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JOINT CHINOOK TECHNICAL
COMMITTEE REPORT

ANNUAL EXPLOITATION RATE ANALYSIS
AND
MODEL CALIBRATION

REPORT TCCHINOOK (01)-2

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List of Acronyms with Definitions

ADF&G	Alaska Department of Fish & Game
AEQ	Adult Equivalent
AWG	Analytical Working Group of the CTC
C&S	Ceremonial & Subsistence
CBC	Central British Columbia Fishing area – Kitimat to Cape Caution
CDFO	Canadian Department of Fisheries & Oceans
CNR	Chinook Nonretention
CR	Columbia River
CRITFC	Columbia River Intertribal Fish Commission
CTC	Chinook Technical Committee
CUS	Columbia Upriver Spring chinook stock
CWT	Coded Wire Tag
ESA	U.S. Endangered Species Act
est+fw	Estuary Plus Fresh Water Area
FR	Fraser River
GS	Strait of Georgia
IDFG	Idaho Department of Fish & Game
IDL	InterDam Loss
LFR	Lower Fraser River
LGS	Lower Strait of Georgia
mar	Marine Area
mar+fw	Marine Plus Fresh Water Area
MRP	Mark-Recovery Program
MSY	Maximum Sustainable Yield for a stock, in adult equivalents
MSY ER	Exploitation Rate at the MSY escapement level for a stock, in AEQs
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
NMFS	National Marine Fisheries Service
NOC	Oregon Coastal North Migrating Stocks
NPS	North Puget Sound
NPS-S/F	North Puget Sound Summer/Fall chinook stock
NR	Not Representative
NWIFC	Northwest Indian Fisheries Commission
ODFW	Oregon Department of Fish & Wildlife
OTAC	Outside Troll Advisory Committee
PFMC	Pacific Fisheries Management Council
PS	Puget Sound
PSC	Pacific Salmon Commission
PSMFC	Pacific States Marine Fisheries Commission
PST	Pacific Salmon Treaty
QIN	Quinault Nation
SEAK	Southeast Alaska – Cape Suckling to Dixon Entrance
SPS	South Puget Sound
SSRAA	Southern Southeast Regional Aquaculture Association
TBR	Transboundary Rivers
TBTC	Transboundary Technical Committee
UFR	Upper Fraser River
UGS	Upper Strait of Georgia
USFWS	U.S. Fish & Wildlife Service
UW	University of Washington
WA/OR	Ocean areas off Washington and Oregon North of Cape Falcon
WAC	North Washington Coastal Area (Grays Harbor northward)
WACO	Washington, Oregon, Columbia River chinook stock
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 Committees (CTC) annual exploitation rate assessment, the Abundance Indices (AIs) for the Aggregate Abundance Based Management (AABM) fisheries from the final preseason chinook model calibration for 2001 (CLB 0107), Individual Stock Based Management (ISBM) Indices for each party, a summary of preseason forecast methods by stock and an assessment of escapement trends and goals as called for in Chapter 3, paragraph 9 of the Agreement.

AABM Abundance Indices

The AIs for the three AABM fisheries; Southeast Alaska (SEAK) All Gear, Northern British Columbia Troll and Queen Charlotte Islands (NBC) Sport, and West Coast Vancouver Island (WCVI) Troll and Outside Sport are presented in Table 1. Beginning with the 1999 fishing season, the Agreement specified that the AABM fisheries were to be managed through the use of the AIs. In 1999 and 2000 the CTC pre-season calibrations provided AIs that were used to set fishing plans but were not deemed to be final calibrations. Compliance with the Agreement specifies that the first post-season calibration be used. The AIs for 1999 and 2000 are final, while the AI for 2001 is used to set preliminary catches for the year.

Table 1. AI values for 1999, 2000, and 2001 for the SEAK, NBC, and WCVI Troll fisheries.

Fishery	1999	2000	2001
SEAK	1.12	1.10	1.14
NBC	0.97	0.95	1.02
WCVI	0.50	0.47	0.66

In general, the AIs remain low compared to AIs in the late 1980s and early 1990s but values in 2001 are larger than in recent years. 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 and treaty catches for the AABM fisheries in 1999 and 2000 and the preseason forecast for 2001.

Fishery	1999 Observed	1999 Treaty	2000 Observed	2000 Treaty	2001 Forecast
SEAK All Gear	200,250	184,200	183,979	178,500	189,900
NBC Troll and QCI Sport	103,900	126,100	58,012	123,500	132,600
WCVI Troll and Outside Sport	31,085	107,000	100,030	92,300	141,182

In SEAK, the observed catch in 1999 and 2000 was greater than the treaty catch associated with the AI by 8.7% and 3.1%. In WCVI, the observed catch in 2000 was greater than the treaty catch associated with the AI by 8.4%, but the size limit in the troll fishery was reduced from 67 cm to 55 cm.

The Agreement specified that overage/underage provisions apply to both AABM and ISBM fisheries. The Agreement directed the CTC to adapt the previous overage/underage annex provisions to reflect changes based on a catch established through in season or pre-season abundance indicators. The CTC was also asked to review the 7.5% range above and below the management objective and consider whether increased flexibility in the management range is desirable or necessary taking into consideration management precision and increased risk on affected stock groups. The CTC has not yet discussed measures for implementation of overage/underage provisions.

ISBM Fisheries

For the ISBM fisheries, the Agreement specified that Canada and the United States would reduce base period exploitation rates on specified stocks by 0.365 and 0.400, respectively. This requirement does not apply to stocks that achieve their CTC agreed escapement goal. Canadian ISBM indices (Table 3) were all below the target ISBM index of 0.635. Thus, the general obligation was met for Canadian ISBM fisheries. For U.S. fisheries, several ISBM indices were above the target value of 0.600 (italicized in Table 4).

For 1999, eight CWT-based U.S. ISBM indices were above 0.600. Four of these were for stocks that had 1999 escapements above their CTC escapement goal. The remaining four were for the Upriver Bright and Washington Coastal Fall stocks (Queets, Hoh, and Quillayute). Although they lack CTC escapement goals, all exceeded their agency management goals in 1999. However, one interpretation of the Treaty is that they are not in compliance with the "general obligation" of the agreement until the CTC has reviewed and accepted biologically-based goals for these four stocks.

In 2000, seven U.S. ISBM indices were above 0.600. Two of these indices were for stocks that exceeded their CTC escapement goals in 2000. The other five were for the Hoh Fall, Quillayute Fall, Upriver Bright, Deschutes, and Nehalem stocks. Of these, only the Nehalem has a CTC agreed escapement goal. For the Nehalem, escapement was below the CTC escapement goal, but was above the 85% production level defined as the lower bound for escapement (footnote 3, page 40 of the agreement). As noted above, the other four stocks may not be in compliance with the general obligation. The Hoh, Quillayute, and Upriver Bright fall stocks met their agency management goals, but the Deschutes stock did not.

For 2001, twelve U.S. ISBM indices are predicted to be above 0.600 (Table 4). One of these is for the Lewis River stock, which is predicted to be above the CTC agreed goal in 2001. Planned harvest patterns for the remaining 11 stocks may not be in compliance with the general obligation of the Agreement.

Table 3. ISBM Indices for Canadian fisheries, 1999 through 2001.

Stock Group	Stock	Canadian ISBM Indices			
		CWT Index	Modeled Indices		
		1999[1]	1999	2000	2001
North / Central B. C.	Yakoun, Nass, Skeena, Area 8	NA[2]	0.237	0.254	0.613
West Coast Vancouver Island	WCVI (Artlish, Burman, Gold, Kauok, Tahsis, Tashish, Marble)	0.431	0.365	0.327	0.244
Fraser Early	Upper Fraser, Mid Fraser, Thompson	NA[2]	0.125	0.124	0.210
Fraser Late	Harrison River	0.112	0.309	0.198	0.336
Upper Strait of Georgia	Klinaklini, Kakweikan, Wakeman, Kingcome, Nimpkish	0.021	0.174	0.118	0.314
Lower Strait of Georgia	Cowichan	0.517	0.304	0.232	0.325
	Nanaimo	0.163	0.209	0.113	0.246
North PS Nat Springs	Nooksack, Skagit	0.183	0.233	0.156	0.241
Puget Sound Natural Summer / Falls	Skagit	NA	0.197	0.119	0.217
	Stillaguamish	0.194	0.355	0.234	0.469
	Snohomish	NA	0.185	0.116	0.222
	Lake Washington	NA	0.332	0.202	0.355
	Green R	0.171	0.333	0.202	0.356
Washington Coastal Fall Naturals	Hoko, Grays Harbor, Queets, Hoh, Quillayute	NA	0.201	0.161	0.354
Col River Falls	Upriver Brights	NA	0.124	0.104	0.377
	Deschutes	NA	0.124	0.104	0.377
	Lewis	NA	0.056	0.180	0.180
Col R Summers	Mid-Col Summers	NA	0.109	0.085	0.144
Far North Migrating OR Coastal Falls	Nehalem, Siletz, Siuslaw	NA	0.094	0.110	0.505

[1] The 1999 CWT based estimates, not the 1999 model estimates, are used for evaluating compliance.
[2] NA means not available because of insufficient data (lack of tag codes, base period CWT, etc).

Table 4. ISBM indices for U.S. fisheries, 1999 through 2001 (indices above 0.60 are italicized for stocks without CTC agreed escapement goals and for stocks that did not achieve CTC agreed escapement goals).

Stock Group	Stock	US ISBM Indices			
		CWT Index	Modeled Indices		
		1999[1]	1999	2000	2001
North / Central B. C.	Yakoun, Nass, Skeena, Area 8	NA[2]	NC[3]	NC	NC
West Coast Vancouver Island	WCVI (Artlish, Burman, Gold, Kauok, Tahsis, Tashish, Marble)		0.26	0.38	*0.73*[4]
Fraser Early	Upper Fraser, Mid Fraser, Thompson		0.08	0.15	*0.70*[4]
Fraser Late	Harrison River	0.47	0.66	0.39	*0.62*
Upper Strait of Georgia	Klinaklini, Kakweikan, Wakeman, Kingcome, Nimpkish	NA	NC	NC	NC
Lower Strait of Georgia	Cowichan	NA	0.17	0.21	0.48
	Nanaimo	NA	0.17	0.21	0.48
North PS Nat Springs	Nooksack	0.44	0.15	0.20	0.01
	Skagit	NA	ID[5]	ID	0.07
Puget Sound Natural Summer / Falls	Skagit	NA	0.17	0.21	*0.78*
	Stillaguamish	0.12	0.14	0.14	0.40
	Snohomish	NA	0.04	0.05	0.60
	Lake Washington	NA	0.50	0.48	0.59
	Green R	0.50	0.50	0.48	0.60
Washington Coastal Fall Naturals	Hoko	NA	0.39	0.34	0.56
	Grays Harbor	0.43	0.44	0.43	0.45
	Queets	*1.00*	0.88	0.42	0.44
	Hoh	*1.54*	1.39	*0.73*	*0.76*
	Quillayute	*1.30*	1.14	*0.72*	*0.75*
Col River Falls	Upriver Brights	*1.37*	1.02	*1.09*	*0.99*
	Deschutes	0.51	1.02	*0.88*	*0.74*
	Lewis	0.00	0.11	0.16	1.70[6]
Col R Summers	Mid-Col Summers	1.64[7]	0.11	0.09	0.14
Far North Migrating OR Coastal Falls	Nehalem	1.96[7]	2.67	*2.66*	*2.75*
	Siletz	0.82[7]	1.81	1.79[7]	*1.87*
	Siuslaw	1.22[7]	0.94	0.93[7]	*0.95*

[1] The 1999 CWT based estimates, not the 1999 model estimates, are used for evaluating compliance.
[2] NA means not available because of insufficient data (lack of tag codes, base period CWT, etc).
[3] NC means that the current model assumes the stock is not caught in US ISBM fisheries.
[4] Stock group not in Annex Table V.
[5] ID means insufficient data available to estimate stock specific impacts.
[6] Escapement predicted to be above CTC goal.
[7] Escapement was above CTC goal.

As with the AABM fisheries, the agreement specifies that overages are to be accounted for. The CTC has not yet discussed measures for implementation of overage/underage provisions. This is the first year that the nonceiling fishery index method has been adapted to ISBM fishery indices and the first year that preseason ISBM projections have been made. Estimates based upon CWTs versus the CTC model can vary substantially. Projections of 2001 ISBM indices provide a caution to management agencies for preseason planning, but there is uncertainty associated with them. The number of stocks with U.S. ISBM indices above 0.60 that do not have CTC-accepted escapement goals emphasize the need for agencies to provide for CTC review the data and analyses to justify biologically-based escapement goals.

Stock Forecasts

A summary of recent forecasts for 14 stocks used in the CTC model calibration indicates that the accuracy of individual stock/year forecasts have ranged from 31% to 148% while the average accuracy has ranged from 63% to 126% during the period of 1997–2000. The variability of these forecasts is greater in the smaller stocks and for the WCVI stock. For the major production stocks, these forecasts suggest that their abundance in 2001 will be less than reported for 2000.

Escapement Trends and Goals

Paragraph 9 of the new Agreement defines criteria for identifying stocks of concern (only for stocks with CTC agreed escapement goals) and escapement levels in those stocks that would trigger additional management action (footnote 3, page 40 Agreement). Of the 15 stocks with CTC agreed escapement goals, the Blossom stock was the only stock to potentially qualify as a stock of concern (two years below escapement range). However, additional management action for this stock is not triggered in 2001 since both years exceed the lower bound of escapement as defined in footnote 3 of the Agreement.

The 1999 escapements for the Taku and Lewis chinook salmon stocks were less than the 85% production trigger values, but escapements in 2000 equaled or exceeded their goals. Thus, escapements during 1999 and 2000, for stocks with agreed escapement goals, do not trigger any additional management actions for 2001 as per paragraph 9, Chapter 3 of the Agreement.

1.0 INTRODUCTION

Annexes and Related Agreements (Agreement) to the Pacific Salmon Treaty (PST) dated June 30, 1999, changed the management of chinook salmon fisheries 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 that are managed according to the abundance of chinook salmon in the fisheries. Allowable catch for the upcoming year in each AABM (Southeast Alaska All Gear (SEAK), Northern British Columbia Troll and Sport (NBC), and West Coast Vancouver Island Troll and Outside Sport (WCVI)) fishery is determined through an Abundance Index (AI) calculated from an agreed preseason 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. Pre-season and post-season indices are also calculated for ISBM fisheries, but management of these fisheries is not based on allowable catch. Under the Agreement, annual aggregate exploitation rates in Canadian and U.S. ISBM fisheries are to be reduced by 36.5% and 40% respectively from those in the base period (1979–1982) until these fisheries can be managed to achieve Maximum Sustained Yield (MSY) or other biologically-based escapement goals.

This annual exploitation rate and calibration report describes the cohort analysis used to estimate exploitation rates from Coded-Wire-Tag (CWT) data, describes the chinook model calibration procedures, summarizes the results of the cohort analysis, and summarizes the results of the April 2001 calibration (CLB 0107). Calibration results are based on completion of the exploitation rate analysis for indicator stocks through 1999 fisheries, coastwide data on catch, spawning escapements and age structure through 2000, and forecasts of chinook returns expected in 2001. The results reported include:

- estimates of the abundance indices for the years 1979 through 2000 and a projection for 2001 for the AABM fisheries,
- estimates of the non-ceiling index, referred to as the ISBM index in this report, for 1999 and 2000 and projections for the 2001 ISBM fisheries,
- estimates for 1979 through 2000 and a projection for 2001 of stock composition in the AABM fisheries,
- the distribution of landed and total fishing mortality in all fisheries for the indicator stocks, and
- identification of stocks of concern for 1999 and 2000 as detailed in paragraph 9 of the Agreement.

Calibration 0107 will remain unchanged, but other calibrations may be completed to update the model as improved forecasts of abundance and/or model enhancements are identified.

2.0 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 rates, and annual distribution of fishery-related mortalities. The exploitation rate analysis provides data to estimate fishery harvest rate indices and evaluate compliance with ISBM obligations under the Agreement.

Estimates of age-fishery 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 preseason calibration of the chinook model are used to calculate: (a) AIs for three fisheries to determine the allowable 2001 catch of treaty chinook in AABM fisheries; (b) the post-season AI for previous years; and (c) pre-season and post-season non-ceiling indices (ISBM Indices) for ISBM fisheries.

Projected AIs for 2001 are used to determine allowable catches for AABM fisheries as specified in Table 1 of Chapter 3 of the Agreement. That table implicitly reflects the relationships between allowable catches for AABM fisheries, Abundance Indices, and harvest rate indices described in the language of the Agreement. The post-season AI is used to evaluate compliance for purposes of the overage-underage provision for AABM fisheries.

For the ISBM fisheries, the Agreement specified that Canada and the United States will reduce the exploitation rate from the 1979–1982 base period by 36.5% and 40%, respectively, on stocks that are not achieve their CTC agreed escapement goals. The ISBM Index is employed to measure compliance and implementation of overage-underage provisions for ISBM fisheries. Post Season ISBM indices for 1999 are computed using results of the exploitation rate analysis, but are preliminary since Adult Equivalent (AEQ) rates cannot be finally determined until all broods that contributed to the 1999 fishery are complete. The 2000 and 2001 ISBM indices are computed using the CTC model. The Agreement specifies that final post season ISBM indices will be estimated through exploitation rate analysis, therefore the 2000 model estimates are also preliminary. The 2001 preseason predictions of the ISBM indices are final.

2.1. Exploitation Rate Assessment (Through Calendar Year 1999)

The Exploitation Rate Assessment relies on CWT release and recovery data from a set of 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 AEQ factors. 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 mortality of the oldest age class and working backwards in time to calculate the total abundance of ocean age-2 chinook before the beginning of fishing. These re-constructions are based on estimated CWT recoveries by stock, brood year, age, fisheries, and escapements.

The CTC currently monitors 40 CWT indicator stocks, but only 33 were used for analyses in this chapter. A current listing of the 40 CWT indicator stocks is provided in Table 2.1, and those used in this analysis and the analyses performed using each are shown in Table 2.2. The relationship between these CWT stocks, CTC model stocks, and PST Annex stocks are shown in Appendix A. A CWT indicator stock is not used in the exploitation rate analysis if the number of recoveries is very limited or there is no quantitative estimate of tags in the spawning escapement (see footnotes in Table 2.2). A list of tag codes used per 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 indicator stocks are representative of the array of stocks harvested in the fisheries or the stock groupings which they represent.

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 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 were: age-2, 40%; age-3, 30%; age-4, 20%; and age-5 and older 10% (i.e., after fishing mortality and maturity, 10% of the age-4 cohort dies due to natural sources before commencement of fishing on the age-5 chinook).

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 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 assumes that the stock distribution in any year remains unchanged from the period of legal catch retention in the same year. Gear and/or area restrictions during the chinook non-retention (CNR) fishery are believed to reduce the number of encounters of legal-size fish. To account for this, the number of legal encounters during the non-retention fishery was adjusted by a selectivity factor. A factor of 0.34 was used for the WCVI and 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 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 estimating the fishery indices as a measure of the change in fishery harvest rates between years, the temporal and spatial distributions of stocks in and between fisheries and years is assumed to be stable.

Table 2.1. CWT exploitation rate indicator stocks, location, run type, and smolt age.

Origin	Stock Name	Location	Run Type	Smolt Age
S.E. Alaska	Alaska Spring	Southeast Alaska	Spring	Age 1
British Columbia	Kitsumkalum	North/Central BC	Summer	Age 1
	Snootli Creek[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 Wash. 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
	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 Rvr. (WA)	Fall Tule	Age 0
	Spring Creek Tule	Columbia Rvr. (WA)	Fall Tule	Age 0
	Columbia Lower River Hatchery	Columbia River (OR)	Fall Tule	Age 0
	Upriver Bright	Upper Columbia Rvr.	Fall Bright	Age 0
	Hanford Wild	Upper Columbia Rvr.	Fall Bright	Age 0
	Leavenworth Spring[2]	Upper Columbia Rvr.	Spring	Age 1
	Lewis River Wild	Lower Columbia Rvr.	Fall Bright	Age 0
	Lyons Ferry[3]	Snake River	Fall Bright	Age 0
	Willamette Spring	Lower Columbia Rvr.	Spring	Age 1
	Summers	Columbia Rvr. (WA)	Summer	Age 1
Oregon Coast	Salmon River	North Oregon Coast	Fall	Age 0
Idaho	Sawtooth Spring[2]	Idaho	Spring	Age 1
	Rapid River Spring[2]	Idaho	Spring	Age 1
	McCall Summer[2]	Idaho	Summer	Age 1

[1] These stocks are CWTd, but there is no quantitative escapement data, useful for distribution only.
[2] Tagged PSC indicator stocks with too few recoveries for analysis.
[3] Subyearling have been CWT 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, type of analyses, availability of quantitative escapement recoveries and base period tagging data. Brood = brood exploitation rates; Distn = stock catch distribution, Esc=quantitative estimates of escapement. Base Tagging = data is available during the base period years 1979–1982.

Indicator Stock Name	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	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]	—
Univ 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]	[2]	yes	yes	yes	yes
Spring Creek Tule	yes	[2]	[2]	yes	yes	yes	
Columbia Lower River Hatchery	yes	[2]	[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.

Fishery indices are presented for both reported catch (same as landed catch) and total mortality. 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 retention and CNR fisheries. Management strategies have changed considerably for fisheries of interest to the PSC. Regulatory changes have included size limit changes, extended periods of CNR, 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 three types 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 and released during a chinook retention fishery.

2. Sublegal CNR: chinook below the legal size limit that are encountered and released during a chinook non-retention fishery.

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

There are several methods used to estimate the number of CNR encounters 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 the CNR encounters. The CWT cohort analysis allows the use of a method based on catchability coefficients. The procedures used to estimate incidental mortality in the exploitation rate assessment have been previously described in CTC (1988). The chinook model allows the use of a method, known as the RT method, based on the difference between the estimated catch in a fishery using base period exploitation rates and current exploitation rates. The stock composition of the legal CNR encounters is estimated using the same proportions 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 (1991).

It should be noted that for a few fisheries or time periods quantitative estimates of CWT recoveries are unavailable (Table 2.3). These fisheries can not be included in certain analyses of this exploitation rate assessment.

Table 2.3. Fisheries for which CWT recoveries are not available.

Fishery	Reason data are unavailable
Chinook by-catch in non-salmon fisheries	Limited or qualitative sampling, no base period sampling
Incidental mortalities in salmon fisheries	Limited or qualitative sampling, no base period sampling
SEAK sport	No base period sampling
SEAK winter troll	No base period sampling
NCBC and WCVI sport	No base period sampling
Johnstone Strait sport	Incomplete sampling
Canadian freshwater net	Incomplete sampling
Most freshwater sport	Incomplete sampling

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 AEQ total mortality to AEQ total mortality plus escapement. The AEQ factor is used as an adjustment to reflect 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 its 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 all 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:

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

See Table 2.4 for a description of notation.

2.1.3. Brood Year Survival Rates and Indices

The survival of CWT'd smolts after release is calculated for each indicator stock and brood year. This survival rate is frequently referred to as the marine survival of the tag group but may include mortality in freshwater following release. Interpretation of this survival rate will be 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 (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 tags released.

Table 2.4. 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)
$Age2CohSurv_{BY}$ =	cohort survival of CWT fish to age 2 (pre-fishery) for brood year *BY*
$Bper$ =	base period years (1979 through 1982)
$BYEXP$ =	brood year AEQ exploitation rate
BY =	brood year
CY =	calendar year
$CYDist$ =	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 divided by cohort size at age for stock *s* in fishery *f* in year *CY*
$Ev_{n,BY}$ =	the stock productivity scalar for iteration *n* and brood year *BY*
$f \in \{F\}$ =	a fishery with the set of fisheries of interest
F =	ocean, terminal or other sets of fisheries or spawning escapement
$FI_{f,CY}$ =	fishery exploitation rate index for fishery *f* in year *CY*
$MatRte_{a-1,BY}$ =	maturity rate at next younger age by brood year
$Maxage$ =	maximum age of stock (generally age 5 for stream type stocks, age 6 for ocean type stocks)
$Minage$ =	minimum age of stock (generally age 2 for stream type stocks, age 3 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*
$TotRelease_{BY}$ =	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:

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

2.1.4. Stock Distribution Patterns

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

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

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

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. The relative magnitude of the change is the difference of the index from 1.0. 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.

$$ER_{s,a,f,y} = \frac{TotMorts_{s,a,f,y} * AEQ_{s,a,f,y}}{Cohort_{s,f,BY+a,y}}$$

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

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 a base period (1979–1982). The form of the *FI* limits consideration of stocks to those with adequate tagging during the base period, but fishing patterns for some fisheries have changed substantially. 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, 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 and with changes in fishery harvest rates, 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 ADF&G.

Initially the CWT harvest rate ($h_{t,y}$) 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 $h_{t,y}$ and subsequently $d_{t,s,a}$. The largest stock-age distribution parameter in a stratum is set to 1 to create a unique solution. See Table 2.5 for notation description.

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

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

The resulting unique solution is plugged 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 2.5. Parameter definitions for equations used for SPFI in SEAK.

Parameter	Description
$A_{t,CY}$ =	Alaska hatchery 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*
$t_{t,CY,s,a}$ =	adult equivalent CWT total mortality by strata *t*, year *CY*, stock *s* and age *a*

2.1.6. ISBM Indices

In previous reports, the CTC (1996) proposed a non-ceiling fishery index as a measure of the passthrough provision in the 1985 PST. This index compares the expected AEQ mortality (assuming base period exploitation rates and current abundance) with the observed AEQ mortality on a stock within calendar year, over all non-ceiling fisheries of a party (Table 2.6). 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 apply the form of this index to ISBM fisheries (the ISBM Index), as a measure of compliance with ISBM obligations 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 preseason 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…"

Table 2.6. 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 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 TCChinook (96)-1 for a stock/country combination is:

$$ISBMIdx_{CY} = \frac{\sum_{f \in \{F\}} \sum_{a=Minage}^{Maxage} (TotMorts_{CY,f,a} * AEQ_{CY,f,a})}{\sum_{f \in \{F\}} \sum_{a=2}^{5} (BPER_{f,a} * Cohort_{CY,f,a})}$$

$$BPER_{f,a} = \frac{\sum_{CY=79}^{82} \frac{(TotMorts_{CY,f,a}) * AEQ_{CY,f,a}}{Cohort_{CY,f,a}}}{4}$$

The ISBM obligation does not apply to stocks that achieved their CTC agreed escapement goal. For 1999, ISBM indices are presented from model and CWT estimates, but CWT estimates are used to evaluate compliance. Postseason indices for 2000 and projected indices for 2001 were estimated using the CTC model.

Direct application of the CTC model or CWT data alone was not possible in the computation of all 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 exploitation rate not representative of the untagged stocks.

In those instances the following methods were used:

1) For 2001, two preseason 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). These estimated impacts were then used to compute PSC model fishing policy (FP) factors for the corresponding PSC model fisheries.

2) For 2001 many ISBM fisheries or stock/fishery combinations had no preseason predictions of harvest rates and in some cases, no prediction of abundance. In those cases, a repeat of 2000 harvest rates, or a repeat of 1999 rates if estimates of 2000 were also unavailable, was assumed.

3) In 1999 and 2000, external estimates of impacts in terminal ISBM fisheries were used to generate FP estimates (for model generated estimates) or to modify estimated CWT recoveries (for CWT-based estimates) for many stocks. This was necessary because terminal impacts on CWT indicator stocks, which are generally hatchery stocks, may not be representative of the fishery impacts on the stock of interest.

4) For the CWT-based estimates reported for 1999, 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 2.7 and 2.8 show which Model stock (Table 2.7) or CWT indicator stock (Table 2.8) was used to represent each wild stock. Also shown are which of the above methods (if any) were used to generate FP scalars for the model stocks or to adjust the CWT indicator stock data for the computation of the indices.

Table 2.7. Methods used to compute FP scalars for input into the CTC Chinook Model to produce ISBM Indices for 1999–2001.

Stock Group	Stock	Model Stock	Stock Specific method		
			1999	2000	2001
Lower Strait of Georgia	Cowichan	GST	3	3	2
	Nanaimo	GST	3	3	2
Fraser Late	Harrison	FRL	3	3	1, 2
North Puget Sound Natural Spring	Nooksack Spr	NKS	3	3	1, 2
	Skagit Spring	NKS	3	3	1, 2
Upper Strait of Georgia	Klinaklini Kakweikan Wakeman Kingcome Nimpkish	GSQ	Model Only	Model Only	Model Only
Fraser Early (springs and summers)	Upper Fraser Mid Fraser Thompson	FRE	3	3	2
West Coast Vancouver Island Falls	Artlish Burman Gold Kauok Tahsis Tashish Marble	RBT	3	3	2
Puget Sound Natural Summer/Falls	Skagit	SKG	3	3	1
	Stillaguamish	STL	3	3	1
	Snohomish	SNO	3	3	1
	Lake WA	PSN	3	3	1
	Green River	PSN	3	3	1
North/Central BC	Yakoun Nass Skeena Area 8	NTH	Model Only	Model Only	Model Only
Washington Coastal Fall Naturals	Hoko	WCN	3	2	2
	Grays Harbor	WCN	3	2	2
	Queets	WCN	3	2	2
	Hoh	WCN	3	2	2
	Quillayute	WCN	3	2	2
Col River Falls	Upriver Br	URB	3	3	1
	Deschutes	URB	3	3	2
	Lewis	LRW	3	3	1
Columbia River Summers	Mid-Col Summers	SUM	3	3	2
Far North Migrating Oregon Coastal Falls	Nehalem	SRH	3	2	2
	Siletz	SRH	3	2	2
	Siuslaw	SRH	3	2	2

Table 2.8. Methods used to adjust CWT data for computation of the 1999 ISBM indices.

Stock Group	Stock	CWT Stock	Stock Specific Method
Lower Strait of Georgia	Cowichan Nanaimo	Cowichan Big Qualicum River	4 3
Fraser Late	Harrison	Fraser Late	Not needed
North Puget Sound Natural Spring	Nooksack Spr 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 Gold Kauok Tahsis Tashish Marble	Robertson Creek	3
Puget Sound Natural Summer/Falls	Skagit Stillaguamish Snohomish Lake Washington Green River	N/A Stillaguamish Fall Fing N/A N/A South PS 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 3 3 3
Col River Falls	Upriver Brights Deschutes Lewis	Upriver Bright Upriver Bright Lewis River Wild	Not needed Not needed 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 of the report 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). Concerns were previously raised about the similarity of the model used to that used during the negotiations that led to the Agreement. For 2001, the model used was the same as used during the negotiations (CLB 9812) but with the following exceptions: the actual catch, escapement and other data through 2000 was added and the enhanced production for three stocks that were incorrectly specified in CLB 9812 were corrected. In addition, CTC accepted escapement goals were used where available and the form of the Ricker production function was adjusted for those stocks with accepted goals. The CTC compared estimates of the historic AIs from this calibration to those from CLB 9812 in a memo to the Commissioners dated February 22, 2001.

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 predictions become available since model predictions are sensitive to preseason forecasts and postseason 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 2.9.

The model is recalibrated annually to incorporate 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 is not vulnerable to the gear, identification of terminal fisheries, stock names and production parameters. This file may be modified annually to reflect changes in fisheries or stocks, or to incorporate productivity parameters that correspond to CTC agreed escapement goals.

CEI (ceiling). This file contains historical catch data for the 17 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 included depends on which of the three available options are used to model CNR: (1) reported encounters during the CNR period; (2) fishing effort in the CNR period relative to the retention period; and (3) exploitation rates in the retention period relative to the model base period.

ENH (enhancement file). This file contains productivity parameters and smolt production for the 13 hatchery stocks and one natural stock (LGS) 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). Postseason estimates of terminal run sizes or escapements and agency supplied preseason forecasts (Table 2.4) are included in the FCS file. Age-specific forecasts are used for those stocks and years for which data are available.

FP (fishery policy). This file contains fishery-stock-age-specific scalars to be applied to base period fishery exploitation rates. The FPs are used for a variety of purposes. For example, in the 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. In most instances, the FPs are used to scale fishery exploitation rates relative to the model base period. The source of the FPs is generally the fishery index computed from CWT data in the annual exploitation rate or 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, 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, fallbacks, 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 resulting from 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 with a continuous series of CWT data are stored 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 cohort sizes, the base period exploitation rates on the total cohort in pre-terminal fisheries, exploitation rates on mature fish, maturation schedules, and adult equivalent factors. This file is updated as new stocks are added, or new CWT tag codes are used to represent distribution patterns of existing model stocks.

The calibration is controlled through a file designated OP7.

Table 2.9. Months that preseason 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	November	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 Fall Fingerling	June	February
Puget Sound Natural Fall	June	February
Puget Sound Fall Yearling	June	February
Nooksack Spring	June	Not Used
Skagit Summer/Fall Wild	June	February
Stillaguamish Summer/Fall Wild	June	February
Snohomish Summer/Fall Wild	June	February
WA Coastal Fall Hatchery	June	None
Columbia Upriver Bright	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 Spring Hatchery	June	December
Spring Cowlitz Hatchery	June	December
Columbia River Summer	September	March
Oregon Coastal Fall North Migrating	February	February
WA Coastal Fall Wild	June	None
Snake River Wild Fall	April	April
Mid-Columbia River Bright Hatchery	April	February, April

2.2.2. Calibration Procedures

The objective of the calibration is to estimate the abundance of each stock prior to the initiation of fishing. This abundance is determined by first estimating the number of age-1 (cohort size at the end of the first ocean year, equivalent to the age-2 pre-fishery cohort size in the CWT cohort analysis) fish and then applying fishing and natural mortalities through model processes. 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. 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 as illustrated 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 set equal to 1.

(2) The ratio (SC_{BY}) of the estimated terminal run and model predicted terminal run 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:

$$SC_{BY} = \frac{\sum_a (Estimated\,Terminal\,Run)_a}{\sum_a (Model\,Predicted\,Terminal\,Run)_a}$$

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

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:

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

(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 2001 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 included 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 were typically for terminal runs or escapements without adjustments for changes in ocean fisheries. Since the forecasts implicitly include exploitation in preterminal 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 2001 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 2000 using updated catch and escapement data for 2000. Average exploitation rate scalars were then computed and used as input values for 2001 fisheries in the Stage 2 calibration, except for the WCVI and 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 fisheries and was stock 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 2001; 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 may consistently differ from the actual catches if the calibration is not able to recreate the actual catches in the years 1979 through 1984, the model years prior to implementation of the ceiling algorithm);
(2) accuracy of terminal runs or escapements compared to the data used for calibration of each stock;
(3) comparison of 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 based on CWT data;
(5) comparison of CWT and model estimates of fishery harvest rate indices; and
(6) comparison of model estimates with mortality distributions for individual stocks generated from the annual CWT-based exploitation rate analysis.

Calibration usually involves an iterative process until a judgment is made by the CTC that an acceptable fit to all the data has been 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. Model and Data Changes

2.2.3.1. File Format Changes

2.2.3.1.1. BSE File

The BSE file contains information about the Ricker spawner-recruit parameters for each of the model stocks. The format of the BSE file was modified in 1999 to reflect a reparameterization of the spawner-recruit function in the chinook model. The old format of the BSE file contained the alpha parameter and the estimate of MSY escapement. The new format contains the alpha parameter, the maximum estimated escapement, and the MSY escapement and a flag indicating which form of the spawner recruit curve to use.

2.2.3.1.2. OP7 File

Several changes have been made to the OP7 file format. The OP7 option file now specifies the name of the MATAEQ (maturation rate and adult equivalent) file, it specifies the name of the two new PNV files and it specifies the name of the new IM file. In addition, a new line specifying the number of years to average to estimate future EVs was added.

2.2.3.1.3. IM File

The IM input file was added to the chinook model in 1998. This file contains information about changes to the incidental mortality rate estimates for specific fisheries. These new rates replace the rates that are read from the BSE file.

2.2.3.1.4. PNV File

Two new proportion non-vulnerable (PNV) files were added to the chinook model in 2000. These PNV files account for changes in the size limit in the Puget Sound North and South Sport fisheries.

2.2.3.2. Coding Changes

Model code was revised to use new estimates of incidental mortality rates in troll and sport fisheries developed by the CTC. The model and input files were also revised to input incidental mortality rates by model fishery and year (previously incidental mortality rates were gear, not fishery specific, and could not vary through time).

The model was also changed so that the user can input the number of years of model estimated Evs to use in computing future brood survival. The number is provided to the model through a new input line in the OP7 file.

2.2.3.3. Data Files

For the WCVI stocks (RBT and RBH), recoveries for the WCVI sport fishery were reassigned to the terminal sport fishery to accommodate the outside versus inside WCVI sport fishery provisions of the Agreement.

The FP values utilized for the 2001 calibration are derived from fishery indices computed from the CWT-based 1999 exploitation rate analysis. In 1999 and 2000, ADF&G revised historical estimates of CWT recoveries for 1976–1979. This period overlaps the base period used for the CTC Model, but the CTC determined that revisions to base period data should be undertaken when converting to the new model currently under development. Consequently, the CWT data used to generate base period exploitation patterns for the CTC model stocks differ from those used for the exploitation rate analysis. The CTC's initial assessment of these changes is that the effect would be very small.

2.3 Forecast Methods by Stock

Three general methods were used to estimate the model abundance of chinook salmon for 2001. These include:

i) expected age-2 recruitment from the most recent brood year based on past EV scalars by stock (i.e., for 2001, age-2 production from 1999 brood year has not yet been observed);
ii) expected production from stocks with forecasts provided by management agencies (details below); and
iii) expected production from stocks without forecasts provided (i.e., calculated internally in the model and based on calibration data provided).

Age-2 pre-fishery cohort size for each stock is predicted based on the spawning population observed in the brood year, the spawner-recruit relationship (provided in the model BSE file), and an EV scalar determined from past estimated values. The user may specify how to determine the scalar based on the number of years specified in the OP7 control file (CLB 0107 used the recent 5-year average for the EV scalar).

For stocks without agency forecasts, the model estimates the expected stock-specific production of age-3 through age-5 chinook salmon. The surviving ocean cohort (by age and stock) expected to enter 2001 was predicted based on the brood year EVs (brood years 1995 to 1998) determined during calibration and the mortality within brood years though 2000 (forecast type C in Table 2.6).

For those stocks with externally provided forecasts of abundance in 2001, management agencies used three general methods:

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 2001 from data collected in previous years. These data are often recoveries of CWTs from tagged fish or results of run reconstruction for the entire stock (forecast type S in Table 2.10.

Average Return Rate Models. Return rates of adults by age from smolts or parents are averaged over past brood years, then these mean averages are used to discount abundance of smolts or parents for brood years that will be exploited in 2001 (forecast type R in Table 2-10).

Average Return Models. Returns are averaged over the past several calendar years and the averages used as a forecast for year 2001. This simple approach is usually used with a lack of data or more complicated methods have not provided better forecasts (forecast type A in Table 2-10).

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

Table 2.10. Methods used to forecast the abundance of stocks in PSC Chinook Model: Externally provided forecast type codes are S=sibling; R= return rate; A=average return; model internally provided projection =C).

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 + Wild (RCH and RCT model stocks)	S	Yes	Yes	Robertson Creek Hatchery forecasts plus expansion for other WCVI stocks based on ratio of terminal run sizes
Upper Georgia Strait	C	-	No	Calibrated to escapement
Lower Georgia Strait Wild	C	-	Yes	Calibrated to escapement to Cowichan and Nanaimo Rivers
Lower Georgia Strait Hatchery	C	-	Yes	Calibrated to escapement to LGS hatchery systems and Squamish River
Nooksack Fall	R	No	No	1999–2000 return rate
Puget Sound Fingerling + Yearling	R	No	No	Age specific forecast for Green River, Kitsap and Puyullap
Puget Sound Natural	R	Partial	No	Age specific forecasts for Skagit and Stillaguamish
Nooksack Spring	R, A	Partial	No	North Fork is age specific
Skagit Summer/Fall	S	Yes	Partial	Cohort return rate
Snohomish Summer/Fall	R	No	No	Average of two methods used in 1995
Stillaguamish Summer/Fall	R	No	No	Marked and unmarked estimates
Washington Coastal Hatchery	R	No	No	Calibrated to terminal run
Washington Coastal Wild	C	-	No	Calibrated to terminal run
Columbia Upriver Bright	S	Yes	Yes	Run reconstruction used to estimate Columbia River mouth return
Mid-Columbia 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 Columbia River 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
Cowlitz Spring	S	Yes	Yes	Prediction is to mouth of Cowlitz River
Willamette River Hatchery	S	Yes	Yes	Prediction is to mouth of Willamette River
Columbia Upriver Summer	A	No	No	Changed in 2001 to 5-year average
Oregon Coastal North Migrating	A	Yes	Yes	Weighted average age composition from four index rivers
Snake River Fall (model stock)	C	-	No	Calibrated to escapement to Lower Granite

2.4. Escapement Trends and Goals

The Agreement includes chapter 3, section 9(b):

> "(*b) the additional management actions to be taken in relevant fisheries in accordance with this paragraph are as follows:*[3]

Percentage Reduction in Index	***Number of Stock Groups Requiring Response***
10%	*2 stock groups*
20%	*3 stock groups*
30%	*4+ stock groups*

> [3] *A stock group should be considered for additional management action pursuant to this paragraph if a significant loss of production results from escapement less than the agreed escapement objective for an extended period of time. By the end of 2001, the CTC will recommend, for adoption by the Commission, criteria defining the lower bound of escapement for the purposes of taking additional management actions pursuant to this paragraph. Until the end of 2001, the escapement level at which the MSY production is reduced by more than 15% will be defined as the lower bound for escapement."*

For the purpose of this year's analysis the CTC used the escapement value associated with a 15% reduction in production from the production level associated with MSY as a lower bound as per the Agreement. Also as per the Agreement, subsequent reports will use the lower bound definition developed by the CTC in 2001.

At the current time, the CTC has accepted escapement goals for ten SEAK stocks, three North Coastal Oregon stocks, and two Columbia River stocks as being biologically based. These escapement goals are based on relationships between estimates or predictions of spawning escapements and resulting production. In some cases, these escapement goals were expressed as point values while in other cases they have been expressed as a range. For this analysis, the goals expressed as a range were converted to point values. Estimated relationships between spawning escapements and subsequent production can readily be used to predict spawning escapements associated with a 15% reduction in production from the MSY production level (Appendix E, Method 1).

3.0 RESULTS

3.1. Exploitation Rate Analysis

3.1.1. Brood Year Exploitation Rates

Estimated brood year exploitation rates for 12 stocks were computed (Appendix F, Figures F.1–F.12). These figures are presented as cumulative bar graphs: reported catch plus incidental mortality summing to the total mortality for each brood year. Figures are labeled as ocean mortality (i.e. excludes terminal fisheries) or total mortality indicating ocean plus terminal fisheries. In general, exploitation rates for these 12 stocks have declined from the base period years.

3.1.2. Survival Indices

Estimated total brood year survival from CWT analysis and EV scalars from the model are presented for 24 of the index stocks in Appendix G. In general, recent brood year survivals are lower than in earlier years of the time series. 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 amount of correlation varied substantially among the stocks. Of the 24 stocks, 16 had *r* values that were significantly different from zero ($P < 0.05$). Correlation coefficients for these 16 stocks ranged from 0.47 to 0.90.

3.1.3. Stock Distribution

Tables in Appendix H provide the distribution and portion of a stock's production, for both reported and total mortality, within a calendar year (values within each year sum to 100%).

Table 3.1. Correlation (*r*) between total brood year survival estimated from CWTs and EV scalars for 24 stocks. *N* is the number of brood years for which both survival and EV data are available; *P* is the probability that the true *r* is equal to 0. A low *P* value indicates a significant correlation.

Stock	*N*	*r*	*P*
Hanford Wild	9	0.902	<0.001
Alaska Spring	16	0.816	<0.001
Cowlitz Fall Tule	18	0.757	<0.001
Quinsam	20	0.747	<0.001
Chilliwack	14	0.743	0.002
Nooksack Spring Yearling	11	0.740	0.009
Oregon Columbia River Tules	19	0.732	<0.001
Robertson Creek	20	0.657	0.002
Samish Fall Fingerling	13	0.628	0.022
Spring Creek Tule	21	0.624	0.003
George Adams Fall Fingerlings	16	0.575	0.020
Columbia River Upriver Bright	20	0.547	0.013
Lewis River Wild	16	0.521	0.039
Big Qualicum	21	0.481	0.027
South Puget Sound Fall Fingerling	19	0.478	0.038
Puntledge	21	0.469	0.032
Kitsumkalum	15	0.429	0.111
Skagit Spring Yearling	9	0.068	0.862
Squaxin Pens Fall Yearling	8	0.046	0.913
Cowichan	9	-0.003	0.993
Columbia River Summer	14	-0.040	0.893
South Puget Sound Fall Yearling	12	-0.187	0.560
White River Spring Yearling	17	-0.191	0.447
Sooes Fall Fingerling	8	-0.376	0.358

3.2 Model Output

3.2.1. 1999, 2000, and 2001 AABM Annual Abundance Indices

Beginning with the 1999 fishing season, the Agreement specified that the AABM fisheries were to be managed through the use of the AIs. In 1999 and 2000 the CTC pre-season calibration provided AIs that were used to set fishing plans. In addition to the pre-season AIs, the Agreement also provided that CTC approved in-season AIs could be used. Compliance with the Agreement specifies that the first post-season calibration will be used to assess compliance. However, the CTC did not produce a final calibration in 2000, thus the 2001 calibration is considered the first post-season for 1999. The 2001 final pre-season calibration (CLB 0107) provided AIs for 1979 through 2001 (Appendix I). The AIs from 1999 and 2000 are final, while the AI for 2001 is used to set preliminary catches for the year (Table 3.2).

Table 3.2. Abundance Indices for 1999, 2000, and 2001 for the SEAK, NBC, and WCVI Troll fisheries.

Fishery	1999	2000	2001
SEAK	1.12	1.10	1.14
NBC	0.97	0.95	1.02
WCVI	0.50	0.47	0.66

The Agreement specifies a 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.

Table 3.3. Observed and treaty catches for the AABM fisheries in 1999 and 2000 and the preseason forecast for 2001.

Fishery	1999 Observed	1999 Treaty	2000 Observed	2000 Treaty	2001 Forecast
SEAK All Gear	200,250	184,200	183,979	178,500	189,900
NBC Troll and QCI Sport	103,900	126,100	58,012	123,500	132,600
WCVI Troll and Outside Sport	31,085	107,000	100,030	92,300	141,182

In SEAK, the observed catch in 1999 and 2000 was greater than the treaty catch associated with the AI by 8.7% and 3.1%. In WCVI, the observed catch in 2000 was greater than the treaty catch associated with the AI by 8.4%, but the size limit in the troll fishery was reduced from 67 cm to 55 cm.

The Agreement specifies that overage/underage provisions apply to both AABM and ISBM fisheries. The Agreement directed the CTC to adapt the previous overage/underage annex provisions to reflect changes based on a catch established through in season or pre-season abundance indicators. The CTC was also asked to review the 7.5% range above and below the management objective and consider whether increased flexibility in the management range is desirable or necessary taking into consideration management precision and increased risk on affected stock groups[1]. The CTC has not yet discussed measures for implementation of overage/underage provisions.

[1] The complete instructions are in paragraph 7 and in the Appendix to Annex IV, Chapter 3 (2).

3.2.1.1. Abundance Indices and stock composition of AABM fisheries, 1979 to 2001

The AIs and associated stock compositions were calculated for the three AABM troll fisheries beginning in 1979 (Figures 3.1 through 3.3). There are 30 stock groups used in the model, however, the AABM fisheries are often composed of several major stocks. The relative abundance for each major stock is shown in the graphs.

