age 3, 4, 5, and 6. Both age-specific average cohort ratios and age specific cohort regressions were used in the individual forecasts. Additional details by stock are presented below. The preliminary forecast for 2003 ocean escapement is 622,600 adults, compared to the 2002 run of 727,500.

Cowlitz Fall and Bonneville Tule

The Bonneville tule and Cowlitz fall stocks comprise the LRH stock and their individual forecasts are based on an estimate of their proportion of the forecasted total LRH return. The LRH age-3 forecast was produced from 1981-99 brood cohort regressions, age-4 from 1980-99 brood cohort regressions, and age-5 from 1979-97 brood regressions. Ocean escapement in 2003 is forecast to be 115,900 LRH adults, less than the 2002 actual return of 156,400 adults but more than to the recent 5-year average of 72,600. The recent 8-year average LRH forecast error is -30% with a range between -6% and -66% of actual. The Bonneville tule and Cowlitz fall individual forecasts are much less accurate than the composite LRH forecast.

Mid-Columbia Brights

The current year forecast for Mid-Columbia Brights (MCB) is the sum of the BUB and PUB forecasts. For the BUB component, the age 3 forecast was made from the 1993-99 brood cohort ratios, age 4 from the 93-98 brood cohort ratios, age 5 from the 1992-97 brood cohort ratios, and age 6 from the 1977-96 brood cohort regression. For the PUB component, the age 3 forecast was made from 1987-99 brood cohort ratios, age 4 from 1984-98 brood cohort regressions, and age 5 from 1984-97 brood cohort regressions, and age 6 from 1983-96 brood cohort regressions. Ocean escapement in 2003 is forecast to be 104,800 MCB adults, less than the 2002 actual return of 108,400 adults but comparable to the recent 5-year average of 61,700. The recent 8-year average forecast error is -6% with a range of -43% to 37%.

Spring Creek Hatchery

Data from brood years 1979–99 (excluding 1980) was used in the regression of age 3 on age 2, brood years 1975-98 (excluding 1979) in the regression of age 4 on age 2 & 3, and brood years 1984–1997 in the age-4:5 cohort ratio. Ocean escapement in 2003 is projected to be 96,900 adults, less than the 2002 actual return of 160,800 adults but more than the recent 5-year average of 75,300. The recent 8-year average forecast error is -18% with a range of -55% to 7%.

Lewis River Wild

Data from brood years 1993–99 were used in the age-2:3 cohort ratio, brood years 1994–1998 in the age-3:4 cohort ratio, brood years 1978–1997 in the regression of age 5 on ages 3 and 4, and brood years 1980–1996 in the age-5:6 cohort ratio. Ocean escapement in 2003 is forecast at 24,600 adults, comparable to the 2002 actual return of 24,900, both an improvement over the

recent 5-year average of 12,300. The recent 8-year average forecast error is –24% with a range of -66% to 11%.

Puget Sound Stocks

Methodologies for pre-season forecasts are described in joint WDFW-Tribal annual Puget Sound management reports (starting in 1993, reports are available by Puget Sound management unit, not by individual species).

Nooksack River Spring

North Fork Spring Chinook (natural origin and acclimated fish)—Average return rates of the most recent age classes (1996-2001) times parent brood of acclimation releases and natural escapements. Separate estimates are made for natural origin and cultured origin.

North Fork spring chinook (hatchery)—Average of 1996–2000 age class return rates times the appropriate brood year releases.

South Fork spring chinook (natural origin)—Average recruit (BY+4) per spawner (.97) for years 1988–2000.

Nooksack/Samish Fall

Summer/fall chinook (hatchery) — 1999–2000 average return rate (0.0071) times 1998 brood release (7,439,442 fingerlings) from Mamoya Pond, Lummi Sea Ponds, Samish Hatchery, and Maritime Heritage Center.

The hatchery return in 2002 is projected to be 54,420.

Skagit River

Spring Chinook (wild) —The wild spring chinook forecast is based on mean cohort return rate for each age class multiplied by the appropriate brood year escapement. The mean return rates are calculated from scale samples in the terminal fisheries and escapement sampling for the 1990–2001 return years. Age classes include both fingerling and yearling types for ages 2–6. The natural return in 2002 is projected to be 885.

Spring Chinook (hatchery) — The hatchery spring chinook forecast is based on the return per release of hatchery yearlings. Yearling estimate derived by multiplying brood year release (144,124) multiplied by the average return/release of brood years 85–97 (0.0057). The fingerling forecast is derived by estimating each returning age class by multiplying appropriate age class release by the average return rate. Total hatchery return is predicted to be 2,091 adults.

Summer/Fall Chinook (Wild) — Forecast year age-specific estimates are based on mean cohort return rate for each age class multiplied by the appropriate brood year escapement. The

methodology is the same as that used for wild spring Chinook. The natural return in 2002 is projected to be 13,455.

Stillaguamish River

Summer Chinook (natural origin) —The wild summer chinook forecast is based on recruits per spawner of natural escapement for each age cohort multiplied by the geometric mean of estimated marine survival and freshwater indices. The recruit per spawner estimates are based on CWT analysis for brood years 1986–1993 for North Fork data only but is applied to the entire system. The expected escapements with zero fishing are calculated by multiplying the cohort forecasts times the geometric mean of the marine survival indices times the geometric mean of the freshwater indices. This calculation is equivalent to multiplying the escapement by the geometric mean of the estimated recruits per spawner. The marine survival and freshwater survival components are separated to incorporate deviations from average conditions. For 2002 the average rates for both indices were used. The freshwater indices are calculated by dividing the AEQ recruits per spawner for naturally-produced chinook divided by the marine index. The AEQ values used are the same as CTC values. The marine indices are an average computed for all of Puget Sound using CWT analysis. The natural return in 2002 is projected to be 1,449.

Summer Chinook (hatchery origin, supplemented) —The forecast is calculated by multiplying the release numbers by the geometric mean of survival rates. Marked and unmarked fish are calculated separately to facilitate modeling of mark selective fisheries. The estimated return for 2002 is 553 adults.

Snohomish River

Summer/fall Chinook (natural) — The revised wild Snohomish forecasts are based on average recruits per spawner for brood years 1985 through 1994. These estimates come from the latest version of the Puget Sound TRT's Abundance and productivity tables, which use estimates of pre-terminal exploitation rates derived from aggregate coded-wire tag estimates worked out by Jim Scott and Dell Simmons. The former forecasts used pre-terminal estimates as described by the CTC model for the same brood years. The difference, for both the Snoqualmie and Skykomish populations, was approximately a two-fold increase in assumed recruits per spawner. The recruits per spawner values for the 2002 forecasts are much closer to the apparent realized recruits per spawner for the brood years that returned in 2001 than the ones used for the earlier version of the forecast.

In addition, the 2002 forecast dropped the augmentation of the Tulalip and Wallace River hatchery numbers to take into account hatchery fish that would stray to natural spawning areas. There is agreement that these fish should be included in the forecast. However, there are some significant questions about the method, and past forecasts may have overestimated this component. With pending information from the Snohomish River straying evaluation study, it should be possible to develop a more acceptable method of forecasting this component for 2003.

Summer/fall Chinook (hatchery) —The forecast is based on average adult returns from the Puget Sound run reconstruction (4B run) per pound released because no CWT data exists for either yearlings or fingerlings specific to Snohomish. The run reconstruction methodology assumes that all fish are age 4.

The natural and hatchery returns in 2002 are projected to be 6,700 and 4,100 respectively. The natural return is slightly above the recent five-year average, while the hatchery return is less than the five-year average.

Southern Puget Sound Stocks

Southern Puget Sound fall chinook stocks include hatchery fingerling, hatchery yearling, and natural production. These stocks aggregate production from South Puget Sound (south of the Snohomish River), Hood Canal and the eastern Strait of Juan de Fuca. Forecasts are produced jointly by WDFW and the western Washington treaty tribes using a variety of methods. Most of the forecasts are based on one or more of 4 methods: 1) average run size from some recent historic period, 2) hatchery releases, in pounds or numbers, from the brood year making the largest contribution to the forecast run (usually 4-years earlier) multiplied by an average rate of return-per-release, 3) spawning escapement in the predominant brood year multiplied by an average rate of return-per-spawner, or 4) hatchery releases multiplied by average rates of return-at-age, summed over the broods contributing to the forecast.

Puget Sound Fall Fingerling

Puget Sound Fall Fingerling stock is an aggregate of fall chinook fingerling hatchery production from South Puget Sound and Hood Canal. Terminal fisheries targeting hatchery production subject Puget Sound and Hood Canal stocks to different exploitation rates. To account for these differences, forecasts are generated separately for each hatchery prior to aggregation. Forecast methods vary, but include:

Elwha — the 1997–2001 average terminal run expanded to 4B run size.

Hood Canal — (Hoodsport Summer/fall chinook (hatchery and natural)) Forecast is the product of brood 1998 fingerling released (pounds) from WDFW facilities in 1999, multiplied by the average of post-season estimated terminal return rates (terminal run/fingerling pounds released 3 years previous) for the last four return years (1998-2001), which are believed to represent the current survival rates. The resulting terminal area forecast is 24,036 adults. The forecast is then apportioned at 21,098 hatchery fish (36.7% George Adams and 51% Hoodsport Hatchery) 2,938 (12.2%) natural fish based on Puget Sound run reconstruction based relative contribution for individual management units in the 1998-2001 return years

Puyallup Summer/Fall Chinook (hatchery)—Age specific mean return /number and pounds of Voights Creek fingerlings released for return years 1992-99 are applied to Voights Creek fingerling release numbers and pounds for the appropriate contributing brood years. The mean of the two predictors provides the 2002 forecast.

Chambers Creek — the 1998 pounds of hatchery fingerlings released multiplied by 1990–2000 average returns/lb released.

Nisqually — the 1998 brood hatchery fingerlings released multiplied by 1996–2000 average return/fingerling.

McAllister Creek — the 1998 brood year hatchery fingerling releases multiplied by the 1984–2000 mean return per hatchery release.

Deschutes — average of the 1998 brood year hatchery fingerling releases (numbers and pounds) multiplied by the 1983–2000 average return/fingerling release, and 1998 brood year hatchery fingerling releases (lb) multiplied by 1980–2000 average return/lb released.

Coulter Creek — the 1995–2000 average run size.

Carr Inlet — average of two methods using numbers released and pounds released for the 1998 brood year hatchery releases multiplied by 1980–2000 average returns per hatchery release.

Grovers Creek — average cohort return rate (1978-1997) times number of fish released.

Puget Sound Natural and Hatchery Fall

Hoko River Summer/fall chinook (natural)—Four year average of 1999-2002 escapement multiplied by the average ratio of 1996 and 1997 4B run size/escapement expansion (1.0135). Prediction for 2003 is 1050.

Elwha River Summer/fall chinook (hatchery and natural)—Average of 1999-2002 terminal run. Prediction for 2003 is 2,050.

Dungeness River Summer chinook (natural)—Average of 1999-2002 escapement. No expansion for 4B. Prediction for 2003 is 350.

Nooksack River North Fork Spring Chinook (wild natural origin)—Average return rates of the most recent age classes (1997-2002) times parent brood escapement. Prediction for 2003 is 250.

Nooksack River North Fork Spring Chinook (wild culture origin)—Average return rates of the most recent age classes (1997-2002) times parent brood acclimation releases and escapements. Prediction for 2,003 is 2,900.

Nooksack River North Fork spring chinook (hatchery)—Average of 1995-2001 age class return rates times the appropriate brood year releases. Prediction for 2003 is 6,250.

Nooksack River South Fork spring chinook (natural origin)—Average recruit (BY+4) per spawner (1.02) for years 1988-2002. Prediction for 2003 is 150.

Nooksack/Samish Summer/fall chinook (hatchery)—2001+2002 return rate (0.0075) times 1999 brood release (6,397,705 fingerlings) from Slater Slough, Lummi Sea Ponds, Samish Hatchery and Maritime Heritage Center. Prediction for 2003 is 45,750.

Glenwood Springs Summer/fall chinook (hatchery)—1991-2000 average Nooksack/Samish fall chinook return rate (0.00237) times 1999 brood release (675,000) at Glenwood Springs. Prediction for 2003 is 1,600.

Skagit River Spring Chinook (wild)—Brood-specific estimates based on 1990-2002 samples applied to terminal run sizes to estimate mean cohort return rate. This was then applied to the appropriate brood year to obtain age-specific returns per spawner estimates, which were summed for total estimate. Prediction for 2003 is 1,150.

Skagit River Spring Chinook (hatchery)—Yearling estimate is based on the returns per releases (BY-4) of hatchery yearlings multiplying brood year release (144,124) times average return/release of brood years 85-98 (0.0056). Fingerling forecast is based on Nooksack return from last 6 years. Prediction for 2003 is 1,950.

Skagit River Summer/Fall Chinook (Wild)—Forecast year age-specific estimates derived age data, estimating mean cohort return rate for each age class times appropriate brood year escapement. Prediction for 2003 is 13,700.

Stillaguamish River Summer Chinook (natural origin)—Recruits per spawner of natural escapement for each age cohort multiplied by the geometric mean of estimated marine survival and freshwater indices. Prediction is based on zero fishing within all waters. Recruits per spawner based on North Fork only. Prediction for 2003 is 2,050.

Stillaguamish River Summer Chinook (hatchery origin, supplemented)—Release numbers multiplied by geometric mean of survival rates. Marked and unmarked fish are calculated separately. Prediction for 2003 is not estimated.

Tulalip Hatchery Summer/fall Chinook (hatchery)—Cohort specific release numbers for brood years, separated for yearling and fingerling forecasts, 1998 through 2000 multiplied by survival rates from CWTs released in brood years 1986-1991, adjusted by Adult Equivalency. Prediction is based on zero fishing. Prediction for 2003 is 6,000.

Snohomish River Summer/falls—Brood forecast returns (97-2000) times recruit per spawner of natural escapement for each age cohort multiplied by the geometric mean of estimated marine survival and freshwater indices time percent at age applied AEQ to estimated cohort forecasts and potential returns. Prediction for 2003 is 9,450.

Lake Washington Cedar River Summer/fall Chinook (natural)—Forecast was generated by applying the three year average exploitation rate for 1996-1998 (0.017) to the 2002 chinook escapement (369), resulting in 241*1.3141. Prediction for 2003 is 300.

Lake Washington North Tributary Summer/fall Chinook (natural)—Recent four-year average escapement to Bear and Cottage creeks. Prediction for 2003 is 350.

Lake Washington Issaquah Hatchery Chinook—1999 brood hatchery pounds released (24,499) times 1999-02 average (UW + Issaquah) return /pound (0.2062). Prediction for 2003 is 5100.

Lake Washington University of Washington Hatchery (Portage Bay)—1999 brood hatchery pounds released (7,440) times 1999-02 average (UW + Issaquah) return /pound (0.2082). Prediction for 2003 is 1550.

Green River Summer/Fall Chinook (natural spawners)—1999 brood year escapement (11,025) times average R/S (1.1241) from years with similar escapement (1983, 1991, 1993, 1995, 2001). Prediction for 2003 is 12,050.

Green River Soos Creek Hatchery Chinook (fingerlings)—Average cohort return rate (since 1985) for age 3's (0.0982), age 4's (0.1546) and age 5's (0.0142) times pounds released, which are 44,001 41,748 and 43,954; respectively. Prediction for 2003 is 11,400.

Green River Icy Creek Hatchery Chinook (yearlings)—Average cohort return rate (since 1985) for age 3's (0.003405), age 4's (0.02247) and age 5's (0.0047) times pounds of smolts released, which are 34,333; 30,163 and 29,611; respectively. Prediction for 2003 is 1000.

Kitsap Tributaries Grovers Creek Fall Chinook (hatchery fingerlings)—Average cohort return rate (1978-99) for 3's (0.00374), 4's (0.00262) and 5's (7.89E-05) times number released, which calculated to 2264 threes, 1729 fours and 55 five-year-olds. Prediction for 2003 is 4050.

Kitsap Tributaries Gorst Creek Fall Chinook (hatchery fingerlings)—Average Grover's cohort return rate (1990-99) for 3's (0.005008), 4's (0.002327) and 5's (9.417E-05) times number released, which calculated to 6455 threes, 7175 fours and 188 five-year-olds. Prediction for 2003 is 13,800.

Kitsap Tributaries Dogfish Creek Chinook (hatchery fingerlings)—Average cohort return rate (1984-91) for 3's (0.001059), 4's (0.001357) and, 5's (6.27E-05) times number released, which calculated to 170 threes, 224 fours and 10 five-year-olds. Prediction for 2003 is 400.

Kitsap Tributaries Clear Creek Fall Chinook (hatchery fingerlings)—Average cohort return rate (1984-91) for 3's (0.001059), 4's (0.001357) and 5's (6.27E-05) times number released, which calculated to 58 threes, 75 fours and 3 five-year-olds. Prediction for 2003 is 140.

Kitsap Tributaries Gorst Creek Fall Chinook (hatchery yearlings)—Average cohort return rate (1978-97) for 3's (0.005008), 4's (0.003227) and 5's (9.417E-05) times number released, which calculated to 397 threes, 289 fours and 8 five-year-olds. Prediction for 2003 is 700.

White River Spring Chinook (natural spawners)—Total adult chinook (ages 3 – 5 years) expected to be passed above Mud Mountain Dam in 2003 was forecast. Mean year class contribution ratios (e.g. the mean 2-yr-old/3-yr-old return ratios for several broods) were calculated and applied to the 2000 brood 2 return, the 1999 brood 3 return and the 1998 brood 4 return. This exercise yielded a 2003 forecast of 220 threes, 493 fours and 16 five-year-olds. Note that this is a total of naturally produced fish, acclimation pond origin fish and some apparently fall-type fish. There are no tools currently available to separate these run components. Prediction for 2003 is 700.

White River Spring Chinook (White River Hatchery)—Cohort mean return rates based on CWT information (1989-99 brood years) times the number of released fish for each brood year. Prediction for 2003 is 550.

White River Spring Chinook (Minter Creek Hatchery)—Cohort mean return rates based on CWT information (1986-99 brood years) times the number of released fish for each brood year. Prediction for 2003 is 550.

Puyallup River Summer/Fall Chinook (natural spawners)—The natural forecast for 2003 is similar to last year's method in that it estimated predicted return at age calculated for return years 1992-2002. This information was generated from escapement estimates derived by expanding South Prairie Creek for the entire basin. Total run sizes were then estimated by applying the appropriate year-specific run reconstruction run size/total escapement ratio to estimate historic run sizes. This year's method accounts for the harvest variation between those years. Prediction for 2003 is 3750.

Puyallup River Summer/Fall Chinook (hatchery)—The Puyallup hatchery fall chinook forecast used the method developed last year, applying mean return by age rates (based on both number and pounds releases) to appropriate brood releases. Return rates were update with age sampling data acquired through the 2000 return. Prediction for 2003 is 4350.

Chambers Creek Summer/Fall Chinook (hatchery fingerlings)—1999 pounds of fingerlings released multiplied by the 1991-01 mean return/pound released provided a 2003 forecast of fingerling origin returns. Prediction for 2003 is 1400.

Chambers Creek Summer/Fall Chinook (hatchery yearlings)—Yearling origin returns were forecast by applying age specific mean return /number and pounds derived from Deschutes yearling CWT releases (1986-93 brood years) to Chambers Creek yearling release numbers and pounds for the appropriate contributing brood years. Prediction for 2003 is 600.

Nisqually River Summer/Fall Chinook (natural spawners)—1999 escapement (1,399) multiplied by the 1997-2001 mean return per/spawner (2.98). Prediction for 2003 is 3100.

Nisqually River Summer/Fall Chinook (hatchery)—A new method was developed for 2003. Mean three, four- and five-year-old return rates (based on both numbers and pounds) were calculated from 1986-2002 CWT return data to pre-terminal, terminal and river fisheries and escapement. Contributing brood releases were then multiplied by the appropriate mean return rates to forecast brood contribution to the 2003 run size. Prediction for 2003 is 14,550.

McAllister Creek Summer/Fall Chinook (hatchery fingerling)—Average of two methods: 1) 1999 brood fingerling pounds released (20,418) multiplied by the 1984-00 mean return/pound released (0.1965) (96-97 return years not used due to missing brood contributions); 2) 1998 brood fingerling released (1,096,500) multiplied by the 1984-00 mean return/fingerling released (0.0034) (96-97 return years not used due to missing brood contributions). Prediction for 2003 is 3800.

McAllister Creek Summer/Fall Chinook (hatchery yearling)—Yearling origin returns were forecast by applying age specific mean return /number and pounds derived from Deschutes

yearling CWT releases (1986-93 brood years) to McAllister Creek yearling release numbers and pounds for the appropriate contributing brood years. Prediction for 2003 is 1200.

Deschutes River Summer/fall chinook (hatchery fingerling)—Age specific, mean return/fingerling numbers and pounds released (derived from brood years 1986-93 CWT data) multiplied times the fingerling numbers and pounds released from Tumwater Falls for the appropriate contributing broods. The mean of the two predictors (numbers and pounds) provides the 2002 forecast. Prediction for 2003 is 11,000.

Deschutes River Summer/fall chinook (hatchery yearlings)—Age specific, mean return/yearling numbers and pounds released (derived from brood years 1986-93 CWT data) multiplied times the yearling numbers and pounds released in Capitol Lake for the appropriate contributing broods. The mean of the two predictors provides the 2002 forecast. Prediction for 2003 is 700.

Coulter Creek (13 D-K) Summer/fall chinook (hatchery)—Mean of 1995-01 run size (4,259). Prediction for 2003 is 4300.

Carr Inlet Summer/fall chinook (hatchery)—Forecast is the average of two methods: 1) 1999 brood fingerling release (1,892,500) times 1980-01 mean return per number released (0.0031); 2) 1998 brood pounds released (25,945) times 1980-01 mean return/total pounds released (0.2764). Note: in both cases the 1994-97 return data was not used due to missing brood contributions. Prediction for 2003 is 6550.

Hood Canal Summer/fall chinook (hatchery and natural)—Forecast is the product of brood 1999 fingerling released (pounds) from WDFW facilities, multiplied by the average of post-season estimated terminal return rates (terminal run/fingerling pounds released 3 years previous) for the last four return years (1998-2001), which are believed to represent the current survival rates. The resulting terminal area forecast is 33,794 chinook salmon. The forecast is then apportioned at 30,206 hatchery fish (35.1% George Adams and 54.2% Hoodsport Hatchery) 3,588 (10.6%) natural fish based on Puget Sound run reconstruction based relative contribution for individual management units in the 1999-2002 return years. Prediction for 2003 is 33,800.

Puget Sound Fall Yearling

Puget Sound Fall Yearling stock includes hatchery production of fall yearlings aggregated for South Puget Sound and Hood Canal.

McAllister Creek – Average of two methods: 1) 1998 brood fingerling pounds released (21,253) multiplied by the 1984-00 mean return/pound released (0.1899) (96-97 return years not used due to missing brood contributions); 2) 1998 brood fingerling released (1,173,400) multiplied by the 1984-00 mean return/fingerling released (0.0033) (96-97 return years not used due to missing brood contributions).

Canadian Stocks

Fraser Late

The abundance forecast for Fraser Late chinook (FRL in the chinook model) consists of age-structured forecasts for two systems, the Harrison and Chilliwack Rivers, that are summed to project a total spawning escapement of lower Fraser River fall white chinook. The Harrison River spawning population, estimated annually since 1984 through a mark-recapture program, is large and essentially natural. The Chehalis River Hatchery, located near the confluence of the Chehalis and Harrison Rivers, has released coded-wire tagged juveniles originating from adults captured from the Harrison River each year since 1982. Recoveries of CWTd adults in the Harrison River are so few, however, that this component in the fall white spawning population is not estimated nor considered in the Harrison River forecast. The Chilliwack River spawning population, recently approaching that of the Harrison River in size, was originally founded from Harrison River brood stock. It has increased substantially since adults began returning to the Chilliwack River and Hatchery (1983) and now includes a component returning directly to the hatchery as well as a substantial number of natural spawners. Both components are enumerated annually and included in the Chilliwack River forecast. CWTd juveniles have been released from Chilliwack Hatchery into the Chilliwack River (entering on the south side of the Fraser River opposite to that of the Harrison River) every year since 1981 enabling this population to be used as an exploitation rate indicator for the Harrison River natural population.

The foundation for the two forecasts is an estimate of the terminal run to each river system. The combination of two distinguishing characters of Fraser Late chinook (late return timing and white flesh color) make it possible to estimate a total terminal catch from the Area 29 Fraser River commercial and test gillnet fisheries, the lower Fraser River sport and native food and ceremonial fisheries, and the in-river sport fisheries. These catches are apportioned to the Harrison and Chilliwack River populations by using information from estimated Chilliwack CWT recoveries where possible or by using the proportion of each in the total estimated escapement. Separate programs provide independent estimates of the spawning populations and these are added to each terminal catch estimate to derive terminal run estimates by age class. Terminal fisheries for Fraser Late chinook are generally small (although the Chilliwack River sport fishery has grown considerably in recent years) and are usually only a modest component of the terminal runs.

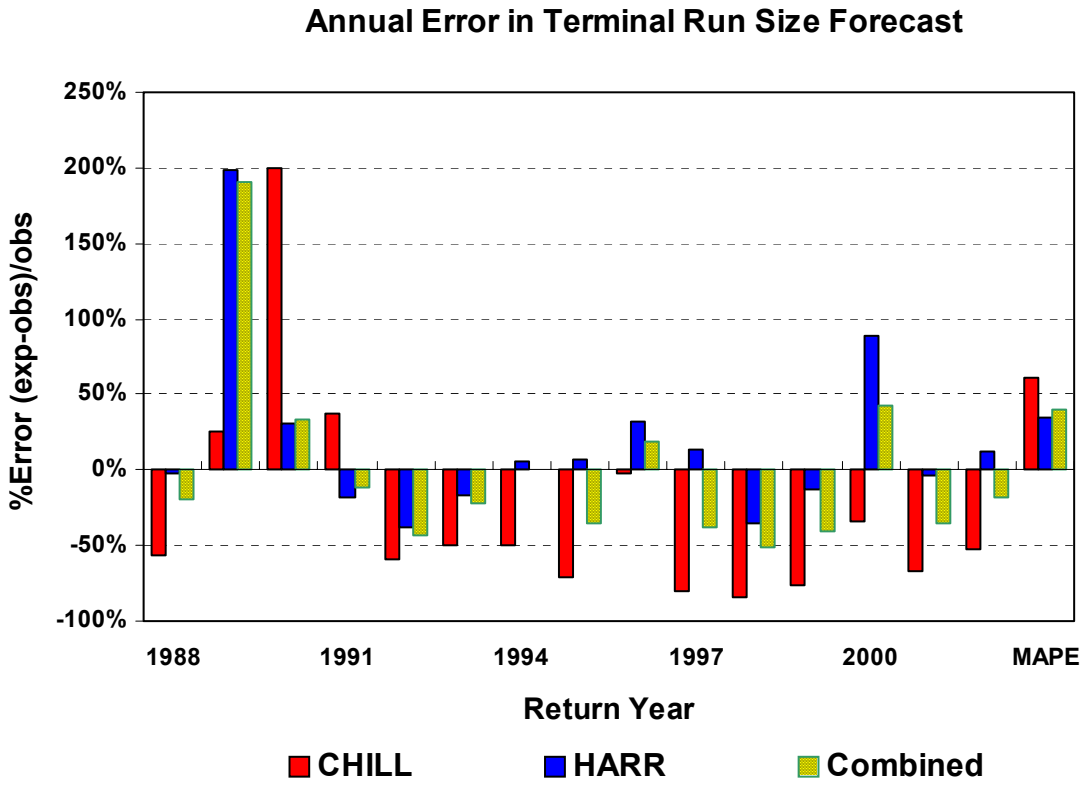
The CWT recoveries for Chilliwack Hatchery fall whites are used in a cohort analysis to obtain exploitation rates, maturation rates, and adult equivalent factors by age and brood year. These data are then used in linear sibling regression models to estimate ocean abundance at age for both the Chilliwack and Harrison River populations. The strongest regression models for the Harrison River chinook are based on the terminal run at one age against the ocean cohort abundance of the following age. For the Chilliwack River chinook, the strongest sibling regression models result from regressing the ocean cohort abundance at one age against that of the following age. The weaker relationships involving terminal run sizes may be due to uncertainties in the estimation of the escapements of the large, natural spawning component.

The estimates of age-specific ocean abundance for Chilliwack and Harrison chinook are combined in a spreadsheet model analogous to that previously developed for the Robertson

Creek fall chinook salmon stock (RBH in the chinook model). Terminal runs at age are then predicted based on changes in ocean exploitation rates and maturation rates at age. One notable difference from the RBH model, however, is that only the terminal run vs. ocean production spreadsheet models are applicable to the FRL forecasts since catch and CWT data will not be available from the past year's fisheries in Washington State. Consequently, the regression models include only brood years with complete recovery data and the independent variable (terminal run at age) is limited to returns within the Fraser River. These latter data are available within the time required for annual forecasts.

A problem that we are continuing to investigate is a consistent and significant under-estimation of the Chilliwack terminal runs for several recent years (Figure 1). We have estimated the bias using a retrospective 'leave-one-out' analysis resulting in adjustment to the 2003 forecast using the estimated –63% average error.

Figure 1. Estimated % annual error [(Expected return – Observed return)/Observed Return] in Chilliwack and Harrison River chinook forecasts based on a leave-one-out retrospective assessment of the regression models and fishery-specific exploitation rate analyses from the cohort analysis. The 'Combined' bars are the error estimates for the sum of the Chilliwack and Harrison population-specific forecasts. MAPE is the mean absolute percent error.



West Coast Vancouver Island

The abundance forecast for the West Coast Vancouver Island (WCVI) model stock is based on the RBH/Somass forecast and the relative run size of other WCVI chinook populations in the past year. The method used to forecast the terminal run of RBH/Somass chinook is documented annually in the Canadian Stock Assessment Secretariat (CSAC) Research Documents (*www.dfo-mpo.gc.ca/sci/csac/*) and has previously been reviewed by a working group of the CTC (March 26, 1996 Interim Report of CTC Workgroup, on file with PSC).

RBH/Somass Forecast: Predictions of ocean abundance for RBH fall chinook were developed from the CWT data used for the exploitation rate analyses. Sibling regression models were developed using estimated (observed recovery expanded by the catch/sample ratio) CWT recoveries in the fisheries and spawning escapement. The independent variable in these regression models may be the terminal run size at age, or the total production at age (ocean fishing mortality plus terminal run), but the dependent variable in both models is the pre-fishery ocean abundance in the next age class. The terminal run used in these regressions includes the catch of RBH and Somass River chinook in the Barkley Sound sport fishery, terminal commercial and native gillnet fisheries, and spawning escapement to the Somass system. These regression models only account for production associated with the CWT groups selected to represent RBH brood years.

To account for the total production of RBH and natural Somass production, a ratio is calculated of total terminal return of all hatchery and wild chinook salmon (by age and brood year) divided by the terminal return of chinook salmon by age and brood year for the specified CWT groups. Due to the multiple age classes in chinook salmon, ratios are based on observations in the previous year within the same cohort. For example, the expansion for the age-4 cohort in 2003 would be expanded by the ratio of age-3 chinook salmon observed in 2002 and the age-2 chinook salmon observed in 2001. Note that this expansion assumes natural production from the Stamp River exhibits similar behavior and encounters similar fishing pressure as the hatchery stock.

The estimates of age-specific ocean abundance for RBH/Somass chinook are input to a spreadsheet model used to predict the terminal run size. Terminal runs at age, expected in the next year, are predicted based on changes in ocean exploitation rates (i.e., management scalars) and maturation rates at age. Over the past five years of extensive changes in ocean and terminal fisheries, this spreadsheet model has predicted the observed terminal run with a mean absolute percent error of 21%. Error rates were about half of this value in the past when survival of RBH chinook was greater and more data was available from fisheries.

Based on the age-structured terminal run to 25 indicator streams, the forecasted terminal run of RBH/Somass chinook is expanded to account for other WCVI chinook populations. For example, the 2003 forecast of RBH/Somass was expanded as follows:

Age Class	RBH/Somass Forecast*	WCVI Expansion Factor	Total WCVI Forecast	Comments
Age 3	8,997	2.2	19,794	Average expansion of past age-3 returns
Age 4	30,602	1.75	53,699	Age-4 expansion based on observed expansion for age-3 returns in the brood year
Age 5	17,623	1.83	32,308	Expansion based on average value of age-3 and age-4 returns within brood year
Total	57,221		105,802	RBH/Somass = 54% of Total

* The forecast used in calibration of the CTC model uses base period exploitation rates (i.e., management scalars = 1.0).

The age-structured total WCVI forecast is used in the CTC model calibration process.

Southeast Alaska Stocks

The PSC CTC Model is used to internally forecast abundance of southern Southeast Alaska hatchery stocks.

Appendix E. CWT (Cohort) release to age 2 survival indices (completed brood years only) and chinook model-derived age 1 to age 2 survival indices (up to 2001) for exploitation rate indicator stocks.

Indices are survival indices relative to base period.

LIST OF FIGURES

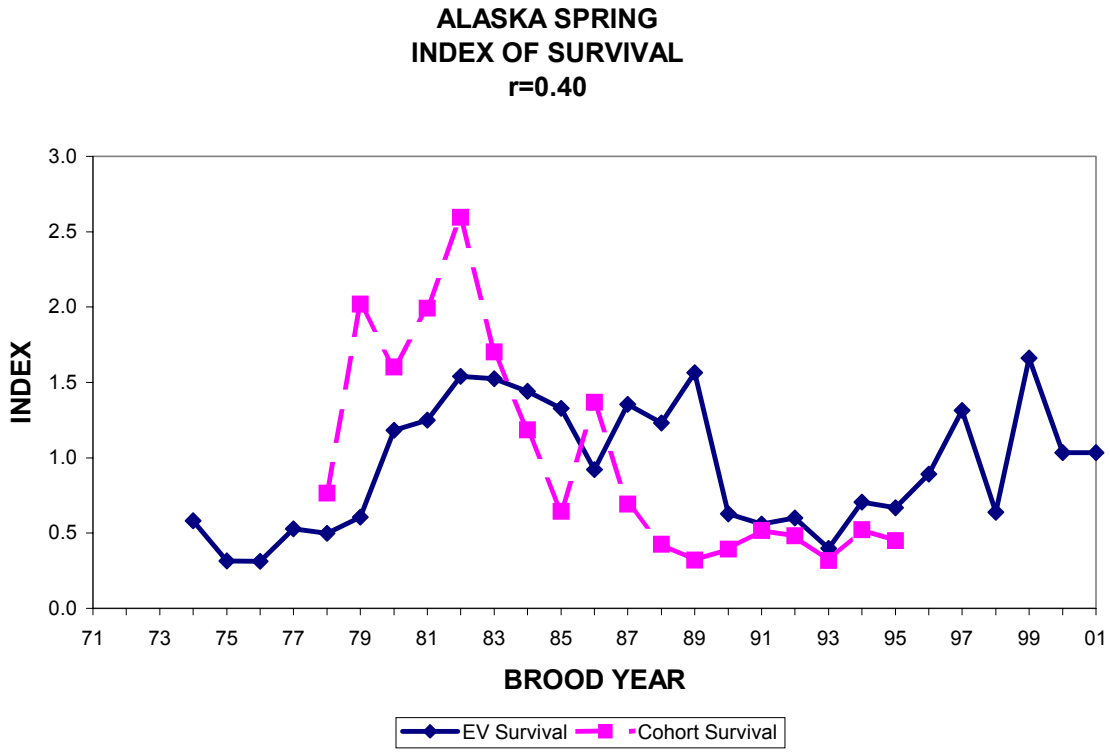


Figure E.1. Alaska Spring CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

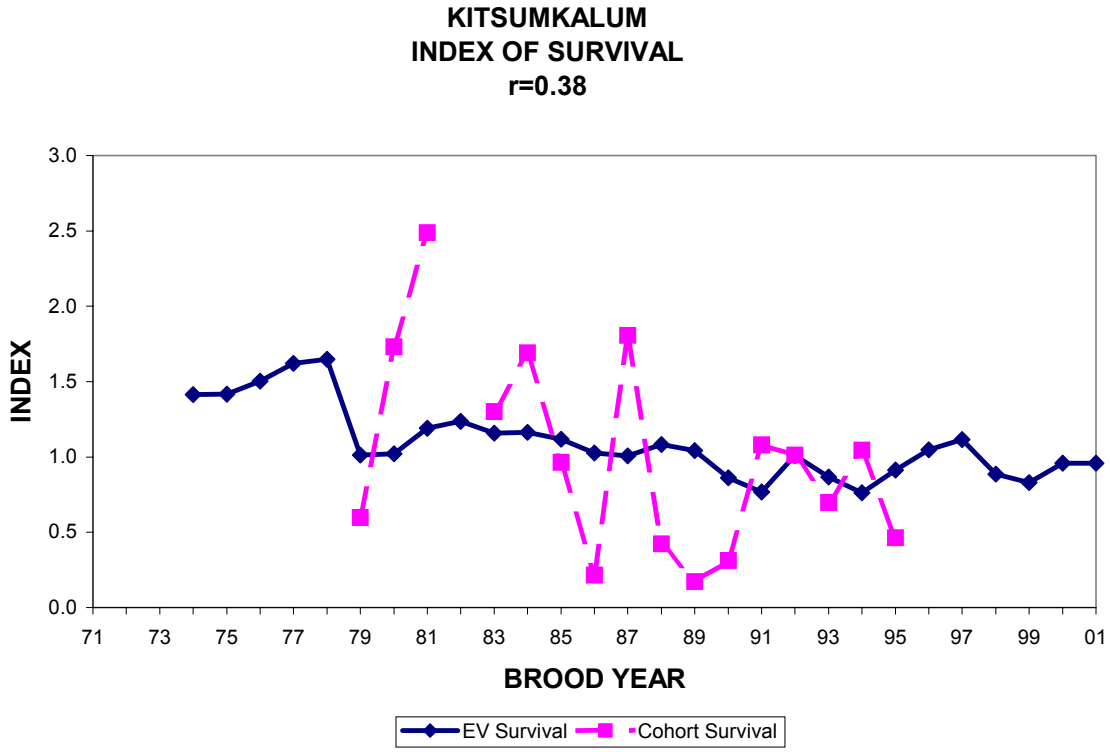


Figure E.2. Kitsumkalum CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

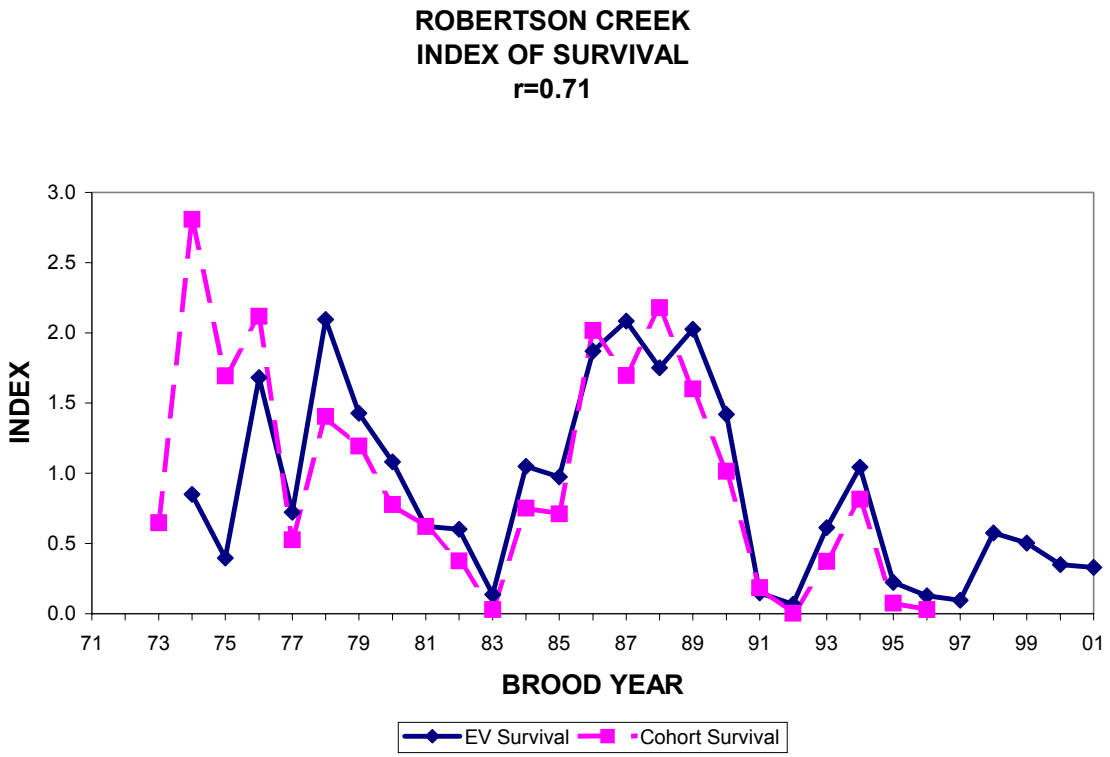


Figure E.3. Robertson Creek CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

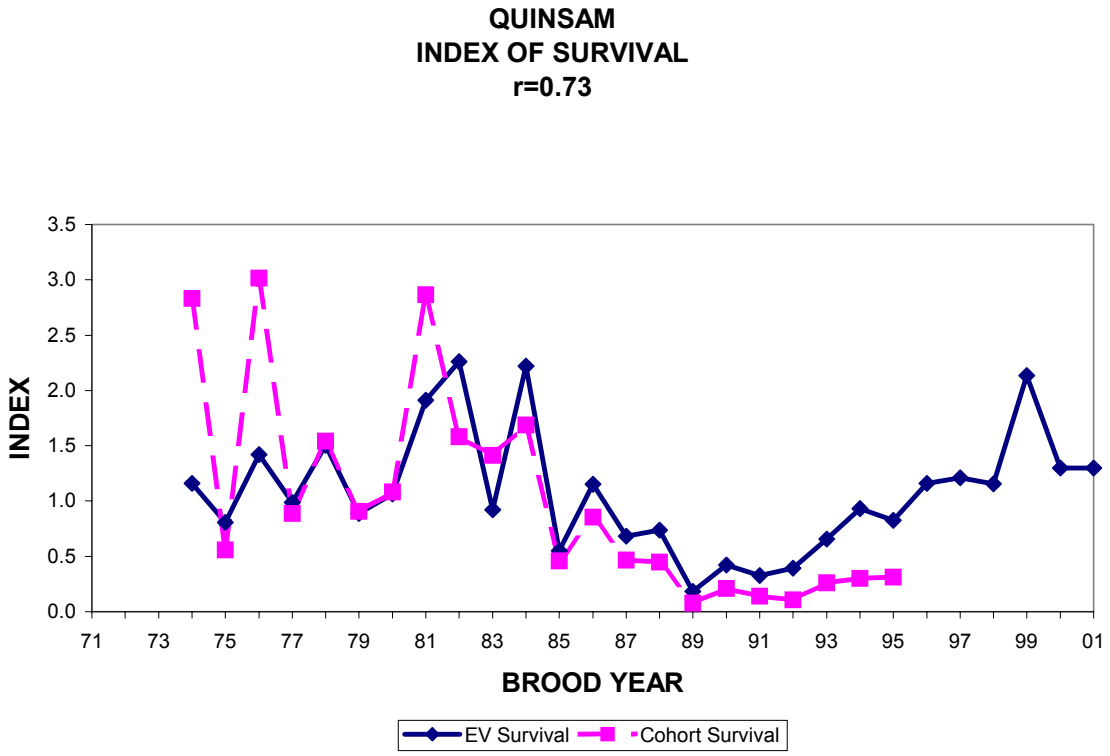


Figure E.4. Quinsam CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

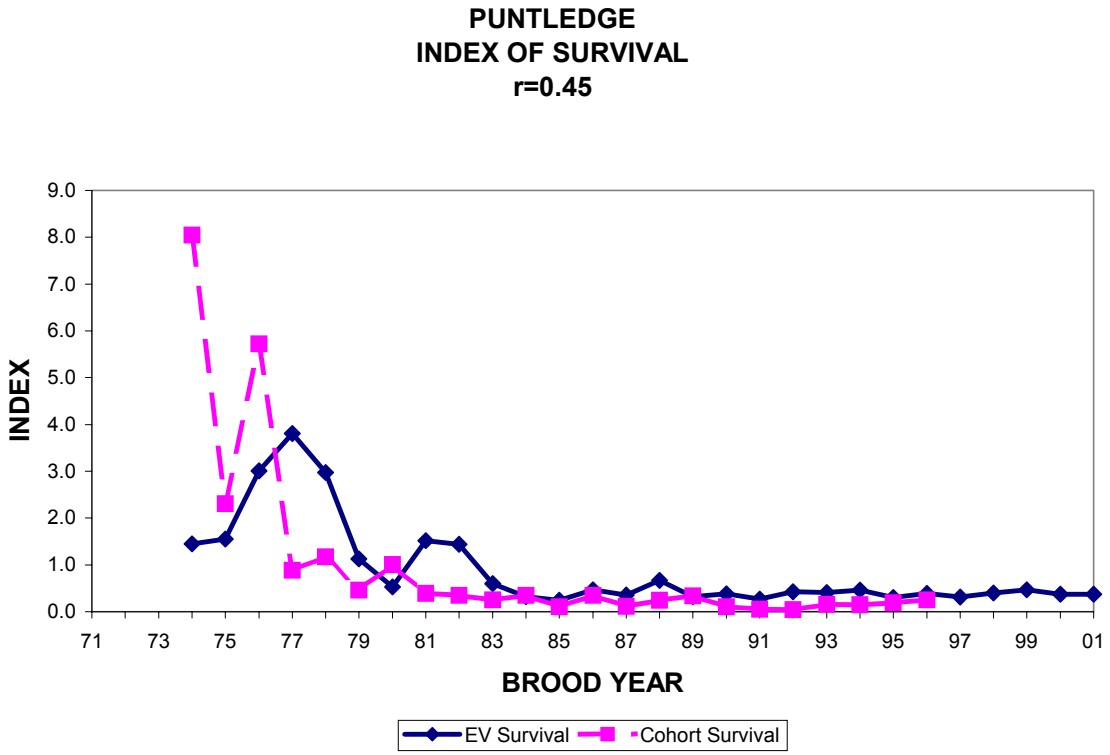


Figure E.5. Puntledge CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

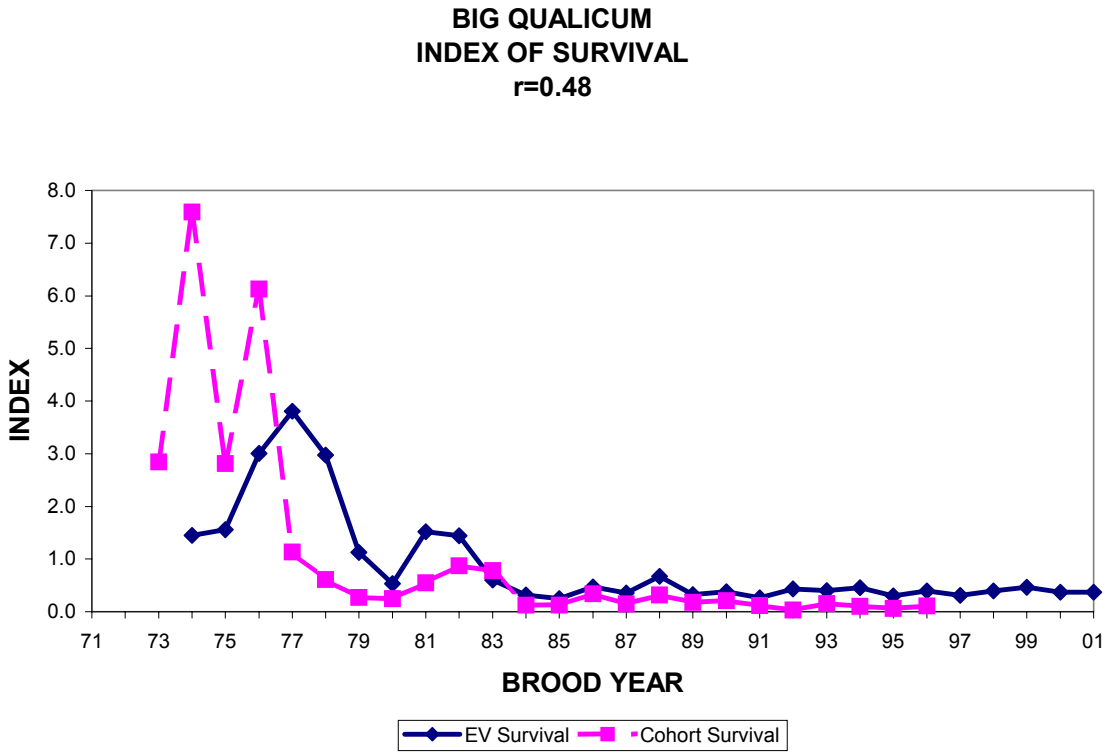


Figure E.6. Big Qualicum CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

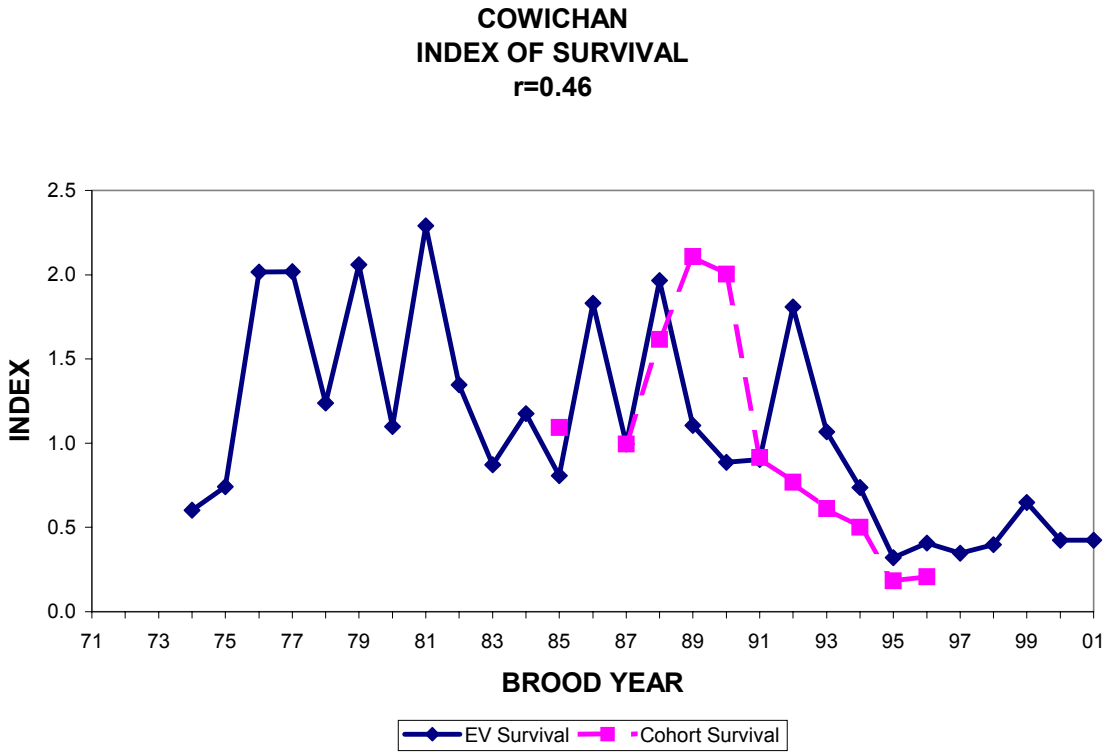


Figure E.7. Cowichan CWT (cohort) and model (EV) age 2 survival indices (r=correlation between survival indices).