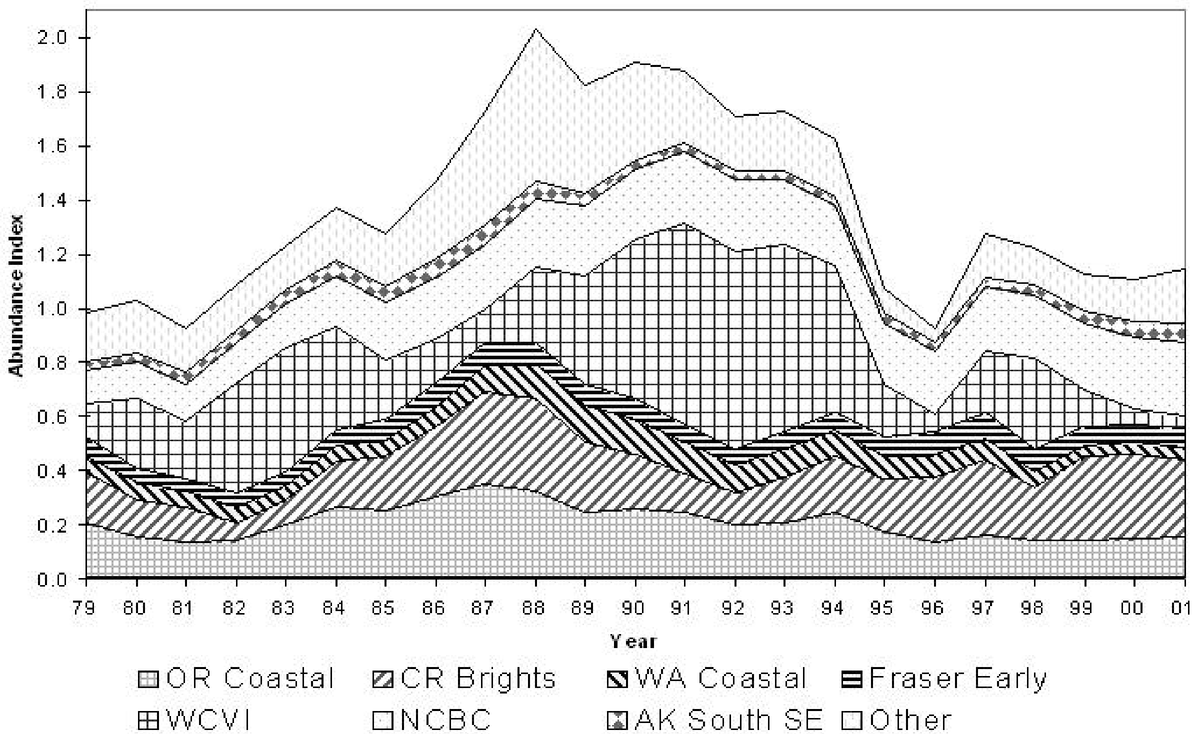

Figure 3.1. Total abundance index for the Southeast Alaska troll fishery and the annual stock composition estimated in CLB 0107.

- The 2001 AI for the SEAK troll fishery is 1.14, the same as the 2000 pre-season, but 0.04 points greater than the 2000 post-season.

- The stock composition for 2001 is similar to that of the 2000 post-season assessment.

The major stocks contributing to the index are: WCVI, Upriver Brights, NCBC, and Oregon Coastal. However, in 2001, production of WCVI chinook continues to be greatly reduced from past years.

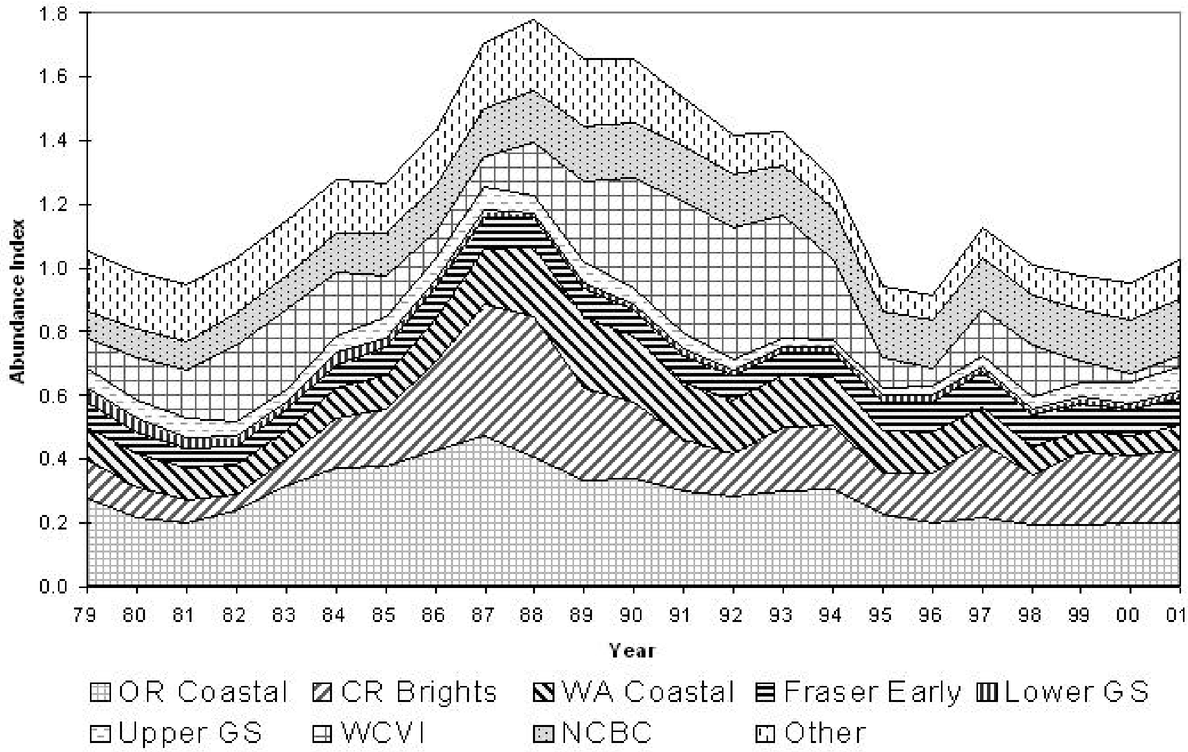

Figure 3.2. Total abundance index for the Northern BC troll fishery and the annual stock composition estimated in CLB 0107.

- The projected 2001 AI for the NBC troll fishery is 1.02. This is 0.02 points greater than the 2000 pre-season projection and 0.07 points greater than the 2000 post-season projection of 0.95.

- The stock composition for 2001 is similar to that of 2000.

The major stock groups in the NBC fishery are WCVI, Upriver Brights, Oregon Coastal, NCBC, and Washington Coastal. However, in 2001, production of WCVI chinook continues to be greatly reduced from past years.

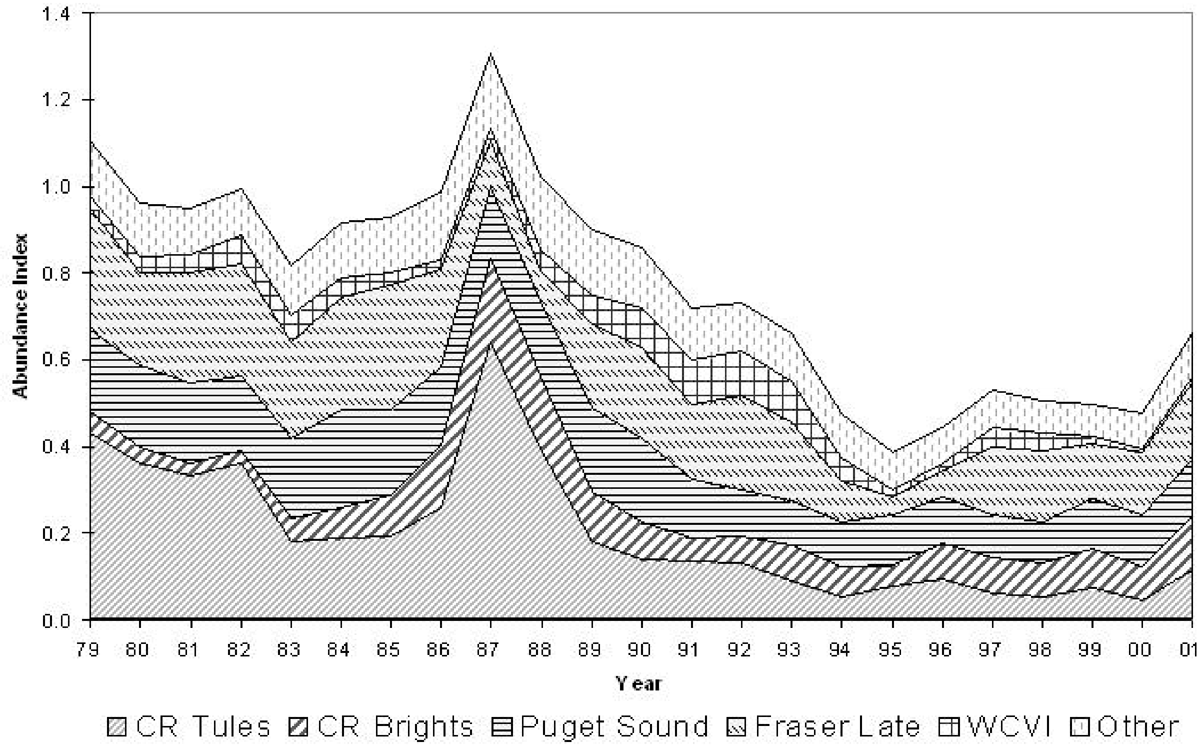

Figure 3.3. Total abundance index for the WCVI troll fishery and the annual stock composition estimated in CLB 0107.

- The projected 2001 AI is 0.66. This is 0.12 points greater than the pre-season AI for 2000 and 0.19 points greater than the 2000 post-season assessment.

- The increase in the projected 2001 AI is primarily due to an increase in the Columbia River Tules and Upriver Bright chinook stocks.

The major stock groups in the WCVI fishery are: Fraser Late, Puget Sound, Upriver Brights, and Columbia River Tules.

3.2.2. 1999, 2000, and 2001 ISBM Indices by Stock

For the ISBM fisheries, the Agreement specified that Canada and the United States would reduce base period exploitation rates on specified stocks by 0.365 and 0.400, respectively. This requirement does not apply to stocks that achieved their CTC agreed escapement goal. Canadian ISBM indices (Table 3.4) were all below the target ISBM index of 0.635. Thus, the general obligation was met for Canadian ISBM fisheries. For U.S. fisheries, several ISBM indices were above the target value of 0.600 (italicized in Table 3.5).

For 1999, eight CWT-based U.S. ISBM indices were above 0.600 (Table 3.6). Four of these were for stocks that had 1999 escapements above their CTC escapement goal. The remaining four were for the Upriver Bright and Washington Coastal Fall stocks (Queets, Hoh, and Quillayute). Although they lack CTC escapement goals, all exceeded their agency management goals in 1999. However, until the CTC has reviewed and accepted biologically-based escapement goals for these four stocks, one interpretation of the Treaty is that they are not in compliance with the "general obligation" of the agreement.

In 2000, seven U.S. ISBM indices were above 0.600 (Table 3.6). Two of these indices were for stocks that exceeded their CTC escapement goals in 2000. The other five were for the Hoh Fall, Quillayute Fall, Upriver Bright, Deschutes, and Nehalem stocks. Of these, only the Nehalem has a CTC agreed escapement goal. For the Nehalem, escapement was below the CTC escapement goal, but was above the 85% production level defined as the lower bound for escapement (footnote 3, page 40 of the agreement) (Table 3.11). As noted above, the other four stocks may not be in compliance with the general obligation. The Hoh, Quillayute, and Upriver Bright fall stocks met their agency management goals, but the Deschutes stock did not.

For 2001, twelve U.S. ISBM indices are predicted to be above 0.600 (Table 3.6). One was for Lewis River stock of chinook salmon, which is predicted to be above the CTC agreed goal in 2001. Planned harvest patterns for the remaining 11 stocks may not be in compliance with the general obligation of the Agreement.

Table 3.4. ISBM Indices for Canadian fisheries, 1999 through 2001.

Stock Group	Stock	Canadian ISBM Indices			
		CWT Index	Modeled Indices		
		1999[1]	1999	2000	2001
North / Central B. C.	Yakoun, Nass, Skeena, Area 8	NA[2]	0.237	0.254	0.613
West Coast Vancouver Island	WCVI (Artlish, Burman, Gold, Kauok, Tahsis, Tashish, Marble)	0.431	0.365	0.327	0.244
Fraser Early	Upper Fraser, Mid Fraser, Thompson	NA[2]	0.125	0.124	0.210
Fraser Late	Harrison River	0.112	0.309	0.198	0.336
Upper Strait of Georgia	Klinaklini, Kakweikan, Wakeman, Kingcome, Nimpkish	0.021	0.174	0.118	0.314
Lower Strait of Georgia	Cowichan	0.517	0.304	0.232	0.325
	Nanaimo	0.163	0.209	0.113	0.246
North PS Nat Springs	Nooksack, Skagit	0.183	0.233	0.156	0.241
Puget Sound Natural Summer / Falls	Skagit	NA	0.197	0.119	0.217
	Stillaguamish	0.194	0.355	0.234	0.469
	Snohomish	NA	0.185	0.116	0.222
	Lake Washington	NA	0.332	0.202	0.355
	Green R	0.171	0.333	0.202	0.356
Washington Coastal Fall Naturals	Hoko, Grays Harbor, Queets, Hoh, Quillayute	NA	0.201	0.161	0.354
Col River Falls	Upriver Brights	NA	0.124	0.104	0.377
	Deschutes	NA	0.124	0.104	0.377
	Lewis	NA	0.056	0.180	0.180
Col R Summers	Mid-Col Summers	NA	0.109	0.085	0.144
Far North Migrating OR Coastal Falls	Nehalem, Siletz, Siuslaw	NA	0.094	0.110	0.505

[1] The 1999 CWT based estimates, not the 1999 model estimates, are used for evaluating compliance.
[2] NA means not available because of insufficient data (lack of tag codes, base period CWT, etc).

Table 3.5. ISBM indices for U.S. fisheries, 1999 through 2001 (indices above 0.60 are italicized for stocks without CTC agreed escapement goals and for stocks that did not achieve CTC agreed escapement goals).

Stock Group	**Stock**	**US ISBM Indices**			
		CWT Index	**Modeled Indices**		
		1999[1]	**1999**	**2000**	**2001**
North / Central B. C.	Yakoun, Nass, Skeena, Area 8	NA[2]	NC[3]	NC	NC
West Coast Vancouver Island	WCVI (Artlish, Burman, Gold, Kauok, Tahsis, Tashish, Marble)		0.26	0.38	*0.73*[4]
Fraser Early	Upper Fraser, Mid Fraser, Thompson		0.08	0.15	*0.70*[4]
Fraser Late	Harrison River	0.47	0.66	0.39	*0.62*
Upper Strait of Georgia	Klinaklini, Kakweikan, Wakeman, Kingcome, Nimpkish	NA	NC	NC	NC
Lower Strait of Georgia	Cowichan	NA	0.17	0.21	0.48
	Nanaimo	NA	0.17	0.21	0.48
North PS Nat Springs	Nooksack	0.44	0.15	0.20	0.01
	Skagit	NA	ID[5]	ID	0.07
Puget Sound Natural Summer / Falls	Skagit	NA	0.17	0.21	*0.78*
	Stillaguamish	0.12	0.14	0.14	0.40
	Snohomish	NA	0.04	0.05	0.60
	Lake Washington	NA	0.50	0.48	0.59
	Green R	0.50	0.50	0.48	0.60
Washington Coastal Fall Naturals	Hoko	NA	0.39	0.34	0.56
	Grays Harbor	0.43	0.44	0.43	0.45
	Queets	*1.00*	0.88	0.42	0.44
	Hoh	*1.54*	1.39	*0.73*	*0.76*
	Quillayute	*1.30*	1.14	*0.72*	*0.75*
Col River Falls	Upriver Brights	*1.37*	1.02	*1.09*	*0.99*
	Deschutes	0.51	1.02	*0.88*	*0.74*
	Lewis	0.00	0.11	0.16	1.70[6]
Col R Summers	Mid-Col Summers	1.64[7]	0.11	0.09	0.14
Far North Migrating OR Coastal Falls	Nehalem	1.96[7]	2.67	*2.66*	*2.75*
	Siletz	0.82[7]	1.81	1.79[7]	*1.87*
	Siuslaw	1.22[7]	0.94	0.93[7]	*0.95*

[1] The 1999 CWT based estimates, not the 1999 model estimates, are used for evaluating compliance.
[2] NA means not available because of insufficient data (lack of tag codes, base period CWT, etc).
[3] NC means that the current model assumes the stock is not caught in US ISBM fisheries.
[4] Stock group not in Annex Table V.
[5] ID means insufficient data available to estimate stock specific impacts.
[6] Escapement predicted to be above CTC goal.
[7] Escapement was above CTC goal.

Table 3.6. ISBM indices above the general obligation in 1999 and 2000 for stocks without CTC agreed escapement goals.

Stock	US ISBM Indices	Comment
Queets	1999: *1.00*	No CTC goal. Escapement was above mgmt. floor.
Hoh Falls	1999: *1.54*	No CTC goal. Escapement was above mgmt. floor.
	2000: *0.73*	No CTC goal. Escapement was above mgmt. floor.
Quillayute Falls	1999: *1.30*	No CTC goal. Escapement was above mgmt. floor.
	2000: *0.72*	No CTC goal. Escapement was above mgmt. floor.
Upriver Brights	1999: *1.37*	No CTC goal. Escapement was above mgmt. goal.
	2000: *1.09*	No CTC goal. Escapement was above mgmt. goal.
Deschutes	2000: *0.88*	No CTC goal. Escapement below mgmt. goal.
Nehalem	2000: *2.66*	Below CTC goal. Above 85% production (Table 3.9)

As with the AABM fisheries, the agreement specifies that overages are to be accounted for. The CTC has not yet discussed measures for implementation of overage/underage provisions. This is the first year that the nonceiling fishery index method has been adapted to ISBM fishery indices and the first year that preseason ISBM projections have been made. As shown for 1999 in Tables 3.4 and 3.5, estimates based upon CWTs versus the CTC model can vary substantially. Projections of 2001 ISBM indices provide a caution to management agencies for preseason planning, but there is uncertainty associated with them. The number of stocks with U.S. ISBM indices above 0.60 that do not have CTC-accepted escapement goals emphasize the need for agencies to provide for CTC review, the data and analyses to justify biologically-based escapement goals.

3.3. Model Calibration Evaluation

The model catches and stock escapements or terminal runs estimated by CLB 0107 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 may reflect errors in the estimation of initial stock abundances used to initiate the model. This has been a consistent problem for certain fisheries. The effect of these deviations depends on the direction of the error (over or under estimation), magnitude of the catches, and the stocks involved in each fishery.

Table 3.7. Average proportion of observed catch accounted for by model CLB 0107.

Model Fishery	Model Catch as Proportion of Observed Catch
Southeast Alaska Troll	0.826
Northern BC Troll	1.052
Central BC Troll	1.340
West Coast Vancouver Island Troll	1.154
Washington/Oregon Ocean Troll	1.361
Strait of Georgia Troll	1.021
Southeast Alaska Net	0.599
Northern BC Net	0.648
Central BC Net	1.182
Puget Sound North Net	0.838
Southeast Alaska Sport	0.688
North/Central BC Sport	1.708
West Coast Vancouver Island Sport	0.608
Washington/Oregon Ocean Sport	1.008
Puget Sound North Sport	0.844
Puget Sound South Sport	0.629
Strait of Georgia Sport	1.463

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 0107. The column entitled “Avg Fit” represents the 1979–2000 average ratio between the model-generated estimate and reported values. On average, the model is able to accurately estimate the observed terminal run or escapements used in the calibration process. The column entitled “SD” is the standard deviation of the ratios between model estimates and reported values.

Table 3.8. Comparison of model calibration results with estimated terminal run sizes or escapements during 1979 through 2000. For most stocks (or stock groups) included in the model calibration, N = 22 years, except for Nooksack Springs (N = 8, years 1980–1987) and the Mid-Columbia River Bright Hatchery group (N = 20, years 1981–2000).

Model Stock	Calibration Type	Avg Fit	SD	Min	Max
Alaska South SE	Escapement	1.035	0.211	0.745	1.521
Northern/Central BC	Term. Run	1.012	0.094	0.797	1.267
Fraser Early	Term. Run	1.015	0.096	0.854	1.164
Fraser Late	Escapement	0.996	0.118	0.799	1.165
WCVI Hatchery & Natural	Term. Run	1.022	0.204	0.713	1.727
Upper Strait of Georgia	Escapement	1.085	0.313	0.739	2.116
Lower Strait of Georgia Natural	Escapement	1.033	0.196	0.750	1.391
Lower Strait of Georgia Hatchery	Term. Run	1.024	0.233	0.663	1.818
Nooksack Fall	Term. Run	1.042	0.176	0.773	1.382
Puget Sound Fall Fingerling & Yearling	Term. Run	1.021	0.106	0.828	1.186
Puget Sound Natural Fall	Term. Run	1.033	0.145	0.837	1.313
Nooksack Spring	Escapement	1.059	0.219	0.864	1.547
Skagit Summer/Fall Wild	Term. Run	1.046	0.244	0.658	1.749
Stillaguamish Summer/Fall Wild	Escapement	1.060	0.228	0.738	1.709
Snohomish Summer/Fall Wild	Term. Run	1.019	0.125	0.816	1.237
Washington Coastal Fall Hatchery	Term. Run	1.052	0.176	0.815	1.453
Columbia Upriver Bright	Term. Run	1.000	0.154	0.719	1.223
Spring Creek Hatchery	Term. Run	1.011	0.125	0.771	1.300
Lower Bonneville Hatchery & Fall Cowlitz Hatchery	Term. Run	0.999	0.206	0.589	1.297
Lewis River Wild	Term. Run	1.036	0.217	0.647	1.542
Willamette Spring Hatchery	Term. Run	1.002	0.122	0.798	1.317
Spring Cowlitz Hatchery	Term. Run	1.023	0.172	0.632	1.341
Columbia River Summer	Escapement	1.010	0.095	0.886	1.244
Oregon Coastal Fall North Migrating	Escapement	1.028	0.200	0.709	1.393
Washington Coastal Fall Wild	Term. Run	1.032	0.149	0.819	1.401
Snake River Wild Fall	Escapement	1.136	0.585	0.636	2.987
Mid-Columbia River Bright Hatchery	Term. Run	1.042	0.176	0.761	1.476

The variability in these annual estimates differs between stocks. The variability tend to be greatest in stocks without age-specific data or in stocks 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 2001. The minimum column (Min) represents the smallest proportion of the reported value estimated by the model. The maximum column (Max) represents the largest ratio between the estimated value and the model estimate. 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 a stock that has a minor impact on a fishery of concern may not necessitate further attempts at model calibration.

Total mortality fishery indices generated by CLB 0107 can also be compared to the CWT-based exploitation rate analysis. Model and CWT based fishery indices use the same equation, but employ model estimates for all model stocks instead of CWT recovery data from select exploitation rate indicator stocks.

The CWT estimates are considered to be the best estimate and a comparison of those estimates with those derived from the model provides one measure of how well the model represents changes in fisheries. Two types of Fishery Index are presented; reported catch and total mortality. A correlation coefficient was calculated between the CWT and model estimates for each type of index for the three AABM troll fisheries (Table 3.9). The coefficients were all significant ($P<0.01$; $N=21$ years). The model results are closely associated with the CWT-based indices and changes in fishery harvest rates as indicated in Figures 3.4 through 3.6.

Table 3.9. Correlation coefficients between CWT and model fishery indices for the AABM troll fisheries.

	Troll Fishery		
Index	SEAK	NBC	WCVI
Reported	0.905	0.833	0.925
Total	0.816	0.831	0.929

The model fishery index for SEAK closely follows the trend of the CWT derived estimate from 1979 through 1987 for both landed and total mortality (Figures 3.7 and 3.8). Beginning in 1988, the model estimate is consistently less than that derived with CWT except for 1996. The model estimate is also relatively stable during this period while that for the CWT data shows some large fluctuations.

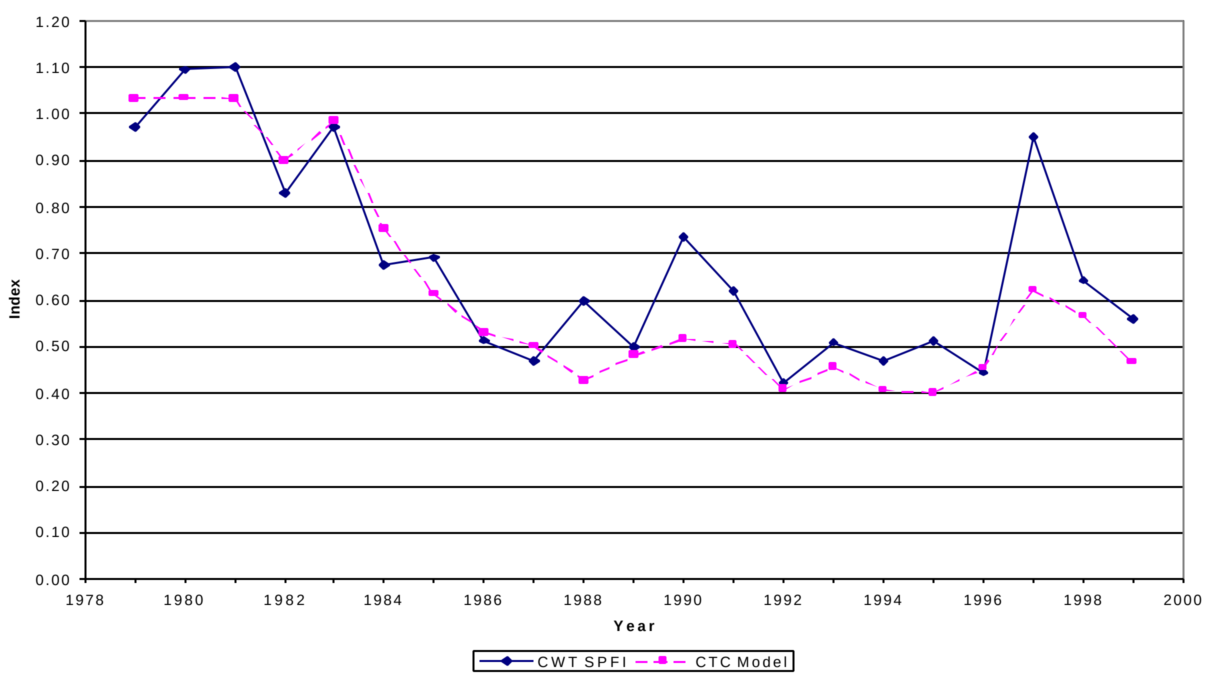

Figure 3.4. Estimated CWT and model reported catch fishery indices for SEAK troll.

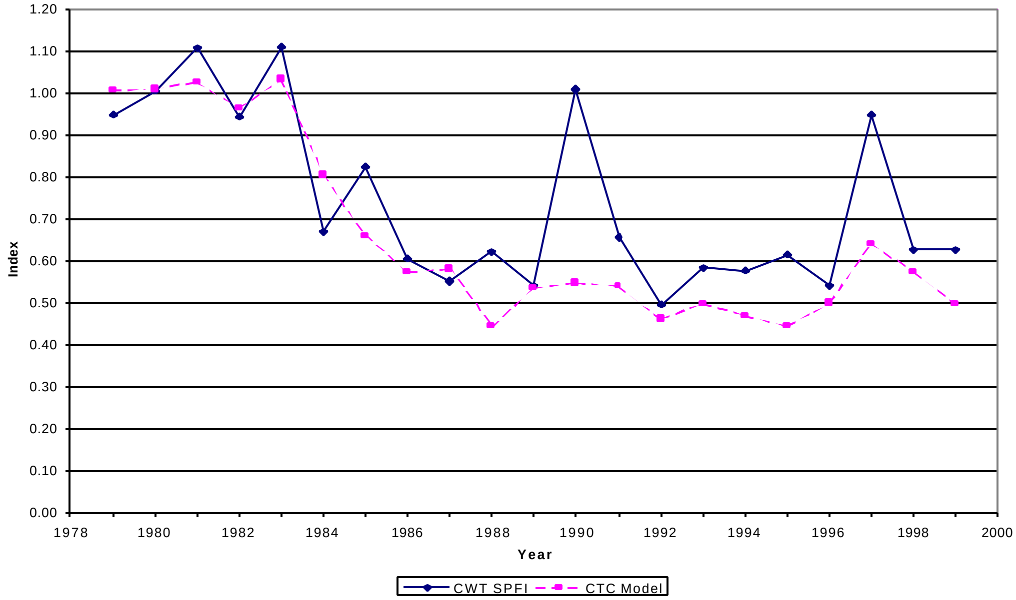

Figure 3.5. Estimated CWT and model total mortality fishery indices for SEAK troll.

The model derived fishery index for NBC generally follows the trend estimated with CWTs (Figures 3.6 and 3.7). From 1984 through 1990 the model derived fishery index estimates are less than the estimates based upon CWTs, but in following years those trends reverse and the CWT based estimates exceed the model derived estimates.

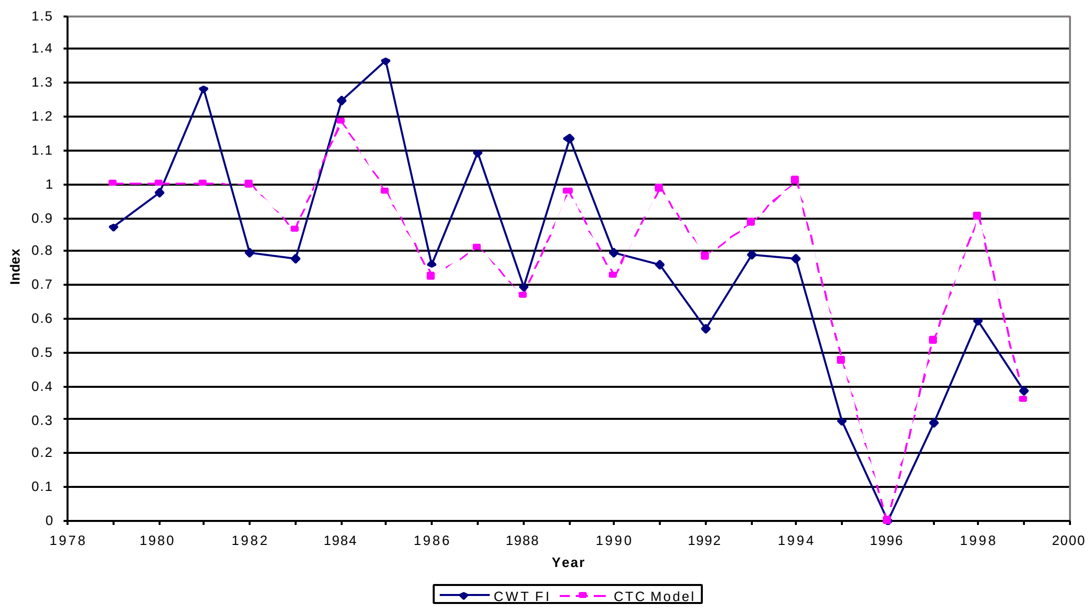

Figure 3.6. Estimated CWT and model reported catch fishery indices for the NBC troll fishery.

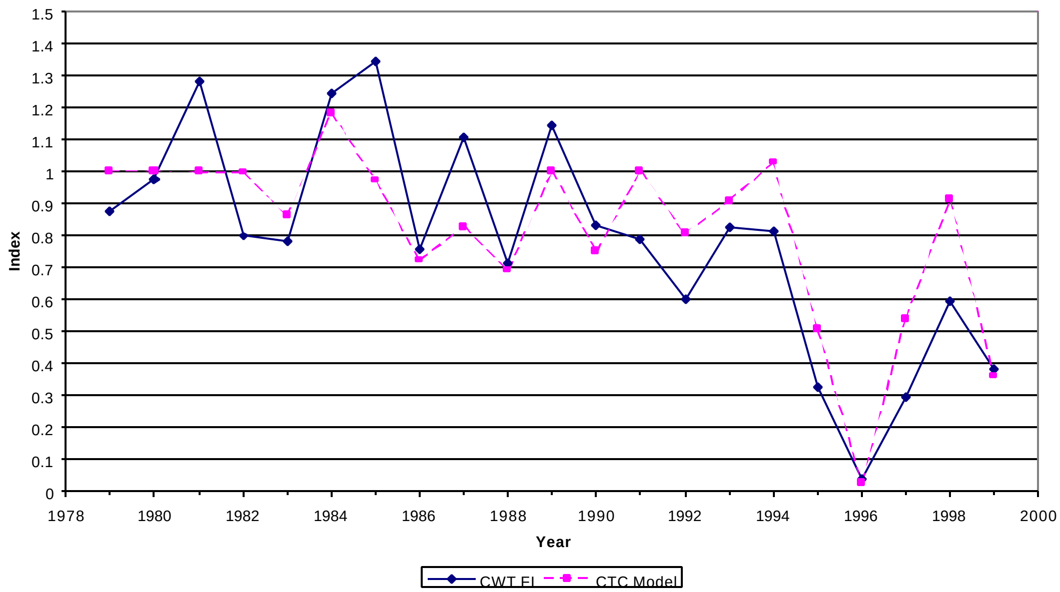

Figure 3.7. Estimated CWT and model total mortality fishery indices for the NBC troll fishery.

The model derived reported catch fishery index estimates and trends for the WCVI troll fishery are similar to that information derived from CWTs since the base period, although between 1991 and 1995, the model estimates were consistently greater than the CWT based estimates (Figures 3.5 and 3.6).

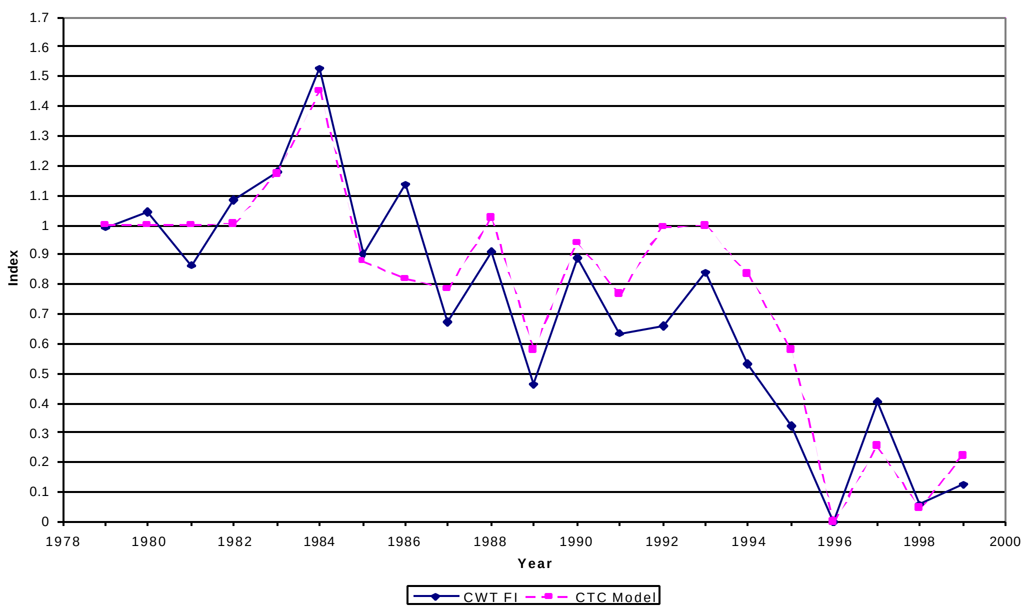

Figure 3.8. Estimated CWT and model reported catch fishery indices for the WCVI troll fishery.

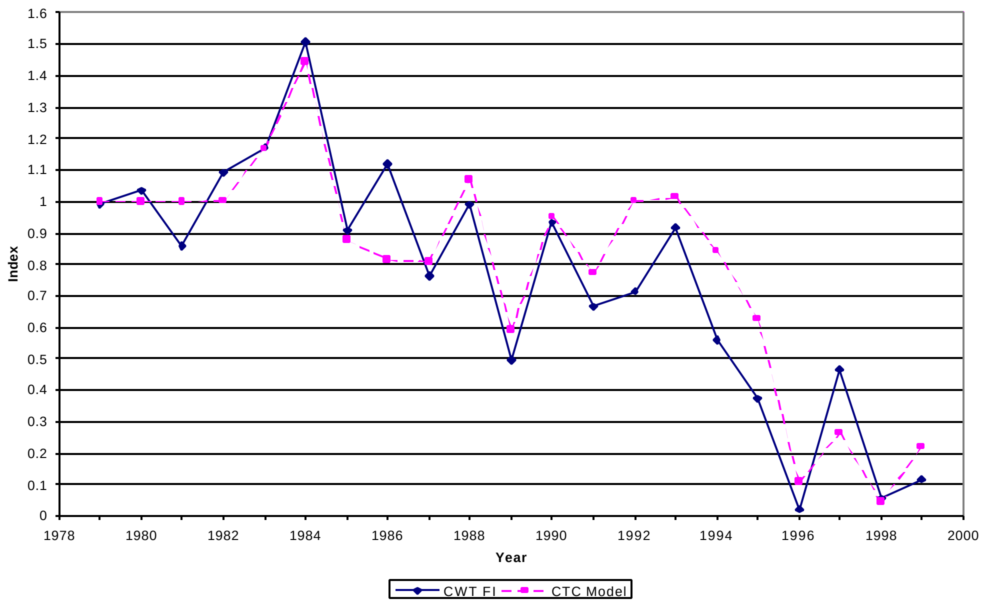

Figure 3.9. Estimated CWT and model total mortality fishery indices for the WCVI troll fishery.

3.4. Summary of Model Stock Forecasts

A summary of recent forecasts for 14 stocks used in the CTC model calibration indicates that the accuracy of individual stock/year forecasts have ranged from 31% to 148% while the average accuracy has ranged from 63% to 126% during the period of 1997–2000 (Table 3.10). The variability of these forecasts is greater in the smaller stocks and for the WCVI stock, which involves extrapolation of the Robertson Creek Hatchery forecast to all WCVI stocks as described in Appendix D. For the major production stocks, these forecasts suggest that their abundance in 2001 will be less than reported for 2000.

3.5. Summary of Escapement Trends and Goals

Paragraph 9 of the new Agreement defines criteria for identifying stocks of concern (only for stocks with CTC agreed escapement goals) and escapement levels in those stocks that would trigger additional management action (footnote 3, page 40 Agreement). Of the 15 stocks with CTC agreed escapement goals (Table 3.11), the Blossom stock was the only stock to potentially qualify as a stock of concern (two years below escapement range). However, additional management action for this stock is not triggered in 2001 since both years exceed the lower bound of escapement as defined in footnote 3 of the Agreement[2] (85% Production column in Table 3.11).

The 1999 escapements for the Taku and Lewis chinook salmon stocks were less than the 85% production trigger values, but escapements in 2000 equaled or exceeded their goals. Thus, escapements during 1999 and 2000, for stocks with agreed escapement goals, do not trigger any additional management actions for 2001 as per paragraph 9, Chapter 3 of the Agreement.

[2] Feb. 22, 2001 memo from CTC to PSC Commissioners. Clarification of Footnote 3, Chinook Chapter. pg. 6

Table 3.10. Comparison of preseason forecasts with postseason estimates for various PSC model stocks of chinook salmon.

Model Stock	1997			1998			1999			2000			97–00 Avg%	2001
	Forecast	Post-Season Assessment	%	Forecast	Post-Season Assessment	%	Forecast	Post-Season Assessment	%	Forecast	Post-Season Assessment	%		Forecast
N. Oregon Coastal	86,653	58,542	148	77,454	65,080	119	72,084	66,033	109	63,222	52,888	120	124	61,338
Willamette Spring	27,400	34,500	79	32,800	43,500	75	46,000	52,600	87	59,900	57,500	104	87	61,000
Cowlitz Spring	1,400	1,900	74	1,500	1,100	136	2,100	1,600	131	2,000	1,700	118	115	1,000
Col. Upriver Summer	16,700	28,000	60	17,300	21,500	80	16,500	26,200	63	33,300	30,700	108	78	24,500
Upriver Bright Fall	166,400	164,900	101	150,800	142,300	106	147,500	166,700	88	171,100	152,500	112	102	127,200
Spring Cr Hatch. Fall	21,900	27,400	80	14,200	20,200	70	65,800	49,300	133	21,900	19,600	112	99	56,600
Lewis River Wild Fall	7,500	12,300	61	8,100	7,300	111	2,600	3,300	79	3,500	11,400	31	70	16,700
Nooksack Hatchery	34,000	34,165	100	28,000	29,506	95	27,000	40,855	66	19,000	Not Available	-	87	34,900
Skagit Natural	6,357	6,214	102	6,388	14,931	43	7,600	5,187	147	7,300	Not Available	-	97	9,100
Stillaguamish Natural	1,600	1,186	135	1,600	1,563	102	1,550	1,104	140	2,000	Not Available	-	126	1,700
Snohomish Natural	5,000	9,493	53	4,200	7,950	53	5,200	4,409	118	6,000	Not Available	-	74	5,800
Snohomish Hatchery	2,300	3,927	59	2,700	3,974	68	4,000	8,612	46	6,200	Not Available	-	58	4,100
WCVI Total	119,300	145,200	82	105,800	183,600	58	68,400	98,400	70	15,100	37,100	41	63	31,000
Harrison Stock[1]	80,000	76,000	105	161,700	264,200	61	82,650	189,400	44	220,400	195,500	113	81	131,800

[1] 1997 forecast for Harrison River only, Harrison and Chilliwack included for 1998 onward.

Table 3.11. Escapement Assessment for stocks with CTC agreed escapement goals (Bold values indicate escapements below goals).

Stock	Area	Agreed Goals	Point Estimate	85% Production	1999 Escapement	2000 Escapement	Below 85%[1]
Situk	SEAK	5,00–1,000	600	381	1,811	2,018	No
Alsek (Klukshu)	SEAK	1,100–2,300	1,100	721	2,166	1,363	No
Taku	SEAK	30,000–55,000	35,938	25,903	**20,545**	30,014	No
Stikine	SEAK	14,000–28,000	17,368	13,428	25,968	35,447	No
King Salmon	SEAK	120–240	150	100	300	137	No
Andrew Creek	SEAK	650–1,500	850	586	1,210	1,286	No
Unuk (index)	SEAK	650–1,400	800	547	680	1,341	No
Chickamin (index)	SEAK	450–900	525	351	492	801	No
Blossom (index)	SEAK	250–500	300	195	212	231	No
Keta (index)	SEAK	250–500	300	198	276	300	No
Columbia River Summers	Col River	17,857	17,857	11,715	23,057	27,073	No
Lewis	Col River	5,700	5,700	3,721	**3,184**	8,718	No
Nehalem	NOC	6,989	6,989	4,762	8,063	5,257	No
Siletz	NOC	2,944	2,944	1,849	4,166	4,982	No
Siuslaw Falls	NOC	12,925	12,925	9,194	29,610	12,999	No

[1] Whether or not the spawning escapement is below the 85% production level (of MSY) for the latest two consecutive years.

4.0. REFERENCES CITED

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Appendix A. Relationship between CWT exploitation rate indicator stocks, escapement assessment stocks, model stocks and additional management action stocks.

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

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

Table A.2. Indicator stocks for Canada.

Area	Annex Stock Group	Annex Indicator Stocks	Run	Escapement Indicator Stock	Escapement Objective	Model Stock	Esc Goal in Model	ER Stock
NBC-Area 1	North / Central British Columbia	Yakoun	Sum	Yakoun	Escapement goal range by stock	North / Central BC	117,500	Kitsumkalum
NBC-Area 3		Nass	Sp/Su	Nass				Snootli Cr Hat (Atnarko R)
NBC-Area 4		Skeena	Sp/Su	Skeena				Kitimat River
CBC-Area 8			Sp	Dean				
CBC-Area 9			Sp/Su	Rivers Inlet				
CBC-Area 10			Sum	Smith Inlet				
WCVI	West Coast Vancouver Island Falls	(Artlish, Burman, Gold, Kauok, Tahsis, Tashish, Marble Rivers)	Fall	WCVI Aggregate	Escapement goal range for aggregate	WCVI Natural	42,734	Robertson Creek
			Fall			WCVI Hat	6,472	
Fraser River	Fraser Late	Harrison River	Fall	Harrison River	Esc goal	Fraser Late	98,000	Chehalis
			Fall					Chilliwack
	Fraser Early	Upper Fraser rivers	Spr	Upper Fraser	Escapement goal range by stock	Fraser Early	93,700	
		Mid Fraser rivers	Sp/Su	Mid Fraser				
		Thompson rivers	Sum	Thompson				
Upper Strait of Georgia	Upper Strait of Georgia	(Klinaklini, Kakwiekan, Wakeman, Kingcome, Nimpkish)	Su/F	Upper Strait of Georgia	Escapement goal range for aggregate	Upper Georgia Strait	23,300	Quinsam
Lower Strait of Georgia	Lower Strait of Georgia	(Cowichan, Nanaimo rivers)	Fall	Cowichan / Nanaimo	Escapement goal range for aggregate	Lower Georgia Strait Nat	21,935	Cowichan
			Sum/ Fall			Lower Georgia Strait Hat	5,318	Big Qualicum Falls
								Puntledge Summers

Table A.3. Indicator stocks for Puget Sound.

Area	Annex Stock Group	Annex Indicator Stocks	Run	Escapement Indicator Stock	Escapement Objective	Model Stock	Esc Goal in Model	ER Stock
Hood Canal			Fall					George Adams
Juan de Fuca			Fall					Elwha Fall Fing
	Washington Coastal Fall Naturals	Hoko	Fall	Hoko				Hoko Fingerling
North/Central Puget Sound	North PS Nat Springs	Nooksack	Spr	Nooksack	Escapement goal range by stock	Nooksack Spring	4,000	Nooksack Spr Y
		Skagit	Spr	Skagit spring				Skagit Spr Year
			Fall			Nooksack Fall	11,923	
			Fall					Samish Fing
	Puget Sound Natural Summer/ Falls	Stillaguamish	Su/F		Escapement goal ranges by stock	Stillaguam. Wild	2,000	Stillag. Fall Fing
		Snohomish	Su/F			Snohomish Wild	5,250	
		Skagit group	Su/F	Skagit sum/fall		Skagit Wild	9,778	
		Lake WA	Fall			PS Nat Fing	16,966	
		Green River	Fall					
			Fall					Nisqually Fing
			Fall					UW Accelerated
South Puget Sound			Fall			PS Hatchery Fing	24,769	S. PS Fall Fing
			Fall			PS Hatchery Year	9,136	S. PS Fall Year.
			Fall					Squaxin P. Year
			Spr					White R Spr Y

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

Area	Annex Stock Group	Annex Indicator Stocks	Run	Escapement Indicator Stock	Escapement Objective	Model Stock	Esc Goal in Model	ER Stock
WA Coast	Washington Coastal Fall Naturals	Grays Harbor	Fall	Grays Harbor Fall	Escapement goal range by stock	WA Coastal Wild	21,500	
		Queets	Fall	Queets Fall				Queets Fingerling
		Hoh	Fall	Hoh Fall				
		Quillayute	Fall	Quillayute Fall				
			Fall					Sooes Fingerling
			Fall			WA Coastal Hat	6,703	
			Spr	Grays Harbor Spr				
			Sum	Quillayute Summer				
			Sp/Su	Queets Spr/Sum				
			Sum	Hoh Spr/Sum				

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

Area	Annex Stock Group	Annex Indicator Stocks	Run	Escapement Indicator Stock	Escapement Objective	Model Stock	Esc Goal in Model	ER Stock
Columbia River	Columbia River Falls	Upriver Brights	Fall	Col. Upr. Bright		Upriver Brights	40,000	Priest Rapids
			Fall					Hanford Wild
		Deschutes	Fall	Deschutes				
		Lewis River	Fall	Lewis	5,700	Lewis R. Wild	5,700	Lewis R Wild
			Fall			Lyons Ferry Hat	3,430	Lyons Ferry
			Fall			Mid Col R Bright	12,500	
			Fall			Spring Creek Hat	7,000	Spring Cr Tule
			Fall			Lwr Bonn. Hat	26,200	Col Lwr R Hat
			Fall			Cowlitz Fall Hat.	8,800	Cowlitz Tule
	Columbia R Summers	Mid-Col Summers	Sum	Col Upriver Summer	17,857[1]	Col R Summer	17,857	Col R Summer
			Spr	Col. Upriver Spring				
			Spr			Cowlitz Spr Hat	2,500	
			Spr			Willamette R. Hat	13,500	Willamette Spr
North Oregon Coast	Far North Migrating OR Coastal Falls	Nehalem	Fall	Nehalem	6,989			
		Siuslaw	Fall	Siuslaw	12,925			Salmon River
		Siletz	Fall	Siletz	2,944	Oregon Coast	62,382	
Mid-Oregon Coast			Fall	Umpqua				
			Fall	Coquille				

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

Appendix B. Coded-wire tags used in exploitation rate analyses.

LIST OF APPENDIX B TABLES

Table B.1. Tag codes for Alaska Spring.

BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89	BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96
031661	031716	031753	031761	031655	031826	031901	031957	032027	032037	030116	030218	030227	030233	030234	030130	030138	030142	032128
031703	031717	031754	031762	031807	031827	031902	031958	032028	032038	030119	030219	030228	032233	030235	030131	030139	030143	032301
031704	041917	041944	031763	031808	031828	031903	031959	032029	032039	030121	030220	030229	032234	030236	030132	030140	030144	036212
031705	041943	042121	031801	031809	031829	031904	031960	032030	032040	030122	030221	030230	032235	030237	030133	030141	032051	036215
031706	041945	042202	031802	031810	031830	031905	031961	032031	032041	030125	030222	030231	036332	030238	030134	032247	032245	036234
031707	042039	044005	031803	031811	031831	031906	031962	032032	032042	030216	030223	030332	036335	032236	030135	032248	032246	036235
031708	042040		031804	031812	031832	031907	031963	032033	032043	030217	030224	031618	036337	032237	032137	032249	032257	036236
031709	042042		036303	031813	031833	031908	032001	032034	032044	031947	030225	032216	036338	032238	032242	032250	032258	036239
031710	042043		036304	031814	031834	031909	032002	032113	032045	032138	030226	032217	036339	032239	032243	032251	032259	036240
031711	042045		036305	031815	031835	031910	032003	032114	032131	032141	032052	032218	036340	032240	032244	032252	032260	036336
031712			042222	031816	031836	031911	032004	032116	032132	032201	032203	032219	036341	032241	036209	032253	032305	044624
031713			042223	031817	031837	031912	032005	032119	032135	032202	032204	032220	036342	036350	036210	032254	032306	044625
031714			042227	031818	031838	031913	032006	032121	036226	036237	032205	032221	036343	036351	036301	032255	032307	044626
031715			042229	031819	031839	031914	032007	032122	036228	036238	032206	032222	036344	036352	036357	032256	032308	044662
041932			042230	036306	031843	031915	032008	036213	036231	036329	032207	032223	036345	036353	036358	036217	032309	044942
041938			B40907	036307	031844	031916	032009	036214	036232	036330	032208	032224	036346	036354	036359	036218	036224	044958
041939			B40908	036308	031845	031917	032010	036216	036319	036331	032209	032225	036347	036355	036360	036220	036227	044959
041940				036309	031846	031918	032011	036219	036321	043247	032210	032226	036348	036356	036361	036223	036229	044960
				042255	031847	031919	032012	036221	036322	043249	032211	032227	036349	044049	036362	044502	044242	044961
				042354	031848	031920	032013	036222	036323	043250	032212	032228	043857	044050	036363	044504	044243	044962
				042355	031849	031921	032014	036225	036324	043252	032213	032229	043858	044142	044314	044543	044525	045001
				042356	031850	031922	032015	036310	036325	043255	032214	032230	043859	044143	044315	044544	044526	045002
				042430	031851	031923	032016	036311	036326	043303	032215	032231	043904	044148	044407	044561	044619	045003
				042431	031852	031924	032017	036312	036327	043304	043232	032232	043905	044149	044416	044562	044717	
					031853	031925	032018	036313	036328	043305	043449	036333	043906	044157	044417	044563	044718	
					031854	031926	032019	036314	042737	043306	043450	036334	043907	044223	044418	044601	044737	
					031855	031927	032101	036315	042738	043319	043501	042945	043933	044224	044419	044602	044738	
					031856	031928	032102	036316	043027	043320	043502	043701	043934	044238	044420	044603	044745	
					031857	031929	032103	036317	043028	043323	043504	043702	043936	044239	044421	044604	044746	
					031858	031930	032104	042754	043029	043324	043507	043704	043937		044430	044610	044747	
					031859	031931	042626	042908	043030	043406	043530	043705	043938		044431	044611	044754	
					031860	031932	042628	042909	043031	043407	043531	043706	043939				044755	
					031861	031933	042631	042960	043032		043532	043707	044028				044756	
					031862	031934	042632	043101	043058		043533	043708	044029				044757	
					031863	031935	042633	043102	043059		043606	043745	044101				044758	
					040321	031936	042634	043104	043141		043607	043746	044102				044759	
					042463	031937	042713	043107	043142		043608	043747	044104				044760	
					042503	031938	042731	043108	043144			043748						
					042511	031939	042732		043147			043749						
					042512	031940	042733		043149			043750						
					042513	031941	042825					043821						

-continued-

Table B.1. (page 2 of 2)

BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89	BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96
						031942						043822						
						031943						043823						
						031944												
						031945												
						031946												
						031948												
						040329												
						040330												
						040331												
						040332												
						040333												
						040336												
						040342												
						040343												
						040344												
						040345												
						040346												
						040347												
						040348												
						040349												
						040350												
						042321												
						042530												
						042531												
						042534												
						042535												
						042536												
						042537												
						042538												
						042539												
						042540												

Table B.2. Tag codes for Kitsumkalum River.

BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89	BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
021852	021951	022312		022758	023346	023704	024414	024944	026039	020940	021133	023116	181046	021104	180608	182339	182749	182809
		022313			023347	023705	024413	024941	026040	020941	021134	021010	181047	181423	180609	182340	182750	182810
					023348	023706	024412	024942	026041	020942	021135	021011	181048	181424	180640	182341	182751	183308
					023349	023707	024411	024943	026042	020943	021136		181049		180641	182342	182752	
					023350		024410	025060	026043	020944	021137		181050		180642	182343	182753	
					023351			025061	026044	020945	021138		181051		182155	182344	182754	
					023352				026045	020946	021139		181052		182156	182345	182755	
					023353					026137	021140				182157			
										026138								

Table B.3. Tag codes for Robertson Creek.

BY 73	BY 74	BY 75	BY 76	BY 77	BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89
020203	020606	020408	021629	022217	021615	021827	021661	022202	022541	022662	023131	023734	024256	024311	025014	020151
020406	020906	020409	021630	022218	021635	021829		022405	082225	022663	023132	023735	024257	024802	025836	020152
020506	021206	021305	021631							022708	023133	023736	024361	024809	025837	020153
020602	021406									022753	023134	023737	024362	024810	025838	020645
										082247	023135	023738	024363	024951	025839	020646
										082248	023136	023739	024401	024952	026055	020647
											023142	023740		024958	026056	020648
											023143	023741		024959	026057	020948
											023144			024960		020949
											023145			024961		020950
											023151			025326		
											023203			025327		
											023204			025328		

BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
021208	180620	180259	181539	181455	182226	182232	182814
021209	180621	180260	181540	181456	182227	182233	182815
021549	180622	180261	181541	181457	182228	182234	182816
021550	180623	180262	181542	181458	182229	182235	182817
021551	180802	180624	181543	181459	182230	182236	183153
021552	180803	180625	181544	181460	182231	182237	183154
021553	180804	180626	181545	182220	182502	182541	183155
	180805	180627	181546	182221	182503	182542	183156
				182222	182504	182543	183157
				182223	182505	182544	183158
				182224	182506	182545	
				182225	182507	182546	
					182508	182547	

Table B.4. Tag codes for Quinsam River.

BY 74	BY 75	BY 76	BY 77	BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89
020403	020108	021916	021736	021759	021757	021657	022303	022518	022631	023322	023522	024152	024419	025814	026062
			021737		021758	021943	022304	022519	022632	023323	023523	024153	024420	025815	026063
			021738			021950				023324	023524	024154	024421	025816	026101
										023325	023525	024155	024956	025817	026102
										023326	023554	024156	025358	025818	020361
										023327	023555	024157	025359	025819	020360
										023328	023556	024158	025360	025820	020359
										023329	023557	024159	025361	025821	020358
										023330	023558	024160	025362	025822	020357

BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
020956	180422	181150	180629	181644	181658	181830	183035
020957	180421	181151	180630	181645	181659	182512	183036
020958	180420	181152	180631	181646	181660	182513	183037
020959	180419	181153	181357	181647	181661	182514	183038
021448	180418	181154	181358	181648	182016	182515	183039
021449	180417	181155	181359	181649	182017	182516	183040
021450	180416	181156	181360	181650	182018	182517	183041
021451	180415	181157	181361	181651	182020	182518	183042
026019	021331	181158	181362	181652	182021		

Table B.5. Tag codes for Puntledge.

BY 74	BY 75	BY 76	BY 77	BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89
021402	020308	021816	021634	021731	021854	021947	022302	022556	022710	023357	023727	024701	023701	026034	020809
								022557	022711	023358		024702			020810
										023359					
										023360					

BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
180315	180817	181403	181410	182138	182449	182841	182843
180316	180816	181404	181411	182139	182450	182842	182844
	180815						
	180814						

Table B.6. Tag codes for Big Qualicum.

BY 73	BY 74	BY 75	BY 76	BY 77	BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89
BLRD	021002	020206	021716	021726	021612	021824	021810	022223	022543	022661	023217	023742	024260	024416	026010	020660
BLRDGN				021727	021613	021825	021944	022306		022747	023320	023743	024261	024742	026047	020661
BLRDGD					021656	021826				022748	023321	023744	024262	024761	026048	020662
021102										022824	023333	023745	024263	024762	026049	020663
										022825	023334	024047	024357	024957	026050	020727
										022826	023335	024048	024358	024962	026051	020952
											023336	024049	024359	024963	026052	020953
											023337	024050	024360	025001	026053	020954
											023338				026054	
											023345				026323	
															026324	

BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
021312	180863	180406	180636	181059	181516	182757	183057
021313	180862	180407	180637	181060	181517	182758	183058
021314	180861	180408	180638	181061	181519	182759	183059
021315	021335	180409	180639	181062	181653	183418	183422
180253	021334	180410	181055	182014	182347	183419	183423
180254	021333	180411	181056	182015	182348	183420	183424
180255	021332	181103	181057	182121	182349	183421	183425
180256		181104	181058	182122	182350		

Table B.7. Tag codes for Cowichan Falls.

BY 85	BY 86	BY 87	BY 88	BY 89	BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
023803		024334	024860	020352	020336	180515	180210	181320	181436	182026	182740	182761
023804		024729	025012	020522	020337	180516	180550	181321	181437	182027	182741	182762
023911		024730	025013	020622	020338	180517	181042	181322	181438	182028	182742	182763
		024735	025015	020623	020339	180518	181044			182029	182743	182801
		024945	025016	020624	020340					182030	182744	182802
		024946	025017	020938	020341					182031	182745	182803
			025523	020939								182804
			025524	026103								182805

Table B.8. Tag codes for Chilliwack/Harrison River Fall Stock.

BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89	BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
022163	022422	022658	023414	024101	024547	025542	025747	020242	180330	180334	181211	181420	180211	182261	182856	183353
		022659	023415				025748	020243		180332	181212	181421	180212	182262	182857	183354
		022660	023416										182123			
			023417										182124			
			023418													
			023419													

Table B.9. Tag codes for South Puget Sound Fall Yearling

BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89	BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96
632004	632015	632248	632147					634959	635502	630138	633926	634257	634528	635217	635721	635856	635961	630146
	632019	632302	632360															
	632054	632308	632416															
	632055																	
	632056																	
	H10204																	

Table B.10 Tag codes for Squaxin Pens Fall Yearling.

BY 86	BY 87	BY 88	BY 89	BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
634162	634202	635244	630455	633955		635218	635719	635855	635962		630615
				634008							

Table B.11. Tag codes for University of Washington Accelerated.

BY 75	BY 76	BY 77	BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84
110211	110116	111601	111603	111627	110634	111644	111655	633025	111718
110212	110117	111602	111604	111628	110635	111645	111656		111719
110213	110118		111605	111629	110636	111646	111657		111720
110214	110119		111606	111630	110637	111647	111658		111721
110301			111618	111631	110638	111648	111659		111722
110302			111624	111632	110639	111649	111660		111723
					110640	111650			
					110641	111651			
					110642	111652			

Table B.12. Tag codes for Samish Fall Fingerling.

BY 74	BY 75	BY 76	BY 77	BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89
011305	130302				632042						633804	634122	634732	635242	630731
130104	130602				632101						633805				
130215	130603				632102						633806				
											633807				
											634111				

BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
634025	634340	635009	635543	635758	636004	630129	630407
							630410

Table B.13. Tag codes for Stillaguamish Fall Fingerling.

BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89	BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
050843	051063	051427	211618			212221	212555	213147	211826	212026	212205	212251	212330	212610	212954	212960	213203
																	213223

Table B.14. Tag codes for George Adams Fall Fingerling.

BY 72	BY 73	BY 74	BY 75	BY 76	BY 77	BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89
150812		130303	130913			631752	632041	632146	632235				633501	634119	635208	635237	630450
151013						631915	632109	632262	632331				633502				
								632161					633503				
													633504				

BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
630862	634023	634946	635545	635023	636045	630148	630304
	634620	635057		635801			

Table B.15. Tag codes for South Puget Sound Fall Fingerling.

BY 71	BY 72	BY 73	BY 74	BY 75	BY 76	BY 77	BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89
150010	151010	151312	011403	130604			631935	631943	632145	051047	051346	211622	211657	211901	211961	212542	213137	211831
150109	151012	151313	011404				631936	631944	632233	632256				633643	634116	635221	635238	630261
150111	151202						631940		632253	632158				633644	634121	635222	635262	
150114							631945							633645				
150200														633646				
150203														634104				
150806																		

BY 90	BY 91	BY 92	BY 93	BY 94	BY 94	BY 94	BY 94	BY 94	BY 94	BY 94	BY 94	BY 94	BY 95	BY 96	BY 97
634024	634339	212326	212329	635826	212653	212706	212717	212728	212739	212750	212761	212818	212947	212963	213157
212014	212217	634953	635318	635831	212654	212707	212718	212729	212740	212751	212762	212820	636102	630127	
				212634	212657	212708	212719	212730	212741	212752	212763	212823	636103		
				212636	212658	212709	212720	212731	212742	212753	212803	212824			
				212639	212660	212710	212721	212732	212743	212754	212805	212829			
				212640	212663	212711	212722	212733	212744	212755	212806	212830			
				212643	212701	212712	212723	212734	212745	212756	212809	212833			
				212645	212702	212713	212724	212735	212746	212757	212810	212834			
				212646	212703	212714	212725	212736	212747	212758	212812	212836			
				212648	212704	212715	212726	212737	212748	212759	212815				
				212651	212705	212716	212727	212738	212749	212760	212817				

Table B.16. Tag codes for Nisqually Fall Fingerling.

BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89	BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
050722	050839	051048	051344	211628	211706	211759	211962	212541	213138	211836	211833	212206	212323	212450	212606	212946	212957	212956
	050840	051049	051345	211629	211707	211761										635630	636352	

Table B.17. Tag codes for Elwha Fall Fingerling.

BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89	BY 90	BY 91	BY 92	BY 93	BY 94
051363	211616	211658	211919	212208		213132	211827	212015	212215	212324	212451	212617
632721	633038	633419	211920				211828					212618
632722	633039	633420	211921									635332
			633543									
			633544									
			633547									
			633548									

Table B.18. Tag codes for Hoko Fall Fingerling

BY 85	BY 86	BY 87	BY 88	BY 89	BY 90	BY 91	BY 92	BY 93	BY 94
211935	212216	211907		211829	212018	212218	212327	212453	212609

Table B.19. Tag codes for Skagit Spring Yearling.

BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89	BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96
632606	632607	632608	633353	633323	633314	634744			633114			635027	635842	636021	635325
			633354			634902								636055	
						635026									

Table B.20. Tag codes for Nooksack Spring Yearling.

BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89	BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
632411	632546		633452		633247	634962	634422	635261	634123		634529	635018	635815	636048	635533	630604
			633453		633248	635059							635830			
					633336								635835			

Table B.21. Tag codes for White River Spring Yearling.

BY 74	BY 75	BY 76	BY 77	BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89	BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96
130208	131010			631834	632047	632136	632341	632853	633049	632508	633131	633246	634702	630161	635542	635908	634224	634619	635046	635827	635633	636009
							632604	633009	633050	633060	633648	634145	634704	630162						635832		
										633108												

Table B.22. Tag codes for Sooes Fall Fingerling.

BY 85	BY 86	BY 87	BY 88	BY 89	BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
051744	051907	051950		051955	052353	052822	053131	053133	053753	054048	054052	054054
051745					052354	052823	053132	053134	053754	054049	054053	054055
051746					052355	052824		053519	053755	054050		055034
051747					052356	052825		053520	053756	054051		055035

Table B.23. Tag codes for Queets Fall Fingerling.

BY 77	BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89
050361	050520	050661	050830	050962	051425	211621		211908	212101	212835	213144	211835
	050521		050833	051016								
	050522											
	050525											

BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96
212010	212260	212328	212452	212425	212948	212961
				212624		

Table B.24. Tag codes for Cowlitz Tule.

BY 77	BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89
631802	631942	632154	632156	632462	632503	633019	633235	634108	634126	635231	635250	630452
			632255			633020	633236					
						633124	633237					
						633125	633238					

BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96
634056	634526	635015	635539	635620	636005	630224
				635523	635851	630227

Table B.25. Tag codes for Spring Creek Tule.

BY 72	BY 73	BY 74	BY 75	BY 76	BY 77	BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89
050101	050401	050901	050202	054101	055501	050433	050639	050740	051050	051142	051151	051534	B50109	051855	051445	052013	052207
050201	050501	051001	050302	054201	055601	050434	050640	050741	051051	051143	051152	051535	B50110	051856	051449	052015	052208
050301	050601	051101	050402	054401	055701	050444	050641	050742	051052			051536	B50111	051857	051450	052016	052209
		051201	050502	054501	056001	050446		050748				051537	B50112	051858	051451	052017	052210
		051301	050602	054601	056201			050749				051538	B50113	051859	051659	052018	052211
		051401	050702					050750				051539	B50114	051860	051660	052019	052212
			050802					050751					B50115	051861	051661	052020	052213
													B50208	051862	051662	052021	052214
													B50209	051863	051910	052023	052215
														051905	051912	052024	052216
														051906	051913	052025	052217
														051909	051914	052032	052218
															051923	052033	052335
																051924	052336
																051925	

BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
052106	052127	052133	053356	053757	053831	054341	054347
052109	052129	052134	053357	053758	053832	054342	054348
052110	052130	052146	053430	053759	053833	054343	054349
052112	052544	052149	053431	053760	053834	054344	054350
052115	052545	052732	053432	053761	053835	054345	054351
052117	052553	052733	053433	053762	053836	054346	054352
052118	052554	052735	053434				
052123	052557	052736	053435				
052124	052558	052840					
	052559	053045					
	052560						
	052561						
	052562						
	052563						
	052605						
	052606						

Table B.26. Tag codes for Oregon Columbia River Tule.

BY 76	BY 77	BY78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89
091605	071656	071841	072055	072156	072407	072328	073120	073352	073818	074050	074526	075012	075218
		071842	072157	072329	072408	072729	073121	073353	073819	074051	074527	075015	075219
			072163	072341	072411	072730	073144	073354	073820	074052	074528	075017	075220
				072342	072662	072830	073145	073355	073821	074053	074529	075018	075221
				072335		072831	073146	073356	073822	074054	074530	075020	075222
						072832	073147	073323					
						072833	073148	073322					
						072834							

BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
075227	071601	070221	076143	070852	070544	071251	092121
075228	071602	070222	070234	070432	070545		092448
075229	071603	070223	070235	075812	071144		
075230	071604	070224	070516				
075231	075905	075942	070517				
		076020	070518				
		075657	070519				
		075658	070520				
		076321					

Table B.27. Tag codes for Columbia Upriver Bright.

BY 75	BY 76	BY 77	BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89
130713	631662	631741	631821	631948	632155	632252	632611	632859	633221	634102	634128	635226	635249	630732
131101		631745			632261	632456	632612	632860	633222					
131202														

BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
634057	634341	635010	635540	635710	636001	636328	630517
				635711			

Table B.28. Tag codes for Hanford Wild.

BY 86	BY 87	BY 88	BY 89	BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
634152	635232	635252	630755	634115	634527	635017	635704	635759	636116	630133	630603
									636117		
									636118		

Table B.29. Tag codes for Lewis River Wild.

BY 77	BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89
631611	631813	632123			632737	633126	633411	633821	634151	635061	630456	631350
631618	631858	632124			632738	633127	633412	633822	634153	635062		
631619	631859	632125										
	631902	632207										
	631920	632208										
	632002	632214										
		632213										

BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
634217	634206	634940	635157	635627	635738	630343	630303
				635663	636059		630355
							630356
							630519
							630520

Table B.30. Tag codes for Lyons Ferry.

BY 84	BY 85	BY 86	BY 87	BY 88	BY 89	BY 90	BY 91	BY 92
633226	633638	634259	635214	630226	635544	634143		635012
633227	633639	634261	635216	630228	635547	634160		
633228	633640							
	633641							
	633642							

Table B.31. Tag codes for Willamette Spring.

BY 75	BY 76	BY 77	BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89
090503	091621	071730	071925	072217	072237	072521	072863	072902	073651	073428	074962	075028	073721	075347
090504	091622	071731	071945	072218	072418	072720	072905	073024	073652	073429	075002	075038	075158	075348
090505	091626	071732	071946	072224	072422		072930		073653	073902	075004	075041	075159	075501
090506	091627	071737	072020	072225	072517				073654	073903	075013	075047	075160	075502
090507	091628	071743	072021	072226	072518				073655	073944		075049	075161	075504
090509	091629	071919	072022	072252	072528				073656	073945		075050	075162	075506
	091701	071920	072044	072253	072529				073663	073948			075163	075514
	091702	071921	072050	072254	072530				073701	073949			075206	075515
	091703	071926	072051						073702	073950			075207	075516
		071927							073729	073951			075208	075522
		071928							073730	073952			075210	075523
									073731	073953			075211	075524
									073732					075525
									073733					075526
									073734					075527
									073735					075528
									073736					

BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96
075021	071457	070133	070233	070445	070741	092120
075626	071458	070134	070442	070450	071254	092155
075627	071459	070240	070443	070855	071255	092156
075628	073722	070253	070444	070856	071256	092157
075630	075732	070254	070563	070857	071257	092158
075643	075734	070428	070616	070858	071259	092160
075644	075904	070430	070850	070860	071260	092240
075656	075921	070431	070851	070861	071317	092241
075710	075922	071535	076125	070862	076140	092242
075711	075933	071536	076338	071153	091803	092243
	075934	076121			091804	092244
	076114	076122				092245
	076115	076123				092248
	076116					092250
	076117					092251
	076118					092319
	076119					092320

Table B.32. Tag codes for Salmon River.

BY 77	BY 78	BY 79	BY 80	BY 81	BY 82	BY 83	BY 84	BY 85	BY 86	BY 87	BY 88	BY 89
071643	071849	072239	072504		072647	072726	073051	073329	073342	074629	075131	075458
071644	071850	072240	072505				073052	073330	074321	074635	075132	075459
									074322	074636	075133	075460
									074323	074637	075134	075461
									074324	074638	075135	075462
											075136	

BY 90	BY 91	BY 92	BY 93	BY 94	BY 95	BY 96	BY 97
075705	071559	070417	070459	070962	071252	092149	092447
075706	071560	070418	070460				
075707	071561	070419	070461				
075708	071562	070420	070462				
075709	071563	070421	070463				

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

STOCK #	STOCK	FISHERY #	FISHERY
1	Alaska South SE	1	Alaska T
2	North/Centr	2	North T
3	Fraser Early	3	Centr T
4	Fraser Late	4	WCVI T
5	WCVI Hatchery	5	WA/OR T
6	WCVI Natural	6	Geo St T
7	Georgia St. Upper	7	Alaska N
8	Georgia St. Lwr Nat	8	North N
9	Georgia St. Lwr Hat	9	Centr N
10	Nooksack Fall	10	WCVI N
11	Pgt Sd Fing	11	J De F N
12	Pgt Sd NatF	12	PgtNth N
13	Pgt Sd Year	13	PgtSth N
14	Nooksack Spring	14	Wash Cst N
15	Skagit Wild	15	Col R N
16	Stillaguamish Wild	16	John St N
17	Snohomish Wild	17	Fraser N
18	WA Coastal Hat	18	Alaska S
19	UpRiver Brights	19	Nor/Cen S
20	Spring Creek Hat	20	WCVI S
21	Lwr Bonneville Hat	21	Wash Ocn S
22	Fall Cowlitz Hat	22	PgtNth S
23	Lewis R Wild	23	PgtSth S
24	Willamette R	24	Geo St S
25	Spr Cowlitz Hat	25	Col R S
26	Col R Summer		
27	Oregon Coast		
28	WA Coastal Wild		
29	Lyons Ferry		
30	Mid Col R Brights		

Appendix D. Detailed description of external stock forecasts.

APPENDIX D TABLE OF CONTENTS

Stock **Page**

Oregon Coastal North Migrating

Forecasts of spawning escapements are made for an aggregate of chinook salmon populations from 7 major river systems on the North Oregon Coast. River systems in the aggregate include: Nehalem, Tillamook, Nestucca, Siletz, Yaquina, Alsea, and Siuslaw. Annual escapement estimates are made through 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 amount of spawning habitat in the river. The annual aggregate escapement estimate is the sum of the escapements of the seven rivers. Forecast for the forthcoming year is merely the average escapement of the previous three years for the aggregate.

The 2001 forecast is 66,142.

Columbia River Stocks

The upriver brights (URB) and lower river wild (LRW) are primarily naturally produced stocks while the Spring Creek stock is hatchery (SCH) tule. The tule stocks generally mature at an earlier age than the natural fall stocks and do not migrate as far north. Minor stocks include lower river bright (LRB).

<u>Willamette Spring</u>

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. Brood years 1975–1996 and brood years 1975–1995 were used in the regressions of age 4 on age 3 and age 5 on age 4, respectively.

<u>Cowlitz Spring</u>

The current year forecast was made using age-specific linear regressions of cohort returns in previous years. Brood years 1989–1996 and brood years 1987–1995 were used in the regressions of age 4 on age 3 and age 5 on age 4, respectively.

<u>Upriver Summer</u>

The 2001 forecast was based the recent 5-year average run size of adults at the Columbia River mouth. The 5-year average adult:jack ratio method in use between 1994 and 2000 was abandoned this year as a poor predictor.

<u>Upriver Brights</u>

The current year forecast was made using a mix of age-specific average cohort ratios and cohort regressions. Data from brood years 1979–1997 (excluding 1980) was used in the regression of age 3 on age 2, brood years 1981–1996 in the regression of age 4 on age 3, brood years 1978–1995 in the regression of age 5 on age 4, and brood years 1979–1994 in the regression of age 6 on age 5.

The preliminary forecast for 2001 ocean escapement is 127,200 adults, compared to the recent 5-year range of 142,300 to 164,900 adults. The 1996–2000 average forecast error is +2% with a range of 62% to 112%.

Spring Creek Hatchery

The current year forecast was made using a mix of age-specific average cohort ratios and cohort regressions. Data from brood years 1979–1997 (excluding 1980) was used in the regression of age 3 on age 2, brood years 1981–1996 in the age-3:4 cohort ratio, and brood years 1977–1995 in the age-4:5 cohort ratio.

Ocean escapement in 2001 is projected to be 56,600 adults, more than double the 2000 actual return of 20,100 adults and above the recent 5-year average. The average 5-year forecast error is –1% with a range of 70% to 133%.

Lewis River Wild

The current year forecast was made using a mix of age-specific average cohort ratios and cohort regressions. Data from brood years 1993–1997 was used in the age-2:3 cohort ratio, brood years 1992–1996 in the age-3:4 cohort ratio, brood years 1991–1995 in the regression of age 5 on ages 3 and 4, and brood years 1990–1994 in the age-5:6 cohort ratio.

Ocean escapement in 2001 is forecast at 16,700 adults, an improvement over the recent 5-year range of 2,600 to 8,800. The average forecast error is –29% with a range of 61% to 166%.

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 times parent brood of acclimation releases and natural escapements. Separate estimates 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 1988–1999.

Nooksack/Samish Fall

Summer/fall chinook (hatchery) — 1999–2000 average return rate (0.0037) times 1997 brood release (9,306,706 fingerlings) from Mamoya Pond, Lummi Sea Ponds, Samish Hatchery, and Maritime Heritage Center.

The hatchery return in 2001 is projected to be 34,900. This is greater than any return since 1996.

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 1990–2000 return years. Age classes include both fingerling and yearling types for ages 2–6. The natural return in 2001 is projected to be 890.

Spring Chinook (hatchery) — The hatchery spring chinook forecast is based on the return per release of hatchery yearlings. In addition, return of fingerlings released is based on Nooksack return rates by age from the last 5 years, due to the lack of Skagit return data. Yearling estimate derived by multiplying brood year release (142,380) multiplied by the average return/release of brood years 85–95 (0.0054) to yield 765 adults. Fingerling forecast derived by estimating each returning age class by multiplying appropriate age class release multiplied by the average return rate to yield 667 adults. Total hatchery return is predicted to be 1,432 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 2001 is projected to be 9,100. This is greater than any return since 1996.

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 2001 the average rates for both indices were used. The freshwater indices are calculated by dividing the AEQ recruits per spawner for naturally-produced 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 2001 is projected to be 1,741.

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.

Snohomish River

Summer/fall Chinook (natural) — The forecast is based on the same assumptions for recruit per spawner and survival indices developed for Stillaguamish wild chinook because no specific information for Snohomish exists.

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 are projected to be 5,800 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 — 1997–1999 average terminal run expanded to 4B run size.

Hood Canal — 1997 brood hatchery (George Adams and Hoodsport) fingerling releases (lbs) multiplied by 1996–2000 average return/lb released. Terminal area forecast was expanded by the 1996–1999 average ratio of 4B run size to terminal run.

Puyallup — 1997 brood on station hatchery fingerling releases multiplied by the 1994–1999 mean return/number released.

Chambers Creek — 1997 lbs of hatchery fingerlings released multiplied by 1990–1999 average returns/lb released.

Nisqually — 1997 brood hatchery fingerlings released multiplied by 1995–1999 average return/fingerling.

McAllister Creek — 1997 brood year hatchery fingerling releases multiplied by the 1984–1999 mean return per hatchery release.

Deschutes — average of 1997 brood year hatchery fingerling releases (numbers) multiplied by the 1983–1999 average return/fingerling release, and 1997 brood year hatchery fingerling releases (lbs) multiplied by 1980–1999 average return/lb released.

Coulter Creek — 1994–1999 average run size.

Carr Inlet — average of 1997 brood year hatchery releases in lbs and numbers multiplied by 1980–1999 average returns per hatchery release.

Grovers Creek — sum of 1996 to 1998 brood year releases multiplied by their 1978–1996 brood year average returns at age 3, 4, and 5.

Puget Sound Natural Fall

Puget Sound Natural Fall stock includes natural production from rivers tributary to South Puget Sound and Hood Canal.

Dungeness – Average of 1997–2000 terminal area run size.

Hoko – Average 1997–2000 terminal area run size.

Hood Canal – Forecast is based on the 1997 releases of chinook fingerlings from Hoodsport and George Adams hatcheries multiplied by the 1996–2000 average return to natural return to natural spawning areas per hatchery release.

Puyallup – 1997 spawning escapement multiplied by the 1994–1998 average return per spawner.

Nisqually – average run size from 1995–1999, or 1997 escapement multiplied by 1995–1999 average return per spawner.

Puget Sound Fall Yearling

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

McAllister Creek – 1997 and 1998 brood year hatchery yearling releases multiplied by the 1994 and 1995 brood year average age-4 and age-3 returns per yearling release respectively.

Canadian Stocks

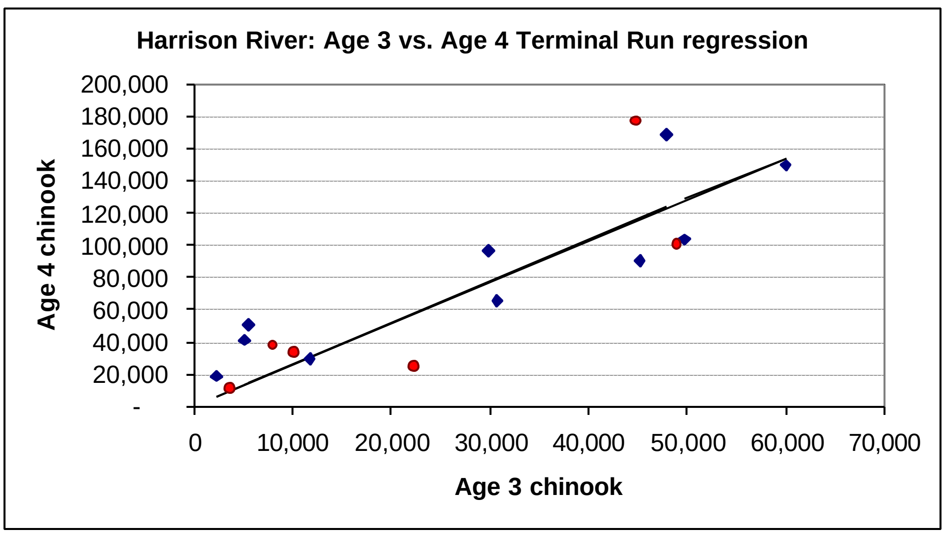
Fraser Late

The abundance forecast for the Fraser Late stock consists of two forecasts summed to predict the total return of lower Fraser River fall chinook. One population is the naturally spawning stock in the Harrison River (includes a relatively small return to the Chehalis Hatchery tributary to the Harrison). A mark-recapture program has monitored the spawning escapement to the Harrison River since 1984 (reported annually in the CTC annual reports). The other population has developed from the transplant of Harrison River white fall chinook to the Chilliwack Hatchery and the subsequent development of a naturally spawning component in the Chilliwack River. Tagging of the Chilliwack Hatchery fall chinook has been used as an exploitation rate indicator stock associated with the Harrison River natural population.

Harrison River forecasts: For several years, the forecasts of Harrison chinook salmon had been based on sibling regressions of age-structured terminal runs (e.g., the terminal run expected in year *t+1* for age *x+1* based on the terminal run of age *x* chinook salmon observed in year *t*). Terminal runs consist of Area 29 Fraser River commercial gillnet catch, in-river sport catch, and spawning escapement. Historical relationships between age-4 to age-3 returns and age-5 to age-4 returns have been good (Figures 2.1 and 2.2). The line on each graph is the regression relationship for the first ten or eleven years of the Harrison data (1984–1994, diamond symbols) and the circles indicate the recent six years of data (1995–2000, not included in the regressions). During this latter period, the mean absolute percent error for the combined forecast of age-4 plus age-5 returns has been 40%.

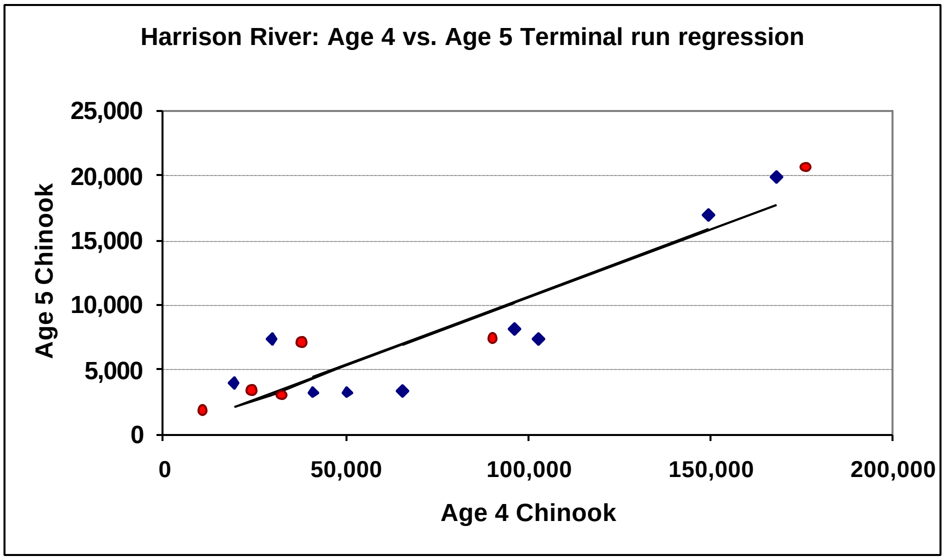
These simple regression models, however, have two significant problems: (a) they assume a consistent relationship between terminal runs over time, i.e., constant ocean exploitation rates, and (b) they do not provide a prediction for the Age 3 chinook return. A prediction of Age 3 chinook would require a consistent estimate of Age 2 terminal runs. Previous to five years ago, CDFO did not attempt to quantitatively estimate the returns of age-2 male chinook (Jacks) due to the difficulty of getting adequate numbers of tag recoveries. Since 1996, however, mark-recapture programs have been conducted on both Jack and age-3+ chinook populations.

Relationship of Harrison River age-3 and age-4 chinook salmon.



During 2000, the problems noted above lead CDFO to develop a new forecasting model for Harrison River chinook. This model incorporates the terminal run at age data, exploitation rates by age and brood year (calculated for Chilliwack stock), and the recent estimates of age-2 Jack chinook. Ocean abundance at age is reconstructed from these data and regressed against the terminal run data from the previous year. The age-3 ocean cohort was estimated based on the terminal run of Jack chinook, and the average age-at-maturity observed for age-2 chinook in the past three complete brood years.

Relationship of Harrison River age-4 and age-5 chinook salmon.



Chilliwack River forecasts: Forecasts of expected ocean abundance of Chilliwack 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) coded-wire tag recoveries in the fisheries and spawning escapement. The slope of these age-specific regressions were then applied to the terminal run size at age *x* (includes hatchery and naturally produced chinook) in year *t* to predict the ocean abundance of age *x+1* in year *t+1*.

Combined Spreadsheet model: The estimates of age-specific ocean abundance for Chilliwack and Harrison chinook are combined in a spreadsheet model analogous to the model developed for the Robertson Creek (RCH) chinook salmon stock. Terminal runs at age, expected in the next year, are then predicted based on changes in ocean exploitation rates and maturation rates at age.

One notable difference from the RCH model, however, is that only the ocean production vs. terminal run models are applicable for the FRL forecasts since catch and coded-wire tag data will not be available from the past year's fisheries in Washington State. Consequently, the regression models only include brood years with complete recovery data and the independent variable (terminal run at age) is limited to returns within the Fraser River. This latter is available within the time required for these annual forecasts.

Expected error for the new procedure has not been modeled. Based on our experience with the RCH data, however, we expect the error to be less than the terminal-to-terminal regression models previously applied.

West Coast Vancouver Island

The abundance forecast for the West Coast Vancouver Island (WCVI) model stock is based on the RCH/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 RCH/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).

RCH/Somass Forecast: Predictions of ocean abundance for RCH fall chinook were developed from the coded-wire tag 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 RCH 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 RCH brood years.

To account for the total production of RCH 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 2001 would be expanded by the ratio of age-3 chinook salmon observed in 2000 and the age-2 chinook salmon observed in 1999. 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 RCH/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 RCH chinook was greater and more data was available from fisheries.

Based on the age-structured terminal run to these 25 indicator streams, the forecasted terminal run of RCH/Somass chinook is expanded to account for these other chinook populations. For example, the 2001 forecast of RCH/Somass was expanded as follows:

Age class	RCH/Somass forecast*	WCVI expansion factor	Total WCVI forecast	Comments
Age 3	9,524	2.26	21,506	Average expansion of past age-3 returns
Age 4	857	3.89	3,333	Age 4 expansion based on observed expansion for age-3 returns in the brood year
Age 5	1,124	5.15	5,789	Expansion based on average value of age-3 and age-4 returns within brood year
Total	11,505		30,628	RCH/Somass = 38% of Total

* The forecast used in calibration of the CTC model uses base period exploitation rates (i.e., management scalars = 1.0). Terminal runs expected in 2001 will be larger due to reduction in ocean exploitation rates under the new PST and due to Canadian reductions for conservation of WCVI chinook.

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. Lower bound calculations.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

Memo to Commissioners on Lower Bound Calculations

Date: February 22, 2001

To: The Commissioners

From: Chinook Technical Committee

RE: Clarification of Footnote 3, Chinook Chapter

According to the negotiated treaty of 1999, the PSC annex document has a footnote on trigger points where action should be taken to reduce fisheries. The footnote states (Footnote 3, Chapter 3, page 40):

> *"A stock group should be considered for additional management action pursuant to this paragraph if a significant loss of production results from escapement less than the agreed escapement objective for an extended period of time. By the end of 2001, the CTC will recommend, for adoption by the Commission, criteria defining the lower bound of escapement for the purposes of taking additional management actions pursuant to this paragraph. Until the end of 2001, the escapement level at which the MSY production is reduced by more than 15% will be defined as the lower bound for escapement."*

Different interpretations of the above paragraph lead to different methods for estimating the lower bound for escapements. The CTC is providing three methods in this memo, representing three interpretations of the above paragraph, one of which could be used until the CTC completes the above assignment. Other methods may be suggested at a future date.

Method 1: The lower bound is estimated as the escapement where the expected production equals 85% of the *production* at MSY escapement.

Method 2: The lower bound is estimated as the escapement that is expected to produce a sustained *yield* equal to 85% of MSY.

Method 3: The lower bound is estimated as the escapement expected to provide a yield equal to 85% of MSY plus allowing a return to the number of spawners expected to produce MSY.

A Ricker Stock-Recruit model is used in this memo to analyze the differences between these methods. Important concepts related to Ricker Stock-Recruit relationships are first presented. Technical details and comparisons of the three interpretations and their methods follow.

Note that all figures in this memo reflect agreed escapements for the Lewis River. The formulas used for computing escapements at the lower bound for each method are described analytically in the Appendix.

Concepts for the Ricker Stock-Recruit Relationships

- **Production**: The total number of fish (fishing mortality plus spawning escapement) produced from a given number of spawners.

- **Spawners**: The total number of adult fish in a spawning population (jacks normally excluded).

- **Maximum Sustainable Yield** (MSY) is the maximum difference between the production and its associated spawning escapement level, (i.e., number of fish available for harvest that is surplus to replacing the spawning escapement).

- **MSY Escapement** is the spawning escapement that is expected, on average, to sustain the maximum yield.

- **Maximum Production** is the maximum number of fish produced on average by the population. Maximum Production = $1/\beta$.

- **Replacement Line** is the line representing number of spawners in the parent stock.

The graph below illustrates these concepts.

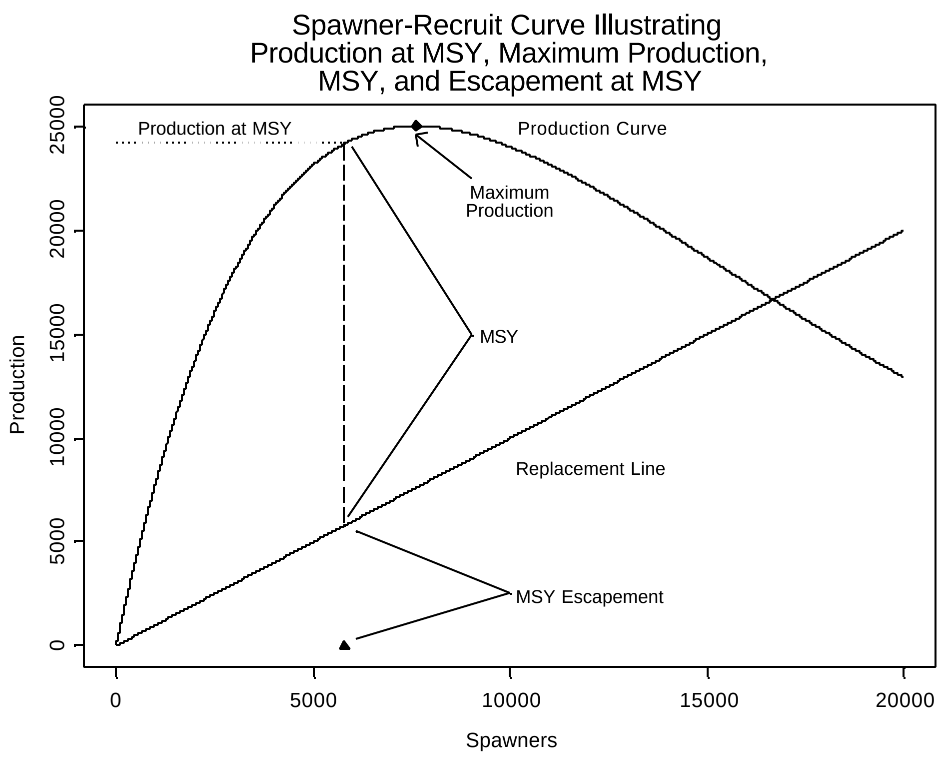


Figure E.1. Graph illustrating Maximum Production, Maximum Sustainable Yield (MSY), Production at MSY, and Escapement at MSY (S_{msy}).

Technical Details

Graphical Depictions of the Computation of the Three Methods

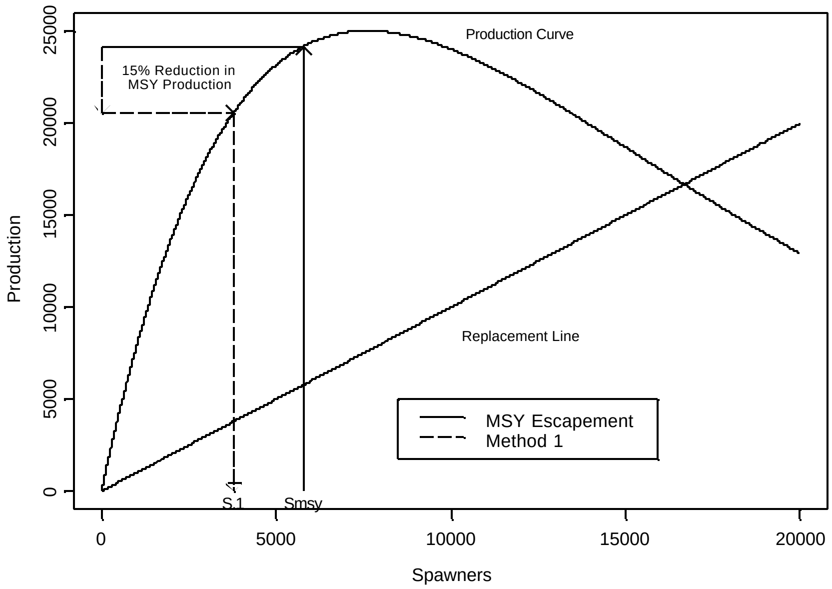


Figure E.2. Method 1 estimates spawners (S.1) at a 15% reduction of MSY production.

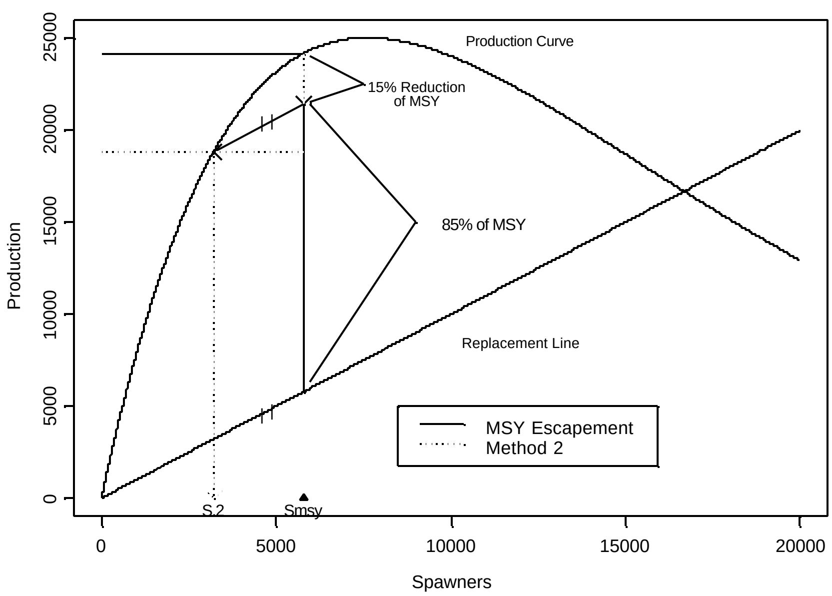


Figure E.3. Method 2 estimates spawners (S.2) for a 15% reduction in maximum sustainable yield (MSY).