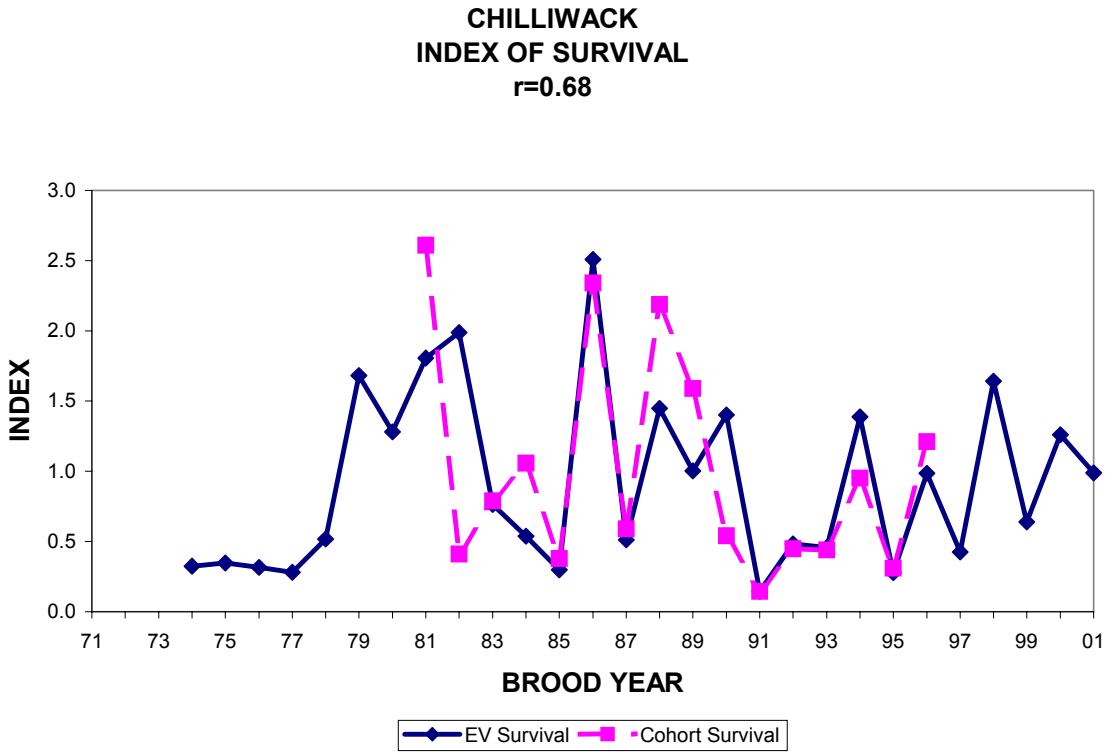


Figure E.8. Chilliwack CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

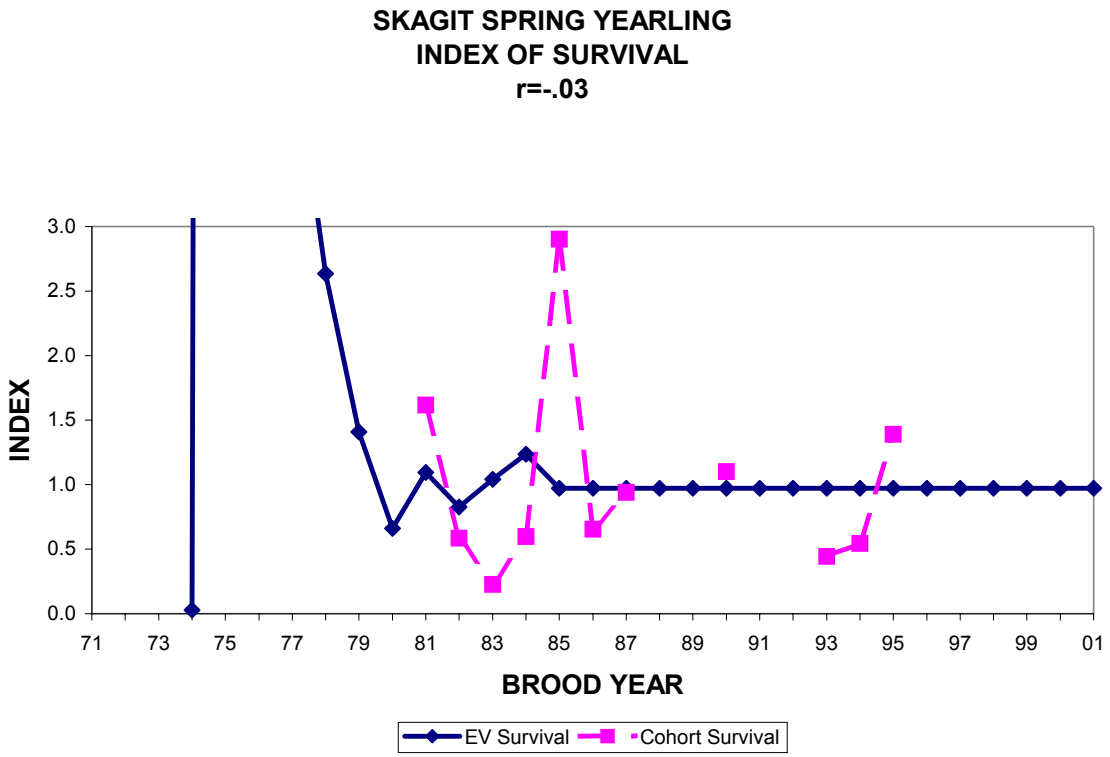


Figure E.9. Skagit Spring Yearling CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

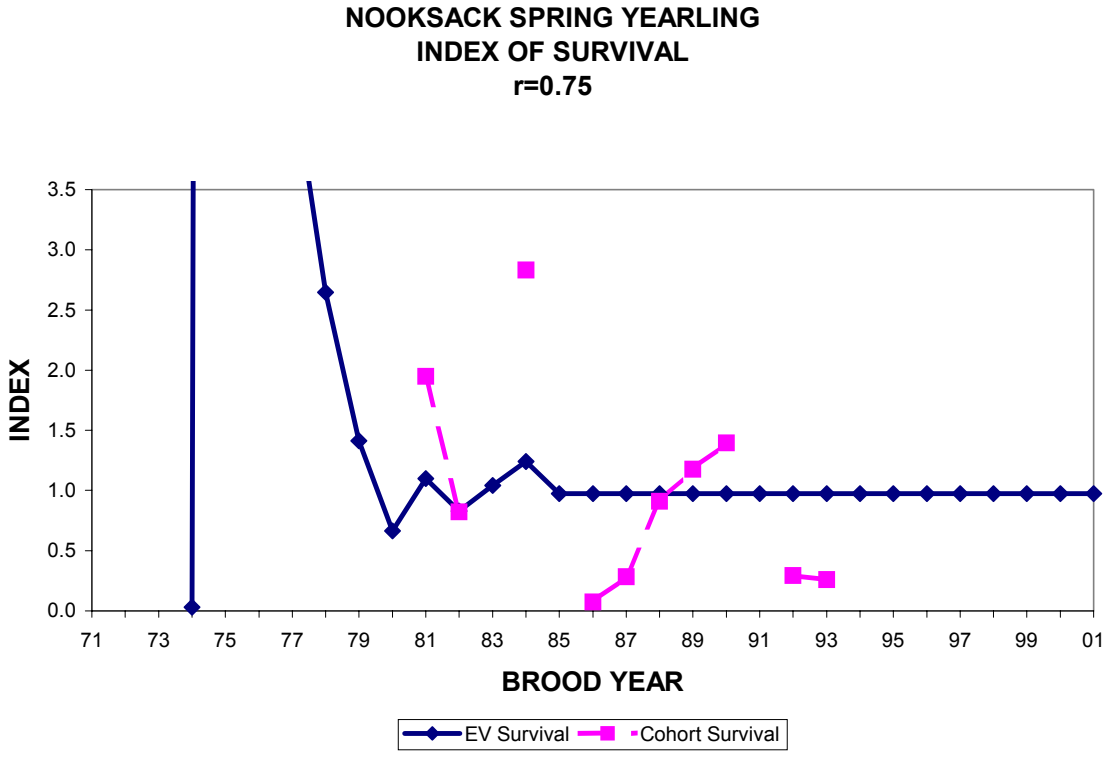


Figure E.10. Nooksack Spring Yearling CWT (cohort) and model age 2 survival indices (r=correlation between survival rates).

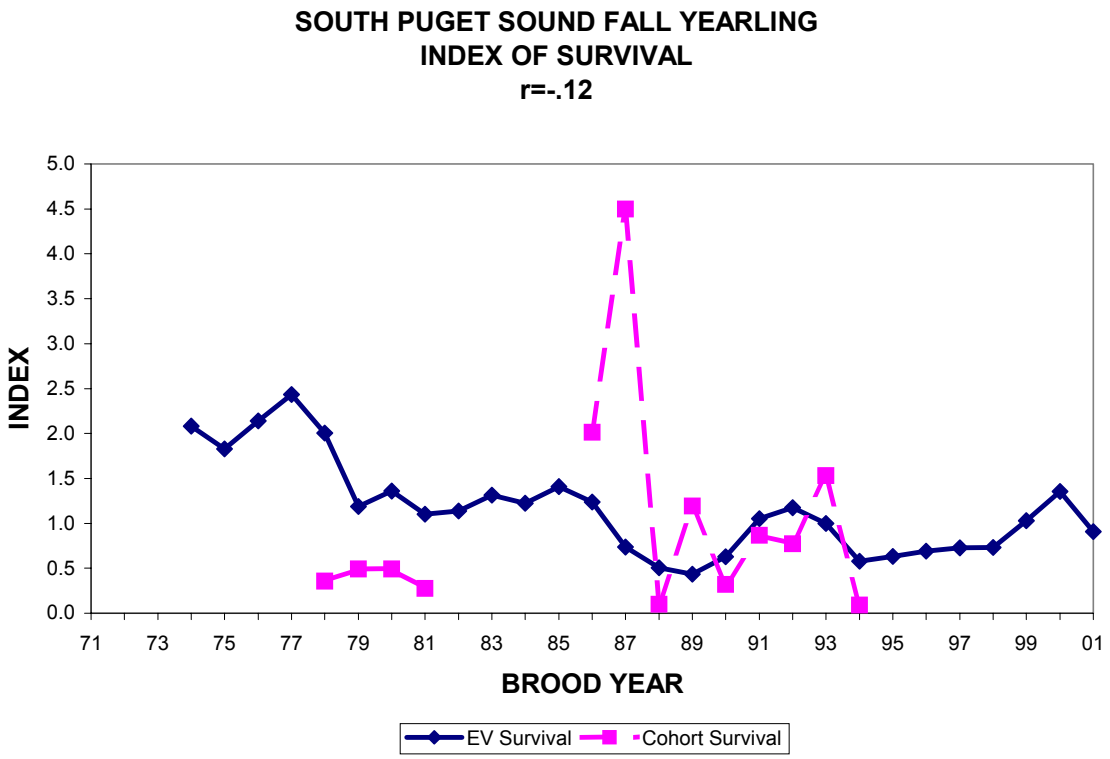


Figure E.11. South Puget Sound Fall Yearling CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

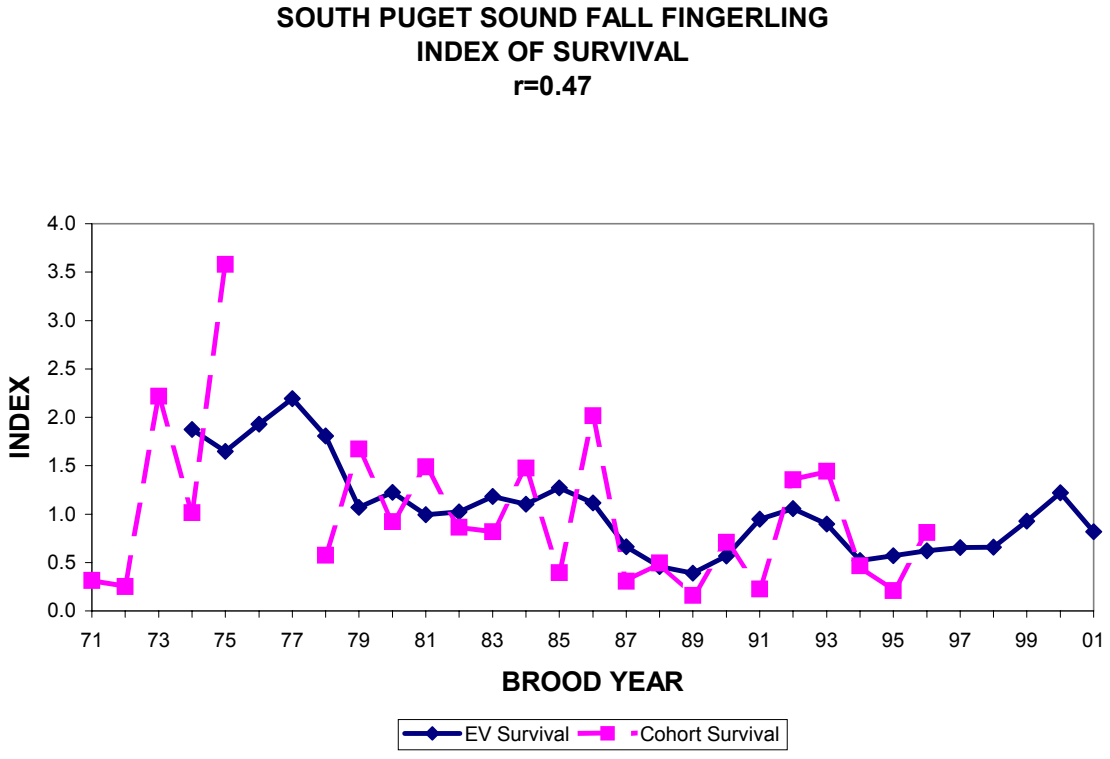


Figure E.12. South Puget Sound Fall Fingerling CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

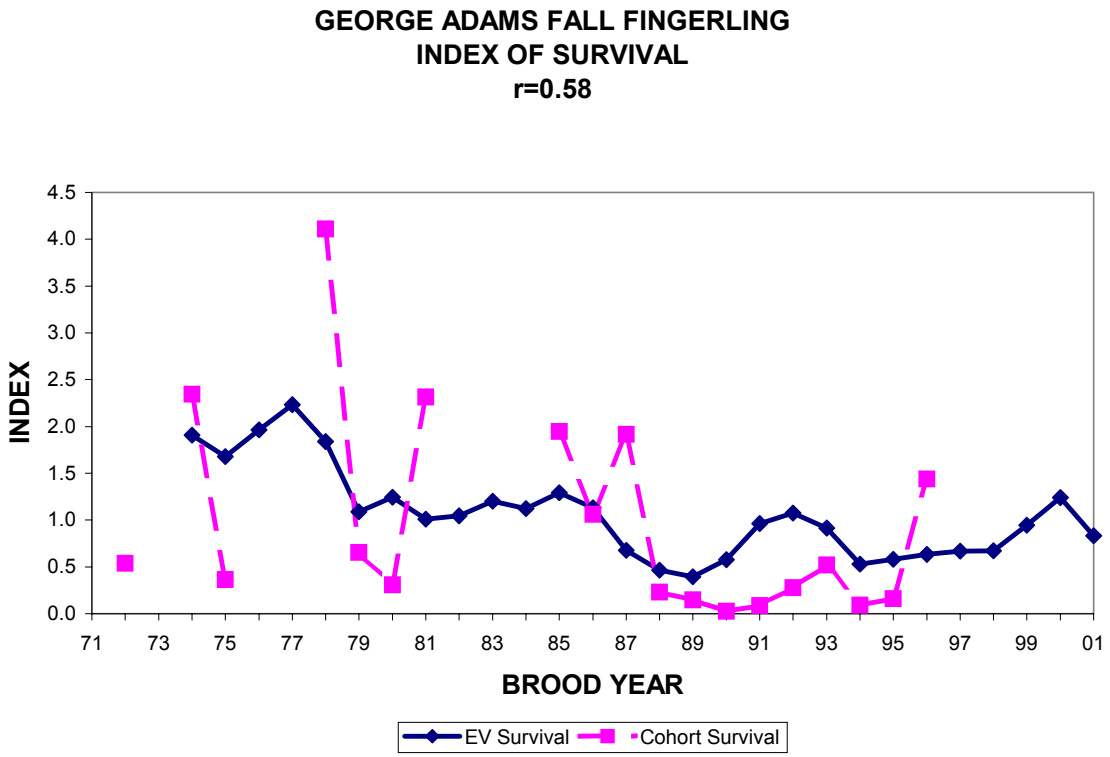


Figure E.13. George Adams Fall Fingerling CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

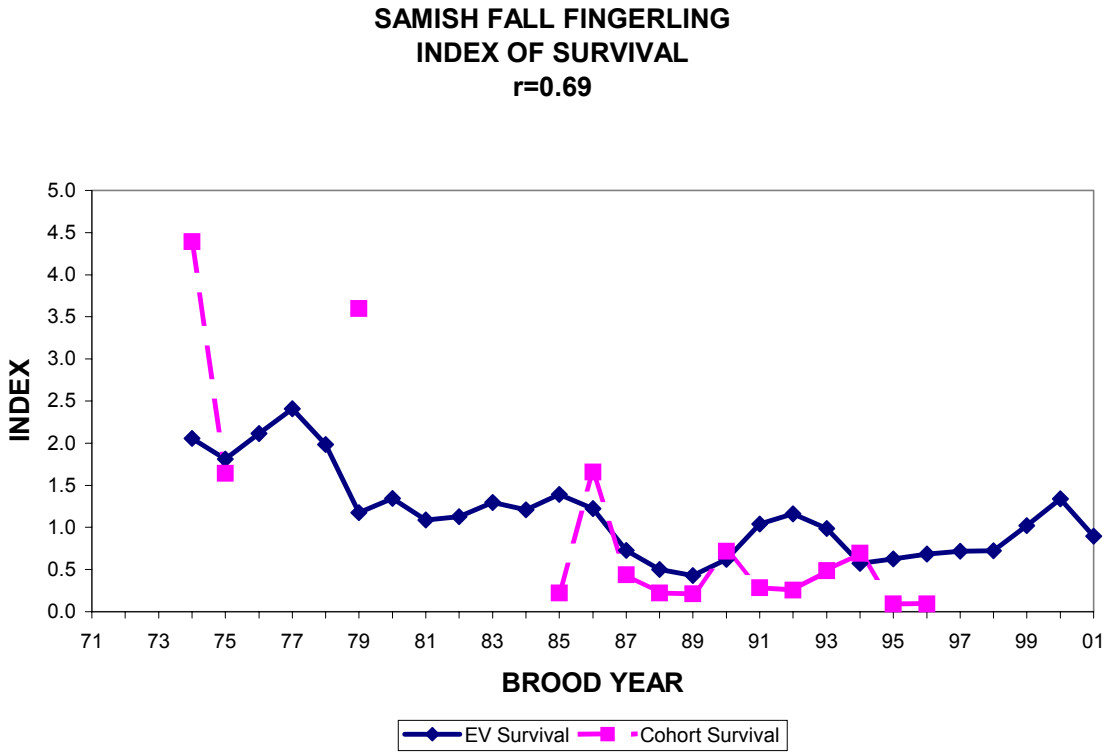


Figure E.14. Samish Fall Fingerling CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

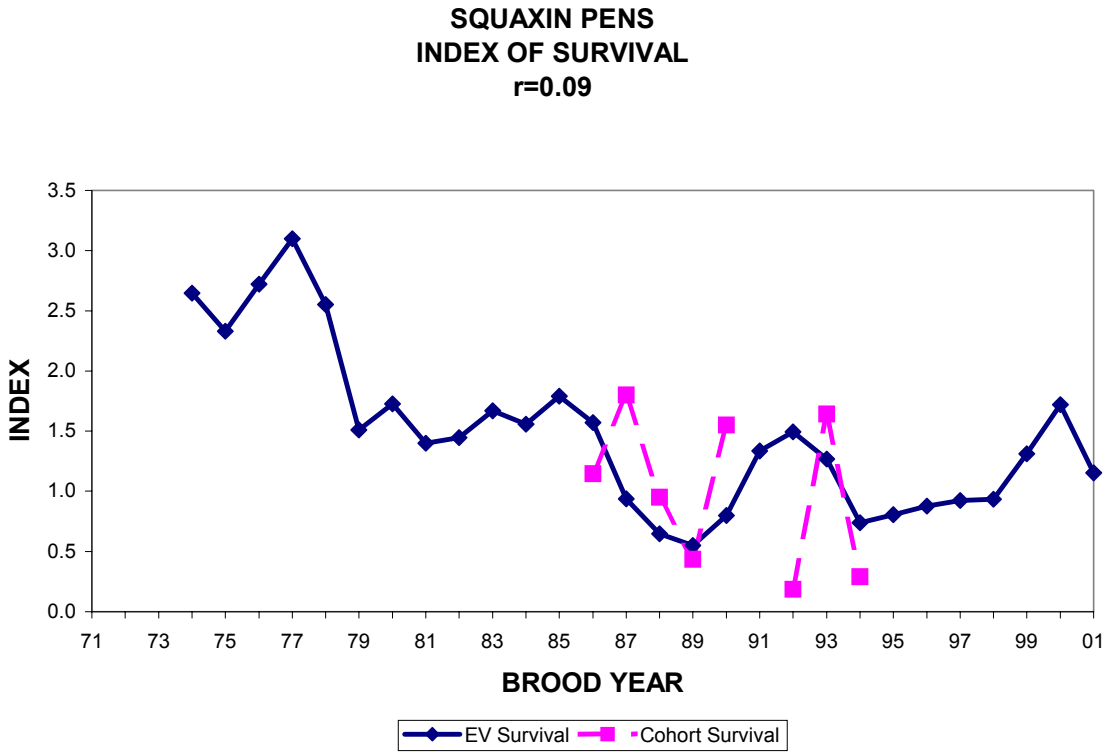


Figure E.15. Squaxin Pens Fall Yearling CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

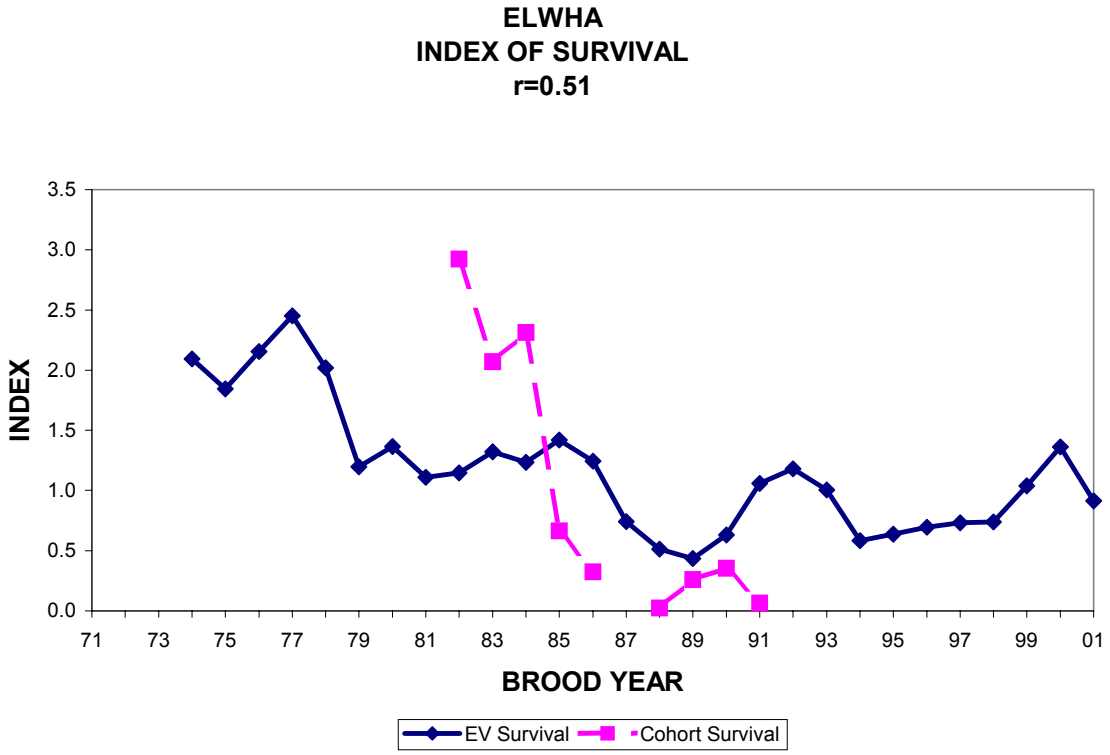


Figure E.16. Elwha Fall Fingerling CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

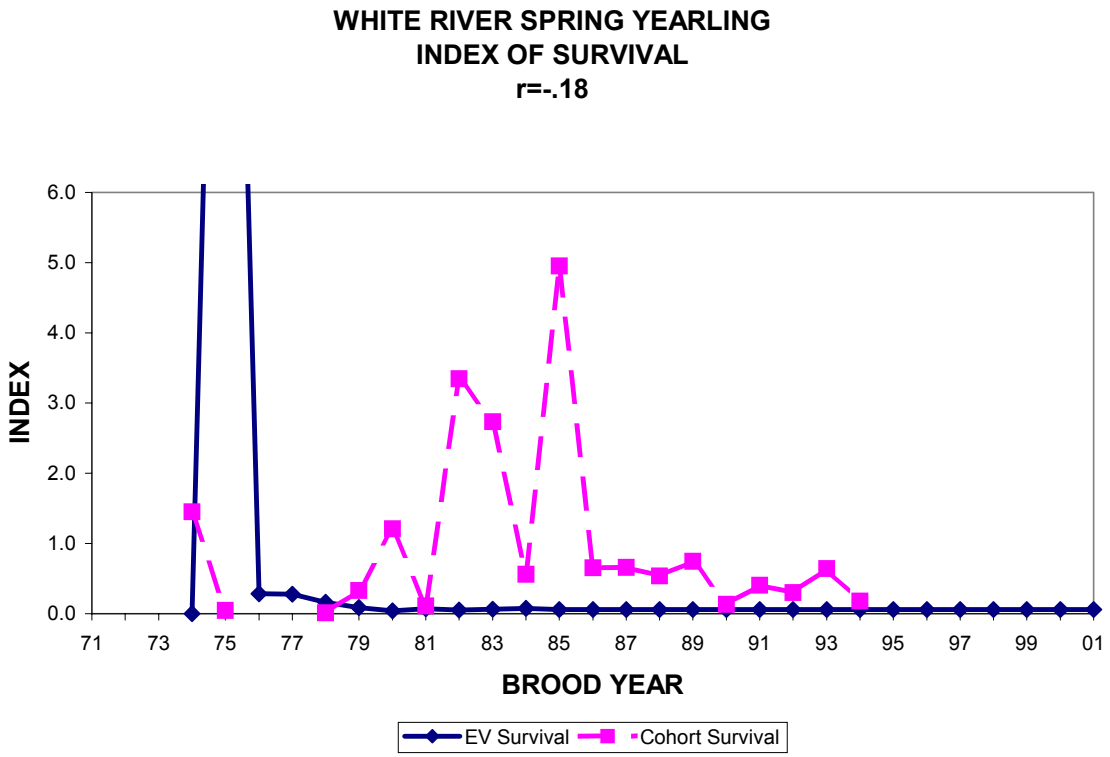


Figure E.17. White River Spring Yearling CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

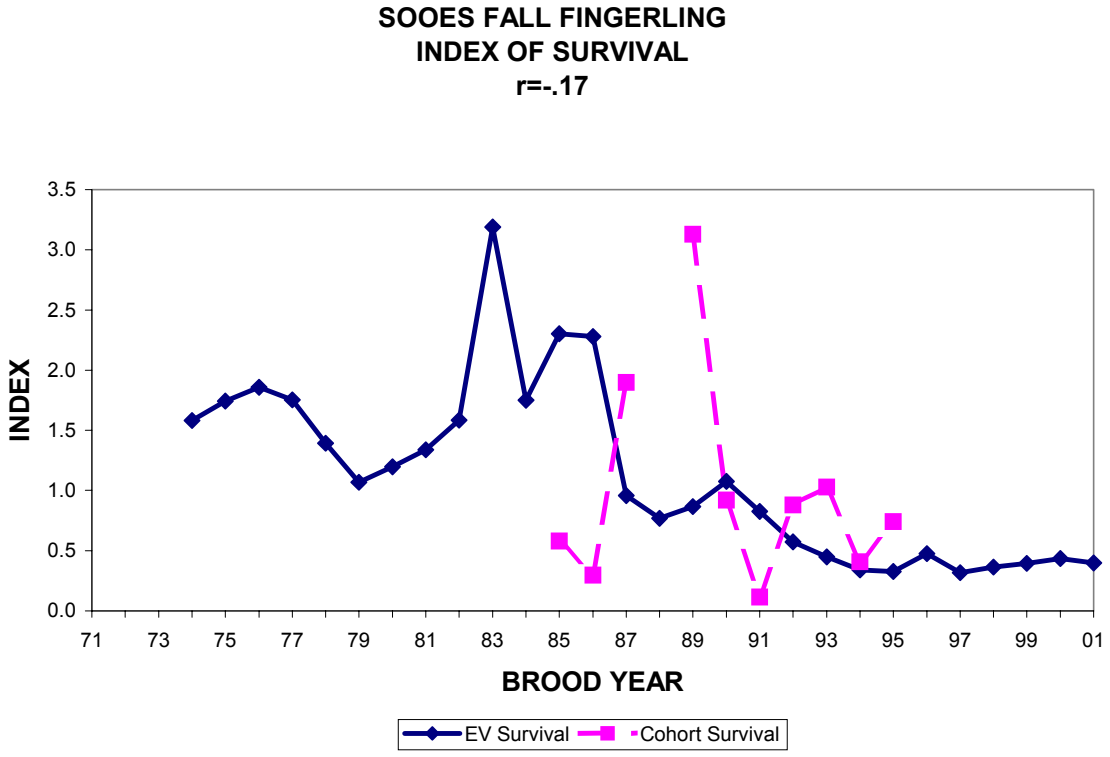


Figure E.18. Sooes Fall Fingerling CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

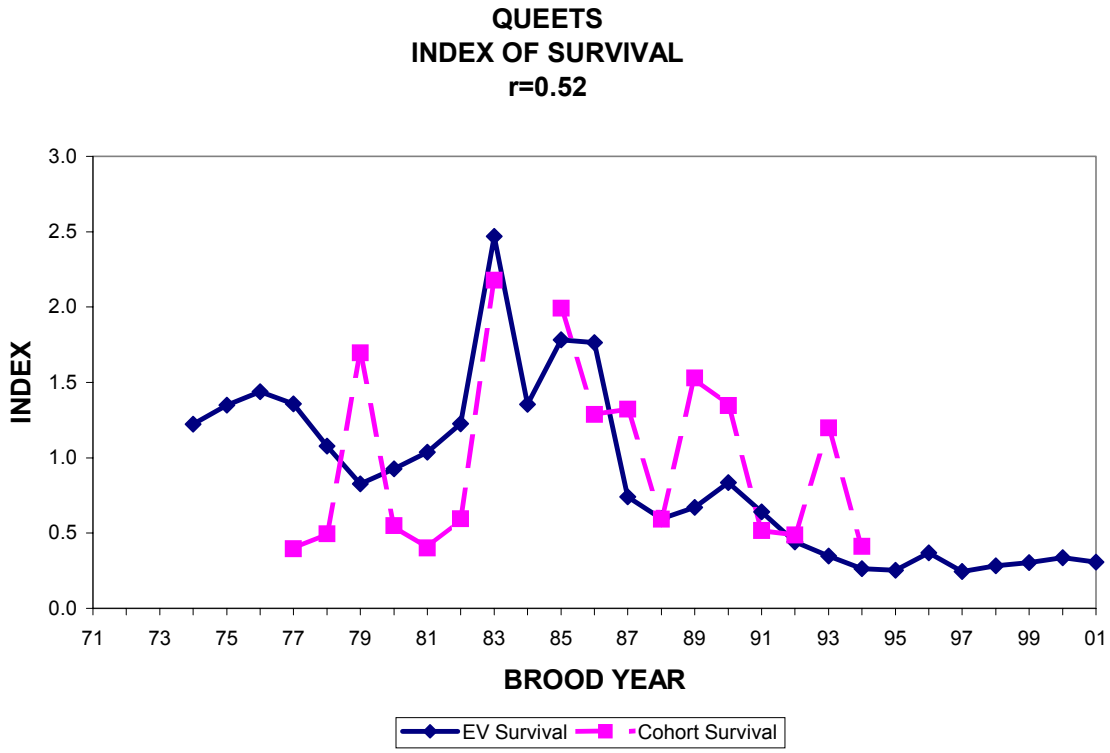


Figure E.19. Queets Fall Fingerling CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

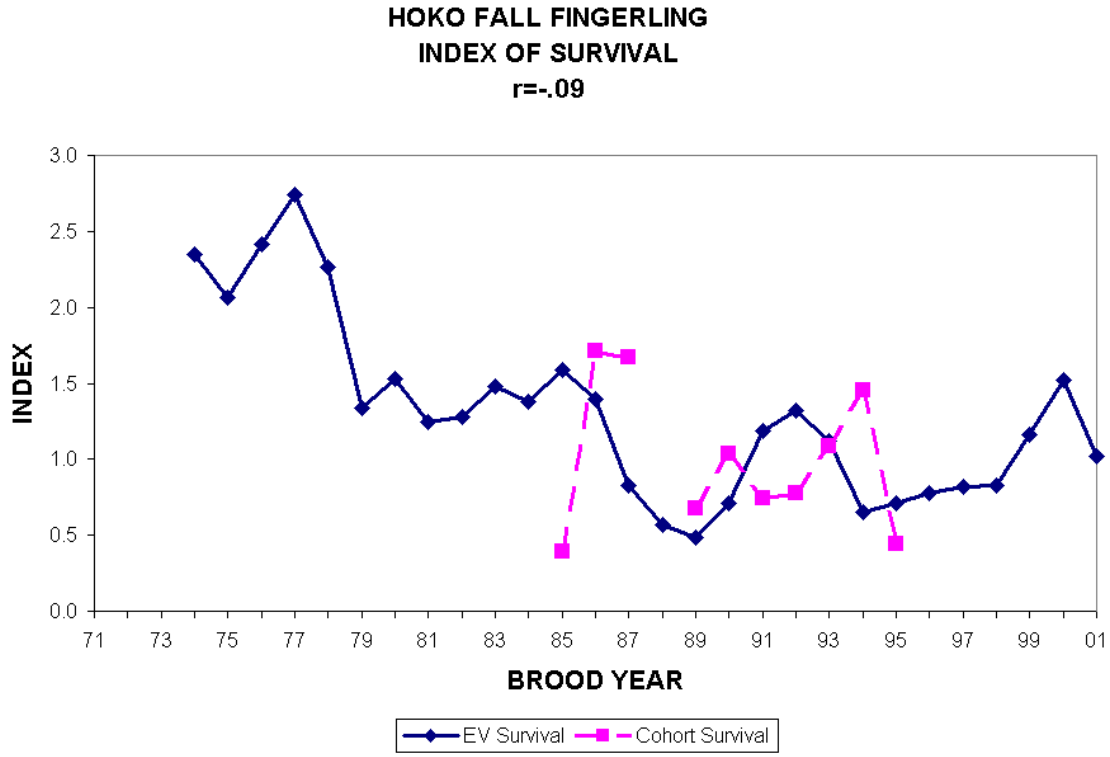


Figure E.20. Hoko Fall Fingerling CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

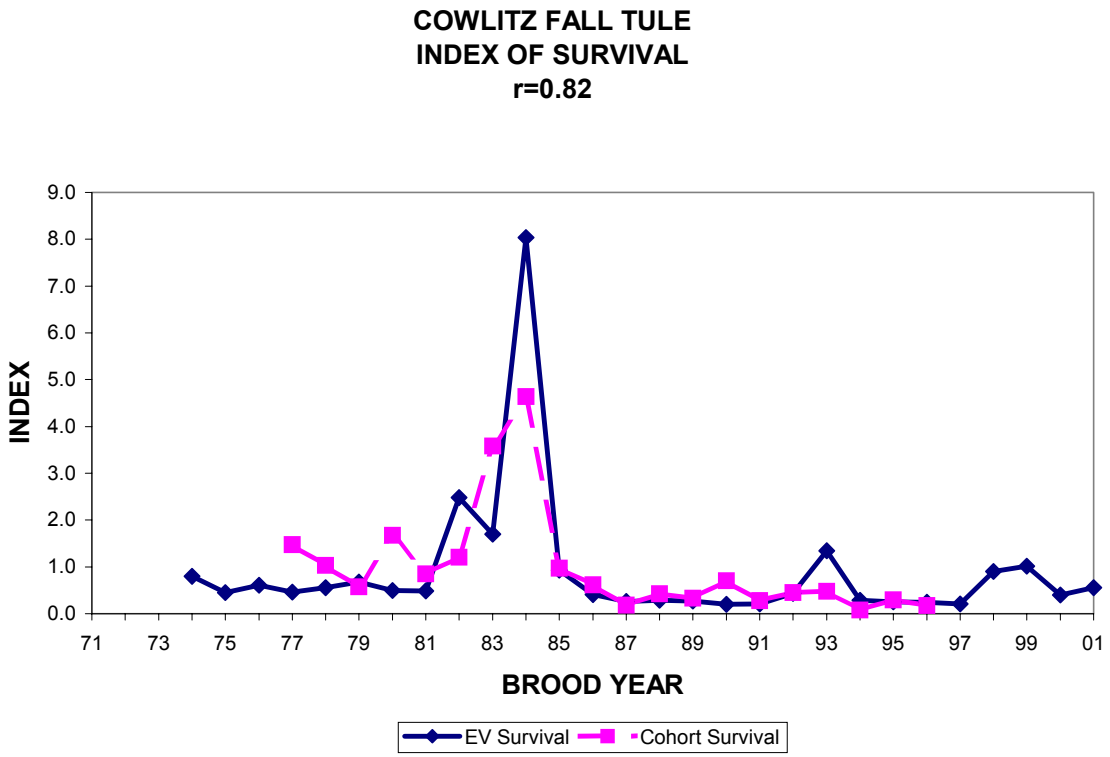


Figure E.21. Cowlitz Tule CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

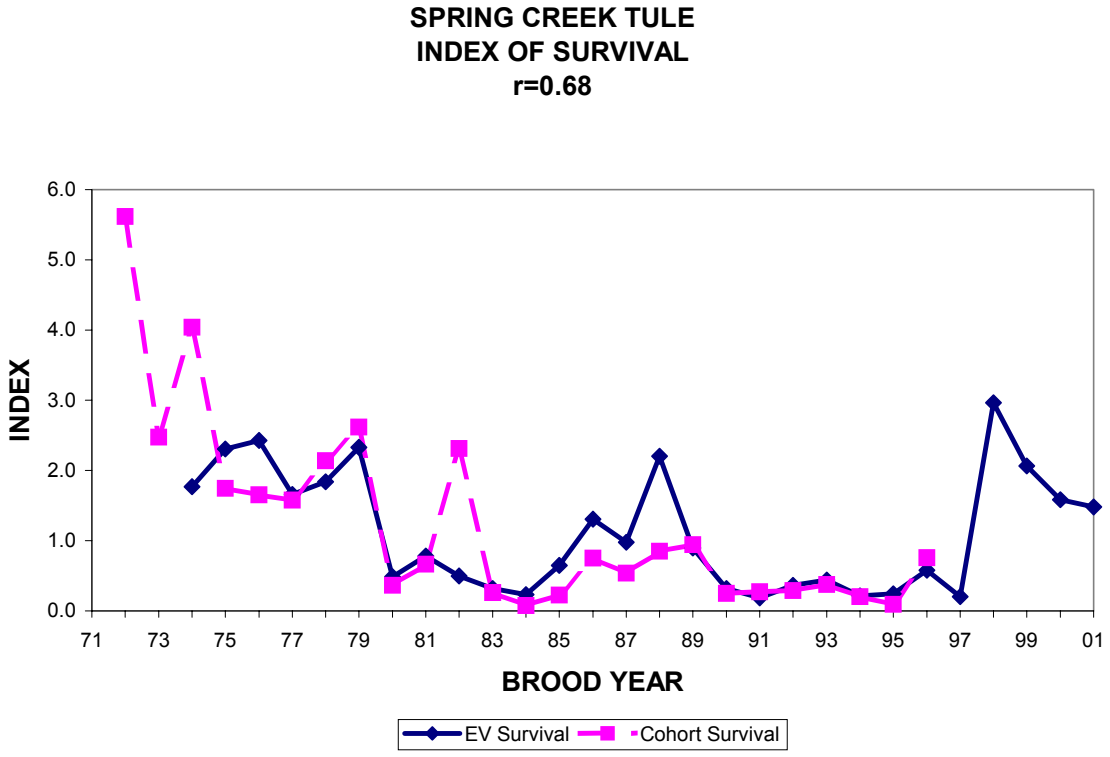


Figure E.22. Spring Creek Tule CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

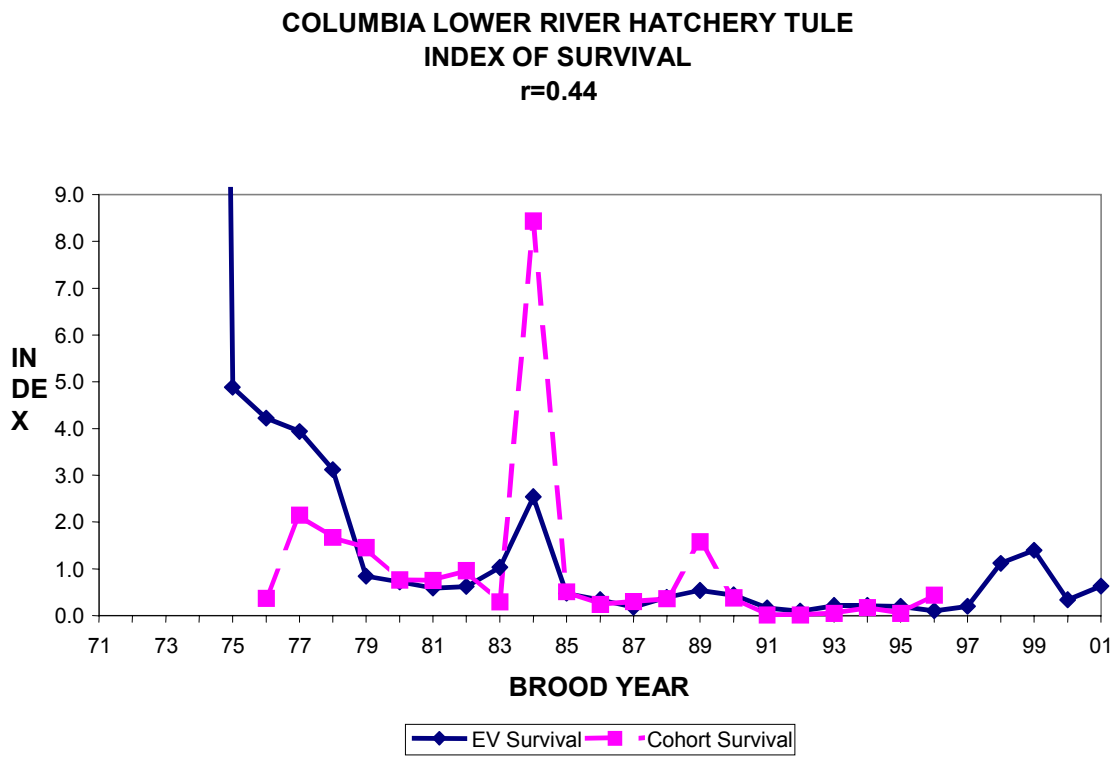


Figure E.23. Columbia Lower River Hatchery CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

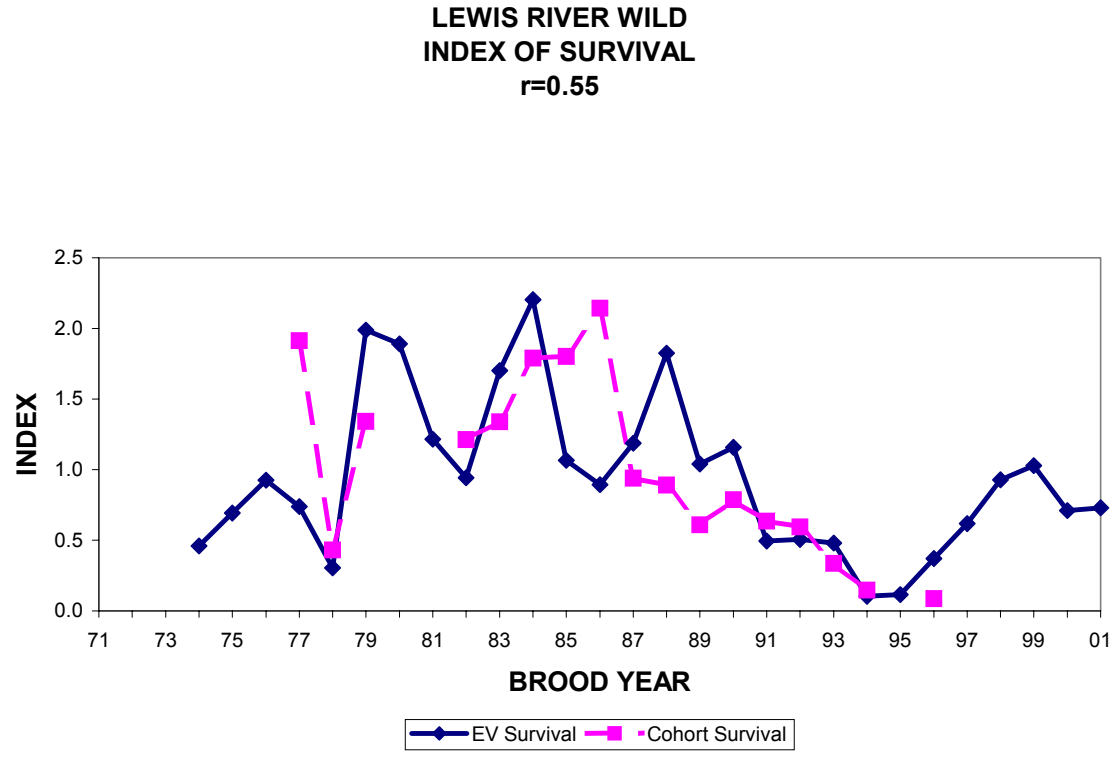


Figure E.24. Lewis River Wild CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

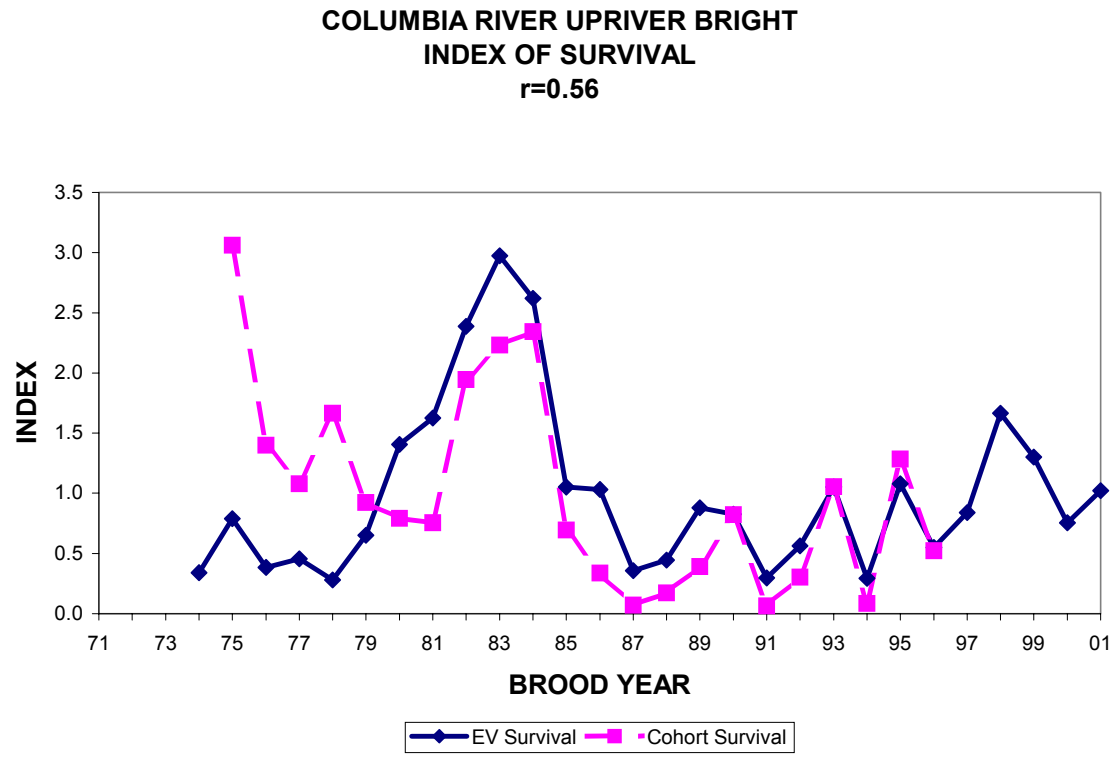


Figure E.25. Columbia River Upriver Bright CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

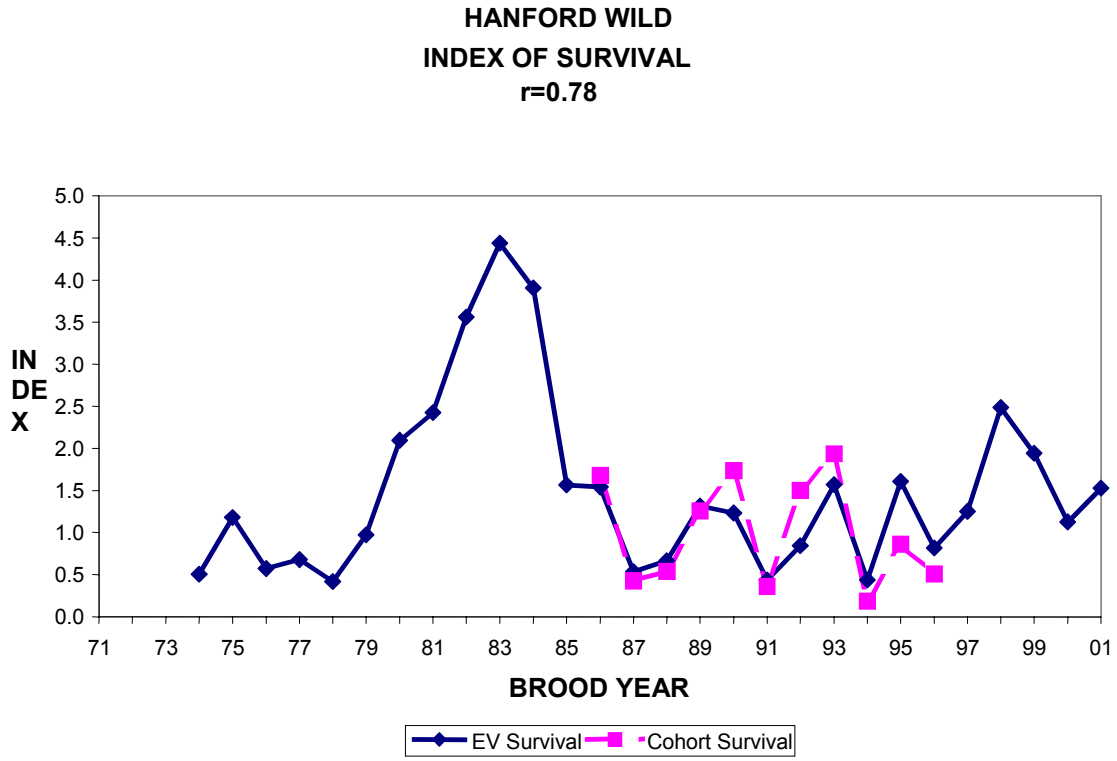


Figure E.26. Hanford Wild CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

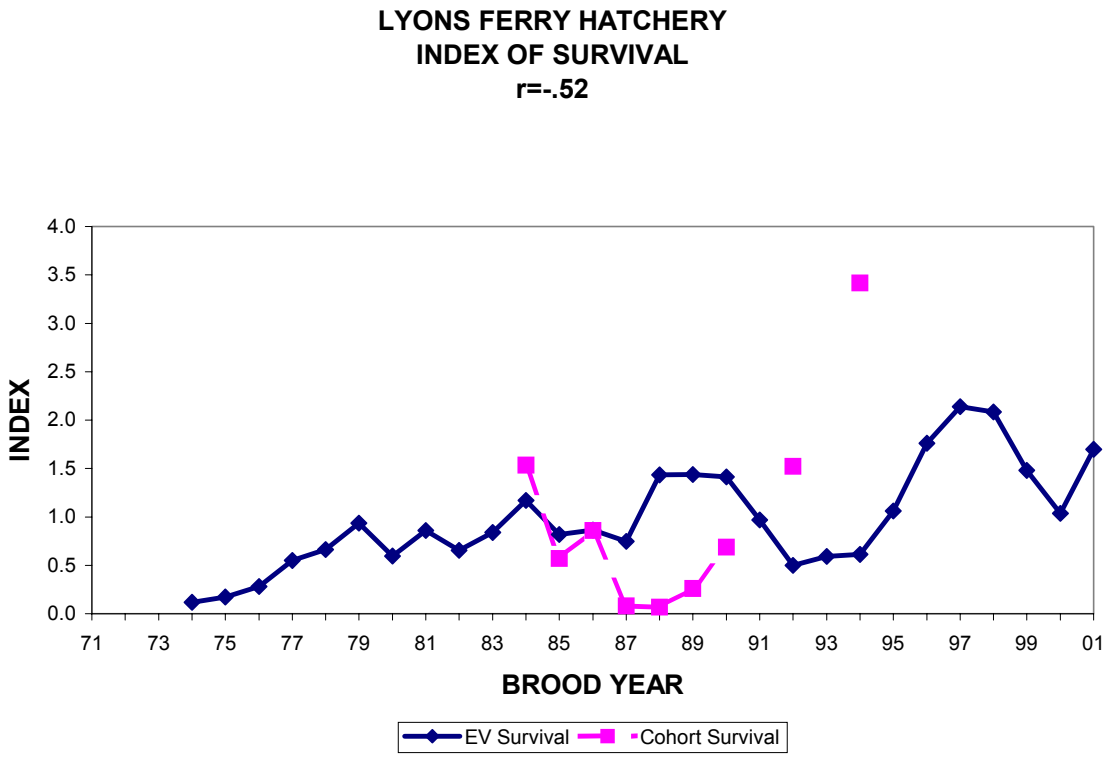


Figure E.27. Lyons Ferry Hatchery CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