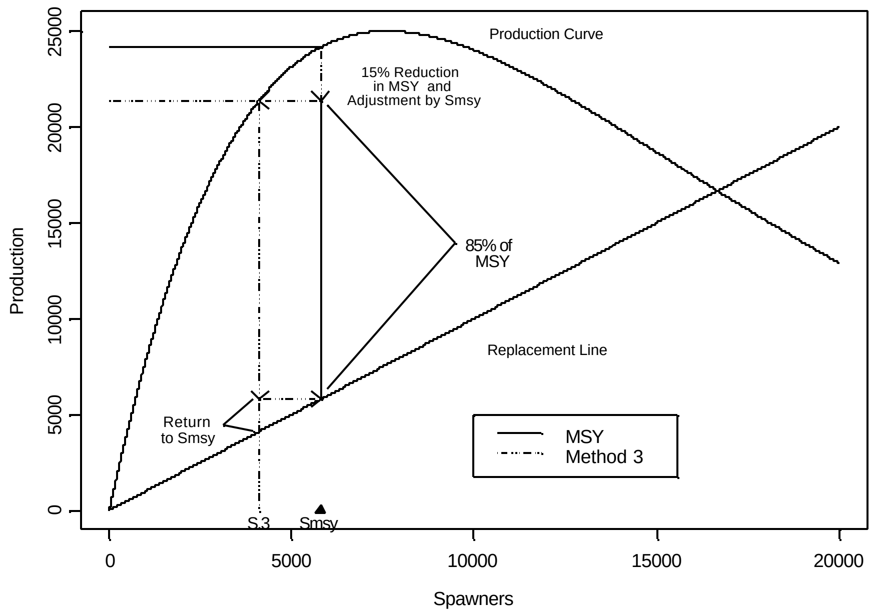


Figure E.4. Method 3 estimates spawners (S.3) for a 15% reduction in MSY yield to maintain *Smsy*.

Comparison of the Three Methods for Different Stocks

In Ricker stock-recruit models, two parameters, α and β, determine the shape of the curve and the production dynamics of the stock. Consequently, the value of the lower bound and proportion of a stock's Smsy will vary with the value of these parameters (α, productivity; β, spawning capacity). In order to compare the effect of these different methods on different stocks, we computed the lower bound for a number of PSC stocks with different α's and β's (Table 1).

From analysis of the formulas and from the computations using PSC stocks, we know that Method 2 will always produce a lower bound less than the other two methods, and that Method 3 always be the most conservative approach (i.e., results in lower bounds larger than the other two methods).

Expressed as escapement as a percentage of Smsy (Table 1), the three methods differ most for small productivity. Also note that Method 3 is the most sensitive to productivity of a stock, as indicated by the greater range of percent Smsy's for the range of productivity analyzed in this memo (range of percent Smsy for Method 1: 67.3% to 89.8%). In contrast, Method 2 is the least sensitive to productivity of a stock, as indicated by providing the most constant range of percent Smsy (range of percent Smsy Method 2: 55.1% to 58.5%) for the range of productivity analyzed in this memo. Method 1 is between Method 2 and Method 3 in sensitivity to productivity.

Table E.1. Escapement estimates at MSY, and from Method 1 (S.1), Method 2 (S.2), and Method 3 (S.3), for various PSC stocks. All estimates in this table are computed without an adjustment for bias, and thus are for comparison of the three proposed methods and not for management.

	Parameter Values	MSY Escapement	S.1 (% MSY escapement)	S.2 (% MSY escapement)	S.3 (% MSY escapement)
Estimates from various stocks:					
Stikine River	α = 2.609 β = 0.0000268	15909	12299 (77.3%)	9305 (58.5%)	14291 (89.8%)
Taku River	α = 4.406 β = 0.0000164	36109	26029 (72.1%)	20629 (57.1%)	29578 (81.9%)
Siuslaw River	α = 4.840 β = 0.000044	14024	9975 (71.1%)	7981 (56.9%)	11277 (80.4%)
Harrison River	α = 5.114 β = 0.0000078	80995	57161 (70.6%)	45990 (56.8%)	64420 (79.5%)
Nehalem River	α = 6.540 β = 0.0000977	7103	4840 (68.1%)	3995 (56.2%)	5375 (75.7%)
Lewis River	α = 8.929 β = 0.000027	5791	3780 (65.3%)	3223 (55.7%)	4119 (71.1%)
Siletz River	α = 12.098 β = 0.000273	2980	1872 (62.8%)	1643 (55.1%)	2005 (67.3%)

Lower Bound Estimate Methods

All lower bound estimates below are based on the Lewis River agreed stock-recruit parameters.

Method 1:
The goal of this method is to find the escapement (*S*) that satisfies:

$$a * S * e^{-b*S} = 0.85 * (aS_{msy}e^{-b*S_{msy}}) \tag{1}$$

This would give us a trigger value of S.1 = 3780.

In this interpretation, it is important to note that we are finding the Production at *MSY*, calculating the 15% reduction of Production (i.e., is 85% of yield at *MSY*), then finding the Spawner value that gives us that 15% reduction of Production at *MSY*. (i.e., is 85% of yield at *MSY*).

Method 2:
The goal of this method is to find the escapement (*S*) that satisfies:

$$a * S * e^{-b*S} - S = 0.85 * (aS_{msy}e^{-b*S_{msy}} - S_{msy}) \tag{2}$$

for $S < S_{msy}$.

Substituting for the unknowns and solving using equation 1 will give us a S.2 to be 3223.

In this interpretation we are adjusting Production by some Spawner value (i.e. Production – Spawner) that will give us the amount that is a 15% reduction in Yield at MSY (i.e., is 85% of Yield at MSY).

Method 3:
The goal of this method is to find the escapement (*S*) that satisfies:

$$a * S * e^{-b*S} - S_{msy} = 0.85 * (aS_{msy}e^{-b*S_{msy}} - S_{msy}) \tag{3}$$

for P > S_{msy} and P = Production = $a*S*e^{-bS}$

In this interpretation, we are adjusting Production by Spawners at *MSY* (i.e. Production – Spawners at *MSY*) that will give us the amount that is a 15% reduction in Yield at *MSY* (i.e., is 85% of Yield at *MSY*).

This would give us a trigger value of S.3 = 4119 for the Lewis River.

Appendix F. Brood year exploitation rate graphs.

LIST OF FIGURES

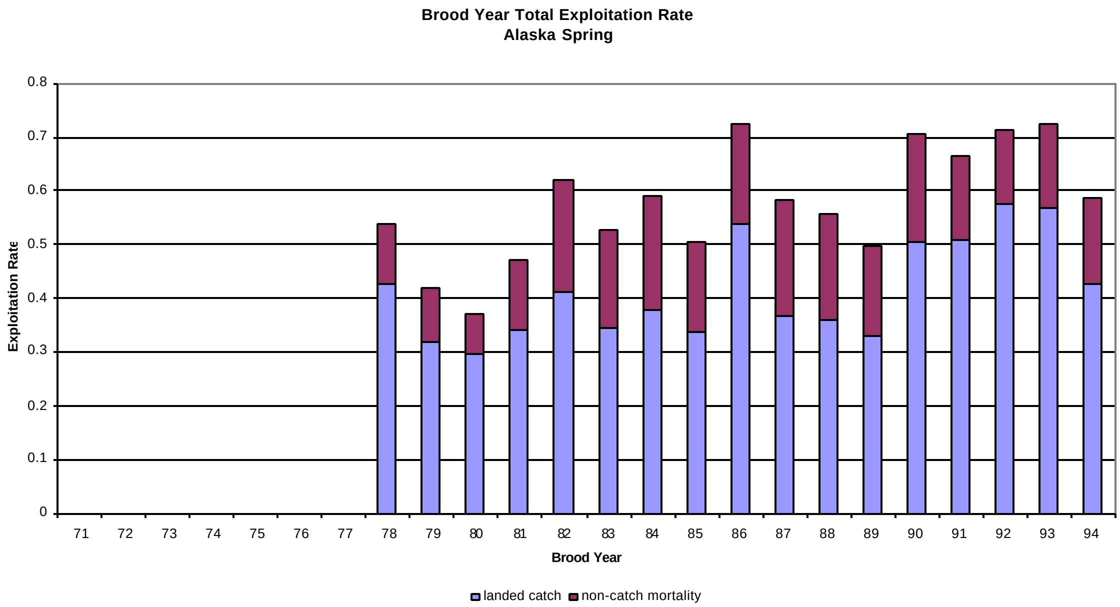


Figure F.1. Southeast Alaska springs total brood year exploitation rates.

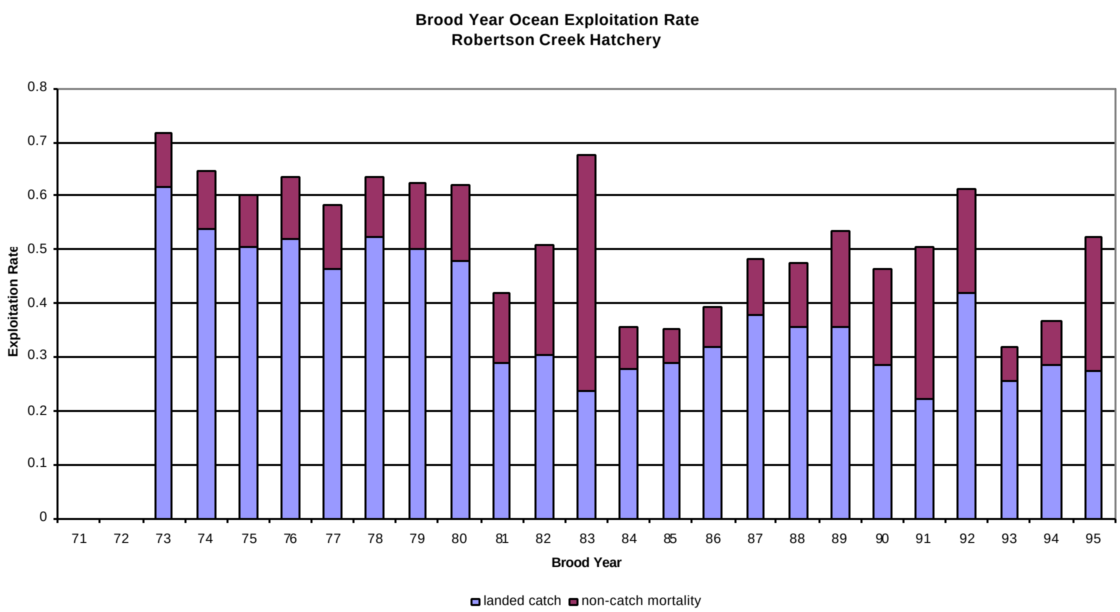


Figure F.2. Robertson Creek (West Coast Vancouver Island) ocean brood year exploitation rates.

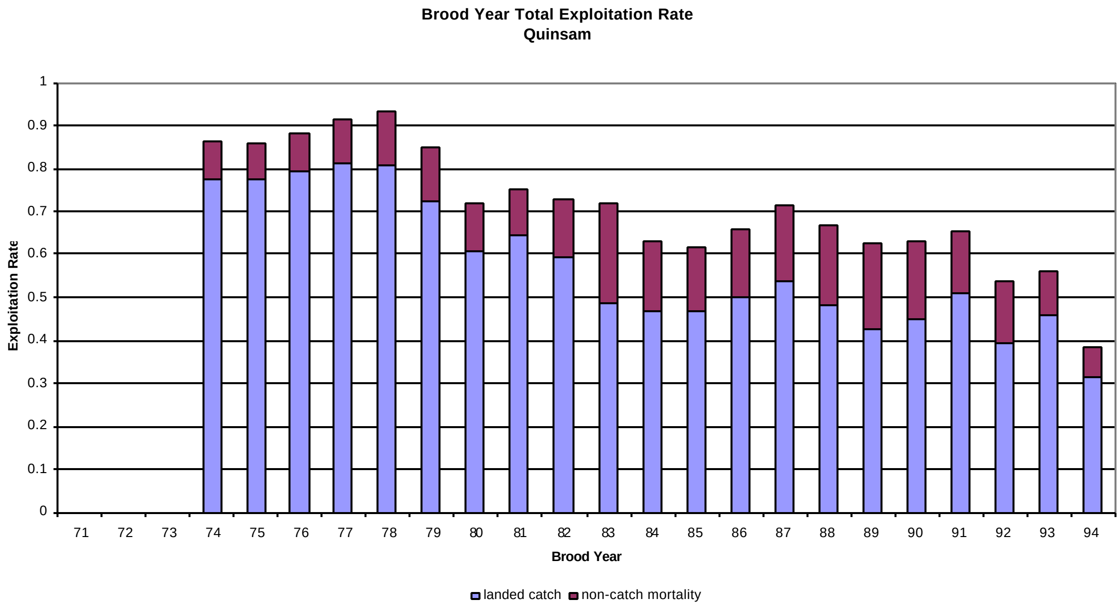


Figure F.3. Quinsam River (Upper Georgia Strait) total brood year exploitation rates.

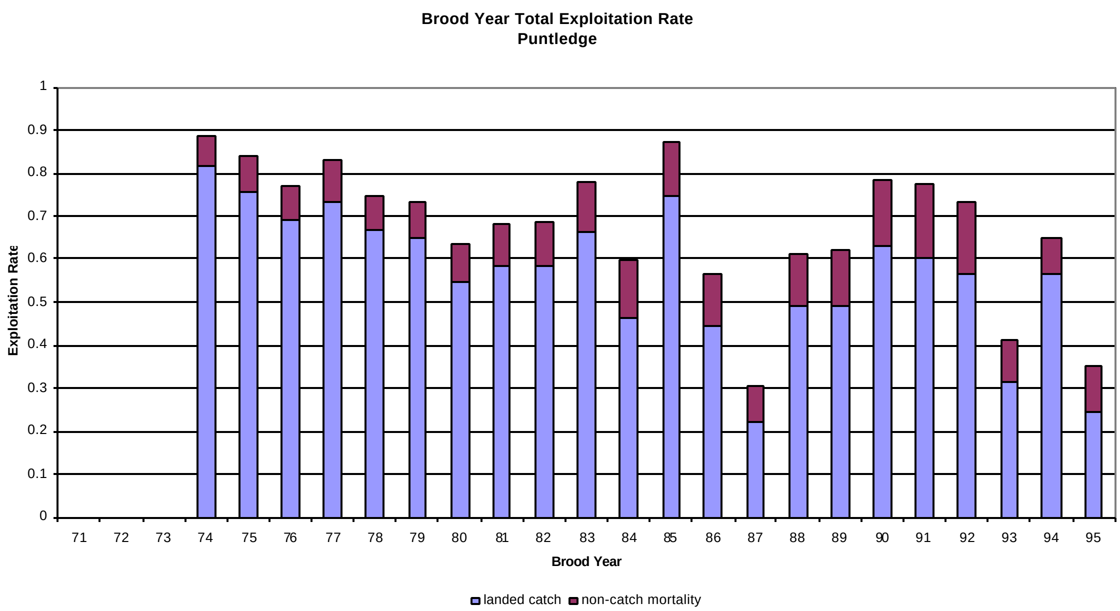


Figure F.4. Puntledge River (Lower Georgia Strait) total brood year exploitation rates.

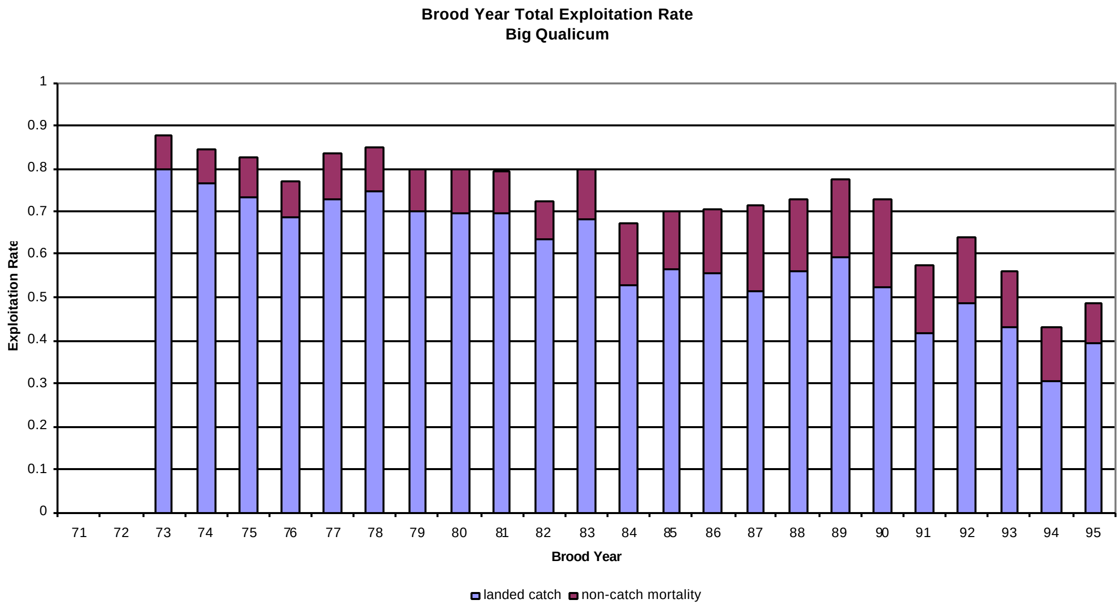


Figure F.5. Big Qualicum River (Lower Georgia Strait) total brood year exploitation rates.

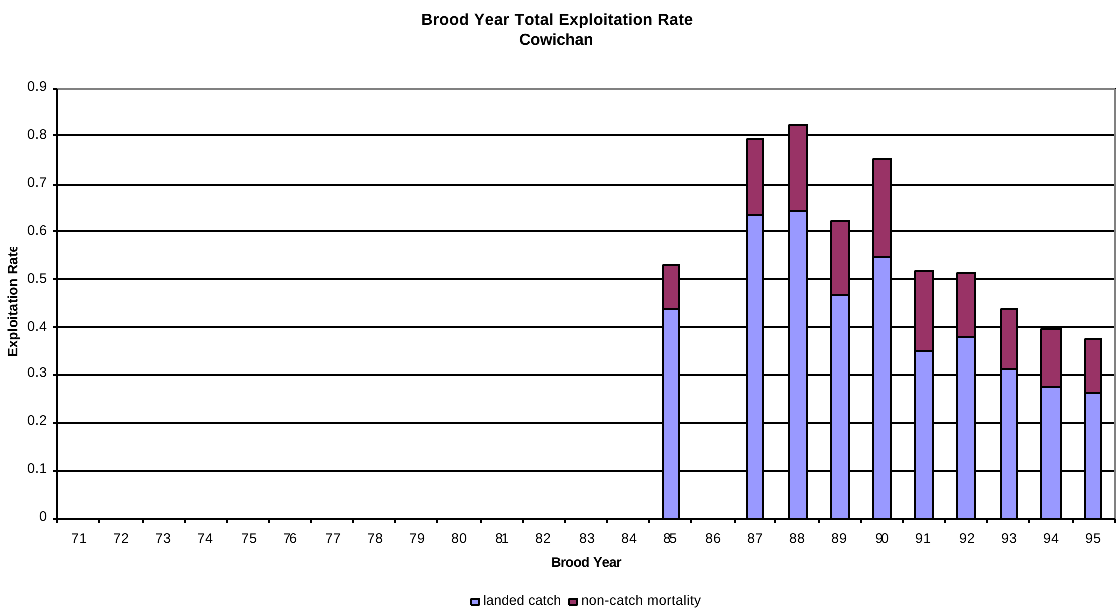


Figure F.6. Cowichan River (Lower Georgia Strait) total brood year exploitation rates.

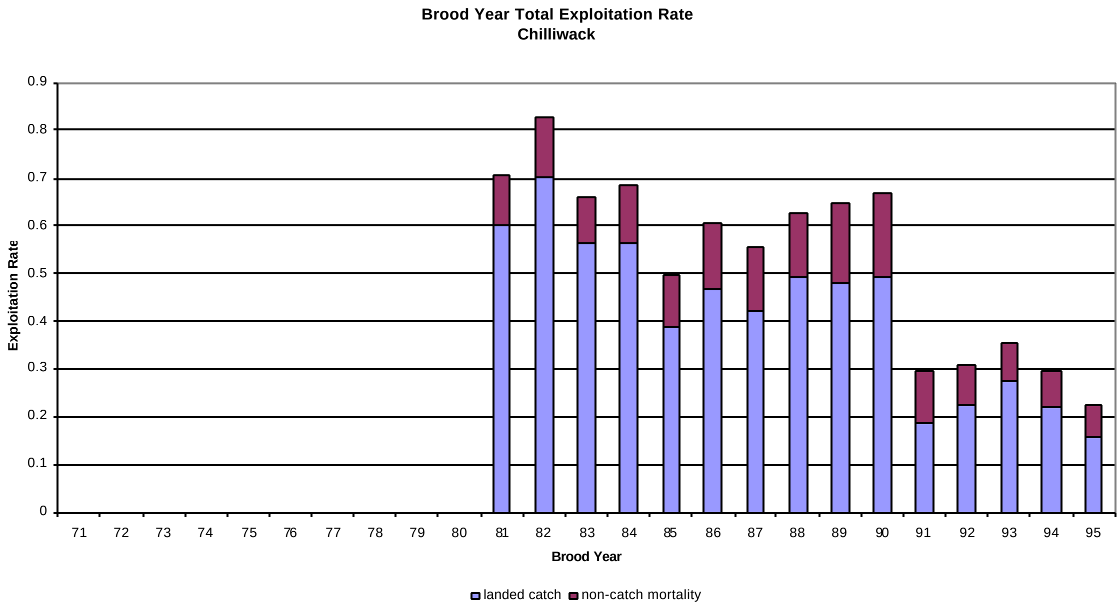


Figure F.7. Chilliwack River (Lower Fraser River) total brood year exploitation rates.

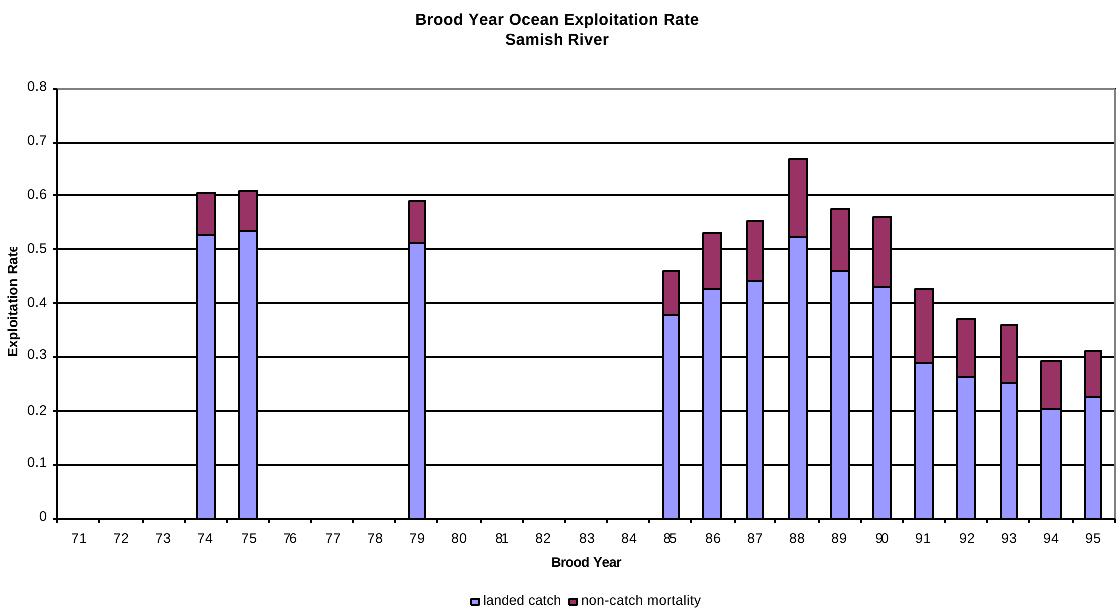


Figure F.8. Samish River (North Puget Sound) total ocean brood year exploitation rates.

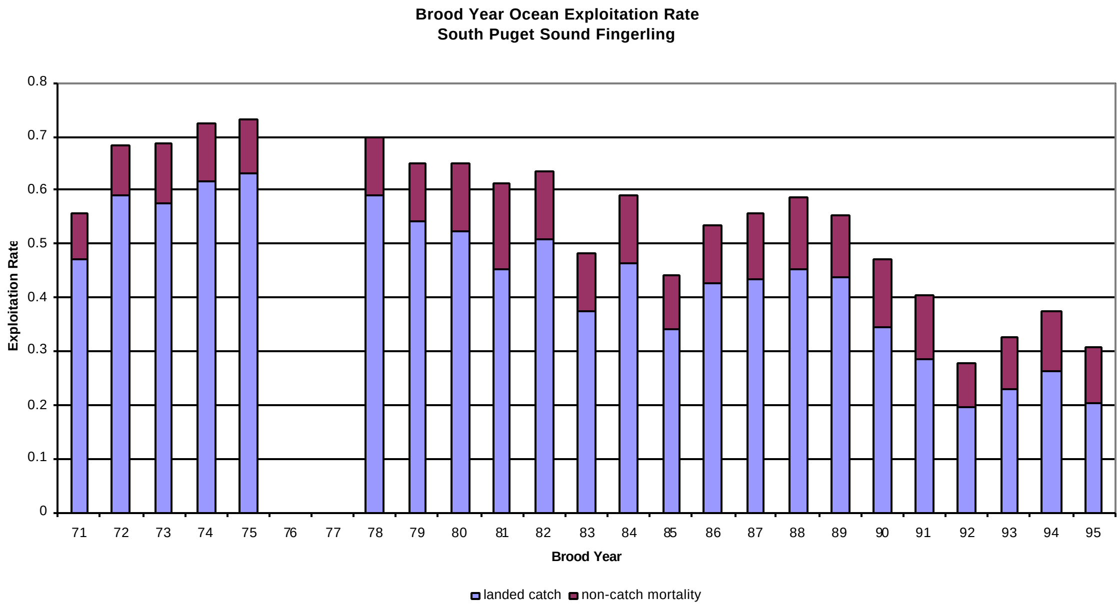


Figure F.9. South Puget Sound fingerling total ocean brood year exploitation rates.

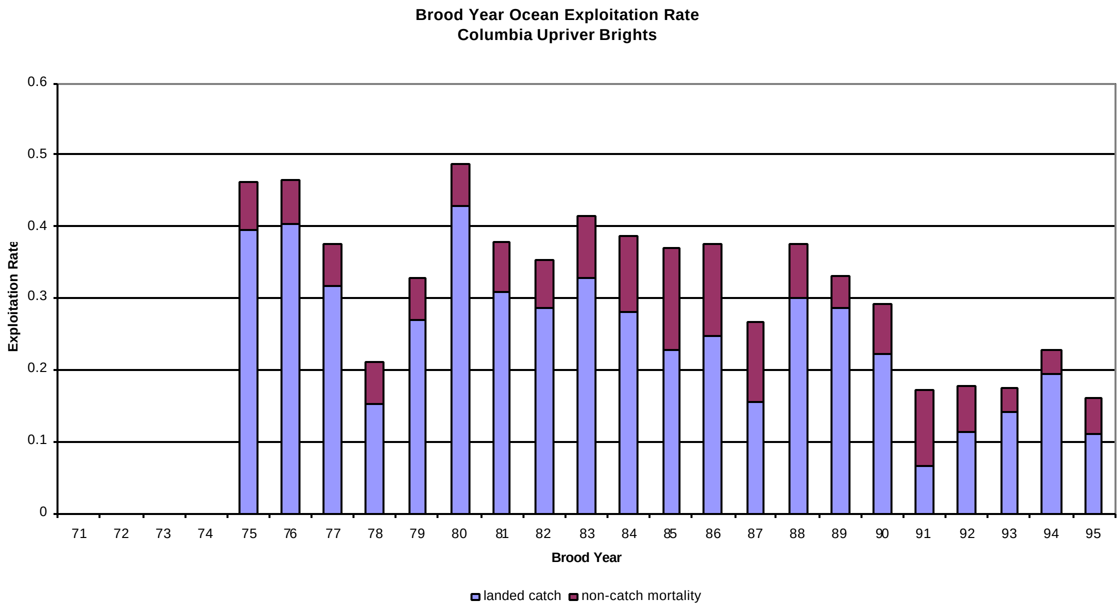


Figure F.10. Columbia River Brights ocean brood year exploitation rates.

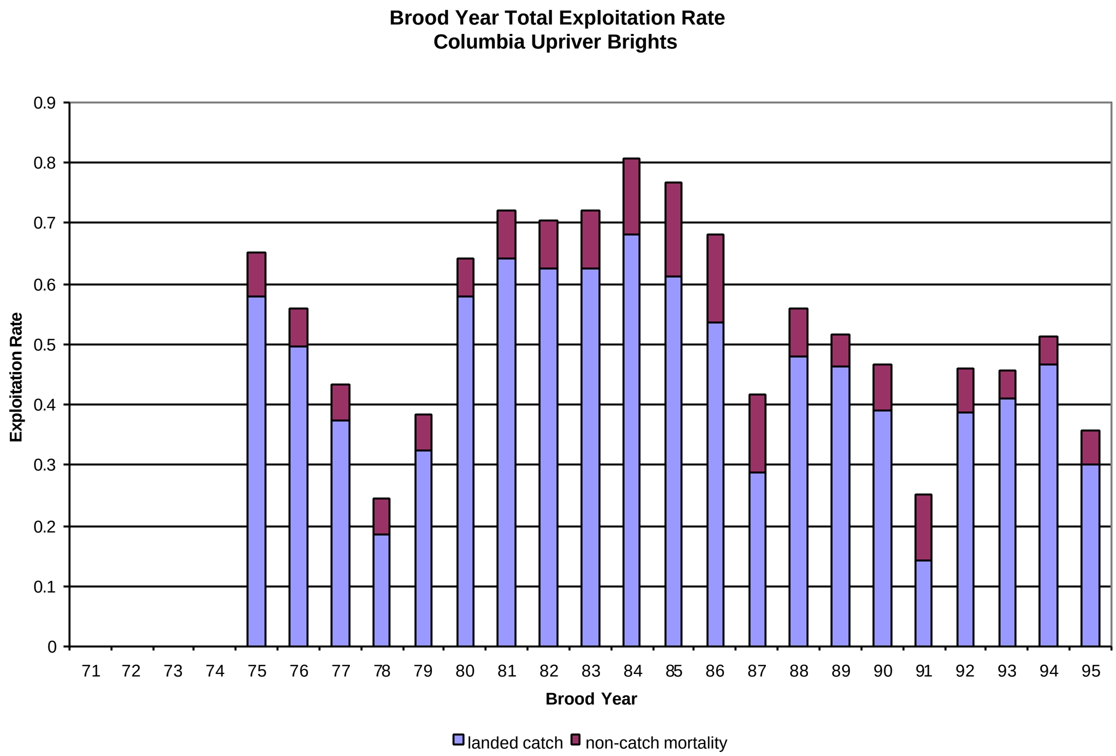


Figure F.11. Columbia River Brights total brood year exploitation rates.

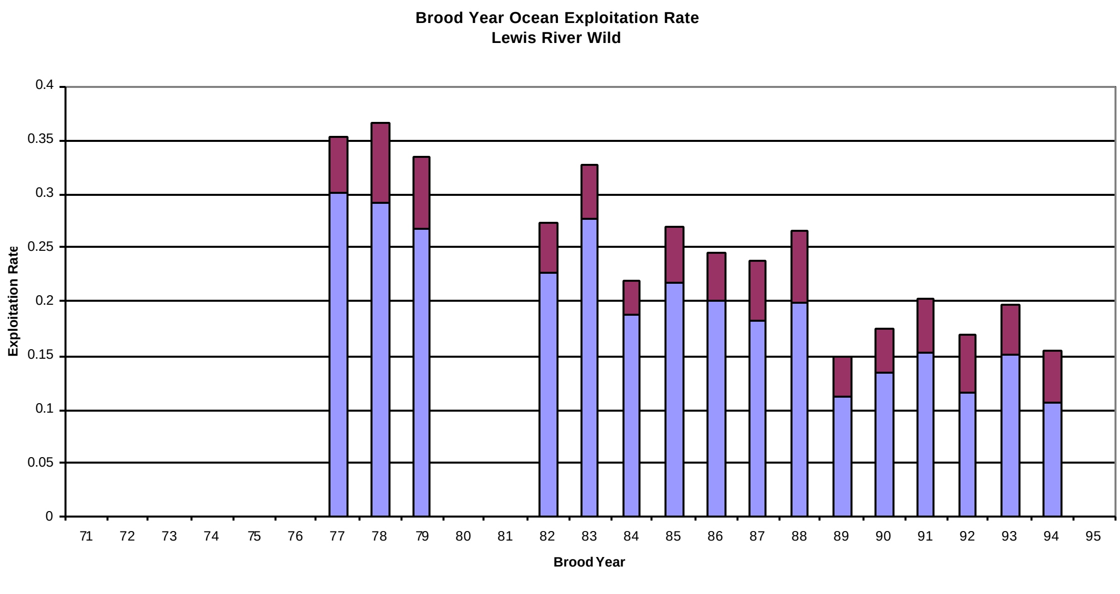


Figure F.12. Lewis River ocean brood year exploitation rates.

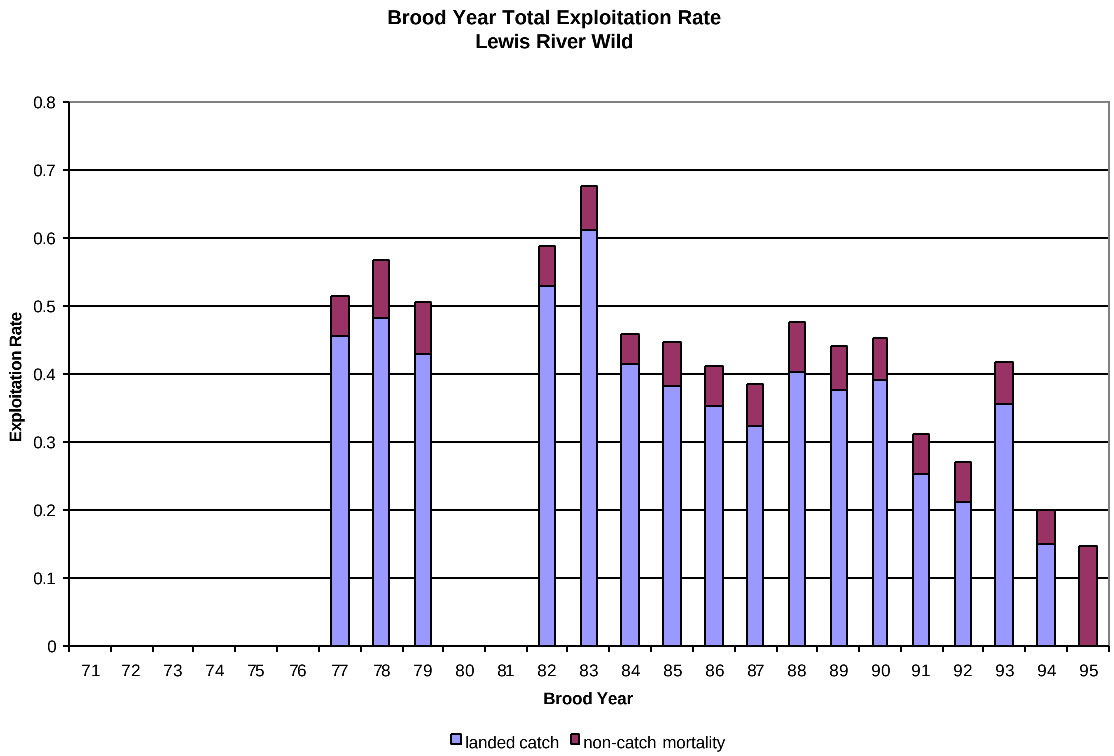


Figure F.13. Lewis River total ocean brood year exploitation rates.

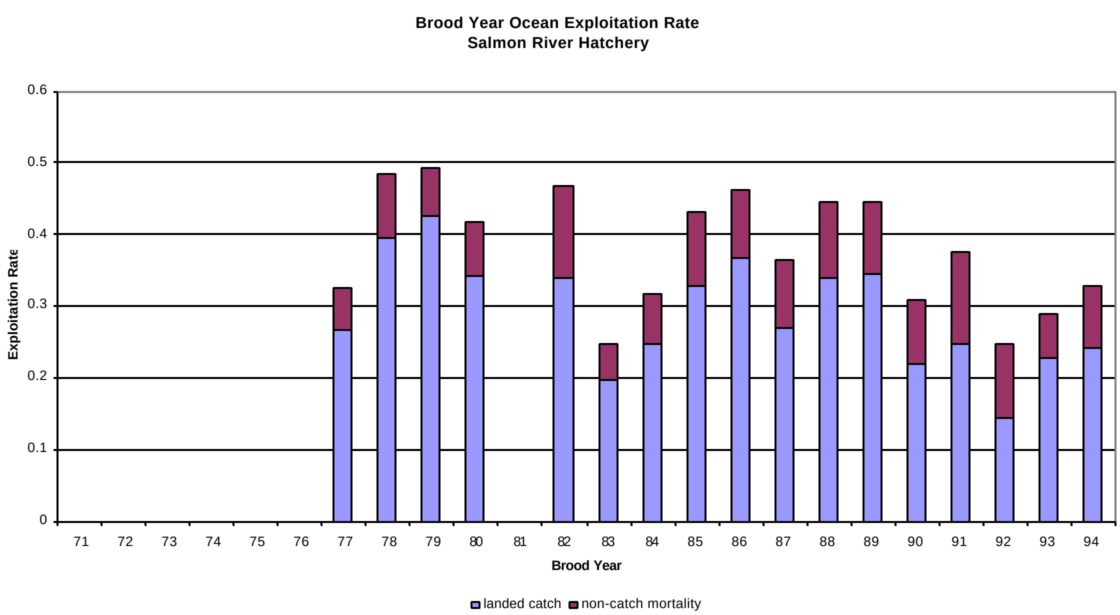


Figure F.14. Salmon River (Oregon Coastal) total brood year exploitation rates.

Appendix G. Survival rate graphs.

LIST OF FIGURES

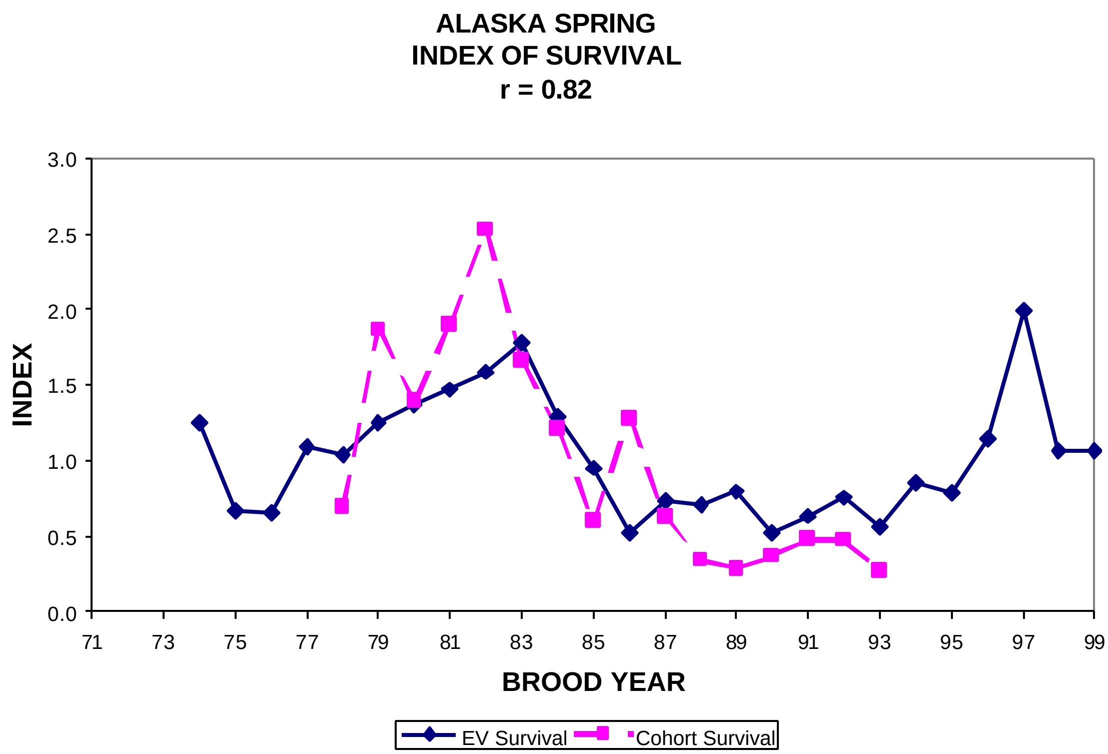


Figure G.1. Alaska Spring.

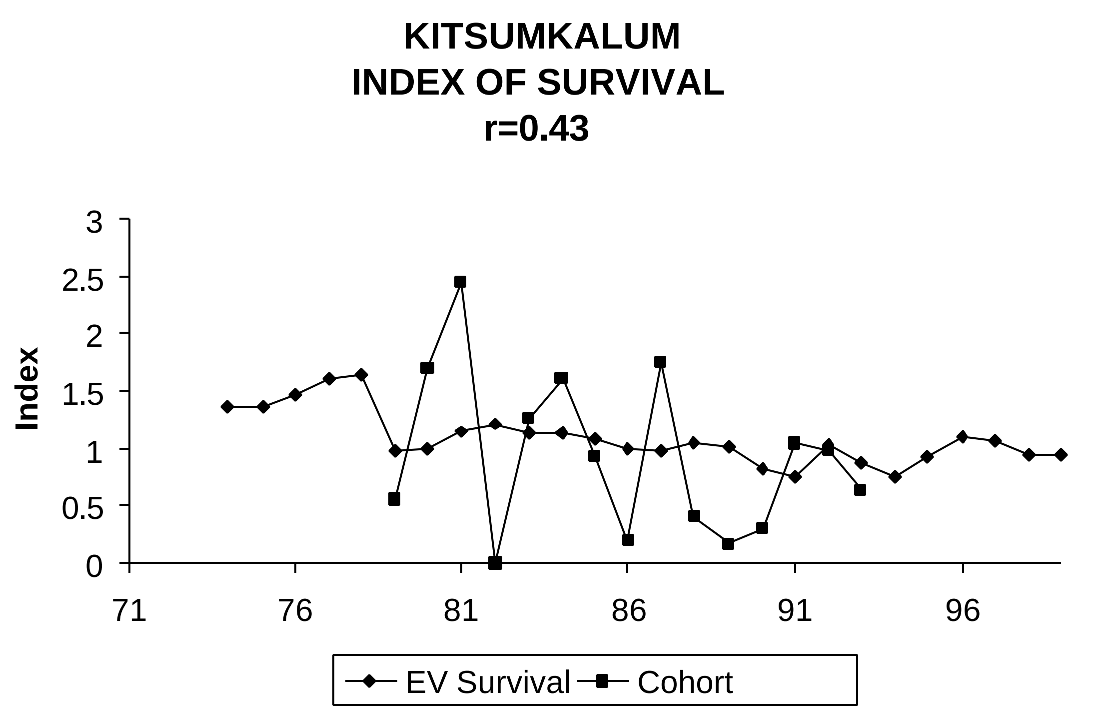


Figure G.2. Kitsumkalum.

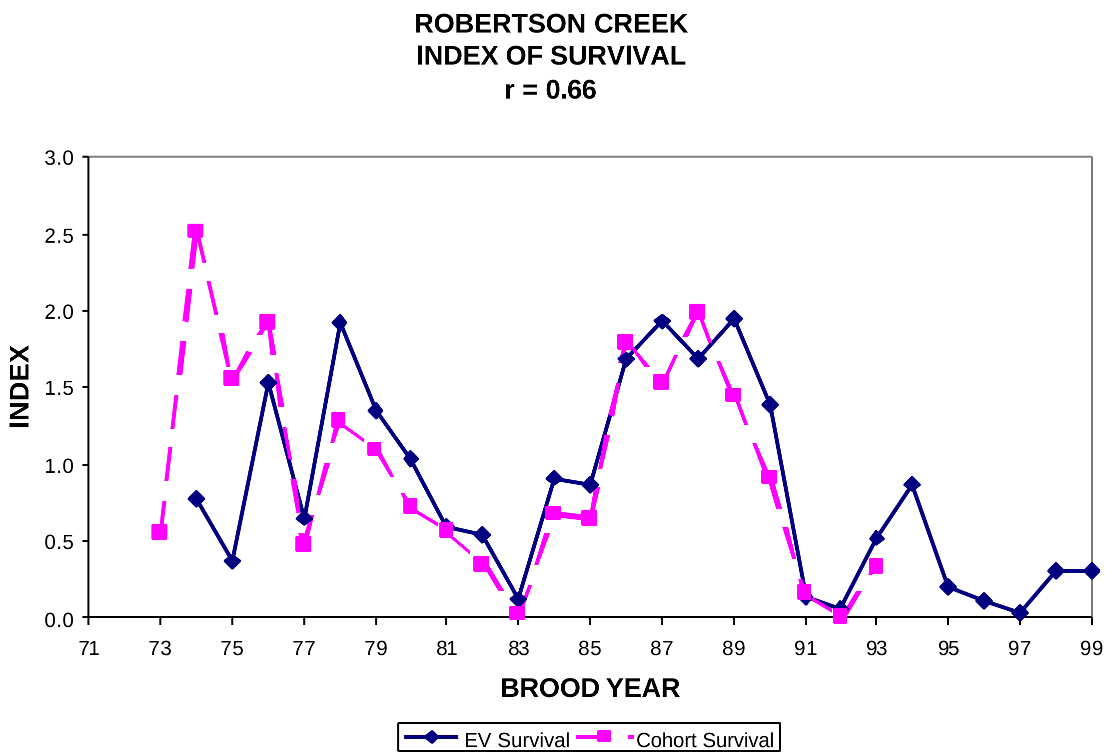


Figure G.3. Robertson Creek.

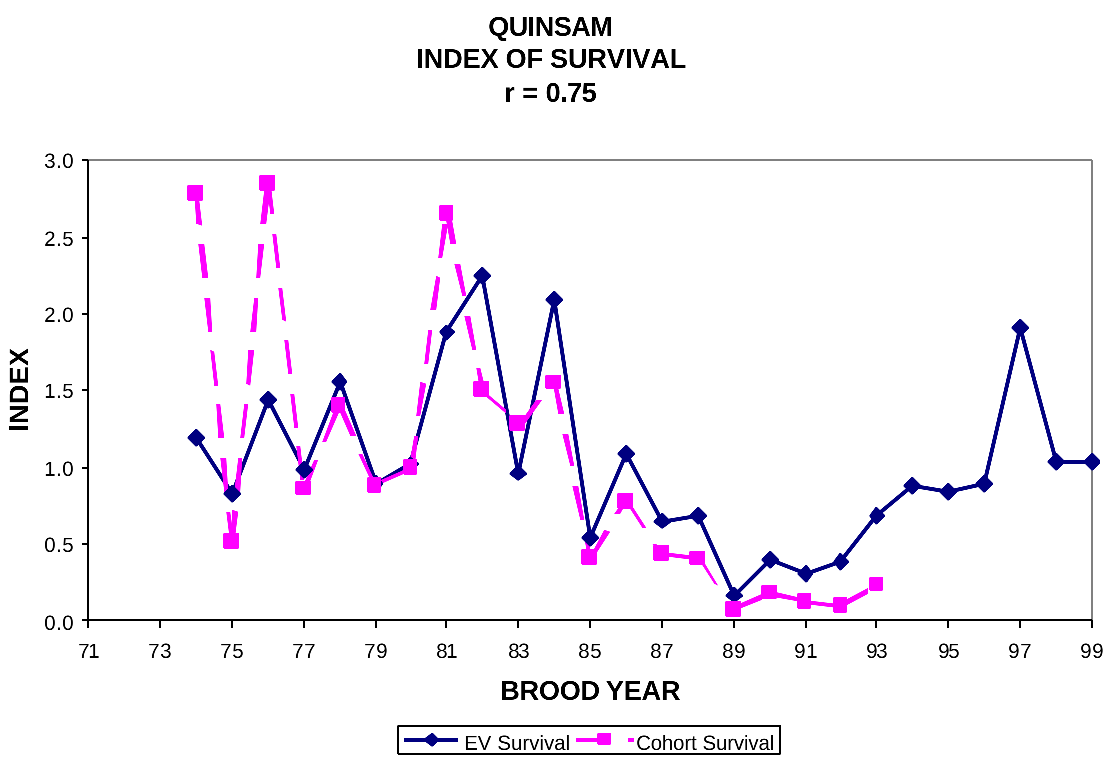


Figure G.4. Quinsam.

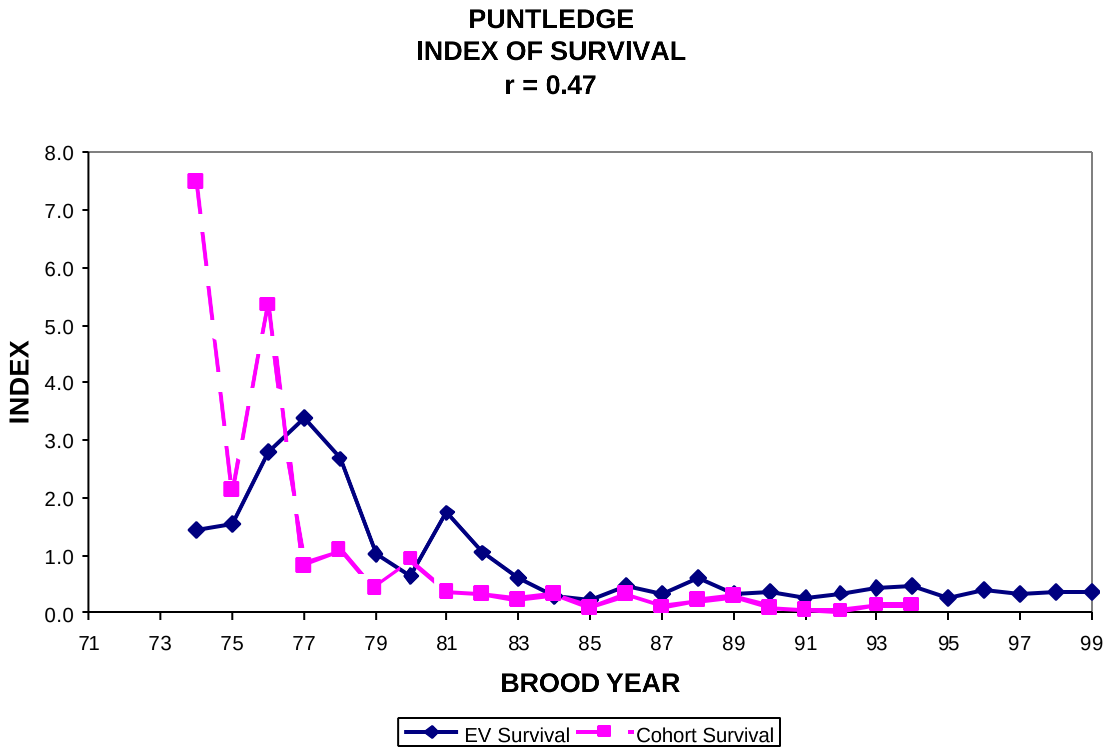


Figure G.5. Puntledge.

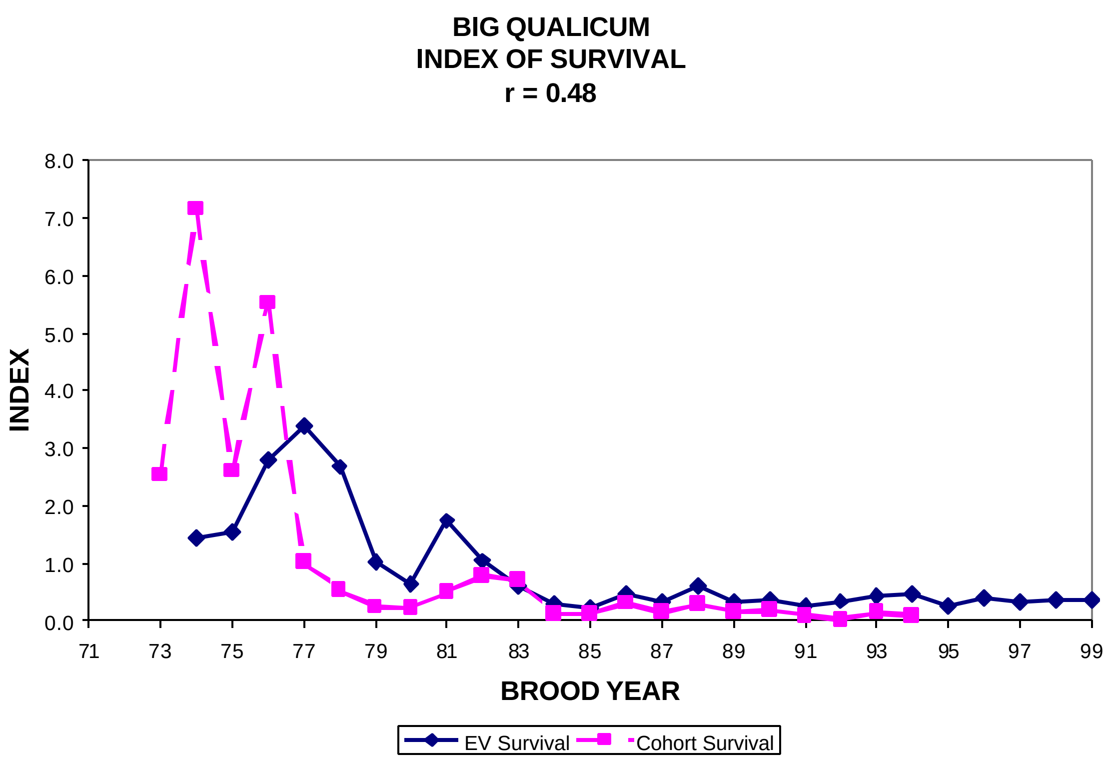


Figure G.6. Big Qualicum.

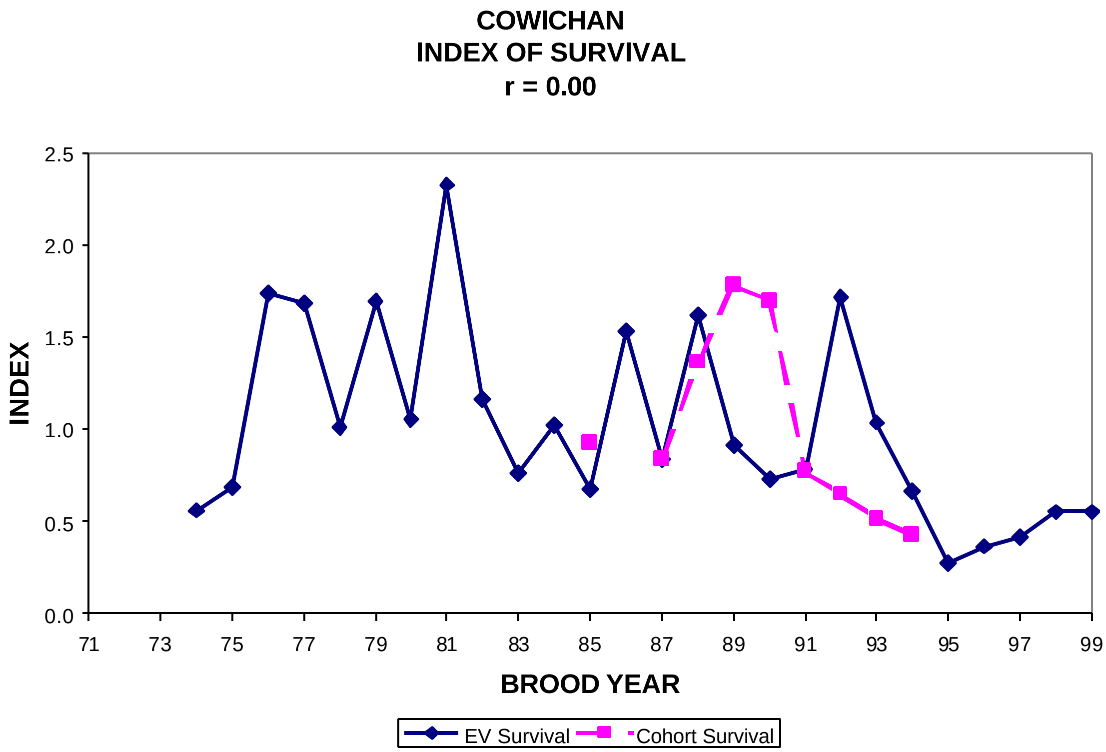


Figure G.7. Cowichan.

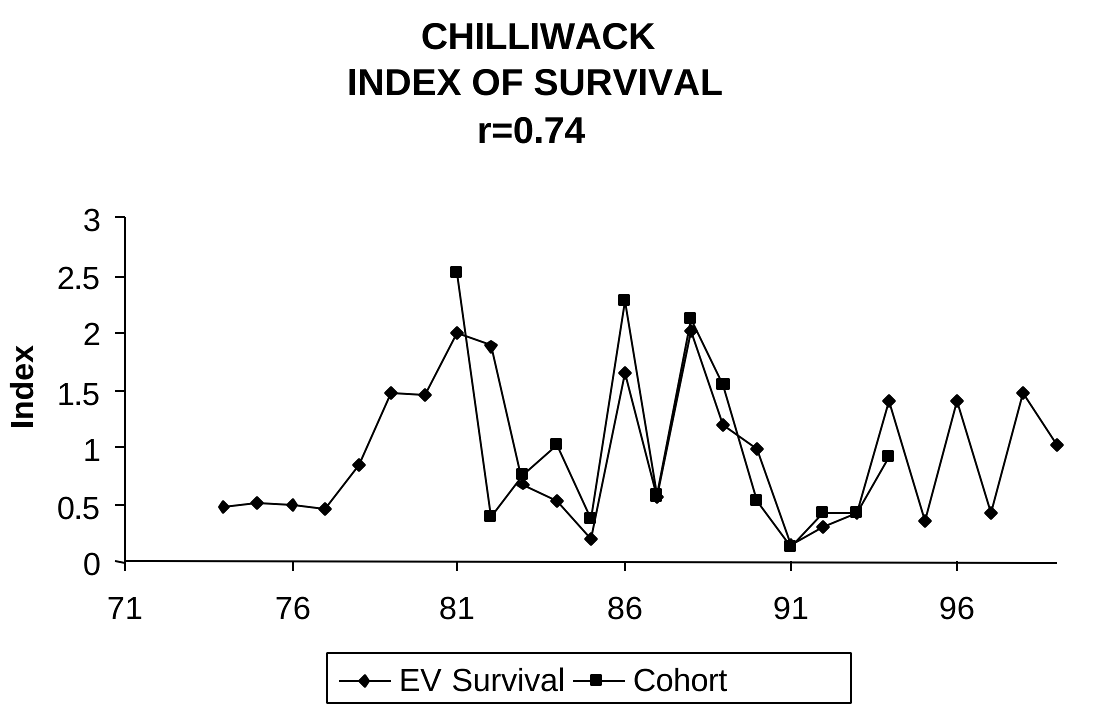


Figure G.8. Chilliwack.

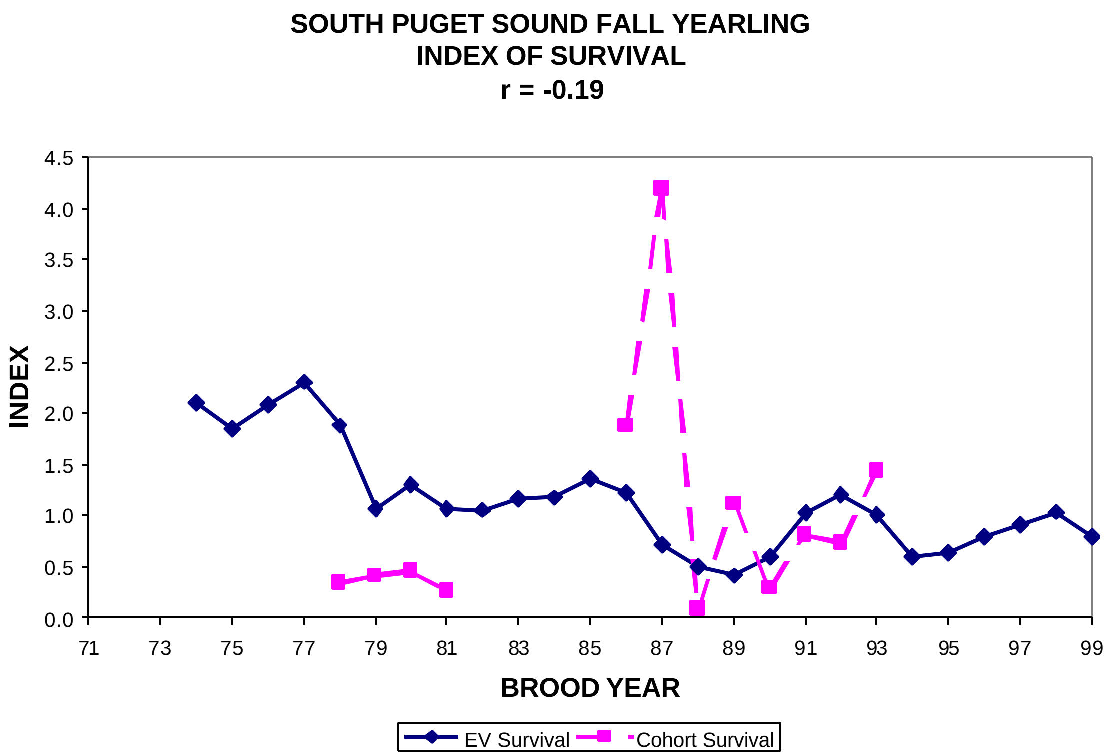


Figure G.9. South Puget Sound Fall Yearling.

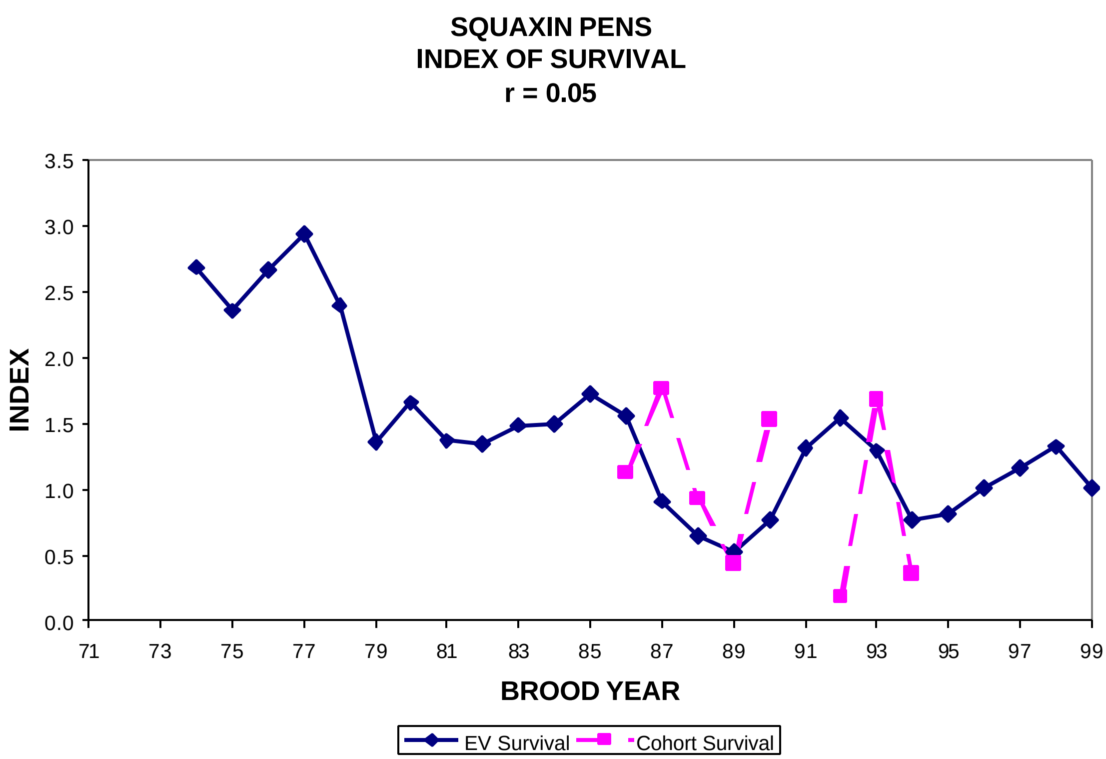


Figure G.10. Squaxin Pens.

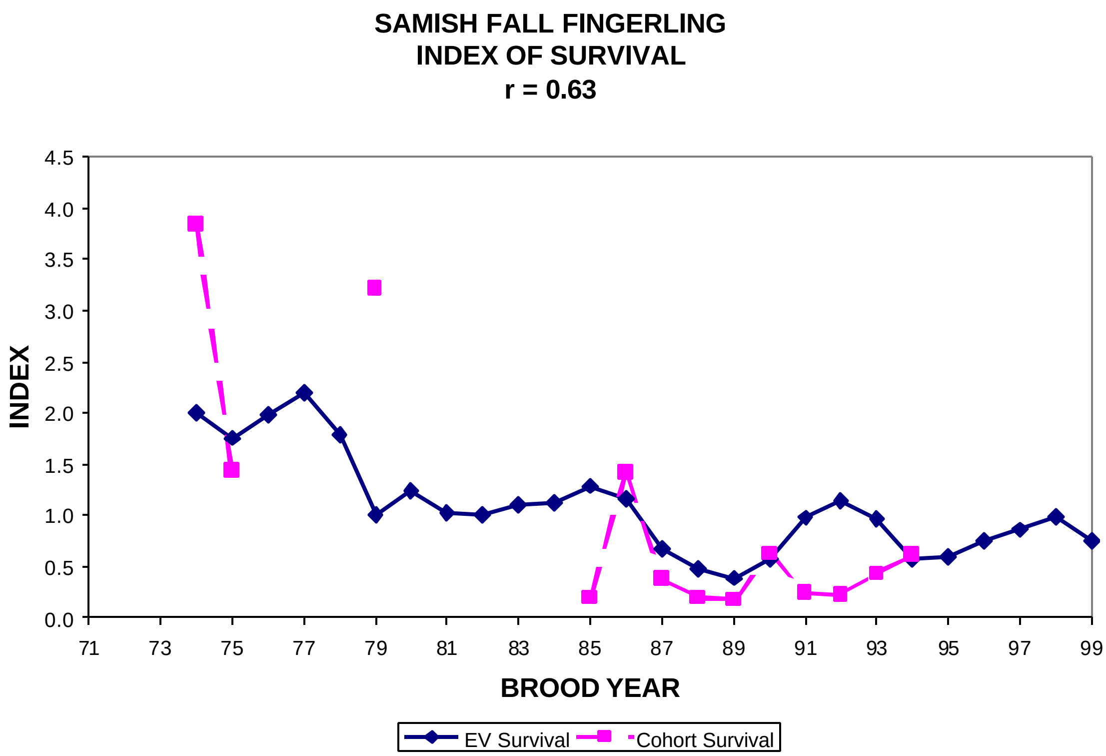


Figure G.11. Samish Fall Fingerling.

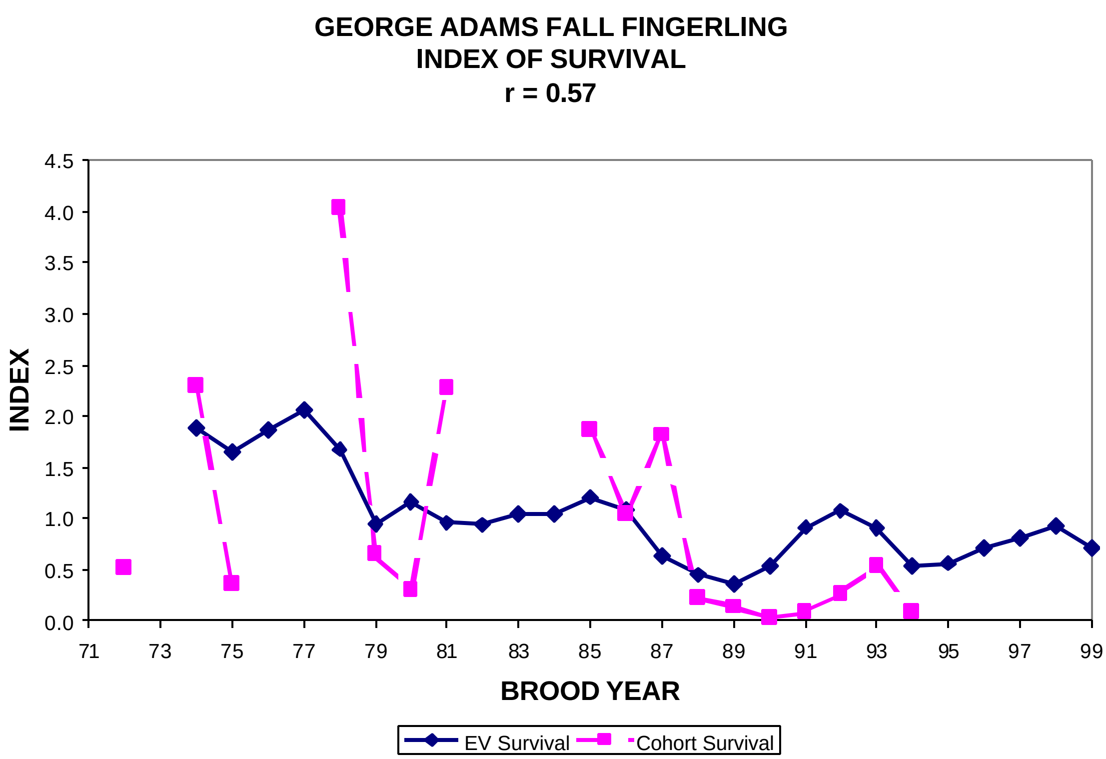


Figure G.12. George Adams Fall Fingerling.

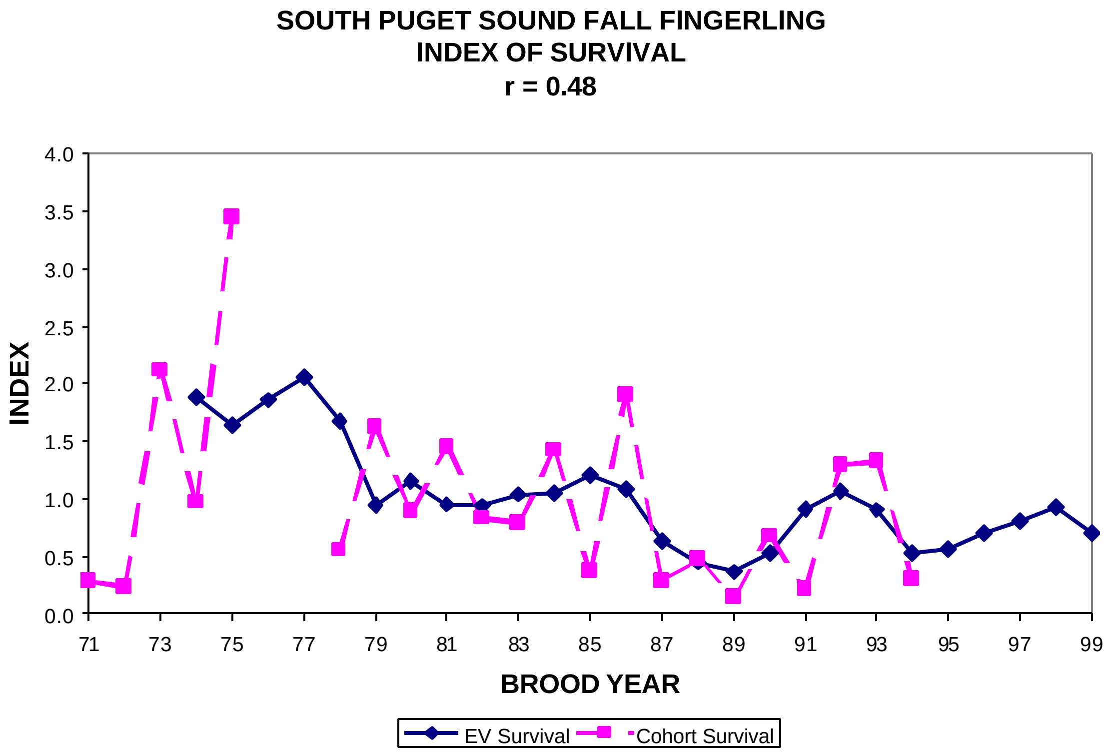


Figure G.13. South Puget Sound Fall Fingerling.

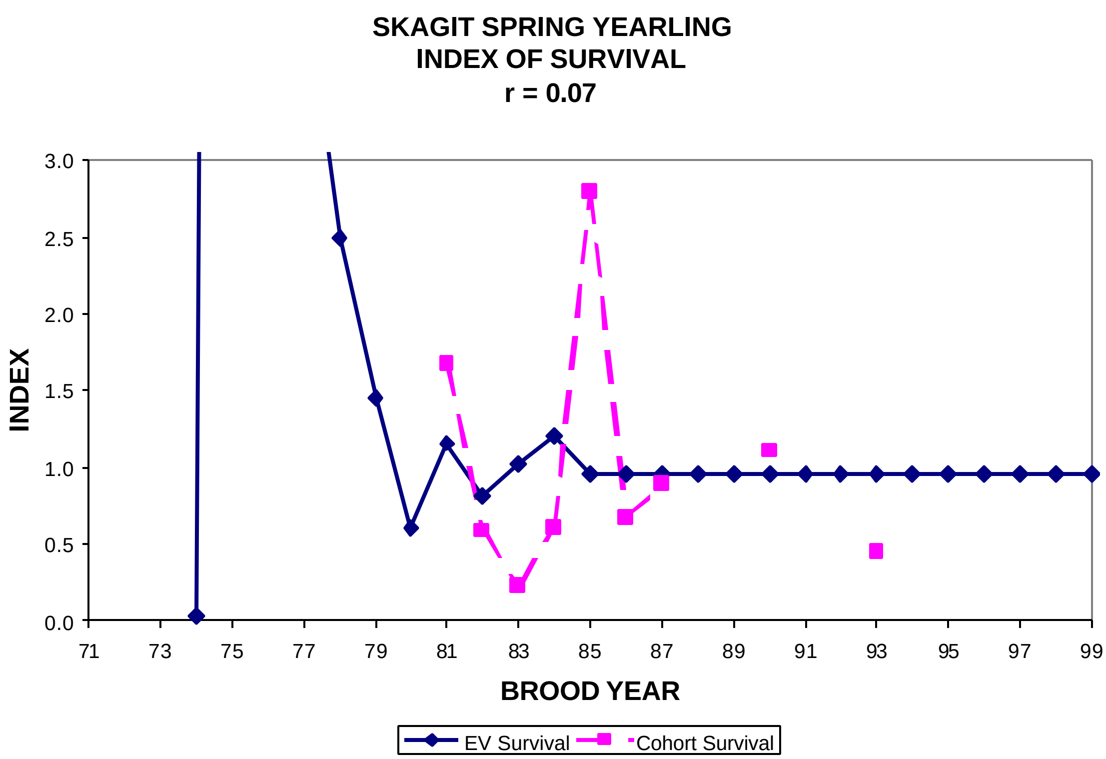


Figure G.14. Skagit Spring Yearling.

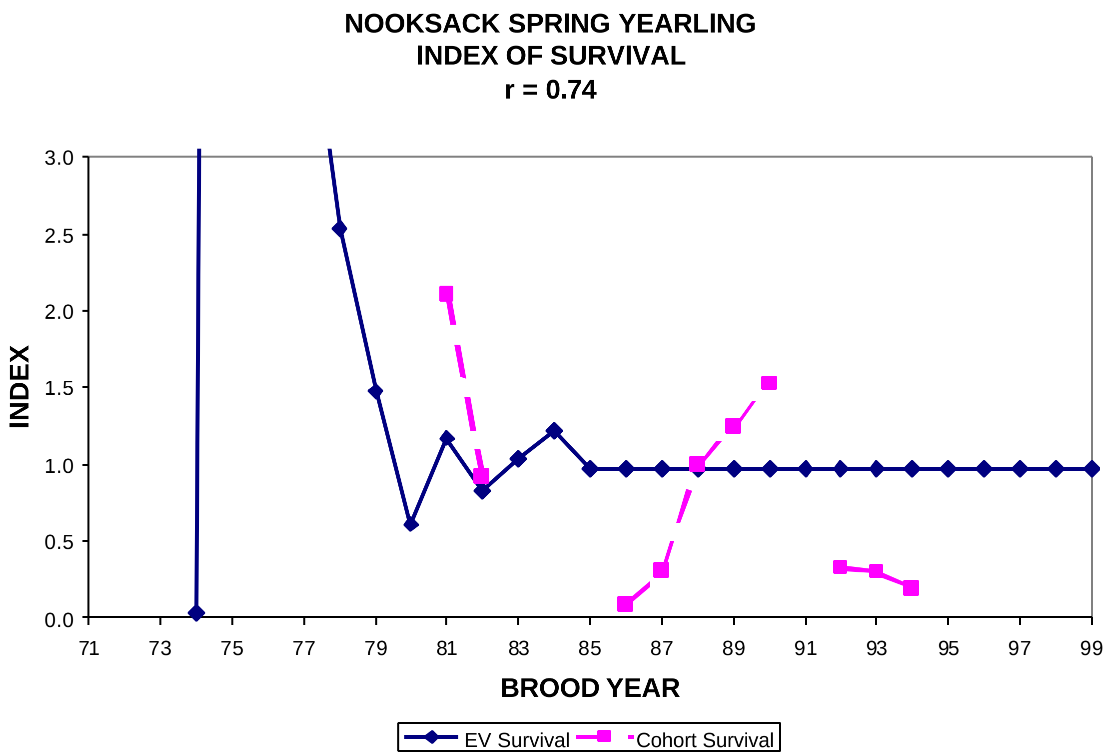


Figure G.15. Nooksack Spring Yearling.

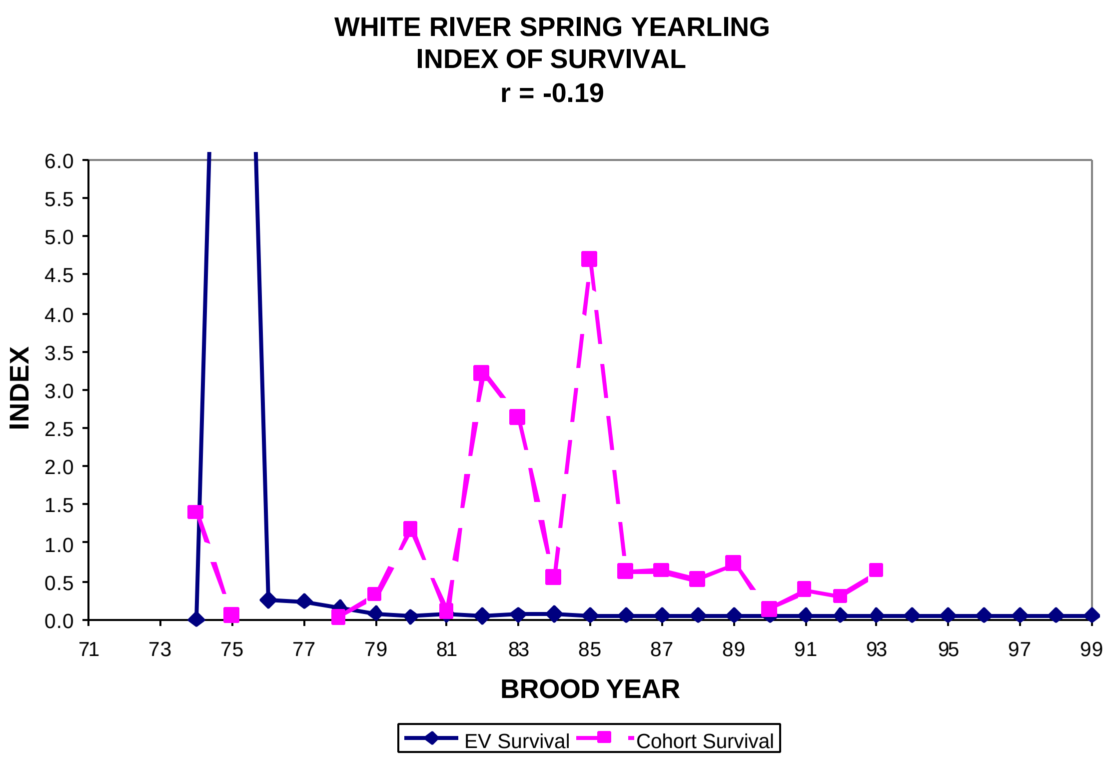


Figure G.16. White River Spring Yearling.

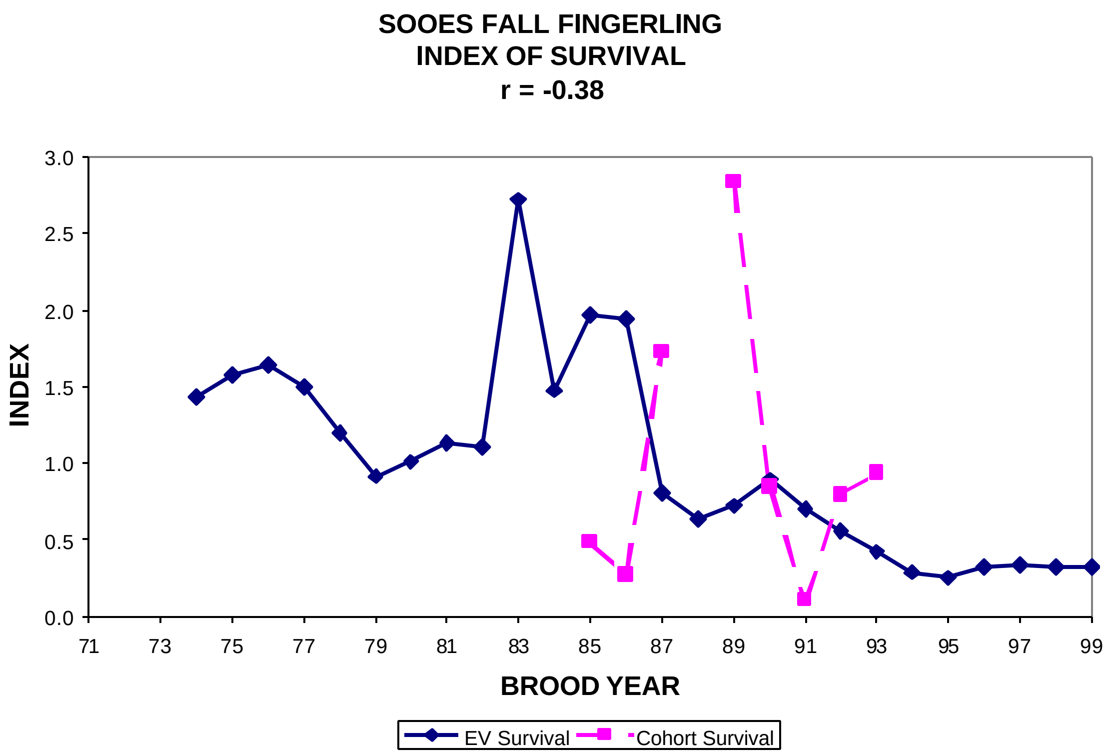


Figure G.17. Sooes Fall Fingerling.

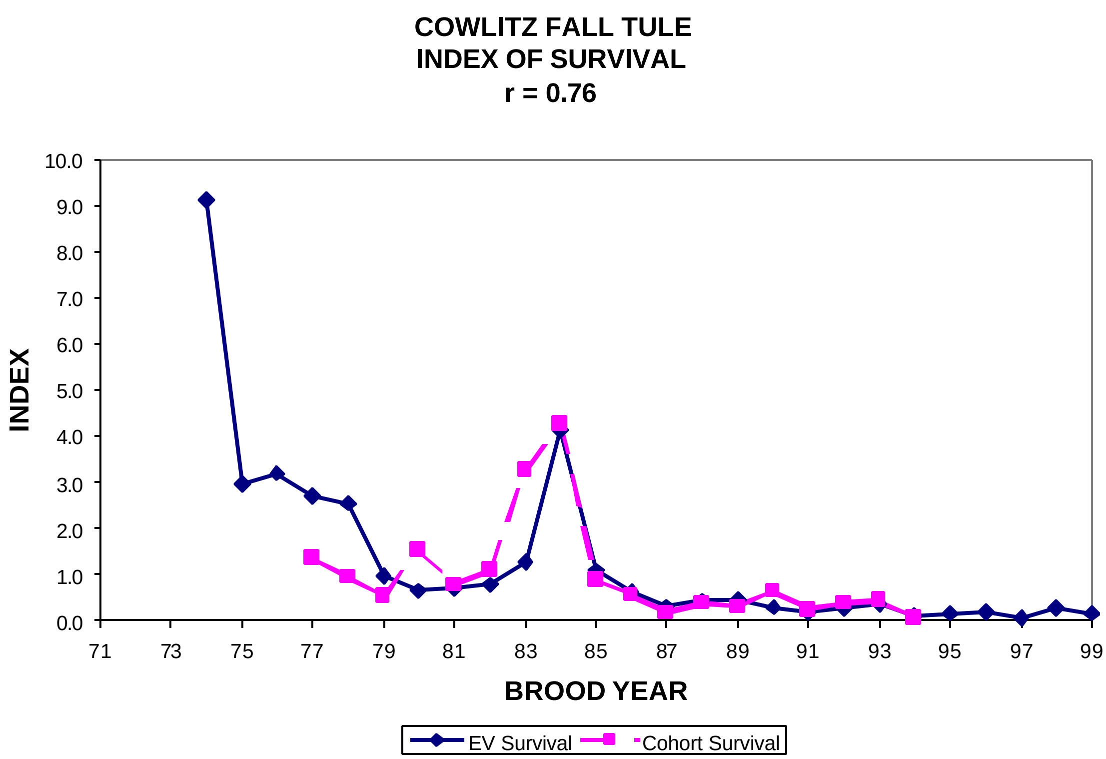


Figure G.18. Cowlitz Fall Tule.

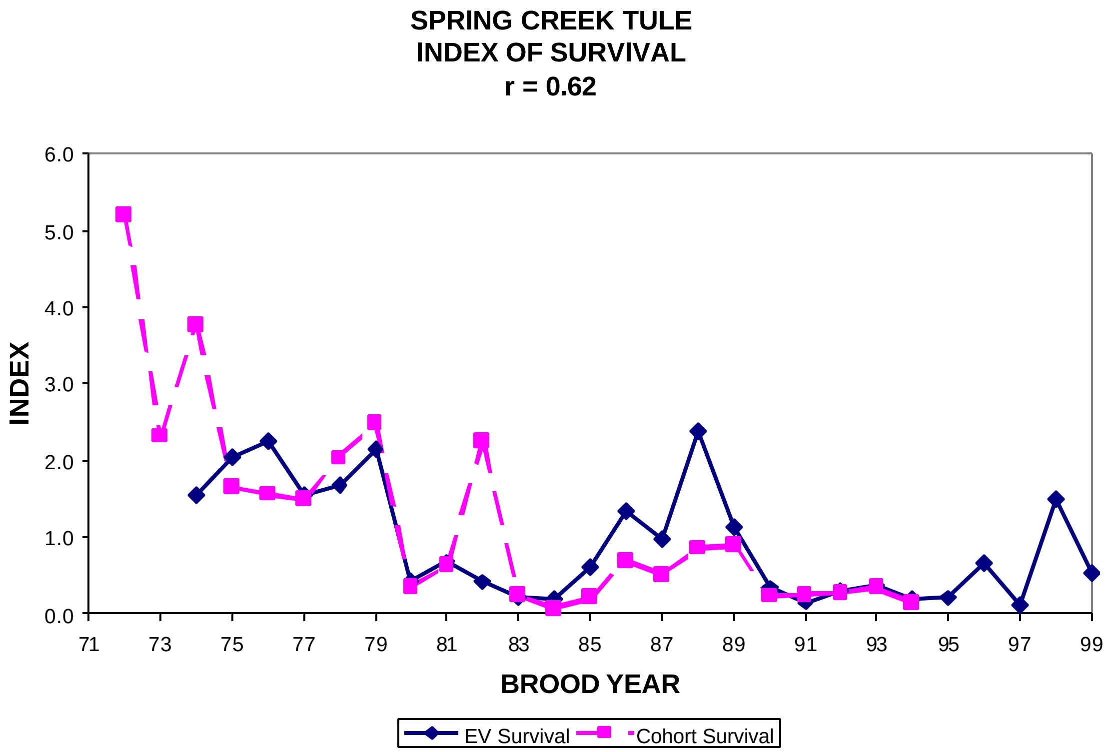


Figure G.19. Spring Creek Tule.

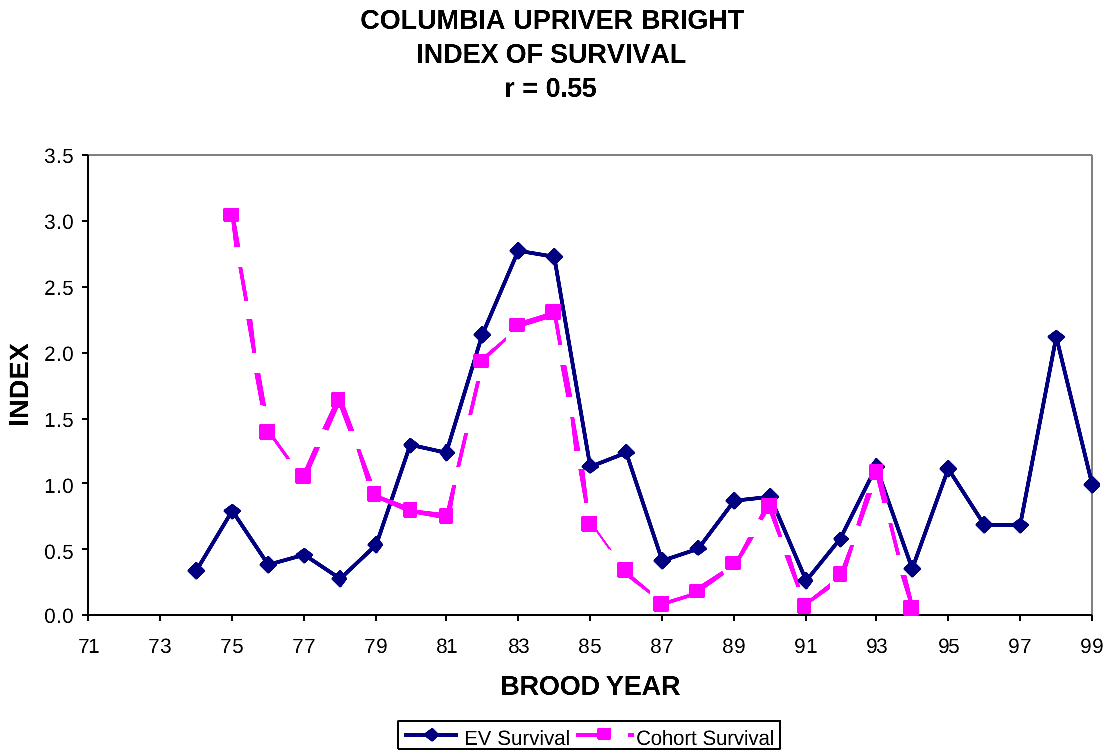


Figure G.20. Columbia Upgriver Bright.

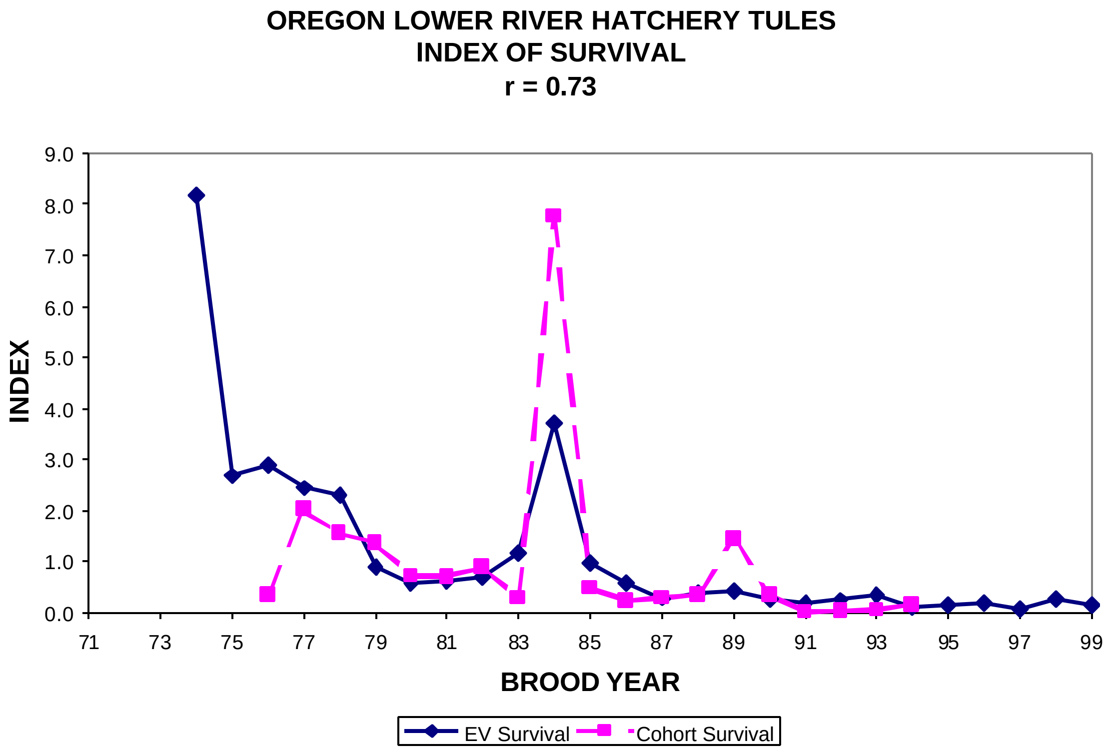


Figure G.21. Oregon Lower River Hatchery Tules.

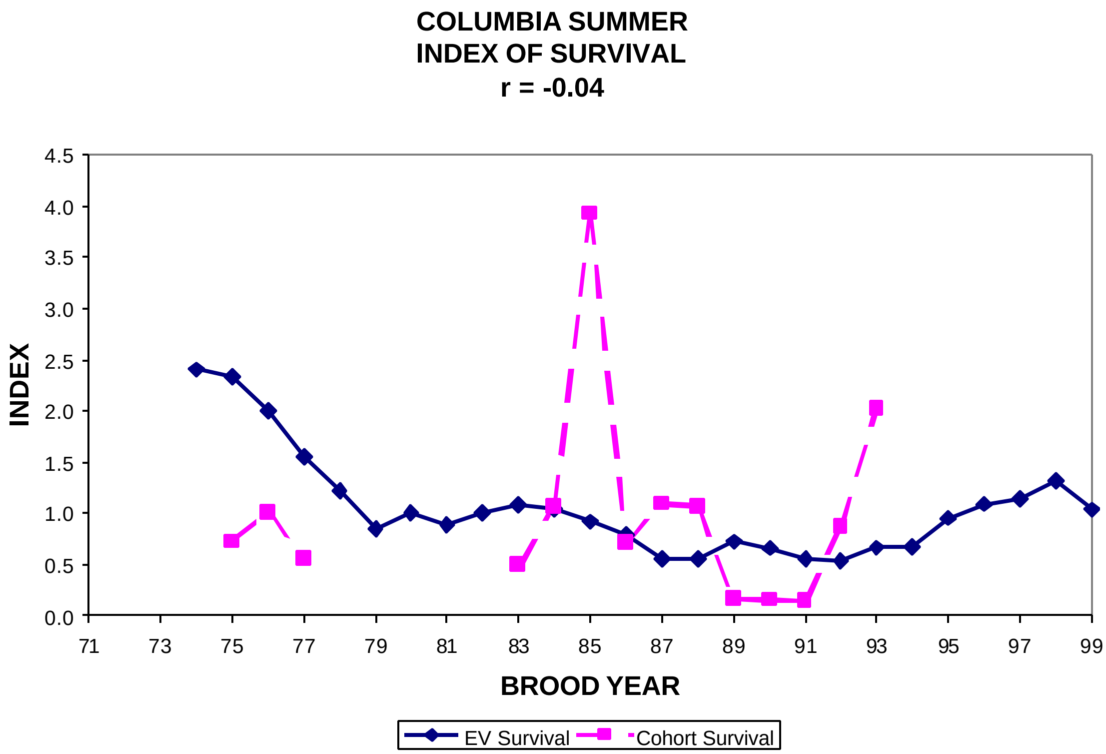


Figure G.22. Columbia Summer.