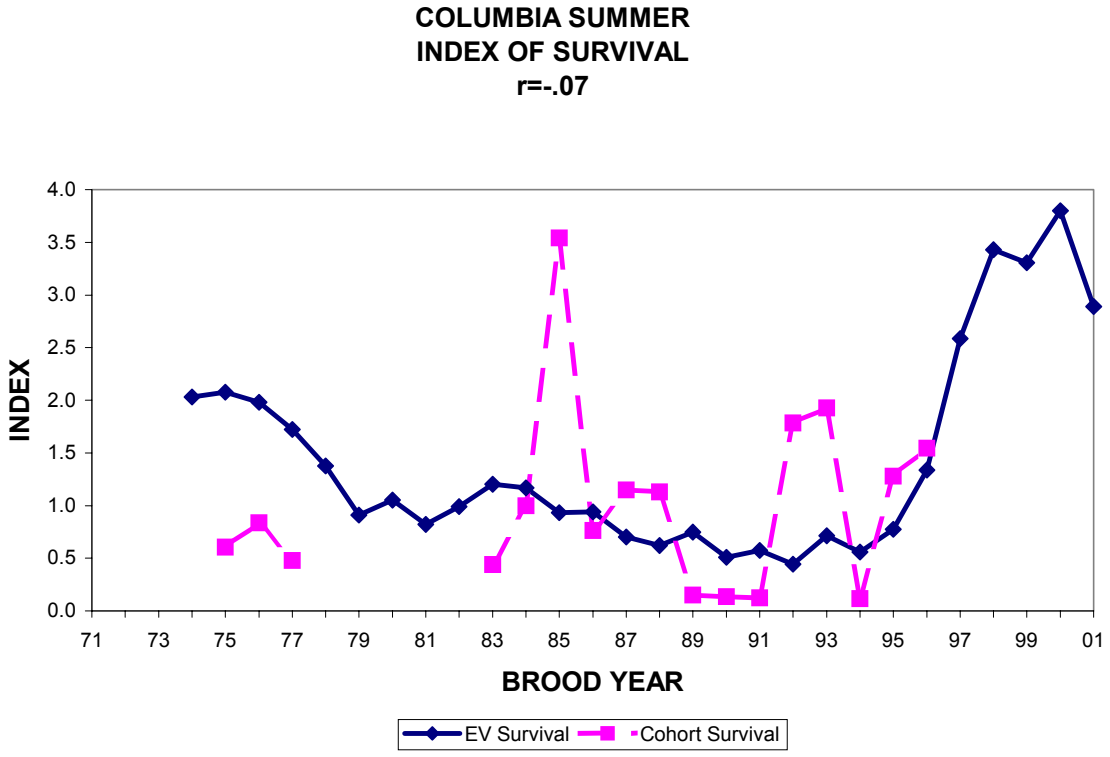


Figure E.28. Columbia Summers CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

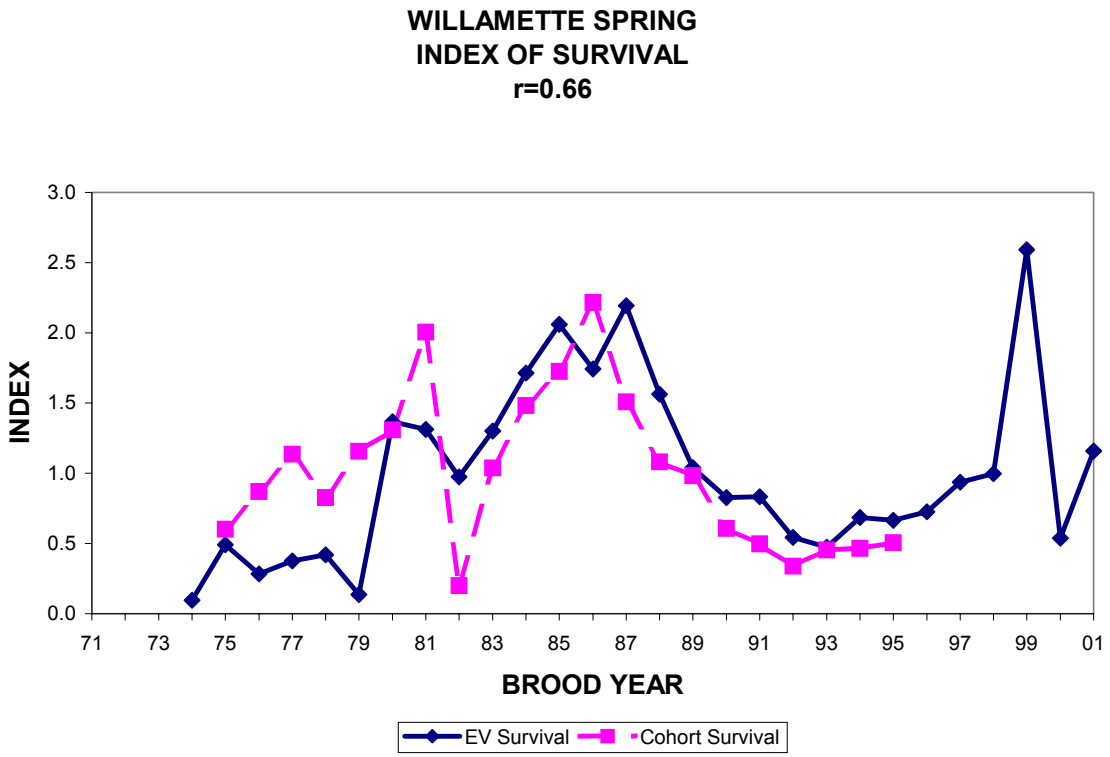


Figure E.29. Willamette Spring CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

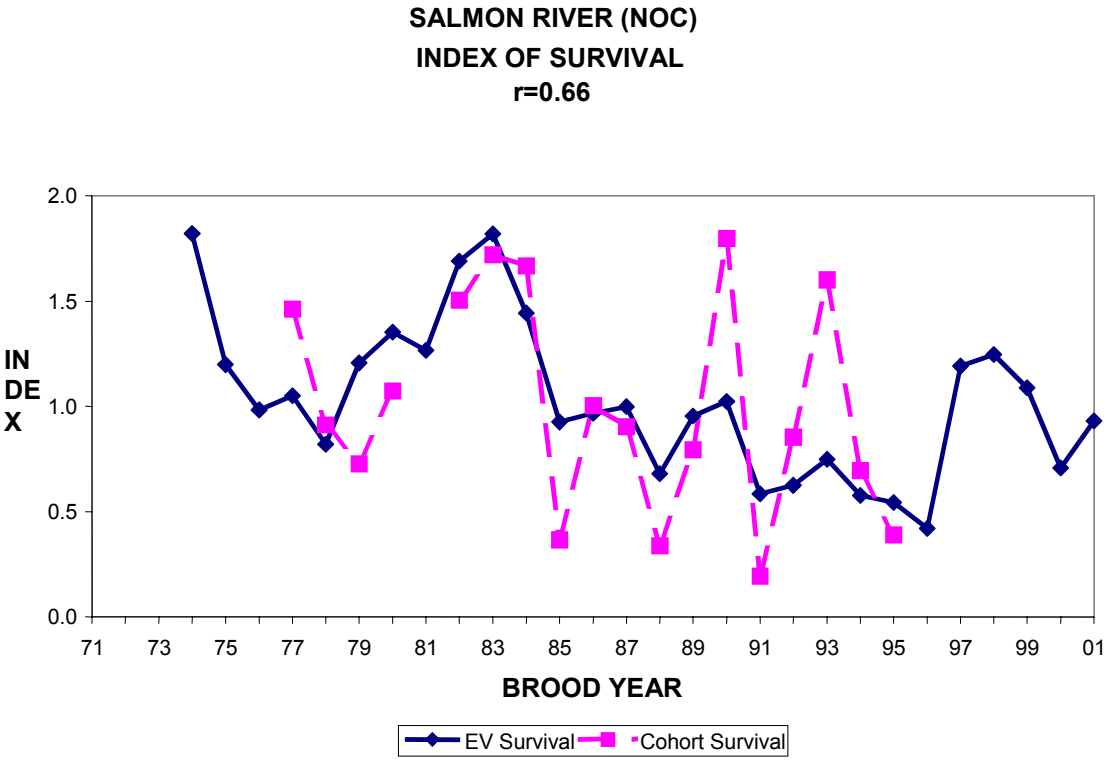


Figure E.30. Salmon River (NOC) CWT (cohort) and model age 2 survival indices (r=correlation between survival indices).

Appendix F. Total mortality and landed catch exploitation rates for exploitation rate indicator stocks for complete broods up to 1997.

The corresponding stocks used in the chinook model calibration are indicated in brackets. Exploitation rates based only on ocean fisheries are shown for those stocks in which terminal fisheries differentially impact the coded-wire tagged indicator compared to the associated wild stock. Exploitation rates based on ocean plus terminal fisheries are shown for stocks in which fishery impacts on the indicator and the associated wild stock are similar in terminal areas.

LIST OF FIGURES

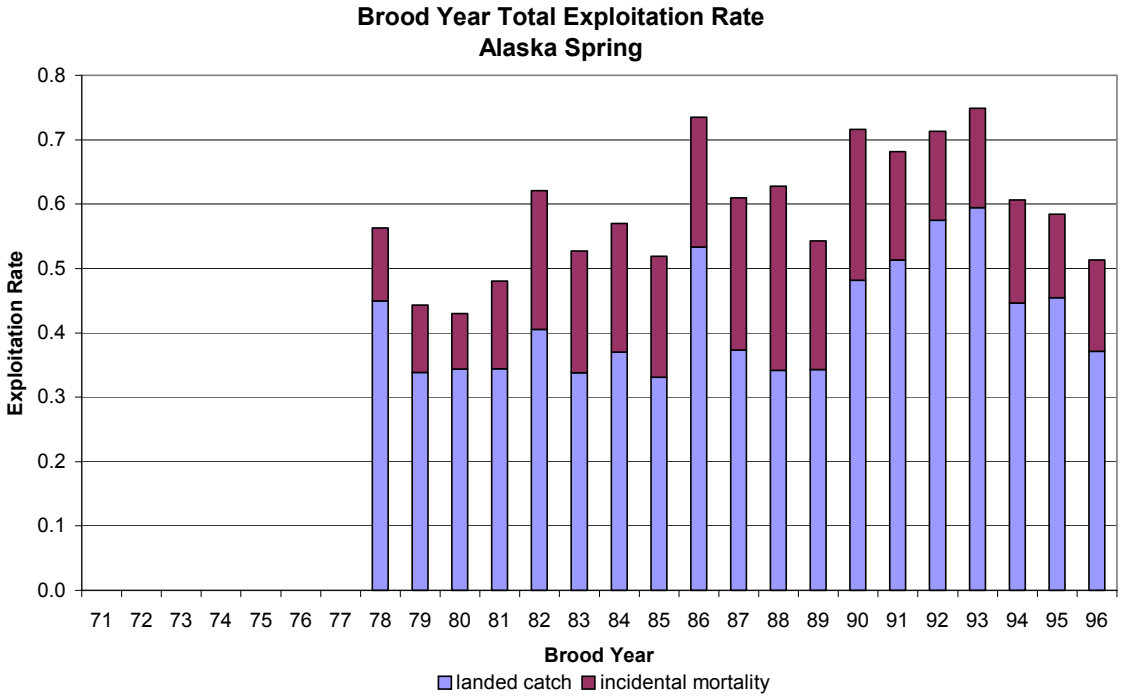


Figure F.1. Southeast Alaska springs total exploitation rates by brood year.

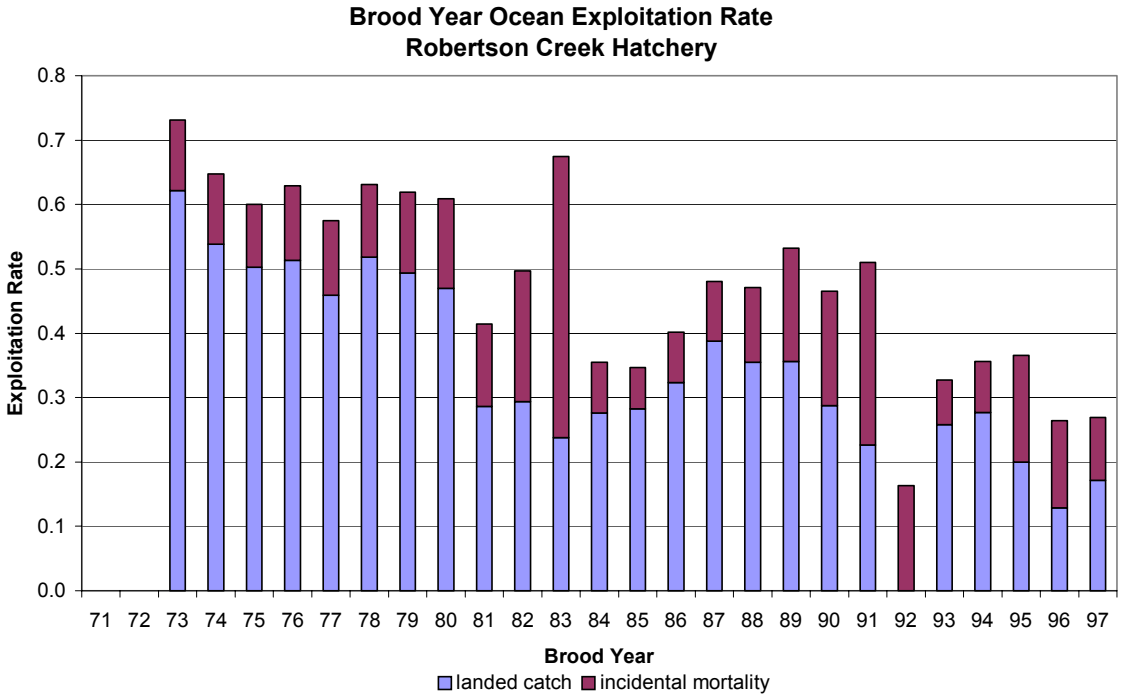


Figure F.2. Robertson Creek (West Coast Vancouver Island Hatchery and Natural) ocean exploitation rates by brood year.

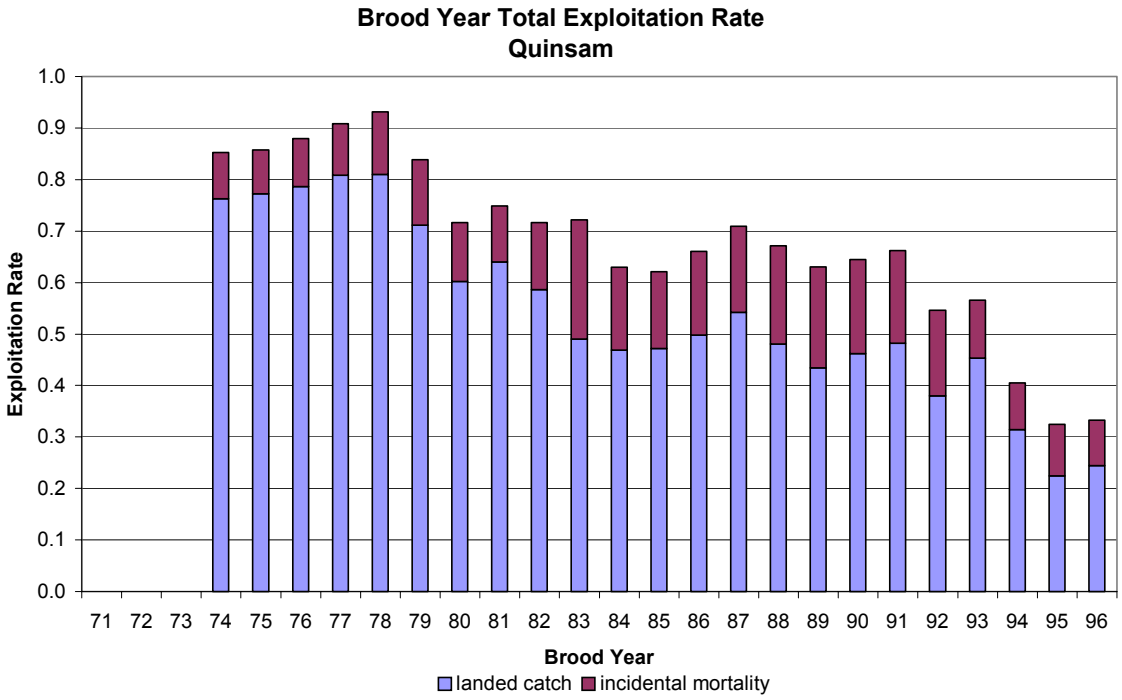


Figure F.3. Quinsam (Upper Strait of Georgia) total exploitation rates by brood year.

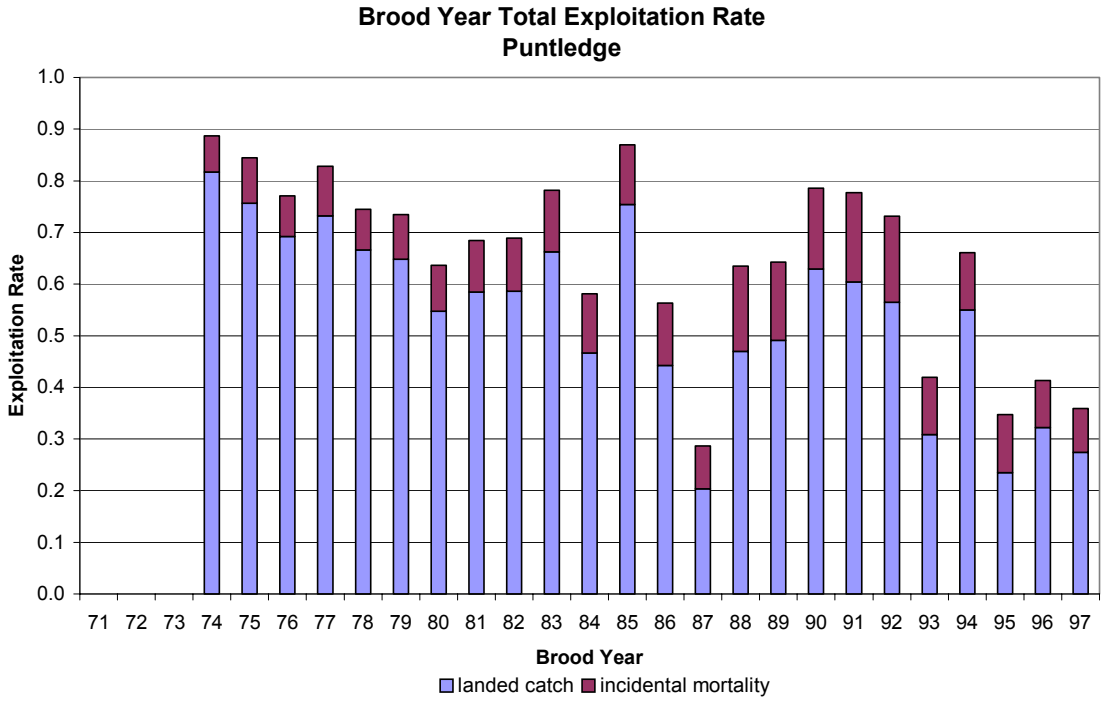


Figure F.4. Puntledge (Lower Strait of Georgia Hatchery) total exploitation rates by brood year.

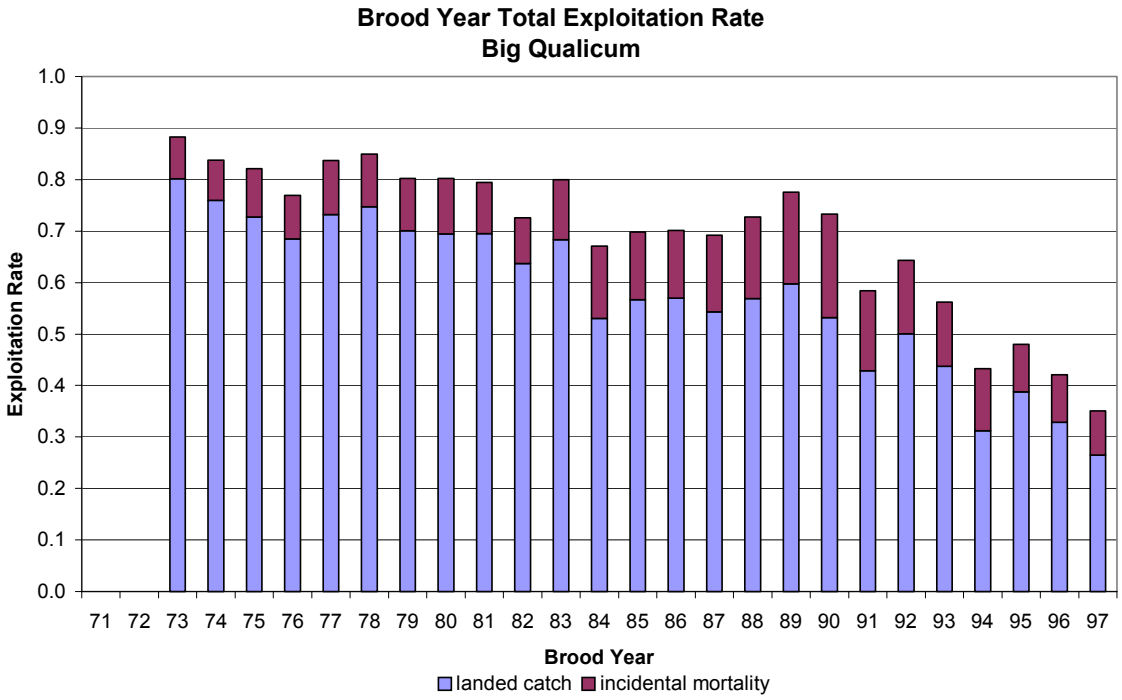


Figure F.5. Big Qualicum (Lower Georgia Strait Hatchery and Natural) total exploitation rates by brood year.

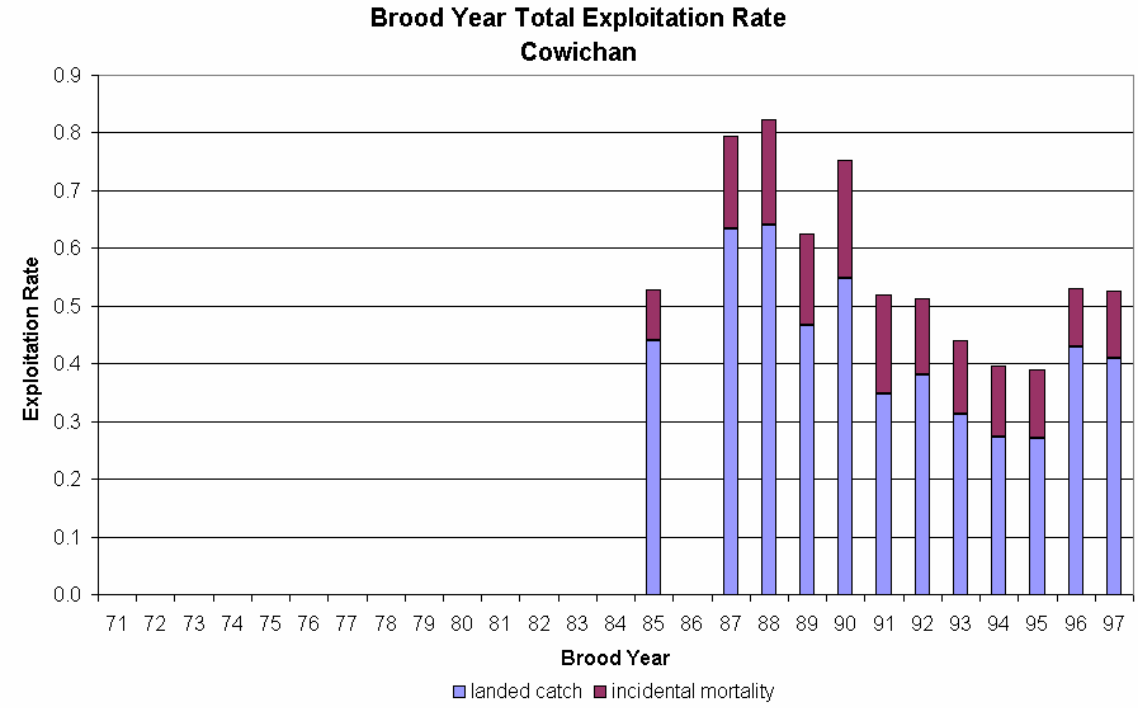


Figure F.6. Cowichan (Lower Georgia Strait Natural) total exploitation rates by brood year.

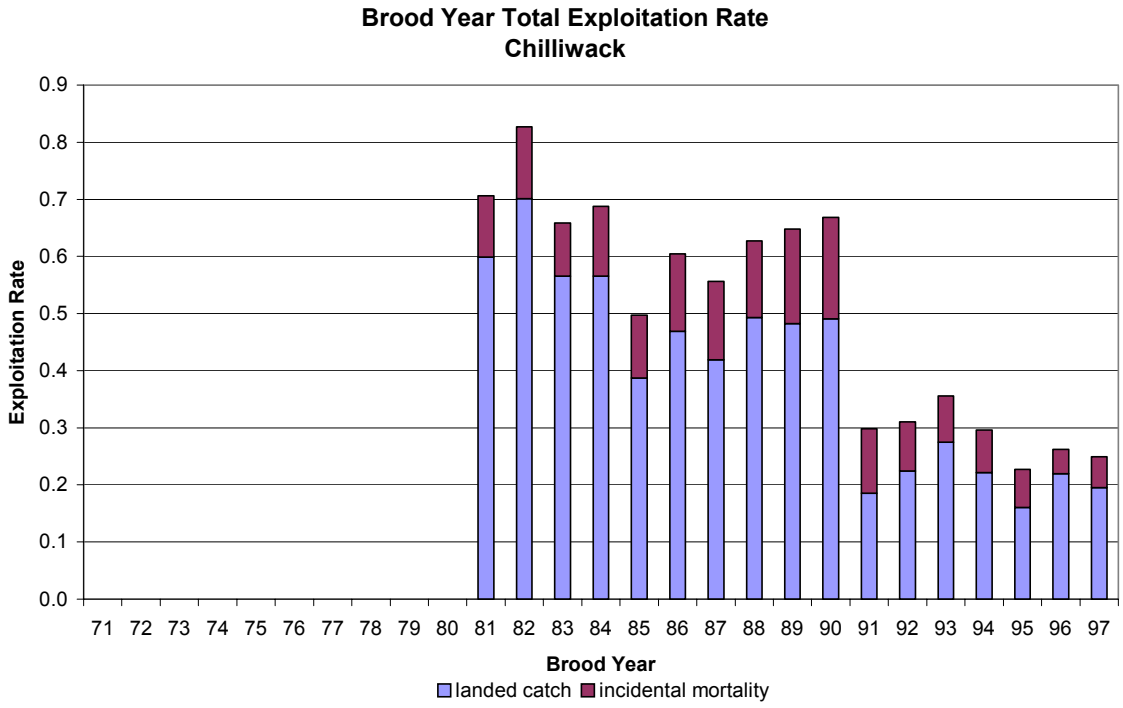


Figure F.7. Chilliwack (Fraser Late) total exploitation rates by brood year.

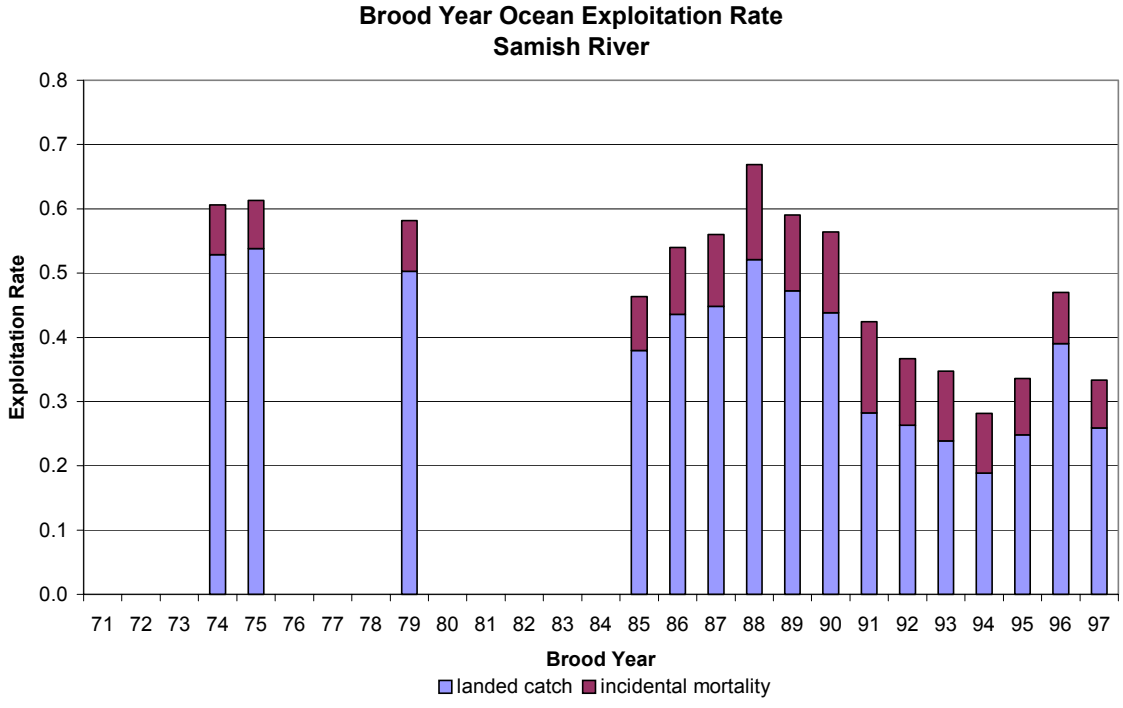


Figure F.8. Samish Fall Fingerling (Nooksack Fall) ocean exploitation rates by brood year.

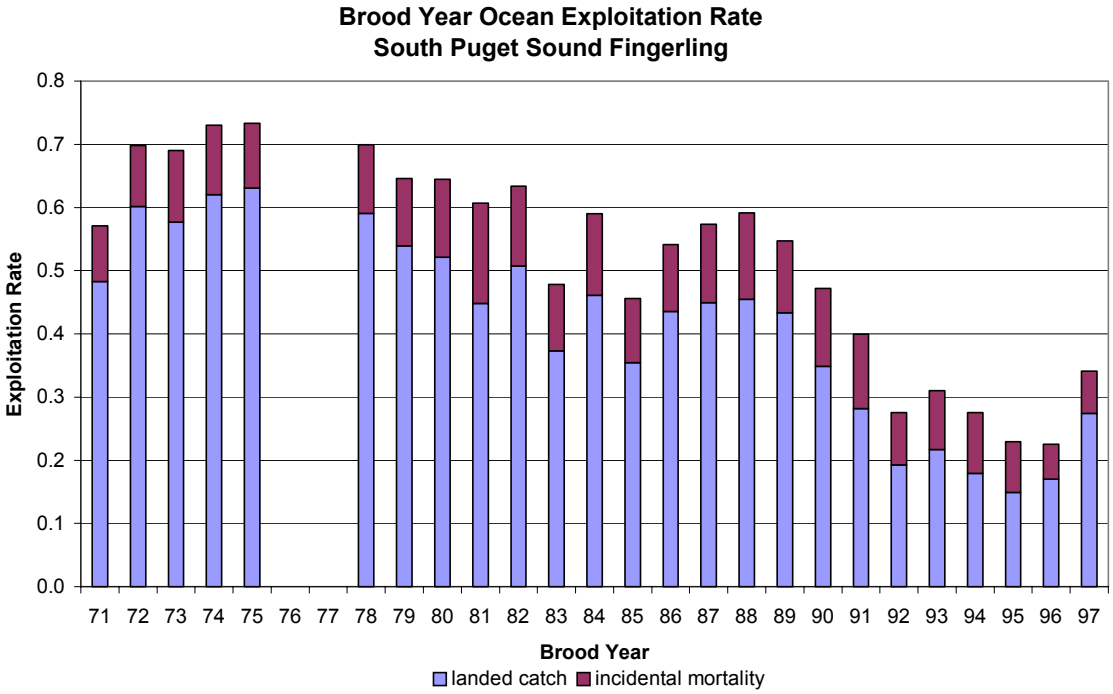


Figure F.9. South Puget Sound Fall Fingerling (Puget Sound Hatchery Fingerling) ocean exploitation rates by brood year.

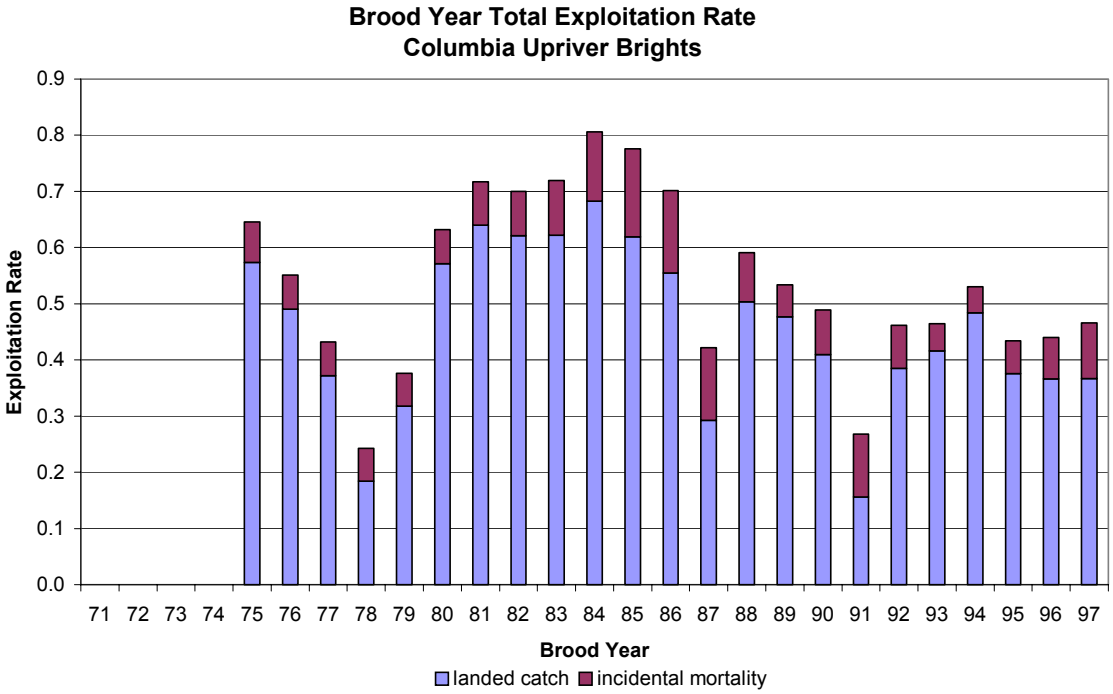


Figure F.10. Columbia Upriver Brights (Upriver Brights) total exploitation rates by brood year.

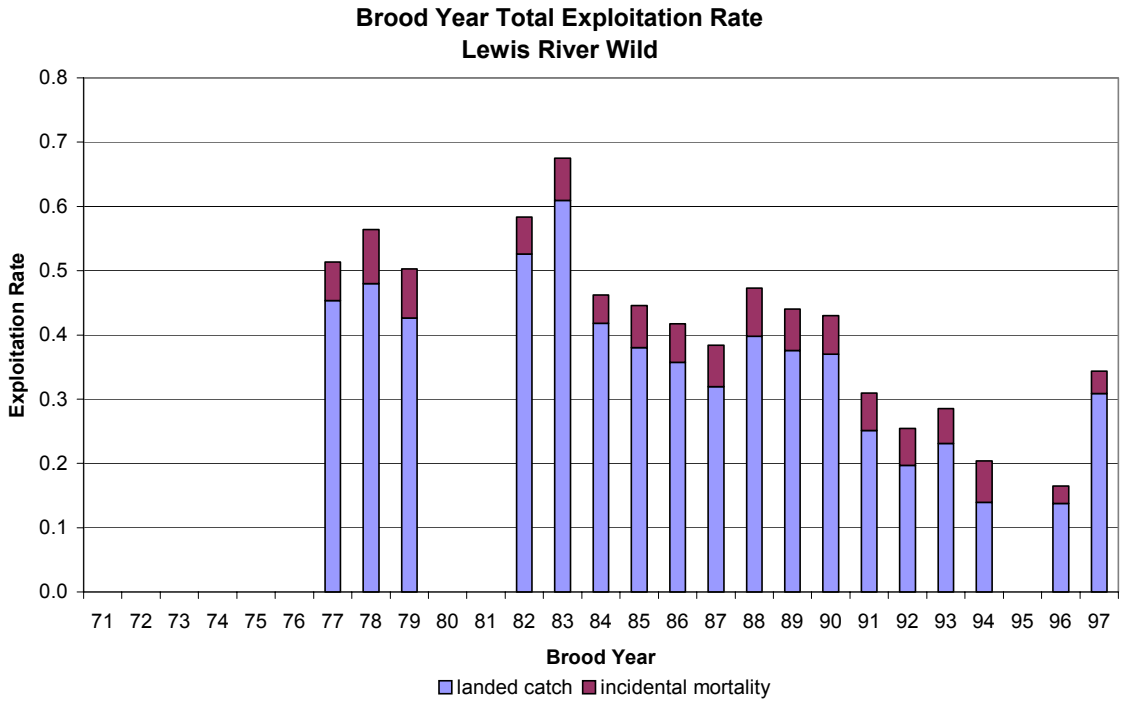


Figure F.11. Lewis River Wild (Lewis River Wild) total exploitation rates by brood year.

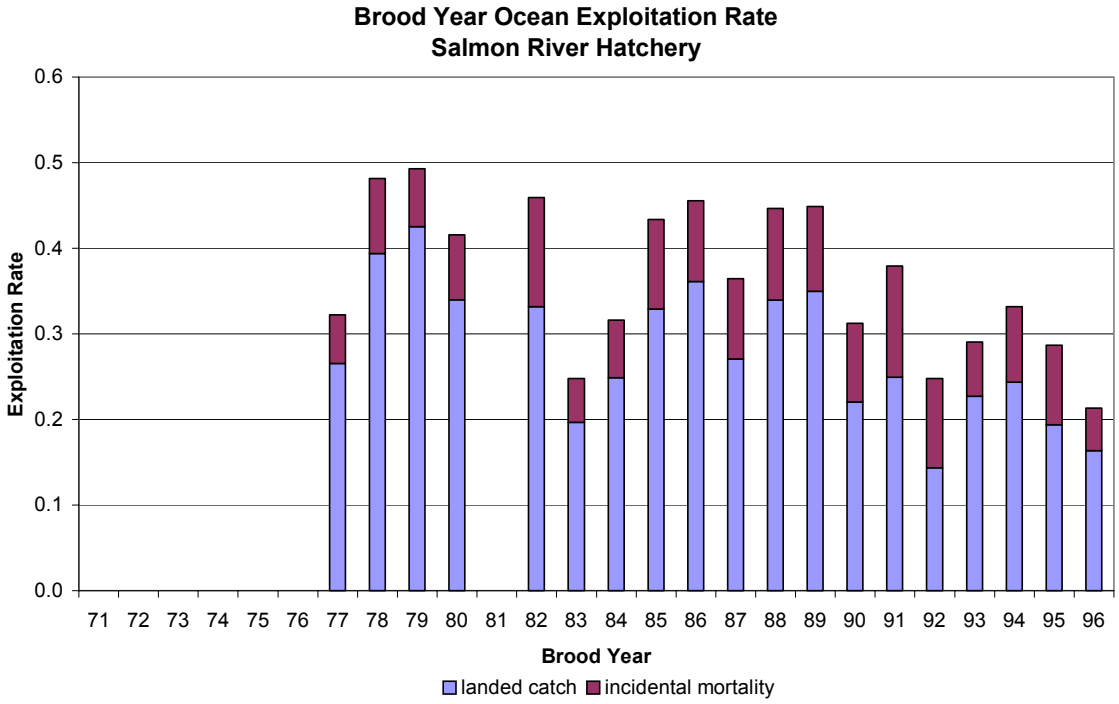


Figure F.12. Salmon River (Oregon Coast) ocean exploitation rates by brood year.

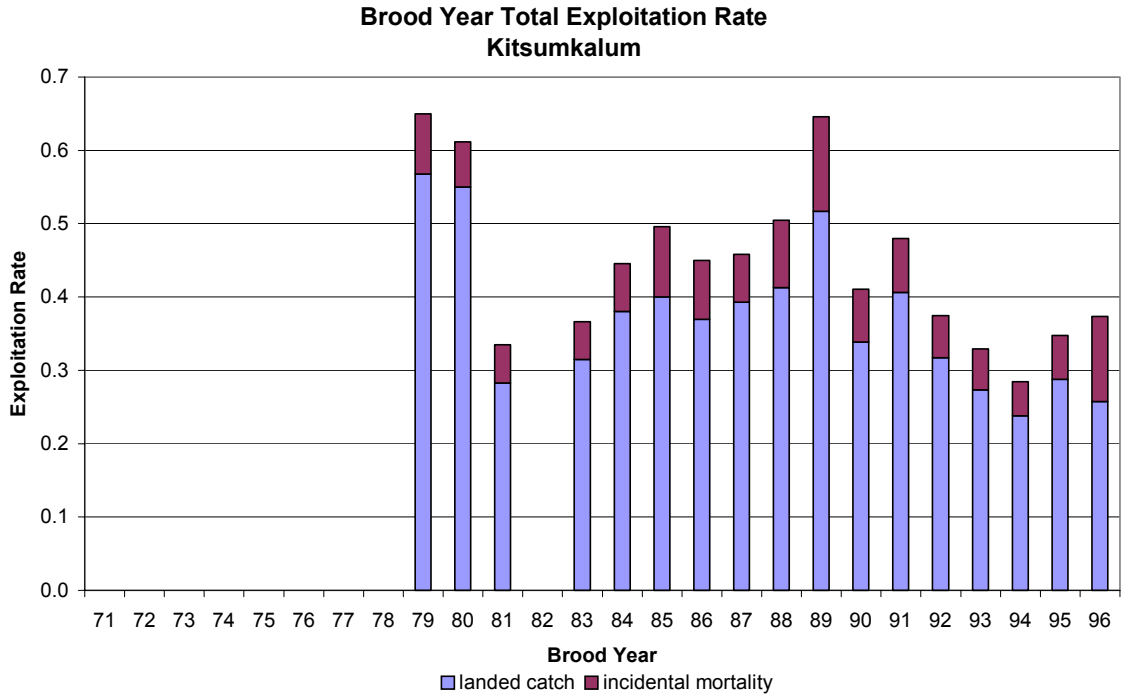


Figure F.13. Kitsumkalum (North/Central BC) total exploitation rates by brood year.

Appendix G. Percent distribution of landed catch and total mortality among fisheries and escapement for exploitation rate indicator stocks by calendar year.

These data result from cohort analysis of CWT recoveries for the indicator stocks; data within a row for each calendar year sum to 100%. Many changes are present in these distribution tables compared to those presented in previous reports. There are various reasons for the changes including updates to escapement time series or in the case of some Columbia River stocks, the inter-dam loss rates (IDLs), which affect estimated escapements. In addition, some CWT codes have either been added to or excluded from the historical series affecting the outcome of the cohort analysis. Finally, a computational rule used in producing the stock-specific distribution tables determines whether data are generated for any particular calendar year. The rule is that at least three-year classes of CWT recoveries (out of four or five) must be available in any calendar year. Lack of CWT tagging in recent years for some of the indicators has resulted in no distribution data for 2000 and/or 2001. Missing broods are noted in the caption of those tables.

LIST OF TABLES

Table G.1. Percent distribution of Alaska Spring chinook reported catch among fisheries and escapement.

										Other Fisheries					
Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr& Sp	Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	Escapement
1983	27.9%	1.3%	6.7%	1.7%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	62.1%
1984	23.0%	2.6%	13.7%	0.9%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	59.4%
1985	24.1%	5.6%	13.7%	1.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	55.5%
1986	25.1%	5.2%	11.9%	0.6%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	57.1%
1987	30.9%	2.8%	10.6%	0.4%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	54.8%
1988	29.9%	2.0%	14.5%	1.1%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	52.2%
1989	25.3%	9.5%	10.4%	0.6%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	53.8%
1990	37.0%	2.4%	13.4%	1.7%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	45.4%
1991	40.0%	3.5%	17.2%	0.6%	0.0%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	38.2%
1992	26.1%	6.8%	20.3%	0.4%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	46.2%
1993	19.8%	5.8%	19.4%	0.1%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	54.5%
1994	16.2%	16.1%	13.6%	0.4%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	53.2%
1995	26.8%	14.0%	18.0%	0.3%	0.0%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	40.4%
1996	24.4%	10.3%	30.5%	0.0%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	34.3%
1997	25.7%	8.3%	29.5%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	36.3%
1998	28.8%	10.3%	25.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	35.5%
1999	19.9%	5.5%	29.5%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	44.7%
2000	22.8%	5.2%	24.2%	0.0%	0.0%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	47.5%
2001	15.6%	4.3%	18.0%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	61.8%
(83-01)	25.8%	6.4%	17.9%	0.5%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	49.1%
(85-01)	25.8%	6.9%	18.8%	0.4%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	47.7%

Table G.2. Percent distribution of Alaska Spring chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1983	34.6%	1.5%	11.2%	1.7%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.8%
1984	27.5%	2.6%	17.8%	1.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	50.7%
1985	27.8%	10.8%	15.2%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	45.2%
1986	29.1%	10.9%	12.4%	0.5%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	46.9%
1987	40.4%	5.3%	9.9%	0.4%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	43.5%
1988	34.3%	5.8%	14.2%	1.2%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	44.2%
1989	29.5%	16.1%	10.9%	0.6%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	42.6%
1990	43.0%	6.5%	13.0%	1.9%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	35.4%
1991	41.8%	8.6%	16.3%	0.6%	0.0%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	32.2%
1992	25.4%	20.3%	17.9%	0.4%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	35.9%
1993	23.5%	9.3%	19.8%	0.2%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	46.9%
1994	20.0%	29.0%	12.5%	0.4%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	37.7%
1995	32.3%	13.9%	18.3%	0.4%	0.0%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	34.6%
1996	27.2%	11.2%	30.6%	0.1%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	30.4%
1997	26.8%	10.8%	29.7%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	32.4%
1998	28.4%	19.2%	23.6%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	28.2%
1999	22.3%	7.5%	31.5%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	38.1%
2000	26.8%	7.2%	24.8%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	40.9%
2001	18.3%	6.7%	18.5%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	56.2%
(83-01)	29.4%	10.7%	18.3%	0.5%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	40.7%
(85-01)	29.2%	11.7%	18.8%	0.4%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	39.5%

Table G.3. Percent distribution of Kitsumkalum chinook reported catch among fisheries and escapement (NA=not available).

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1984	50.8%	0.0%	0.0%	18.5%	0.0%	30.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	NA [1]
1985	26.1%	0.0%	1.6%	7.1%	0.0%	13.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	51.6%
1986	8.9%	0.0%	0.0%	14.1%	0.0%	8.9%	2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	65.7%
1987	7.4%	0.0%	0.0%	9.1%	0.0%	7.8%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	71.4%
1988	17.4%	0.6%	1.9%	3.1%	0.0%	23.0%	7.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	46.6%
1989	10.9%	0.3%	6.8%	5.0%	0.0%	11.3%	6.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	59.1%
1990	10.7%	0.0%	2.8%	6.6%	0.3%	7.1%	7.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	65.0%
1991	14.6%	0.0%	3.7%	8.8%	0.7%	16.7%	13.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	41.8%
1992	13.9%	0.0%	1.9%	7.0%	0.0%	9.4%	6.6%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	60.7%
1993	10.4%	0.9%	2.2%	10.0%	0.0%	18.7%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	53.5%
1994	11.1%	0.0%	0.0%	5.6%	0.0%	19.0%	6.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	57.9%
1995	12.1%	0.0%	2.7%	7.1%	0.0%	29.1%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	42.9%
1996	8.5%	0.2%	6.0%	0.0%	0.0%	18.5%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	61.9%
1997	10.6%	0.0%	7.5%	0.0%	0.0%	8.3%	11.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	62.6%
1998	8.6%	0.0%	3.1%	0.0%	0.0%	1.2%	5.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	81.6%
1999	14.7%	0.0%	9.7%	0.0%	0.0%	0.9%	6.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	68.0%
2000	6.7%	0.0%	6.7%	0.0%	0.0%	9.9%	5.4%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	71.0%
2001	7.8%	0.0%	5.2%	0.4%	0.0%	7.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	69.4%
(84-01)	13.9%	0.1%	3.4%	5.7%	0.1%	13.4%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	57.3%
(85-01)	11.8%	0.1%	3.6%	4.9%	0.1%	12.4%	6.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	60.6%

1. Values represent estimates of catch distribution only for this year.

Table G.4. Percent distribution of Kitsumkalum chinook total fishing mortalities among fisheries and escapement (NA=not available).