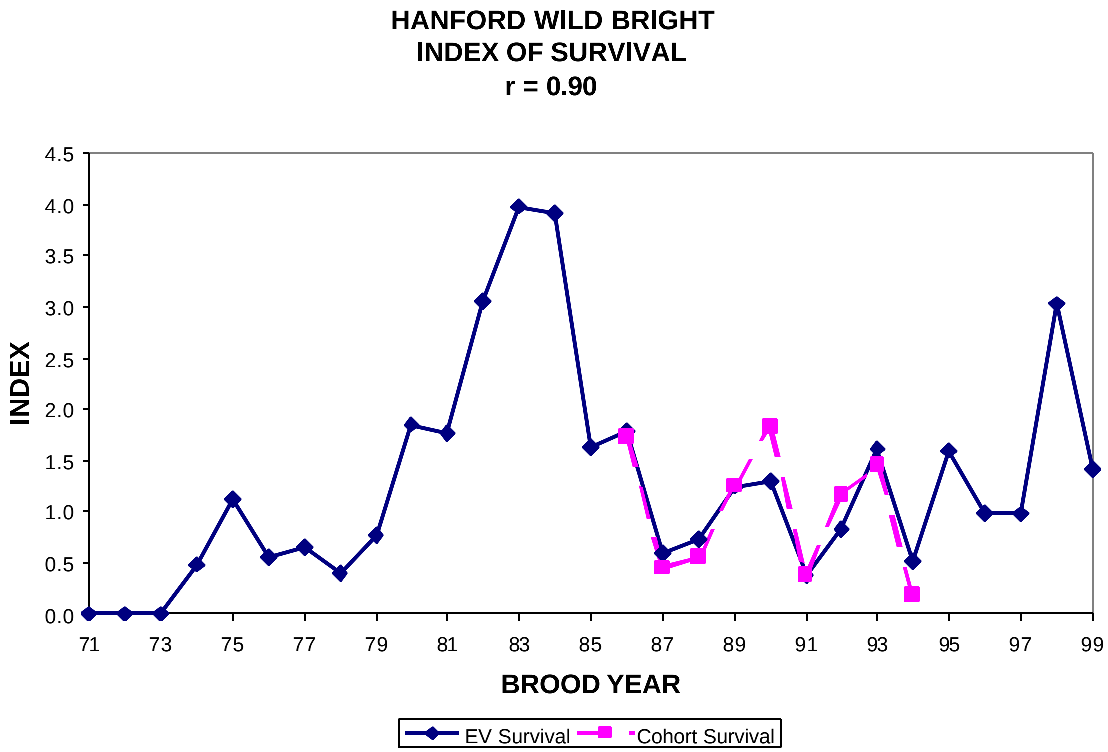


Figure G.23. Hanford Wild Bright.

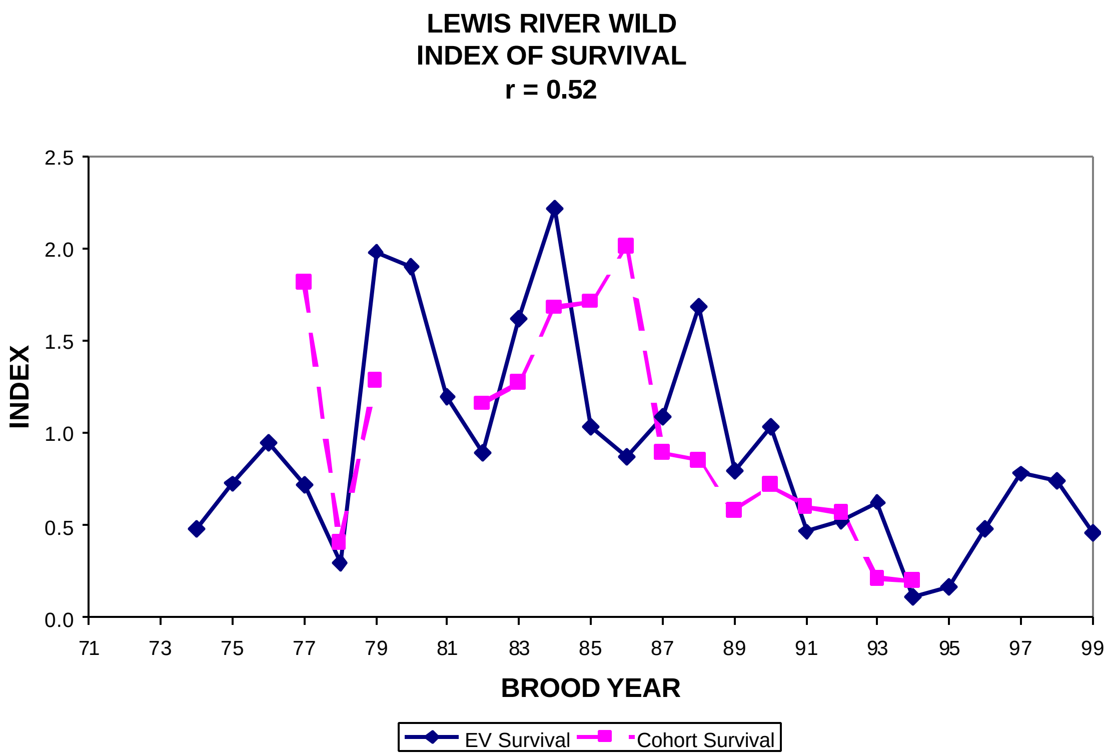


Figure G.24. Lewis River Wild.

Appendix H. Stock catch distributions.

LIST OF TABLES

Table H.1. Alaska Spring distribution of reported catch 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
83	29.3%	1.3%	4.8%	1.8%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	62.6%
84	26.3%	2.8%	4.6%	1.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	64.9%
85	27.0%	5.6%	6.1%	1.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	60.2%
86	27.5%	7.3%	6.9%	0.6%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	57.6%
87	30.5%	2.5%	11.9%	0.4%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	54.2%
88	29.0%	2.8%	17.6%	1.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	49.3%
89	26.3%	7.2%	11.1%	0.6%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	54.5%
90	37.7%	2.0%	13.0%	1.7%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	45.4%
91	41.5%	2.2%	16.3%	0.6%	0.0%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	38.9%
92	28.7%	2.0%	19.2%	0.5%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	49.5%
93	20.7%	5.9%	16.5%	0.1%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	56.3%
94	16.9%	13.5%	13.5%	0.4%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	55.1%
95	31.7%	13.6%	14.0%	0.3%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	40.0%
96	36.2%	11.1%	16.0%	0.0%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	36.2%
97	42.3%	7.6%	14.8%	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	35.2%
98	41.8%	8.5%	10.4%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	38.8%
99	34.3%	5.0%	11.2%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	49.1%
(83-99)	31.0%	5.9%	12.2%	0.6%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	49.9%
(85-99)	31.5%	6.5%	13.2%	0.5%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	48.0%

Table H.2. Alaska Spring distribution of total fishing mortalities 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	Other Fisheries: Canada Sport	Other Fisheries: U.S. Troll	Other Fisheries: U.S. Net	Other Fisheries: U.S. Sport	Escapement
83	37.4%	1.5%	6.3%	1.8%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	52.8%
84	32.4%	2.8%	6.4%	1.1%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	56.9%
85	31.8%	10.6%	6.9%	1.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	49.6%
86	31.3%	14.7%	6.9%	0.5%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	46.4%
87	40.2%	4.6%	11.1%	0.4%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	43.3%
88	32.8%	7.7%	17.0%	1.1%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	41.1%
89	31.8%	10.1%	12.0%	0.6%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	45.1%
90	44.1%	5.4%	12.7%	1.9%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	35.7%
91	44.2%	5.3%	15.9%	0.6%	0.0%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.6%
92	31.1%	6.0%	19.1%	0.5%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	43.1%
93	24.5%	9.7%	16.8%	0.2%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	48.4%
94	21.9%	23.2%	13.0%	0.4%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	41.1%
95	36.9%	13.4%	14.6%	0.3%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	34.2%
96	39.1%	12.0%	16.3%	0.1%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	31.9%
97	43.2%	9.7%	15.4%	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	31.4%
98	42.2%	13.8%	11.8%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	31.7%
99	38.3%	7.2%	12.3%	0.0%	0.0%	0.1%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	41.8%
(83-99)	35.5%	9.3%	12.6%	0.6%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	41.7%
(85-99)	35.6%	10.2%	13.5%	0.5%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	39.9%

Table H.3. Kitsumkalum distribution of 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: Canada Net	Other Fisheries: Canada Sport	Other Fisheries: U.S. Troll	Other Fisheries: U.S. Net	Other Fisheries: U.S. Sport	Escapement
84	50.7%	0.0%	1.5%	17.9%	0.0%	29.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
85	26.5%	0.0%	0.0%	7.2%	0.0%	13.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	52.5%
86	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%
87	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%
88	19.1%	0.6%	0.6%	3.1%	0.0%	22.8%	7.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	46.3%
89	11.2%	0.5%	3.9%	5.1%	0.0%	11.6%	6.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	60.8%
90	11.0%	0.0%	0.8%	6.7%	0.3%	7.3%	7.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	66.3%
91	16.1%	0.0%	1.7%	8.9%	0.7%	16.8%	13.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	42.1%
92	14.0%	0.0%	0.9%	7.1%	0.0%	9.5%	6.6%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	61.3%
93	10.9%	0.9%	1.3%	10.0%	0.0%	18.8%	4.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	53.7%
94	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%
95	12.6%	0.0%	2.7%	7.1%	0.0%	29.0%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	42.6%
96	9.4%	0.2%	3.7%	0.0%	0.0%	18.6%	5.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	63.0%
97	11.9%	0.0%	7.8%	0.0%	0.0%	8.2%	10.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	61.3%
98	8.8%	0.0%	2.7%	0.0%	0.0%	1.2%	5.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	81.8%
99	13.0%	0.0%	8.5%	0.0%	0.0%	0.6%	6.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	71.2%
(84-99)	15.2%	0.1%	2.3%	6.4%	0.1%	14.0%	5.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	56.1%
(85-99)	12.9%	0.1%	2.3%	5.6%	0.1%	12.9%	6.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	59.8%

Table H.4. Kitsumkalum distribution of total fishing mortalities 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
84	52.6%	0.0%	1.3%	20.5%	0.0%	25.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
85	30.1%	0.0%	0.0%	7.8%	0.0%	13.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	49.2%
86	11.8%	0.0%	0.0%	13.6%	0.0%	8.6%	2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	63.6%
87	13.0%	0.0%	1.5%	10.0%	0.0%	7.3%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	63.2%
88	25.9%	1.5%	2.0%	7.5%	0.0%	18.4%	7.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	37.3%
89	14.6%	1.3%	4.0%	5.4%	0.0%	10.8%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	56.9%
90	12.0%	0.0%	1.0%	7.9%	0.3%	7.0%	8.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	63.6%
91	21.6%	0.0%	1.8%	10.8%	0.9%	15.0%	12.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	36.9%
92	15.4%	0.0%	0.9%	8.0%	0.0%	9.2%	7.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	59.1%
93	12.0%	1.7%	1.2%	11.6%	0.0%	17.8%	4.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	51.0%
94	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%
95	13.9%	0.0%	2.8%	9.7%	0.0%	31.5%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	36.1%
96	11.1%	0.2%	4.0%	0.4%	0.0%	20.8%	5.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	58.3%
97	13.5%	0.0%	9.3%	0.0%	0.0%	8.5%	11.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	57.5%
98	11.0%	0.0%	3.0%	0.0%	0.0%	1.4%	5.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	78.9%
99	14.2%	0.0%	9.6%	0.0%	0.0%	0.7%	7.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	68.1%
(84-99)	17.9%	0.3%	2.6%	7.5%	0.1%	13.3%	6.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	52.1%
(85-99)	15.6%	0.3%	2.7%	6.6%	0.1%	12.5%	6.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	55.6%

Table H.5. Robertson Creek distribution of 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: Canada Net	Other Fisheries: Canada Sport	Other Fisheries: U.S. Troll	Other Fisheries: U.S. Net	Other Fisheries: U.S. Sport	Escapement
79	19.7%	0.9%	0.7%	11.4%	10.6%	7.6%	0.3%	7.9%	1.7%	2.3%	5.1%	0.0%	0.1%	0.0%	31.7%
80	27.3%	6.6%	1.3%	7.9%	8.1%	4.4%	0.1%	7.4%	0.1%	11.2%	3.4%	0.0%	0.0%	0.0%	22.1%
81	30.2%	1.6%	1.2%	12.0%	8.1%	4.8%	0.5%	5.3%	0.6%	13.6%	5.7%	0.0%	0.0%	0.0%	16.4%
82	25.4%	3.5%	1.6%	13.6%	7.5%	5.0%	0.1%	5.8%	0.8%	15.0%	6.4%	0.0%	0.0%	0.0%	15.3%
83	36.1%	3.2%	2.5%	10.1%	7.7%	2.3%	0.3%	5.1%	0.3%	17.7%	4.5%	0.0%	0.2%	0.0%	10.1%
84	26.7%	3.8%	2.3%	14.2%	2.9%	2.7%	0.0%	6.5%	0.7%	17.2%	15.4%	0.0%	0.2%	0.0%	7.3%
85	14.0%	5.9%	1.3%	17.4%	0.5%	4.4%	0.0%	1.9%	0.8%	3.6%	17.4%	0.0%	1.9%	0.0%	30.8%
86	14.6%	4.3%	0.7%	7.9%	1.1%	3.1%	0.7%	4.3%	0.0%	1.4%	26.2%	0.0%	0.0%	1.1%	34.5%
87	6.7%	1.2%	0.2%	6.2%	2.9%	2.4%	0.5%	2.2%	0.5%	1.1%	21.0%	0.0%	0.3%	0.1%	54.5%
88	10.1%	2.1%	0.8%	6.6%	1.2%	2.0%	1.1%	4.1%	0.6%	8.0%	18.6%	0.0%	0.3%	0.2%	44.3%
89	8.6%	2.0%	0.6%	7.8%	0.8%	1.1%	1.0%	1.6%	0.7%	20.4%	18.5%	0.0%	0.1%	0.1%	36.8%
90	15.8%	1.8%	0.9%	7.3%	2.0%	1.7%	0.9%	6.3%	0.3%	10.4%	10.7%	0.0%	0.0%	0.1%	41.7%
91	17.0%	1.2%	2.1%	9.2%	2.7%	0.6%	0.8%	4.5%	0.3%	15.0%	13.8%	0.0%	0.0%	0.1%	32.6%
92	13.9%	3.1%	1.2%	7.2%	3.0%	1.0%	1.5%	18.9%	0.1%	0.8%	8.0%	0.0%	0.1%	0.1%	41.3%
93	14.1%	1.1%	2.6%	7.1%	1.9%	0.4%	1.4%	13.6%	0.5%	8.3%	15.6%	0.1%	0.0%	0.1%	33.1%
94	15.7%	2.2%	3.7%	9.5%	1.1%	1.1%	1.1%	5.3%	0.4%	12.8%	21.4%	0.0%	0.0%	0.1%	25.7%
95	15.3%	0.0%	3.4%	3.1%	0.3%	0.3%	0.9%	1.6%	1.4%	7.3%	12.6%	0.0%	0.2%	0.0%	53.7%
96	5.8%	0.0%	1.0%	0.0%	0.7%	0.0%	2.8%	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	88.2%
97	10.5%	3.4%	3.9%	4.5%	1.9%	0.4%	2.8%	0.1%	0.5%	6.5%	20.0%	0.1%	0.0%	0.0%	45.1%
98	16.9%	1.6%	4.6%	6.2%	0.0%	0.0%	2.0%	0.0%	0.6%	4.2%	19.1%	0.0%	0.0%	0.0%	44.9%
99	16.5%	0.6%	7.2%	5.6%	0.2%	0.0%	3.9%	0.0%	1.1%	9.5%	30.5%	0.0%	0.0%	0.0%	24.9%
(79-99)	17.2%	2.4%	2.1%	8.3%	3.1%	2.2%	1.1%	4.9%	0.6%	8.9%	14.0%	0.0%	0.2%	0.1%	35.0%
(85-99)	13.0%	2.0%	2.3%	7.0%	1.4%	1.2%	1.4%	4.3%	0.6%	7.3%	16.9%	0.0%	0.2%	0.1%	42.1%

Table H.6. Robertson Creek distribution of total fishing mortalities 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
79	23.2%	0.9%	0.8%	11.7%	10.9%	7.1%	0.3%	8.1%	1.6%	2.1%	4.9%	0.0%	0.1%	0.0%	28.3%
80	28.5%	6.6%	1.4%	8.3%	8.4%	4.4%	0.1%	7.7%	0.1%	10.6%	3.4%	0.0%	0.0%	0.0%	20.5%
81	34.2%	1.5%	1.5%	12.2%	8.3%	4.5%	0.5%	5.4%	0.6%	12.0%	5.3%	0.0%	0.0%	0.0%	14.0%
82	29.7%	3.3%	1.8%	13.5%	7.5%	4.7%	0.1%	5.8%	0.8%	13.3%	6.1%	0.0%	0.0%	0.0%	13.4%
83	40.8%	2.9%	2.5%	9.7%	7.4%	2.1%	0.3%	5.0%	0.3%	15.7%	4.2%	0.0%	0.2%	0.0%	8.9%
84	28.0%	3.7%	2.4%	14.3%	2.9%	2.6%	0.0%	6.7%	0.7%	16.1%	15.4%	0.0%	0.2%	0.0%	6.8%
85	14.8%	16.9%	1.1%	15.7%	0.4%	3.7%	0.0%	1.7%	0.7%	2.9%	15.2%	0.0%	1.8%	0.0%	25.0%
86	18.6%	12.1%	1.1%	8.6%	1.2%	2.9%	1.4%	4.4%	0.0%	1.2%	21.5%	0.0%	0.0%	1.1%	26.0%
87	10.5%	2.9%	0.3%	7.6%	3.5%	2.3%	0.6%	2.7%	0.5%	1.0%	19.9%	0.0%	0.3%	0.1%	47.7%
88	11.3%	4.8%	1.0%	7.3%	1.3%	1.9%	1.2%	4.6%	0.7%	7.3%	18.4%	0.0%	0.4%	0.2%	39.7%
89	11.8%	5.9%	0.8%	9.1%	1.0%	1.1%	1.1%	1.9%	0.8%	18.1%	17.2%	0.0%	0.1%	0.1%	31.2%
90	19.0%	5.7%	1.1%	8.7%	2.3%	1.5%	0.9%	6.6%	0.3%	8.9%	9.8%	0.0%	0.0%	0.1%	35.1%
91	20.1%	2.7%	2.2%	10.0%	3.0%	0.6%	0.8%	4.8%	0.3%	13.5%	13.1%	0.0%	0.0%	0.1%	28.9%
92	16.8%	8.5%	1.1%	7.5%	3.0%	0.8%	1.4%	18.7%	0.1%	0.6%	7.2%	0.0%	0.1%	0.0%	34.2%
93	16.1%	2.5%	2.6%	7.5%	2.1%	0.4%	1.4%	14.3%	0.5%	7.5%	15.1%	0.0%	0.0%	0.1%	29.8%
94	17.8%	5.0%	3.5%	9.3%	1.0%	1.0%	1.1%	5.3%	0.4%	11.6%	20.7%	0.0%	0.0%	0.1%	23.2%
95	16.9%	0.0%	3.8%	3.7%	0.4%	0.5%	1.0%	1.9%	1.5%	6.8%	15.1%	0.0%	0.2%	0.0%	48.4%
96	9.3%	0.0%	2.5%	2.7%	0.8%	0.0%	2.6%	0.8%	1.8%	0.0%	2.2%	0.0%	0.0%	0.0%	77.4%
97	13.4%	9.1%	4.4%	5.2%	2.1%	0.4%	2.6%	0.2%	0.6%	5.6%	18.1%	0.1%	0.0%	0.0%	38.1%
98	17.4%	4.0%	4.6%	6.2%	0.0%	0.0%	2.0%	0.0%	0.6%	3.9%	19.1%	0.0%	0.0%	0.0%	42.2%
99	17.1%	1.2%	7.2%	5.4%	0.2%	0.0%	4.1%	0.0%	1.2%	9.0%	31.0%	0.0%	0.0%	0.0%	23.6%
(79-99)	19.8%	4.8%	2.3%	8.8%	3.2%	2.0%	1.1%	5.1%	0.7%	8.0%	13.5%	0.0%	0.2%	0.1%	30.6%
(85-99)	15.4%	5.4%	2.5%	7.6%	1.5%	1.1%	1.5%	4.5%	0.7%	6.5%	16.2%	0.0%	0.2%	0.1%	36.7%

Table H.7. Quinsam distribution of 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: Canada Net	Other Fisheries: Canada Sport	Other Fisheries: U.S. Troll	Other Fisheries: U.S. Net	Other Fisheries: U.S. Sport	Escapement
79	6.4%	12.0%	0.9%	6.8%	12.8%	24.1%	3.9%	0.0%	8.7%	5.4%	0.0%	0.0%	0.0%	0.0%	18.9%
80	15.3%	9.4%	3.0%	10.4%	16.3%	12.8%	5.2%	0.0%	6.6%	8.6%	0.0%	0.0%	0.0%	0.0%	12.3%
81	12.6%	4.2%	2.1%	15.1%	14.0%	11.9%	7.3%	0.6%	13.6%	7.5%	0.0%	0.0%	0.0%	0.0%	11.0%
82	18.3%	10.9%	4.0%	8.3%	7.1%	21.4%	2.5%	0.4%	4.3%	8.4%	0.0%	0.0%	0.0%	0.0%	14.5%
83	22.9%	2.1%	3.8%	15.6%	12.1%	18.0%	2.9%	0.7%	5.0%	8.9%	0.0%	0.0%	0.0%	0.0%	7.9%
84	15.3%	7.7%	2.9%	5.9%	5.0%	15.0%	4.0%	0.8%	7.8%	6.5%	0.0%	0.0%	0.0%	0.0%	29.0%
85	25.9%	6.0%	6.1%	5.0%	3.5%	10.7%	1.0%	0.1%	4.3%	8.1%	0.0%	0.0%	0.0%	0.0%	29.3%
86	14.8%	4.2%	3.6%	6.5%	7.1%	19.5%	2.8%	0.0%	6.1%	6.2%	0.0%	0.0%	0.0%	0.0%	29.1%
87	10.7%	4.4%	2.4%	6.3%	6.1%	17.2%	6.5%	0.4%	4.0%	7.3%	0.4%	0.0%	0.0%	0.0%	34.2%
88	20.1%	1.7%	0.7%	6.5%	2.4%	5.5%	2.9%	0.7%	3.7%	4.0%	0.9%	0.0%	0.0%	0.1%	50.8%
89	12.8%	3.0%	2.1%	3.9%	1.9%	4.9%	3.3%	0.3%	7.4%	13.1%	0.0%	0.0%	0.1%	0.0%	47.3%
90	17.4%	3.0%	0.2%	6.6%	4.8%	11.1%	8.9%	1.4%	3.5%	4.7%	0.0%	0.0%	0.0%	0.0%	38.3%
91	10.5%	2.5%	2.1%	5.6%	9.0%	10.1%	11.8%	0.5%	4.4%	3.5%	0.7%	0.0%	0.0%	0.0%	39.4%
92	11.7%	0.6%	2.4%	10.1%	9.3%	7.3%	6.2%	0.3%	3.5%	2.6%	0.0%	0.0%	0.0%	0.0%	46.0%
93	8.2%	4.3%	0.3%	5.8%	5.8%	19.5%	8.8%	1.2%	10.7%	3.4%	0.0%	0.0%	0.0%	0.0%	32.0%
94	5.6%	1.4%	4.2%	9.5%	1.4%	14.7%	5.3%	0.0%	6.3%	4.2%	0.0%	0.0%	0.0%	0.0%	47.4%
95	7.0%	5.8%	0.0%	9.1%	0.0%	14.5%	7.9%	0.0%	6.6%	0.8%	0.0%	0.0%	0.0%	0.0%	48.3%
96	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%
97	10.0%	3.0%	2.5%	3.9%	3.4%	2.3%	8.9%	0.7%	8.4%	0.2%	5.0%	0.0%	0.0%	0.0%	51.8%
98	14.0%	2.2%	0.4%	0.0%	0.0%	0.4%	8.8%	0.0%	5.6%	0.0%	0.0%	0.0%	0.2%	0.0%	68.5%
99	8.7%	2.5%	4.1%	1.4%	0.2%	1.0%	9.4%	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	71.3%
(79-99)	13.1%	4.3%	2.3%	6.8%	5.8%	12.3%	5.8%	0.4%	6.1%	4.9%	0.3%	0.0%	0.0%	0.0%	37.7%
(85-99)	12.3%	3.0%	2.1%	5.3%	3.7%	10.4%	6.5%	0.4%	5.5%	3.9%	0.5%	0.0%	0.0%	0.0%	46.5%

Table H.8. Quinsam distribution of total fishing mortalities 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
79	8.5%	11.6%	1.5%	7.6%	13.4%	22.9%	4.1%	0.1%	8.2%	5.4%	0.0%	0.0%	0.0%	0.0%	16.9%
80	16.0%	9.2%	3.3%	10.5%	16.7%	12.8%	5.5%	0.0%	6.4%	8.4%	0.0%	0.0%	0.0%	0.0%	11.2%
81	13.4%	4.1%	2.2%	15.5%	14.1%	11.7%	7.6%	0.7%	13.5%	7.1%	0.0%	0.0%	0.0%	0.0%	10.1%
82	22.5%	10.6%	4.3%	8.2%	7.0%	20.5%	2.5%	0.3%	3.9%	7.6%	0.0%	0.0%	0.0%	0.0%	12.4%
83	26.7%	1.9%	4.6%	15.1%	11.8%	17.0%	3.0%	0.7%	4.6%	8.0%	0.0%	0.0%	0.0%	0.0%	6.6%
84	16.7%	7.6%	3.3%	6.1%	5.1%	14.8%	4.3%	0.9%	7.9%	6.3%	0.0%	0.0%	0.0%	0.0%	27.0%
85	27.3%	13.2%	5.8%	4.6%	3.2%	9.7%	0.9%	0.1%	3.8%	7.0%	0.0%	0.0%	0.0%	0.0%	24.4%
86	16.4%	10.5%	4.0%	6.5%	7.0%	18.1%	3.0%	0.0%	5.5%	5.6%	0.0%	0.0%	0.0%	0.0%	23.5%
87	15.9%	11.8%	2.5%	6.7%	6.7%	14.2%	5.6%	0.4%	3.4%	5.9%	0.3%	0.0%	0.0%	0.0%	26.7%
88	21.1%	4.0%	0.7%	7.0%	2.6%	5.5%	3.1%	0.8%	3.9%	3.9%	1.0%	0.0%	0.0%	0.2%	46.4%
89	14.2%	8.4%	2.1%	4.1%	2.0%	4.6%	3.2%	0.3%	7.6%	11.9%	0.0%	0.0%	0.1%	0.0%	41.4%
90	18.6%	7.5%	0.2%	7.2%	5.3%	10.3%	8.8%	1.5%	3.6%	4.3%	0.0%	0.0%	0.0%	0.0%	32.7%
91	11.7%	7.1%	2.1%	5.9%	9.4%	9.1%	11.3%	0.5%	4.5%	3.2%	0.7%	0.0%	0.0%	0.0%	34.6%
92	15.4%	1.5%	2.5%	10.6%	9.6%	7.2%	6.3%	0.3%	3.7%	2.4%	0.0%	0.0%	0.0%	0.0%	40.6%
93	9.3%	8.8%	0.3%	6.5%	6.5%	17.8%	8.5%	1.3%	11.1%	2.8%	0.0%	0.0%	0.0%	0.0%	27.1%
94	7.3%	3.5%	4.4%	10.4%	1.6%	13.9%	5.7%	0.0%	6.9%	3.8%	0.0%	0.0%	0.0%	0.0%	42.6%
95	8.5%	6.5%	0.0%	11.2%	0.0%	16.7%	8.8%	0.0%	6.5%	2.0%	0.0%	0.0%	0.0%	0.0%	39.8%
96	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%
97	10.8%	4.9%	3.1%	4.3%	3.7%	2.4%	9.4%	0.8%	9.1%	1.6%	4.9%	0.0%	0.0%	0.0%	44.9%
98	15.2%	6.2%	0.5%	0.0%	0.0%	0.3%	10.8%	0.0%	6.1%	0.3%	0.0%	0.0%	0.2%	0.0%	60.3%
99	10.4%	5.3%	5.4%	1.6%	0.2%	1.2%	10.2%	0.0%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	63.8%
(79-99)	14.9%	6.9%	2.5%	7.2%	6.0%	11.9%	6.1%	0.4%	6.1%	4.7%	0.3%	0.0%	0.0%	0.0%	32.9%
(85-99)	14.0%	6.7%	2.2%	5.9%	3.8%	10.1%	6.7%	0.4%	5.6%	3.7%	0.5%	0.0%	0.0%	0.0%	40.4%

Table H.9. Puntledge distribution of reported catch 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
79	1.8%	1.1%	0.2%	3.1%	8.3%	6.6%	0.3%	0.9%	39.3%	6.5%	0.0%	0.0%	0.0%	0.0%	31.9%
80	2.5%	0.0%	0.4%	2.0%	5.9%	4.4%	1.3%	4.9%	38.5%	5.9%	0.0%	0.0%	0.0%	0.0%	34.1%
81	0.8%	0.0%	0.2%	5.4%	7.2%	3.6%	4.0%	0.0%	60.1%	5.4%	0.0%	0.0%	0.0%	0.0%	13.2%
82	0.9%	0.7%	0.0%	2.2%	12.8%	5.5%	1.0%	1.6%	19.1%	14.7%	0.0%	0.0%	0.0%	0.0%	41.6%
83	1.0%	0.2%	0.0%	7.5%	15.9%	5.2%	3.0%	2.4%	25.6%	2.6%	0.0%	0.0%	0.0%	0.0%	36.7%
84	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%
85	10.9%	0.8%	3.1%	6.2%	1.6%	8.5%	6.2%	0.0%	33.3%	5.4%	0.0%	0.0%	0.0%	0.0%	24.0%
86	6.8%	0.0%	2.3%	2.8%	4.0%	10.2%	0.0%	2.8%	43.8%	1.7%	0.0%	0.0%	0.0%	0.0%	25.6%
87	2.6%	2.0%	1.3%	11.8%	2.0%	5.9%	9.9%	0.0%	16.4%	0.0%	4.6%	0.0%	0.0%	0.0%	43.4%
88	12.9%	0.0%	0.0%	0.0%	0.0%	4.3%	14.0%	0.0%	17.2%	1.1%	0.0%	0.0%	0.0%	0.0%	50.5%
89	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%
90	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%
91	6.3%	1.8%	0.0%	0.0%	0.0%	5.4%	8.0%	0.0%	24.1%	5.4%	0.0%	0.0%	0.0%	0.0%	49.1%
92	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%
93	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%
94	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%
95	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%
96	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%
97	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%
98	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%
99	9.2%	0.0%	0.0%	0.0%	0.0%	1.2%	9.2%	0.0%	11.7%	0.0%	0.0%	0.0%	0.0%	0.0%	68.7%
(79-99)	4.9%	0.8%	0.4%	2.5%	3.2%	5.8%	5.4%	0.7%	29.6%	3.7%	0.2%	0.0%	0.0%	0.0%	42.9%
(85-99)	6.4%	0.9%	0.4%	2.0%	0.7%	6.2%	6.8%	0.2%	27.4%	2.6%	0.3%	0.0%	0.0%	0.0%	46.0%

Table H.10. Puntledge distribution of total fishing mortalities 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	Other Fisheries: Canada Sport	Other Fisheries: U.S. Troll	Other Fisheries: U.S. Net	Other Fisheries: U.S. Sport	Escapement
79	2.4%	1.1%	0.3%	3.6%	9.2%	6.6%	0.3%	1.1%	39.2%	6.4%	0.0%	0.0%	0.0%	0.0%	30.0%
80	3.0%	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%
81	0.9%	0.0%	0.2%	5.9%	8.0%	3.3%	4.1%	0.0%	59.9%	5.4%	0.0%	0.0%	0.0%	0.0%	12.3%
82	0.9%	0.8%	0.0%	2.5%	14.1%	5.9%	1.3%	1.9%	19.5%	15.0%	0.0%	0.0%	0.0%	0.0%	38.1%
83	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%
84	0.0%	1.1%	0.0%	2.6%	6.6%	4.4%	1.5%	2.6%	27.5%	2.9%	0.0%	0.0%	0.0%	0.0%	50.9%
85	14.0%	1.3%	4.0%	6.7%	1.3%	8.7%	6.7%	0.0%	31.3%	5.3%	0.0%	0.0%	0.0%	0.0%	20.7%
86	7.1%	0.0%	3.0%	3.0%	4.6%	10.2%	0.0%	3.0%	44.7%	1.5%	0.0%	0.0%	0.0%	0.0%	22.8%
87	2.9%	5.7%	1.1%	14.4%	2.9%	5.7%	9.8%	0.0%	15.5%	0.0%	4.0%	0.0%	0.0%	0.0%	37.9%
88	12.7%	0.0%	0.0%	0.0%	0.0%	4.9%	15.7%	0.0%	19.6%	1.0%	0.0%	0.0%	0.0%	0.0%	46.1%
89	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%
90	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%
91	6.9%	4.6%	0.0%	0.0%	0.0%	4.6%	9.2%	0.0%	26.9%	5.4%	0.0%	0.0%	0.0%	0.0%	42.3%
92	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%
93	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%
94	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%
95	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%
96	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%
97	0.0%	0.0%	0.0%	10.5%	0.0%	8.8%	15.8%	0.0%	8.8%	1.8%	0.0%	0.0%	0.0%	0.0%	54.4%
98	19.5%	17.1%	0.0%	0.0%	0.0%	0.0%	17.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	46.3%
99	10.1%	0.0%	0.0%	0.0%	0.0%	1.7%	11.7%	0.0%	14.0%	0.0%	0.0%	0.0%	0.0%	0.0%	62.6%
(79-99)	5.3%	1.6%	0.4%	2.8%	3.5%	5.9%	5.8%	0.8%	31.3%	3.8%	0.2%	0.0%	0.0%	0.0%	38.4%
(85-99)	6.7%	2.1%	0.5%	2.3%	0.9%	6.2%	7.4%	0.2%	29.9%	2.8%	0.3%	0.0%	0.0%	0.0%	40.6%

Table H.11. Big Qualicum distribution of 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: Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	Escapement
79	3.7%	1.2%	0.4%	1.7%	9.4%	4.1%	0.4%	2.2%	38.9%	8.0%	0.1%	0.0%	0.3%	0.1%	29.8%
80	1.4%	1.7%	0.4%	4.4%	6.6%	3.4%	1.4%	4.2%	39.4%	9.5%	0.0%	0.0%	0.0%	0.0%	27.8%
81	1.9%	0.3%	0.4%	1.4%	11.9%	4.6%	0.8%	1.6%	54.7%	9.8%	0.3%	0.0%	0.0%	0.0%	12.4%
82	4.6%	0.4%	0.8%	4.6%	6.0%	8.8%	0.4%	4.4%	26.0%	12.4%	0.0%	0.0%	0.0%	0.0%	31.7%
83	5.4%	0.3%	1.1%	4.9%	6.9%	4.5%	1.0%	1.1%	35.9%	14.5%	0.0%	0.0%	0.0%	0.6%	23.8%
84	1.4%	0.2%	0.4%	1.4%	6.7%	3.7%	5.9%	1.4%	51.5%	6.1%	0.0%	0.0%	0.0%	0.0%	21.1%
85	4.1%	0.3%	1.0%	1.8%	3.8%	6.8%	1.8%	1.5%	34.1%	12.5%	0.0%	0.0%	2.6%	0.0%	29.8%
86	2.1%	0.2%	0.6%	0.8%	12.7%	8.2%	2.9%	1.4%	44.8%	7.5%	0.0%	0.0%	0.0%	0.0%	18.8%
87	8.8%	0.0%	1.6%	3.9%	2.4%	2.6%	2.7%	4.2%	31.3%	5.2%	0.0%	0.8%	0.7%	0.0%	35.6%
88	2.8%	0.3%	0.0%	2.3%	1.3%	9.8%	1.3%	2.8%	32.2%	4.6%	2.1%	0.0%	1.0%	0.0%	39.4%
89	4.0%	3.2%	0.6%	3.2%	0.6%	1.0%	1.8%	4.6%	37.6%	8.2%	0.0%	0.2%	0.0%	1.0%	34.1%
90	4.9%	4.8%	0.0%	5.9%	1.5%	6.3%	2.3%	2.9%	22.0%	10.9%	0.0%	0.2%	0.0%	1.8%	36.4%
91	2.6%	0.3%	0.0%	2.1%	1.1%	2.9%	2.0%	2.0%	45.0%	5.7%	0.0%	0.5%	0.5%	0.0%	35.3%
92	2.4%	0.0%	0.7%	5.5%	6.1%	1.7%	7.9%	3.5%	41.7%	4.0%	0.0%	0.0%	0.4%	0.0%	26.1%
93	1.2%	1.2%	0.0%	1.5%	4.0%	2.7%	3.2%	1.7%	44.6%	6.9%	0.0%	0.0%	0.0%	1.0%	31.9%
94	4.6%	0.0%	0.0%	1.3%	1.7%	3.8%	2.1%	2.9%	34.2%	2.1%	0.0%	0.0%	2.5%	0.0%	45.0%
95	6.6%	0.0%	0.0%	1.5%	0.0%	7.1%	2.5%	0.0%	20.3%	0.5%	0.0%	0.0%	0.0%	0.0%	61.4%
96	2.2%	0.0%	0.0%	0.0%	0.0%	0.7%	1.1%	0.0%	46.7%	0.0%	0.0%	0.0%	0.0%	1.1%	48.2%
97	3.0%	0.0%	0.0%	5.1%	1.5%	1.5%	2.0%	0.0%	29.8%	0.5%	4.5%	0.0%	0.0%	0.0%	52.0%
98	7.7%	0.6%	0.0%	0.0%	0.0%	0.0%	6.5%	0.0%	20.7%	0.0%	0.0%	0.0%	0.0%	0.0%	64.5%
99	5.8%	1.7%	0.0%	3.8%	3.8%	0.0%	2.1%	0.0%	12.1%	0.0%	3.8%	0.0%	0.8%	0.0%	66.3%
(79-99)	3.9%	0.8%	0.4%	2.7%	4.2%	4.0%	2.5%	2.0%	35.4%	6.1%	0.5%	0.1%	0.4%	0.3%	36.7%
(85-99)	4.2%	0.8%	0.3%	2.6%	2.7%	3.7%	2.8%	1.8%	33.1%	4.6%	0.7%	0.1%	0.6%	0.3%	41.7%

Table H.12. Big Qualicum distribution of total fishing mortalities 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
79	4.7%	1.2%	0.5%	1.9%	10.4%	4.1%	0.4%	2.5%	38.5%	7.8%	0.1%	0.0%	0.3%	0.1%	27.6%
80	1.6%	1.7%	0.4%	4.7%	7.2%	3.5%	1.5%	4.6%	39.3%	9.5%	0.0%	0.0%	0.0%	0.0%	26.0%
81	2.4%	0.3%	0.4%	1.5%	12.8%	4.6%	0.9%	1.7%	54.0%	9.6%	0.3%	0.0%	0.0%	0.0%	11.4%
82	5.9%	0.5%	0.9%	4.8%	6.3%	8.7%	0.4%	4.7%	26.0%	12.1%	0.0%	0.0%	0.0%	0.0%	29.7%
83	5.6%	0.3%	1.6%	5.1%	7.1%	4.6%	1.2%	1.2%	36.8%	14.1%	0.0%	0.0%	0.0%	1.0%	21.5%
84	2.4%	0.2%	0.6%	1.7%	7.3%	3.7%	7.0%	1.7%	50.6%	6.1%	0.0%	0.0%	0.0%	0.0%	18.9%
85	7.0%	1.1%	1.5%	2.0%	4.4%	6.6%	2.3%	1.6%	32.6%	12.0%	0.0%	0.0%	3.4%	0.0%	25.4%
86	3.5%	0.9%	0.7%	0.8%	13.5%	7.8%	2.9%	1.4%	44.9%	7.0%	0.0%	0.0%	0.0%	0.0%	16.7%
87	10.6%	0.0%	1.8%	4.3%	2.8%	2.5%	2.9%	4.8%	31.1%	5.0%	0.0%	0.9%	0.8%	0.0%	32.8%
88	3.1%	0.9%	0.0%	2.6%	1.3%	9.9%	1.5%	3.3%	35.5%	4.4%	2.0%	0.0%	1.5%	0.0%	33.8%
89	4.2%	9.0%	0.8%	3.6%	0.5%	0.8%	1.8%	5.0%	38.1%	7.0%	0.0%	0.3%	0.0%	1.0%	27.9%
90	5.0%	11.9%	0.0%	6.5%	1.6%	5.8%	2.4%	3.0%	22.4%	9.8%	0.0%	0.1%	0.0%	1.8%	29.6%
91	3.7%	1.5%	0.0%	2.5%	1.4%	2.8%	1.9%	2.2%	48.1%	5.0%	0.0%	0.6%	0.4%	0.0%	30.0%
92	3.9%	0.0%	0.8%	6.2%	6.4%	1.5%	7.9%	3.6%	44.2%	3.5%	0.0%	0.0%	0.5%	0.0%	21.5%
93	1.7%	2.5%	0.0%	1.7%	4.5%	2.5%	3.1%	1.9%	48.3%	6.2%	0.0%	0.0%	0.0%	1.0%	26.7%
94	5.2%	0.0%	0.0%	1.9%	1.9%	3.4%	1.9%	3.0%	37.1%	2.2%	0.0%	0.0%	3.0%	0.0%	40.4%
95	7.5%	0.0%	0.0%	2.2%	0.0%	8.8%	3.5%	0.0%	21.9%	3.1%	0.0%	0.0%	0.0%	0.0%	53.1%
96	2.5%	0.0%	0.0%	0.6%	0.0%	0.9%	0.9%	0.3%	52.3%	0.3%	0.0%	0.0%	0.0%	1.2%	40.9%
97	3.6%	0.0%	0.0%	5.9%	1.8%	1.8%	2.3%	0.0%	31.1%	2.7%	4.5%	0.0%	0.0%	0.0%	46.4%
98	8.1%	1.1%	0.0%	0.0%	0.0%	0.0%	8.1%	0.0%	23.2%	0.5%	0.0%	0.0%	0.0%	0.0%	58.9%
99	6.8%	3.8%	0.0%	4.2%	4.5%	0.0%	2.3%	0.0%	13.3%	0.0%	4.2%	0.0%	0.8%	0.0%	60.2%
(79-99)	4.7%	1.8%	0.5%	3.1%	4.6%	4.0%	2.7%	2.2%	36.6%	6.1%	0.5%	0.1%	0.5%	0.3%	32.3%
(85-99)	5.1%	2.2%	0.4%	3.0%	3.0%	3.7%	3.0%	2.0%	34.9%	4.6%	0.7%	0.1%	0.7%	0.3%	36.3%

Table H.13. Chilliwack distribution of reported catch 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
85	0.5%	0.0%	0.0%	0.3%	2.3%	0.8%	0.2%	34.2%	28.7%	5.9%	0.0%	3.9%	4.1%	3.7%	15.3%
86	0.0%	0.0%	0.0%	0.7%	2.3%	1.5%	0.2%	18.8%	27.2%	12.1%	0.0%	2.5%	5.4%	5.7%	23.7%
87	0.0%	0.0%	0.0%	0.7%	0.4%	0.3%	0.3%	16.0%	35.0%	2.2%	0.5%	3.7%	3.6%	2.7%	34.4%
88	0.6%	0.1%	0.0%	0.2%	0.0%	0.1%	0.0%	16.9%	18.7%	2.1%	0.0%	4.0%	2.9%	1.7%	52.6%
89	0.3%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	17.7%	15.7%	3.3%	0.0%	4.8%	3.5%	1.2%	52.9%
90	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%	5.1%	46.0%
91	0.3%	0.1%	0.0%	0.4%	0.2%	1.0%	0.2%	18.9%	22.5%	4.3%	0.8%	13.8%	5.4%	5.0%	27.3%
92	0.4%	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%
93	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%
94	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%
95	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.1%	8.5%	6.3%	0.5%	0.4%	1.1%	1.1%	1.6%	79.5%
96	0.2%	0.0%	0.0%	0.0%	0.0%	1.2%	0.0%	0.0%	16.5%	0.1%	0.6%	4.7%	1.0%	3.0%	72.8%
97	0.7%	0.0%	0.0%	0.1%	0.4%	0.6%	0.6%	9.9%	15.0%	1.5%	2.0%	4.9%	2.9%	3.4%	58.0%
98	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.4%	3.7%	0.1%	0.2%	2.9%	0.2%	0.4%	91.5%
99	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.2%	2.6%	9.8%	0.0%	1.7%	10.8%	0.6%	0.9%	73.4%
(85-99)	0.3%	0.0%	0.0%	0.2%	0.4%	0.6%	0.2%	12.8%	17.4%	2.9%	0.7%	5.5%	3.1%	2.8%	53.0%
(85-99)	0.3%	0.0%	0.0%	0.2%	0.4%	0.6%	0.2%	12.8%	17.4%	2.9%	0.7%	5.5%	3.1%	2.8%	53.0%

Table H.14. Chilliwack distribution of total fishing mortalities 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
85	1.1%	0.0%	0.0%	0.4%	2.2%	0.7%	0.2%	33.9%	28.6%	5.6%	0.0%	3.9%	5.2%	4.5%	13.7%
86	0.0%	0.0%	0.0%	0.8%	2.4%	1.4%	0.2%	19.8%	27.6%	11.2%	0.0%	2.7%	6.7%	6.9%	20.3%
87	0.0%	0.0%	0.0%	0.8%	0.4%	0.3%	0.3%	18.8%	35.5%	2.1%	0.5%	3.9%	3.7%	2.8%	30.8%
88	0.5%	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%	49.2%
89	0.3%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	22.3%	19.3%	3.0%	0.0%	5.6%	3.6%	1.4%	44.0%
90	0.9%	0.0%	0.0%	0.0%	0.1%	1.3%	0.3%	10.8%	15.2%	3.5%	2.2%	6.3%	16.0%	6.6%	36.8%
91	0.3%	0.2%	0.0%	0.4%	0.2%	0.9%	0.2%	20.4%	24.8%	3.8%	0.7%	14.1%	6.2%	5.6%	22.2%
92	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%
93	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%
94	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%
95	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%	2.5%	72.3%
96	0.3%	0.0%	0.0%	0.1%	0.0%	1.5%	0.0%	2.1%	18.7%	0.3%	0.8%	5.2%	1.3%	5.2%	64.6%
97	0.8%	0.0%	0.0%	0.2%	0.4%	0.6%	0.6%	12.4%	16.7%	1.8%	1.9%	5.5%	3.1%	4.0%	51.8%
98	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.4%	4.4%	0.1%	0.3%	3.3%	0.3%	1.0%	89.4%
99	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.2%	2.6%	11.6%	0.0%	1.8%	12.7%	0.6%	1.0%	69.2%
(85-99)	0.4%	0.0%	0.0%	0.3%	0.5%	0.7%	0.2%	14.6%	18.9%	2.8%	0.8%	5.9%	3.9%	3.6%	47.6%
(85-99)	0.4%	0.0%	0.0%	0.3%	0.5%	0.7%	0.2%	14.6%	18.9%	2.8%	0.8%	5.9%	3.9%	3.6%	47.6%