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1984	52.6%	0.0%	0.0%	21.1%	0.0%	26.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	NA [1]
1985	29.6%	0.0%	1.5%	7.7%	0.0%	12.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	48.5%
1986	10.2%	0.0%	0.0%	13.9%	0.0%	8.8%	2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	64.8%
1987	12.9%	0.0%	2.7%	9.8%	0.0%	7.2%	4.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	62.5%
1988	23.4%	2.4%	4.9%	7.3%	0.0%	18.0%	7.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	36.6%
1989	14.2%	0.6%	6.9%	5.3%	0.0%	10.6%	6.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	55.6%
1990	11.7%	0.0%	3.3%	7.8%	0.3%	6.8%	7.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	62.2%
1991	19.9%	0.0%	4.2%	10.7%	0.9%	14.9%	12.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	36.6%
1992	15.3%	0.0%	2.0%	7.9%	0.0%	9.1%	6.9%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	58.4%
1993	11.6%	1.7%	2.1%	11.6%	0.0%	17.8%	4.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.8%
1994	13.3%	0.0%	0.0%	6.7%	0.0%	17.8%	8.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	54.1%
1995	13.5%	0.0%	2.8%	9.8%	0.0%	31.6%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	36.3%
1996	10.1%	0.2%	6.4%	0.2%	0.0%	20.6%	5.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	57.3%
1997	12.0%	0.0%	8.7%	0.0%	0.0%	8.7%	12.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	58.5%
1998	10.4%	0.0%	3.3%	0.0%	0.0%	1.4%	6.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	78.7%
1999	15.8%	0.0%	12.8%	0.0%	0.0%	1.0%	8.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	61.7%
2000	8.5%	0.0%	8.8%	0.0%	0.0%	10.0%	7.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	65.5%
2001	8.3%	0.0%	5.3%	0.5%	0.0%	12.6%	11.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	62.2%
(84-01)	16.3%	0.3%	4.2%	6.7%	0.1%	13.1%	6.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	52.8%
(85-01)	14.2%	0.3%	4.5%	5.8%	0.1%	12.3%	6.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	55.9%

1. Values represent estimates of catch distribution only for this year.

Table G.5. Percent distribution of Robertson Creek chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	18.4%	0.8%	0.6%	11.6%	10.8%	7.7%	0.3%	8.0%	1.7%	2.3%	5.2%	0.0%	0.1%	0.0%	32.2%
1980	26.8%	7.0%	0.9%	8.1%	8.2%	4.4%	0.1%	7.0%	0.1%	11.4%	3.4%	0.0%	0.2%	0.0%	22.4%
1981	29.6%	1.6%	0.8%	12.1%	8.2%	4.9%	0.5%	5.3%	0.6%	13.7%	5.7%	0.0%	0.4%	0.0%	16.5%
1982	25.2%	3.4%	0.8%	13.6%	7.6%	5.0%	0.1%	5.8%	0.9%	15.0%	6.5%	0.1%	0.5%	0.2%	15.4%
1983	36.0%	3.3%	0.6%	10.4%	8.0%	2.4%	0.3%	5.3%	0.3%	18.2%	4.6%	0.0%	0.2%	0.0%	10.4%
1984	26.5%	4.0%	0.2%	14.6%	3.0%	2.7%	0.0%	6.7%	0.8%	17.7%	15.9%	0.0%	0.2%	0.0%	7.6%
1985	14.1%	5.8%	0.0%	17.7%	0.5%	4.5%	0.0%	2.0%	0.8%	3.6%	17.7%	0.0%	2.0%	0.0%	31.3%
1986	13.9%	4.6%	0.0%	8.1%	1.1%	3.1%	0.7%	4.4%	0.0%	1.5%	26.6%	0.0%	0.0%	1.1%	35.0%
1987	6.5%	1.5%	0.6%	6.1%	2.9%	2.4%	0.5%	2.2%	0.5%	1.1%	20.9%	0.0%	0.3%	0.1%	54.3%
1988	9.9%	2.1%	0.9%	6.6%	1.2%	2.0%	1.1%	4.1%	0.6%	8.1%	18.6%	0.0%	0.3%	0.2%	44.4%
1989	8.0%	2.5%	0.4%	7.8%	0.8%	1.1%	1.0%	1.6%	0.8%	20.5%	18.5%	0.0%	0.1%	0.1%	36.9%
1990	15.8%	1.1%	1.3%	7.3%	2.0%	1.7%	0.9%	6.3%	0.3%	10.4%	10.8%	0.0%	0.0%	0.1%	41.9%
1991	16.9%	1.1%	3.1%	9.1%	2.7%	0.6%	0.8%	4.4%	0.3%	14.9%	13.6%	0.0%	0.0%	0.1%	32.3%
1992	13.7%	3.0%	1.7%	7.2%	3.0%	0.9%	1.5%	18.8%	0.1%	0.8%	8.0%	0.0%	0.1%	0.1%	41.1%
1993	13.9%	1.0%	2.5%	7.1%	2.0%	0.4%	1.4%	13.7%	0.5%	8.4%	15.7%	0.0%	0.0%	0.1%	33.2%
1994	15.8%	2.2%	3.7%	9.5%	1.1%	1.1%	1.1%	5.3%	0.4%	12.8%	21.3%	0.0%	0.0%	0.1%	25.6%
1995	15.3%	0.0%	4.0%	3.1%	0.3%	0.3%	0.9%	1.5%	1.4%	7.3%	12.5%	0.0%	0.2%	0.0%	53.2%
1996	5.6%	0.1%	1.9%	0.0%	0.7%	0.0%	2.8%	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	87.4%
1997	10.8%	3.2%	3.9%	4.5%	1.8%	0.4%	2.8%	0.1%	0.5%	6.5%	19.9%	0.1%	0.0%	0.0%	45.2%
1998	16.5%	1.2%	5.1%	6.2%	0.0%	0.0%	2.0%	0.0%	0.6%	4.2%	19.1%	0.1%	0.0%	0.0%	45.1%
1999	12.2%	0.4%	7.9%	3.3%	0.2%	0.0%	2.9%	0.0%	0.8%	7.0%	22.3%	0.0%	0.0%	0.0%	42.9%
2000	5.6%	0.0%	0.0%	0.0%	0.0%	0.0%	3.4%	0.0%	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	88.4%
2001	3.2%	0.0%	2.0%	0.0%	0.0%	0.0%	0.4%	0.0%	2.0%	0.0%	3.2%	0.0%	0.0%	0.0%	89.0%
(79-01)	15.7%	2.2%	1.9%	7.6%	2.9%	2.0%	1.1%	4.5%	0.8%	8.1%	12.6%	0.0%	0.2%	0.1%	40.5%
(85-01)	11.6%	1.8%	2.3%	6.1%	1.2%	1.1%	1.4%	3.8%	0.8%	6.3%	14.6%	0.0%	0.2%	0.1%	48.7%

Table G.6. Percent distribution of Robertson Creek chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	21.9%	0.8%	0.7%	12.0%	11.1%	7.3%	0.3%	8.3%	1.6%	2.1%	5.0%	0.0%	0.1%	0.0%	28.8%
1980	27.9%	7.0%	1.0%	8.4%	8.5%	4.5%	0.1%	7.2%	0.1%	10.8%	3.4%	0.0%	0.2%	0.0%	20.8%
1981	33.7%	1.5%	1.0%	12.3%	8.4%	4.5%	0.5%	5.4%	0.6%	12.2%	5.3%	0.0%	0.5%	0.0%	14.1%
1982	29.5%	3.2%	0.9%	13.6%	7.6%	4.7%	0.1%	5.8%	0.8%	13.4%	6.1%	0.1%	0.6%	0.1%	13.5%
1983	40.7%	3.0%	0.6%	10.1%	7.7%	2.2%	0.3%	5.1%	0.3%	16.3%	4.4%	0.0%	0.2%	0.0%	9.2%
1984	28.0%	3.8%	0.2%	14.8%	3.0%	2.7%	0.0%	6.9%	0.8%	16.7%	15.9%	0.0%	0.2%	0.0%	7.1%
1985	14.9%	16.8%	0.0%	16.0%	0.4%	3.7%	0.0%	1.8%	0.7%	2.9%	15.5%	0.0%	1.9%	0.0%	25.4%
1986	18.0%	12.7%	0.0%	8.7%	1.2%	2.9%	1.4%	4.4%	0.0%	1.2%	21.9%	0.0%	0.0%	1.1%	26.4%
1987	10.2%	3.4%	1.1%	7.5%	3.5%	2.3%	0.6%	2.7%	0.5%	1.0%	19.7%	0.0%	0.3%	0.1%	47.1%
1988	11.0%	4.8%	1.2%	7.3%	1.3%	1.9%	1.2%	4.6%	0.7%	7.3%	18.4%	0.0%	0.4%	0.2%	39.8%
1989	11.0%	6.9%	0.5%	9.1%	1.0%	1.1%	1.1%	1.9%	0.8%	18.1%	17.2%	0.0%	0.1%	0.1%	31.2%
1990	19.4%	2.9%	1.5%	8.9%	2.3%	1.6%	0.9%	6.8%	0.3%	9.2%	10.0%	0.0%	0.0%	0.1%	36.1%
1991	19.9%	2.5%	3.3%	9.9%	2.9%	0.6%	0.8%	4.8%	0.3%	13.4%	13.0%	0.0%	0.0%	0.1%	28.6%
1992	16.6%	8.3%	1.7%	7.5%	3.0%	0.8%	1.4%	18.6%	0.1%	0.6%	7.2%	0.0%	0.1%	0.0%	34.1%
1993	15.9%	2.3%	2.5%	7.6%	2.1%	0.4%	1.4%	14.5%	0.5%	7.6%	15.2%	0.0%	0.0%	0.1%	30.0%
1994	17.9%	4.9%	3.6%	9.3%	1.0%	1.0%	1.1%	5.2%	0.4%	11.6%	20.7%	0.0%	0.0%	0.1%	23.2%
1995	17.0%	0.0%	4.5%	3.6%	0.4%	0.5%	1.1%	1.8%	1.5%	6.7%	14.9%	0.0%	0.2%	0.0%	47.8%
1996	9.2%	0.1%	4.5%	2.8%	0.8%	0.0%	2.5%	0.8%	1.8%	0.0%	2.1%	0.0%	0.0%	0.0%	75.4%
1997	13.9%	8.3%	4.4%	5.1%	2.0%	0.4%	3.0%	0.2%	0.6%	5.7%	18.0%	0.1%	0.0%	0.0%	38.3%
1998	17.0%	3.1%	5.1%	6.2%	0.0%	0.0%	2.3%	0.0%	0.6%	3.9%	19.2%	0.1%	0.0%	0.0%	42.4%
1999	12.9%	0.8%	8.1%	3.3%	0.2%	0.0%	3.2%	0.0%	0.8%	6.8%	23.1%	0.0%	0.0%	0.0%	40.8%
2000	6.4%	0.0%	0.0%	0.0%	0.0%	0.0%	8.0%	0.0%	3.2%	0.0%	0.0%	0.0%	0.0%	0.0%	82.4%
2001	4.9%	0.0%	3.0%	0.0%	0.0%	0.0%	0.6%	0.0%	2.6%	0.0%	3.8%	0.0%	0.0%	0.0%	85.1%
(79-01)	18.2%	4.2%	2.1%	8.0%	3.0%	1.9%	1.4%	4.6%	0.8%	7.3%	12.2%	0.0%	0.2%	0.1%	36.0%
(85-01)	13.9%	4.6%	2.6%	6.6%	1.3%	1.0%	1.8%	4.0%	0.9%	5.7%	14.1%	0.0%	0.2%	0.1%	43.2%

Table G.7. Percent distribution of Quinsam chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	6.3%	6.8%	0.9%	7.3%	13.6%	25.7%	4.1%	0.0%	9.3%	5.8%	0.0%	0.0%	0.0%	0.0%	20.1%
1980	15.4%	5.2%	3.1%	10.9%	17.2%	13.5%	5.5%	0.0%	7.0%	9.1%	0.0%	0.0%	0.0%	0.0%	13.0%
1981	12.7%	2.8%	1.9%	15.4%	14.2%	12.2%	7.5%	0.7%	13.9%	7.6%	0.0%	0.0%	0.0%	0.0%	11.2%
1982	18.4%	8.0%	5.7%	8.4%	7.2%	21.8%	2.5%	0.4%	4.4%	8.5%	0.0%	0.0%	0.0%	0.0%	14.7%
1983	22.9%	1.7%	2.2%	16.1%	12.5%	18.5%	2.9%	0.8%	5.1%	9.1%	0.0%	0.0%	0.0%	0.0%	8.2%
1984	14.5%	6.0%	4.7%	5.9%	5.0%	15.1%	4.1%	0.8%	7.9%	6.6%	0.0%	0.0%	0.0%	0.0%	29.3%
1985	25.9%	5.8%	4.4%	5.1%	3.6%	11.1%	1.0%	0.1%	4.4%	8.3%	0.0%	0.0%	0.0%	0.0%	30.2%
1986	13.8%	4.3%	2.8%	6.6%	7.3%	19.9%	2.9%	0.0%	6.2%	6.4%	0.0%	0.0%	0.0%	0.0%	29.7%
1987	10.8%	3.7%	2.8%	6.3%	6.1%	17.3%	6.6%	0.4%	4.0%	7.3%	0.4%	0.0%	0.0%	0.0%	34.3%
1988	19.0%	1.8%	1.0%	6.6%	2.4%	5.5%	2.9%	0.7%	3.7%	4.1%	0.9%	0.0%	0.0%	0.1%	51.2%
1989	12.6%	2.8%	2.8%	3.9%	1.9%	4.9%	3.2%	0.3%	7.3%	13.0%	0.0%	0.0%	0.1%	0.0%	47.1%
1990	17.3%	2.2%	0.6%	6.7%	4.9%	11.2%	9.0%	1.4%	3.5%	4.8%	0.0%	0.0%	0.0%	0.0%	38.5%
1991	10.1%	2.8%	1.4%	5.7%	9.1%	10.2%	11.9%	0.5%	4.4%	3.5%	0.8%	0.0%	0.0%	0.0%	39.7%
1992	11.5%	0.5%	2.4%	10.1%	9.3%	7.4%	6.3%	0.3%	3.5%	2.6%	0.0%	0.0%	0.0%	0.0%	46.2%
1993	8.0%	3.4%	1.2%	5.8%	5.8%	19.6%	8.9%	1.2%	10.7%	3.4%	0.0%	0.0%	0.0%	0.0%	32.1%
1994	5.3%	6.0%	4.0%	9.3%	1.3%	14.0%	5.0%	0.0%	6.0%	4.0%	0.0%	0.0%	0.0%	0.0%	45.0%
1995	7.1%	5.0%	0.0%	9.2%	0.0%	14.6%	7.9%	0.0%	6.7%	0.8%	0.0%	0.0%	0.0%	0.0%	48.8%
1996	6.8%	0.4%	0.0%	0.0%	0.0%	17.4%	4.5%	0.0%	6.0%	0.4%	0.0%	0.0%	0.0%	0.0%	64.5%
1997	9.1%	3.2%	2.5%	4.1%	3.4%	2.3%	8.9%	0.7%	8.7%	0.2%	5.0%	0.0%	0.0%	0.0%	51.9%
1998	14.2%	2.0%	2.0%	0.0%	0.0%	0.4%	8.7%	0.0%	5.5%	0.0%	0.0%	0.0%	0.4%	0.0%	66.9%
1999	9.0%	3.4%	4.1%	1.2%	0.2%	1.4%	10.2%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	69.0%
2000	13.0%	2.2%	4.9%	0.3%	0.0%	0.0%	5.5%	0.0%	2.8%	0.5%	0.0%	0.0%	0.0%	0.0%	70.9%
2001	9.4%	1.4%	1.8%	0.1%	0.0%	0.0%	5.3%	0.0%	1.6%	0.1%	0.0%	0.0%	0.0%	0.0%	80.4%
(79-01)	12.7%	3.5%	2.5%	6.3%	5.4%	11.5%	5.9%	0.4%	5.8%	4.6%	0.3%	0.0%	0.0%	0.0%	41.0%
(85-01)	11.9%	3.0%	2.3%	4.8%	3.3%	9.2%	6.4%	0.3%	5.1%	3.5%	0.4%	0.0%	0.0%	0.0%	49.8%

Table G.8. Percent distribution of Quinsam chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	8.6%	6.6%	1.4%	8.1%	14.2%	24.4%	4.4%	0.1%	8.7%	5.7%	0.0%	0.0%	0.0%	0.0%	17.9%
1980	16.1%	5.1%	3.4%	11.1%	17.5%	13.5%	5.9%	0.0%	6.9%	8.9%	0.0%	0.0%	0.0%	0.0%	11.8%
1981	13.5%	2.7%	2.1%	15.7%	14.4%	11.9%	7.7%	0.7%	13.7%	7.3%	0.0%	0.0%	0.0%	0.0%	10.3%
1982	22.4%	7.8%	6.2%	8.4%	7.1%	20.8%	2.5%	0.3%	4.0%	7.8%	0.0%	0.0%	0.0%	0.0%	12.6%
1983	26.7%	1.5%	2.7%	15.7%	12.2%	17.6%	3.1%	0.7%	4.7%	8.2%	0.0%	0.0%	0.0%	0.0%	6.9%
1984	15.8%	6.0%	5.5%	6.2%	5.1%	14.9%	4.3%	0.9%	7.9%	6.3%	0.0%	0.0%	0.0%	0.0%	27.1%
1985	27.4%	12.8%	4.2%	4.7%	3.3%	10.0%	1.0%	0.1%	4.0%	7.2%	0.0%	0.0%	0.0%	0.0%	25.3%
1986	15.4%	10.9%	3.1%	6.6%	7.2%	18.4%	3.1%	0.0%	5.6%	5.8%	0.0%	0.0%	0.0%	0.0%	23.9%
1987	16.0%	10.4%	2.8%	6.8%	6.7%	14.4%	5.7%	0.4%	3.4%	6.0%	0.3%	0.0%	0.0%	0.0%	27.0%
1988	20.0%	4.5%	1.1%	7.0%	2.6%	5.5%	3.1%	0.8%	3.9%	3.9%	1.0%	0.0%	0.0%	0.2%	46.5%
1989	14.1%	8.1%	2.8%	4.1%	2.0%	4.6%	3.2%	0.3%	7.6%	11.9%	0.0%	0.0%	0.1%	0.0%	41.3%
1990	18.7%	5.5%	0.6%	7.4%	5.3%	10.5%	9.0%	1.5%	3.7%	4.4%	0.0%	0.0%	0.0%	0.0%	33.5%
1991	11.3%	7.9%	1.4%	5.9%	9.4%	9.1%	11.3%	0.5%	4.5%	3.2%	0.7%	0.0%	0.0%	0.0%	34.7%
1992	15.2%	1.1%	2.6%	10.6%	9.6%	7.2%	6.4%	0.3%	3.7%	2.4%	0.0%	0.0%	0.0%	0.0%	40.9%
1993	8.9%	7.1%	1.3%	6.5%	6.5%	18.1%	8.6%	1.3%	11.3%	2.9%	0.0%	0.0%	0.0%	0.0%	27.5%
1994	6.5%	12.8%	4.0%	9.7%	1.4%	12.5%	5.1%	0.0%	6.3%	3.4%	0.0%	0.0%	0.0%	0.0%	38.4%
1995	8.6%	5.1%	0.0%	11.3%	0.0%	16.8%	9.6%	0.0%	6.5%	2.1%	0.0%	0.0%	0.0%	0.0%	40.1%
1996	7.5%	0.7%	0.0%	1.4%	0.0%	20.3%	5.1%	0.0%	6.8%	0.3%	0.0%	0.0%	0.0%	0.0%	58.0%
1997	9.9%	5.8%	2.9%	4.3%	3.5%	2.3%	10.9%	0.8%	8.9%	1.4%	4.9%	0.0%	0.0%	0.0%	44.4%
1998	14.8%	6.4%	2.2%	0.0%	0.0%	0.3%	11.3%	0.0%	5.9%	0.2%	0.0%	0.0%	0.5%	0.0%	58.5%
1999	10.2%	6.7%	5.3%	1.4%	0.2%	1.7%	12.4%	0.0%	1.7%	0.0%	0.0%	0.0%	0.0%	0.0%	60.5%
2000	14.4%	3.4%	6.0%	0.2%	0.0%	0.0%	7.3%	0.0%	3.1%	1.7%	0.0%	0.0%	0.0%	0.0%	63.8%
2001	10.5%	2.9%	2.0%	0.1%	0.0%	0.0%	6.6%	0.0%	1.8%	0.6%	0.0%	0.0%	0.0%	0.0%	75.5%
(79-01)	14.5%	6.2%	2.8%	6.7%	5.6%	11.1%	6.4%	0.4%	5.8%	4.4%	0.3%	0.0%	0.0%	0.0%	35.9%
(85-01)	13.5%	6.6%	2.5%	5.2%	3.4%	8.9%	7.0%	0.4%	5.2%	3.4%	0.4%	0.0%	0.0%	0.0%	43.5%

Table G.9. Percent distribution of Puntledge chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	1.6%	0.3%	0.2%	3.2%	8.3%	6.7%	0.3%	0.9%	39.7%	6.5%	0.0%	0.0%	0.0%	0.0%	32.2%
1980	2.4%	0.0%	0.4%	2.0%	5.9%	4.4%	1.3%	4.9%	38.6%	5.9%	0.0%	0.0%	0.0%	0.0%	34.2%
1981	0.8%	0.0%	0.0%	5.4%	7.2%	3.6%	4.0%	0.0%	60.2%	5.4%	0.0%	0.0%	0.0%	0.0%	13.3%
1982	0.9%	0.3%	0.0%	2.2%	12.8%	5.5%	1.0%	1.6%	19.2%	14.7%	0.0%	0.0%	0.0%	0.0%	41.7%
1983	1.0%	0.2%	0.0%	7.5%	16.0%	5.1%	3.0%	2.4%	25.5%	2.6%	0.0%	0.0%	0.0%	0.0%	36.6%
1984	0.0%	1.2%	0.0%	2.0%	5.9%	3.9%	1.2%	2.3%	26.6%	2.7%	0.0%	0.0%	0.0%	0.0%	54.3%
1985	10.9%	0.8%	2.3%	6.2%	1.6%	8.5%	6.2%	0.0%	33.3%	6.2%	0.0%	0.0%	0.0%	0.0%	24.0%
1986	5.6%	0.0%	4.5%	2.8%	3.9%	10.1%	0.0%	2.8%	43.3%	1.7%	0.0%	0.0%	0.0%	0.0%	25.3%
1987	2.7%	0.7%	0.0%	12.1%	2.0%	6.7%	10.1%	0.0%	16.8%	0.0%	4.7%	0.0%	0.0%	0.0%	44.3%
1988	12.0%	0.0%	0.0%	0.0%	0.0%	4.3%	14.1%	0.0%	17.4%	1.1%	0.0%	0.0%	0.0%	0.0%	51.1%
1989	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	45.5%	0.0%	0.0%	0.0%	0.0%	0.0%	51.5%
1990	9.4%	0.0%	0.0%	0.0%	3.5%	11.8%	3.5%	0.0%	9.4%	4.7%	0.0%	0.0%	0.0%	0.0%	57.6%
1991	5.2%	5.2%	0.0%	0.0%	0.0%	5.2%	7.8%	0.0%	23.5%	5.2%	0.0%	0.0%	0.0%	0.0%	47.8%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	3.5%	0.0%	37.2%	15.1%	0.0%	0.0%	0.0%	0.0%	37.2%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	6.6%	10.5%	0.0%	44.7%	0.0%	0.0%	0.0%	0.0%	0.0%	38.2%
1994	7.1%	0.0%	0.0%	0.0%	0.0%	7.1%	0.0%	0.0%	53.6%	3.6%	0.0%	0.0%	0.0%	0.0%	28.6%
1995	5.9%	2.9%	0.0%	0.0%	0.0%	14.7%	0.0%	0.0%	32.4%	0.0%	0.0%	0.0%	0.0%	0.0%	44.1%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	2.6%	7.9%	0.0%	34.2%	2.6%	0.0%	0.0%	0.0%	0.0%	52.6%
1997	0.0%	0.0%	0.0%	9.8%	0.0%	7.8%	13.7%	0.0%	7.8%	0.0%	0.0%	0.0%	0.0%	0.0%	60.8%
1998	21.2%	6.1%	0.0%	0.0%	0.0%	0.0%	15.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	57.6%
1999	9.1%	0.0%	0.0%	0.0%	0.0%	1.8%	9.1%	0.0%	12.1%	0.0%	0.0%	0.0%	0.0%	0.0%	67.9%
2000	1.6%	0.8%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	25.6%	0.0%	0.0%	0.0%	0.0%	0.0%	70.5%
2001	8.3%	0.6%	0.0%	0.0%	0.0%	0.0%	4.9%	1.2%	7.4%	0.0%	0.0%	0.0%	0.0%	0.0%	77.6%
(79-01)	4.7%	0.8%	0.3%	2.4%	2.9%	5.4%	5.1%	0.7%	28.4%	3.4%	0.2%	0.0%	0.0%	0.0%	45.6%
(85-01)	6.0%	1.0%	0.4%	1.9%	0.6%	5.6%	6.3%	0.2%	26.1%	2.4%	0.3%	0.0%	0.0%	0.0%	49.2%

Table G.10. Percent distribution of Puntledge chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	2.1%	0.3%	0.3%	3.7%	9.3%	6.6%	0.3%	1.1%	39.6%	6.4%	0.0%	0.0%	0.0%	0.0%	30.3%
1980	2.9%	0.0%	0.5%	2.2%	6.5%	4.6%	1.5%	5.5%	38.6%	6.0%	0.0%	0.0%	0.0%	0.0%	31.8%
1981	0.9%	0.0%	0.0%	6.0%	8.0%	3.4%	4.1%	0.0%	60.0%	5.4%	0.0%	0.0%	0.0%	0.0%	12.3%
1982	1.0%	0.5%	0.0%	2.5%	14.1%	5.9%	1.3%	1.9%	19.5%	15.1%	0.0%	0.0%	0.0%	0.0%	38.3%
1983	2.0%	0.2%	0.0%	8.2%	17.0%	5.1%	3.1%	2.6%	25.5%	2.6%	0.0%	0.0%	0.0%	0.0%	33.8%
1984	0.0%	1.1%	0.0%	2.6%	6.6%	4.0%	1.5%	2.6%	27.6%	2.9%	0.0%	0.0%	0.0%	0.0%	51.1%
1985	14.1%	1.3%	3.4%	6.7%	1.3%	8.7%	6.7%	0.0%	31.5%	5.4%	0.0%	0.0%	0.0%	0.0%	20.8%
1986	6.0%	0.0%	5.5%	3.0%	4.5%	10.0%	0.0%	3.0%	44.0%	1.5%	0.0%	0.0%	0.0%	0.0%	22.5%
1987	3.0%	1.2%	0.0%	15.2%	3.0%	6.1%	10.4%	0.0%	16.5%	0.0%	4.3%	0.0%	0.0%	0.0%	40.2%
1988	11.9%	0.0%	0.0%	0.0%	0.0%	5.0%	15.8%	0.0%	19.8%	1.0%	0.0%	0.0%	0.0%	0.0%	46.5%
1989	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	52.6%	0.0%	0.0%	0.0%	0.0%	0.0%	44.7%
1990	10.9%	0.0%	0.0%	0.0%	4.3%	12.0%	4.3%	0.0%	9.8%	5.4%	0.0%	0.0%	0.0%	0.0%	53.3%
1991	5.6%	14.0%	0.0%	0.0%	0.0%	4.2%	8.4%	0.0%	24.5%	4.9%	0.0%	0.0%	0.0%	0.0%	38.5%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	7.3%	3.1%	0.0%	42.7%	13.5%	0.0%	0.0%	0.0%	0.0%	33.3%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	5.9%	10.6%	0.0%	49.4%	0.0%	0.0%	0.0%	0.0%	0.0%	34.1%
1994	9.4%	0.0%	0.0%	0.0%	0.0%	6.3%	0.0%	0.0%	56.3%	3.1%	0.0%	0.0%	0.0%	0.0%	25.0%
1995	5.1%	2.6%	0.0%	0.0%	0.0%	15.4%	0.0%	0.0%	35.9%	2.6%	0.0%	0.0%	0.0%	0.0%	38.5%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	7.1%	0.0%	40.5%	2.4%	0.0%	0.0%	0.0%	0.0%	47.6%
1997	0.0%	0.0%	0.0%	10.2%	0.0%	8.5%	18.6%	0.0%	8.5%	1.7%	0.0%	0.0%	0.0%	0.0%	52.5%
1998	19.0%	16.7%	0.0%	0.0%	0.0%	0.0%	19.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	45.2%
1999	9.7%	0.0%	0.0%	0.0%	0.0%	2.2%	13.5%	0.0%	14.1%	0.0%	0.0%	0.0%	0.0%	0.0%	60.5%
2000	2.2%	1.4%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	29.5%	0.0%	0.0%	0.0%	0.0%	0.0%	65.5%
2001	10.6%	1.1%	0.0%	0.0%	0.0%	0.0%	8.7%	1.6%	9.2%	0.0%	0.0%	0.0%	0.0%	0.0%	68.8%
(79-01)	5.2%	1.8%	0.4%	2.7%	3.3%	5.4%	6.0%	0.8%	30.2%	3.5%	0.2%	0.0%	0.0%	0.0%	40.7%
(85-01)	6.5%	2.3%	0.5%	2.2%	0.8%	5.5%	7.4%	0.3%	28.5%	2.4%	0.3%	0.0%	0.0%	0.0%	43.4%

Table G.11. Percent distribution of Big Qualicum chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	3.4%	0.9%	0.3%	1.7%	9.4%	4.1%	0.4%	2.2%	39.3%	8.0%	0.1%	0.0%	0.3%	0.1%	29.8%
1980	1.4%	1.6%	0.4%	4.3%	6.6%	3.4%	1.3%	4.2%	39.2%	9.4%	0.0%	0.1%	0.3%	0.2%	27.6%
1981	1.9%	0.3%	0.4%	1.3%	11.5%	4.5%	0.8%	1.6%	54.6%	9.7%	0.3%	0.0%	0.1%	0.6%	12.3%
1982	4.5%	0.4%	1.2%	4.5%	5.8%	8.5%	0.4%	4.3%	25.6%	12.1%	0.0%	0.0%	1.1%	0.7%	30.9%
1983	5.4%	0.3%	0.3%	4.9%	6.8%	4.5%	1.0%	1.1%	36.6%	14.6%	0.0%	0.0%	0.0%	0.6%	23.7%
1984	1.4%	0.4%	0.0%	1.4%	6.6%	3.6%	5.8%	1.4%	52.3%	6.2%	0.0%	0.0%	0.0%	0.0%	20.7%
1985	3.9%	0.3%	0.6%	1.7%	3.7%	6.8%	1.7%	1.4%	35.6%	12.4%	0.0%	0.0%	2.6%	0.0%	29.3%
1986	1.9%	0.3%	0.0%	0.8%	12.8%	8.3%	2.9%	1.4%	45.4%	7.5%	0.0%	0.0%	0.0%	0.0%	18.8%
1987	8.8%	0.0%	1.0%	4.0%	2.5%	2.6%	2.7%	4.2%	31.7%	5.2%	0.0%	0.8%	0.7%	0.0%	35.8%
1988	2.8%	0.5%	0.0%	2.3%	1.3%	10.2%	1.3%	2.8%	31.9%	4.8%	2.0%	0.0%	1.0%	0.0%	39.0%
1989	4.2%	1.6%	0.6%	3.2%	0.6%	1.0%	1.8%	4.8%	39.0%	8.2%	0.0%	0.2%	0.0%	1.0%	34.0%
1990	4.8%	1.9%	0.0%	6.1%	1.6%	6.5%	2.4%	3.0%	22.8%	11.3%	0.0%	0.2%	0.0%	1.9%	37.6%
1991	2.4%	1.3%	0.0%	2.1%	1.1%	2.9%	1.9%	1.9%	44.7%	5.6%	0.0%	0.5%	0.5%	0.0%	35.0%
1992	2.3%	0.0%	2.5%	5.4%	5.9%	1.6%	7.7%	3.4%	41.2%	4.0%	0.0%	0.0%	0.4%	0.0%	25.5%
1993	1.2%	1.2%	0.0%	1.5%	3.9%	2.9%	3.2%	1.7%	45.0%	6.8%	0.0%	0.0%	0.0%	1.0%	31.5%
1994	4.5%	0.0%	0.0%	1.6%	1.6%	3.7%	2.0%	2.8%	34.6%	2.4%	0.0%	0.0%	2.8%	0.0%	43.9%
1995	7.0%	0.0%	0.0%	1.5%	0.0%	7.0%	2.5%	0.0%	20.6%	0.5%	0.0%	0.0%	0.0%	0.0%	60.8%
1996	2.9%	0.0%	0.0%	0.0%	0.0%	0.7%	1.1%	0.0%	46.8%	0.0%	0.0%	0.0%	0.0%	1.1%	47.5%
1997	3.0%	0.0%	0.0%	5.0%	1.5%	1.5%	2.0%	0.0%	30.5%	0.5%	4.5%	0.0%	0.0%	0.0%	51.5%
1998	7.6%	0.6%	0.0%	0.0%	0.0%	0.0%	6.5%	0.0%	21.2%	0.0%	0.0%	0.0%	0.0%	0.0%	64.1%
1999	6.0%	2.6%	0.0%	2.1%	2.6%	0.0%	2.1%	0.0%	12.3%	0.0%	3.8%	0.0%	0.9%	0.0%	67.7%
2000	14.2%	0.9%	0.0%	0.0%	0.0%	0.5%	3.2%	0.0%	11.5%	0.0%	0.0%	0.0%	3.2%	0.0%	66.5%
2001	4.0%	6.8%	0.0%	0.0%	0.0%	0.0%	5.3%	0.6%	10.2%	0.0%	0.0%	0.0%	1.5%	0.0%	71.5%
(79-01)	4.3%	1.0%	0.3%	2.4%	3.7%	3.7%	2.6%	1.9%	33.6%	5.6%	0.5%	0.1%	0.7%	0.3%	39.4%
(85-01)	4.8%	1.1%	0.3%	2.2%	2.3%	3.3%	3.0%	1.7%	30.9%	4.1%	0.6%	0.1%	0.8%	0.3%	44.7%

Table G.12. Percent distribution of Big Qualicum chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	4.4%	0.9%	0.4%	1.9%	10.5%	4.1%	0.4%	2.5%	38.9%	7.8%	0.1%	0.0%	0.3%	0.1%	27.7%
1980	1.6%	1.7%	0.4%	4.7%	7.1%	3.4%	1.5%	4.6%	39.1%	9.4%	0.0%	0.2%	0.3%	0.2%	25.8%
1981	2.4%	0.3%	0.4%	1.5%	12.4%	4.6%	0.8%	1.7%	53.8%	9.5%	0.3%	0.0%	0.2%	0.7%	11.3%
1982	5.7%	0.5%	1.4%	4.7%	6.1%	8.5%	0.4%	4.6%	25.5%	11.9%	0.0%	0.0%	1.1%	0.6%	28.9%
1983	5.5%	0.3%	0.7%	5.1%	7.2%	4.6%	1.3%	1.2%	37.4%	14.2%	0.0%	0.0%	0.0%	1.0%	21.5%
1984	2.3%	0.4%	0.0%	1.6%	7.2%	3.6%	6.9%	1.6%	51.6%	6.1%	0.0%	0.0%	0.0%	0.0%	18.6%
1985	6.8%	1.1%	0.9%	2.1%	4.3%	6.5%	2.2%	1.6%	34.2%	12.0%	0.0%	0.0%	3.3%	0.0%	25.0%
1986	3.2%	1.3%	0.0%	0.7%	13.6%	7.8%	2.8%	1.4%	45.4%	7.0%	0.0%	0.0%	0.0%	0.0%	16.6%
1987	10.6%	0.0%	1.0%	4.3%	2.8%	2.5%	2.9%	4.8%	31.6%	5.0%	0.0%	0.9%	0.8%	0.0%	33.0%
1988	3.0%	2.0%	0.0%	2.6%	1.3%	10.0%	1.5%	3.3%	35.2%	4.3%	2.0%	0.0%	1.5%	0.0%	33.3%
1989	4.6%	4.8%	0.8%	3.7%	0.5%	0.8%	1.9%	5.3%	39.7%	7.5%	0.0%	0.3%	0.0%	1.0%	29.0%
1990	5.1%	5.0%	0.0%	7.0%	1.8%	6.5%	2.7%	3.3%	24.0%	10.6%	0.0%	0.1%	0.0%	1.9%	32.0%
1991	3.1%	3.7%	0.0%	2.5%	1.4%	2.7%	1.9%	2.2%	47.1%	4.9%	0.0%	0.5%	0.4%	0.0%	29.6%
1992	3.9%	0.0%	2.7%	6.1%	6.2%	1.5%	7.7%	3.6%	43.5%	3.4%	0.0%	0.0%	0.4%	0.0%	21.1%
1993	1.6%	2.8%	0.0%	1.6%	4.7%	2.6%	3.0%	1.8%	48.2%	6.1%	0.0%	0.0%	0.0%	1.2%	26.2%
1994	5.2%	0.0%	0.0%	1.9%	1.9%	3.3%	1.9%	3.0%	37.5%	2.2%	0.0%	0.0%	3.0%	0.0%	40.1%
1995	7.4%	0.0%	0.0%	2.2%	0.0%	8.7%	3.9%	0.0%	21.8%	3.1%	0.0%	0.0%	0.0%	0.0%	52.8%
1996	3.4%	0.0%	0.0%	0.6%	0.0%	0.9%	0.9%	0.3%	51.8%	0.3%	0.0%	0.0%	0.0%	1.2%	40.5%
1997	3.6%	0.0%	0.0%	5.9%	1.8%	1.8%	2.7%	0.0%	30.6%	2.7%	4.5%	0.0%	0.0%	0.0%	46.4%
1998	8.0%	1.1%	0.0%	0.0%	0.0%	0.0%	9.6%	0.0%	22.5%	0.5%	0.0%	0.0%	0.0%	0.0%	58.3%
1999	6.8%	6.4%	0.0%	2.7%	3.0%	0.0%	2.7%	0.0%	13.3%	0.0%	4.2%	0.0%	0.8%	0.0%	60.2%
2000	16.6%	1.7%	0.0%	0.0%	0.0%	0.4%	4.6%	0.0%	12.9%	0.0%	0.0%	0.0%	3.7%	0.0%	60.2%
2001	4.5%	16.8%	0.0%	0.0%	0.0%	0.0%	6.4%	0.5%	10.3%	0.0%	0.0%	0.0%	1.4%	0.0%	60.1%
(79-01)	5.2%	2.2%	0.4%	2.8%	4.1%	3.7%	3.1%	2.0%	34.6%	5.6%	0.5%	0.1%	0.8%	0.3%	34.7%
(85-01)	5.7%	2.7%	0.3%	2.6%	2.5%	3.3%	3.5%	1.8%	32.3%	4.1%	0.6%	0.1%	0.9%	0.3%	39.1%

Table G.13. Percent distribution of Chilliwack chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1985	0.5%	0.0%	0.0%	0.3%	2.3%	0.8%	0.2%	34.2%	28.6%	5.9%	0.0%	3.9%	4.1%	3.6%	15.3%
1986	0.0%	0.0%	0.0%	0.7%	2.4%	1.5%	0.2%	18.8%	27.2%	12.1%	0.0%	2.5%	5.4%	5.7%	23.6%
1987	0.0%	0.0%	0.0%	0.7%	0.4%	0.3%	0.3%	16.0%	34.9%	2.2%	0.5%	3.7%	3.9%	2.7%	34.3%
1988	0.4%	0.1%	0.0%	0.2%	0.0%	0.1%	0.0%	17.0%	18.8%	2.1%	0.0%	4.0%	2.9%	1.7%	52.7%
1989	0.3%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	17.8%	15.7%	3.3%	0.0%	4.8%	3.4%	1.2%	53.0%
1990	0.8%	0.0%	0.0%	0.0%	0.1%	1.4%	0.3%	8.7%	14.2%	4.0%	2.2%	5.8%	11.4%	5.2%	45.9%
1991	0.3%	0.1%	0.0%	0.4%	0.2%	1.0%	0.2%	18.9%	22.6%	4.3%	0.8%	13.8%	5.4%	4.8%	27.3%
1992	0.3%	0.0%	0.0%	0.1%	0.7%	0.3%	0.2%	19.3%	17.2%	1.0%	0.1%	8.8%	0.9%	3.6%	47.3%
1993	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	14.8%	18.2%	1.8%	0.5%	8.8%	0.0%	1.2%	54.0%
1994	0.3%	0.1%	0.0%	0.6%	0.3%	1.4%	0.0%	5.7%	11.9%	3.9%	2.1%	1.4%	3.1%	3.3%	65.9%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.1%	8.5%	6.3%	0.6%	0.4%	1.1%	1.1%	1.6%	79.5%
1996	0.2%	0.0%	0.0%	0.0%	0.0%	1.2%	0.0%	0.0%	16.3%	1.2%	0.6%	4.6%	1.0%	2.8%	72.1%
1997	0.7%	0.0%	0.0%	0.1%	0.4%	0.6%	0.6%	10.0%	15.1%	1.6%	2.0%	4.9%	2.4%	3.3%	58.4%
1998	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	3.8%	0.2%	0.2%	2.9%	0.2%	0.4%	91.4%
1999	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.2%	0.3%	10.2%	0.5%	1.8%	11.4%	0.7%	0.8%	73.9%
2000	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	4.8%	5.6%	0.0%	1.9%	3.6%	0.5%	0.4%	82.8%
2001	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.3%	3.2%	8.4%	0.0%	1.5%	5.5%	0.9%	2.5%	77.5%
(85-01)	0.3%	0.0%	0.0%	0.2%	0.4%	0.6%	0.2%	11.7%	16.2%	2.6%	0.9%	5.4%	2.8%	2.6%	56.2%
(85-01)	0.3%	0.0%	0.0%	0.2%	0.4%	0.6%	0.2%	11.7%	16.2%	2.6%	0.9%	5.4%	2.8%	2.6%	56.2%

Table G.14. Percent distribution of Chilliwack chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1985	1.1%	0.1%	0.0%	0.4%	2.2%	0.7%	0.2%	33.9%	28.6%	5.6%	0.0%	3.9%	5.2%	4.5%	13.6%
1986	0.0%	0.0%	0.0%	0.8%	2.5%	1.4%	0.2%	19.8%	27.6%	11.2%	0.0%	2.7%	6.7%	6.9%	20.3%
1987	0.0%	0.0%	0.0%	0.8%	0.4%	0.3%	0.3%	18.7%	35.4%	2.0%	0.5%	3.9%	3.9%	2.9%	30.7%
1988	0.4%	0.2%	0.0%	0.2%	0.0%	0.1%	0.0%	17.5%	19.6%	2.1%	0.0%	4.1%	4.0%	2.5%	49.3%
1989	0.3%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	22.4%	19.4%	3.0%	0.0%	5.6%	3.4%	1.5%	44.0%
1990	0.9%	0.0%	0.0%	0.0%	0.1%	1.3%	0.3%	10.8%	15.2%	3.5%	2.2%	6.3%	16.1%	6.6%	36.7%
1991	0.3%	0.2%	0.0%	0.4%	0.2%	0.9%	0.2%	20.5%	24.9%	3.8%	0.7%	14.1%	6.2%	5.4%	22.2%
1992	0.4%	0.0%	0.0%	0.1%	0.7%	0.3%	0.2%	21.5%	19.4%	0.9%	0.2%	9.3%	1.0%	3.8%	42.2%
1993	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	16.5%	21.0%	1.7%	0.4%	9.3%	0.0%	1.2%	49.0%
1994	0.4%	0.3%	0.0%	0.8%	0.4%	1.5%	0.0%	7.2%	13.4%	4.5%	2.5%	1.6%	4.8%	4.7%	58.1%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.2%	12.7%	7.3%	0.9%	0.6%	1.3%	1.5%	2.4%	72.3%
1996	0.3%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	2.1%	18.6%	1.3%	0.8%	5.2%	1.3%	4.8%	64.3%
1997	0.8%	0.0%	0.0%	0.2%	0.4%	0.6%	0.8%	12.5%	16.8%	1.8%	1.9%	5.5%	2.5%	3.9%	52.2%
1998	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%	4.4%	0.3%	0.3%	3.4%	0.3%	0.9%	89.6%
1999	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.3%	0.3%	12.0%	0.5%	1.9%	13.4%	0.7%	1.0%	69.7%
2000	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	5.3%	6.4%	0.0%	2.4%	4.3%	0.7%	1.1%	79.0%
2001	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.4%	3.3%	9.8%	0.0%	1.7%	6.4%	1.2%	4.9%	71.9%
(85-01)	0.3%	0.1%	0.0%	0.2%	0.4%	0.6%	0.3%	13.2%	17.6%	2.5%	1.0%	5.9%	3.5%	3.5%	50.9%
(85-01)	0.3%	0.1%	0.0%	0.2%	0.4%	0.6%	0.3%	13.2%	17.6%	2.5%	1.0%	5.9%	3.5%	3.5%	50.9%

Table G.15. Percent distribution of Cowichan chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1990	0.0%	0.0%	0.0%	0.0%	1.4%	4.7%	0.3%	1.3%	52.7%	13.1%	0.0%	0.7%	3.2%	2.2%	20.4%
1991	0.0%	0.0%	0.0%	0.1%	0.2%	0.5%	1.0%	2.3%	40.6%	3.6%	0.5%	0.6%	2.6%	0.6%	47.3%
1992	0.1%	0.0%	0.0%	0.3%	0.9%	1.0%	0.8%	8.5%	56.1%	3.8%	1.2%	0.2%	1.2%	1.1%	24.6%
1993	0.2%	0.0%	0.0%	0.1%	0.4%	0.5%	1.3%	6.8%	52.4%	3.0%	1.4%	0.5%	0.8%	0.4%	32.1%
1994	0.5%	0.0%	0.0%	0.3%	0.2%	2.2%	0.0%	3.6%	33.9%	5.6%	0.8%	0.3%	3.3%	0.4%	48.8%
1995	0.3%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	3.4%	28.8%	0.4%	0.6%	0.0%	1.9%	0.7%	62.8%
1996	0.2%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	33.3%	0.3%	0.9%	0.0%	0.7%	2.8%	61.4%
1997	0.9%	0.0%	0.0%	0.0%	0.0%	0.5%	0.6%	2.8%	25.9%	0.2%	1.1%	0.0%	3.6%	3.0%	61.5%
1998	4.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.6%	31.7%	0.3%	1.8%	0.0%	3.3%	0.0%	56.9%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	41.9%	1.3%	4.5%	1.1%	7.4%	0.8%	41.9%
2000	1.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	21.6%	0.0%	5.7%	0.0%	4.7%	1.3%	63.7%
2001	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	10.7%	22.3%	0.3%	0.0%	0.1%	12.8%	0.9%	52.1%
(90-01)	0.7%	0.0%	0.0%	0.1%	0.3%	0.9%	0.6%	3.5%	36.8%	2.7%	1.5%	0.3%	3.8%	1.2%	47.8%
(90-01)	0.7%	0.0%	0.0%	0.1%	0.3%	0.9%	0.6%	3.5%	36.8%	2.7%	1.5%	0.3%	3.8%	1.2%	47.8%

Table G.16. Percent distribution of Cowichan chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1990	0.0%	0.0%	0.0%	0.1%	1.4%	3.6%	0.7%	2.8%	59.0%	10.0%	0.1%	0.8%	4.6%	2.5%	14.2%
1991	0.1%	0.0%	0.0%	0.2%	0.3%	0.5%	1.1%	3.3%	47.1%	3.3%	0.6%	0.6%	2.9%	0.6%	39.4%
1992	0.1%	0.1%	0.0%	0.4%	1.0%	0.9%	0.8%	8.9%	60.7%	3.3%	1.2%	0.2%	1.3%	1.2%	20.0%
1993	0.3%	0.0%	0.0%	0.1%	0.5%	0.5%	1.2%	7.4%	57.1%	2.7%	1.3%	0.5%	0.8%	0.4%	27.3%
1994	0.5%	0.0%	0.0%	0.4%	0.2%	2.0%	0.0%	4.1%	38.7%	5.8%	0.8%	0.5%	4.1%	0.6%	42.4%
1995	0.3%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	5.0%	32.4%	1.5%	0.8%	0.0%	2.3%	0.9%	55.4%
1996	0.3%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.3%	38.1%	0.5%	1.1%	0.0%	0.9%	3.8%	54.6%
1997	1.2%	0.0%	0.0%	0.0%	0.0%	0.4%	0.7%	3.6%	29.6%	1.1%	1.1%	0.0%	4.3%	3.5%	54.5%
1998	4.9%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.5%	35.1%	0.3%	1.9%	0.0%	4.6%	0.0%	51.6%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	46.3%	1.1%	4.7%	1.1%	9.8%	0.7%	35.0%
2000	1.8%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	24.3%	0.0%	6.6%	0.0%	6.2%	2.8%	56.4%
2001	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	10.1%	25.3%	0.3%	0.0%	0.1%	13.6%	1.9%	47.4%
(90-01)	0.8%	0.0%	0.0%	0.1%	0.3%	0.8%	0.7%	4.0%	41.1%	2.5%	1.7%	0.3%	4.6%	1.6%	41.5%
(90-01)	0.8%	0.0%	0.0%	0.1%	0.3%	0.8%	0.7%	4.0%	41.1%	2.5%	1.7%	0.3%	4.6%	1.6%	41.5%

Table G.17. Percent distribution of Samish Fall Fingerling chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries: Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	Escapement
1989	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%	0.3%	6.8%	17.2%	3.5%	1.9%	7.5%	36.2%	9.7%	16.5%
1990	2.1%	0.0%	0.0%	0.5%	0.1%	0.2%	0.0%	18.5%	12.9%	1.3%	2.0%	9.0%	30.5%	7.5%	15.4%
1991	0.0%	0.0%	0.0%	0.0%	0.1%	0.3%	0.0%	13.4%	11.3%	2.6%	3.2%	9.0%	23.0%	10.8%	26.4%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.5%	11.4%	14.6%	2.1%	0.9%	10.2%	15.6%	17.2%	27.4%
1993	0.0%	0.0%	0.0%	0.3%	0.2%	0.5%	0.3%	12.3%	19.0%	2.3%	8.5%	3.9%	16.5%	12.7%	23.6%
1994	0.2%	0.0%	0.0%	0.4%	0.0%	0.4%	0.0%	11.8%	13.8%	1.9%	5.4%	2.2%	38.5%	3.9%	21.2%
1995	0.3%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	5.8%	5.1%	0.3%	3.4%	3.4%	27.2%	15.0%	38.8%
1996	0.0%	0.1%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	10.7%	0.1%	0.7%	1.9%	33.9%	24.1%	28.1%
1997	0.5%	0.2%	0.0%	0.3%	0.7%	0.8%	0.3%	2.0%	8.2%	0.1%	1.8%	0.9%	34.5%	9.8%	40.0%
1998	3.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	10.9%	0.0%	1.7%	0.7%	44.2%	4.1%	33.3%
1999	3.6%	0.0%	0.0%	1.2%	0.0%	0.0%	3.2%	1.6%	10.9%	0.0%	10.1%	1.6%	39.1%	3.6%	25.0%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.4%	6.4%	0.0%	9.5%	0.4%	37.9%	1.5%	33.0%
2001	0.0%	0.3%	0.0%	0.0%	0.0%	0.1%	0.3%	4.6%	8.3%	0.0%	6.7%	2.3%	38.8%	3.9%	34.7%
(89-01)	0.8%	0.0%	0.0%	0.2%	0.1%	0.3%	0.4%	7.8%	11.5%	1.1%	4.3%	4.1%	32.0%	9.5%	27.9%
(89-01)	0.8%	0.0%	0.0%	0.2%	0.1%	0.3%	0.4%	7.8%	11.5%	1.1%	4.3%	4.1%	32.0%	9.5%	27.9%

Table G.18. Percent distribution of Samish Fall Fingerling chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1989	0.2%	0.0%	0.0%	0.2%	0.2%	0.2%	0.2%	9.1%	18.3%	3.1%	1.9%	8.0%	33.2%	11.0%	14.3%
1990	2.1%	0.0%	0.0%	0.5%	0.1%	0.2%	0.0%	19.9%	13.5%	1.3%	2.0%	9.3%	28.7%	8.2%	14.1%
1991	0.0%	0.0%	0.0%	0.0%	0.1%	0.4%	0.0%	14.5%	12.3%	2.5%	3.2%	9.4%	21.6%	12.0%	24.1%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.6%	11.6%	15.4%	1.8%	0.8%	10.0%	14.2%	23.7%	21.9%
1993	0.0%	0.0%	0.0%	0.3%	0.2%	0.4%	0.3%	14.0%	21.6%	2.0%	8.1%	4.1%	15.3%	13.6%	20.1%
1994	0.5%	0.0%	0.0%	0.5%	0.0%	0.4%	0.0%	13.0%	15.1%	1.9%	5.6%	2.3%	36.9%	4.5%	19.2%
1995	0.2%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	7.2%	5.3%	0.7%	4.7%	3.3%	23.9%	22.0%	31.8%
1996	0.0%	0.1%	0.0%	0.1%	0.0%	0.4%	0.0%	1.0%	11.6%	0.2%	0.8%	1.9%	33.1%	27.6%	23.3%
1997	0.6%	0.4%	0.0%	0.4%	0.8%	0.8%	0.4%	2.5%	9.4%	0.4%	1.7%	1.1%	33.6%	11.6%	36.6%
1998	3.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	11.9%	0.0%	1.8%	0.8%	43.2%	5.5%	31.6%
1999	3.9%	0.0%	0.0%	1.4%	0.0%	0.0%	3.9%	1.4%	12.1%	0.0%	10.7%	1.8%	36.8%	5.7%	22.1%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.1%	6.3%	0.0%	10.1%	0.3%	39.9%	8.3%	25.0%
2001	0.0%	0.7%	0.0%	0.0%	0.0%	0.2%	0.3%	4.2%	9.7%	0.0%	6.9%	2.6%	37.5%	7.1%	30.7%
(89-01)	0.9%	0.1%	0.0%	0.3%	0.1%	0.3%	0.4%	8.5%	12.5%	1.1%	4.5%	4.2%	30.6%	12.4%	24.2%
(89-01)	0.9%	0.1%	0.0%	0.3%	0.1%	0.3%	0.4%	8.5%	12.5%	1.1%	4.5%	4.2%	30.6%	12.4%	24.2%

Table G.19. Percent distribution of Squaxin Pens Fall Yearling chinook reported catch among fisheries and escapement.

Catch[1] Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1990	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	3.3%	0.7%	1.2%	0.6%	4.0%	32.7%	54.8%	2.5%
1991	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.2%	1.5%	0.6%	0.0%	9.0%	32.7%	48.4%	3.5%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.5%	2.3%	3.4%	1.2%	0.8%	7.1%	22.3%	57.1%	4.7%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	9.7%	5.4%	1.4%	2.3%	13.5%	3.4%	49.9%	13.5%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	24.7%	5.9%	3.5%	4.7%	6.5%	22.4%	10.6%	21.8%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	47.5%	30.5%	22.0%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.9%	0.0%	0.0%	1.1%	4.7%	89.8%	2.5%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.4%	0.0%	0.0%	0.0%	2.8%	8.0%	85.2%	0.6%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%	2.9%	91.3%	2.9%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.5%	0.0%	0.0%	0.0%	0.0%	0.0%	62.5%	25.0%
(90-99)	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	6.0%	1.9%	0.8%	0.8%	4.7%	17.7%	58.0%	9.9%
(90-99)	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	6.0%	1.9%	0.8%	0.8%	4.7%	17.7%	58.0%	9.9%

1. No data are shown for 2000 and 2001 because of lack of coded-wire tagging of broods from 1997-1999.
2. Values represent estimates of catch distribution only.

Table G.20. Percent distribution of Squaxin Pens Fall Yearling chinook total fishing mortalities among fisheries and escapement.

										Other Fisheries					
Catch[1] Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	Escapement
1990	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	3.2%	0.8%	1.0%	0.6%	4.1%	31.7%	56.6%	2.0%
1991	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.3%	1.6%	0.5%	0.0%	9.0%	30.8%	50.8%	3.0%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.5%	2.0%	3.0%	0.9%	0.6%	6.0%	22.1%	61.1%	3.5%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	10.7%	5.9%	1.3%	2.0%	13.0%	3.6%	50.9%	12.0%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	23.3%	5.8%	4.2%	4.8%	6.3%	20.6%	15.3%	19.6%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.4%	0.0%	0.0%	0.4%	22.3%	70.7%	5.7%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	0.0%	0.0%	0.9%	5.2%	90.0%	2.0%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.0%	0.0%	0.0%	0.0%	2.1%	6.4%	88.0%	0.4%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	2.3%	93.0%	2.3%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.5%	0.0%	0.5%	0.9%	6.0%	89.0%	1.8%
(90-99)	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	4.8%	2.0%	0.8%	0.8%	4.5%	15.1%	66.6%	5.2%
(90-99)	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	4.8%	2.0%	0.8%	0.8%	4.5%	15.1%	66.6%	5.2%

1. No data are shown for 2000 and 2001 because of lack of coded-wire tagging of broods from 1997-1999.
2. Values represent estimates of catch distribution only.

Table G.21. Percent distribution of Stillaguamish Fall Fingerling chinook reported catch among fisheries and escapement (NA=not available).

										Other Fisheries					
Catch[1] Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	Escapement
1984	0.0%	0.0%	0.0%	3.6%	19.3%	2.4%	3.6%	7.2%	15.7%	24.1%	0.0%	0.0%	4.8%	19.3%	NA [1]
1985	7.3%	0.0%	0.0%	4.2%	0.0%	4.2%	0.0%	30.2%	10.4%	11.5%	9.4%	0.0%	9.4%	13.5%	NA [1]
1986	4.2%	0.0%	0.0%	0.0%	0.0%	4.2%	0.0%	30.2%	18.8%	0.0%	0.0%	0.0%	15.6%	19.8%	7.3%
1990	0.4%	0.0%	0.0%	0.7%	6.2%	4.0%	0.0%	16.2%	7.5%	4.2%	4.9%	4.2%	7.1%	10.4%	34.3%
1991	0.3%	0.0%	0.0%	0.0%	0.0%	0.1%	0.4%	5.9%	4.4%	0.9%	2.6%	5.1%	6.9%	7.9%	65.5%
1992	0.0%	0.0%	0.0%	0.3%	0.0%	2.4%	0.0%	17.0%	5.1%	2.5%	4.0%	5.7%	11.9%	28.1%	23.0%
1993	0.0%	0.0%	0.0%	0.6%	0.4%	1.0%	1.4%	11.4%	8.7%	1.4%	9.6%	5.3%	1.5%	22.6%	36.1%
1994	2.4%	0.0%	0.0%	0.7%	0.0%	1.3%	0.0%	6.7%	7.8%	0.9%	5.3%	0.0%	2.4%	5.8%	66.7%
1995	2.3%	0.0%	0.0%	0.0%	0.0%	9.8%	0.0%	2.3%	4.1%	1.0%	9.6%	1.0%	2.3%	13.7%	53.6%
1996	0.9%	0.0%	0.0%	0.0%	0.0%	8.1%	1.3%	0.0%	6.1%	0.4%	7.5%	0.0%	0.3%	19.0%	56.2%
1997	10.6%	0.5%	0.0%	0.6%	0.0%	1.5%	1.2%	8.1%	5.5%	0.0%	5.8%	0.0%	2.3%	17.7%	46.2%
1998	10.7%	0.2%	0.3%	1.1%	0.0%	0.0%	0.7%	1.1%	1.9%	0.1%	2.4%	0.0%	2.0%	2.1%	77.4%
1999	1.0%	2.5%	0.0%	0.0%	0.0%	0.7%	0.5%	1.7%	8.8%	0.0%	11.8%	0.0%	0.5%	3.9%	68.6%
2000	4.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	2.1%	0.0%	1.6%	0.5%	0.4%	1.7%	81.8%
(84-00)	3.2%	0.2%	0.0%	0.8%	1.8%	2.8%	0.7%	10.4%	7.6%	3.4%	5.3%	1.6%	4.8%	13.3%	44.1%
(85-00)	3.5%	0.2%	0.0%	0.6%	0.5%	2.9%	0.4%	10.6%	7.0%	1.8%	5.7%	1.7%	4.8%	12.8%	47.4%

1. No data are shown for 2000 and 2001 because of lack of coded-wire tagging of broods from 1998-1999.
2. Values represent estimates of catch distribution only for this year.

Table G.22. Percent distribution of Stillaguamish Fall Fingerling chinook total fishing mortalities among fisheries and escapement (NA=not available).

										Other Fisheries					
Catch[1] Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	Escapement
1984	0.9%	0.0%	0.0%	3.7%	16.7%	1.9%	2.8%	10.2%	13.0%	19.4%	0.9%	0.0%	4.6%	25.9%	NA [1]
1985	7.1%	0.0%	0.0%	4.5%	0.0%	3.6%	0.0%	31.3%	8.9%	9.8%	8.9%	0.0%	8.0%	17.9%	NA [1]
1986	5.7%	0.0%	0.0%	0.0%	0.0%	3.8%	0.0%	29.5%	19.0%	0.0%	0.0%	0.0%	14.3%	21.0%	6.7%
1990	0.6%	0.0%	0.0%	0.8%	6.1%	3.6%	0.2%	16.9%	8.3%	3.8%	4.9%	5.1%	7.4%	12.9%	29.4%
1991	0.2%	0.0%	0.0%	0.0%	0.0%	0.1%	0.5%	6.7%	5.1%	1.0%	2.7%	5.9%	6.9%	10.1%	60.7%
1992	0.0%	0.0%	0.0%	0.4%	0.0%	2.1%	0.0%	16.6%	4.9%	2.0%	3.6%	5.3%	10.4%	38.6%	16.1%
1993	0.0%	0.0%	0.0%	0.9%	0.5%	1.0%	1.3%	13.8%	10.0%	1.3%	9.1%	5.9%	1.4%	23.6%	31.3%
1994	2.9%	0.0%	0.0%	0.6%	0.0%	1.3%	0.0%	7.3%	8.6%	1.0%	5.7%	0.0%	2.3%	7.1%	63.1%
1995	2.3%	0.0%	0.0%	0.0%	0.0%	10.2%	0.0%	3.6%	4.1%	1.7%	13.5%	0.9%	2.1%	22.7%	38.9%
1996	1.1%	0.0%	0.0%	0.0%	0.0%	8.9%	1.1%	1.1%	6.5%	0.6%	8.8%	0.0%	0.2%	25.3%	46.3%
1997	11.1%	0.9%	0.0%	0.5%	0.0%	1.6%	1.4%	8.8%	5.7%	0.4%	5.6%	0.0%	2.0%	20.9%	41.0%
1998	11.8%	0.8%	0.4%	1.9%	0.0%	0.0%	0.9%	1.0%	2.1%	0.1%	2.7%	0.0%	1.9%	3.3%	73.0%
1999	1.0%	14.3%	0.0%	0.0%	0.0%	0.6%	0.4%	1.4%	8.8%	0.0%	10.8%	0.0%	0.4%	5.1%	57.1%
2000	4.8%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	6.9%	2.5%	0.0%	1.8%	0.5%	0.4%	2.4%	80.1%
(84-00)	3.6%	1.2%	0.0%	0.9%	1.7%	2.8%	0.6%	11.1%	7.7%	2.9%	5.7%	1.7%	4.5%	16.9%	38.8%
(85-00)	3.8%	1.3%	0.0%	0.7%	0.5%	2.8%	0.4%	11.2%	7.3%	1.7%	6.0%	1.8%	4.4%	16.2%	41.8%

1. No data are shown for 2000 and 2001 because of lack of coded-wire tagging of broods from 1998-1999.
2. Values represent estimates of catch distribution only for this year.

Table G.23. Percent distribution of George Adams Fall Fingerling chinook among fisheries reported catch and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1982	0.0%	0.0%	0.0%	0.0%	0.5%	0.3%	0.0%	20.8%	4.4%	0.4%	0.0%	3.0%	38.1%	10.7%	21.9%
1983	0.0%	0.0%	0.0%	0.0%	1.6%	1.6%	0.0%	15.7%	3.5%	4.2%	0.5%	0.2%	29.8%	25.8%	17.2%
1984	0.0%	0.1%	0.0%	0.5%	3.2%	0.7%	0.4%	18.1%	5.7%	1.2%	0.0%	2.2%	31.3%	20.6%	15.9%
1989	0.0%	0.2%	0.0%	0.0%	0.0%	0.2%	0.0%	8.5%	3.8%	4.5%	1.7%	12.9%	38.6%	17.2%	12.2%
1990	0.1%	0.0%	0.0%	0.4%	0.3%	0.5%	0.0%	19.3%	4.7%	1.0%	5.0%	15.1%	28.4%	18.4%	6.8%
1991	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	18.4%	2.2%	0.4%	4.5%	8.6%	33.3%	18.0%	14.4%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	15.6%	2.1%	5.2%	0.0%	20.3%	9.4%	39.6%	7.3%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.9%	4.3%	0.0%	7.8%	8.7%	4.3%	22.6%	18.3%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	14.0%	7.0%	72.1%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.0%	7.9%	3.9%	0.5%	3.9%	1.0%	4.4%	18.7%	57.6%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	0.0%	0.0%	12.6%	0.0%	4.7%	5.9%	0.0%	13.8%	60.6%
1997	1.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.2%	3.0%	0.3%	1.4%	3.0%	0.8%	18.8%	66.5%
1998	0.7%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.9%	0.0%	1.1%	1.8%	1.8%	7.3%	86.0%
1999	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	2.3%	0.0%	8.2%	4.5%	12.5%	10.0%	61.4%
2000	0.3%	0.0%	0.0%	0.2%	0.0%	0.1%	0.0%	18.1%	3.2%	0.0%	10.1%	3.2%	0.3%	8.6%	55.8%
2001	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	10.9%	1.9%	0.0%	2.2%	5.2%	5.7%	10.8%	62.5%
(82-01)	0.3%	0.0%	0.0%	0.1%	0.3%	0.5%	0.0%	12.0%	4.1%	1.1%	3.2%	6.0%	15.8%	16.8%	39.8%
(85-01)	0.3%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	10.6%	4.0%	0.9%	3.9%	6.9%	11.8%	16.2%	44.7%

Table G.24. Percent distribution of George Adams Fall Fingerling chinook total fishing among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1982	0.0%	0.0%	0.0%	0.0%	0.6%	0.4%	0.0%	20.8%	4.4%	0.5%	0.0%	2.9%	37.1%	12.9%	20.5%
1983	0.0%	0.0%	0.0%	0.0%	1.2%	1.1%	0.0%	12.6%	2.4%	3.1%	0.4%	0.1%	25.7%	42.3%	11.0%
1984	0.0%	0.1%	0.0%	0.6%	3.2%	0.7%	0.5%	18.2%	5.6%	1.1%	0.0%	2.3%	30.6%	22.5%	14.6%
1989	0.0%	0.7%	0.0%	0.1%	0.1%	0.3%	0.0%	10.2%	3.9%	4.0%	1.9%	13.1%	35.6%	19.8%	10.3%
1990	0.8%	0.0%	0.0%	0.5%	0.4%	0.5%	0.0%	21.2%	4.9%	1.0%	4.7%	15.6%	25.9%	18.7%	5.9%
1991	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	19.4%	2.3%	0.4%	4.5%	8.7%	31.6%	19.7%	13.3%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	16.6%	1.8%	4.6%	0.0%	20.3%	8.3%	41.5%	6.5%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.6%	5.1%	0.0%	7.3%	8.0%	4.4%	26.3%	15.3%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.2%	0.0%	0.0%	0.0%	16.3%	12.2%	63.3%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	9.5%	4.2%	1.1%	5.7%	0.8%	4.2%	27.8%	44.5%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	2.7%	0.0%	1.3%	14.1%	0.0%	5.3%	6.4%	0.0%	15.6%	54.6%
1997	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.5%	3.0%	0.8%	1.3%	3.0%	0.8%	24.2%	60.6%
1998	0.7%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.8%	0.0%	1.2%	1.7%	2.0%	27.5%	65.2%
1999	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	2.8%	0.0%	8.4%	5.3%	12.5%	12.9%	56.9%
2000	0.4%	0.0%	0.0%	0.3%	0.0%	0.2%	0.0%	17.6%	3.5%	0.0%	11.9%	3.3%	0.4%	18.8%	43.7%
2001	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	10.6%	2.2%	0.0%	2.3%	5.9%	5.7%	14.8%	57.5%
(82-01)	0.3%	0.1%	0.0%	0.1%	0.3%	0.5%	0.1%	12.3%	4.3%	1.0%	3.4%	6.1%	15.1%	22.4%	34.0%
(85-01)	0.4%	0.1%	0.0%	0.1%	0.0%	0.5%	0.0%	11.2%	4.4%	0.9%	4.2%	7.1%	11.4%	21.5%	38.3%

Table G.25. Percent distribution of Nisqually Fall Fingerling chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1983	0.0%	0.0%	0.0%	2.5%	0.0%	0.0%	0.0%	16.4%	12.4%	6.0%	0.0%	4.5%	10.9%	45.8%	1.5%
1984	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	28.8%	1.5%	2.5%	0.0%	1.5%	37.9%	21.7%	6.1%
1985	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	30.3%	0.0%	6.1%	3.0%	7.6%	31.8%	16.7%	4.5%
1986	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.7%	13.0%	1.7%	0.0%	0.0%	35.7%	14.8%	19.1%
1987	0.0%	0.0%	0.0%	0.0%	2.0%	1.3%	0.0%	10.7%	13.3%	0.7%	0.0%	5.3%	35.3%	18.7%	12.7%
1988	0.0%	0.0%	0.0%	0.7%	2.2%	0.7%	2.2%	5.4%	17.7%	4.7%	0.0%	8.7%	17.3%	10.5%	30.0%
1989	0.0%	0.0%	0.0%	0.3%	0.0%	0.7%	0.0%	4.4%	2.5%	3.6%	6.3%	13.3%	42.6%	18.3%	8.0%
1990	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	22.5%	3.1%	0.2%	5.8%	10.2%	37.8%	12.0%	8.2%
1991	0.0%	0.0%	0.0%	2.1%	0.0%	0.0%	0.0%	8.2%	3.3%	2.5%	2.1%	16.5%	23.0%	24.3%	18.1%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.8%	7.6%	2.9%	2.6%	4.2%	7.6%	18.2%	16.7%	39.3%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	12.5%	3.9%	2.2%	1.9%	2.9%	22.5%	19.3%	33.7%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	4.5%	2.4%	2.4%	0.5%	0.8%	22.0%	21.2%	46.2%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.2%	5.4%	1.7%	0.1%	3.1%	2.7%	32.4%	24.4%	29.6%
1996	0.2%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	3.3%	0.0%	1.1%	1.7%	42.0%	21.3%	29.4%
1997	0.0%	0.3%	0.0%	0.0%	0.0%	0.3%	0.6%	2.4%	0.6%	0.0%	4.5%	0.8%	18.9%	24.4%	47.0%
1998	0.2%	0.0%	0.0%	0.5%	0.0%	0.0%	0.3%	0.4%	1.4%	0.0%	0.7%	0.8%	34.7%	12.1%	48.9%
1999	0.2%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.7%	3.1%	0.0%	3.3%	3.6%	35.9%	21.6%	31.4%
2000	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	14.9%	3.3%	0.0%	5.7%	1.7%	36.2%	20.8%	17.0%
2001	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.5%	2.4%	0.0%	4.9%	4.8%	25.5%	19.2%	39.5%
(83-01)	0.1%	0.0%	0.0%	0.3%	0.2%	0.3%	0.2%	10.2%	4.8%	1.8%	2.5%	5.0%	29.5%	20.2%	24.7%
(85-01)	0.1%	0.0%	0.0%	0.2%	0.3%	0.3%	0.2%	8.8%	4.6%	1.6%	2.8%	5.2%	30.1%	18.6%	27.2%

Table G.26. Percent distribution of Nisqually Fall Fingerling chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1983	0.0%	0.0%	0.0%	1.7%	0.0%	0.0%	0.0%	14.7%	8.9%	4.8%	0.0%	3.1%	9.2%	56.7%	1.0%
1984	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	28.8%	1.3%	2.5%	0.0%	1.7%	35.2%	25.4%	5.1%
1985	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	28.6%	0.0%	4.8%	3.6%	7.1%	31.0%	21.4%	3.6%
1986	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.4%	12.5%	1.6%	0.0%	0.0%	32.8%	19.5%	17.2%
1987	0.0%	0.0%	0.0%	0.0%	2.7%	1.1%	0.0%	14.4%	11.8%	0.5%	0.0%	5.9%	29.9%	23.5%	10.2%
1988	0.0%	0.0%	0.0%	0.8%	2.2%	0.8%	3.2%	5.7%	19.2%	3.8%	0.0%	8.4%	16.5%	17.0%	22.4%
1989	0.0%	0.0%	0.0%	0.4%	0.0%	0.6%	0.0%	5.4%	3.0%	3.2%	6.0%	14.6%	40.5%	19.1%	7.2%
1990	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	23.4%	3.2%	0.1%	5.9%	10.4%	35.7%	13.4%	7.6%
1991	0.0%	0.0%	0.0%	2.2%	0.0%	0.0%	0.0%	9.1%	3.6%	2.2%	1.8%	17.2%	21.2%	26.6%	16.1%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	1.2%	7.1%	2.9%	1.9%	3.9%	6.9%	18.3%	28.4%	29.2%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	14.7%	4.5%	2.0%	1.9%	3.2%	21.8%	21.9%	29.1%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	4.2%	2.3%	2.4%	0.5%	0.7%	17.8%	39.8%	32.2%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.2%	7.9%	1.9%	0.3%	4.0%	2.8%	29.8%	27.3%	25.4%
1996	0.2%	0.0%	0.0%	0.0%	0.0%	1.2%	0.0%	0.6%	3.6%	0.0%	1.4%	1.8%	38.8%	26.2%	26.3%
1997	0.0%	0.5%	0.0%	0.0%	0.0%	0.3%	0.8%	2.9%	0.7%	0.4%	4.4%	0.8%	17.4%	32.0%	39.8%
1998	0.2%	0.0%	0.0%	0.6%	0.0%	0.0%	0.5%	0.4%	1.5%	0.0%	0.7%	0.8%	30.9%	24.5%	40.0%
1999	0.3%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.6%	3.5%	0.0%	3.2%	4.0%	34.0%	26.3%	27.8%
2000	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.6%	2.7%	0.0%	5.5%	1.4%	26.9%	39.8%	11.7%
2001	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.1%	2.7%	0.0%	4.9%	5.1%	23.5%	26.6%	33.9%
(83-01)	0.1%	0.0%	0.0%	0.3%	0.3%	0.3%	0.3%	10.5%	4.7%	1.6%	2.5%	5.0%	26.9%	27.1%	20.3%
(85-01)	0.1%	0.0%	0.0%	0.3%	0.3%	0.3%	0.4%	9.2%	4.7%	1.4%	2.8%	5.4%	27.5%	25.5%	22.3%

Table G.27. Percent distribution of South Puget Sound Fall Fingerling chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1982	0.2%	0.0%	0.0%	0.1%	0.8%	0.4%	0.1%	23.0%	13.8%	1.6%	0.1%	2.8%	24.8%	21.3%	10.9%
1983	0.1%	0.0%	0.0%	0.7%	1.8%	0.6%	0.1%	17.3%	4.6%	2.6%	0.3%	1.6%	27.4%	28.6%	14.3%
1984	0.1%	0.2%	0.0%	0.7%	1.4%	0.2%	0.1%	20.5%	8.5%	1.0%	0.3%	1.4%	24.6%	22.5%	18.5%
1985	0.8%	0.0%	0.0%	0.0%	0.3%	0.4%	0.2%	18.7%	6.3%	1.6%	0.8%	1.9%	29.3%	18.2%	21.6%
1986	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	18.4%	7.5%	1.7%	0.0%	4.0%	10.7%	22.4%	34.0%
1987	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.7%	12.7%	3.9%	0.0%	7.2%	13.9%	10.9%	38.8%
1988	0.1%	0.0%	0.0%	0.2%	0.5%	0.8%	0.5%	5.4%	7.5%	3.8%	4.2%	7.3%	26.4%	14.7%	28.6%
1989	0.1%	0.0%	0.0%	0.2%	0.3%	0.1%	0.0%	7.4%	4.5%	3.9%	2.5%	11.0%	21.4%	16.1%	32.3%
1990	0.0%	0.0%	0.1%	0.3%	0.3%	0.3%	0.0%	22.7%	3.7%	1.0%	4.3%	9.0%	23.7%	12.4%	22.4%
1991	0.4%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	15.1%	1.8%	1.0%	2.6%	11.6%	26.5%	13.1%	27.7%
1992	0.6%	0.1%	0.0%	0.0%	0.9%	0.5%	0.0%	17.2%	3.7%	2.5%	2.2%	9.1%	23.7%	18.0%	21.4%
1993	0.2%	0.1%	0.0%	0.0%	0.1%	0.6%	0.0%	15.7%	3.8%	2.2%	4.6%	5.5%	15.7%	21.0%	30.4%
1994	0.0%	0.0%	0.0%	0.5%	0.0%	0.2%	0.0%	8.9%	3.0%	4.1%	1.3%	0.7%	16.3%	10.0%	55.0%
1995	0.2%	0.0%	0.0%	0.1%	0.0%	0.9%	0.0%	3.7%	1.8%	0.2%	1.1%	1.3%	5.6%	11.7%	73.4%
1996	0.1%	0.0%	0.0%	0.0%	0.0%	0.4%	0.1%	0.0%	4.1%	0.1%	1.8%	2.9%	6.3%	14.8%	69.4%
1997	0.5%	0.0%	0.0%	0.3%	0.0%	0.5%	0.0%	5.2%	1.8%	0.0%	1.5%	1.6%	2.9%	13.2%	72.5%
1998	1.3%	0.0%	0.0%	0.9%	0.0%	0.0%	0.2%	0.5%	1.7%	0.0%	0.8%	1.0%	8.0%	6.3%	79.4%
1999	0.5%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.7%	2.4%	0.0%	4.1%	3.0%	8.9%	5.3%	75.0%
2000	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.2%	1.9%	0.0%	4.2%	0.3%	11.3%	6.5%	66.1%
2001	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.3%	7.3%	3.3%	0.0%	4.5%	4.1%	10.9%	8.8%	60.7%
(82-01)	0.3%	0.0%	0.0%	0.2%	0.3%	0.3%	0.1%	11.5%	4.9%	1.6%	2.0%	4.4%	16.9%	14.8%	42.6%
(85-01)	0.3%	0.0%	0.0%	0.2%	0.1%	0.3%	0.1%	9.9%	4.2%	1.5%	2.4%	4.8%	15.4%	13.1%	47.6%

Table G.28. Percent distribution of South Puget Sound Fall Fingerling chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1982	0.2%	0.0%	0.0%	0.2%	0.9%	0.3%	0.1%	23.3%	12.8%	1.5%	0.1%	2.8%	23.6%	24.6%	9.4%
1983	0.1%	0.0%	0.0%	0.7%	1.8%	0.5%	0.1%	16.8%	3.9%	2.3%	0.2%	1.6%	25.2%	35.6%	11.2%
1984	0.1%	0.2%	0.0%	0.7%	1.4%	0.2%	0.1%	20.8%	8.3%	0.9%	0.3%	1.5%	23.9%	24.8%	16.9%
1985	0.8%	0.0%	0.0%	0.0%	0.3%	0.3%	0.2%	18.6%	6.3%	1.6%	0.9%	1.9%	28.4%	20.7%	20.2%
1986	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	18.5%	7.1%	1.6%	0.0%	4.0%	9.9%	28.0%	29.6%
1987	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	21.2%	10.6%	3.4%	0.0%	8.9%	11.8%	15.2%	28.8%
1988	0.4%	0.0%	0.0%	0.2%	1.0%	0.6%	0.5%	9.9%	9.5%	3.0%	3.6%	7.9%	22.6%	20.9%	19.7%
1989	0.1%	0.0%	0.0%	0.3%	0.4%	0.1%	0.0%	8.8%	5.2%	3.6%	2.5%	12.2%	20.5%	17.4%	28.9%
1990	0.0%	0.1%	0.1%	0.3%	0.3%	0.3%	0.0%	23.9%	3.8%	0.9%	4.4%	9.2%	22.4%	13.8%	20.6%
1991	0.5%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	16.5%	1.9%	0.9%	2.6%	12.3%	25.2%	14.5%	25.4%
1992	0.6%	0.2%	0.0%	0.0%	0.9%	0.5%	0.0%	17.4%	3.8%	2.4%	2.1%	9.1%	21.1%	24.0%	17.9%
1993	0.3%	0.1%	0.0%	0.0%	0.1%	0.6%	0.0%	18.2%	4.5%	2.0%	4.4%	5.9%	14.7%	22.7%	26.5%
1994	0.0%	0.0%	0.0%	0.5%	0.0%	0.2%	0.0%	9.4%	3.3%	4.8%	1.4%	0.7%	15.5%	17.3%	46.9%
1995	0.2%	0.0%	0.0%	0.1%	0.0%	1.0%	0.0%	5.4%	2.1%	0.6%	1.7%	1.5%	5.7%	17.1%	64.4%
1996	0.2%	0.0%	0.0%	0.0%	0.0%	0.4%	0.1%	0.9%	4.7%	0.2%	2.1%	3.2%	6.2%	17.8%	64.1%
1997	0.5%	0.0%	0.0%	0.3%	0.0%	0.6%	0.0%	6.2%	1.9%	0.3%	1.5%	1.7%	2.8%	16.3%	67.7%
1998	1.4%	0.0%	0.0%	0.9%	0.0%	0.0%	0.3%	0.5%	1.8%	0.0%	0.8%	1.1%	8.0%	11.9%	73.3%
1999	0.6%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.7%	3.0%	0.0%	4.4%	3.5%	9.1%	8.1%	70.5%
2000	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	8.9%	2.1%	0.0%	4.9%	0.3%	10.7%	16.5%	56.1%
2001	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.3%	7.0%	4.0%	0.0%	4.7%	4.6%	10.8%	12.3%	56.0%
(82-01)	0.3%	0.0%	0.0%	0.2%	0.4%	0.3%	0.1%	12.6%	5.0%	1.5%	2.1%	4.7%	15.9%	19.0%	37.7%
(85-01)	0.4%	0.0%	0.0%	0.2%	0.2%	0.3%	0.1%	11.3%	4.5%	1.5%	2.5%	5.2%	14.4%	17.3%	42.2%

Table G.29. Percent distribution of South Puget Sound Fall Yearling chinook reported catch among fisheries and escapement. No data are shown for 2001 because of lack of coded-wire tagging of broods from 1998-1999.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1982	0.0%	0.0%	0.0%	0.0%	2.5%	0.0%	0.0%	2.8%	3.2%	0.0%	0.0%	1.1%	14.5%	67.4%	8.5%
1983	0.0%	0.0%	0.0%	0.0%	1.8%	0.0%	0.0%	5.8%	0.5%	0.0%	0.0%	0.0%	9.8%	76.3%	5.8%
1984	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.2%	1.6%	0.0%	0.0%	0.0%	33.3%	43.8%	14.1%
1990	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	0.0%	0.3%	0.0%	0.5%	0.0%	1.4%	32.4%	54.6%	10.7%
1991	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.6%	0.7%	0.0%	0.0%	3.7%	12.8%	57.6%	19.6%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.6%	0.8%	0.0%	1.2%	4.6%	28.2%	48.7%	11.9%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	1.1%	0.0%	0.0%	1.4%	10.4%	57.9%	27.9%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.5%	2.2%	0.7%	0.0%	15.6%	63.3%	16.9%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.4%	2.6%	0.0%	2.0%	0.4%	10.4%	68.2%	10.0%
1996	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	0.0%	1.3%	0.7%	3.2%	89.3%	3.3%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	1.1%	0.0%	0.4%	1.3%	4.0%	66.6%	25.2%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.2%	5.6%	82.2%	10.0%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.0%	0.0%	0.0%	7.5%	2.5%	70.0%	5.0%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.8%	6.3%	11.3%	67.5%	6.3%
(82-00)	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	2.6%	2.1%	0.2%	1.0%	2.2%	13.9%	65.2%	12.5%
(85-00)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.9%	2.1%	0.2%	1.3%	2.7%	12.4%	66.0%	13.3%

Table G.30. Percent distribution of South Puget Sound Fall Yearling chinook for total fishing mortalities among fisheries and escapement.

No data is shown for 2001 because of lack of coded-wire tagging of broods from 1998-1999.

										Other Fisheries					
Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	Escapement
1982	0.0%	0.0%	0.0%	0.0%	2.2%	0.0%	0.0%	3.3%	2.7%	0.0%	0.0%	0.8%	12.8%	71.7%	6.5%
1983	0.0%	0.0%	0.0%	0.0%	1.8%	0.0%	0.0%	5.5%	0.4%	0.0%	0.0%	0.0%	8.8%	78.8%	4.7%
1984	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.9%	1.8%	0.0%	0.0%	0.0%	31.4%	47.1%	12.8%
1990	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.8%	0.1%	0.4%	0.0%	1.6%	30.6%	56.8%	9.5%
1991	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.4%	0.6%	0.0%	0.0%	3.5%	11.4%	62.5%	16.5%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.9%	0.9%	0.0%	1.2%	4.8%	26.7%	51.3%	10.2%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	1.0%	0.0%	0.0%	1.2%	6.7%	75.0%	15.0%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.6%	2.3%	0.6%	0.0%	14.5%	67.0%	14.1%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.9%	2.0%	0.4%	2.4%	0.3%	8.2%	74.0%	6.9%
1996	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	1.8%	0.0%	1.5%	0.7%	2.8%	89.6%	2.8%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	1.0%	0.0%	0.3%	1.2%	3.4%	72.0%	20.6%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	4.3%	86.1%	7.8%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.3%	0.0%	0.0%	3.7%	1.9%	84.3%	1.9%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.2%	6.1%	9.2%	71.4%	5.1%
(82-00)	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	2.6%	1.5%	0.2%	1.0%	1.8%	12.3%	70.5%	9.6%
(85-00)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.9%	1.5%	0.3%	1.3%	2.2%	10.9%	71.8%	10.0%

Table G.31. Percent distribution of Nooksack Spring Yearling chinook reported catch among fisheries and escapement.

										Other Fisheries					
Catch[1] Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	Escapement
1986	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.9%	4.7%	0.0%	0.0%	0.0%	1.6%	84.7%
1989	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.3%	0.0%	0.0%	0.0%	14.3%	7.1%	72.3%
1990	0.0%	0.0%	0.0%	0.0%	0.0%	4.9%	0.0%	0.0%	14.6%	9.8%	0.0%	2.4%	4.9%	34.1%	29.3%
1991	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	2.1%	32.5%	5.9%	7.0%	2.1%	8.4%	5.2%	36.0%
1992	0.4%	0.4%	0.0%	0.0%	1.0%	0.6%	0.4%	17.8%	12.5%	1.1%	2.4%	1.0%	0.4%	8.0%	54.2%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	4.6%	15.4%	6.4%	7.9%	0.8%	5.6%	12.0%	46.8%
1994	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.1%	34.3%	1.0%	0.0%	0.2%	6.3%	3.3%	49.2%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0%	0.0%	0.0%	0.0%	3.2%	7.7%	64.1%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	12.4%	0.0%	3.2%	0.5%	0.0%	3.2%	79.5%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	14.2%	2.7%	5.3%	0.0%	3.5%	15.9%	58.4%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	4.5%	4.5%	0.0%	20.2%	1.1%	7.9%	0.0%	5.6%	6.7%	49.4%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.0%	27.9%	0.0%	1.2%	3.0%	4.8%	1.2%	58.8%
(86-99)	0.1%	0.0%	0.0%	0.0%	0.1%	0.9%	0.5%	2.7%	18.7%	2.7%	2.9%	0.8%	4.7%	8.9%	56.9%
(86-99)	0.1%	0.0%	0.0%	0.0%	0.1%	0.9%	0.5%	2.7%	18.7%	2.7%	2.9%	0.8%	4.7%	8.9%	56.9%

1. No data are shown for 2000 and 2001 because of lack of coded-wire tagging of broods from 1997-1999.

Table G.32. Percent distribution of Nooksack Spring Yearling chinook total fishing mortalities among fisheries and escapement.

										Other Fisheries					
Catchh[1] Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	Escapement
1986	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	2.1%	12.5%	4.6%	1.3%	0.4%	7.9%	3.8%	67.1%
1989	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.3%	0.0%	0.0%	0.0%	15.0%	9.2%	67.5%
1990	0.0%	0.0%	0.0%	0.0%	1.4%	4.2%	0.0%	9.7%	26.4%	8.3%	1.4%	1.4%	2.8%	27.8%	16.7%
1991	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	2.4%	36.8%	5.6%	7.1%	2.4%	7.7%	6.8%	30.6%
1992	1.9%	0.9%	0.0%	0.0%	1.0%	0.6%	0.4%	19.8%	14.0%	1.0%	2.5%	1.0%	0.4%	9.9%	46.4%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	5.0%	18.4%	5.9%	8.0%	0.8%	5.3%	12.8%	43.3%
1994	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.1%	36.0%	0.9%	0.0%	0.2%	6.0%	4.0%	47.3%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	26.4%	0.6%	0.6%	0.0%	3.4%	12.9%	56.2%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.5%	14.5%	0.0%	4.5%	0.5%	0.0%	5.5%	73.5%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.6%	2.3%	5.5%	0.0%	3.1%	21.9%	51.6%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	4.7%	6.6%	0.0%	20.8%	1.9%	7.5%	0.0%	4.7%	12.3%	41.5%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.8%	30.5%	0.0%	1.7%	3.4%	4.5%	2.3%	54.8%
(86-99)	0.2%	0.1%	0.0%	0.0%	0.2%	0.9%	0.7%	4.0%	21.7%	2.6%	3.3%	0.8%	5.1%	10.8%	49.7%
(86-99)	0.2%	0.1%	0.0%	0.0%	0.2%	0.9%	0.7%	4.0%	21.7%	2.6%	3.3%	0.8%	5.1%	10.8%	49.7%

1. No data are shown for 2000 and 2001 because of lack of coded-wire tagging of broods from 1997-1999.

Table G.33. Percent distribution of Skagit Spring Yearling chinook r reported catch among fisheries and escapement.

										Other Fisheries					
Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	Escapement
1985	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.7%	29.2%	26.7%	0.0%	0.0%	10.0%	15.8%	11.7%
1986	1.4%	0.0%	0.0%	0.0%	4.3%	6.6%	0.0%	6.2%	41.7%	2.8%	5.7%	0.0%	3.3%	7.6%	20.4%
1987	0.0%	0.0%	0.0%	4.6%	0.0%	6.5%	0.0%	3.7%	10.2%	5.6%	0.0%	1.9%	24.1%	20.4%	23.1%
1988	0.0%	0.0%	0.0%	0.0%	0.0%	5.9%	0.0%	1.8%	14.9%	7.7%	9.6%	1.8%	20.6%	14.5%	23.2%
1989	0.0%	0.0%	0.0%	0.0%	0.8%	0.1%	0.0%	3.4%	17.5%	3.3%	1.8%	4.3%	30.4%	8.3%	29.9%
1990	0.0%	0.0%	0.0%	0.0%	0.4%	1.9%	1.0%	4.9%	14.0%	4.0%	8.7%	3.4%	15.4%	22.9%	23.3%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	2.0%	19.6%	1.6%	10.2%	0.0%	2.4%	20.9%	42.2%
1998	0.6%	0.0%	0.0%	0.0%	0.0%	0.2%	3.5%	1.3%	9.1%	0.0%	7.2%	0.0%	3.2%	17.2%	57.8%
1999	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	1.2%	7.7%	0.0%	4.5%	0.2%	1.1%	9.1%	75.4%
2000	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	6.3%	15.7%	0.0%	3.5%	0.0%	1.8%	16.8%	54.5%
2001	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.0%	21.6%	0.0%	4.5%	6.0%	3.7%	20.1%	38.1%
(85-01)	0.3%	0.0%	0.0%	0.4%	0.5%	2.0%	0.5%	3.9%	18.3%	4.7%	5.1%	1.6%	10.6%	15.8%	36.3%
(85-01)	0.3%	0.0%	0.0%	0.4%	0.5%	2.0%	0.5%	3.9%	18.3%	4.7%	5.1%	1.6%	10.6%	15.8%	36.3%

Table G.34. The distribution of Skagit Spring Yearling chinook total fishing mortalities among fisheries and escapement.

										Other Fisheries					
Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	Escapement
1985	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	6.9%	29.2%	24.6%	0.0%	0.0%	9.2%	18.5%	10.8%
1986	1.8%	0.0%	0.0%	0.0%	4.0%	6.6%	0.0%	6.2%	41.9%	2.6%	5.7%	0.0%	3.1%	9.3%	18.9%
1987	0.0%	0.0%	0.0%	4.9%	0.0%	4.9%	0.0%	3.1%	7.4%	4.3%	0.0%	1.2%	19.0%	39.9%	15.3%
1988	0.0%	0.0%	0.0%	0.0%	0.0%	5.5%	0.0%	2.2%	17.6%	7.1%	9.3%	2.1%	19.6%	16.1%	20.4%
1989	0.0%	0.0%	0.0%	0.0%	0.8%	0.1%	0.0%	4.0%	19.6%	3.3%	1.9%	4.7%	28.2%	10.3%	26.9%
1990	0.0%	0.0%	0.0%	0.0%	0.4%	1.9%	1.1%	5.1%	14.8%	3.7%	8.6%	3.7%	14.6%	24.6%	21.6%
1997	0.3%	0.0%	0.0%	0.0%	0.0%	0.8%	1.0%	2.6%	19.2%	2.8%	9.4%	0.0%	1.8%	31.1%	30.9%
1998	0.7%	0.0%	0.0%	0.0%	0.0%	0.2%	3.9%	1.2%	10.2%	0.2%	7.1%	0.0%	3.0%	21.1%	52.5%
1999	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	1.2%	8.0%	0.0%	4.7%	0.2%	1.0%	12.8%	71.2%
2000	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	5.9%	16.5%	0.0%	3.7%	0.0%	1.7%	20.7%	50.1%
2001	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.4%	21.6%	0.0%	4.7%	5.4%	3.4%	25.0%	34.5%
(85-01)	0.4%	0.0%	0.0%	0.4%	0.5%	1.9%	0.6%	4.0%	18.7%	4.4%	5.0%	1.6%	9.5%	20.9%	32.1%
(85-01)	0.4%	0.0%	0.0%	0.4%	0.5%	1.9%	0.6%	4.0%	18.7%	4.4%	5.0%	1.6%	9.5%	20.9%	32.1%

Table G.35. Percent distribution of White River Spring Yearling chinook reported catch among fisheries and escapement. No data is shown for 2001 because of lack of coded-wire tagging of broods from 1998-1999.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1982	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	0.0%	0.0%	0.0%	73.2%	23.2%	1.2%[1]
1983	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	0.0%	4.3%	0.0%	0.0%	0.0%	1.6%	11.3%	59.7%	21.5%
1984	0.0%	0.0%	0.0%	0.0%	5.8%	0.0%	0.0%	4.5%	5.2%	0.0%	0.0%	2.6%	9.0%	25.2%	47.7%
1985	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%	2.2%	0.0%	30.8%	50.6%	13.5%
1986	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.6%	2.3%	1.9%	0.0%	0.3%	18.7%	50.2%	25.7%
1987	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	0.4%	0.0%	3.3%	11.3%	42.3%	41.2%
1988	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	2.5%	0.2%	0.8%	1.3%	13.0%	48.4%	33.6%
1989	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	1.2%	1.0%	0.0%	6.0%	13.6%	41.1%	35.8%
1990	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.9%	0.4%	0.6%	0.0%	5.2%	15.4%	44.6%	31.8%
1991	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	1.3%	0.0%	1.3%	4.1%	10.8%	38.1%	43.6%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	2.4%	1.9%	2.3%	0.8%	2.4%	7.8%	45.5%	36.2%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%	2.9%	3.6%	30.5%	62.4%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	0.9%	0.0%	0.0%	1.4%	45.2%	50.7%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.8%	29.4%	69.3%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	0.0%	0.0%	0.3%	42.9%	55.9%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.7%	40.4%	55.8%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	1.6%	27.0%	69.8%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	2.4%	0.0%	0.0%	0.0%	0.0%	29.4%	65.9%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.4%	0.0%	0.0%	0.0%	0.0%	2.7%	18.9%	73.0%
(82-00)	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%	1.2%	1.3%	0.5%	0.3%	1.7%	12.1%	38.6%	43.9%
(85-00)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	1.1%	0.6%	0.3%	1.7%	8.5%	39.0%	47.8%

Table G.36. Percent distribution of White River Spring Yearling chinook total fishing mortalities among fisheries and escapement. No data is shown for 2001 because of lack of coded-wire tagging of broods from 1998-1999.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1982	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	0.0%	0.9%	1.9%	0.0%	0.0%	0.9%	60.4%	34.0%	0.9%[1]
1983	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	4.3%	0.0%	0.0%	0.0%	1.4%	10.4%	63.5%	19.0%
1984	0.0%	0.0%	0.0%	0.0%	4.7%	0.0%	0.0%	3.9%	4.3%	0.0%	0.0%	1.7%	6.9%	46.6%	31.9%
1985	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%	1.9%	0.0%	25.9%	60.0%	9.7%
1986	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	0.6%	2.2%	1.9%	0.0%	0.4%	17.3%	54.3%	22.8%
1987	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.4%	0.0%	2.5%	8.2%	61.9%	25.9%
1988	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	2.9%	0.2%	0.8%	1.4%	12.7%	52.1%	29.7%
1989	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	1.3%	1.0%	0.0%	6.3%	12.3%	46.5%	31.4%
1990	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.4%	0.6%	0.0%	5.5%	13.7%	50.6%	27.2%
1991	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	1.3%	0.0%	1.3%	4.1%	9.8%	46.0%	36.7%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	2.7%	2.1%	2.1%	0.7%	2.7%	7.5%	49.0%	32.9%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	2.8%	3.1%	39.3%	54.2%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.8%	0.0%	0.0%	1.6%	52.4%	43.3%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.9%	41.3%	57.2%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%	0.3%	48.5%	50.1%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.5%	49.5%	47.0%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	1.4%	33.3%	63.8%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.9%	1.9%	0.0%	0.0%	0.0%	0.0%	43.4%	52.8%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.1%	0.0%	0.0%	0.0%	0.0%	2.6%	23.1%	69.2%
(82-00)	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%	1.3%	1.2%	0.5%	0.2%	1.6%	10.4%	47.1%	37.1%
(85-00)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	1.1%	0.6%	0.3%	1.7%	7.5%	46.9%	40.9%

Table G.37. Percent distribution of Hoko Fall Fingerling chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries: Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	Escapement
1989	4.8%	0.8%	0.0%	7.6%	0.4%	6.0%	0.0%	10.8%	1.6%	15.2%	0.0%	0.8%	0.8%	22.0%	29.2%
1990	15.8%	1.9%	0.5%	8.0%	0.7%	2.4%	0.0%	17.0%	0.8%	1.9%	0.0%	0.5%	1.0%	14.4%	35.1%
1991	15.2%	0.0%	0.0%	5.0%	1.1%	0.3%	0.6%	6.9%	0.4%	0.6%	0.5%	0.2%	1.0%	8.2%	59.8%
1992	7.7%	1.7%	1.2%	4.4%	1.2%	1.4%	0.7%	9.8%	0.5%	0.0%	2.1%	0.0%	0.2%	2.4%	66.6%
1993	6.6%	0.0%	2.0%	6.6%	0.0%	3.3%	0.0%	14.9%	0.3%	2.0%	0.0%	0.0%	0.3%	4.6%	59.4%
1994	13.6%	2.1%	2.4%	14.8%	0.6%	1.5%	0.0%	11.4%	2.1%	1.5%	2.1%	0.0%	0.0%	0.0%	47.9%
1995	12.6%	0.0%	4.1%	6.2%	0.0%	0.3%	0.4%	2.9%	0.8%	0.1%	0.0%	0.0%	0.0%	0.7%	71.9%
1996	10.6%	0.0%	3.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	85.2%
1997	13.9%	0.0%	0.0%	1.7%	0.2%	0.0%	0.6%	0.9%	0.0%	0.0%	0.6%	0.0%	0.0%	0.5%	81.7%
1998	9.0%	0.0%	0.4%	5.9%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.3%	0.0%	0.0%	0.0%	84.1%
1999	6.6%	0.0%	0.7%	4.3%	0.0%	0.0%	0.6%	0.0%	0.3%	0.0%	1.4%	0.0%	0.1%	0.0%	86.0%
2000	4.2%	0.2%	1.6%	0.0%	0.0%	0.0%	0.0%	0.2%	1.2%	0.0%	0.0%	0.6%	0.0%	0.0%	92.0%
2001	6.0%	0.0%	1.7%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.6%	90.1%
(89-01)	9.7%	0.5%	1.4%	5.0%	0.3%	1.2%	0.2%	5.8%	0.8%	1.6%	0.5%	0.2%	0.3%	4.1%	68.4%
(89-01)	9.7%	0.5%	1.4%	5.0%	0.3%	1.2%	0.2%	5.8%	0.8%	1.6%	0.5%	0.2%	0.3%	4.1%	68.4%

Table G.38. Percent distribution of Hoko Fall Fingerling chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries: Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	Escapement
1989	11.6%	3.1%	0.3%	8.5%	1.1%	4.8%	0.0%	13.6%	1.7%	11.3%	0.3%	0.6%	0.6%	21.8%	20.7%
1990	18.3%	4.8%	0.6%	8.4%	0.9%	2.0%	0.0%	16.9%	0.7%	1.6%	0.0%	0.6%	0.9%	14.1%	30.1%
1991	18.6%	0.0%	0.1%	5.2%	1.1%	0.3%	0.5%	7.0%	0.4%	0.6%	0.4%	0.2%	1.0%	8.8%	55.7%
1992	8.6%	4.9%	1.6%	5.5%	1.1%	1.4%	0.6%	10.3%	0.6%	0.0%	2.1%	0.0%	0.2%	2.7%	60.4%
1993	12.0%	1.1%	2.3%	7.7%	0.0%	2.9%	0.0%	14.9%	0.6%	1.7%	0.0%	0.0%	0.3%	4.9%	51.6%
1994	20.4%	4.8%	2.8%	13.5%	0.5%	1.3%	0.0%	10.7%	2.0%	1.5%	2.0%	0.0%	0.0%	0.0%	40.5%
1995	16.2%	0.0%	4.7%	7.8%	0.0%	0.4%	0.5%	3.7%	0.8%	0.1%	0.0%	0.0%	0.0%	1.0%	64.8%
1996	13.8%	0.0%	4.4%	0.7%	0.0%	0.0%	0.0%	1.3%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	79.3%
1997	16.3%	0.0%	0.0%	1.9%	0.2%	0.0%	0.7%	1.1%	0.0%	0.1%	0.5%	0.0%	0.0%	0.4%	78.8%
1998	10.0%	0.0%	0.3%	6.4%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.3%	0.0%	0.0%	0.0%	82.8%
1999	8.0%	0.0%	0.7%	4.7%	0.0%	0.0%	0.7%	0.0%	0.3%	0.0%	1.5%	0.0%	0.1%	0.0%	84.1%
2000	5.8%	0.2%	4.3%	0.0%	0.0%	0.0%	0.0%	0.2%	1.3%	0.0%	0.0%	0.8%	0.0%	0.0%	87.4%
2001	9.2%	0.0%	2.4%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.0%	0.0%	0.0%	0.0%	0.6%	85.8%
(89-01)	13.0%	1.5%	1.9%	5.4%	0.4%	1.0%	0.2%	6.1%	0.8%	1.3%	0.5%	0.2%	0.3%	4.2%	63.2%
(89-01)	13.0%	1.5%	1.9%	5.4%	0.4%	1.0%	0.2%	6.1%	0.8%	1.3%	0.5%	0.2%	0.3%	4.2%	63.2%

Table G.39. Percent distribution of Sooes Fall Fingerling chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1989	7.0%	1.3%	0.0%	0.0%	0.0%	4.4%	0.0%	1.9%	0.0%	1.9%	8.2%	0.0%	0.0%	0.0%	75.3%
1990	9.9%	2.8%	4.3%	14.2%	1.4%	0.7%	0.0%	17.7%	7.1%	2.1%	0.0%	1.4%	0.0%	3.5%	34.8%
1991	11.9%	0.0%	0.0%	9.9%	0.0%	1.7%	0.0%	5.2%	0.0%	2.0%	0.0%	0.0%	0.0%	4.9%	64.3%
1992	8.5%	0.0%	0.0%	9.5%	2.0%	0.0%	0.0%	19.3%	1.0%	3.4%	1.7%	0.3%	0.0%	2.4%	51.9%
1993	4.6%	0.0%	0.0%	7.6%	2.1%	2.1%	2.1%	16.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.8%	64.1%
1994	17.0%	3.0%	4.0%	10.5%	1.0%	0.0%	1.0%	8.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	55.5%
1995	8.5%	0.0%	0.0%	4.6%	0.0%	0.7%	0.0%	9.8%	0.0%	0.0%	0.0%	0.0%	2.6%	0.0%	73.9%
1996	8.7%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	90.3%
1997	10.3%	0.0%	5.2%	5.5%	0.7%	0.3%	0.0%	0.0%	1.4%	0.0%	2.8%	1.0%	23.4%	0.0%	49.3%
1998	9.0%	0.0%	1.5%	17.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	72.0%
1999	12.3%	0.0%	12.3%	4.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	70.5%
2000	0.0%	0.0%	2.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.7%	0.0%	0.0%	0.0%	86.9%
2001	5.7%	0.0%	1.9%	0.0%	0.0%	0.0%	1.3%	0.0%	1.3%	0.0%	1.9%	0.0%	0.0%	0.0%	88.0%
(89-01)	8.7%	0.5%	2.4%	6.4%	0.6%	0.8%	0.3%	6.0%	0.8%	0.7%	1.9%	0.2%	2.1%	0.9%	67.4%
(89-01)	8.7%	0.5%	2.4%	6.4%	0.6%	0.8%	0.3%	6.0%	0.8%	0.7%	1.9%	0.2%	2.1%	0.9%	67.4%