Table H.15. Cowichan, Distribution of Reported Catch 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
90	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%
91	0.0%	0.0%	0.0%	0.1%	0.2%	0.5%	1.0%	2.3%	40.7%	3.6%	0.5%	0.6%	2.6%	0.6%	47.2%
92	0.1%	0.0%	0.0%	0.3%	0.9%	1.0%	0.8%	8.5%	56.2%	3.8%	1.2%	0.2%	1.2%	1.1%	24.6%
93	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%
94	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%
95	0.3%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	3.4%	28.8%	0.5%	0.6%	0.0%	1.9%	0.7%	62.8%
96	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%
97	0.9%	0.0%	0.0%	0.0%	0.0%	0.5%	0.6%	2.8%	25.8%	0.2%	1.1%	0.0%	4.0%	3.0%	61.2%
98	4.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.6%	31.6%	0.3%	1.8%	0.0%	3.3%	0.0%	56.7%
99	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.8%	41.4%	1.4%	3.5%	1.1%	7.3%	0.8%	42.7%
(90-99)	0.7%	0.0%	0.0%	0.1%	0.3%	1.1%	0.6%	3.0%	39.7%	3.2%	1.2%	0.4%	2.8%	1.2%	45.8%
(90-99)	0.7%	0.0%	0.0%	0.1%	0.3%	1.1%	0.6%	3.0%	39.7%	3.2%	1.2%	0.4%	2.8%	1.2%	45.8%

Table H.16. Cowichan distribution of total fishing mortalities 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
90	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%
91	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%
92	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%
93	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%
94	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%
95	0.3%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	5.0%	32.3%	1.5%	0.8%	0.0%	2.3%	0.9%	55.4%
96	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%
97	1.2%	0.0%	0.0%	0.0%	0.0%	0.4%	0.6%	3.6%	29.3%	1.1%	1.1%	0.0%	4.7%	3.6%	54.4%
98	5.1%	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%	51.4%
99	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.7%	46.1%	1.2%	3.5%	1.2%	8.3%	0.7%	37.4%
(90-99)	0.8%	0.0%	0.0%	0.1%	0.3%	1.0%	0.6%	3.7%	44.4%	3.0%	1.2%	0.4%	3.4%	1.4%	39.6%
(90-99)	0.8%	0.0%	0.0%	0.1%	0.3%	1.0%	0.6%	3.7%	44.4%	3.0%	1.2%	0.4%	3.4%	1.4%	39.6%

Table H.17. Samish Fall Fingerling distribution of reported catch 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
89	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%	0.2%	6.9%	17.5%	3.5%	0.6%	7.6%	36.5%	9.9%	16.7%
90	0.1%	0.0%	0.0%	0.5%	0.1%	0.2%	0.0%	19.1%	14.0%	1.4%	0.7%	9.2%	31.4%	7.5%	15.8%
91	0.0%	0.0%	0.0%	0.0%	0.1%	0.3%	0.0%	13.5%	11.5%	2.7%	2.3%	9.1%	23.2%	10.7%	26.6%
92	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.5%	11.3%	16.1%	2.1%	0.5%	10.1%	15.4%	16.9%	27.0%
93	0.0%	0.0%	0.0%	0.3%	0.2%	0.5%	0.3%	12.8%	21.7%	2.4%	3.1%	4.1%	17.2%	13.0%	24.5%
94	0.2%	0.0%	0.0%	0.4%	0.0%	0.4%	0.0%	11.8%	15.7%	1.9%	4.0%	2.2%	38.3%	3.9%	21.0%
95	0.3%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	5.8%	6.1%	0.3%	2.8%	3.3%	27.0%	15.0%	38.7%
96	0.0%	0.1%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	11.0%	0.1%	0.7%	1.9%	33.8%	24.1%	28.0%
97	0.5%	0.1%	0.0%	0.3%	0.7%	0.8%	0.3%	2.0%	8.6%	0.1%	3.4%	0.9%	33.4%	9.8%	39.2%
98	3.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.9%	12.1%	0.0%	2.0%	0.7%	43.5%	3.5%	32.9%
99	3.6%	0.0%	0.0%	0.8%	0.0%	0.0%	1.6%	5.1%	11.5%	0.0%	7.9%	1.6%	39.9%	3.6%	24.5%
(89-99)	0.7%	0.0%	0.0%	0.2%	0.1%	0.3%	0.3%	8.2%	13.2%	1.3%	2.6%	4.6%	30.9%	10.7%	26.8%
(89-99)	0.7%	0.0%	0.0%	0.2%	0.1%	0.3%	0.3%	8.2%	13.2%	1.3%	2.6%	4.6%	30.9%	10.7%	26.8%

Table H.18. Samish Fall Fingerling distribution of total fishing mortalities 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
89	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%	0.2%	9.2%	18.8%	3.2%	0.5%	8.1%	33.6%	11.1%	14.6%
90	0.1%	0.0%	0.0%	0.6%	0.1%	0.2%	0.0%	20.5%	14.7%	1.4%	0.8%	9.6%	29.5%	8.2%	14.5%
91	0.0%	0.0%	0.0%	0.0%	0.1%	0.4%	0.0%	14.5%	12.5%	2.5%	2.4%	9.6%	21.7%	11.9%	24.2%
92	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.5%	11.5%	16.7%	1.8%	0.5%	9.8%	14.1%	23.4%	21.6%
93	0.0%	0.0%	0.0%	0.3%	0.3%	0.4%	0.3%	14.5%	24.5%	2.1%	3.0%	4.2%	15.8%	13.9%	20.7%
94	0.5%	0.0%	0.0%	0.5%	0.0%	0.4%	0.0%	13.0%	17.1%	1.9%	4.1%	2.3%	36.7%	4.5%	19.0%
95	0.2%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	7.2%	6.2%	0.7%	3.9%	3.3%	23.9%	22.0%	31.7%
96	0.0%	0.1%	0.0%	0.1%	0.0%	0.4%	0.0%	1.0%	11.8%	0.2%	0.8%	1.9%	33.0%	27.5%	23.2%
97	0.5%	0.1%	0.0%	0.3%	0.8%	0.8%	0.3%	2.4%	9.8%	0.3%	3.3%	1.0%	32.5%	11.8%	35.9%
98	3.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	13.1%	0.0%	2.1%	0.8%	42.4%	4.9%	31.2%
99	4.0%	0.0%	0.0%	0.7%	0.0%	0.0%	1.8%	5.1%	13.0%	0.0%	7.9%	1.8%	38.3%	5.1%	22.4%
(89-99)	0.8%	0.0%	0.0%	0.3%	0.1%	0.3%	0.3%	9.1%	14.4%	1.3%	2.7%	4.8%	29.2%	13.1%	23.5%
(89-99)	0.8%	0.0%	0.0%	0.3%	0.1%	0.3%	0.3%	9.1%	14.4%	1.3%	2.7%	4.8%	29.2%	13.1%	23.5%

Table H.19. Squaxin Pens Fall Yearling distribution of reported catch 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
90	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	3.3%	0.8%	1.2%	0.4%	4.0%	32.9%	54.9%	2.5%
91	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.2%	1.5%	0.6%	0.0%	9.2%	32.6%	48.4%	3.5%
92	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.4%	2.3%	3.7%	1.2%	0.5%	7.1%	22.4%	57.1%	4.7%
93	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	9.6%	8.2%	1.4%	0.8%	13.8%	3.4%	48.7%	13.2%
94	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.3%	6.0%	3.6%	2.4%	6.6%	22.9%	10.8%	22.3%
95	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%
96	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.9%	0.0%	0.0%	1.1%	4.6%	90.1%	2.4%
97	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%	1.9%	35.6%	59.8%	0.4%
98	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	2.9%	2.9%	90.5%	2.9%
99	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	71.4%	28.6%
(90-99)	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	4.8%	2.2%	0.8%	0.4%	4.7%	20.5%	56.2%	10.2%
(90-99)	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	4.8%	2.2%	0.8%	0.4%	4.7%	20.5%	56.2%	10.2%

Table H.20. Squaxin Pens Fall Yearling distribution of total fishing mortalities 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
90	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	3.2%	0.9%	1.0%	0.4%	4.0%	31.7%	56.7%	2.0%
91	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.3%	1.6%	0.5%	0.0%	9.2%	30.6%	50.7%	3.0%
92	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.3%	2.0%	3.2%	0.9%	0.4%	6.0%	22.1%	61.2%	3.5%
93	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	10.4%	8.5%	1.2%	1.0%	13.4%	3.5%	49.5%	11.7%
94	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	23.9%	6.0%	4.3%	2.2%	6.5%	21.2%	15.8%	20.1%
95	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.4%	0.0%	0.0%	0.4%	23.2%	69.7%	5.7%
96	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	1.8%	0.0%	0.0%	0.9%	5.3%	89.9%	2.0%
97	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.1%	0.0%	0.0%	0.0%	1.8%	31.4%	64.3%	0.3%
98	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%	2.3%	2.3%	92.3%	2.3%
99	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	78.9%	21.1%
(90-99)	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	4.7%	2.2%	0.8%	0.4%	4.5%	17.1%	62.9%	7.2%
(90-99)	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	4.7%	2.2%	0.8%	0.4%	4.5%	17.1%	62.9%	7.2%

Table H.21. Stillaguamish Fall Fingerling distribution of reported catch 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
84	0.0%	0.0%	0.0%	3.5%	18.8%	2.4%	4.7%	7.1%	16.5%	23.5%	0.0%	0.0%	4.7%	18.8%	0.0%
85	7.9%	0.0%	4.0%	4.0%	0.0%	4.0%	0.0%	28.7%	9.9%	10.9%	8.9%	0.0%	8.9%	12.9%	0.0%
86	5.1%	0.0%	0.0%	0.0%	0.0%	4.1%	0.0%	29.6%	19.4%	0.0%	0.0%	0.0%	15.3%	19.4%	7.1%
90	0.5%	0.0%	0.0%	0.7%	6.5%	4.4%	0.0%	16.9%	8.1%	4.4%	1.9%	4.4%	7.4%	10.9%	33.9%
91	0.3%	0.0%	0.0%	0.0%	0.0%	0.1%	0.4%	5.6%	4.2%	1.0%	1.9%	5.1%	6.5%	7.7%	67.2%
92	0.0%	0.0%	0.0%	0.5%	0.0%	2.7%	0.0%	19.1%	6.5%	2.8%	3.3%	6.4%	13.4%	31.4%	13.9%
93	0.0%	0.0%	0.0%	0.7%	0.4%	1.2%	2.0%	13.2%	13.0%	1.6%	4.8%	6.2%	1.7%	26.3%	28.9%
94	3.7%	0.0%	0.0%	1.0%	0.0%	2.0%	0.0%	9.8%	12.1%	1.7%	4.7%	0.0%	3.7%	8.8%	52.5%
95	2.2%	0.0%	0.0%	0.0%	0.0%	8.4%	0.0%	2.2%	4.8%	0.9%	6.4%	0.9%	2.0%	12.1%	60.2%
96	1.1%	0.0%	0.0%	0.0%	0.0%	12.1%	2.3%	0.0%	10.3%	0.7%	11.7%	0.0%	0.5%	28.6%	32.7%
97	12.4%	0.5%	0.0%	0.7%	0.0%	1.8%	0.9%	9.4%	6.5%	0.0%	7.8%	0.0%	1.8%	20.9%	37.3%
98	16.3%	0.2%	0.7%	1.5%	0.0%	0.0%	0.7%	2.6%	2.8%	0.2%	3.8%	0.0%	3.0%	3.1%	65.3%
99	1.0%	0.2%	0.0%	0.0%	0.0%	0.7%	0.7%	6.7%	10.0%	0.0%	7.6%	0.0%	0.5%	4.1%	68.5%
(84-99)	3.9%	0.1%	0.4%	1.0%	2.0%	3.4%	0.9%	11.6%	9.6%	3.7%	4.8%	1.8%	5.3%	15.8%	36.0%
(85-99)	4.2%	0.1%	0.4%	0.8%	0.6%	3.4%	0.6%	12.0%	9.0%	2.0%	5.2%	1.9%	5.4%	15.5%	39.0%

Table H.22. Stillaguamish Fall Fingerling distribution of total fishing mortalities 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
84	0.9%	0.0%	0.9%	3.6%	15.5%	1.8%	3.6%	10.0%	14.5%	19.1%	0.9%	0.0%	3.6%	25.5%	0.0%
85	7.6%	0.0%	5.0%	4.2%	0.0%	3.4%	0.0%	29.4%	8.4%	9.2%	8.4%	0.0%	7.6%	16.8%	0.0%
86	6.5%	0.0%	0.0%	0.0%	0.0%	3.7%	0.0%	29.0%	19.6%	0.0%	0.0%	0.0%	14.0%	20.6%	6.5%
90	0.6%	0.0%	0.0%	0.8%	6.5%	4.0%	0.0%	17.8%	8.9%	4.0%	2.0%	5.5%	7.3%	13.7%	28.9%
91	0.2%	0.0%	0.0%	0.0%	0.0%	0.1%	0.4%	6.4%	4.9%	1.0%	2.0%	5.7%	6.6%	9.9%	62.8%
92	0.0%	0.0%	0.0%	0.5%	0.0%	2.2%	0.0%	18.7%	6.3%	2.1%	3.0%	5.8%	11.7%	39.9%	9.7%
93	0.0%	0.0%	0.0%	1.0%	0.6%	1.0%	1.8%	15.4%	14.4%	1.5%	4.4%	6.7%	1.5%	27.0%	24.7%
94	4.6%	0.0%	0.0%	0.9%	0.0%	1.8%	0.0%	11.0%	13.1%	1.8%	4.9%	0.0%	3.4%	11.0%	47.6%
95	2.2%	0.0%	0.0%	0.0%	0.0%	9.2%	0.0%	3.4%	5.3%	1.4%	9.3%	0.8%	1.9%	20.0%	46.5%
96	1.5%	0.0%	0.0%	0.0%	0.0%	12.0%	1.7%	1.0%	10.0%	0.8%	12.4%	0.0%	0.3%	35.9%	24.2%
97	12.9%	1.1%	0.0%	0.8%	0.0%	1.8%	0.8%	10.2%	6.8%	0.3%	7.2%	0.0%	1.5%	24.2%	32.5%
98	17.5%	1.0%	0.7%	3.0%	0.0%	0.0%	0.7%	2.5%	3.0%	0.1%	4.3%	0.0%	2.7%	5.1%	59.3%
99	1.1%	1.3%	0.0%	0.0%	0.0%	0.7%	0.9%	6.4%	11.5%	0.0%	8.0%	0.0%	0.4%	6.0%	63.6%
(84-99)	4.3%	0.3%	0.5%	1.1%	1.7%	3.2%	0.8%	12.4%	9.8%	3.2%	5.1%	1.9%	4.8%	19.6%	31.3%
(85-99)	4.6%	0.3%	0.5%	0.9%	0.6%	3.3%	0.5%	12.6%	9.4%	1.9%	5.5%	2.1%	4.9%	19.2%	33.9%

Table H.23. George Adams Fall Fingerling distribution of reported catch 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
82	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%
83	0.0%	0.0%	0.0%	0.0%	1.6%	1.6%	0.0%	15.6%	4.7%	4.2%	0.5%	0.2%	29.2%	25.6%	17.0%
84	0.0%	0.1%	0.0%	0.5%	3.1%	0.7%	0.4%	18.0%	6.3%	1.2%	0.0%	2.2%	31.1%	20.5%	15.8%
89	0.0%	0.1%	0.0%	0.0%	0.0%	0.2%	0.0%	8.6%	3.9%	4.7%	0.5%	13.0%	39.2%	17.4%	12.4%
90	0.2%	0.0%	0.0%	0.4%	0.3%	0.5%	0.0%	20.1%	5.2%	1.1%	1.2%	15.5%	29.4%	19.0%	7.0%
91	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	18.6%	2.5%	0.4%	3.2%	8.7%	33.7%	18.2%	14.4%
92	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%
93	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	35.5%	4.5%	0.0%	3.6%	9.1%	4.5%	23.6%	19.1%
94	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%
95	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.0%	7.8%	4.9%	0.5%	3.4%	1.0%	4.4%	18.6%	57.4%
96	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	13.2%	0.0%	4.7%	5.8%	0.0%	13.7%	60.2%
97	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.9%	2.9%	0.3%	2.1%	2.9%	6.0%	17.7%	62.5%
98	0.7%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0.7%	0.0%	0.9%	1.8%	1.8%	6.9%	85.8%
99	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.2%	2.1%	0.0%	5.9%	4.0%	11.7%	8.9%	57.9%
(82-99)	0.2%	0.0%	0.0%	0.1%	0.4%	0.6%	0.0%	12.5%	4.6%	1.3%	1.9%	6.3%	18.0%	17.7%	36.5%
(85-99)	0.3%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	11.0%	4.4%	1.1%	2.3%	7.5%	14.0%	17.3%	41.5%

Table H.24. George Adams Fall Fingerling distribution of total fishing mortalities 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
82	0.0%	0.0%	0.0%	0.0%	0.6%	0.4%	0.0%	20.8%	4.4%	0.5%	0.0%	2.9%	37.0%	13.0%	20.5%
83	0.0%	0.0%	0.0%	0.0%	1.2%	1.1%	0.0%	12.6%	3.2%	3.1%	0.4%	0.1%	25.3%	42.0%	10.9%
84	0.0%	0.1%	0.0%	0.6%	3.2%	0.7%	0.4%	18.1%	6.2%	1.1%	0.0%	2.3%	30.5%	22.4%	14.5%
89	0.0%	0.3%	0.0%	0.1%	0.1%	0.3%	0.0%	10.4%	4.1%	4.1%	0.6%	13.2%	36.2%	20.1%	10.5%
90	0.8%	0.0%	0.0%	0.5%	0.4%	0.5%	0.0%	21.9%	5.5%	1.0%	1.2%	16.0%	26.7%	19.4%	6.1%
91	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	19.6%	2.6%	0.4%	3.2%	8.8%	31.9%	19.9%	13.4%
92	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%
93	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	34.6%	5.3%	0.0%	3.8%	8.3%	4.5%	27.8%	15.8%
94	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%
95	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	9.5%	5.0%	1.1%	4.6%	0.8%	4.2%	27.9%	44.7%
96	0.0%	0.0%	0.0%	0.0%	0.0%	2.6%	0.0%	1.3%	15.0%	0.0%	5.2%	6.3%	0.0%	15.5%	54.1%
97	1.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.3%	2.9%	0.7%	2.1%	2.9%	5.7%	22.8%	57.0%
98	0.6%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.6%	0.0%	0.7%	1.5%	1.8%	35.9%	57.5%
99	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.8%	2.7%	0.0%	5.9%	4.8%	11.8%	11.2%	54.3%
(82-99)	0.3%	0.1%	0.0%	0.1%	0.4%	0.6%	0.0%	12.8%	4.8%	1.2%	2.0%	6.3%	17.2%	23.7%	30.6%
(85-99)	0.3%	0.1%	0.0%	0.0%	0.0%	0.6%	0.0%	11.6%	4.9%	1.1%	2.5%	7.5%	13.4%	23.1%	34.8%

Table H.25. Nisqually Fall Fingerling distribution of reported catch 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
83	0.0%	0.0%	0.0%	2.5%	0.0%	0.0%	0.0%	16.3%	13.3%	5.9%	0.0%	4.4%	10.8%	45.3%	1.5%
84	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	28.8%	2.0%	2.5%	0.0%	1.5%	37.9%	21.7%	5.6%
85	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%
86	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	14.9%	13.2%	1.8%	0.0%	0.0%	36.0%	14.9%	19.3%
87	0.0%	0.0%	0.0%	0.0%	2.0%	1.3%	0.0%	10.7%	14.0%	0.7%	0.0%	5.3%	34.7%	18.7%	12.7%
88	0.0%	0.0%	0.0%	0.7%	2.2%	0.7%	1.5%	5.5%	17.8%	4.7%	0.0%	8.7%	17.5%	10.5%	30.2%
89	0.0%	0.0%	0.0%	0.3%	0.0%	0.7%	0.0%	4.6%	2.6%	3.7%	2.0%	13.9%	44.5%	19.2%	8.4%
90	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	23.4%	3.5%	0.2%	1.5%	10.5%	39.5%	12.6%	8.5%
91	0.0%	0.0%	0.0%	2.0%	0.0%	0.0%	0.0%	8.0%	3.6%	2.4%	1.2%	16.4%	22.4%	26.4%	17.6%
92	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.8%	7.7%	2.9%	2.7%	2.7%	7.4%	18.4%	17.0%	40.2%
93	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	12.6%	4.9%	2.2%	0.5%	3.1%	22.6%	19.4%	33.8%
94	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	4.5%	2.6%	2.4%	0.3%	0.7%	22.0%	21.2%	46.2%
95	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	5.4%	2.5%	0.1%	2.3%	2.7%	32.4%	24.5%	29.7%
96	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%	29.3%
97	0.0%	0.3%	0.0%	0.0%	0.0%	0.3%	0.5%	2.6%	0.9%	0.0%	4.2%	0.9%	15.3%	24.3%	50.6%
98	0.2%	0.0%	0.0%	0.5%	0.0%	0.0%	0.4%	0.8%	1.5%	0.0%	0.5%	0.7%	34.7%	11.5%	49.3%
99	0.2%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	3.5%	3.7%	0.0%	2.5%	3.5%	35.9%	20.0%	30.2%
(83-99)	0.0%	0.0%	0.0%	0.4%	0.3%	0.3%	0.2%	10.6%	5.4%	2.1%	1.3%	5.2%	29.3%	20.3%	24.6%
(85-99)	0.0%	0.0%	0.0%	0.3%	0.3%	0.4%	0.2%	9.0%	5.1%	1.8%	1.5%	5.5%	30.0%	18.5%	27.4%

Table H.26. Nisqually Fall Fingerling distribution of total fishing mortalities 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
83	0.0%	0.0%	0.0%	1.7%	0.0%	0.0%	0.0%	14.5%	9.8%	4.7%	0.0%	3.0%	9.1%	56.1%	1.0%
84	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	28.8%	1.7%	2.5%	0.0%	1.7%	35.2%	25.4%	4.7%
85	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%
86	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.7%	12.6%	1.6%	0.0%	0.0%	33.1%	19.7%	17.3%
87	0.0%	0.0%	0.0%	0.0%	2.7%	1.1%	0.0%	14.0%	12.4%	0.5%	0.0%	5.9%	29.6%	23.7%	10.2%
88	0.0%	0.0%	0.0%	0.8%	2.2%	0.8%	2.2%	5.7%	19.4%	3.8%	0.0%	8.5%	16.7%	17.2%	22.7%
89	0.0%	0.0%	0.0%	0.5%	0.0%	0.6%	0.0%	5.6%	3.2%	3.3%	1.9%	15.3%	42.2%	20.0%	7.5%
90	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	24.4%	3.7%	0.2%	1.5%	10.7%	37.3%	14.0%	8.0%
91	0.0%	0.0%	0.0%	2.1%	0.0%	0.0%	0.0%	8.8%	3.9%	2.1%	1.4%	17.0%	20.5%	28.6%	15.5%
92	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.8%	7.3%	3.0%	2.0%	2.4%	6.9%	18.5%	29.2%	29.8%
93	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	14.7%	5.7%	2.0%	0.6%	3.4%	21.8%	21.9%	29.1%
94	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	4.2%	2.4%	2.4%	0.2%	0.6%	17.8%	40.0%	32.3%
95	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	7.8%	2.8%	0.3%	3.0%	2.8%	29.9%	27.5%	25.5%
96	0.2%	0.0%	0.0%	0.0%	0.0%	1.2%	0.0%	0.7%	3.5%	0.0%	1.4%	1.8%	38.9%	26.0%	26.4%
97	0.0%	0.6%	0.0%	0.0%	0.0%	0.3%	0.4%	3.0%	1.0%	0.3%	4.1%	0.9%	13.9%	32.3%	43.1%
98	0.2%	0.0%	0.0%	0.5%	0.0%	0.0%	0.5%	0.7%	1.5%	0.0%	0.5%	0.7%	28.6%	29.1%	37.7%
99	0.3%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	3.2%	4.3%	0.0%	2.4%	3.8%	34.1%	24.6%	26.8%
(83-99)	0.0%	0.0%	0.0%	0.4%	0.3%	0.3%	0.2%	11.0%	5.3%	1.8%	1.4%	5.3%	26.9%	26.9%	20.1%
(85-99)	0.0%	0.0%	0.0%	0.3%	0.3%	0.4%	0.3%	9.6%	5.3%	1.6%	1.5%	5.7%	27.6%	25.0%	22.4%

Table H.27. So. Puget Sound Fall Fingerling distribution of reported catch 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
82	0.2%	0.0%	0.0%	0.1%	0.8%	0.4%	0.1%	22.8%	14.2%	1.6%	0.1%	2.8%	24.8%	21.2%	10.8%
83	0.1%	0.0%	0.0%	0.7%	1.8%	0.6%	0.1%	17.1%	5.6%	2.6%	0.3%	1.6%	27.1%	28.3%	14.1%
84	0.1%	0.2%	0.0%	0.7%	1.4%	0.2%	0.1%	20.4%	8.9%	1.0%	0.3%	1.4%	24.5%	22.3%	18.4%
85	0.8%	0.0%	0.1%	0.0%	0.3%	0.3%	0.2%	18.3%	6.1%	1.6%	0.8%	1.9%	28.7%	19.9%	21.2%
86	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	18.4%	7.7%	1.7%	0.0%	4.0%	10.7%	22.4%	33.9%
87	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.7%	12.7%	3.9%	0.0%	7.2%	13.7%	10.9%	38.9%
88	0.1%	0.0%	0.0%	0.2%	0.5%	0.8%	0.4%	5.6%	7.8%	3.9%	1.6%	7.5%	27.0%	15.0%	29.5%
89	0.1%	0.0%	0.0%	0.2%	0.3%	0.1%	0.0%	7.5%	4.6%	4.0%	0.8%	11.2%	21.8%	16.4%	32.9%
90	0.0%	0.0%	0.1%	0.3%	0.3%	0.3%	0.0%	23.4%	4.0%	1.0%	1.2%	9.2%	24.5%	12.7%	23.1%
91	0.4%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	15.3%	1.8%	1.0%	1.9%	11.6%	26.7%	13.2%	27.9%
92	0.6%	0.1%	0.0%	0.0%	0.9%	0.5%	0.0%	17.3%	4.3%	2.6%	1.3%	9.0%	23.7%	18.1%	21.5%
93	0.2%	0.1%	0.0%	0.0%	0.1%	0.6%	0.0%	15.9%	5.4%	2.2%	2.3%	5.5%	15.9%	21.1%	30.6%
94	0.0%	0.0%	0.0%	0.5%	0.0%	0.2%	0.0%	8.9%	3.2%	4.1%	0.9%	0.8%	16.3%	10.0%	55.0%
95	0.2%	0.0%	0.0%	0.1%	0.0%	0.9%	0.0%	3.7%	2.3%	0.2%	0.9%	1.4%	5.6%	11.7%	73.3%
96	0.1%	0.0%	0.0%	0.0%	0.0%	0.4%	0.1%	0.0%	4.2%	0.1%	1.8%	2.9%	6.3%	14.9%	69.3%
97	0.5%	0.0%	0.0%	0.4%	0.0%	0.6%	0.0%	5.9%	2.1%	0.0%	2.6%	1.7%	3.2%	14.7%	68.2%
98	2.9%	0.0%	0.0%	2.0%	0.0%	0.0%	0.5%	1.7%	4.0%	0.0%	3.6%	2.4%	18.4%	12.9%	51.7%
99	0.5%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	4.7%	2.7%	0.0%	3.2%	2.8%	8.5%	4.8%	72.4%
(82-99)	0.4%	0.0%	0.0%	0.3%	0.4%	0.4%	0.1%	12.2%	5.6%	1.8%	1.3%	4.7%	18.2%	16.1%	38.5%
(85-99)	0.4%	0.0%	0.0%	0.3%	0.2%	0.4%	0.1%	10.6%	4.9%	1.8%	1.5%	5.3%	16.7%	14.6%	43.3%

Table H.28. So. Puget Sound Fall Fingerling distribution of total fishing mortalities 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
82	0.2%	0.0%	0.0%	0.2%	0.9%	0.3%	0.1%	23.1%	13.2%	1.5%	0.1%	2.8%	23.6%	24.5%	9.4%
83	0.1%	0.0%	0.0%	0.7%	1.7%	0.5%	0.1%	16.6%	4.8%	2.3%	0.2%	1.6%	25.1%	35.2%	11.1%
84	0.1%	0.2%	0.0%	0.7%	1.4%	0.2%	0.1%	20.7%	8.7%	0.9%	0.3%	1.5%	23.7%	24.6%	16.8%
85	0.8%	0.0%	0.1%	0.0%	0.3%	0.3%	0.2%	18.1%	6.1%	1.5%	0.8%	1.9%	27.8%	22.4%	19.8%
86	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	18.4%	7.3%	1.6%	0.0%	4.0%	9.9%	27.9%	29.6%
87	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	21.1%	10.8%	3.4%	0.0%	9.1%	11.6%	15.2%	28.8%
88	0.5%	0.0%	0.0%	0.2%	1.0%	0.6%	0.4%	10.1%	9.9%	3.1%	1.4%	8.2%	23.1%	21.2%	20.3%
89	0.1%	0.0%	0.0%	0.3%	0.4%	0.1%	0.0%	9.0%	5.3%	3.7%	0.8%	12.4%	20.8%	17.7%	29.4%
90	0.0%	0.1%	0.1%	0.3%	0.3%	0.3%	0.0%	24.6%	4.1%	1.0%	1.2%	9.5%	23.1%	14.2%	21.2%
91	0.5%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	16.7%	2.0%	1.0%	1.9%	12.3%	25.4%	14.6%	25.6%
92	0.6%	0.2%	0.0%	0.0%	0.9%	0.5%	0.0%	17.5%	4.4%	2.4%	1.3%	9.0%	21.0%	24.1%	18.0%
93	0.3%	0.4%	0.0%	0.0%	0.1%	0.6%	0.0%	18.2%	6.2%	2.0%	2.2%	5.8%	14.8%	22.7%	26.6%
94	0.0%	0.0%	0.0%	0.5%	0.0%	0.2%	0.0%	9.5%	3.5%	4.8%	1.0%	0.7%	15.5%	17.2%	46.9%
95	0.2%	0.0%	0.0%	0.1%	0.0%	1.0%	0.0%	5.4%	2.6%	0.6%	1.3%	1.5%	5.7%	17.0%	64.4%
96	0.2%	0.0%	0.0%	0.0%	0.0%	0.4%	0.1%	0.8%	4.8%	0.2%	2.2%	3.3%	6.2%	17.6%	64.3%
97	0.6%	0.0%	0.0%	0.4%	0.0%	0.7%	0.0%	6.8%	2.2%	0.3%	2.7%	1.8%	3.1%	18.2%	63.3%
98	2.5%	0.0%	0.0%	1.6%	0.0%	0.0%	0.5%	1.4%	3.5%	0.1%	3.0%	1.9%	14.6%	35.2%	35.7%
99	0.6%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	4.7%	3.2%	0.0%	3.3%	3.2%	8.7%	6.7%	69.1%
(82-99)	0.4%	0.1%	0.0%	0.3%	0.4%	0.4%	0.1%	13.5%	5.7%	1.7%	1.3%	5.0%	16.9%	20.9%	33.3%
(85-99)	0.5%	0.0%	0.0%	0.3%	0.2%	0.4%	0.1%	12.2%	5.1%	1.7%	1.5%	5.6%	15.4%	19.5%	37.5%

Table H.29. So. Puget Sound Fall Yearling distribution of reported catch 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
82	0.0%	0.0%	0.0%	0.0%	2.5%	0.0%	0.0%	2.8%	3.5%	0.0%	0.0%	1.1%	14.5%	67.1%	8.5%
83	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%
84	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%
90	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	0.0%	0.3%	0.0%	0.5%	0.0%	1.4%	32.5%	54.5%	10.7%
91	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.6%	0.9%	0.0%	0.0%	3.7%	12.8%	57.5%	19.6%
92	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.6%	0.8%	0.0%	0.8%	4.6%	28.5%	48.8%	12.0%
93	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	2.1%	0.0%	0.0%	1.4%	10.2%	57.2%	27.6%
94	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.8%	2.2%	0.4%	0.0%	15.6%	63.3%	16.9%
95	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.4%	2.6%	0.0%	1.5%	0.4%	10.4%	68.7%	10.1%
96	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.0%	1.6%	0.6%	3.2%	88.9%	3.3%
97	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	1.0%	0.0%	1.5%	1.3%	3.8%	66.0%	25.0%
98	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.2%	4.5%	83.1%	10.1%
99	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.4%	0.0%	0.0%	7.7%	2.6%	71.8%	2.6%
(82-99)	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	2.8%	2.4%	0.2%	0.4%	1.9%	14.0%	65.2%	12.8%
(85-99)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.1%	2.6%	0.3%	0.6%	2.3%	12.4%	66.0%	13.8%

Table H.30. So. Puget Sound Fall Yearling distribution of total fishing mortalities 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	Other Fisheries: Canada Sport	Other Fisheries: U.S. Troll	Other Fisheries: U.S. Net	Other Fisheries: U.S. Sport	Escapement
82	0.0%	0.0%	0.0%	0.0%	2.2%	0.0%	0.0%	3.3%	3.0%	0.0%	0.0%	0.8%	12.8%	71.5%	6.5%
83	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%
84	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%
90	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.8%	0.1%	0.4%	0.0%	1.6%	30.7%	56.7%	9.5%
91	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.4%	0.8%	0.0%	0.0%	3.5%	11.4%	62.5%	16.4%
92	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%	0.9%	0.0%	0.7%	4.8%	27.0%	51.5%	10.3%
93	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	1.9%	0.0%	0.0%	1.1%	6.7%	74.3%	14.9%
94	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.9%	2.3%	0.3%	0.0%	14.5%	67.1%	14.0%
95	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.9%	2.0%	0.4%	1.6%	0.3%	8.2%	74.7%	6.9%
96	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	2.1%	0.0%	1.7%	0.5%	2.8%	89.4%	2.8%
97	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	1.0%	0.0%	1.4%	1.2%	3.2%	71.3%	20.5%
98	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	3.6%	86.6%	8.0%
99	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.5%	0.0%	0.0%	6.3%	2.1%	77.1%	2.1%
(82-99)	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	2.8%	2.1%	0.2%	0.4%	1.7%	12.5%	69.9%	10.0%
(85-99)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.1%	2.2%	0.3%	0.6%	2.1%	11.0%	71.1%	10.5%

Table H.31. Nooksack Spring Yearling distribution of reported catch 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
86	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.9%	4.7%	0.0%	0.0%	0.0%	1.6%	83.9%
89	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.3%	0.0%	0.0%	0.0%	13.5%	7.2%	73.0%
90	0.0%	0.0%	0.0%	0.0%	0.0%	4.7%	0.0%	0.0%	18.6%	9.3%	0.0%	2.3%	4.7%	32.6%	27.9%
91	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	2.1%	34.0%	5.7%	5.0%	2.1%	8.5%	5.3%	36.5%
92	0.4%	0.2%	0.0%	0.0%	1.0%	0.6%	0.4%	17.8%	13.3%	1.1%	1.3%	1.0%	0.4%	8.1%	54.6%
93	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	4.7%	17.7%	6.4%	3.8%	0.9%	5.7%	12.3%	48.0%
94	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.9%	36.4%	0.9%	0.0%	0.2%	6.1%	3.2%	47.6%
95	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	28.7%	0.0%	0.0%	0.0%	3.0%	7.3%	61.0%
96	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	0.0%	14.1%	0.0%	3.7%	0.5%	0.0%	3.1%	77.0%
97	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.3%	2.7%	4.5%	0.0%	1.8%	16.2%	59.5%
98	0.0%	0.0%	0.0%	0.0%	0.0%	4.4%	2.2%	5.5%	25.3%	1.1%	5.5%	0.0%	1.1%	6.6%	48.4%
99	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.3%	25.9%	0.0%	1.1%	2.7%	4.3%	2.2%	59.5%
(86-99)	0.1%	0.0%	0.0%	0.0%	0.1%	0.9%	0.3%	3.3%	20.5%	2.7%	2.1%	0.8%	4.1%	8.8%	56.4%
(86-99)	0.1%	0.0%	0.0%	0.0%	0.1%	0.9%	0.3%	3.3%	20.5%	2.7%	2.1%	0.8%	4.1%	8.8%	56.4%

Table H.32. Nooksack Spring Yearling distribution of total fishing mortalities 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
86	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	1.7%	13.4%	4.6%	0.4%	0.4%	7.6%	3.8%	67.6%
89	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.4%	0.0%	0.0%	0.0%	14.3%	9.2%	68.1%
90	0.0%	0.0%	0.0%	0.0%	1.4%	4.1%	0.0%	8.2%	28.8%	8.2%	1.4%	1.4%	2.7%	27.4%	16.4%
91	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	2.4%	38.4%	5.7%	4.8%	2.4%	7.8%	6.9%	30.9%
92	2.0%	0.6%	0.0%	0.0%	1.0%	0.6%	0.3%	19.9%	14.8%	1.0%	1.3%	1.0%	0.4%	10.1%	46.8%
93	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	5.1%	21.0%	6.1%	3.7%	0.8%	5.4%	13.1%	44.3%
94	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.9%	38.1%	0.9%	0.0%	0.2%	5.8%	3.8%	45.7%
95	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	29.8%	0.5%	0.5%	0.0%	2.7%	12.8%	53.2%
96	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	0.5%	16.5%	0.0%	4.9%	0.5%	0.0%	4.9%	71.4%
97	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.8%	2.4%	4.8%	0.0%	1.6%	21.6%	52.8%
98	0.0%	0.0%	0.0%	0.0%	0.0%	4.7%	1.9%	4.7%	26.2%	1.9%	5.6%	0.0%	0.9%	13.1%	41.1%
99	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.4%	30.6%	0.0%	1.5%	2.9%	3.9%	3.4%	53.4%
(86-99)	0.2%	0.1%	0.0%	0.0%	0.2%	0.9%	0.3%	4.3%	23.6%	2.6%	2.4%	0.8%	4.4%	10.8%	49.3%
(86-99)	0.2%	0.1%	0.0%	0.0%	0.2%	0.9%	0.3%	4.3%	23.6%	2.6%	2.4%	0.8%	4.4%	10.8%	49.3%

Table H.33. Skagit Spring Yearling distribution of reported catch 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
85	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%
86	1.4%	0.0%	0.5%	0.0%	4.2%	6.6%	0.0%	6.1%	42.0%	2.8%	5.7%	0.0%	3.3%	7.5%	19.8%
87	0.0%	0.0%	0.0%	4.7%	0.0%	6.5%	0.0%	3.7%	11.2%	5.6%	0.0%	1.9%	22.4%	20.6%	23.4%
88	0.0%	0.0%	0.0%	0.0%	0.0%	6.5%	0.0%	1.9%	16.1%	8.2%	3.1%	1.9%	22.0%	15.5%	24.7%
89	0.0%	0.0%	0.0%	0.0%	0.8%	0.1%	0.0%	3.5%	17.7%	3.3%	0.5%	4.5%	30.8%	8.4%	30.3%
90	0.0%	0.0%	0.0%	0.0%	0.5%	2.0%	0.8%	5.1%	16.2%	4.2%	3.0%	3.4%	16.2%	24.1%	24.6%
97	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	2.0%	20.2%	1.6%	9.4%	0.0%	2.5%	20.4%	42.7%
98	0.5%	0.0%	0.0%	0.0%	0.0%	0.2%	2.8%	5.8%	10.0%	0.0%	7.9%	0.0%	2.5%	16.1%	54.2%
99	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	1.4%	17.2%	0.0%	6.4%	0.3%	2.0%	17.1%	54.0%
(85-99)	0.3%	0.0%	0.1%	0.5%	0.6%	2.6%	0.5%	4.0%	20.0%	5.8%	4.0%	1.3%	12.4%	16.2%	31.7%
(85-99)	0.3%	0.0%	0.1%	0.5%	0.6%	2.6%	0.5%	4.0%	20.0%	5.8%	4.0%	1.3%	12.4%	16.2%	31.7%

Table H.34. Skagit Spring Yearling distribution of total fishing mortalities 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
85	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%
86	1.7%	0.0%	0.9%	0.0%	3.9%	6.5%	0.0%	6.1%	42.2%	2.6%	5.7%	0.0%	3.0%	9.1%	18.3%
87	0.0%	0.0%	0.0%	5.0%	0.0%	5.0%	0.0%	3.1%	8.1%	4.4%	0.0%	1.3%	17.5%	40.0%	15.6%
88	0.0%	0.0%	0.0%	0.0%	0.0%	6.1%	0.0%	2.4%	19.0%	7.6%	3.1%	2.2%	20.8%	17.1%	21.7%
89	0.0%	0.0%	0.0%	0.0%	0.8%	0.1%	0.0%	4.1%	19.8%	3.4%	0.6%	4.9%	28.6%	10.4%	27.3%
90	0.0%	0.0%	0.0%	0.0%	0.4%	2.0%	0.7%	5.3%	16.9%	3.9%	2.9%	3.7%	15.4%	25.9%	22.8%
97	0.3%	0.0%	0.0%	0.0%	0.0%	0.8%	0.5%	3.3%	20.3%	2.5%	8.7%	0.0%	1.8%	30.4%	31.4%
98	0.6%	0.0%	0.0%	0.0%	0.0%	0.2%	2.8%	5.4%	11.2%	0.2%	7.8%	0.0%	2.4%	20.0%	49.5%
99	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	1.4%	16.8%	0.0%	6.3%	0.3%	1.8%	22.2%	49.3%
(85-99)	0.4%	0.0%	0.1%	0.6%	0.6%	2.4%	0.5%	4.2%	20.4%	5.4%	3.9%	1.4%	11.2%	21.5%	27.4%
(85-99)	0.4%	0.0%	0.1%	0.6%	0.6%	2.4%	0.5%	4.2%	20.4%	5.4%	3.9%	1.4%	11.2%	21.5%	27.4%

Table H.35. White River Spring Yearling distribution of reported catch 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
82	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.6%	0.0%	0.0%	0.0%	72.3%	22.9%	1.2%
83	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%
84	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%
85	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%
86	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.6%	2.5%	1.9%	0.0%	0.3%	18.6%	50.1%	25.7%
87	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	0.4%	0.0%	3.3%	11.1%	42.4%	41.2%
88	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	2.6%	0.2%	0.2%	1.3%	13.1%	48.7%	33.8%
89	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	1.2%	1.0%	0.0%	5.8%	13.1%	41.5%	36.2%
90	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.4%	0.7%	0.0%	5.2%	15.2%	44.7%	31.9%
91	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	1.3%	0.0%	1.0%	4.1%	10.8%	38.4%	43.6%
92	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	2.4%	2.3%	2.3%	0.3%	2.4%	7.9%	45.6%	36.2%
93	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	0.0%	2.8%	3.6%	30.2%	61.9%
94	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%
95	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%	29.5%	69.3%
96	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%
97	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.9%	39.1%	56.0%
98	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%	1.6%	1.6%	26.2%	69.8%
99	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	2.5%	0.0%	0.0%	0.0%	0.0%	30.9%	65.4%
(82-99)	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%	1.0%	1.5%	0.6%	0.2%	1.7%	12.5%	39.6%	42.3%
(85-99)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	1.3%	0.7%	0.2%	1.8%	8.9%	40.4%	46.1%

Table H.36. White River Spring Yearling distribution of total fishing mortalities 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
82	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	0.0%	0.9%	3.7%	0.0%	0.0%	0.9%	59.3%	33.3%	0.9%
83	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%
84	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%
85	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%
86	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	0.6%	2.3%	1.8%	0.0%	0.4%	17.3%	54.3%	22.8%
87	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.4%	0.0%	2.5%	8.1%	61.9%	26.1%
88	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	2.9%	0.2%	0.2%	1.4%	12.7%	52.4%	29.8%
89	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	1.3%	1.0%	0.0%	6.0%	11.8%	46.9%	31.7%
90	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.4%	0.6%	0.0%	5.6%	13.5%	50.6%	27.3%
91	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	1.3%	0.0%	1.1%	4.1%	9.7%	46.3%	36.6%
92	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	2.7%	2.5%	2.1%	0.2%	2.7%	7.5%	49.1%	32.8%
93	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	0.0%	0.0%	2.8%	3.1%	38.9%	53.7%
94	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%
95	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%	41.4%	57.1%
96	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%
97	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.7%	48.3%	47.0%
98	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%	1.5%	1.5%	32.1%	64.2%
99	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	2.2%	0.0%	0.0%	0.0%	0.0%	37.1%	59.6%
(82-99)	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%	1.0%	1.5%	0.5%	0.2%	1.7%	10.8%	48.0%	35.8%
(85-99)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	1.3%	0.6%	0.2%	1.8%	7.9%	48.0%	39.5%

Table H.37. Hoko Fall Fingerling distribution of reported catch 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
89	4.8%	0.4%	0.0%	7.6%	0.4%	6.0%	0.0%	10.8%	1.6%	15.3%	0.0%	0.8%	0.8%	22.1%	29.3%
90	15.9%	1.9%	0.5%	8.1%	0.7%	2.4%	0.0%	16.9%	0.8%	1.9%	0.0%	0.5%	1.0%	14.4%	35.0%
91	15.6%	0.0%	0.0%	5.0%	1.1%	0.3%	0.5%	6.9%	0.4%	0.6%	0.3%	0.2%	1.0%	8.3%	59.7%
92	8.0%	1.4%	1.2%	4.4%	1.2%	1.4%	0.5%	10.0%	0.5%	0.0%	0.7%	0.0%	0.2%	2.5%	67.8%
93	6.9%	0.0%	2.0%	6.5%	0.0%	3.3%	0.0%	14.7%	1.0%	2.0%	0.0%	0.0%	0.3%	4.6%	58.8%
94	13.5%	1.8%	2.4%	14.7%	0.6%	1.5%	0.0%	11.4%	4.2%	1.5%	1.5%	0.0%	0.0%	0.0%	47.0%
95	12.6%	0.0%	4.1%	6.1%	0.0%	0.3%	0.5%	2.9%	1.6%	0.1%	0.0%	0.0%	0.0%	0.7%	71.1%
96	10.9%	0.0%	2.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	86.1%
97	14.1%	0.0%	0.0%	1.6%	0.2%	0.0%	0.3%	0.9%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	82.6%
98	8.8%	0.0%	0.3%	5.9%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.2%	0.0%	0.0%	0.0%	84.6%
99	6.0%	0.0%	0.6%	11.1%	0.0%	0.0%	0.5%	0.0%	0.5%	0.0%	1.0%	0.0%	0.1%	0.0%	80.1%
(89-99)	10.6%	0.5%	1.2%	6.5%	0.4%	1.4%	0.2%	6.8%	1.0%	1.9%	0.4%	0.1%	0.4%	4.8%	63.8%
(89-99)	10.6%	0.5%	1.2%	6.5%	0.4%	1.4%	0.2%	6.8%	1.0%	1.9%	0.4%	0.1%	0.4%	4.8%	63.8%

Table H.38. Hoko Fall Fingerling distribution of total fishing mortalities 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
89	12.0%	2.3%	0.3%	8.6%	1.1%	4.9%	0.0%	13.7%	1.7%	11.4%	0.0%	0.6%	0.6%	22.0%	20.9%
90	18.5%	4.7%	0.6%	8.6%	0.9%	2.0%	0.0%	16.9%	0.7%	1.6%	0.0%	0.6%	0.9%	14.1%	30.1%
91	18.8%	0.0%	0.1%	5.2%	1.1%	0.3%	0.5%	7.1%	0.4%	0.6%	0.3%	0.2%	1.0%	8.9%	55.7%
92	8.9%	3.9%	1.6%	5.7%	1.1%	1.5%	0.5%	10.6%	0.7%	0.0%	0.7%	0.0%	0.2%	2.8%	62.0%
93	12.5%	0.9%	2.3%	7.7%	0.0%	2.8%	0.0%	14.8%	1.1%	1.7%	0.0%	0.0%	0.3%	4.8%	51.1%
94	20.5%	3.6%	2.6%	13.6%	0.5%	1.3%	0.0%	10.8%	3.8%	1.5%	1.5%	0.0%	0.0%	0.0%	40.3%
95	16.0%	0.0%	4.7%	7.8%	0.0%	0.4%	0.6%	3.7%	1.7%	0.1%	0.0%	0.0%	0.0%	1.0%	64.2%
96	14.0%	0.0%	3.0%	0.7%	0.0%	0.0%	0.0%	1.3%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	80.5%
97	16.6%	0.0%	0.0%	1.9%	0.2%	0.0%	0.3%	1.1%	0.0%	0.2%	0.2%	0.0%	0.0%	0.0%	79.5%
98	9.9%	0.0%	0.3%	6.5%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.2%	0.0%	0.0%	0.0%	82.9%
99	7.5%	0.0%	0.7%	12.9%	0.0%	0.0%	0.6%	0.0%	0.5%	0.0%	1.1%	0.0%	0.1%	0.0%	76.5%
(89-99)	14.1%	1.4%	1.5%	7.2%	0.5%	1.2%	0.2%	7.3%	1.0%	1.6%	0.4%	0.1%	0.3%	4.9%	58.5%
(89-99)	14.1%	1.4%	1.5%	7.2%	0.5%	1.2%	0.2%	7.3%	1.0%	1.6%	0.4%	0.1%	0.3%	4.9%	58.5%