Table G.40. Percent distribution of Sooes Fall Fingerling chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1989	10.5%	3.7%	0.5%	3.2%	0.0%	3.7%	0.0%	4.7%	0.0%	2.1%	7.4%	0.0%	0.0%	1.6%	62.6%
1990	11.6%	7.0%	4.1%	16.3%	1.7%	0.6%	0.0%	17.4%	6.4%	1.7%	0.0%	1.7%	0.0%	2.9%	28.5%
1991	13.6%	0.0%	0.3%	10.7%	0.3%	1.6%	0.0%	7.2%	0.0%	1.9%	0.0%	0.0%	0.0%	5.1%	59.4%
1992	11.0%	0.3%	0.3%	10.7%	2.1%	0.0%	0.0%	20.4%	1.2%	3.0%	1.5%	0.3%	0.0%	2.4%	46.6%
1993	7.5%	0.4%	0.0%	7.9%	2.0%	2.0%	2.0%	16.9%	0.0%	0.0%	0.0%	0.4%	0.0%	1.2%	59.8%
1994	20.6%	7.5%	3.5%	9.6%	0.9%	0.0%	0.9%	7.5%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	48.7%
1995	14.4%	0.0%	0.0%	6.1%	0.0%	1.1%	0.0%	12.8%	0.0%	0.6%	0.0%	0.0%	2.2%	0.0%	62.8%
1996	15.5%	0.0%	0.0%	0.9%	0.0%	0.4%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	82.3%
1997	12.0%	0.0%	5.8%	5.8%	0.6%	0.3%	0.0%	0.0%	1.3%	0.3%	2.9%	1.0%	23.6%	0.0%	46.3%
1998	10.3%	0.0%	1.8%	19.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	68.7%
1999	13.4%	0.0%	14.2%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	66.8%
2000	0.0%	0.0%	4.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	13.5%	0.0%	0.0%	0.0%	82.0%
2001	9.0%	0.0%	2.4%	0.0%	0.0%	0.0%	1.8%	0.0%	1.5%	0.0%	2.1%	0.0%	0.0%	0.0%	83.2%
(89-01)	11.5%	1.4%	2.9%	7.3%	0.6%	0.7%	0.4%	6.7%	0.8%	0.7%	2.1%	0.3%	2.2%	1.0%	61.4%
(89-01)	11.5%	1.4%	2.9%	7.3%	0.6%	0.7%	0.4%	6.7%	0.8%	0.7%	2.1%	0.3%	2.2%	1.0%	61.4%

Table G.41. Percent distribution of Queets Fall Fingerling chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1981	9.2%	0.0%	0.0%	13.3%	2.0%	2.0%	0.0%	11.2%	0.0%	1.0%	0.0%	1.0%	30.6%	3.1%	26.5%
1982	11.6%	2.4%	0.0%	22.5%	0.0%	0.8%	1.2%	12.0%	0.0%	0.0%	0.0%	0.0%	25.3%	0.0%	24.1%
1983	31.4%	0.0%	0.0%	6.6%	0.0%	0.7%	0.0%	7.3%	0.0%	2.2%	0.0%	0.7%	24.8%	0.0%	26.3%
1984	15.1%	0.7%	0.0%	18.4%	0.0%	0.0%	2.0%	7.2%	0.0%	0.0%	0.0%	2.0%	27.0%	0.0%	27.6%
1985	15.3%	0.0%	0.0%	31.0%	0.0%	0.0%	0.0%	2.0%	0.0%	1.6%	0.0%	0.0%	14.1%	1.2%	34.9%
1986	17.2%	0.0%	1.0%	11.3%	1.7%	0.0%	0.0%	6.9%	0.0%	1.0%	0.0%	0.0%	9.6%	0.0%	51.2%
1987	22.3%	0.2%	0.0%	11.7%	0.9%	0.6%	0.9%	0.7%	0.0%	0.0%	0.0%	0.6%	22.6%	0.6%	39.0%
1988	14.6%	0.8%	1.7%	7.8%	2.5%	0.4%	0.0%	4.0%	0.0%	0.0%	1.1%	0.0%	16.6%	3.2%	47.3%
1989	10.7%	0.0%	0.0%	8.7%	0.5%	0.2%	1.0%	7.1%	0.0%	0.0%	0.0%	0.0%	26.9%	1.5%	43.4%
1990	12.6%	0.0%	0.0%	5.5%	0.3%	0.3%	1.8%	6.6%	0.0%	0.0%	0.0%	0.0%	13.9%	0.0%	59.0%
1991	17.8%	0.2%	0.9%	8.4%	0.0%	0.0%	1.1%	4.2%	0.0%	0.0%	0.0%	0.0%	13.6%	0.4%	53.5%
1992	8.3%	0.8%	2.2%	7.7%	0.0%	0.2%	1.9%	17.5%	0.0%	0.0%	0.0%	0.0%	19.2%	0.8%	41.5%
1993	15.5%	0.0%	0.7%	14.1%	0.3%	0.0%	2.1%	12.1%	0.0%	0.0%	0.0%	0.5%	16.0%	2.8%	35.8%
1994	15.6%	0.3%	0.5%	20.9%	0.2%	0.4%	1.5%	3.9%	0.3%	0.0%	1.0%	0.0%	20.6%	0.0%	35.0%
1995	17.2%	0.0%	1.6%	6.0%	0.0%	0.1%	2.0%	0.7%	0.3%	0.0%	0.4%	0.7%	33.2%	0.0%	37.8%
1996	11.8%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20.0%	0.6%	65.9%
1997	43.3%	0.4%	0.0%	7.6%	1.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	26.3%	0.0%	21.1%
1998	23.6%	0.0%	3.1%	19.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.9%	5.1%	37.3%
1999	26.2%	0.0%	3.9%	5.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.4%	0.4%	38.7%
2000	19.1%	0.0%	8.1%	8.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.2%	0.0%	61.0%
2001	15.9%	0.0%	3.9%	2.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	51.2%	0.5%	25.4%
(81-01)	17.8%	0.3%	1.4%	11.3%	0.5%	0.3%	0.7%	4.9%	0.0%	0.3%	0.1%	0.3%	21.5%	1.0%	39.6%
(85-01)	18.1%	0.2%	1.7%	10.4%	0.4%	0.1%	0.7%	3.9%	0.0%	0.2%	0.1%	0.1%	20.3%	1.0%	42.8%

Table G.42. Percent distribution of Queets Fall Fingerling chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1981	13.0%	0.0%	0.0%	15.7%	1.7%	1.7%	0.0%	11.3%	0.0%	0.9%	0.0%	1.7%	27.8%	3.5%	22.6%
1982	14.2%	2.2%	0.0%	22.8%	0.0%	0.7%	1.1%	11.6%	0.0%	0.0%	0.0%	0.0%	24.7%	0.0%	22.5%
1983	48.4%	0.0%	0.0%	5.3%	0.0%	0.5%	0.0%	5.3%	0.0%	2.1%	0.0%	0.5%	18.9%	0.0%	18.9%
1984	19.8%	0.6%	0.0%	19.2%	0.0%	0.0%	2.3%	7.0%	0.0%	0.0%	0.0%	2.3%	24.4%	0.0%	24.4%
1985	19.9%	0.0%	0.0%	33.0%	0.0%	0.0%	0.0%	2.0%	0.0%	1.3%	0.0%	0.0%	12.1%	1.7%	30.0%
1986	26.3%	0.0%	1.2%	10.8%	1.5%	0.0%	0.0%	6.7%	0.0%	0.9%	0.0%	0.0%	9.1%	0.0%	43.6%
1987	28.5%	0.5%	0.0%	11.6%	0.8%	0.5%	1.0%	1.3%	0.0%	0.0%	0.0%	0.5%	20.2%	0.7%	34.4%
1988	17.6%	2.4%	1.6%	9.3%	2.4%	0.4%	0.1%	5.3%	0.0%	0.0%	1.0%	0.0%	14.9%	3.4%	41.6%
1989	16.3%	0.1%	0.1%	10.1%	0.6%	0.3%	1.2%	8.5%	0.0%	0.0%	0.0%	0.0%	23.6%	1.6%	37.4%
1990	15.3%	0.1%	0.1%	6.4%	0.3%	0.3%	1.9%	7.1%	0.0%	0.0%	0.0%	0.0%	13.4%	0.0%	55.1%
1991	21.1%	0.3%	1.0%	8.9%	0.0%	0.0%	1.2%	4.4%	0.0%	0.0%	0.0%	0.0%	12.8%	0.4%	49.9%
1992	15.1%	2.2%	2.4%	8.7%	0.0%	0.1%	1.8%	18.0%	0.0%	0.0%	0.0%	0.0%	16.3%	0.8%	34.6%
1993	19.7%	0.0%	0.7%	15.3%	0.3%	0.0%	2.0%	13.0%	0.0%	0.0%	0.0%	0.4%	14.3%	2.9%	31.3%
1994	23.5%	0.6%	0.4%	20.4%	0.2%	0.3%	1.4%	3.9%	0.2%	0.0%	0.9%	0.0%	17.9%	0.0%	30.2%
1995	21.8%	0.0%	1.7%	7.3%	0.0%	0.1%	2.4%	0.8%	0.2%	0.0%	0.6%	0.7%	30.3%	0.0%	34.0%
1996	20.8%	0.0%	1.5%	1.0%	0.0%	0.0%	0.1%	0.4%	0.0%	0.0%	0.0%	0.0%	17.8%	0.6%	57.8%
1997	46.8%	0.6%	0.0%	7.5%	0.9%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	24.5%	0.0%	19.4%
1998	25.8%	0.0%	3.2%	19.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.2%	5.2%	34.9%
1999	34.4%	0.0%	5.8%	5.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	21.8%	0.6%	32.1%
2000	23.0%	0.0%	10.0%	9.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.1%	0.0%	54.8%
2001	19.4%	0.0%	3.9%	2.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	48.9%	0.4%	24.1%
(81-01)	23.4%	0.5%	1.6%	11.9%	0.4%	0.2%	0.8%	5.1%	0.0%	0.2%	0.1%	0.3%	19.4%	1.0%	34.9%
(85-01)	23.2%	0.4%	2.0%	11.0%	0.4%	0.1%	0.8%	4.2%	0.0%	0.1%	0.1%	0.1%	18.4%	1.1%	38.0%

Table G.43. Percent distribution of Cowlitz Tule chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1981	5.6%	0.0%	0.0%	2.4%	0.0%	1.3%	6.5%	16.1%	0.0%	2.4%	0.0%	9.7%	15.1%	12.9%	28.0%
1982	3.7%	0.0%	0.2%	1.4%	0.5%	2.1%	0.0%	14.5%	0.0%	1.2%	0.9%	18.5%	9.7%	12.5%	34.9%
1983	3.7%	0.0%	0.0%	6.7%	3.7%	0.5%	0.0%	17.8%	0.4%	0.5%	0.0%	6.9%	4.8%	18.7%	36.2%
1984	4.4%	0.0%	0.0%	7.2%	2.1%	0.1%	0.8%	24.5%	0.0%	1.7%	0.0%	4.4%	15.1%	3.6%	36.0%
1985	3.7%	0.3%	0.0%	4.0%	0.0%	4.4%	0.0%	11.4%	0.4%	1.2%	0.0%	4.4%	6.5%	13.7%	49.9%
1986	0.4%	0.1%	0.0%	0.2%	0.6%	0.8%	0.0%	12.6%	0.4%	1.1%	0.0%	13.0%	30.9%	12.5%	27.4%
1987	3.7%	0.3%	0.0%	3.9%	1.2%	0.0%	0.0%	9.6%	0.0%	0.8%	1.0%	11.4%	22.9%	16.1%	29.0%
1988	1.7%	0.3%	0.0%	1.9%	0.0%	0.1%	0.0%	15.9%	0.0%	0.6%	0.0%	15.5%	24.0%	12.4%	27.6%
1989	3.3%	0.0%	0.7%	4.5%	0.0%	0.3%	0.0%	6.6%	0.0%	1.0%	0.0%	17.8%	7.1%	10.6%	48.1%
1990	4.4%	0.0%	0.0%	1.8%	2.9%	2.6%	0.0%	14.2%	0.0%	0.7%	0.0%	9.5%	0.0%	12.0%	51.8%
1991	9.7%	0.0%	0.0%	3.2%	1.6%	0.0%	0.0%	5.6%	0.0%	0.0%	3.2%	10.5%	11.3%	9.7%	45.2%
1992	2.2%	0.0%	0.0%	0.0%	2.2%	0.0%	1.6%	17.7%	0.0%	0.0%	0.0%	7.0%	5.4%	4.8%	59.1%
1993	3.4%	0.0%	0.0%	2.5%	0.0%	0.9%	0.0%	6.7%	0.0%	0.0%	0.0%	17.5%	3.1%	22.4%	43.6%
1994	4.2%	0.0%	0.0%	1.9%	0.0%	0.0%	0.0%	1.9%	0.0%	0.0%	0.0%	3.3%	0.0%	0.0%	88.7%
1995	0.6%	0.0%	0.0%	1.8%	0.0%	1.2%	0.0%	1.8%	0.0%	0.0%	2.4%	4.7%	2.4%	1.8%	83.4%
1996	4.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.2%	0.0%	0.0%	5.9%	1.1%	3.7%	83.0%
1997	4.9%	0.0%	9.8%	3.0%	0.0%	0.0%	0.0%	4.9%	2.4%	0.0%	0.0%	5.5%	0.0%	1.2%	68.3%
1998	3.7%	0.0%	0.0%	7.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.9%	0.0%	2.5%	76.5%
1999	4.5%	0.0%	3.8%	0.0%	0.0%	0.0%	2.3%	3.8%	0.0%	0.0%	0.0%	9.0%	0.0%	18.0%	58.6%
2000	3.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.2%	0.0%	0.0%	12.4%	13.4%	5.2%	7.2%	51.5%
2001	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	2.6%	9.2%	1.4%	20.0%	65.1%
(81-01)	3.6%	0.0%	0.7%	2.6%	0.7%	0.7%	0.5%	9.2%	0.3%	0.5%	1.1%	9.9%	7.9%	10.3%	52.0%
(85-01)	3.4%	0.1%	0.8%	2.1%	0.5%	0.6%	0.2%	7.1%	0.3%	0.3%	1.3%	9.9%	7.1%	9.9%	56.3%

Table G.44. Percent distribution of Cowlitz Tule chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1981	6.1%	0.0%	0.0%	2.4%	0.0%	1.2%	6.4%	17.4%	0.0%	2.2%	0.0%	11.5%	14.4%	13.0%	25.4%
1982	4.4%	0.0%	0.4%	1.6%	0.4%	2.2%	0.0%	16.0%	0.0%	1.2%	1.0%	20.4%	9.6%	12.8%	30.1%
1983	4.4%	0.0%	0.0%	7.2%	3.9%	0.5%	0.0%	18.9%	0.3%	0.5%	0.0%	7.8%	4.7%	18.7%	33.2%
1984	4.5%	0.0%	0.0%	7.5%	2.3%	0.1%	0.9%	25.6%	0.0%	1.8%	0.0%	4.7%	14.8%	3.7%	34.2%
1985	4.1%	1.1%	0.0%	4.5%	0.0%	4.5%	0.0%	12.7%	0.4%	1.2%	0.0%	5.1%	6.4%	14.5%	45.7%
1986	0.5%	0.2%	0.0%	0.2%	0.7%	0.8%	0.0%	14.0%	0.3%	1.0%	0.0%	14.6%	30.1%	12.7%	24.9%
1987	6.0%	0.7%	0.0%	4.6%	1.4%	0.0%	0.0%	11.2%	0.0%	0.7%	0.9%	12.1%	21.2%	15.5%	25.6%
1988	1.8%	0.8%	0.0%	2.1%	0.0%	0.1%	0.0%	17.5%	0.0%	0.6%	0.0%	16.1%	22.8%	12.4%	25.8%
1989	4.4%	0.0%	0.7%	4.7%	0.0%	0.3%	0.0%	7.2%	0.0%	1.0%	0.0%	18.8%	6.9%	10.8%	45.4%
1990	4.4%	0.0%	0.0%	2.4%	3.4%	2.7%	0.0%	15.5%	0.0%	1.0%	0.0%	10.1%	0.0%	12.8%	47.8%
1991	12.3%	0.0%	0.0%	3.6%	1.4%	0.0%	0.0%	6.5%	0.0%	0.0%	3.6%	11.6%	10.9%	9.4%	40.6%
1992	2.5%	0.0%	0.0%	0.0%	2.5%	0.0%	2.0%	20.2%	0.0%	0.0%	0.0%	7.9%	5.4%	5.4%	54.2%
1993	4.2%	0.0%	0.0%	3.1%	0.0%	1.1%	0.0%	7.8%	0.0%	0.0%	0.0%	19.2%	3.1%	22.2%	39.4%
1994	5.0%	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%	3.7%	0.0%	0.0%	86.7%
1995	1.1%	0.0%	0.0%	2.8%	0.0%	1.1%	0.0%	2.2%	0.0%	2.2%	3.3%	5.5%	2.2%	1.7%	77.9%
1996	5.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%	0.0%	0.0%	6.8%	1.1%	3.9%	80.3%
1997	5.1%	0.0%	10.9%	3.4%	0.0%	0.0%	0.0%	5.7%	2.9%	1.1%	0.0%	5.7%	0.0%	1.1%	64.0%
1998	4.8%	0.0%	0.0%	8.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.7%	0.0%	2.4%	73.8%
1999	6.9%	0.0%	4.2%	0.0%	0.0%	0.0%	3.5%	3.5%	0.0%	0.0%	0.0%	9.7%	0.0%	18.1%	54.2%
2000	3.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.3%	0.0%	0.0%	15.5%	16.4%	4.5%	7.3%	45.5%
2001	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	0.0%	3.0%	10.7%	1.3%	21.0%	61.9%
(81-01)	4.4%	0.1%	0.8%	2.9%	0.8%	0.7%	0.6%	10.1%	0.3%	0.7%	1.3%	10.9%	7.6%	10.4%	48.4%
(85-01)	4.3%	0.2%	0.9%	2.5%	0.6%	0.6%	0.3%	7.9%	0.4%	0.5%	1.6%	10.9%	6.8%	10.1%	52.6%

Table G.45. Percent distribution of Columbia Lower River Hatchery chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1980	0.8%	0.0%	0.0%	0.0%	0.5%	1.3%	0.0%	16.0%	3.4%	6.4%	1.3%	18.3%	9.8%	22.4%	19.8%
1981	0.0%	0.0%	0.0%	0.0%	0.5%	0.1%	0.0%	30.6%	1.8%	2.4%	0.3%	22.6%	1.9%	11.6%	28.2%
1982	0.0%	0.0%	0.0%	0.3%	1.8%	0.0%	0.0%	26.0%	0.8%	0.3%	0.5%	18.6%	16.4%	9.0%	26.5%
1983	0.0%	0.0%	0.0%	0.0%	2.3%	0.3%	0.1%	35.0%	1.4%	0.6%	0.4%	11.2%	6.8%	8.5%	33.4%
1984	0.0%	0.0%	0.0%	0.0%	3.2%	0.0%	0.0%	49.9%	1.3%	1.6%	0.3%	5.9%	11.3%	3.7%	22.7%
1985	0.0%	0.0%	0.0%	0.0%	0.9%	0.4%	0.0%	28.2%	1.1%	1.2%	0.7%	15.6%	4.1%	5.8%	41.9%
1986	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.1%	8.9%	2.4%	7.3%	2.6%	6.7%	13.1%	11.3%	46.9%
1987	0.0%	0.0%	0.0%	0.2%	1.6%	0.0%	0.0%	26.9%	0.5%	0.2%	2.5%	16.6%	20.7%	9.5%	21.3%
1988	0.3%	0.0%	0.0%	0.3%	0.6%	0.0%	0.0%	28.8%	1.0%	0.0%	2.4%	11.5%	24.3%	3.2%	27.6%
1989	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.4%	0.0%	2.0%	0.0%	22.4%	5.9%	5.1%	49.2%
1990	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	19.8%	0.0%	1.7%	0.0%	16.3%	0.3%	11.1%	50.3%
1991	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	10.0%	0.7%	2.5%	2.0%	9.3%	2.3%	15.0%	58.0%
1992	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	16.3%	0.0%	1.0%	1.9%	28.0%	0.8%	11.0%	40.5%
1993	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	18.4%	0.0%	0.0%	4.5%	19.7%	2.0%	11.1%	43.6%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	27.6%	10.3%	0.0%	0.0%	0.0%	0.0%	0.0%	62.1%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.3%	10.0%	86.7%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.1%	6.5%	0.0%	85.5%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.5%	2.9%	0.0%	3.9%	8.7%	1.0%	11.2%	55.8%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.0%	1.0%	0.0%	0.0%	5.1%	1.0%	2.0%	23.2%	63.6%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	9.1%	6.8%	3.3%	9.8%	68.7%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.9%	2.1%	0.0%	16.7%	2.1%	2.6%	4.3%	56.2%
2001	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.8%	0.2%	0.0%	3.2%	18.4%	1.4%	16.8%	52.3%
(80-01)	0.0%	0.0%	0.0%	0.0%	0.6%	0.1%	0.2%	18.2%	1.4%	1.2%	2.6%	12.2%	6.3%	9.7%	47.3%
(85-01)	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.2%	14.3%	1.3%	0.9%	3.2%	11.3%	5.5%	9.3%	53.6%

Table G.46. Percent distribution of Columbia Lower River Hatchery chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1980	0.4%	0.0%	0.0%	0.1%	0.7%	0.9%	0.0%	28.7%	2.1%	4.5%	1.0%	24.2%	7.0%	18.7%	11.5%
1981	0.0%	0.0%	0.0%	0.0%	0.5%	0.1%	0.0%	31.5%	1.7%	2.2%	0.3%	25.8%	1.8%	11.8%	24.3%
1982	0.0%	0.0%	0.0%	0.3%	1.9%	0.0%	0.0%	27.2%	0.8%	0.3%	0.5%	20.6%	15.7%	9.1%	23.5%
1983	0.0%	0.0%	0.0%	0.0%	2.4%	0.3%	0.1%	37.0%	1.3%	0.5%	0.4%	12.3%	6.7%	9.6%	29.4%
1984	0.0%	0.0%	0.0%	0.0%	3.4%	0.0%	0.0%	51.6%	1.3%	1.6%	0.2%	6.3%	11.1%	4.1%	20.4%
1985	0.0%	0.0%	0.0%	0.0%	0.9%	0.4%	0.0%	30.3%	1.1%	1.2%	0.7%	17.7%	4.1%	5.9%	37.7%
1986	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.2%	8.4%	1.9%	6.2%	2.8%	6.2%	12.4%	27.9%	33.4%
1987	0.0%	0.0%	0.0%	0.2%	1.9%	0.0%	0.0%	33.0%	0.5%	0.2%	2.3%	17.3%	18.4%	8.6%	17.6%
1988	0.3%	0.0%	0.0%	0.3%	0.6%	0.0%	0.0%	31.2%	1.0%	0.0%	2.4%	11.8%	23.2%	3.2%	25.9%
1989	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	17.0%	0.0%	1.8%	0.0%	25.3%	5.4%	5.4%	45.1%
1990	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	22.9%	0.0%	1.5%	0.0%	18.3%	0.3%	11.8%	44.9%
1991	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	12.4%	1.0%	2.4%	2.4%	11.0%	2.4%	16.8%	51.3%
1992	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	19.6%	0.0%	0.8%	1.8%	30.5%	0.8%	10.7%	35.2%
1993	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%	20.9%	0.0%	0.0%	4.3%	20.9%	1.9%	11.3%	40.0%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	31.3%	12.5%	0.0%	0.0%	0.0%	0.0%	0.0%	56.3%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.2%	0.0%	0.0%	3.2%	9.7%	83.9%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.5%	6.3%	0.0%	84.1%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20.4%	3.1%	0.4%	3.6%	9.3%	0.9%	11.1%	51.1%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.5%	0.9%	0.0%	0.0%	5.6%	0.9%	1.9%	24.3%	58.9%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.2%	0.0%	0.0%	10.0%	8.1%	3.4%	10.3%	65.9%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.2%	2.6%	0.0%	20.7%	2.3%	2.3%	6.8%	49.2%
2001	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.9%	0.2%	0.0%	3.7%	21.2%	1.4%	17.5%	48.1%
(80-01)	0.0%	0.0%	0.0%	0.0%	0.6%	0.1%	0.4%	20.5%	1.4%	1.2%	2.9%	13.6%	5.9%	10.7%	42.6%
(85-01)	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.5%	16.1%	1.4%	1.0%	3.5%	12.4%	5.2%	10.7%	48.8%

Table G.47. Percent distribution of Spring Creek Tule chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	0.0%	0.0%	0.0%	0.1%	0.6%	0.3%	0.0%	23.5%	1.4%	2.4%	0.1%	17.5%	23.0%	13.1%	17.9%
1980	0.1%	0.0%	0.0%	0.1%	0.5%	0.1%	0.0%	25.4%	2.8%	1.0%	0.1%	23.5%	23.6%	10.2%	12.6%
1981	0.0%	0.0%	0.0%	0.1%	0.2%	0.1%	0.0%	21.0%	1.5%	1.9%	0.1%	23.5%	20.7%	12.6%	18.3%
1982	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	22.0%	1.0%	0.2%	0.0%	19.6%	35.6%	8.3%	12.7%
1983	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	29.8%	1.1%	0.0%	0.5%	8.4%	20.2%	9.8%	29.7%
1984	0.0%	0.0%	0.0%	0.0%	2.4%	0.0%	0.0%	27.5%	0.0%	1.3%	0.4%	6.0%	25.9%	7.4%	29.1%
1985	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	14.2%	0.0%	0.2%	0.7%	13.8%	27.2%	4.0%	39.7%
1986	0.0%	0.0%	0.0%	0.0%	2.9%	0.0%	0.0%	20.6%	1.9%	1.6%	2.5%	2.5%	36.2%	7.9%	23.8%
1987	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.9%	0.0%	0.0%	0.0%	14.0%	38.6%	20.2%	19.3%
1988	0.0%	0.0%	0.0%	0.5%	0.3%	0.2%	0.0%	23.2%	0.9%	1.9%	2.2%	18.2%	31.0%	10.3%	11.3%
1989	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	14.4%	0.4%	0.4%	3.2%	24.8%	34.5%	8.3%	13.8%
1990	0.0%	0.0%	0.0%	0.2%	0.3%	0.1%	0.0%	17.6%	0.7%	0.8%	4.5%	14.3%	23.0%	13.1%	25.3%
1991	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%	13.1%	0.2%	0.4%	1.3%	16.9%	34.2%	11.0%	22.5%
1992	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	11.9%	0.6%	0.5%	2.5%	26.5%	14.7%	11.8%	31.3%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	17.7%	0.0%	0.4%	4.2%	17.7%	21.4%	10.5%	28.2%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	18.6%	0.0%	0.8%	3.9%	3.5%	28.9%	0.8%	43.4%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.7%	0.0%	0.2%	2.7%	1.8%	37.9%	0.0%	50.7%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.1%	6.1%	57.8%	3.3%	29.7%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.9%	0.0%	0.0%	2.7%	5.4%	24.4%	11.8%	43.9%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.5%	2.8%	15.0%	12.7%	68.6%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.3%	0.0%	3.7%	16.5%	37.9%	9.0%	32.3%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.8%	0.0%	0.0%	6.4%	5.5%	21.6%	9.6%	53.1%
2001	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.8%	0.4%	0.0%	1.1%	16.7%	28.1%	15.9%	34.0%
(79-01)	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	14.6%	0.6%	0.6%	2.0%	13.3%	28.8%	9.6%	30.1%
(85-01)	0.0%	0.0%	0.0%	0.1%	0.2%	0.0%	0.0%	11.0%	0.3%	0.4%	2.7%	12.2%	30.1%	9.4%	33.6%

Table G.48. Percent distribution of Spring Creek Tule chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	0.0%	0.0%	0.0%	0.1%	0.7%	0.2%	0.0%	25.0%	1.3%	2.3%	0.1%	19.5%	21.6%	14.0%	15.3%
1980	0.1%	0.0%	0.0%	0.1%	0.5%	0.1%	0.0%	26.4%	2.5%	0.9%	0.1%	25.2%	22.2%	11.1%	10.7%
1981	0.0%	0.0%	0.0%	0.1%	0.2%	0.1%	0.0%	21.7%	1.4%	1.8%	0.2%	25.1%	20.0%	13.1%	16.4%
1982	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	22.6%	1.0%	0.2%	0.0%	22.1%	33.9%	8.2%	11.4%
1983	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	31.5%	1.1%	0.0%	0.5%	9.1%	18.9%	12.1%	26.4%
1984	0.0%	0.0%	0.0%	0.0%	2.4%	0.0%	0.0%	27.2%	0.0%	1.2%	0.4%	6.1%	24.6%	12.6%	25.5%
1985	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	15.3%	0.0%	0.2%	0.6%	16.0%	27.0%	4.1%	36.6%
1986	0.0%	0.0%	0.0%	0.0%	2.9%	0.0%	0.0%	21.8%	1.8%	1.8%	2.7%	2.7%	35.4%	8.8%	22.1%
1987	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	0.0%	15.3%	40.0%	20.0%	14.7%
1988	0.0%	0.0%	0.0%	0.5%	0.3%	0.3%	0.0%	26.3%	1.0%	1.5%	2.4%	19.1%	27.6%	12.0%	9.0%
1989	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	16.6%	0.5%	0.4%	3.2%	26.9%	32.1%	8.3%	11.9%
1990	0.0%	0.0%	0.0%	0.2%	0.4%	0.1%	0.0%	19.9%	0.7%	0.8%	4.7%	15.5%	21.2%	14.6%	21.7%
1991	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%	15.3%	0.3%	0.4%	1.3%	18.7%	32.2%	11.7%	19.7%
1992	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	14.1%	0.7%	0.5%	2.4%	28.8%	13.8%	11.8%	27.6%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	19.8%	0.0%	0.3%	4.2%	19.3%	19.8%	11.5%	25.0%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	21.9%	0.0%	0.9%	4.1%	3.9%	28.5%	1.0%	39.7%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.7%	0.0%	2.3%	3.9%	2.1%	36.6%	0.0%	45.5%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	3.8%	7.1%	57.8%	3.6%	27.6%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	14.8%	0.0%	0.8%	2.6%	5.8%	23.5%	12.3%	40.2%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.6%	3.4%	15.6%	14.9%	65.2%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.3%	0.0%	3.8%	19.2%	37.6%	9.1%	29.7%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.9%	0.0%	0.0%	8.4%	6.3%	20.7%	13.6%	47.1%
2001	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.8%	0.4%	0.0%	1.2%	19.1%	27.5%	17.1%	30.8%
(79-01)	0.0%	0.0%	0.0%	0.1%	0.4%	0.0%	0.0%	16.0%	0.6%	0.7%	2.2%	14.6%	27.7%	10.7%	27.0%
(85-01)	0.0%	0.0%	0.0%	0.1%	0.3%	0.0%	0.0%	12.6%	0.3%	0.6%	2.9%	13.5%	29.2%	10.3%	30.2%

Table G.49. Percent distribution of Columbia River Summer chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	10.7%	0.0%	1.1%	6.7%	2.2%	9.0%	0.0%	15.2%	7.3%	1.7%	0.0%	0.0%	4.5%	4.5%	37.1%
1980	32.8%	0.0%	0.9%	8.7%	3.9%	1.2%	0.0%	16.7%	0.0%	0.0%	0.0%	1.5%	0.6%	0.0%	33.7%
1987	13.7%	0.0%	0.0%	5.6%	4.8%	4.0%	3.2%	0.0%	0.0%	0.0%	0.0%	20.2%	15.3%	0.0%	33.1%
1988	1.2%	0.8%	0.0%	7.9%	0.0%	7.9%	2.0%	16.7%	0.0%	1.6%	4.4%	3.6%	15.9%	3.2%	34.9%
1989	4.6%	0.5%	0.6%	4.9%	0.6%	0.3%	0.6%	14.5%	1.4%	2.2%	2.3%	13.9%	8.2%	2.5%	43.0%
1990	9.9%	0.0%	0.0%	6.8%	1.1%	1.3%	0.0%	19.9%	0.6%	0.4%	0.0%	5.8%	11.0%	2.5%	40.7%
1991	3.9%	0.0%	0.0%	2.2%	0.5%	1.6%	0.0%	5.7%	0.0%	1.1%	0.7%	3.4%	3.9%	2.2%	74.7%
1992	13.5%	0.0%	0.0%	3.3%	2.0%	1.0%	0.0%	14.1%	0.7%	0.0%	0.0%	6.3%	1.3%	1.3%	56.6%
1993	7.1%	0.0%	0.0%	1.4%	0.0%	2.4%	0.0%	14.3%	0.0%	0.0%	1.9%	5.2%	3.3%	1.4%	62.9%
1994	13.2%	0.0%	0.0%	0.0%	0.0%	0.0%	13.2%	0.0%	0.0%	0.0%	0.0%	0.0%	10.5%	0.0%	63.2%
1995	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.6%	0.0%	0.0%	0.0%	2.0%	1.3%	0.0%	89.5%
1996	13.3%	0.3%	0.0%	0.0%	0.0%	2.8%	0.0%	0.0%	2.2%	0.0%	0.0%	2.8%	3.9%	4.2%	70.6%
1997	8.5%	0.1%	3.6%	0.3%	0.0%	0.4%	0.9%	1.8%	0.0%	0.0%	0.0%	3.2%	1.3%	0.8%	79.1%
1998	8.9%	0.1%	0.9%	0.5%	0.0%	0.1%	0.5%	0.0%	0.0%	0.0%	0.6%	1.9%	5.2%	1.0%	80.3%
1999	10.1%	2.7%	1.8%	0.4%	0.0%	0.6%	2.7%	0.6%	0.0%	0.0%	5.0%	8.5%	1.2%	3.4%	62.9%
2000	20.5%	1.3%	2.5%	0.4%	0.0%	0.0%	1.4%	4.2%	0.6%	0.1%	4.8%	2.9%	1.0%	3.8%	56.5%
2001	14.4%	2.9%	1.5%	0.5%	0.0%	0.0%	1.5%	12.6%	0.2%	0.0%	4.5%	18.0%	0.8%	6.4%	36.7%
(79-01)	11.1%	0.5%	0.8%	2.9%	0.9%	1.9%	1.5%	8.3%	0.8%	0.4%	1.4%	5.8%	5.2%	2.2%	56.2%
(85-01)	9.7%	0.6%	0.7%	2.3%	0.6%	1.5%	1.7%	7.3%	0.4%	0.4%	1.6%	6.5%	5.6%	2.2%	59.0%

Table G.50. Percent distribution of Columbia River Summer chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	13.8%	0.0%	1.0%	7.6%	3.3%	8.1%	1.4%	16.7%	6.7%	1.4%	0.0%	0.5%	3.8%	4.3%	31.4%
1980	32.9%	0.0%	0.9%	8.9%	4.0%	1.2%	0.0%	17.3%	0.0%	0.0%	0.0%	1.7%	0.6%	0.0%	32.6%
1987	16.0%	0.0%	0.0%	8.0%	3.7%	4.3%	2.5%	7.4%	0.0%	0.0%	0.6%	19.8%	11.7%	0.6%	25.3%
1988	2.0%	2.3%	0.0%	10.4%	0.0%	7.8%	2.0%	21.2%	0.0%	1.3%	4.2%	3.6%	13.7%	2.9%	28.7%
1989	6.8%	2.0%	0.7%	5.4%	0.7%	0.3%	0.5%	16.0%	1.4%	1.9%	2.3%	14.5%	7.3%	2.4%	37.8%
1990	10.8%	0.0%	0.0%	7.7%	1.1%	1.4%	0.0%	20.7%	0.6%	0.3%	0.0%	5.8%	10.5%	2.6%	38.4%
1991	4.1%	0.0%	0.0%	2.3%	0.5%	1.7%	0.0%	6.3%	0.0%	1.1%	0.7%	3.6%	4.0%	2.3%	73.4%
1992	17.5%	0.0%	0.0%	3.3%	1.8%	0.9%	0.0%	14.8%	0.6%	0.0%	0.0%	6.3%	1.2%	1.5%	52.0%
1993	7.8%	0.0%	0.0%	1.4%	0.0%	2.8%	0.0%	15.6%	0.0%	0.0%	1.8%	5.5%	3.2%	1.4%	60.6%
1994	16.7%	0.0%	0.0%	0.0%	0.0%	0.0%	16.7%	0.0%	0.0%	0.0%	0.0%	0.0%	9.5%	0.0%	57.1%
1995	3.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.5%	0.0%	3.6%	0.0%	2.4%	2.4%	0.0%	81.5%
1996	21.2%	0.7%	0.0%	0.2%	0.0%	3.1%	1.6%	0.0%	2.6%	0.2%	0.0%	3.1%	3.3%	4.0%	60.0%
1997	9.7%	0.1%	4.0%	0.2%	0.0%	0.5%	1.3%	2.0%	0.0%	0.2%	0.0%	3.6%	1.2%	1.0%	76.3%
1998	10.6%	0.5%	1.2%	0.5%	0.0%	0.1%	0.7%	0.0%	0.0%	0.0%	0.6%	2.2%	5.1%	1.0%	77.5%
1999	14.0%	5.2%	2.8%	0.4%	0.0%	0.6%	3.9%	0.5%	0.0%	0.0%	5.5%	9.2%	1.1%	3.2%	53.5%
2000	25.1%	2.9%	2.8%	0.4%	0.0%	0.0%	1.6%	3.9%	0.7%	0.1%	4.9%	3.0%	1.0%	3.7%	50.0%
2001	16.0%	5.3%	1.4%	0.5%	0.0%	0.0%	1.7%	11.7%	0.2%	0.0%	4.6%	17.6%	0.7%	6.8%	33.4%
(79-01)	13.4%	1.1%	0.9%	3.4%	0.9%	1.9%	2.0%	9.4%	0.7%	0.6%	1.5%	6.0%	4.7%	2.2%	51.1%
(85-01)	12.1%	1.3%	0.9%	2.7%	0.5%	1.6%	2.2%	8.4%	0.4%	0.6%	1.7%	6.7%	5.1%	2.2%	53.7%

Table G.51. Percent distribution of Willamette Spring chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1980	6.5%	0.9%	0.3%	11.0%	0.3%	0.8%	0.1%	4.7%	0.0%	0.1%	0.0%	0.9%	0.6%	15.8%	57.9%
1981	8.7%	1.1%	0.2%	12.0%	0.8%	0.2%	0.0%	2.7%	0.0%	0.0%	0.0%	0.7%	3.1%	18.4%	52.2%
1982	4.1%	1.1%	0.1%	6.6%	0.1%	0.3%	0.1%	4.1%	0.0%	0.0%	0.0%	1.1%	7.3%	24.9%	50.1%
1983	12.8%	0.1%	0.0%	12.0%	0.3%	0.0%	0.0%	1.9%	0.8%	0.0%	0.0%	1.9%	6.5%	21.2%	42.6%
1984	4.0%	0.3%	0.3%	2.1%	0.1%	0.1%	0.1%	1.9%	0.1%	0.0%	0.0%	1.0%	6.2%	23.9%	59.8%
1985	5.1%	0.1%	0.0%	0.5%	0.2%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.3%	18.3%	20.5%	54.6%
1986	3.1%	0.4%	0.0%	6.6%	0.6%	2.5%	0.0%	5.5%	0.0%	0.0%	0.6%	0.0%	9.2%	17.1%	54.4%
1987	9.8%	0.0%	0.6%	13.3%	0.8%	1.1%	0.0%	0.9%	0.0%	0.0%	1.3%	2.4%	6.3%	27.0%	36.5%
1988	8.6%	0.2%	0.4%	6.2%	0.6%	0.1%	0.0%	3.1%	0.0%	0.0%	0.0%	2.2%	6.9%	28.8%	42.9%
1989	4.4%	0.0%	0.2%	1.8%	0.0%	0.1%	0.0%	1.4%	0.5%	0.2%	0.5%	1.5%	12.6%	20.3%	56.6%
1990	6.3%	0.3%	0.2%	1.4%	0.2%	0.5%	0.2%	2.1%	0.0%	0.1%	0.7%	1.3%	17.0%	27.7%	42.0%
1991	3.1%	1.2%	0.6%	1.7%	0.0%	0.2%	0.0%	0.4%	0.2%	0.0%	0.2%	0.7%	6.0%	42.8%	43.0%
1992	3.5%	1.3%	0.2%	1.7%	0.0%	0.2%	0.2%	2.7%	0.0%	0.1%	0.2%	2.4%	5.8%	31.3%	50.4%
1993	8.1%	0.0%	0.0%	1.3%	0.0%	0.0%	0.1%	1.4%	0.0%	0.0%	0.2%	1.5%	0.8%	43.1%	43.5%
1994	4.1%	0.3%	0.9%	0.7%	0.2%	0.2%	0.1%	0.6%	0.0%	0.0%	0.0%	0.2%	5.1%	38.9%	48.7%
1995	2.8%	0.1%	0.3%	1.0%	0.0%	0.3%	0.0%	0.3%	0.0%	0.0%	0.1%	0.0%	0.3%	43.8%	50.9%
1996	2.2%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	1.2%	7.9%	88.6%
1997	3.6%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.8%	15.8%	79.0%
1998	4.2%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.4%	16.4%	78.5%
1999	4.8%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.9%	16.2%	77.1%
2000	7.9%	0.1%	0.5%	0.1%	0.0%	0.0%	0.3%	0.3%	0.0%	0.0%	0.3%	0.3%	2.5%	29.9%	57.9%
2001	1.6%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.1%	0.4%	4.2%	22.8%	70.1%
(80-01)	5.4%	0.3%	0.2%	3.7%	0.2%	0.3%	0.1%	1.6%	0.1%	0.0%	0.2%	0.9%	5.5%	25.2%	56.2%
(85-01)	4.9%	0.2%	0.3%	2.2%	0.1%	0.3%	0.0%	1.2%	0.0%	0.0%	0.3%	0.8%	5.8%	26.5%	57.3%

Table G.52. Percent distribution of Willamette Spring chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1980	8.9%	1.0%	0.4%	13.2%	0.4%	0.8%	0.1%	5.4%	0.0%	0.1%	0.0%	1.2%	0.7%	15.4%	52.5%
1981	10.9%	1.1%	0.3%	13.5%	0.8%	0.2%	0.0%	3.0%	0.0%	0.0%	0.0%	0.8%	3.0%	18.2%	48.1%
1982	5.8%	1.2%	0.2%	7.7%	0.1%	0.4%	0.1%	4.8%	0.0%	0.0%	0.0%	1.3%	7.0%	24.9%	46.4%
1983	19.0%	0.1%	0.0%	13.2%	0.3%	0.0%	0.0%	2.0%	0.8%	0.0%	0.0%	2.1%	5.9%	19.9%	36.7%
1984	4.6%	0.3%	0.4%	2.5%	0.1%	0.1%	0.1%	2.1%	0.1%	0.0%	0.0%	1.2%	6.3%	24.7%	57.6%
1985	7.9%	0.3%	0.0%	0.5%	0.2%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.3%	17.7%	20.8%	51.8%
1986	4.9%	1.2%	0.0%	7.5%	0.7%	2.6%	0.0%	6.2%	0.0%	0.0%	0.7%	0.0%	8.8%	17.1%	50.3%
1987	18.7%	0.0%	1.0%	15.4%	1.2%	1.0%	0.0%	1.5%	0.0%	0.0%	1.2%	3.1%	5.3%	23.1%	28.5%
1988	12.0%	0.5%	0.6%	8.2%	0.8%	0.0%	0.0%	3.8%	0.0%	0.0%	0.0%	2.5%	6.8%	27.2%	37.7%
1989	5.8%	0.0%	0.3%	2.2%	0.0%	0.1%	0.0%	1.7%	0.6%	0.1%	0.6%	1.8%	12.4%	20.7%	53.8%
1990	10.3%	0.8%	0.3%	2.0%	0.2%	0.5%	0.2%	2.7%	0.0%	0.1%	0.7%	1.5%	15.8%	26.8%	38.0%
1991	4.2%	3.0%	0.7%	2.1%	0.0%	0.2%	0.0%	0.4%	0.2%	0.0%	0.2%	0.8%	5.8%	42.4%	39.8%
1992	7.8%	3.3%	0.3%	2.1%	0.0%	0.1%	0.2%	3.2%	0.0%	0.1%	0.3%	2.8%	5.4%	30.0%	44.5%
1993	13.9%	0.0%	0.0%	1.6%	0.0%	0.0%	0.1%	1.7%	0.0%	0.0%	0.2%	1.7%	0.8%	41.2%	38.8%
1994	5.9%	0.7%	1.1%	0.9%	0.3%	0.2%	0.1%	0.8%	0.0%	0.0%	0.0%	0.2%	5.0%	39.1%	45.7%
1995	5.3%	0.1%	0.4%	1.5%	0.0%	0.4%	0.0%	0.5%	0.0%	0.0%	0.2%	0.1%	0.3%	43.8%	47.5%
1996	3.4%	0.0%	0.0%	0.2%	0.0%	0.3%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	1.2%	8.2%	86.6%
1997	4.4%	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.8%	16.5%	77.1%
1998	5.8%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.2%	0.4%	17.2%	75.7%
1999	10.2%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	0.9%	16.1%	70.9%
2000	14.9%	0.2%	1.1%	0.1%	0.0%	0.0%	0.4%	0.4%	0.0%	0.0%	0.4%	0.3%	2.4%	28.6%	51.2%
2001	2.0%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.1%	0.4%	4.5%	23.9%	68.2%
(80-01)	8.5%	0.6%	0.4%	4.3%	0.2%	0.3%	0.1%	1.9%	0.1%	0.0%	0.3%	1.0%	5.3%	24.8%	52.1%
(85-01)	8.1%	0.6%	0.4%	2.7%	0.2%	0.3%	0.1%	1.4%	0.0%	0.0%	0.3%	0.9%	5.5%	26.0%	53.3%

Table G.53. Percent distribution of Lewis River Wild chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1981	6.4%	0.0%	0.0%	3.3%	1.4%	0.2%	2.1%	6.0%	0.0%	0.7%	0.0%	2.0%	4.2%	15.8%	57.8%
1982	6.0%	1.3%	0.2%	3.0%	1.4%	0.8%	0.0%	10.8%	0.4%	0.8%	0.0%	4.1%	6.2%	23.1%	41.9%
1986	4.9%	0.0%	0.0%	1.6%	2.2%	0.9%	0.0%	6.7%	0.0%	0.0%	2.5%	3.3%	26.5%	12.2%	39.2%
1987	4.0%	0.0%	0.0%	4.7%	1.3%	0.0%	0.0%	8.3%	0.0%	0.0%	0.9%	2.7%	25.3%	6.2%	46.7%
1988	4.4%	0.0%	0.0%	2.9%	0.0%	0.5%	0.0%	8.9%	0.0%	0.1%	0.0%	4.6%	23.0%	16.8%	38.7%
1989	1.8%	0.2%	0.2%	4.4%	0.2%	0.7%	0.5%	5.1%	0.0%	0.8%	0.5%	4.9%	9.4%	7.3%	63.9%
1990	5.4%	0.0%	0.0%	1.7%	0.4%	0.6%	0.6%	12.1%	0.0%	0.0%	0.8%	3.9%	3.3%	5.2%	65.9%
1991	6.0%	0.1%	0.0%	3.8%	0.5%	0.0%	1.1%	5.9%	0.0%	0.7%	0.0%	2.4%	15.8%	7.1%	56.6%
1992	1.6%	0.0%	0.0%	3.8%	1.8%	0.0%	0.7%	6.1%	0.0%	0.0%	0.0%	2.9%	4.5%	23.5%	55.0%
1993	3.6%	0.0%	1.0%	4.9%	0.0%	0.3%	0.0%	7.5%	0.0%	1.6%	0.0%	0.8%	6.7%	9.3%	64.2%
1994	6.4%	0.0%	0.0%	3.2%	0.0%	0.0%	0.0%	3.2%	0.0%	1.6%	0.0%	0.8%	1.6%	0.0%	83.2%
1995	6.6%	0.0%	2.3%	3.2%	0.0%	0.4%	0.0%	5.3%	0.0%	0.0%	0.0%	0.0%	0.0%	24.6%	57.6%
1996	7.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.8%	0.9%	4.6%	84.0%
1997	12.6%	0.0%	0.0%	3.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.6%	80.7%
1998	8.1%	0.0%	0.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	2.0%	84.8%
1999	11.8%	0.0%	0.0%	5.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	82.4%
2000	3.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.9%	0.0%	80.0%
2001	5.0%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	8.7%	0.0%	0.0%	2.3%	6.4%	2.3%	5.5%	68.5%
(81-01)	5.9%	0.1%	0.3%	2.9%	0.5%	0.2%	0.3%	5.2%	0.0%	0.3%	0.4%	2.3%	8.3%	9.3%	63.9%
(85-01)	5.8%	0.0%	0.3%	2.9%	0.4%	0.2%	0.2%	4.9%	0.0%	0.3%	0.4%	2.2%	8.7%	8.0%	65.7%

Table G.54. Percent distribution of Lewis River Wild chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other fisheries: Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	Escapement
1981	7.6%	0.0%	0.0%	3.7%	1.6%	0.2%	2.2%	7.1%	0.0%	0.7%	0.0%	2.5%	4.2%	16.4%	53.9%
1982	7.5%	1.2%	0.2%	3.3%	1.5%	0.7%	0.0%	11.1%	0.4%	0.7%	0.0%	4.3%	6.1%	23.3%	39.6%
1986	6.4%	0.0%	0.0%	2.2%	2.2%	1.0%	0.0%	8.0%	0.0%	0.0%	2.6%	3.8%	25.5%	12.2%	36.2%
1987	5.7%	0.0%	0.0%	5.3%	1.4%	0.0%	0.0%	9.4%	0.0%	0.0%	1.0%	2.8%	24.6%	6.3%	43.4%
1988	5.3%	0.0%	0.0%	3.5%	0.0%	0.5%	0.0%	10.6%	0.0%	0.1%	0.0%	5.1%	22.1%	17.1%	35.7%
1989	2.4%	0.6%	0.3%	5.1%	0.2%	0.7%	0.4%	5.9%	0.0%	0.8%	0.5%	5.4%	9.3%	7.6%	60.7%
1990	7.7%	0.0%	0.0%	1.9%	0.5%	0.7%	0.6%	13.3%	0.0%	0.0%	0.8%	4.2%	3.2%	5.4%	61.7%
1991	7.1%	0.3%	0.0%	4.1%	0.4%	0.0%	1.2%	6.4%	0.0%	0.7%	0.0%	2.5%	15.5%	7.3%	54.5%
1992	1.7%	0.0%	0.0%	4.3%	1.9%	0.0%	0.7%	6.7%	0.0%	0.0%	0.0%	3.1%	4.5%	24.4%	52.6%
1993	4.4%	0.0%	1.2%	5.7%	0.0%	0.2%	0.0%	8.4%	0.0%	1.5%	0.0%	1.5%	6.6%	9.6%	60.9%
1994	9.1%	0.0%	0.0%	4.9%	0.0%	0.0%	0.0%	3.8%	0.0%	1.5%	0.0%	0.8%	1.5%	0.0%	78.5%
1995	7.8%	0.0%	2.3%	3.9%	0.0%	0.5%	0.0%	6.4%	0.0%	0.2%	0.0%	0.0%	0.0%	24.9%	54.0%
1996	9.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	3.0%	0.9%	4.8%	81.7%
1997	14.8%	0.0%	0.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.9%	78.3%
1998	9.0%	0.0%	0.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	2.0%	84.0%
1999	17.9%	0.0%	0.0%	7.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	75.0%
2000	4.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	17.9%	0.0%	77.6%
2001	6.1%	0.0%	1.3%	0.0%	0.0%	0.0%	0.0%	8.7%	0.0%	0.0%	3.0%	7.0%	2.2%	6.5%	65.2%
(81-01)	7.4%	0.1%	0.3%	3.4%	0.5%	0.3%	0.3%	5.9%	0.0%	0.3%	0.4%	2.6%	8.1%	9.5%	60.8%
(85-01)	7.4%	0.1%	0.3%	3.4%	0.4%	0.2%	0.2%	5.5%	0.0%	0.3%	0.5%	2.4%	8.5%	8.3%	62.5%

Table G.55. Percent distribution of Columbia Upriver Bright chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	18.0%	0.3%	0.6%	7.6%	4.0%	3.7%	0.1%	11.8%	0.5%	0.7%	0.0%	1.3%	23.0%	1.8%	26.7%
1980	20.2%	0.6%	0.5%	6.6%	1.6%	1.8%	0.1%	7.4%	1.0%	0.2%	0.0%	1.1%	6.4%	1.8%	50.7%
1981	16.1%	0.0%	0.4%	5.6%	1.1%	1.3%	0.0%	3.8%	0.4%	0.5%	0.2%	0.5%	3.6%	1.0%	65.8%
1982	6.4%	0.4%	0.2%	3.5%	0.2%	1.1%	0.1%	4.6%	0.0%	0.4%	0.0%	0.6%	2.5%	0.7%	79.2%
1983	15.5%	0.2%	0.0%	10.7%	1.8%	3.4%	0.2%	3.7%	0.2%	0.1%	0.0%	0.4%	8.1%	0.0%	55.6%
1984	14.6%	1.1%	0.1%	8.6%	2.0%	1.5%	0.2%	7.2%	0.2%	0.8%	0.2%	0.2%	15.3%	1.9%	46.2%
1985	9.2%	1.2%	0.2%	8.8%	0.8%	1.3%	0.0%	7.9%	0.1%	1.2%	0.1%	0.4%	32.8%	4.5%	31.5%
1986	10.3%	0.7%	0.1%	7.9%	1.2%	1.0%	0.0%	6.2%	0.1%	0.2%	0.1%	0.7%	33.2%	2.4%	35.9%
1987	14.4%	0.4%	0.4%	12.3%	1.8%	0.6%	0.1%	7.8%	0.0%	0.1%	0.3%	1.4%	34.9%	3.7%	21.9%
1988	10.2%	0.7%	0.5%	7.4%	0.6%	0.6%	0.0%	11.2%	0.0%	0.1%	0.0%	2.1%	46.9%	2.6%	17.1%
1989	11.8%	0.0%	0.2%	14.9%	0.2%	0.7%	0.6%	7.7%	0.0%	0.7%	0.0%	1.2%	42.2%	2.0%	17.8%
1990	13.3%	0.0%	1.0%	9.7%	0.7%	0.7%	0.0%	8.0%	0.0%	0.0%	0.0%	1.2%	33.1%	2.3%	30.0%
1991	6.2%	0.4%	2.5%	5.8%	0.0%	0.0%	0.0%	8.7%	0.0%	0.0%	0.0%	0.7%	19.3%	4.4%	52.0%
1992	2.9%	0.0%	0.0%	2.9%	0.0%	2.3%	0.0%	11.3%	0.0%	0.6%	1.0%	0.0%	16.8%	6.8%	55.3%
1993	10.7%	0.0%	0.0%	6.6%	0.0%	0.4%	0.6%	16.8%	0.0%	0.0%	0.0%	1.7%	15.4%	6.4%	41.4%
1994	9.7%	0.9%	0.0%	7.9%	0.2%	0.9%	1.7%	6.8%	0.0%	0.0%	0.7%	0.0%	14.0%	3.5%	53.8%
1995	8.0%	0.1%	1.7%	2.0%	0.0%	0.4%	0.0%	5.3%	0.0%	0.0%	0.0%	0.7%	9.8%	4.3%	67.8%
1996	2.8%	0.0%	0.0%	0.0%	0.0%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	0.8%	21.6%	5.2%	69.2%
1997	10.7%	0.3%	2.4%	4.4%	0.2%	0.0%	0.6%	0.5%	0.0%	0.0%	0.1%	1.0%	19.8%	10.9%	49.2%
1998	7.7%	1.4%	2.1%	2.4%	0.0%	0.0%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	13.0%	6.0%	66.7%
1999	10.0%	0.6%	2.5%	3.6%	0.0%	0.0%	0.7%	0.0%	0.4%	0.0%	0.3%	0.5%	12.9%	9.3%	59.1%
2000	17.4%	0.1%	2.4%	0.0%	0.0%	0.0%	0.4%	1.0%	0.0%	0.0%	2.8%	0.3%	21.9%	4.8%	49.0%
2001	3.3%	0.0%	0.6%	0.0%	0.0%	0.0%	0.6%	0.6%	0.0%	0.0%	0.4%	1.5%	11.5%	11.9%	69.6%
(79-01)	10.8%	0.4%	0.8%	6.0%	0.7%	1.0%	0.3%	6.0%	0.1%	0.2%	0.3%	0.8%	19.9%	4.3%	48.3%
(85-01)	9.3%	0.4%	1.0%	5.7%	0.3%	0.5%	0.4%	5.9%	0.0%	0.2%	0.3%	0.8%	23.5%	5.3%	46.3%

Table G.56. Percent distribution of Columbia Upriver Bright chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	18.6%	0.3%	0.6%	7.8%	4.0%	3.7%	0.1%	12.1%	0.5%	0.7%	0.0%	1.3%	22.4%	2.0%	25.7%
1980	21.3%	0.6%	0.6%	6.8%	1.7%	1.7%	0.1%	7.6%	1.1%	0.2%	0.0%	1.2%	6.4%	1.9%	48.9%
1981	17.2%	0.0%	0.4%	5.8%	1.1%	1.3%	0.0%	4.0%	0.3%	0.5%	0.2%	0.6%	3.6%	1.1%	64.1%
1982	9.0%	0.4%	0.3%	4.0%	0.3%	1.1%	0.2%	5.2%	0.0%	0.5%	0.0%	0.8%	2.5%	0.7%	75.1%
1983	22.1%	0.3%	0.0%	11.7%	2.0%	3.3%	0.2%	3.8%	0.2%	0.1%	0.0%	0.4%	7.4%	0.0%	48.5%
1984	17.6%	1.2%	0.2%	9.8%	2.2%	1.4%	0.2%	8.2%	0.2%	0.8%	0.2%	0.2%	14.5%	2.2%	41.0%
1985	12.9%	2.3%	0.3%	9.0%	0.8%	1.3%	0.0%	8.1%	0.1%	1.1%	0.1%	0.5%	30.9%	4.5%	28.2%
1986	12.2%	1.5%	0.1%	8.1%	1.3%	1.0%	0.0%	6.7%	0.1%	0.2%	0.1%	0.8%	31.9%	2.6%	33.5%
1987	19.2%	1.0%	0.4%	13.0%	2.0%	0.6%	0.1%	8.5%	0.0%	0.1%	0.3%	1.5%	31.1%	3.5%	18.9%
1988	11.5%	2.1%	0.5%	7.9%	0.6%	0.6%	0.0%	12.1%	0.0%	0.1%	0.0%	2.2%	44.0%	2.7%	15.7%
1989	14.3%	0.0%	0.2%	15.2%	0.2%	0.7%	0.5%	8.1%	0.0%	0.7%	0.0%	1.2%	40.3%	2.0%	16.6%
1990	13.9%	0.0%	1.1%	10.6%	0.8%	0.7%	0.0%	8.6%	0.0%	0.0%	0.0%	1.2%	32.0%	2.5%	28.6%
1991	7.6%	1.3%	3.3%	6.6%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	0.0%	1.0%	18.3%	4.3%	47.5%
1992	3.6%	0.0%	0.0%	3.6%	0.0%	2.4%	0.0%	13.3%	0.0%	0.6%	1.2%	0.0%	16.6%	6.9%	51.7%
1993	16.1%	0.0%	0.0%	7.5%	0.0%	0.3%	0.5%	18.4%	0.0%	0.0%	0.0%	1.6%	13.8%	5.9%	35.8%
1994	11.5%	1.8%	0.0%	8.4%	0.2%	0.9%	1.7%	7.2%	0.0%	0.0%	0.6%	0.0%	13.4%	3.5%	50.7%
1995	9.9%	0.1%	2.4%	2.6%	0.0%	0.5%	0.0%	7.0%	0.0%	0.0%	0.0%	0.8%	9.5%	4.3%	62.8%
1996	4.4%	0.0%	0.0%	0.1%	0.0%	0.2%	0.5%	0.0%	0.0%	0.0%	0.0%	0.9%	21.9%	5.5%	66.5%
1997	12.3%	0.5%	3.1%	4.8%	0.2%	0.0%	0.9%	0.6%	0.0%	0.1%	0.1%	1.0%	19.1%	11.0%	46.4%
1998	9.6%	4.4%	2.6%	2.8%	0.0%	0.0%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%	12.6%	6.0%	61.2%
1999	13.2%	1.4%	2.7%	4.0%	0.0%	0.0%	0.9%	0.0%	0.4%	0.0%	0.4%	0.6%	12.4%	9.3%	54.7%
2000	23.6%	0.1%	3.9%	0.0%	0.0%	0.0%	0.8%	1.1%	0.0%	0.0%	3.7%	0.3%	19.9%	4.5%	42.1%
2001	4.9%	0.0%	0.8%	0.0%	0.0%	0.0%	0.9%	0.6%	0.0%	0.0%	0.4%	1.7%	11.7%	12.3%	66.7%
(79-01)	13.3%	0.8%	1.0%	6.5%	0.8%	1.0%	0.4%	6.6%	0.1%	0.2%	0.3%	0.9%	19.0%	4.3%	44.8%
(85-01)	11.8%	1.0%	1.3%	6.1%	0.4%	0.5%	0.4%	6.5%	0.0%	0.2%	0.4%	0.9%	22.3%	5.4%	42.8%

Table G.57. Percent distribution of Hanford Wild chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1990	8.2%	0.4%	0.0%	4.2%	0.4%	0.4%	0.0%	8.2%	0.0%	0.2%	3.6%	0.4%	22.0%	6.9%	44.8%
1991	8.4%	0.0%	1.3%	9.2%	0.2%	0.0%	0.5%	4.6%	0.8%	0.0%	0.0%	1.0%	22.7%	4.3%	47.0%
1992	16.3%	1.7%	1.4%	5.9%	0.0%	0.0%	0.0%	15.9%	0.0%	0.0%	0.0%	1.0%	18.3%	2.8%	36.7%
1993	13.8%	0.0%	2.1%	2.9%	0.0%	0.5%	1.3%	5.2%	0.0%	1.8%	1.8%	3.6%	15.9%	8.1%	43.0%
1994	14.1%	0.8%	0.0%	4.8%	0.3%	1.1%	0.0%	4.4%	0.0%	0.3%	0.0%	0.7%	12.2%	5.3%	56.1%
1995	10.8%	0.0%	3.6%	4.2%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%	0.0%	9.6%	6.9%	62.6%
1996	9.5%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	27.6%	7.6%	54.8%
1997	15.6%	0.6%	0.9%	3.5%	0.0%	0.0%	1.8%	0.8%	0.0%	0.0%	0.0%	0.9%	13.3%	7.1%	55.6%
1998	12.2%	0.0%	0.0%	8.1%	0.0%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	16.5%	6.1%	55.7%
1999	10.1%	0.4%	2.0%	6.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.3%	6.5%	62.9%
2000	16.9%	0.5%	1.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	29.6%	6.1%	45.1%
2001	4.2%	1.1%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	19.2%	13.4%	60.2%
(90-01)	11.7%	0.5%	1.2%	4.1%	0.1%	0.2%	0.4%	3.4%	0.1%	0.2%	0.4%	0.7%	18.2%	6.7%	52.0%
(90-01)	11.7%	0.5%	1.2%	4.1%	0.1%	0.2%	0.4%	3.4%	0.1%	0.2%	0.4%	0.7%	18.2%	6.7%	52.0%

Table G.58. Percent distribution of Hanford Wild chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1990	9.2%	1.0%	0.4%	5.0%	0.4%	0.4%	0.0%	8.8%	0.0%	0.2%	3.6%	0.6%	21.3%	6.9%	42.1%
1991	10.3%	0.0%	1.4%	10.1%	0.2%	0.0%	0.5%	5.0%	0.9%	0.0%	0.0%	1.1%	21.7%	4.4%	44.5%
1992	17.8%	5.4%	1.5%	6.9%	0.0%	0.0%	0.0%	16.9%	0.0%	0.0%	0.0%	0.9%	16.3%	2.4%	31.9%
1993	20.0%	0.0%	2.1%	3.0%	0.0%	0.5%	1.2%	6.0%	0.0%	1.6%	1.8%	3.7%	14.3%	7.8%	38.0%
1994	17.1%	1.9%	0.0%	5.2%	0.3%	1.0%	0.0%	4.7%	0.0%	0.3%	0.0%	0.6%	11.5%	5.3%	52.2%
1995	12.9%	0.0%	4.1%	5.3%	0.0%	0.0%	0.0%	2.8%	0.0%	0.3%	0.0%	0.0%	9.1%	6.9%	58.6%
1996	12.5%	0.0%	0.0%	0.2%	0.0%	0.6%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	26.7%	7.7%	52.2%
1997	16.9%	1.2%	1.0%	3.5%	0.0%	0.0%	2.3%	0.9%	0.0%	0.1%	0.0%	0.9%	12.9%	7.2%	53.2%
1998	14.0%	0.0%	0.0%	9.1%	0.0%	0.0%	1.9%	0.0%	0.0%	0.0%	0.0%	0.0%	15.9%	6.3%	52.7%
1999	13.4%	1.5%	2.2%	7.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.8%	6.3%	58.2%
2000	20.2%	0.4%	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	28.5%	6.1%	42.1%
2001	5.8%	2.9%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	18.6%	13.6%	56.7%
(90-01)	14.2%	1.2%	1.4%	4.6%	0.1%	0.2%	0.5%	3.7%	0.1%	0.2%	0.4%	0.8%	17.3%	6.8%	48.5%
(90-01)	14.2%	1.2%	1.4%	4.6%	0.1%	0.2%	0.5%	3.7%	0.1%	0.2%	0.4%	0.8%	17.3%	6.8%	48.5%

Table G.59. Percent distribution of Salmon River chinook reported catch among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1981	13.9%	0.0%	0.4%	28.2%	0.6%	1.8%	0.0%	3.7%	0.0%	0.0%	0.7%	1.3%	0.0%	17.1%	32.2%
1982	10.4%	1.5%	0.9%	14.4%	1.1%	0.8%	0.0%	7.0%	0.0%	0.0%	0.0%	2.6%	0.0%	21.4%	39.9%
1983	20.6%	0.6%	0.0%	21.5%	0.6%	0.0%	0.0%	10.4%	0.0%	0.0%	0.0%	0.0%	0.0%	15.6%	30.6%
1984	10.5%	0.0%	0.0%	16.9%	3.5%	0.4%	0.0%	3.4%	0.0%	0.8%	0.0%	0.3%	0.4%	21.5%	42.4%
1985	11.9%	6.5%	0.0%	19.1%	1.1%	0.3%	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	19.9%	39.8%
1986	15.2%	0.0%	0.0%	9.0%	4.7%	0.6%	0.0%	2.1%	0.0%	0.0%	0.0%	0.0%	0.0%	16.2%	52.1%
1987	10.4%	0.0%	0.0%	15.3%	0.4%	0.0%	0.0%	2.4%	0.0%	0.0%	0.0%	2.6%	0.0%	24.1%	44.8%
1988	9.6%	0.0%	0.0%	6.4%	0.6%	0.0%	0.0%	3.9%	0.0%	0.0%	0.0%	0.8%	0.0%	16.0%	62.7%
1989	8.4%	0.0%	0.0%	11.4%	0.0%	0.2%	0.0%	3.9%	0.0%	1.2%	0.0%	3.4%	0.0%	24.7%	46.8%
1990	11.9%	0.7%	0.0%	10.6%	0.3%	0.7%	1.3%	7.8%	0.0%	0.3%	0.0%	3.0%	0.0%	25.6%	37.9%
1991	18.4%	0.0%	0.5%	15.2%	0.1%	0.7%	0.8%	5.8%	0.0%	0.0%	0.0%	0.2%	0.0%	24.9%	33.4%
1992	2.6%	0.6%	0.0%	6.6%	0.8%	0.4%	1.8%	15.4%	0.0%	0.0%	0.0%	1.8%	0.0%	15.9%	54.1%
1993	7.7%	0.2%	0.2%	15.3%	0.2%	0.0%	1.1%	17.8%	0.0%	0.5%	0.0%	3.2%	0.0%	23.0%	30.8%
1994	8.8%	0.2%	1.0%	14.8%	0.2%	0.1%	2.1%	4.6%	0.0%	0.0%	0.0%	1.5%	0.0%	17.7%	49.0%
1995	6.8%	0.2%	0.3%	4.6%	0.1%	0.1%	0.6%	0.9%	0.0%	0.0%	0.2%	0.1%	0.0%	30.6%	55.5%
1996	11.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.7%	0.0%	52.6%	31.5%
1997	27.7%	0.0%	1.6%	3.3%	0.1%	0.0%	0.4%	0.2%	0.0%	0.0%	0.0%	1.4%	0.0%	19.2%	46.1%
1998	10.5%	0.4%	0.4%	11.1%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	32.5%	44.4%
1999	12.5%	0.4%	0.0%	2.7%	0.0%	0.0%	2.2%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	36.2%	45.6%
2000	12.8%	0.0%	0.5%	2.2%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	21.9%	61.9%
2001	12.3%	0.0%	0.7%	2.6%	0.0%	0.0%	0.3%	0.3%	0.0%	0.0%	0.2%	2.5%	0.0%	29.4%	51.7%
(81-01)	12.1%	0.5%	0.3%	11.0%	0.7%	0.3%	0.5%	4.3%	0.0%	0.1%	0.1%	1.5%	0.0%	24.1%	44.4%
(85-01)	11.7%	0.5%	0.3%	8.8%	0.5%	0.2%	0.7%	3.9%	0.0%	0.1%	0.0%	1.5%	0.0%	25.3%	46.4%

Table G.60. Percent distribution of Salmon River chinook total fishing mortalities among fisheries and escapement.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1981	16.2%	0.0%	0.4%	29.0%	0.9%	1.9%	0.0%	4.3%	0.0%	0.0%	0.7%	1.5%	0.0%	16.5%	28.7%
1982	14.7%	1.9%	0.9%	16.7%	1.2%	0.7%	0.0%	7.2%	0.0%	0.0%	0.0%	2.4%	0.0%	20.0%	34.4%
1983	26.9%	0.7%	0.0%	20.8%	0.7%	0.0%	0.0%	9.8%	0.0%	0.0%	0.0%	0.0%	0.0%	14.5%	26.6%
1984	12.0%	0.0%	0.0%	17.8%	3.4%	0.4%	0.0%	3.5%	0.0%	0.7%	0.0%	0.2%	0.4%	21.8%	39.8%
1985	14.9%	12.1%	0.0%	18.0%	1.1%	0.3%	0.0%	1.6%	0.0%	0.0%	0.0%	0.1%	0.0%	18.5%	33.3%
1986	22.2%	0.0%	0.0%	11.2%	4.4%	0.5%	0.0%	3.1%	0.0%	0.0%	0.0%	0.5%	0.0%	14.9%	43.3%
1987	17.7%	0.0%	0.0%	15.6%	0.5%	0.0%	0.0%	2.8%	0.0%	0.0%	0.0%	2.5%	0.0%	22.4%	38.6%
1988	15.1%	0.0%	0.0%	8.7%	0.9%	0.0%	0.0%	5.2%	0.0%	0.0%	0.0%	0.9%	0.0%	15.1%	54.0%
1989	19.1%	0.0%	0.0%	16.1%	0.0%	0.1%	0.0%	4.6%	0.0%	1.0%	0.0%	3.3%	0.0%	20.6%	35.2%
1990	18.8%	2.0%	0.0%	13.0%	0.3%	0.6%	1.2%	8.0%	0.0%	0.2%	0.0%	3.0%	0.0%	22.3%	30.7%
1991	24.0%	0.0%	0.6%	16.5%	0.1%	0.7%	0.8%	6.2%	0.0%	0.0%	0.0%	0.2%	0.0%	22.7%	28.2%
1992	4.9%	1.8%	0.0%	8.4%	0.9%	0.3%	2.2%	17.7%	0.0%	0.0%	0.0%	2.0%	0.0%	15.0%	46.7%
1993	11.3%	0.6%	0.2%	17.6%	0.2%	0.0%	1.0%	19.2%	0.0%	0.4%	0.0%	3.3%	0.0%	20.5%	25.6%
1994	15.8%	0.4%	1.0%	15.0%	0.2%	0.1%	2.2%	4.7%	0.0%	0.0%	0.0%	1.5%	0.0%	16.6%	42.5%
1995	10.4%	0.3%	0.4%	6.8%	0.2%	0.1%	0.8%	1.2%	0.0%	0.0%	0.3%	0.1%	0.0%	29.7%	49.6%
1996	20.7%	0.0%	0.0%	2.7%	0.0%	0.0%	0.1%	0.7%	0.0%	0.0%	0.0%	4.7%	0.0%	45.6%	25.5%
1997	32.1%	0.0%	1.7%	3.4%	0.1%	0.0%	0.4%	0.2%	0.0%	0.0%	0.0%	1.5%	0.0%	18.6%	41.8%
1998	12.0%	1.2%	0.5%	12.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	32.4%	41.1%
1999	18.3%	0.8%	0.0%	3.0%	0.0%	0.0%	3.4%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	34.4%	39.4%
2000	18.0%	0.0%	0.7%	2.7%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	21.6%	56.0%
2001	16.7%	0.0%	0.8%	2.9%	0.0%	0.0%	0.3%	0.2%	0.0%	0.0%	0.2%	2.7%	0.0%	28.9%	47.2%
(81-01)	17.2%	1.0%	0.3%	12.3%	0.7%	0.3%	0.7%	4.8%	0.0%	0.1%	0.1%	1.5%	0.0%	22.5%	38.5%
(85-01)	17.2%	1.1%	0.3%	10.2%	0.5%	0.2%	0.8%	4.4%	0.0%	0.1%	0.0%	1.6%	0.0%	23.5%	39.9%

Appendix H. Abundance Indices for 1979 through 2003 for SEAK, NBC, and WCVI AABM fisheries, from calibration #0308.

Year	SEAK	NBC	WCVI
1979	0.97	1.05	1.10
1980	1.03	0.98	0.98
1981	0.92	0.94	0.96
1982	1.08	1.03	0.97
1983	1.22	1.13	0.81
1984	1.37	1.26	0.89
1985	1.28	1.26	0.93
1986	1.47	1.43	0.97
1987	1.74	1.72	1.12
1988	2.13	1.83	1.06
1989	1.83	1.65	0.92
1990	1.86	1.62	0.85
1991	1.79	1.49	0.71
1992	1.64	1.39	0.74
1993	1.66	1.38	0.66
1994	1.54	1.23	0.48
1995	1.02	0.91	0.38
1996	0.90	0.90	0.43
1997	1.20	1.07	0.53
1998	1.16	0.97	0.50
1999	1.05	0.93	0.45
2000	0.98	0.95	0.45
2001	1.22	1.26	0.71
2002	1.82	1.63	0.92
2003	1.79	1.48	0.85

Appendix I. Model estimates of the stock composition of the AABM, and other troll and sport fisheries for 2002 and the average from 1985 to 2001.

"Catch as Percent of Fishery" represents the stock composition of a specific fishery; "Catch as Percent of All Fisheries" represents the proportion of the total catch of a stock that is caught in a specific fishery; "Percent of Total Return" represents the proportion of total return (catch + escapement) caught in a specific fishery.

LIST OF TABLES

Page

Table I.1. Southeast Alaska All Gear.

Model Stock	2002	Average (1985 - 2001)		
	Catch as Percent of Fishery	Catch as Percent of Fishery	Catch as Percent of All Fisheries	Catch as Percent of Total Return
WCVI Hatchery	9.54%	16.98%	37.94%	15.04%
North/Central BC	10.47%	15.96%	34.80%	11.31%
Upriver Brights	19.59%	15.46%	22.99%	12.07%
Oregon Coast	16.80%	13.52%	30.88%	14.92%
Fraser Early	7.60%	6.02%	24.74%	6.49%
Alaska South SE	3.64%	4.41%	96.24%	36.47%
Upper Strait of Georgia	4.88%	4.40%	34.54%	19.87%
Mid-Columbia River Brights	7.72%	4.23%	29.07%	11.73%
WCVI Natural	1.66%	4.07%	37.98%	15.09%
Washington Coastal Wild	1.87%	3.68%	16.45%	9.60%
Washington Coastal Hatchery	1.15%	2.84%	18.54%	8.92%
Columbia River Summer	7.71%	2.47%	31.07%	12.84%
Willamette River Hatchery	3.92%	2.08%	9.77%	4.53%
Fall Cowlitz Hatchery	1.41%	1.32%	5.61%	2.35%
Lewis River Wild	0.82%	0.88%	15.16%	6.31%
Lower Strait of Georgia Hatchery	0.38%	0.45%	2.21%	1.42%
Lower Strait of Georgia	0.14%	0.31%	2.54%	1.60%
Fraser Late	0.14%	0.24%	0.43%	0.14%
Puget Sound Hatchery Fingerling	0.11%	0.17%	0.45%	0.25%
Skagit Wild	0.08%	0.11%	3.96%	1.11%
Spring Cowlitz Hatchery	0.05%	0.08%	1.24%	0.79%
Puget Sound Natural Fingerling	0.03%	0.08%	0.47%	0.25%
Stillaguamish Wild	0.06%	0.07%	13.73%	5.47%
Lyons Ferry	0.18%	0.06%	7.41%	4.83%
Nooksack Fall	0.03%	0.05%	0.14%	0.11%
Snohomish Wild	0.03%	0.04%	3.18%	0.91%
Puget Sound Hatchery Yearling	0.01%	0.03%	0.46%	0.32%
Spring Creek Hatchery	0.00%	0.00%	0.00%	0.00%
Lower Bonneville Hatchery	0.00%	0.00%	0.00%	0.00%
Nooksack Spring	0.00%	0.00%	0.00%	0.00%

Table I.2. North B.C. Troll and Sport.

Model Stock	2002	Average (1985 - 2001)		
	Catch as Percent of Fishery	Catch as Percent of Fishery	Catch as Percent of All Fisheries	Catch as Percent of Total Return
North/Central BC	31.59%	33.17%	47.10%	16.01%
Oregon Coast	13.81%	14.87%	27.27%	14.40%
Upriver Brights	10.12%	8.81%	10.80%	5.98%
WCVI Hatchery	3.90%	8.45%	13.33%	6.04%
Upper Strait of Georgia	8.71%	5.03%	28.60%	17.12%
Fraser Early	4.77%	4.52%	14.87%	4.78%
Washington Coastal Wild	1.78%	4.17%	14.40%	9.21%
Willamette River Hatchery	4.53%	3.81%	13.17%	6.99%
Washington Coastal Hatchery	1.04%	3.23%	16.57%	8.58%
Columbia River Summer	7.98%	2.43%	21.39%	9.38%
Mid-Columbia River Brights	4.01%	2.26%	12.99%	5.74%
WCVI Natural	0.63%	2.03%	13.26%	6.02%
Lower Strait of Georgia Hatchery	1.54%	1.44%	5.21%	3.42%
Fall Cowlitz Hatchery	1.63%	1.25%	3.92%	1.79%
Lower Strait of Georgia Natural	0.57%	0.91%	5.23%	3.46%
Fraser Late	0.70%	0.87%	1.02%	0.40%
Skagit Wild	0.47%	0.50%	12.94%	3.80%
Lewis River Wild	0.47%	0.44%	5.04%	2.54%
Nooksack Fall	0.41%	0.43%	0.89%	0.68%
Puget Sound Hatchery Fingerling	0.37%	0.38%	0.76%	0.43%
Spring Cowlitz Hatchery	0.17%	0.25%	2.85%	1.97%
Snohomish Wild	0.21%	0.24%	11.87%	3.81%
Puget Sound Natural Fingerling	0.08%	0.16%	0.70%	0.39%
Alaska South SE	0.11%	0.13%	2.57%	0.96%
Puget Sound Hatchery Yearling	0.10%	0.11%	1.64%	1.15%
Stillaguamish Wild	0.07%	0.06%	7.59%	3.18%
Lyons Ferry	0.15%	0.05%	5.92%	4.18%
Spring Creek Hatchery	0.05%	0.01%	0.06%	0.05%
Nooksack Spring	0.00%	0.00%	1.34%	0.52%
Lower Bonneville Hatchery	0.00%	0.00%	0.00%	0.00%

Table I.3. Central B.C. Troll.

Model Stock	2002	Average (1985 – 2001)		
	Catch as Percent of Fishery	Catch as Percent of Fishery	Catch as Percent of All Fisheries	Catch as Percent of Total Return
Fraser Late	13.51%	21.36%	2.94%	1.66%
WCVI Hatchery	12.61%	16.92%	4.31%	1.97%
Upriver Brights	11.61%	7.76%	1.27%	0.75%
North/Central BC	5.81%	6.55%	1.91%	0.63%
Upper Strait of Georgia	9.51%	5.86%	5.01%	3.19%
WCVI Natural	2.00%	3.99%	4.25%	1.95%
Columbia River Summer	13.41%	3.91%	4.77%	2.38%
Fraser Early	5.21%	3.60%	1.48%	0.51%
Washington Coastal Wild	2.10%	3.43%	1.66%	1.10%
Lower Strait of Georgia Hatchery	3.80%	3.21%	1.79%	1.32%
Washington Coastal Hatchery	1.20%	2.67%	1.90%	1.01%
Mid-Columbia River Brights	4.80%	2.06%	1.51%	0.76%
Lower Strait of Georgia Natural	1.50%	1.94%	1.69%	1.29%
Lower Bonneville Hatchery	3.30%	1.89%	1.07%	0.59%
Oregon Coast	2.10%	1.80%	0.47%	0.25%
Nooksack Fall	1.30%	1.73%	0.53%	0.44%
Puget Sound Hatchery Fingerling	1.40%	1.36%	0.38%	0.25%
Skagit Wild	1.00%	1.03%	3.10%	1.25%
Puget Sound Natural Fingerling	0.30%	0.64%	0.38%	0.26%
Lewis River Wild	0.60%	0.58%	0.82%	0.48%
Snohomish Wild	0.40%	0.49%	2.44%	1.27%
Puget Sound Hatchery Yearling	0.20%	0.29%	0.54%	0.43%
Willamette River Hatchery	0.30%	0.27%	0.12%	0.07%
Spring Creek Hatchery	1.40%	0.27%	0.16%	0.13%
Spring Cowlitz Hatchery	0.10%	0.15%	0.22%	0.19%
Fall Cowlitz Hatchery	0.20%	0.14%	0.06%	0.04%
Stillaguamish Summer/Fall	0.10%	0.12%	2.45%	1.24%
Lyons Ferry	0.20%	0.09%	0.93%	0.71%
Nooksack Spring	0.00%	0.01%	0.53%	0.26%
Alaska South SE	0.00%	0.00%	0.02%	0.01%

Table I.4. WCVI Troll and Outside Sport.

Model Stock	2002	Average (1985–2001)		
	Catch as Percent of Fishery	Catch as Percent of Fishery	Catch as Percent of All Fisheries	Catch as Percent of Total Return
Fraser Late	10.24%	20.74%	21.67%	11.47%
Upriver Brights	10.51%	10.07%	12.46%	6.99%
Puget Sound Hatchery Fingerling	6.67%	8.74%	17.55%	11.44%
Fall Cowlitz Hatchery	7.42%	7.85%	27.36%	14.24%
Lower Bonneville Hatchery	10.49%	6.98%	33.12%	17.42%
WCVI Hatchery	2.62%	6.52%	11.58%	5.44%
Nooksack Fall	2.99%	5.48%	12.54%	10.20%
Spring Creek Hatchery	21.50%	5.24%	17.62%	14.11%
Oregon Coast	4.49%	5.18%	9.95%	5.14%
Puget Sound Natural Fingerling	1.66%	4.09%	17.44%	11.55%
Mid-Columbia River Brights	4.89%	2.85%	15.10%	7.07%
Columbia River Summers	6.79%	2.74%	26.80%	12.77%
Washington Coastal Wild	1.08%	2.07%	7.34%	4.73%
Willamette River Hatchery	2.38%	1.77%	5.89%	3.37%
Washington Coastal Hatchery	0.57%	1.64%	8.75%	4.51%
WCVI Natural	0.38%	1.56%	11.62%	5.46%
Fraser Early	1.09%	1.33%	4.13%	1.31%
Skagit Wild	0.64%	0.91%	21.89%	7.99%
Lewis River Wild	0.80%	0.83%	11.22%	5.75%
Puget Sound Hatchery Yearling	0.40%	0.77%	11.08%	8.68%
Spring Cowlitz Hatchery	0.41%	0.56%	6.14%	5.22%
Lower Strait of Georgia Hatchery	0.43%	0.46%	1.74%	1.24%
Snohomish Wild	0.30%	0.44%	17.99%	8.05%
North/Central BC	0.21%	0.34%	0.66%	0.22%
Lyons Ferry	0.63%	0.31%	26.46%	19.25%
Lower Strait of Georgia Natural	0.17%	0.30%	1.72%	1.25%
Stillaguamish Wild	0.11%	0.11%	15.72%	7.57%
Upper Strait of Georgia	0.09%	0.09%	0.66%	0.41%
Nooksack Spring	0.05%	0.05%	10.26%	4.46%
Alaska South SE	0.00%	0.00%	0.00%	0.00%

Table I.5. Georgia Strait Sport and Troll.

Model Stock	2002	Average (1985–2001)		
	Catch as Percent of Fishery	Catch as Percent of Fishery	Catch as Percent of All Fisheries	Catch as Percent of Total Return
Fraser Late	37.50%	48.11%	41.97%	21.66%
Nooksack Fall	11.09%	11.28%	20.78%	16.42%
Lower Strait of Georgia Hatchery	13.76%	10.37%	33.83%	23.81%
Lower Strait of Georgia Natural	5.29%	7.08%	34.78%	25.07%
Puget Sound Hatchery Fingerling	6.14%	4.82%	8.12%	5.09%
Fraser Early	6.53%	3.92%	9.91%	2.81%
Upper Strait of Georgia	5.63%	2.60%	13.26%	7.89%
Puget Sound Natural Fingerling	1.46%	2.19%	7.79%	4.87%
Puget Sound Hatchery Yearling	1.70%	1.80%	20.47%	15.57%
Upriver Brights	1.73%	1.14%	1.11%	0.61%
Washington Coastal Wild	0.81%	1.08%	3.17%	1.95%
Skagit Wild	0.91%	0.93%	19.22%	6.61%
Washington Coastal Hatchery	0.40%	0.85%	3.62%	1.86%
WCVI Hatchery	0.50%	0.80%	1.29%	0.49%
Lower Bonneville Hatchery	1.64%	0.75%	3.19%	1.41%
Snohomish Wild	0.43%	0.44%	16.98%	6.58%
Spring Creek Hatchery	2.32%	0.40%	1.19%	0.95%
Mid-Columbia River Brights	0.77%	0.32%	1.44%	0.64%
Nooksack Spring	0.29%	0.28%	52.21%	22.90%
Columbia River Summer	0.65%	0.27%	2.29%	1.04%
WCVI Natural	0.08%	0.19%	1.28%	0.49%
Stillaguamish Wild	0.26%	0.18%	21.81%	10.03%
Willamette River Hatchery	0.09%	0.06%	0.18%	0.09%
Fall Cowlitz Hatchery	0.00%	0.02%	0.04%	0.03%
Lewis River Wild	0.00%	0.02%	0.19%	0.12%
North/Central BC	0.00%	0.02%	0.07%	0.02%
Spring Cowlitz Hatchery	0.01%	0.02%	0.14%	0.10%
Lyons Ferry	0.00%	0.00%	0.10%	0.07%
Oregon Coast	0.00%	0.00%	0.00%	0.00%
Alaska South SE	0.00%	0.00%	0.00%	0.00%

Table I.6. Washington/Oregon Troll and Sport.

Model Stock	2002	Average (1985–2001)		
	Catch as Percent of Fishery	Catch as Percent of Fishery	Catch as Percent of All Fisheries	Catch as Percent of Total Return
Fraser Late	7.07%	21.95%	12.13%	5.70%
Fall Cowlitz Hatchery	18.92%	20.24%	36.26%	17.92%
Spring Creek Hatchery	43.71%	18.16%	29.41%	23.89%
Lower Bonneville Hatchery	11.96%	13.22%	35.39%	16.67%
Puget Sound Hatchery Fingerling	1.85%	4.24%	4.12%	2.48%
Upriver Bright	3.94%	3.99%	2.52%	1.39%
Spring Cowlitz Hatchery	1.90%	3.58%	22.37%	16.50%
Nooksack Fall	0.88%	2.46%	2.70%	2.14%
Oregon Coast	1.57%	2.12%	2.04%	1.01%
Puget Sound Natural Fingerling	0.46%	1.92%	4.09%	2.43%
Willamette River Hatchery	1.29%	1.92%	3.39%	1.75%
Lewis River Wild	1.28%	1.41%	11.33%	4.69%
Mid-Columbia River Bright	1.73%	1.14%	3.07%	1.35%
Washington Coastal Wild	0.36%	1.12%	1.87%	1.16%
Washington Coastal Hatchery	0.18%	0.91%	2.27%	1.12%
Columbia River Summer	1.70%	0.67%	3.32%	1.47%
Lyons Ferry	0.71%	0.50%	20.73%	14.56%
Fraser Early	0.31%	0.16%	0.32%	0.09%
Puget Sound Hatchery Yearling	0.06%	0.13%	0.98%	0.72%
Alaska South SE	0.05%	0.08%	0.77%	0.28%
Lower Strait of Georgia Hatchery	0.04%	0.03%	0.07%	0.05%
WCVI Hatchery	0.01%	0.02%	0.03%	0.01%
Lower Strait of Georgia Natural	0.02%	0.02%	0.08%	0.05%
WCVI Natural	0.00%	0.01%	0.03%	0.01%
Skagit Wild	0.00%	0.00%	0.03%	0.01%
Snohomish Wild	0.00%	0.00%	0.03%	0.01%
Upper Strait of Georgia	0.00%	0.00%	0.00%	0.00%
Stillaguamish Wild	0.00%	0.00%	0.00%	0.00%
North/Central BC	0.00%	0.00%	0.00%	0.00%
Nooksack Spring	0.00%	0.00%	0.00%	0.00%

Appendix J. Abundance indices in total and by model stock for AABM fisheries, from Calibration #0308.

LIST OF APPENDIX J TABLES

Table J.1. Abundance indices (AIs) for the Southeast Alaska troll fishery by model stock and year (stock groups 1-15), from CLB 0308.

Numbers represent the model stock contribution to the total AI: the summation across all 30 stocks and stock groups equals the AI total for each calendar year.

Year	Alaska South SE	North Central	Fraser Early	Fraser Late	WCVI Hatchery	WCVI Natural	Georg. St. Upper	Georg. St. Lwr. Nat.	Georg. St. Lwr. Hat.	Nooksack Fall	Pug. Snd. Fingerling	Pug. Snd. Nat. F.	Pug. Snd. Yearling	Nooksack Spring	Skagit Wild	AI Total
1979	0.03	0.12	0.07	0.00	0.05	0.07	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97
1980	0.03	0.13	0.05	0.00	0.10	0.15	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.03
1981	0.04	0.13	0.05	0.00	0.08	0.12	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.92
1982	0.05	0.14	0.05	0.00	0.19	0.21	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.08
1983	0.06	0.16	0.05	0.00	0.29	0.14	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.22
1984	0.06	0.18	0.06	0.00	0.27	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.37
1985	0.06	0.20	0.08	0.00	0.16	0.06	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.28
1986	0.07	0.22	0.08	0.00	0.12	0.04	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.47
1987	0.07	0.23	0.08	0.00	0.09	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.74
1988	0.06	0.24	0.08	0.00	0.22	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.13
1989	0.04	0.26	0.07	0.00	0.32	0.07	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.83
1990	0.03	0.26	0.07	0.00	0.48	0.09	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.86
1991	0.03	0.27	0.07	0.00	0.60	0.12	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.79
1992	0.04	0.26	0.06	0.00	0.57	0.13	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.64
1993	0.04	0.24	0.06	0.00	0.53	0.14	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.66
1994	0.03	0.22	0.07	0.00	0.42	0.10	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.54
1995	0.03	0.22	0.07	0.00	0.15	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02
1996	0.03	0.22	0.08	0.00	0.06	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90
1997	0.03	0.23	0.09	0.00	0.18	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20
1998	0.04	0.22	0.08	0.00	0.27	0.06	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.16
1999	0.04	0.24	0.07	0.00	0.13	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05
2000	0.05	0.26	0.07	0.00	0.05	0.01	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98
2001	0.06	0.25	0.09	0.00	0.06	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.22
2002	0.06	0.24	0.11	0.00	0.18	0.03	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.82
2003	0.07	0.23	0.12	0.00	0.19	0.02	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.79
Average	0.05	0.22	0.07	0.00	0.23	0.08	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39

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Table J.1. Page 2 of 2 (stock groups 16-30).

Year	Stillaguamish Wild	Snohomish Wild	WA Co. Hat.	Upriver Brights	Spring Ck. Hat.	L. Bonn. Hatchery	Fall Cow. Hatchery	Lewis R. Wild	Willamette R. Hat	Spr. Cow. Hatchery	Col. R. Summer	Oregon Coast	WA Co. Wild	Lyons Ferry	Mid. Col. R. Brights	AI Total
1979	0.00	0.00	0.03	0.18	0.00	0.00	0.03	0.02	0.02	0.00	0.06	0.20	0.03	0.00	0.00	0.97
1980	0.00	0.00	0.03	0.14	0.00	0.00	0.04	0.02	0.03	0.00	0.05	0.15	0.04	0.00	0.00	1.03
1981	0.00	0.00	0.02	0.11	0.00	0.00	0.03	0.02	0.03	0.01	0.05	0.13	0.04	0.00	0.01	0.92
1982	0.00	0.00	0.02	0.06	0.00	0.00	0.03	0.01	0.04	0.00	0.04	0.13	0.04	0.00	0.01	1.08
1983	0.00	0.00	0.02	0.09	0.00	0.00	0.03	0.01	0.04	0.00	0.04	0.19	0.03	0.00	0.02	1.22
1984	0.00	0.00	0.02	0.20	0.00	0.00	0.03	0.01	0.04	0.00	0.04	0.26	0.04	0.00	0.02	1.37
1985	0.00	0.00	0.02	0.24	0.00	0.00	0.03	0.01	0.03	0.00	0.03	0.24	0.04	0.00	0.01	1.28
1986	0.00	0.00	0.03	0.35	0.00	0.00	0.03	0.01	0.04	0.00	0.04	0.29	0.05	0.00	0.02	1.47
1987	0.00	0.00	0.04	0.50	0.00	0.00	0.03	0.02	0.05	0.01	0.04	0.34	0.06	0.00	0.07	1.74
1988	0.00	0.00	0.05	0.53	0.00	0.00	0.15	0.04	0.06	0.00	0.05	0.31	0.07	0.00	0.14	2.13
1989	0.00	0.00	0.06	0.33	0.00	0.00	0.05	0.04	0.06	0.00	0.04	0.24	0.08	0.00	0.12	1.83
1990	0.00	0.00	0.06	0.25	0.00	0.00	0.02	0.02	0.07	0.00	0.04	0.25	0.08	0.00	0.08	1.86
1991	0.00	0.00	0.05	0.13	0.00	0.00	0.01	0.01	0.05	0.00	0.03	0.24	0.06	0.00	0.05	1.79
1992	0.00	0.00	0.05	0.10	0.00	0.00	0.02	0.01	0.03	0.00	0.03	0.20	0.05	0.00	0.04	1.64
1993	0.00	0.00	0.05	0.18	0.00	0.00	0.02	0.01	0.03	0.00	0.03	0.20	0.05	0.00	0.05	1.66
1994	0.00	0.00	0.05	0.21	0.00	0.00	0.01	0.01	0.02	0.00	0.02	0.24	0.05	0.00	0.05	1.54
1995	0.00	0.00	0.04	0.13	0.00	0.00	0.01	0.01	0.02	0.00	0.02	0.17	0.04	0.00	0.04	1.02
1996	0.00	0.00	0.04	0.13	0.00	0.00	0.02	0.01	0.01	0.00	0.02	0.13	0.04	0.00	0.05	0.90
1997	0.00	0.00	0.03	0.18	0.00	0.00	0.01	0.01	0.02	0.00	0.02	0.16	0.04	0.00	0.09	1.20
1998	0.00	0.00	0.02	0.12	0.00	0.00	0.00	0.01	0.02	0.00	0.02	0.14	0.04	0.00	0.06	1.16
1999	0.00	0.00	0.02	0.21	0.00	0.00	0.01	0.00	0.02	0.00	0.03	0.13	0.03	0.00	0.05	1.05
2000	0.00	0.00	0.02	0.16	0.00	0.00	0.01	0.00	0.03	0.00	0.05	0.13	0.02	0.00	0.05	0.98
2001	0.00	0.00	0.02	0.18	0.00	0.00	0.01	0.01	0.03	0.00	0.09	0.23	0.03	0.00	0.07	1.22
2002	0.00	0.00	0.02	0.35	0.00	0.00	0.03	0.02	0.08	0.00	0.14	0.31	0.03	0.00	0.14	1.82
2003	0.00	0.00	0.02	0.32	0.00	0.00	0.04	0.02	0.02	0.00	0.15	0.26	0.03	0.00	0.18	1.79
Average	0.00	0.00	0.03	0.21	0.00	0.00	0.03	0.01	0.04	0.00	0.05	0.21	0.04	0.00	0.06	1.39

Table J.2. Abundance indices (AIs) for the Northern BC troll fishery by stock and year (stock groups 1-15)), from CLB 0308.

Numbers represent the model stock contribution to the total AI: the summation across all 30 stocks and stock groups equals the AI total for each calendar year.

Year	Alaska South SE	North Central	Fraser Early	Fraser Late	WCVI Hatchery	WCVI Natural	Georg. St. Upper	Georg. St. Lwr. Nat.	Georg. St. Lwr. Hat.	Nooksack Fall	Pug. Snd. Fingerling	Pug. Snd. Nat. F.	Pug. Snd. Yearling	Nooksack Spring	Skagit Wild	AI Total
1979	0.00	0.08	0.08	0.02	0.04	0.06	0.06	0.02	0.02	0.01	0.00	0.00	0.00	0.02	0.01	1.05
1980	0.00	0.08	0.07	0.02	0.05	0.08	0.06	0.02	0.03	0.01	0.00	0.00	0.00	0.00	0.01	0.98
1981	0.00	0.09	0.06	0.02	0.06	0.08	0.06	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.01	0.94
1982	0.00	0.10	0.06	0.02	0.12	0.11	0.05	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.01	1.03
1983	0.00	0.11	0.07	0.01	0.16	0.08	0.04	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	1.13
1984	0.00	0.12	0.07	0.02	0.14	0.05	0.05	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.01	1.26
1985	0.00	0.13	0.09	0.02	0.09	0.03	0.07	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.01	1.26
1986	0.00	0.15	0.10	0.01	0.06	0.02	0.06	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.01	1.43
1987	0.00	0.15	0.10	0.01	0.07	0.02	0.07	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	1.72
1988	0.00	0.16	0.09	0.01	0.13	0.03	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	1.83
1989	0.00	0.17	0.09	0.01	0.20	0.04	0.07	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	1.65
1990	0.00	0.17	0.09	0.01	0.28	0.05	0.05	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	1.62
1991	0.00	0.17	0.08	0.01	0.33	0.07	0.05	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.49
1992	0.00	0.17	0.08	0.01	0.32	0.08	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.39
1993	0.00	0.16	0.08	0.01	0.30	0.07	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.38
1994	0.00	0.15	0.08	0.00	0.20	0.05	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.23
1995	0.00	0.14	0.09	0.00	0.07	0.02	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.91
1996	0.00	0.14	0.09	0.01	0.05	0.01	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.90
1997	0.00	0.15	0.11	0.01	0.12	0.03	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.07
1998	0.00	0.15	0.10	0.01	0.13	0.03	0.04	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.97
1999	0.00	0.16	0.09	0.01	0.07	0.01	0.05	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.93
2000	0.00	0.16	0.09	0.01	0.03	0.00	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.95
2001	0.00	0.17	0.11	0.01	0.05	0.01	0.07	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	1.26
2002	0.00	0.16	0.13	0.01	0.10	0.02	0.10	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	1.63
2003	0.00	0.15	0.15	0.01	0.10	0.01	0.11	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.48
Average	0.00	0.14	0.09	0.01	0.13	0.04	0.05	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	1.26

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Table J.2. Page 2 of 2 (stock groups 16-30).

Year	Stillaguamish Wild	Snohomish Wild	WA Co. Hatchery	Upriver Brights	Spring Ck. Hat.	L. Bonn. Hatchery	Fall Cow. Hatchery	Lewis R. Wild	Willamette R. Hat.	Spr. Cow. Hatchery	Col. R. Summer	Oregon Coast	WA Co. Wild	Lyons Ferry	Mid. Col. R. Brights	AI Total
1979	0.00	0.01	0.04	0.12	0.00	0.00	0.02	0.01	0.06	0.01	0.03	0.27	0.06	0.00	0.00	1.05
1980	0.00	0.01	0.04	0.09	0.00	0.00	0.02	0.01	0.07	0.01	0.03	0.21	0.06	0.00	0.00	0.98
1981	0.00	0.00	0.04	0.07	0.00	0.00	0.02	0.01	0.08	0.01	0.03	0.19	0.06	0.00	0.01	0.94
1982	0.00	0.00	0.03	0.05	0.00	0.00	0.02	0.01	0.09	0.01	0.03	0.22	0.06	0.00	0.01	1.03
1983	0.00	0.00	0.03	0.07	0.00	0.00	0.02	0.01	0.09	0.01	0.02	0.29	0.06	0.00	0.02	1.13
1984	0.00	0.00	0.03	0.14	0.00	0.00	0.02	0.00	0.09	0.01	0.02	0.35	0.06	0.00	0.01	1.26
1985	0.00	0.00	0.04	0.17	0.00	0.00	0.02	0.00	0.08	0.00	0.03	0.36	0.07	0.00	0.01	1.26
1986	0.00	0.00	0.05	0.25	0.00	0.00	0.02	0.01	0.10	0.01	0.03	0.41	0.09	0.00	0.02	1.43
1987	0.00	0.00	0.07	0.34	0.00	0.00	0.04	0.02	0.13	0.01	0.03	0.46	0.11	0.00	0.06	1.72
1988	0.00	0.00	0.09	0.34	0.00	0.00	0.09	0.02	0.14	0.01	0.03	0.39	0.12	0.00	0.09	1.83
1989	0.00	0.00	0.10	0.20	0.00	0.00	0.02	0.01	0.14	0.01	0.03	0.32	0.13	0.00	0.07	1.65
1990	0.00	0.00	0.09	0.15	0.00	0.00	0.01	0.01	0.14	0.00	0.02	0.33	0.12	0.00	0.05	1.62
1991	0.00	0.00	0.08	0.08	0.00	0.00	0.01	0.01	0.10	0.00	0.02	0.30	0.10	0.00	0.03	1.49
1992	0.00	0.00	0.09	0.07	0.00	0.00	0.01	0.01	0.07	0.01	0.02	0.28	0.08	0.00	0.03	1.39
1993	0.00	0.00	0.09	0.12	0.00	0.00	0.01	0.00	0.06	0.00	0.02	0.30	0.08	0.00	0.03	1.38
1994	0.00	0.00	0.08	0.13	0.00	0.00	0.01	0.01	0.05	0.00	0.01	0.30	0.07	0.00	0.03	1.23
1995	0.00	0.00	0.07	0.08	0.00	0.00	0.01	0.01	0.04	0.00	0.01	0.22	0.07	0.00	0.03	0.91
1996	0.00	0.00	0.06	0.10	0.00	0.00	0.01	0.01	0.04	0.00	0.01	0.20	0.07	0.00	0.04	0.90
1997	0.00	0.00	0.05	0.12	0.00	0.00	0.01	0.00	0.05	0.00	0.02	0.22	0.07	0.00	0.06	1.07
1998	0.00	0.00	0.03	0.08	0.00	0.00	0.00	0.00	0.05	0.00	0.02	0.19	0.05	0.00	0.04	0.97
1999	0.00	0.00	0.03	0.14	0.00	0.00	0.01	0.00	0.06	0.00	0.03	0.17	0.04	0.00	0.03	0.93
2000	0.00	0.00	0.03	0.11	0.00	0.00	0.00	0.00	0.07	0.00	0.05	0.23	0.04	0.00	0.03	0.95
2001	0.00	0.00	0.03	0.14	0.00	0.00	0.01	0.01	0.12	0.00	0.07	0.34	0.04	0.00	0.05	1.26
2002	0.00	0.00	0.03	0.24	0.00	0.00	0.02	0.01	0.13	0.00	0.09	0.39	0.05	0.00	0.10	1.63
2003	0.00	0.00	0.03	0.20	0.00	0.00	0.02	0.01	0.06	0.00	0.09	0.31	0.05	0.00	0.12	1.48
Average	0.00	0.00	0.05	0.14	0.00	0.00	0.02	0.01	0.08	0.00	0.03	0.29	0.07	0.00	0.04	1.26

Table J.3. Abundance indices (AIs) for the WCVI troll fishery by stock and year (stock groups 1-15)), from CLB 0308.

Numbers represent the portion of the AI total estimated for each model stock; the summation across all 30 stock groups equals the AI total for each.

	Alaska	North	Fraser	Fraser	WCVI	WCVI	Georg. St.	Georg. St.	Georg. St.	Nooksack	Pug. Snd.	Pug. Snd.	Pug. Snd.	Nooksack	Skagit	AI
Year	South SE	Central	Early	Late	Hatchery	Natural	Upper	Lwr. Nat.	Lwr. Hat.	Fall	Fingerling	Nat. F.	Year.	Spring	Wild	Total
1979	0.00	0.00	0.01	0.28	0.01	0.02	0.00	0.01	0.01	0.08	0.04	0.03	0.02	0.00	0.02	1.10
1980	0.00	0.00	0.01	0.22	0.02	0.02	0.00	0.01	0.01	0.08	0.04	0.02	0.02	0.00	0.02	0.98
1981	0.00	0.00	0.01	0.25	0.02	0.02	0.00	0.00	0.01	0.08	0.04	0.02	0.02	0.00	0.02	0.96
1982	0.00	0.00	0.01	0.25	0.04	0.03	0.00	0.00	0.01	0.09	0.04	0.02	0.02	0.00	0.01	0.97
1983	0.00	0.00	0.01	0.20	0.04	0.02	0.00	0.00	0.00	0.09	0.05	0.02	0.01	0.00	0.01	0.81
1984	0.00	0.00	0.01	0.23	0.03	0.01	0.00	0.00	0.01	0.11	0.05	0.03	0.02	0.00	0.02	0.89
1985	0.00	0.00	0.01	0.29	0.02	0.01	0.00	0.00	0.01	0.10	0.05	0.02	0.01	0.00	0.01	0.93
1986	0.00	0.00	0.01	0.23	0.02	0.01	0.00	0.00	0.00	0.09	0.05	0.03	0.01	0.00	0.01	0.97
1987	0.00	0.00	0.01	0.11	0.02	0.01	0.00	0.00	0.00	0.06	0.06	0.04	0.01	0.00	0.01	1.12
1988	0.00	0.00	0.01	0.07	0.04	0.01	0.00	0.00	0.00	0.05	0.07	0.04	0.01	0.00	0.01	1.06
1989	0.00	0.00	0.01	0.18	0.06	0.01	0.00	0.00	0.00	0.06	0.07	0.05	0.01	0.00	0.01	0.92
1990	0.00	0.00	0.01	0.21	0.08	0.02	0.00	0.00	0.00	0.07	0.07	0.05	0.01	0.00	0.01	0.85
1991	0.00	0.00	0.01	0.16	0.08	0.02	0.00	0.00	0.00	0.04	0.05	0.04	0.00	0.00	0.01	0.71
1992	0.00	0.00	0.01	0.21	0.08	0.02	0.00	0.00	0.00	0.03	0.04	0.03	0.00	0.00	0.00	0.74
1993	0.00	0.00	0.01	0.17	0.08	0.02	0.00	0.00	0.00	0.03	0.04	0.02	0.00	0.00	0.00	0.66
1994	0.00	0.00	0.01	0.10	0.05	0.01	0.00	0.00	0.00	0.02	0.05	0.02	0.00	0.00	0.00	0.48
1995	0.00	0.00	0.01	0.04	0.01	0.00	0.00	0.00	0.00	0.02	0.06	0.03	0.00	0.00	0.00	0.38
1996	0.00	0.00	0.01	0.06	0.02	0.00	0.00	0.00	0.00	0.02	0.06	0.02	0.00	0.00	0.00	0.43
1997	0.00	0.00	0.01	0.15	0.04	0.01	0.00	0.00	0.00	0.02	0.05	0.02	0.00	0.00	0.00	0.53
1998	0.00	0.00	0.01	0.17	0.03	0.01	0.00	0.00	0.00	0.02	0.05	0.02	0.00	0.00	0.00	0.50
1999	0.00	0.00	0.01	0.10	0.01	0.00	0.00	0.00	0.00	0.02	0.06	0.02	0.00	0.00	0.01	0.45
2000	0.00	0.00	0.01	0.10	0.01	0.00	0.00	0.00	0.00	0.02	0.06	0.02	0.00	0.00	0.01	0.45
2001	0.00	0.00	0.01	0.09	0.02	0.00	0.00	0.00	0.00	0.02	0.06	0.01	0.00	0.00	0.01	0.71
2002	0.00	0.00	0.01	0.10	0.03	0.00	0.00	0.00	0.00	0.03	0.07	0.02	0.00	0.00	0.01	0.92
2003	0.00	0.00	0.01	0.14	0.03	0.00	0.00	0.00	0.00	0.04	0.09	0.02	0.01	0.00	0.01	0.85
Average	0.00	0.00	0.01	0.16	0.04	0.01	0.00	0.00	0.00	0.05	0.06	0.03	0.01	0.00	0.01	0.77

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Table J.3. Page 2 of 2 (stock groups 16-30).

Year	Stillaguamish Wild	Snohomish Wild	WA Co. Hatchery	Upriver Brights	Spring Ck. Hat.	L. Bonn. Hatchery	Fall Cow. Hatchery	Lewis R. Wild	Willamette R. Hat.	Spr. Cow. Hatchery	Col. R. Summer	Oregon Coastal	WA Co. Wild	Lyons Ferry	Mid. Col. R. Brights	AI Total
1979	0.00	0.01	0.01	0.05	0.17	0.14	0.08	0.01	0.01	0.01	0.03	0.03	0.01	0.00	0.00	1.10
1980	0.00	0.01	0.01	0.04	0.14	0.14	0.08	0.01	0.01	0.01	0.03	0.03	0.01	0.00	0.00	0.98
1981	0.00	0.01	0.01	0.03	0.12	0.12	0.07	0.01	0.01	0.01	0.02	0.03	0.01	0.00	0.00	0.96
1982	0.00	0.01	0.01	0.03	0.13	0.10	0.08	0.01	0.02	0.01	0.02	0.03	0.01	0.00	0.01	0.97
1983	0.00	0.01	0.01	0.05	0.03	0.07	0.07	0.01	0.02	0.01	0.02	0.04	0.01	0.00	0.01	0.81
1984	0.00	0.01	0.01	0.07	0.04	0.06	0.07	0.00	0.01	0.01	0.02	0.05	0.01	0.00	0.00	0.89
1985	0.00	0.00	0.01	0.09	0.03	0.07	0.07	0.01	0.02	0.01	0.02	0.05	0.01	0.00	0.00	0.93
1986	0.00	0.00	0.01	0.14	0.02	0.11	0.08	0.01	0.02	0.01	0.02	0.05	0.02	0.00	0.01	0.97
1987	0.00	0.00	0.02	0.17	0.01	0.24	0.17	0.02	0.02	0.01	0.02	0.06	0.02	0.00	0.03	1.12
1988	0.00	0.00	0.02	0.13	0.03	0.12	0.26	0.02	0.02	0.01	0.02	0.05	0.02	0.00	0.04	1.06
1989	0.00	0.00	0.02	0.08	0.04	0.05	0.12	0.01	0.03	0.01	0.02	0.04	0.02	0.00	0.03	0.92
1990	0.00	0.00	0.02	0.05	0.04	0.02	0.05	0.01	0.02	0.01	0.02	0.04	0.02	0.00	0.02	0.85
1991	0.00	0.00	0.02	0.03	0.05	0.04	0.03	0.00	0.02	0.01	0.02	0.04	0.02	0.00	0.01	0.71
1992	0.00	0.00	0.02	0.04	0.04	0.05	0.05	0.01	0.01	0.01	0.01	0.03	0.02	0.00	0.01	0.74
1993	0.00	0.00	0.02	0.06	0.02	0.03	0.04	0.00	0.01	0.00	0.02	0.04	0.01	0.00	0.02	0.66
1994	0.00	0.00	0.01	0.05	0.01	0.02	0.02	0.01	0.01	0.00	0.01	0.04	0.01	0.00	0.01	0.48
1995	0.00	0.00	0.01	0.03	0.02	0.01	0.02	0.00	0.01	0.00	0.01	0.03	0.01	0.00	0.01	0.38
1996	0.00	0.00	0.01	0.05	0.02	0.02	0.04	0.00	0.01	0.00	0.01	0.02	0.01	0.00	0.02	0.43
1997	0.00	0.00	0.01	0.05	0.02	0.02	0.03	0.00	0.01	0.00	0.01	0.03	0.01	0.00	0.02	0.53
1998	0.00	0.00	0.00	0.05	0.02	0.01	0.02	0.00	0.01	0.00	0.01	0.02	0.01	0.00	0.02	0.50
1999	0.00	0.00	0.00	0.06	0.03	0.01	0.02	0.00	0.01	0.00	0.02	0.02	0.01	0.00	0.01	0.45
2000	0.00	0.00	0.00	0.05	0.02	0.02	0.02	0.00	0.01	0.00	0.03	0.03	0.01	0.00	0.02	0.45
2001	0.00	0.00	0.01	0.08	0.09	0.06	0.04	0.01	0.02	0.00	0.06	0.05	0.01	0.01	0.03	0.71
2002	0.00	0.00	0.01	0.11	0.16	0.08	0.07	0.01	0.02	0.00	0.08	0.05	0.01	0.01	0.05	0.92
2003	0.00	0.00	0.01	0.08	0.10	0.04	0.07	0.01	0.01	0.00	0.08	0.04	0.01	0.01	0.05	0.85
Average	0.00	0.00	0.01	0.07	0.06	0.07	0.07	0.01	0.02	0.01	0.02	0.04	0.01	0.00	0.02	0.77

Appendix K. Fishery indices by stock, age and fishery, 1975–2001.

LIST OF APPENDIX K TABLES

Table K.1. Alaska troll Stratified Proportion Fishery Index (SPFI) values as landed catch.

YEAR	SPFI	WIN/SPR	JUNE IN	JUNE OUT	JULY IN	JULY OUT	FALL
1979	0.93	1.17	0.65	1.14	0.57	0.88	0.88
1980	1.10	0.63	1.19	0.86	0.98	1.32	1.32
1981	1.12	1.24	0.67	1.07	1.30	1.17	1.17
1982	0.85	0.96	1.50	0.93	1.16	0.62	0.62
1983	0.96	0.91	0.91	0.69	1.01	1.20	1.20
1984	0.64	0.34	1.49	1.05	0.35	0.49	0.49
1985	0.68	0.41	1.02	0.65	0.77	0.76	0.76
1986	0.50	0.38	0.58	0.19	0.69	1.26	1.26
1987	0.50	0.53	0.82	0.20	1.51	0.64	0.64
1988	0.43	1.25	0.16	0.00	1.43	0.65	0.65
1989	0.51	0.76	0.83	0.13	0.68	0.55	0.55
1990	0.76	0.60	1.30	0.12	1.56	1.14	1.14
1991	0.64	1.34	1.38	0.23	0.71	0.72	0.72
1992	0.43	0.94	0.84	0.08	0.29	0.37	0.37
1993	0.47	0.68	0.35	0.02	0.38	0.84	0.84
1994	0.49	0.62	0.14	0.04	0.38	0.68	0.68
1995	0.52	0.45	0.40	0.06	1.17	0.83	0.83
1996	0.44	0.52	0.81	0.10	0.61	0.55	0.55
1997	0.89	0.59	0.71	0.18	0.21	1.56	1.56
1998	0.49	0.76	0.19	0.06	0.72	0.97	0.97
1999	0.69	0.76	0.33	0.14	0.17	1.05	1.05
2000	0.51	0.87	0.10	0.08	0.14	1.44	1.44
2001	0.28	0.48	0.12	0.06	0.15	0.46	0.46

SPFI Stock Components			
Alaska Southeast	Age 4	Age 5	Age 6
Quinsam	Age 4	Age 5	
Robertson Creek	Age 3	Age 4	Age 5
Salmon River Hatchery	Age 4	Age 5	
Columbia Upriver Brights	Age 4	Age 5	
Willamette Spring Hatchery	Age 4	Age 5	

Table K.2. Alaska troll Stratified Proportion Fishery Index (SPFI) values as total mortality.

YEAR	SPFI	WIN/SPR	JUNE IN	JUNE OUT	JULY IN	JULY OUT	FALL
1979	0.91	1.14	0.64	1.14	0.55	0.86	0.86
1980	1.01	0.60	1.09	0.82	0.81	1.19	1.19
1981	1.13	1.24	0.68	1.10	1.16	1.19	1.19
1982	0.96	1.02	1.59	0.95	1.48	0.76	0.76
1983	1.09	0.89	0.97	0.70	0.88	1.63	1.63
1984	0.64	0.35	1.46	1.06	0.34	0.48	0.48
1985	0.81	0.43	0.98	0.64	0.73	1.05	1.05
1986	0.59	0.42	0.59	0.18	0.76	1.59	1.59
1987	0.59	0.54	0.76	0.19	2.32	0.77	0.77
1988	0.44	1.19	0.19	0.01	1.65	0.66	0.66
1989	0.56	0.73	0.79	0.13	0.92	0.59	0.59
1990	1.04	0.75	1.40	0.15	1.50	1.68	1.68
1991	0.67	1.26	1.28	0.22	0.99	0.76	0.76
1992	0.51	0.90	0.77	0.08	0.32	0.56	0.56
1993	0.54	0.65	0.32	0.02	0.41	1.03	1.03
1994	0.60	0.60	0.18	0.04	0.53	0.91	0.91
1995	0.62	0.46	0.42	0.06	1.21	1.03	1.03
1996	0.52	0.53	0.77	0.11	0.66	0.70	0.70
1997	0.88	0.58	0.65	0.17	0.24	1.53	1.53
1998	0.48	0.74	0.19	0.06	0.62	0.94	0.94
1999	0.73	0.76	0.32	0.14	0.22	1.12	1.12
2000	0.53	0.87	0.11	0.09	0.20	1.52	1.52
2001	0.30	0.45	0.11	0.05	0.24	0.51	0.51

SPFI Stock Components			
Alaska Southeast	Age 4	Age 5	Age 6
Quinsam	Age 4	Age 5	
Robertson Creek	Age 3	Age 4	Age 5
Salmon River Hatchery	Age 4	Age 5	
Columbia Upriver Brights	Age 4	Age 5	
Willamette Spring Hatchery	Age 4	Age 5	

Table K.3. Landed catch exploitation rates and exploitation rate indices by stock and age in the Canadian northern troll fishery. Base period is 1979-1982.

Landed Catch Exploitation Rates

Year	AKS Age 4	QUI Age 3	QUI Age 4	RBT Age 3	RBT Age 4	RBT Age 5	SRH Age 3	SRH Age 4	SRH Age 5	URB Age 3	URB Age 4	URB Age 5	WSH Age 4
1979	NA	0.019	NA	0.047	0.069	0.073	NA	NA	NA	0.006	0.055	NA	0.032
1980	NA	0.027	0.06	0.043	0.071	0.077	0.063	NA	NA	0.015	0.046	0.059	0.059
1981	NA	0.07	0.085	0.029	0.087	0.171	0.102	0.148	NA	NA	0.053	0.061	0.057
1982	0.003	0.028	0.034	0.035	0.107	NA	0.028	0.118	0.078	0.019	0.033	0.019	0.017
1983	0.006	0.04	0.088	0.039	0.059	0.059	0.027	0.083	0.096	0.026	0.061	NA	0.033
1984	0.004	0.008	0.027	0.015	0.113	0.199	NA	0.081	0.197	0.014	0.093	NA	0.012
1985	0.003	0.008	0.031	0.034	0.158	NA	0.027	NA	0.213	0.019	0.081	0.078	0.005
1986	0.003	0.029	0.045	NA	0.087	NA	0.006	0.058	NA	0.015	0.063	0.077	NA
1987	0.002	0.011	0.034	0.019	NA	NA	0.01	0.049	0.178	0.016	0.09	0.133	0.014
1988	0.007	0.006	0.037	0.013	0.051	NA	NA	0.04	0.058	0.005	0.049	0.09	0.02
1989	0.003	0.014	0.024	0.014	0.073	0.102	0.007	0.034	0.167	NA	0.047	0.195	0.009
1990	0.007	0.011	0.055	0.012	0.059	0.055	0.009	0.031	0.155	NA	0.056	0.108	0.008
1991	0.002	0.012	0.034	0.015	0.062	0.111	0.007	0.051	0.16	NA	NA	NA	0.007
1992	0	NA	0.097	0.012	0.049	0.068	0.007	0.032	0.075	NA	NA	NA	0.003
1993	0.001	NA	NA	0.007	0.051	0.082	0.007	0.076	0.184	0	0.052	NA	0.005
1994	0	NA	NA	0.013	0.062	0.088	0.011	0.068	0.168	NA	0.044	0.093	0.003
1995	0	NA	NA	NA	0.034	0.025	0.006	0	0.067	NA	NA	0.026	0.005
1996	0	NA	NA	0	NA	NA	0	0	0	0	0	NA	0
1997	NA	0.012	0.021	0.008	0.034	NA	0.007	0.015	0.035	NA	0.029	NA	0.007
1998	0	0	0	NA	0.048	NA	0.005	0.07	0.102	0	NA	0.073	0
1999	0	0.003	0.006	NA	0.018	0.033	0.003	0.015	0.019	NA	0.031	NA	0
2000	0	0	0.002	NA	NA	NA	0.001	0.026	0.022	0	0	0	0
2001	0	0	0.001	0	NA	NA	0.001	0.011	0.052	0	0	NA	0
Base Period Avg	0.003	0.036	0.06	0.039	0.083	0.107	0.064	0.133	0.078	0.013	0.047	0.047	0.041

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Table K.3. Part 2 of 2

Landed Catch Exploitation Rate Indices

Year	AKS Age 4	QUI Age 3	QUI Age 4	RBT Age 3	RBT Age 4	RBT Age 5	SRH Age 3	SRH Age 4	SRH Age 5	URB Age 3	URB Age 4	URB Age 5	WSH Age 4	Fishery
1979	NA	0.532	NA	1.224	0.827	0.685	NA	NA	NA	0.461	1.183	NA	0.775	0.825
1980	NA	0.742	1.004	1.113	0.848	0.718	0.978	NA	NA	1.12	0.987	1.276	1.431	0.968
1981	NA	1.947	1.424	0.75	1.041	1.598	1.589	1.112	NA	NA	1.132	1.308	1.391	1.314
1982	1	0.778	0.573	0.913	1.284	NA	0.433	0.888	1	1.419	0.698	0.416	0.404	0.806
1983	1.797	1.109	1.471	1.018	0.704	0.546	0.422	0.62	1.232	1.942	1.316	NA	0.798	0.874
1984	1.201	0.222	0.459	0.398	1.351	1.858	NA	0.604	2.523	1.024	2	NA	0.299	1.191
1985	0.771	0.212	0.52	0.871	1.897	NA	0.426	NA	2.733	1.392	1.743	1.669	0.13	1.285
1986	0.745	0.821	0.757	NA	1.038	NA	0.089	0.436	NA	1.115	1.355	1.651	NA	0.787
1987	0.629	0.307	0.562	0.478	NA	NA	0.16	0.37	2.28	1.203	1.938	2.853	0.336	0.991
1988	2.056	0.164	0.626	0.325	0.615	NA	NA	0.298	0.748	0.366	1.057	1.937	0.484	0.649
1989	0.973	0.404	0.409	0.354	0.876	0.954	0.106	0.258	2.139	NA	1.002	4.184	0.224	0.935
1990	2.01	0.309	0.928	0.308	0.707	0.512	0.138	0.232	1.985	NA	1.202	2.316	0.185	0.766
1991	0.675	0.346	0.576	0.378	0.746	1.04	0.106	0.385	2.055	NA	NA	NA	0.17	0.718
1992	0.145	NA	1.631	0.298	0.584	0.632	0.104	0.241	0.962	NA	NA	NA	0.062	0.562
1993	0.3	NA	NA	0.174	0.612	0.763	0.105	0.567	2.36	0	1.111	NA	0.127	0.762
1994	0.062	NA	NA	0.323	0.738	0.819	0.17	0.509	2.152	NA	0.945	1.997	0.072	0.854
1995	0	NA	NA	NA	0.405	0.238	0.1	0	0.856	NA	NA	0.553	0.113	0.292
1996	0	NA	NA	0	NA	NA	0	0	0	0	0	NA	0	0
1997	NA	0.349	0.346	0.217	0.413	NA	0.116	0.111	0.448	NA	0.631	NA	0.163	0.292
1998	0	0	0	NA	0.578	NA	0.071	0.526	1.307	0	NA	1.557	0	0.532
1999	0	0.095	0.096	NA	0.212	0.309	0.046	0.111	0.245	NA	0.673	NA	0	0.196
2000	0	0	0.037	NA	NA	NA	0.019	0.192	0.284	0	0	0	0.008	0.099
2001	0	0	0.01	0	NA	NA	0.02	0.082	0.664	0	0	NA	0.01	0.126

Stock Identifiers

AKS = ALASKA SPRING QUI = QUINSAM RBT = ROBERTSON CREEK
SRH = SALMON RIVER HATCHERY URB = COLUMBIA UPRIVER BRIGHT WSH = WILLAMETTE SPRING

Table K.4. Total mortality exploitation rates and exploitation rate indices by stock and age in the Canadian northern troll fishery. Base period is 1979-1982.

Total Mortality Exploitation Rates

Year	AKS Age 4	QUI Age 3	QUI Age 4	RBT Age 3	RBT Age 4	RBT Age 5	SRH Age 3	SRH Age 4	SRH Age 5	URB Age 3	URB Age 4	URB Age 5	WSH Age 4
1979	NA	0.022	NA	0.055	0.071	0.073	NA	NA	NA	0.009	0.056	NA	0.036
1980	NA	0.031	0.062	0.048	0.072	0.077	0.07	NA	NA	0.018	0.047	0.06	0.067
1981	NA	0.077	0.087	0.034	0.088	0.173	0.112	0.152	NA	NA	0.054	0.063	0.066
1982	0.004	0.031	0.035	0.042	0.109	NA	0.035	0.121	0.078	0.022	0.033	0.019	0.021
1983	0.007	0.044	0.089	0.045	0.06	0.06	0.032	0.085	0.096	0.03	0.061	NA	0.038
1984	0.005	0.009	0.028	0.022	0.115	0.203	NA	0.083	0.2	0.017	0.095	NA	0.014
1985	0.003	0.009	0.031	0.046	0.161	NA	0.032	NA	0.216	0.021	0.083	0.078	0.006
1986	0.003	0.033	0.045	NA	0.089	NA	0.009	0.06	NA	0.018	0.065	0.077	NA
1987	0.003	0.017	0.036	0.023	NA	NA	0.014	0.051	0.184	0.029	0.095	0.137	0.021
1988	0.009	0.011	0.04	0.016	0.054	NA	NA	0.042	0.058	0.015	0.053	0.094	0.027
1989	0.004	0.019	0.026	0.019	0.075	0.104	0.016	0.038	0.171	NA	0.051	0.199	0.011
1990	0.009	0.018	0.059	0.019	0.063	0.057	0.018	0.034	0.16	NA	0.061	0.113	0.01
1991	0.003	0.019	0.036	0.023	0.065	0.114	0.018	0.054	0.165	NA	NA	NA	0.009
1992	0.001	NA	0.104	0.02	0.052	0.071	0.011	0.034	0.078	NA	NA	NA	0.004
1993	0.001	NA	NA	0.016	0.054	0.085	0.017	0.08	0.19	0.005	0.056	NA	0.007
1994	0.001	NA	NA	0.025	0.065	0.09	0.023	0.071	0.172	NA	0.047	0.098	0.004
1995	0	NA	NA	NA	0.036	0.028	0.013	0.002	0.072	NA	NA	0.028	0.007
1996	0.001	NA	NA	0.003	NA	NA	0.004	0.002	0.005	0	0	NA	0
1997	NA	0.015	0.021	0.012	0.035	NA	0.01	0.016	0.035	NA	0.03	NA	0.007
1998	0	0	0	NA	0.05	NA	0.012	0.073	0.104	0.001	NA	0.073	0
1999	0	0.003	0.006	NA	0.018	0.034	0.004	0.016	0.019	NA	0.032	NA	0
2000	0	0	0.002	NA	NA	NA	0.002	0.026	0.022	0	0	0	0
2001	0	0	0.001	0	NA	NA	0.003	0.011	0.052	0	0	NA	0
Base Period Avg.	0.004	0.04	0.061	0.044	0.085	0.108	0.072	0.136	0.078	0.016	0.047	0.048	0.048

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Table K.4. Part 2 of 2

Total Mortality Exploitation Rate Indices

Year	AKS Age 4	QUI Age 3	QUI Age 4	RBT Age 3	RBT Age 4	RBT Age 5	SRH Age 3	SRH Age 4	SRH Age 5	URB Age 3	URB Age 4	URB Age 5	WSH Age 4	Fishery
1979	NA	0.546	NA	1.23	0.833	0.68	NA	NA	NA	0.534	1.188	NA	0.761	0.828
1980	NA	0.766	1.002	1.078	0.848	0.713	0.965	NA	NA	1.096	0.987	1.273	1.399	0.966
1981	NA	1.923	1.423	0.755	1.037	1.607	1.548	1.114	NA	NA	1.138	1.32	1.393	1.313
1982	1	0.765	0.575	0.937	1.282	NA	0.487	0.886	1	1.369	0.687	0.408	0.447	0.808
1983	1.709	1.086	1.456	1.007	0.704	0.559	0.45	0.621	1.232	1.856	1.295	NA	0.794	0.873
1984	1.16	0.23	0.462	0.499	1.344	1.881	NA	0.609	2.567	1.038	2.003	NA	0.298	1.183
1985	0.78	0.23	0.513	1.028	1.893	NA	0.442	NA	2.767	1.342	1.745	1.636	0.127	1.262
1986	0.733	0.822	0.736	NA	1.043	NA	0.126	0.44	NA	1.107	1.364	1.618	NA	0.781
1987	0.662	0.415	0.594	0.525	NA	NA	0.196	0.375	2.364	1.83	2.008	2.879	0.435	1.026
1988	2.202	0.262	0.649	0.367	0.631	NA	NA	0.311	0.748	0.919	1.111	1.977	0.557	0.687
1989	0.983	0.464	0.426	0.43	0.884	0.964	0.227	0.277	2.195	NA	1.077	4.19	0.237	0.95
1990	2.35	0.457	0.958	0.427	0.735	0.525	0.254	0.251	2.056	NA	1.291	2.371	0.205	0.804
1991	0.774	0.473	0.585	0.518	0.765	1.059	0.251	0.4	2.115	NA	NA	NA	0.188	0.748
1992	0.224	NA	1.701	0.449	0.612	0.654	0.157	0.252	1.002	NA	NA	NA	0.076	0.589
1993	0.266	NA	NA	0.356	0.638	0.784	0.237	0.586	2.434	0.326	1.174	NA	0.145	0.798
1994	0.137	NA	NA	0.562	0.764	0.837	0.317	0.524	2.21	NA	0.985	2.055	0.086	0.889
1995	0.086	NA	NA	NA	0.422	0.259	0.18	0.016	0.928	NA	NA	0.591	0.154	0.324
1996	0.137	NA	NA	0.072	NA	NA	0.061	0.013	0.06	0	0	NA	0.006	0.033
1997	NA	0.372	0.336	0.277	0.416	NA	0.135	0.115	0.448	NA	0.639	NA	0.155	0.296
1998	0	0	0	NA	0.588	NA	0.171	0.533	1.332	0.071	NA	1.526	0	0.531
1999	0	0.085	0.093	NA	0.207	0.317	0.054	0.116	0.245	NA	0.686	NA	0	0.195
2000	0	0	0.036	NA	NA	NA	0.028	0.188	0.284	0	0	0	0.007	0.095
2001	0.044	0	0.009	0	NA	NA	0.038	0.084	0.664	0	0	NA	0.01	0.123

Stock Identifiers

AKS = ALASKA SPRING QUI = QUINSAM RBT = ROBERTSON CREEK

SRH = SALMON RIVER HATCHERY URB = COLUMBIA UPRIVER BRIGHT WSH = WILLAMETTE SPRING

Table K.5. Landed catch exploitation rates and exploitation rate indices by stock and age in the WCVI troll fishery. Base period is 1979-1982.

Landed Catch Exploitation Rates

Year	CWF Age 4	GAD Age 3	GAD Age 4	LRH Age 3	LRH Age 4	LRW Age 4	RBT Age 3	RBT Age 4	RBT Age 5	SAM Age 3	SAM Age 4	SPR Age 3	SPR Age 4	SPS Age 3	SPS Age 4	SRH Age 3	SRH Age 4	SRH Age 5	SUM Age 4	URB Age 3	URB Age 4	UWA Age 3	UWA Age 4	WSH Age 4	CHI Age 3	CHI Age 4
1979	NA	NA	NA	0.177	NA	NA	0.031	0.06	NA	NA	0.205	0.174	0.176	NA	0.25	NA	NA	NA	NA	0.035	0.078	0.096	0.44	0.034	NA	NA
1980	NA	NA	NA	0.098	0.15	NA	0.036	0.066	NA	NA	NA	0.21	0.292	NA	NA	0.039	NA	NA	0.09	0.034	0.045	0.188	0.29	0.033	NA	NA
1981	0.126	0.036	NA	0.194	0.154	0.059	0.019	0.027	0.03	NA	NA	0.169	0.141	0.05	NA	NA	0.021	NA	0.174	0.005	0.042	0.113	0.338	0.016	NA	NA
1982	0.195	0.066	0.206	0.198	0.25	0.081	0.02	0.034	NA	0.052	NA	0.165	0.251	0.09	0.201	NA	NA	NA	NA	0.026	0.02	0.16	0.366	0.022	NA	NA
1983	0.225	NA	0.289	0.288	0.324	0.068	0.009	0.032	0.075	NA	0.195	0.263	0.207	0.107	0.194	0.024	0.015	NA	NA	0.01	0.021	0.092	0.281	0.005	NA	NA
1984	0.216	0.105	NA	0.363	0.538	NA	0.034	0.047	0.051	NA	NA	0.241	0.31	0.099	0.222	NA	0.017	NA	NA	0.021	0.063	0.241	0.201	0.011	NA	NA
1985	0.15	NA	0.171	0.209	0.217	NA	0.016	0	NA	NA	NA	0.099	0.234	0.05	0.162	NA	NA	NA	NA	0.019	0.05	0.111	0.347	0.008	NA	NA
1986	0.211	NA	NA	0.212	0.218	0.032	NA	0.026	NA	NA	NA	0.213	0.196	0.054	0.263	NA	0.009	NA	NA	0.037	0.035	0.091	0.236	NA	NA	NA
1987	0.14	NA	NA	0.158	NA	0.1	0.007	NA	NA	NA	NA	0.082	NA	0.046	0.125	0.005	0.01	NA	0	0.024	0.045	0.04	0.086	NA	NA	NA
1988	0.138	0.022	NA	0.19	0.263	0.073	0.012	0.027	NA	0.029	NA	0.178	NA	0.018	0.168	NA	0.03	NA	0.142	0.002	0.091	NA	0.167	0.015	NA	NA
1989	0.086	0.013	0.101	0.048	0.108	0.039	0.004	0.016	0	0.01	0.126	0.104	0.087	0.021	0.093	0.006	NA	NA	0.094	NA	0.042	NA	NA	0.009	NA	NA
1990	0.118	0.055	0.193	0.195	0.08	0.083	0.018	0.026	0.046	0.019	0.177	0.165	0.16	0.045	0.2	0.012	0.02	NA	0.168	NA	0.076	NA	NA	0.014	NA	NA
1991	NA	NA	0.194	0.133	NA	0.051	0.016	0.026	0.022	0.012	0.12	0.107	0.14	0.025	0.128	0.016	0.016	NA	0.055	NA	NA	NA	NA	0.001	NA	NA
1992	0.188	NA	0.094	0.111	NA	0.022	0.044	0.116	0.157	0.05	0.056	0.077	0.163	0.045	0.175	0.023	0.125	NA	0.096	NA	NA	NA	NA	0.003	NA	NA
1993	NA	NA	NA	0.184	0.13	NA	0.03	0.105	0.073	0.054	0.089	0.097	0.22	0.064	0.134	0.021	0.056	NA	NA	0.016	0.092	NA	NA	0.007	NA	NA
1994	0.019	NA	NA	NA	NA	0.015	0.016	0.034	0.042	0.004	0.145	0.148	0.14	0.013	0.113	NA	0.017	NA	NA	NA	0.047	NA	NA	0.004	NA	NA
1995	NA	0.011	NA	NA	NA	0.03	NA	0.02	0.011	0.007	0.08	0.063	0.075	0.017	0.063	0.001	NA	NA	NA	NA	NA	NA	NA	0.002	NA	NA
1996	0	0	0	0	NA	NA	0	NA	NA	0	0	0	NA	0	0	0	0	NA	0	0	0	NA	NA	0	NA	NA
1997	0.056	NA	0.041	0.122	NA	NA	0	0.003	NA	0.001	0.049	0.09	0.103	0.002	0.068	0	0.002	NA	0.009	NA	0.004	NA	NA	0	NA	NA
1998	NA	NA	NA	NA	NA	NA	NA	0	NA	NA	0.018	0.008	0	0	0.007	0	0	NA	0	0	NA	NA	NA	0.001	NA	NA
1999	NA	0.002	NA	0.016	NA	NA	NA	NA	0	NA	0.016	0.003	NA	0.001	0.014	0	0	NA	0.003	0	0	NA	NA	0	NA	NA
2000	NA	NA	0.246	0.011	0.358	NA	NA	NA	NA	NA	NA	0.009	0.152	0.001	0.162	0	0	NA	0.026	0.001	0.016	NA	NA	0.001	NA	NA
2001	0.023	0.026	0.276	0.049	0.099	NA	0	NA	NA	0.011	0.071	0.024	0.134	0.015	0.099	0	0.001	NA	0.067	0.001	0.006	NA	NA	0.002	NA	NA
Base Period Avg.	0.161	0.051	0.206	0.167	0.185	0.07	0.026	0.047	0.03	0.052	0.205	0.18	0.215	0.07	0.225	0.039	0.021	-1	0.132	0.025	0.046	0.139	0.358	0.026	NA	NA

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Table K.5. Part 2 of 2

Landed Catch Exploitation Rate Indices

Year	CWF Age 4	GAD Age 3	GAD Age 4	LRH Age 3	LRH Age 4	LRW Age 4	RBT Age 3	RBT Age 4	RBT Age 5	SAM Age 3	SAM Age 4	SPR Age 3	SPR Age 4	SPS Age 3	SPS Age 4	SRH Age 3	SRH Age 4	SRH Age 5	SUM Age 4	URB Age 3	URB Age 4	UWA Age 3	UWA Age 4	WSH Age 4	CHI Age 3	CHI Age 4	Fishery
1979	NA	NA	NA	1.061	NA	NA	1.161	1.269	NA	NA	1	0.966	0.818	NA	1.109	NA	NA	NA	NA	1.391	1.692	0.687	1.227	1.302	NA	NA	1.057
1980	NA	NA	NA	0.588	0.813	NA	1.371	1.415	NA	NA	NA	1.171	1.361	NA	NA	1	NA	NA	0.681	1.356	0.964	1.352	0.81	1.261	NA	NA	0.992
1981	0.784	0.709	NA	1.163	0.832	0.84	0.703	0.582	1	NA	NA	0.942	0.654	0.715	NA	NA	1	NA	1.319	0.198	0.905	0.813	0.942	0.607	NA	NA	0.879
1982	1.216	1.291	1	1.188	1.355	1.16	0.765	0.734	NA	1	NA	0.921	1.166	1.285	0.891	NA	NA	NA	NA	1.055	0.44	1.148	1.021	0.83	NA	NA	1.069
1983	1.404	NA	1.403	1.728	1.755	0.971	0.344	0.678	2.5	NA	0.951	1.465	0.964	1.519	0.864	0.61	0.735	NA	NA	0.383	0.454	0.663	0.783	0.191	NA	NA	1.116
1984	1.346	2.049	NA	2.177	2.914	NA	1.276	1.005	1.709	NA	NA	1.342	1.443	1.406	0.987	NA	0.816	NA	NA	0.849	1.361	1.727	0.56	0.43	NA	NA	1.409
1985	0.932	NA	0.833	1.256	1.176	NA	0.617	0	NA	NA	NA	0.553	1.087	0.707	0.721	NA	NA	NA	NA	0.747	1.075	0.799	0.969	0.307	NA	NA	0.888
1986	1.311	NA	NA	1.27	1.181	0.46	NA	0.563	NA	NA	NA	1.187	0.911	0.775	1.167	NA	0.421	NA	NA	1.496	0.749	0.651	0.658	NA	NA	NA	0.96
1987	0.874	NA	NA	0.947	NA	1.434	0.268	NA	NA	NA	NA	0.455	NA	0.652	0.555	0.116	0.488	NA	0	0.982	0.982	0.289	0.239	NA	NA	NA	0.523
1988	0.861	0.425	NA	1.138	1.423	1.044	0.444	0.568	NA	0.552	NA	0.993	NA	0.261	0.746	NA	1.415	NA	1.078	0.084	1.96	NA	0.467	0.565	NA	NA	0.849
1989	0.537	0.25	0.491	0.288	0.588	0.559	0.166	0.339	0	0.189	0.615	0.581	0.406	0.301	0.412	0.149	NA	NA	0.714	NA	0.915	NA	NA	0.352	NA	NA	0.473
1990	0.733	1.083	0.94	1.167	0.434	1.197	0.663	0.553	1.535	0.37	0.863	0.919	0.743	0.641	0.889	0.312	0.957	NA	1.273	NA	1.652	NA	NA	0.54	NA	NA	0.869
1991	NA	NA	0.943	0.799	NA	0.738	0.599	0.544	0.735	0.227	0.585	0.596	0.654	0.359	0.568	0.408	0.786	NA	0.415	NA	NA	NA	NA	0.051	NA	NA	0.621
1992	1.173	NA	0.455	0.665	NA	0.316	1.672	2.46	5.223	0.963	0.272	0.43	0.76	0.641	0.778	0.589	5.982	NA	0.726	NA	NA	NA	NA	0.124	NA	NA	0.826
1993	NA	NA	NA	1.105	0.704	NA	1.153	2.241	2.445	1.043	0.432	0.538	1.025	0.905	0.595	0.541	2.664	NA	NA	0.628	1.989	NA	NA	0.285	NA	NA	0.88
1994	0.119	NA	NA	NA	NA	0.221	0.601	0.73	1.393	0.077	0.706	0.821	0.652	0.19	0.501	NA	0.832	NA	NA	NA	1.008	NA	NA	0.166	NA	NA	0.551
1995	NA	0.215	NA	NA	NA	0.426	NA	0.432	0.364	0.144	0.39	0.351	0.347	0.24	0.278	0.016	NA	NA	NA	NA	NA	NA	NA	0.094	NA	NA	0.314
1996	0	0	0	0	NA	NA	0	NA	NA	0	0	0	NA	0	0	0	0	NA	0	0	0	NA	NA	0	NA	NA	0
1997	0.346	NA	0.199	0.732	NA	NA	0	0.065	NA	0.021	0.241	0.502	0.479	0.025	0.3	0	0.081	NA	0.069	NA	0.091	NA	NA	0	NA	NA	0.302
1998	NA	NA	NA	NA	NA	NA	NA	0	NA	NA	0.087	0.046	0	0	0.033	0	0	NA	0	0.015	NA	NA	NA	0.025	NA	NA	0.029
1999	NA	0.046	NA	0.098	NA	NA	NA	NA	0	NA	0.076	0.015	NA	0.018	0.061	0	0	NA	0.026	0	0	NA	NA	0	NA	NA	0.045
2000	NA	NA	1.194	0.068	1.94	NA	NA	NA	NA	NA	NA	0.05	0.705	0.021	0.718	0	0	NA	0.196	0.055	0.337	NA	NA	0.052	NA	NA	0.64
2001	0.145	0.501	1.34	0.292	0.538	NA	0	NA	NA	0.22	0.344	0.134	0.623	0.214	0.44	0	0.051	NA	0.511	0.039	0.12	NA	NA	0.091	NA	NA	0.445

Stock Identifiers

CWF = COWLITZ FALL TULE
GAD = G ADAMS FALL FING
LRH = LOWER RIVER TULE 'Oregon Lower River Tule
LRW = LEWIS RIVER WILDRBT = ROBERTSON CREEK
SAM = SAMISH FALL FING
SPR = SPRING CREEK TULE
SPS = SO SOUND FALL FING
SRH = SALMON RIVER HATCHERY
SUM = COL RIVER SUMMERS
URB = COLUMBIA UPRIVER BRIGHT
UWA = U OF W FALL ACCEL
WSH = WILLAMETTE SPRING
CHI = CHILLAWACK

Table K.6. Total mortality exploitation rates and exploitation rate indices by stock and age in the WCVI troll fishery. Base period is 1979-1982.

Total Mortality Exploitation Rates

Year	CWF Age 4	GAD Age 3	GAD Age 4	LRH Age 3	LRH Age 4	LRW Age 4	RBT Age 3	RBT Age 4	RBT Age 5	SAM Age 3	SAM Age 4	SPR Age 3	SPR Age 4	SPS Age 3	SPS Age 4	SRH Age 3	SRH Age 4	SRH Age 5	SUM Age 4	URB Age 3	URB Age 4	UWA Age 3	UWA Age 4	WSH Age 4	CHI Age 3	CHI Age 4
1979	NA	NA	NA	0.193	NA	NA	0.035	0.062	NA	NA	0.21	0.191	0.183	NA	0.257	NA	NA	NA	NA	0.038	0.08	0.104	0.451	0.037	NA	NA
1980	NA	NA	NA	0.108	0.15	NA	0.04	0.068	NA	NA	NA	0.229	0.301	NA	NA	0.042	NA	NA	0.092	0.037	0.046	0.204	0.296	0.037	NA	NA
1981	0.129	0.043	NA	0.214	0.158	0.061	0.021	0.029	0.03	NA	NA	0.184	0.146	0.059	NA	NA	0.023	NA	0.179	0.006	0.043	0.122	0.351	0.018	NA	NA
1982	0.203	0.078	0.21	0.222	0.259	0.083	0.023	0.036	NA	0.06	NA	0.191	0.26	0.101	0.206	NA	NA	NA	NA	0.028	0.02	0.181	0.373	0.025	NA	NA
1983	0.23	NA	0.294	0.316	0.335	0.069	0.011	0.033	0.077	NA	0.2	0.282	0.212	0.119	0.2	0.025	0.017	NA	NA	0.011	0.021	0.103	0.288	0.006	NA	NA
1984	0.221	0.115	NA	0.395	0.553	NA	0.038	0.049	0.053	NA	NA	0.253	0.318	0.112	0.229	NA	0.018	NA	NA	0.024	0.065	0.256	0.205	0.013	NA	NA
1985	0.153	NA	0.179	0.239	0.225	NA	0.017	0	NA	NA	NA	0.116	0.241	0.057	0.168	NA	NA	NA	NA	0.021	0.051	0.119	0.347	0.009	NA	NA
1986	0.214	NA	NA	0.217	0.223	0.032	NA	0.026	NA	NA	NA	0.235	0.201	0.065	0.268	NA	0.009	NA	NA	0.041	0.036	0.101	0.244	NA	NA	NA
1987	0.148	NA	NA	0.232	NA	0.105	0.009	NA	NA	NA	NA	0.091	NA	0.066	0.133	0.006	0.012	NA	0	0.034	0.05	0.048	0.088	NA	NA	NA
1988	0.152	0.032	NA	0.251	0.294	0.078	0.014	0.028	NA	0.041	NA	0.198	NA	0.028	0.179	NA	0.032	NA	0.147	0.015	0.099	NA	0.175	0.018	NA	NA
1989	0.092	0.024	0.107	0.063	0.12	0.042	0.006	0.016	0	0.021	0.133	0.126	0.092	0.03	0.098	0.008	NA	NA	0.099	NA	0.047	NA	NA	0.011	NA	NA
1990	0.127	0.071	0.201	0.225	0.093	0.089	0.021	0.028	0.048	0.028	0.185	0.188	0.17	0.07	0.214	0.016	0.021	NA	0.174	NA	0.081	NA	NA	0.017	NA	NA
1991	NA	NA	0.208	0.145	NA	0.055	0.02	0.028	0.023	0.025	0.127	0.125	0.149	0.04	0.136	0.019	0.018	NA	0.057	NA	NA	NA	NA	0.002	NA	NA
1992	0.195	NA	0.101	0.147	NA	0.024	0.06	0.124	0.162	0.057	0.059	0.102	0.175	0.057	0.182	0.03	0.131	NA	0.102	NA	NA	NA	NA	0.005	NA	NA
1993	NA	NA	NA	0.233	0.15	NA	0.045	0.113	0.077	0.069	0.096	0.122	0.233	0.083	0.144	0.03	0.06	NA	NA	0.026	0.098	NA	NA	0.009	NA	NA
1994	0.019	NA	NA	NA	NA	0.017	0.022	0.038	0.043	0.016	0.151	0.172	0.15	0.018	0.116	NA	0.019	NA	NA	NA	0.05	NA	NA	0.005	NA	NA
1995	NA	0.019	NA	NA	NA	0.034	NA	0.023	0.012	0.015	0.09	0.084	0.085	0.025	0.069	0.002	NA	NA	NA	NA	NA	NA	NA	0.003	NA	NA
1996	0	0.004	0.005	0	NA	NA	0.001	NA	NA	0.004	0.003	0	NA	0.005	0.005	0.001	0.001	NA	0	0	0	NA	NA	0	NA	NA
1997	0.056	NA	0.044	0.164	NA	NA	0	0.003	NA	0.005	0.052	0.119	0.116	0.009	0.073	0	0.002	NA	0.01	NA	0.004	NA	NA	0	NA	NA
1998	NA	NA	NA	NA	NA	NA	NA	0	NA	NA	0.018	0.008	0	0	0.007	0	0	NA	0	0	NA	NA	NA	0.001	NA	NA
1999	NA	0.003	NA	0.016	NA	NA	NA	NA	0	NA	0.016	0.003	NA	0.001	0.014	0	0	NA	0.003	0	0	NA	NA	0	NA	NA
2000	NA	NA	0.25	0.011	0.368	NA	NA	NA	NA	NA	NA	0.009	0.152	0.002	0.165	0	0	NA	0.026	0.001	0.016	NA	NA	0.001	NA	NA
2001	0.023	0.026	0.283	0.05	0.099	NA	0	NA	NA	0.012	0.071	0.025	0.134	0.015	0.101	0	0.001	NA	0.069	0.001	0.006	NA	NA	0.002	NA	NA
Base	0.166	0.06	0.21	0.184	0.189	0.072	0.03	0.049	0.03	0.06	0.21	0.199	0.222	0.08	0.232	0.042	0.023	-1	0.136	0.028	0.047	0.153	0.368	0.029	-1	-1

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Table K.6. Part 2 of 2

Total Mortality Exploitation Rate Indices

Year	CWF Age 4	GAD Age 3	GAD Age 4	LRH Age 3	LRH Age 4	LRW Age 4	RBT Age 3	RBT Age 4	RBT Age 5	SAM Age 3	SAM Age 4	SPR Age 3	SPR Age 4	SPS Age 3	SPS Age 4	SRH Age 3	SRH Age 4	SRH Age 5	SUM Age 4	URB Age 3	URB Age 4	UWA Age 3	UWA Age 4	WSH Age 4	CHI Age 3	CHI Age 4	Fishery
1979	NA	NA	NA	1.05	NA	NA	1.188	1.267	NA	NA	1	0.963	0.823	NA	1.111	NA	NA	NA	NA	1.394	1.697	0.679	1.226	1.263	NA	NA	1.053
1980	NA	NA	NA	0.586	0.793	NA	1.357	1.406	NA	NA	NA	1.151	1.353	NA	NA	1	NA	NA	0.679	1.351	0.969	1.337	0.806	1.275	NA	NA	0.986
1981	0.777	0.71	NA	1.159	0.835	0.846	0.689	0.594	1	NA	NA	0.925	0.656	0.732	NA	NA	1	NA	1.321	0.224	0.906	0.802	0.954	0.612	NA	NA	0.879
1982	1.223	1.29	1	1.205	1.372	1.154	0.766	0.733	NA	1	NA	0.961	1.168	1.268	0.889	NA	NA	NA	NA	1.032	0.428	1.183	1.015	0.85	NA	NA	1.076
1983	1.385	NA	1.396	1.717	1.773	0.966	0.382	0.673	2.561	NA	0.952	1.419	0.954	1.484	0.863	0.609	0.763	NA	NA	0.384	0.442	0.675	0.783	0.201	NA	NA	1.112
1984	1.333	1.91	NA	2.147	2.923	NA	1.264	1.011	1.772	NA	NA	1.275	1.43	1.394	0.99	NA	0.807	NA	NA	0.857	1.361	1.675	0.558	0.438	NA	NA	1.397
1985	0.918	NA	0.853	1.299	1.189	NA	0.585	0	NA	NA	NA	0.586	1.084	0.718	0.723	NA	NA	NA	NA	0.768	1.077	0.778	0.944	0.3	NA	NA	0.889
1986	1.287	NA	NA	1.178	1.182	0.447	NA	0.543	NA	NA	NA	1.185	0.905	0.808	1.155	NA	0.389	NA	NA	1.474	0.76	0.66	0.664	NA	NA	NA	0.951
1987	0.891	NA	NA	1.262	NA	1.46	0.292	NA	NA	NA	NA	0.458	NA	0.828	0.573	0.136	0.526	NA	0	1.219	1.057	0.315	0.241	NA	NA	NA	0.581
1988	0.914	0.524	NA	1.365	1.553	1.086	0.471	0.582	NA	0.687	NA	0.999	NA	0.356	0.77	NA	1.418	NA	1.085	0.533	2.091	NA	0.477	0.612	NA	NA	0.914
1989	0.554	0.399	0.507	0.339	0.637	0.588	0.185	0.337	0	0.344	0.63	0.637	0.413	0.372	0.423	0.185	NA	NA	0.73	NA	0.983	NA	NA	0.368	NA	NA	0.504
1990	0.767	1.184	0.954	1.223	0.494	1.243	0.708	0.572	1.594	0.471	0.877	0.948	0.763	0.874	0.923	0.378	0.943	NA	1.282	NA	1.717	NA	NA	0.586	NA	NA	0.911
1991	NA	NA	0.99	0.788	NA	0.768	0.658	0.565	0.758	0.419	0.606	0.629	0.67	0.498	0.586	0.454	0.795	NA	0.417	NA	NA	NA	NA	0.057	NA	NA	0.65
1992	1.173	NA	0.479	0.797	NA	0.332	2.016	2.544	5.398	0.945	0.283	0.515	0.786	0.708	0.787	0.723	5.766	NA	0.753	NA	NA	NA	NA	0.162	NA	NA	0.868
1993	NA	NA	NA	1.265	0.791	NA	1.517	2.321	2.562	1.15	0.456	0.612	1.05	1.033	0.623	0.727	2.664	NA	NA	0.945	2.06	NA	NA	0.308	NA	NA	0.96
1994	0.115	NA	NA	NA	NA	0.242	0.725	0.773	1.45	0.265	0.719	0.867	0.675	0.227	0.501	NA	0.838	NA	NA	NA	1.055	NA	NA	0.173	NA	NA	0.578
1995	NA	0.319	NA	NA	NA	0.478	NA	0.463	0.405	0.249	0.429	0.421	0.381	0.307	0.3	0.046	NA	NA	NA	NA	NA	NA	NA	0.118	NA	NA	0.359
1996	0	0.074	0.025	0	NA	NA	0.036	NA	NA	0.064	0.016	0	NA	0.062	0.023	0.024	0.025	NA	0	0	0	NA	NA	0.011	NA	NA	0.017
1997	0.335	NA	0.207	0.891	NA	NA	0.005	0.062	NA	0.082	0.245	0.599	0.521	0.118	0.317	0.008	0.075	NA	0.074	NA	0.089	NA	NA	0	NA	NA	0.342
1998	NA	NA	NA	NA	NA	NA	NA	0	NA	NA	0.085	0.042	0	0	0.032	0	0	NA	0	0.014	NA	NA	NA	0.022	NA	NA	0.028
1999	NA	0.049	NA	0.088	NA	NA	NA	NA	0	NA	0.074	0.014	NA	0.016	0.059	0	0	NA	0.025	0	0	NA	NA	0	NA	NA	0.043
2000	NA	NA	1.191	0.062	1.948	NA	NA	NA	NA	NA	NA	0.046	0.682	0.024	0.711	0	0	NA	0.193	0.05	0.329	NA	NA	0.047	NA	NA	0.618
2001	0.14	0.434	1.348	0.271	0.524	NA	0	NA	NA	0.193	0.335	0.124	0.603	0.192	0.435	0	0.047	NA	0.505	0.041	0.117	NA	NA	0.084	NA	NA	0.427

Stock Identifiers

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LRW = LEWIS RIVER WILD
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SAM = SAMISH FALL FING
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SPS = SO SOUN