Table H.39. Sooes Fall Fingerling distribution of reported catch 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
89	7.4%	0.7%	0.0%	0.0%	0.0%	4.7%	0.0%	2.0%	0.0%	2.0%	2.7%	0.0%	0.0%	0.0%	80.4%
90	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%
91	12.1%	0.0%	0.0%	9.8%	0.0%	1.7%	0.0%	5.2%	0.0%	2.0%	0.0%	0.0%	0.0%	4.9%	64.2%
92	8.8%	0.0%	0.0%	9.5%	2.0%	0.0%	0.0%	19.4%	1.0%	3.4%	1.0%	0.3%	0.0%	2.4%	52.0%
93	5.1%	0.0%	0.0%	7.6%	2.1%	2.1%	1.3%	16.1%	0.0%	0.0%	0.0%	0.4%	0.0%	0.8%	64.4%
94	16.8%	3.0%	4.0%	10.4%	1.0%	0.0%	2.0%	7.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	55.0%
95	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%
96	8.8%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	90.7%
97	10.4%	0.0%	5.6%	5.6%	0.7%	0.3%	0.0%	0.0%	1.4%	0.0%	2.4%	0.0%	24.0%	0.0%	49.7%
98	9.0%	0.0%	1.1%	17.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	72.6%
99	12.8%	0.0%	9.9%	7.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	69.0%
(89-99)	10.0%	0.6%	2.3%	7.9%	0.7%	1.0%	0.3%	7.1%	0.9%	0.9%	0.6%	0.2%	2.5%	1.1%	64.2%
(89-99)	10.0%	0.6%	2.3%	7.9%	0.7%	1.0%	0.3%	7.1%	0.9%	0.9%	0.6%	0.2%	2.5%	1.1%	64.2%

Table H.40. Sooes Fall Fingerling distribution of total fishing mortalities 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
89	11.3%	2.3%	0.6%	3.4%	0.0%	4.0%	0.0%	5.1%	0.0%	2.3%	2.3%	0.0%	0.0%	1.7%	67.2%
90	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%
91	13.9%	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%	59.2%
92	11.3%	0.3%	0.3%	10.7%	2.1%	0.0%	0.0%	20.5%	1.2%	3.1%	0.9%	0.3%	0.0%	2.4%	46.8%
93	8.3%	0.4%	0.0%	7.9%	2.0%	2.0%	1.2%	16.9%	0.0%	0.0%	0.0%	0.4%	0.0%	1.2%	59.8%
94	20.5%	7.4%	3.5%	9.6%	0.9%	0.0%	1.7%	7.4%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	48.5%
95	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%
96	15.2%	0.0%	0.0%	0.9%	0.0%	0.4%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	83.0%
97	11.7%	0.0%	6.5%	6.1%	0.6%	0.3%	0.0%	0.0%	1.3%	0.3%	2.6%	0.0%	24.3%	0.0%	46.3%
98	10.4%	0.0%	1.1%	19.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	68.9%
99	13.8%	0.0%	10.5%	8.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	66.7%
(89-99)	12.9%	1.6%	2.4%	9.0%	0.7%	0.9%	0.3%	8.0%	0.8%	0.9%	0.5%	0.2%	2.5%	1.2%	58.0%
(89-99)	12.9%	1.6%	2.4%	9.0%	0.7%	0.9%	0.3%	8.0%	0.8%	0.9%	0.5%	0.2%	2.5%	1.2%	58.0%

Table H.41. Queets Fall Fingerling distribution of reported catch 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
81	11.3%	0.0%	0.0%	13.4%	2.1%	2.1%	0.0%	11.3%	0.0%	1.0%	0.0%	1.0%	30.9%	3.1%	23.7%
82	12.0%	2.4%	1.2%	22.5%	0.0%	0.8%	1.6%	12.0%	0.0%	0.0%	0.0%	0.0%	24.9%	0.0%	22.5%
83	33.1%	0.0%	0.8%	6.8%	0.0%	0.8%	0.0%	7.5%	0.0%	2.3%	0.0%	0.8%	25.6%	0.0%	22.6%
84	16.1%	0.7%	0.0%	19.6%	0.0%	0.0%	2.1%	7.7%	0.0%	0.0%	0.0%	2.1%	28.7%	0.0%	23.1%
85	15.5%	0.0%	0.8%	31.3%	0.0%	0.0%	0.0%	2.0%	0.0%	1.6%	0.0%	0.0%	14.3%	1.2%	33.3%
86	19.5%	0.0%	0.0%	11.5%	1.7%	0.0%	0.0%	7.0%	0.0%	1.0%	0.0%	0.0%	9.4%	0.0%	49.8%
87	22.4%	0.2%	0.9%	11.6%	0.9%	0.6%	0.6%	0.7%	0.0%	0.0%	0.0%	0.6%	22.6%	0.6%	38.4%
88	15.1%	0.8%	0.6%	7.9%	2.5%	0.4%	0.0%	4.0%	0.0%	0.0%	1.0%	0.0%	16.8%	3.3%	47.6%
89	11.1%	0.0%	0.0%	9.2%	0.5%	0.2%	0.9%	7.6%	0.0%	0.0%	0.0%	0.0%	27.8%	1.6%	41.2%
90	12.7%	0.0%	0.0%	5.5%	0.3%	0.3%	1.2%	6.7%	0.0%	0.0%	0.0%	0.0%	13.9%	0.0%	59.3%
91	20.8%	0.0%	1.1%	9.7%	0.0%	0.0%	1.3%	4.8%	0.0%	0.0%	0.0%	0.0%	15.7%	0.5%	46.2%
92	8.4%	0.8%	2.2%	7.7%	0.0%	0.2%	1.6%	17.5%	0.0%	0.0%	0.0%	0.0%	19.3%	0.8%	41.5%
93	15.9%	0.0%	0.7%	14.1%	0.3%	0.0%	1.6%	12.3%	0.0%	0.0%	0.0%	0.5%	16.1%	2.8%	35.7%
94	15.7%	0.3%	0.5%	21.1%	0.2%	0.4%	1.0%	4.0%	0.3%	0.0%	0.6%	0.0%	20.9%	0.0%	35.2%
95	17.2%	0.0%	1.6%	6.0%	0.0%	0.1%	2.9%	0.7%	0.5%	0.0%	0.5%	0.7%	32.9%	0.0%	36.9%
96	10.3%	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	17.6%	0.6%	70.7%
97	34.6%	0.3%	0.0%	6.0%	0.8%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	20.6%	0.0%	37.4%
98	37.6%	0.0%	5.1%	31.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.8%	1.2%	16.8%
99	25.9%	0.0%	4.6%	1.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	29.3%	0.4%	38.1%
(81-99)	18.7%	0.3%	1.1%	12.5%	0.5%	0.3%	0.8%	5.6%	0.0%	0.3%	0.1%	0.3%	20.8%	0.8%	37.9%
(85-99)	18.8%	0.2%	1.3%	11.7%	0.5%	0.1%	0.7%	4.5%	0.1%	0.2%	0.1%	0.1%	19.0%	0.9%	41.9%

Table H.42. Queets Fall Fingerling distribution of total fishing mortalities 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
81	15.0%	0.0%	0.0%	15.9%	1.8%	1.8%	0.0%	11.5%	0.0%	0.9%	0.0%	1.8%	27.4%	3.5%	20.4%
82	14.6%	2.2%	1.1%	23.2%	0.0%	0.7%	1.5%	11.6%	0.0%	0.0%	0.0%	0.0%	24.0%	0.0%	21.0%
83	50.3%	0.0%	0.5%	5.3%	0.0%	0.5%	0.0%	5.3%	0.0%	2.1%	0.0%	0.5%	19.3%	0.0%	16.0%
84	20.9%	0.6%	0.0%	20.2%	0.0%	0.0%	2.5%	7.4%	0.0%	0.0%	0.0%	2.5%	25.8%	0.0%	20.2%
85	19.9%	0.0%	1.0%	33.1%	0.0%	0.0%	0.0%	2.0%	0.0%	1.4%	0.0%	0.0%	12.5%	1.7%	28.4%
86	29.1%	0.0%	0.3%	10.9%	1.5%	0.0%	0.0%	6.5%	0.0%	0.9%	0.0%	0.0%	8.8%	0.0%	42.1%
87	28.7%	0.5%	1.0%	11.6%	0.8%	0.5%	0.7%	1.3%	0.0%	0.0%	0.0%	0.5%	20.0%	0.7%	33.9%
88	18.1%	2.4%	0.6%	9.5%	2.4%	0.4%	0.1%	5.4%	0.0%	0.0%	0.9%	0.0%	15.0%	3.4%	41.8%
89	16.7%	0.0%	0.2%	10.6%	0.6%	0.3%	0.9%	9.0%	0.0%	0.0%	0.0%	0.0%	24.5%	1.7%	35.6%
90	15.5%	0.1%	0.1%	6.5%	0.3%	0.3%	1.3%	7.1%	0.0%	0.0%	0.0%	0.0%	13.4%	0.0%	55.4%
91	24.5%	0.0%	1.2%	10.1%	0.0%	0.0%	1.3%	5.0%	0.0%	0.0%	0.0%	0.0%	14.6%	0.5%	42.7%
92	15.2%	2.2%	2.4%	8.7%	0.0%	0.1%	1.6%	18.1%	0.0%	0.0%	0.0%	0.0%	16.3%	0.8%	34.7%
93	20.1%	0.0%	0.7%	15.4%	0.3%	0.0%	1.6%	13.1%	0.0%	0.0%	0.0%	0.4%	14.3%	2.9%	31.3%
94	23.8%	0.6%	0.4%	20.6%	0.2%	0.3%	1.0%	3.9%	0.2%	0.0%	0.5%	0.0%	18.1%	0.0%	30.3%
95	21.6%	0.0%	1.7%	7.4%	0.0%	0.2%	3.3%	0.8%	0.5%	0.0%	0.7%	0.7%	29.9%	0.0%	33.1%
96	18.5%	0.0%	0.9%	0.9%	0.0%	0.0%	0.1%	0.4%	0.0%	0.0%	0.0%	0.0%	16.0%	0.5%	62.7%
97	37.8%	0.5%	0.0%	6.1%	0.7%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	19.6%	0.0%	35.0%
98	39.3%	0.0%	5.1%	31.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.3%	1.3%	15.2%
99	31.2%	0.0%	4.6%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	26.9%	0.8%	35.0%
(81-99)	24.3%	0.5%	1.1%	13.1%	0.5%	0.3%	0.8%	5.7%	0.0%	0.3%	0.1%	0.3%	18.6%	0.9%	33.4%
(85-99)	24.0%	0.4%	1.3%	12.3%	0.5%	0.1%	0.8%	4.8%	0.0%	0.1%	0.1%	0.1%	17.2%	0.9%	37.1%

Table H.43. Cowlitz Fall Tule distribution of reported catch 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
81	5.9%	0.0%	0.5%	2.4%	0.0%	1.4%	5.1%	16.2%	0.0%	2.4%	0.0%	9.7%	15.1%	13.0%	28.1%
82	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%
83	3.7%	0.0%	0.2%	6.7%	3.7%	0.5%	0.0%	17.7%	0.5%	0.5%	0.0%	6.9%	4.8%	18.6%	36.1%
84	4.5%	0.0%	0.3%	7.2%	2.1%	0.1%	0.7%	24.3%	0.0%	1.7%	0.0%	4.4%	15.0%	3.6%	36.0%
85	3.7%	0.3%	0.3%	4.0%	0.0%	4.4%	0.0%	11.3%	0.4%	1.2%	0.0%	4.4%	6.4%	13.6%	50.1%
86	0.4%	0.1%	0.1%	0.2%	0.6%	0.8%	0.0%	12.6%	0.4%	1.1%	0.0%	12.9%	30.9%	12.5%	27.4%
87	3.7%	0.2%	0.5%	3.9%	1.2%	0.0%	0.0%	9.7%	0.0%	0.8%	0.5%	11.3%	22.9%	16.1%	29.0%
88	1.9%	0.3%	0.0%	1.7%	0.0%	0.1%	0.0%	15.9%	0.0%	0.6%	0.0%	15.6%	24.0%	12.4%	27.6%
89	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%
90	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%
91	10.5%	0.0%	0.0%	3.2%	1.6%	0.0%	0.0%	5.6%	0.0%	0.0%	2.4%	10.5%	11.3%	9.7%	45.2%
92	2.2%	0.0%	0.0%	0.0%	2.2%	0.0%	1.1%	17.8%	0.0%	0.0%	0.0%	7.0%	5.4%	4.9%	59.5%
93	3.7%	0.0%	0.0%	2.4%	0.0%	0.9%	0.0%	6.7%	0.0%	0.0%	0.0%	17.4%	3.1%	22.3%	43.4%
94	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%
95	0.6%	0.0%	2.3%	1.7%	0.0%	1.2%	0.0%	1.7%	0.0%	0.0%	2.3%	4.6%	2.3%	1.7%	81.5%
96	3.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	6.1%	1.1%	3.8%	82.9%
97	4.8%	0.0%	10.3%	3.0%	0.0%	0.0%	0.0%	4.8%	2.4%	0.0%	0.0%	4.8%	0.0%	1.2%	68.5%
98	4.0%	0.0%	0.0%	8.0%	0.0%	0.0%	0.0%	1.3%	0.0%	0.0%	0.0%	10.7%	0.0%	2.7%	73.3%
99	0.0%	0.0%	2.5%	0.0%	0.0%	0.0%	2.5%	5.0%	0.0%	0.0%	0.0%	9.9%	0.0%	19.8%	60.3%
(81-99)	3.6%	0.0%	0.9%	2.8%	0.8%	0.8%	0.5%	9.9%	0.3%	0.6%	0.3%	9.8%	8.4%	10.1%	51.2%
(85-99)	3.4%	0.1%	1.1%	2.4%	0.6%	0.7%	0.2%	7.7%	0.4%	0.4%	0.4%	9.7%	7.6%	9.6%	55.8%

Table H.44. Cowlitz Fall Tule distribution of total fishing mortalities 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
81	6.4%	0.0%	0.5%	2.5%	0.0%	1.2%	4.9%	17.5%	0.0%	2.2%	0.0%	11.6%	14.5%	13.1%	25.6%
82	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%
83	4.4%	0.0%	0.2%	7.1%	3.9%	0.5%	0.0%	18.8%	0.5%	0.5%	0.0%	7.8%	4.7%	18.6%	33.1%
84	4.6%	0.0%	0.3%	7.5%	2.3%	0.1%	0.8%	25.4%	0.0%	1.8%	0.0%	4.7%	14.7%	3.7%	34.3%
85	4.0%	1.1%	0.4%	4.4%	0.0%	4.4%	0.0%	12.6%	0.4%	1.2%	0.0%	5.1%	6.3%	14.3%	45.8%
86	0.5%	0.2%	0.1%	0.2%	0.7%	0.8%	0.0%	14.0%	0.3%	1.0%	0.0%	14.5%	30.1%	12.7%	24.8%
87	6.1%	0.5%	0.5%	4.6%	1.4%	0.0%	0.0%	11.2%	0.0%	0.7%	0.5%	12.0%	21.3%	15.5%	25.7%
88	2.0%	0.8%	0.0%	1.8%	0.0%	0.1%	0.0%	17.6%	0.0%	0.6%	0.0%	16.1%	22.8%	12.4%	25.8%
89	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%
90	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%
91	13.0%	0.0%	0.0%	3.6%	1.4%	0.0%	0.0%	6.5%	0.0%	0.0%	2.9%	11.6%	10.9%	9.4%	40.6%
92	2.5%	0.0%	0.0%	0.0%	2.5%	0.0%	1.5%	20.3%	0.0%	0.0%	0.0%	7.9%	5.4%	5.4%	54.5%
93	4.4%	0.0%	0.0%	3.0%	0.0%	1.1%	0.0%	7.8%	0.0%	0.0%	0.0%	19.1%	3.0%	22.2%	39.3%
94	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%
95	1.1%	0.0%	2.7%	2.2%	0.0%	1.1%	0.0%	2.2%	0.0%	2.2%	3.2%	5.4%	2.2%	1.6%	76.2%
96	4.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.6%	0.0%	0.0%	7.0%	1.1%	4.1%	80.4%
97	5.1%	0.0%	11.4%	3.4%	0.0%	0.0%	0.0%	5.7%	2.8%	1.1%	0.0%	5.1%	0.0%	1.1%	64.2%
98	5.0%	0.0%	0.0%	10.0%	0.0%	0.0%	0.0%	1.3%	0.0%	0.0%	0.0%	11.3%	0.0%	3.8%	68.8%
99	0.0%	0.0%	2.4%	0.0%	0.0%	0.0%	3.3%	4.9%	0.0%	0.0%	0.0%	9.8%	0.0%	20.3%	59.3%
(81-99)	4.3%	0.1%	1.0%	3.2%	0.8%	0.8%	0.5%	10.9%	0.3%	0.8%	0.4%	10.6%	8.1%	10.2%	47.8%
(85-99)	4.2%	0.2%	1.2%	2.8%	0.6%	0.7%	0.3%	8.6%	0.4%	0.6%	0.4%	10.5%	7.3%	9.8%	52.4%

Table H.45. Lower River Hatchery distribution of reported catch 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
80	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%
81	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%
82	0.0%	0.0%	0.0%	0.3%	1.8%	0.0%	0.0%	26.0%	0.8%	0.3%	0.5%	18.5%	16.4%	9.0%	26.5%
83	0.0%	0.0%	0.0%	0.0%	2.3%	0.3%	0.2%	34.8%	2.0%	0.6%	0.4%	11.2%	6.7%	8.4%	33.2%
84	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%
85	0.0%	0.0%	0.0%	0.0%	0.9%	0.4%	0.0%	28.3%	1.1%	1.2%	0.7%	15.5%	4.1%	5.8%	42.0%
86	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.1%	8.8%	2.7%	7.3%	2.6%	6.7%	13.1%	11.2%	46.7%
87	0.0%	0.0%	0.0%	0.2%	1.6%	0.0%	0.0%	27.3%	0.6%	0.2%	1.3%	16.7%	20.9%	9.7%	21.5%
88	0.3%	0.0%	0.0%	0.3%	0.6%	0.0%	0.0%	29.3%	1.0%	0.0%	0.7%	11.7%	24.7%	3.3%	28.1%
89	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%
90	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%
91	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	10.0%	0.7%	2.5%	1.6%	9.1%	2.3%	15.1%	58.4%
92	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	16.4%	0.0%	1.0%	1.3%	28.2%	0.8%	11.0%	40.7%
93	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	19.0%	0.0%	0.0%	1.7%	20.3%	2.1%	11.4%	44.9%
94	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	26.7%	13.3%	0.0%	0.0%	0.0%	0.0%	0.0%	60.0%
95	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%
96	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%
97	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	17.5%	3.2%	0.0%	4.2%	9.0%	1.1%	12.2%	52.9%
98	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.8%	3.8%	0.0%	0.0%	7.6%	1.0%	1.9%	21.9%	60.0%
99	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.9%	0.0%	0.0%	6.9%	7.7%	3.8%	5.0%	69.7%
(80-99)	0.1%	0.0%	0.0%	0.0%	0.6%	0.2%	0.2%	19.3%	1.6%	1.4%	1.6%	12.5%	6.8%	9.4%	46.4%
(85-99)	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.3%	15.3%	1.5%	1.1%	1.9%	11.5%	6.1%	8.8%	53.1%

Table H.46. Lower River Hatchery distribution of total fishing mortalities 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
80	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%
81	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%
82	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%	23.6%
83	0.0%	0.0%	0.0%	0.0%	2.4%	0.3%	0.2%	36.7%	1.9%	0.5%	0.4%	12.2%	6.6%	9.5%	29.2%
84	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%
85	0.0%	0.0%	0.0%	0.0%	0.9%	0.4%	0.0%	30.3%	1.1%	1.2%	0.7%	17.6%	4.1%	6.0%	37.8%
86	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.3%	8.3%	2.1%	6.2%	2.8%	6.2%	12.4%	27.6%	33.4%
87	0.0%	0.0%	0.0%	0.2%	1.9%	0.0%	0.0%	33.4%	0.5%	0.2%	1.2%	17.4%	18.7%	8.7%	17.8%
88	0.3%	0.0%	0.0%	0.3%	0.6%	0.0%	0.0%	31.7%	1.0%	0.0%	0.7%	12.0%	23.6%	3.3%	26.4%
89	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%
90	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%
91	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	12.5%	1.0%	2.4%	1.8%	10.9%	2.4%	17.0%	51.7%
92	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	19.7%	0.0%	0.8%	1.2%	30.8%	0.8%	10.7%	35.4%
93	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%	21.5%	0.0%	0.0%	1.5%	21.5%	1.9%	11.6%	41.2%
94	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	30.3%	15.2%	0.0%	0.0%	0.0%	0.0%	0.0%	54.5%
95	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%
96	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%
97	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	21.6%	3.4%	0.5%	3.8%	9.6%	1.0%	12.0%	48.1%
98	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.3%	4.4%	0.0%	0.0%	9.6%	0.9%	1.8%	22.8%	55.3%
99	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	7.4%	9.2%	4.0%	5.5%	66.9%
(80-99)	0.0%	0.0%	0.0%	0.0%	0.7%	0.1%	0.3%	21.8%	1.6%	1.3%	1.7%	13.9%	6.4%	10.3%	41.8%
(85-99)	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.4%	17.4%	1.6%	1.2%	2.1%	12.6%	5.7%	10.1%	48.4%

Table H.47. Spring Creek Tule distribution of reported catch 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
79	0.0%	0.0%	0.0%	0.1%	0.7%	0.3%	0.0%	23.3%	1.4%	2.4%	0.1%	17.5%	23.1%	13.1%	18.0%
80	0.1%	0.0%	0.0%	0.1%	0.5%	0.1%	0.0%	25.0%	2.8%	1.0%	0.1%	23.6%	23.8%	10.3%	12.7%
81	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%
82	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	22.0%	1.1%	0.2%	0.0%	19.6%	35.6%	8.3%	12.7%
83	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	29.7%	1.5%	0.0%	0.5%	8.4%	20.1%	9.8%	29.6%
84	0.0%	0.0%	0.0%	0.0%	2.4%	0.0%	0.0%	27.3%	0.0%	1.3%	0.4%	6.0%	25.9%	7.4%	29.2%
85	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	13.7%	0.0%	0.2%	0.7%	13.4%	26.3%	3.9%	41.7%
86	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%
87	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.8%	0.0%	0.0%	0.0%	14.8%	38.3%	20.0%	19.1%
88	0.0%	0.0%	0.0%	0.5%	0.3%	0.2%	0.0%	23.5%	1.0%	1.9%	0.8%	18.6%	31.5%	10.5%	11.3%
89	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	14.8%	0.4%	0.5%	1.0%	25.4%	35.5%	8.5%	13.8%
90	0.0%	0.0%	0.0%	0.4%	0.3%	0.1%	0.0%	18.0%	0.7%	0.8%	1.5%	14.6%	23.7%	13.5%	26.3%
91	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	0.0%	11.8%	0.2%	0.3%	0.9%	15.2%	30.6%	9.9%	30.9%
92	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	11.9%	0.7%	0.5%	1.5%	26.7%	14.7%	11.9%	31.9%
93	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	18.1%	0.0%	0.4%	1.9%	18.0%	21.9%	10.7%	29.0%
94	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	18.3%	0.0%	0.8%	2.3%	3.5%	28.2%	0.8%	46.2%
95	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.6%	0.0%	0.2%	2.2%	1.7%	36.9%	0.0%	52.4%
96	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.1%	5.9%	54.6%	3.2%	33.2%
97	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	18.5%	0.0%	0.0%	5.5%	7.9%	38.3%	17.9%	11.9%
98	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	0.0%	1.9%	3.8%	20.0%	16.9%	56.6%
99	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.4%	0.0%	3.2%	16.3%	32.4%	6.3%	40.0%
(79-99)	0.0%	0.0%	0.0%	0.1%	0.4%	0.0%	0.0%	15.9%	0.6%	0.7%	1.4%	13.7%	29.4%	9.7%	28.0%
(85-99)	0.0%	0.0%	0.0%	0.1%	0.3%	0.0%	0.0%	12.4%	0.4%	0.5%	1.9%	12.5%	31.3%	9.5%	31.2%

Table H.48. Spring Creek Tule distribution of total fishing mortalities 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
79	0.0%	0.0%	0.0%	0.1%	0.7%	0.2%	0.0%	24.8%	1.3%	2.3%	0.1%	19.5%	21.6%	14.0%	15.4%
80	0.1%	0.0%	0.0%	0.1%	0.6%	0.1%	0.0%	25.9%	2.6%	0.9%	0.1%	25.3%	22.4%	11.2%	10.8%
81	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%
82	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	22.6%	1.1%	0.2%	0.0%	22.1%	33.9%	8.2%	11.4%
83	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	31.4%	1.5%	0.0%	0.5%	9.0%	18.8%	12.1%	26.3%
84	0.0%	0.0%	0.0%	0.0%	2.4%	0.0%	0.0%	27.1%	0.0%	1.2%	0.4%	6.1%	24.6%	12.7%	25.6%
85	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	14.8%	0.0%	0.2%	0.6%	15.6%	26.1%	4.0%	38.5%
86	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%
87	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.9%	0.0%	0.0%	0.0%	16.4%	39.5%	19.7%	14.5%
88	0.0%	0.0%	0.0%	0.5%	0.3%	0.3%	0.0%	26.8%	1.0%	1.5%	0.8%	19.4%	28.1%	12.3%	9.1%
89	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	17.1%	0.5%	0.4%	1.0%	27.5%	32.9%	8.5%	11.9%
90	0.0%	0.0%	0.0%	0.5%	0.4%	0.1%	0.0%	20.4%	0.8%	0.8%	1.6%	15.9%	21.8%	15.2%	22.5%
91	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%	14.0%	0.2%	0.4%	0.9%	17.0%	29.2%	10.5%	27.4%
92	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	14.1%	0.8%	0.5%	1.4%	29.0%	13.9%	11.8%	28.2%
93	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20.3%	0.0%	0.3%	1.9%	19.7%	20.3%	11.8%	25.7%
94	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	21.4%	0.0%	0.9%	2.5%	3.8%	27.9%	1.0%	42.5%
95	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.5%	0.0%	2.2%	3.2%	2.0%	35.8%	0.0%	47.2%
96	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	3.7%	6.8%	54.9%	3.5%	31.0%
97	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	21.6%	0.0%	0.9%	5.5%	8.5%	35.1%	18.1%	10.3%
98	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	2.4%	4.5%	20.1%	19.2%	52.9%
99	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.4%	0.0%	3.3%	19.0%	32.3%	6.5%	37.0%
(79-99)	0.0%	0.0%	0.0%	0.1%	0.4%	0.0%	0.0%	17.5%	0.6%	0.8%	1.5%	15.0%	28.3%	10.6%	25.1%
(85-99)	0.0%	0.0%	0.0%	0.1%	0.3%	0.0%	0.0%	14.3%	0.4%	0.7%	2.1%	13.9%	30.2%	10.1%	28.1%

Table H.49. Columbia River Summers distribution of 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: Canada Net	Other Fisheries: Canada Sport	Other Fisheries: U.S. Troll	Other Fisheries: U.S. Net	Other Fisheries: U.S. Sport	Escapement
79	12.4%	0.0%	1.1%	6.8%	2.3%	8.5%	0.0%	15.3%	7.3%	1.7%	0.0%	0.0%	4.5%	4.5%	35.6%
80	33.2%	0.0%	1.7%	8.2%	3.7%	1.1%	0.0%	15.9%	0.0%	0.0%	0.0%	1.4%	0.6%	0.0%	34.1%
87	13.5%	0.0%	0.8%	5.6%	4.8%	4.0%	1.6%	0.0%	0.0%	0.0%	0.0%	20.6%	15.1%	0.0%	34.1%
88	1.3%	0.4%	2.6%	8.5%	0.0%	8.5%	1.7%	17.9%	0.0%	1.7%	1.3%	3.8%	17.0%	3.4%	31.9%
89	5.0%	0.5%	0.7%	5.0%	0.7%	0.3%	0.7%	15.1%	1.5%	2.3%	1.0%	14.7%	8.6%	2.6%	41.4%
90	10.1%	0.0%	0.0%	6.8%	1.1%	1.3%	0.0%	20.3%	0.6%	0.4%	0.0%	5.7%	11.0%	2.6%	40.0%
91	6.3%	0.0%	0.0%	3.3%	0.8%	2.5%	0.0%	8.6%	0.0%	1.7%	0.8%	5.2%	6.1%	3.1%	61.5%
92	13.1%	0.0%	0.0%	3.3%	2.0%	1.0%	0.0%	14.1%	0.7%	0.0%	0.0%	6.2%	1.3%	1.3%	57.0%
93	9.8%	0.0%	0.0%	2.0%	0.0%	3.3%	0.0%	19.6%	0.0%	0.0%	2.6%	7.2%	4.6%	2.0%	49.0%
94	12.2%	0.0%	0.0%	0.0%	0.0%	0.0%	9.8%	0.0%	0.0%	0.0%	0.0%	0.0%	9.8%	0.0%	68.3%
95	2.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	92.2%
96	14.2%	0.3%	0.0%	0.0%	0.0%	3.0%	0.0%	0.0%	2.7%	0.0%	0.0%	3.3%	0.0%	4.4%	72.2%
97	13.4%	0.1%	5.8%	0.4%	0.0%	0.7%	1.4%	2.8%	0.0%	0.0%	0.0%	5.2%	0.3%	1.4%	68.5%
98	9.5%	0.3%	1.0%	0.6%	0.0%	0.1%	0.9%	0.3%	0.0%	0.0%	0.7%	2.0%	1.4%	0.5%	82.7%
99	11.9%	0.0%	0.2%	1.2%	0.0%	0.0%	2.5%	4.6%	0.0%	0.0%	4.6%	12.3%	1.2%	2.0%	59.4%
(79-99)	11.3%	0.1%	0.9%	3.5%	1.0%	2.3%	1.2%	9.3%	0.8%	0.5%	0.7%	5.8%	5.4%	1.9%	55.2%
(85-99)	9.5%	0.1%	0.8%	2.8%	0.7%	1.9%	1.4%	8.3%	0.4%	0.5%	0.8%	6.6%	5.9%	1.8%	58.3%

Table H.50. Columbia River Summers distribution of total fishing mortalities 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	Other Fisheries: Canada Sport	Other Fisheries: U.S. Troll	Other Fisheries: U.S. Net	Other Fisheries: U.S. Sport	Escapement
79	15.4%	0.0%	1.0%	7.7%	3.4%	7.7%	1.0%	16.8%	6.7%	1.4%	0.0%	0.5%	3.8%	4.3%	30.3%
80	33.4%	0.0%	1.6%	8.5%	3.8%	1.1%	0.0%	16.4%	0.0%	0.0%	0.0%	1.6%	0.5%	0.0%	32.9%
87	16.0%	0.0%	1.2%	8.0%	3.7%	4.3%	1.2%	7.4%	0.0%	0.0%	0.0%	19.6%	11.7%	0.6%	26.4%
88	2.1%	1.1%	3.2%	11.2%	0.0%	8.1%	1.4%	22.5%	0.0%	1.4%	1.1%	3.9%	14.7%	3.2%	26.3%
89	7.2%	2.1%	0.7%	5.4%	0.7%	0.3%	0.7%	16.6%	1.4%	2.1%	1.0%	15.0%	7.7%	2.6%	36.3%
90	11.1%	0.0%	0.0%	7.8%	1.2%	1.4%	0.0%	21.0%	0.6%	0.3%	0.0%	5.9%	10.5%	2.6%	37.7%
91	6.5%	0.0%	0.0%	3.5%	0.8%	2.6%	0.0%	9.6%	0.0%	1.6%	0.8%	5.5%	6.1%	3.3%	59.8%
92	17.4%	0.0%	0.0%	3.3%	1.8%	0.9%	0.0%	14.7%	0.6%	0.0%	0.0%	6.3%	1.2%	1.5%	52.3%
93	10.6%	0.0%	0.0%	1.9%	0.0%	3.1%	0.0%	21.3%	0.0%	0.0%	2.5%	7.5%	4.4%	1.9%	46.9%
94	15.9%	0.0%	0.0%	0.0%	0.0%	0.0%	11.4%	0.0%	0.0%	0.0%	0.0%	0.0%	9.1%	0.0%	63.6%
95	4.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.3%	0.0%	2.0%	0.0%	0.0%	0.0%	0.0%	86.7%
96	23.6%	0.7%	0.0%	0.0%	0.0%	3.2%	1.7%	0.0%	2.9%	0.2%	0.0%	3.4%	0.0%	4.2%	60.0%
97	15.0%	0.1%	6.4%	0.4%	0.0%	0.8%	1.5%	3.2%	0.0%	0.0%	0.0%	5.8%	0.3%	1.5%	64.9%
98	10.8%	0.9%	1.2%	0.7%	0.0%	0.1%	1.1%	0.2%	0.0%	0.0%	0.7%	2.2%	1.4%	0.5%	80.2%
99	15.5%	0.0%	0.2%	1.2%	0.0%	0.0%	2.5%	4.5%	0.0%	0.0%	4.5%	12.1%	1.2%	2.0%	56.2%
(79-99)	13.6%	0.3%	1.0%	4.0%	1.0%	2.2%	1.5%	10.8%	0.8%	0.6%	0.7%	6.0%	4.8%	1.9%	50.7%
(85-99)	12.0%	0.4%	1.0%	3.3%	0.6%	1.9%	1.7%	9.9%	0.4%	0.6%	0.8%	6.7%	5.2%	1.8%	53.6%

Table H.51. Willamette Spring distribution of 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: Canada Net	Other Fisheries: Canada Sport	Other Fisheries: U.S. Troll	Other Fisheries: U.S. Net	Other Fisheries: U.S. Sport	Escapement
80	7.0%	0.9%	0.5%	10.9%	0.3%	0.8%	0.1%	4.6%	0.0%	0.1%	0.0%	0.9%	0.6%	15.7%	57.5%
81	8.8%	1.1%	0.3%	11.9%	0.7%	0.2%	0.0%	2.7%	0.0%	0.0%	0.0%	0.7%	3.1%	18.3%	52.0%
82	4.2%	1.4%	0.3%	6.6%	0.1%	0.3%	0.1%	4.1%	0.0%	0.0%	0.0%	1.1%	7.2%	24.7%	49.9%
83	13.0%	0.1%	0.7%	11.8%	0.3%	0.0%	0.0%	1.8%	0.9%	0.0%	0.0%	1.8%	6.4%	21.0%	42.1%
84	4.2%	0.3%	0.4%	2.1%	0.1%	0.1%	0.1%	1.9%	0.1%	0.0%	0.0%	1.0%	6.2%	23.9%	59.6%
85	5.2%	0.1%	0.4%	0.5%	0.2%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.3%	18.2%	20.4%	54.3%
86	3.2%	0.1%	0.3%	6.6%	0.6%	2.5%	0.0%	5.5%	0.0%	0.0%	0.6%	0.0%	9.1%	17.1%	54.3%
87	10.0%	0.0%	0.9%	13.3%	0.8%	1.1%	0.0%	0.9%	0.0%	0.0%	0.6%	2.5%	6.3%	27.0%	36.5%
88	9.3%	0.3%	0.1%	6.2%	0.6%	0.1%	0.0%	3.0%	0.0%	0.0%	0.0%	2.2%	6.9%	28.7%	42.6%
89	4.4%	0.0%	0.3%	1.8%	0.0%	0.1%	0.0%	1.4%	0.5%	0.2%	0.2%	1.5%	12.6%	20.3%	56.8%
90	6.3%	0.3%	0.6%	1.5%	0.2%	0.5%	0.1%	2.1%	0.0%	0.1%	0.2%	1.3%	17.0%	27.7%	42.1%
91	3.1%	0.6%	1.3%	1.7%	0.0%	0.2%	0.0%	0.4%	0.2%	0.0%	0.1%	0.7%	6.0%	42.7%	43.0%
92	3.6%	0.7%	0.5%	1.7%	0.0%	0.2%	0.2%	2.7%	0.0%	0.1%	0.2%	2.4%	5.9%	31.4%	50.6%
93	8.1%	0.2%	0.0%	1.3%	0.0%	0.0%	0.1%	1.4%	0.0%	0.0%	0.1%	1.5%	0.8%	43.0%	43.5%
94	4.2%	0.1%	0.1%	0.7%	0.2%	0.2%	0.1%	0.6%	0.0%	0.0%	0.0%	0.2%	5.1%	39.2%	49.2%
95	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%
96	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%	7.8%	88.5%
97	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%
98	4.2%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.1%	0.4%	16.3%	78.4%
99	5.3%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	0.4%	0.0%	0.9%	19.4%	73.0%
(80-99)	5.6%	0.3%	0.4%	4.0%	0.2%	0.3%	0.0%	1.7%	0.1%	0.0%	0.1%	0.9%	5.7%	25.2%	55.2%
(85-99)	5.0%	0.2%	0.4%	2.4%	0.2%	0.4%	0.0%	1.3%	0.0%	0.0%	0.2%	0.9%	6.1%	26.7%	56.2%

Table H.52. Willamette Spring distribution of total fishing mortalities 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
80	9.4%	0.9%	0.7%	13.0%	0.4%	0.8%	0.1%	5.3%	0.0%	0.1%	0.0%	1.1%	0.7%	15.3%	52.1%
81	11.2%	1.1%	0.5%	13.4%	0.8%	0.2%	0.0%	3.0%	0.0%	0.0%	0.0%	0.8%	3.0%	18.1%	47.8%
82	5.9%	1.4%	0.5%	7.6%	0.1%	0.4%	0.1%	4.7%	0.0%	0.0%	0.0%	1.3%	7.0%	24.7%	46.2%
83	19.1%	0.1%	1.1%	13.0%	0.3%	0.0%	0.0%	2.0%	0.9%	0.0%	0.0%	2.1%	5.8%	19.6%	36.1%
84	4.8%	0.3%	0.6%	2.5%	0.1%	0.1%	0.1%	2.1%	0.1%	0.0%	0.0%	1.2%	6.3%	24.6%	57.3%
85	8.1%	0.3%	0.5%	0.5%	0.2%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.3%	17.5%	20.6%	51.4%
86	5.1%	0.4%	0.4%	7.5%	0.7%	2.6%	0.0%	6.2%	0.0%	0.0%	0.7%	0.0%	8.8%	17.1%	50.5%
87	18.8%	0.0%	2.4%	15.2%	1.2%	1.0%	0.0%	1.5%	0.0%	0.0%	0.6%	3.2%	5.2%	22.8%	28.1%
88	12.8%	0.9%	0.1%	8.1%	0.8%	0.0%	0.0%	3.8%	0.0%	0.0%	0.0%	2.4%	6.7%	27.0%	37.3%
89	5.8%	0.0%	0.5%	2.2%	0.0%	0.1%	0.0%	1.7%	0.6%	0.1%	0.2%	1.8%	12.4%	20.7%	53.9%
90	10.2%	0.9%	0.9%	2.0%	0.2%	0.5%	0.1%	2.7%	0.0%	0.1%	0.2%	1.5%	15.8%	26.8%	38.0%
91	4.4%	1.5%	1.6%	2.1%	0.0%	0.2%	0.0%	0.4%	0.2%	0.0%	0.2%	0.8%	5.9%	42.6%	40.0%
92	8.0%	1.8%	0.8%	2.1%	0.0%	0.1%	0.2%	3.3%	0.0%	0.1%	0.2%	2.9%	5.5%	30.2%	44.9%
93	13.8%	0.4%	0.0%	1.6%	0.0%	0.0%	0.1%	1.7%	0.0%	0.0%	0.1%	1.7%	0.8%	41.2%	38.8%
94	5.9%	0.4%	0.1%	0.9%	0.3%	0.2%	0.1%	0.8%	0.0%	0.0%	0.0%	0.2%	5.0%	39.7%	46.4%
95	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%
96	3.5%	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%	86.5%
97	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%	77.2%
98	5.8%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.2%	0.4%	17.1%	75.7%
99	9.1%	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	0.5%	0.0%	0.9%	19.6%	68.6%
(80-99)	8.6%	0.5%	0.6%	4.7%	0.3%	0.4%	0.0%	2.0%	0.1%	0.0%	0.1%	1.1%	5.5%	24.8%	51.2%
(85-99)	8.1%	0.5%	0.6%	3.0%	0.2%	0.4%	0.0%	1.6%	0.1%	0.0%	0.2%	1.0%	5.8%	26.3%	52.3%

Table H.53. Lewis River Wild distribution of reported catch 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
81	6.8%	0.0%	0.2%	3.3%	1.4%	0.2%	1.6%	6.0%	0.0%	0.7%	0.0%	2.0%	4.2%	15.8%	57.8%
82	6.2%	1.3%	0.3%	3.0%	1.4%	0.8%	0.0%	10.7%	0.4%	0.8%	0.0%	4.1%	6.2%	23.0%	41.8%
86	5.4%	0.0%	0.3%	1.6%	2.2%	0.9%	0.0%	6.7%	0.0%	0.0%	2.5%	3.3%	26.2%	12.1%	38.8%
87	4.1%	0.0%	0.3%	4.7%	1.3%	0.0%	0.0%	8.3%	0.0%	0.0%	0.4%	2.7%	25.3%	6.2%	46.7%
88	4.5%	0.0%	0.0%	2.9%	0.0%	0.5%	0.0%	8.9%	0.0%	0.1%	0.0%	4.6%	23.0%	16.7%	38.7%
89	1.8%	0.1%	0.1%	4.5%	0.2%	0.7%	0.3%	5.1%	0.0%	0.8%	0.3%	4.9%	9.5%	7.4%	64.3%
90	5.6%	0.0%	0.0%	1.7%	0.4%	0.6%	0.4%	12.1%	0.0%	0.0%	0.5%	3.9%	3.3%	5.2%	66.1%
91	6.2%	0.1%	0.0%	3.8%	0.5%	0.0%	0.9%	5.9%	0.0%	0.7%	0.0%	2.4%	15.8%	7.1%	56.6%
92	2.0%	0.0%	0.0%	3.8%	1.8%	0.0%	0.7%	6.1%	0.0%	0.0%	0.0%	2.9%	4.5%	23.4%	54.8%
93	3.6%	0.0%	2.3%	4.9%	0.0%	0.3%	0.0%	7.4%	0.0%	1.5%	0.0%	0.8%	6.6%	9.2%	63.4%
94	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%
95	6.9%	0.0%	3.7%	3.3%	0.0%	0.4%	0.0%	5.5%	0.0%	0.0%	0.0%	0.0%	0.0%	25.6%	54.5%
96	7.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.6%	0.9%	6.5%	83.0%
97	17.9%	0.0%	0.0%	4.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.9%	71.1%
98	13.3%	0.6%	0.0%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	1.2%	77.1%
99	4.3%	0.5%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	94.0%
(81-99)	6.4%	0.2%	0.5%	3.2%	0.6%	0.3%	0.2%	5.4%	0.0%	0.4%	0.2%	2.2%	8.1%	10.4%	62.0%
(85-99)	6.4%	0.1%	0.5%	3.2%	0.5%	0.2%	0.2%	4.9%	0.0%	0.3%	0.3%	2.1%	8.5%	9.1%	63.7%

Table H.54. Lewis River Wild distribution of total fishing mortalities 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
81	7.9%	0.0%	0.2%	3.7%	1.6%	0.2%	1.7%	7.1%	0.0%	0.7%	0.0%	2.5%	4.2%	16.3%	53.9%
82	7.7%	1.2%	0.4%	3.3%	1.5%	0.7%	0.0%	11.1%	0.4%	0.7%	0.0%	4.3%	6.0%	23.2%	39.4%
86	7.2%	0.0%	0.3%	2.1%	2.1%	1.0%	0.0%	7.9%	0.0%	0.0%	2.6%	3.7%	25.2%	12.0%	35.8%
87	5.8%	0.0%	0.3%	5.3%	1.4%	0.0%	0.0%	9.4%	0.0%	0.0%	0.4%	2.8%	24.6%	6.3%	43.4%
88	5.4%	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%
89	2.4%	0.2%	0.1%	5.2%	0.2%	0.7%	0.3%	5.9%	0.0%	0.8%	0.3%	5.5%	9.4%	7.6%	61.3%
90	7.9%	0.0%	0.0%	1.9%	0.5%	0.7%	0.4%	13.4%	0.0%	0.0%	0.5%	4.1%	3.2%	5.4%	62.0%
91	7.3%	0.3%	0.0%	4.1%	0.4%	0.0%	1.0%	6.4%	0.0%	0.7%	0.0%	2.5%	15.5%	7.3%	54.5%
92	2.2%	0.0%	0.0%	4.1%	1.9%	0.0%	0.7%	6.7%	0.0%	0.0%	0.0%	3.1%	4.5%	24.3%	52.4%
93	4.4%	0.0%	2.7%	5.6%	0.0%	0.2%	0.0%	8.2%	0.0%	1.5%	0.0%	1.5%	6.5%	9.4%	60.0%
94	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%
95	8.1%	0.0%	3.7%	4.1%	0.0%	0.6%	0.0%	6.6%	0.0%	0.2%	0.0%	0.0%	0.0%	25.8%	51.0%
96	8.5%	0.0%	0.0%	0.3%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	2.8%	0.8%	6.9%	80.4%
97	22.2%	0.0%	0.0%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	66.5%
98	14.1%	1.2%	0.0%	6.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	1.2%	75.3%
99	4.9%	0.5%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	93.5%
(81-99)	7.8%	0.2%	0.5%	3.7%	0.6%	0.3%	0.3%	6.1%	0.0%	0.4%	0.2%	2.4%	7.8%	10.6%	59.0%
(85-99)	7.8%	0.2%	0.5%	3.8%	0.5%	0.3%	0.2%	5.6%	0.0%	0.3%	0.3%	2.3%	8.2%	9.3%	60.7%

Table H.55. Columbia River Upriver Bright distribution of 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: Canada Net	Other Fisheries: Canada Sport	Other Fisheries: U.S. Troll	Other Fisheries: U.S. Net	Other Fisheries: U.S. Sport	Escapement
79	19.2%	0.3%	0.6%	7.5%	3.9%	3.6%	0.1%	11.7%	0.5%	0.7%	0.0%	1.3%	22.6%	1.8%	26.2%
80	20.9%	0.5%	0.8%	6.5%	1.6%	1.7%	0.1%	7.3%	1.0%	0.2%	0.0%	1.1%	6.4%	1.8%	50.2%
81	16.2%	0.0%	0.4%	5.5%	1.1%	1.3%	0.0%	3.7%	0.4%	0.5%	0.2%	0.5%	3.6%	1.0%	65.6%
82	6.4%	0.4%	0.4%	3.5%	0.2%	1.1%	0.1%	4.6%	0.0%	0.4%	0.0%	0.6%	2.5%	0.7%	79.1%
83	15.9%	0.2%	0.6%	10.6%	1.8%	3.5%	0.4%	3.5%	0.2%	0.1%	0.0%	0.4%	8.1%	0.0%	54.8%
84	14.9%	1.1%	1.0%	8.5%	2.0%	1.5%	0.2%	7.1%	0.2%	0.8%	0.2%	0.2%	15.1%	1.7%	45.7%
85	9.3%	1.2%	0.7%	8.8%	0.8%	1.3%	0.0%	7.8%	0.1%	1.2%	0.1%	0.4%	32.6%	4.5%	31.3%
86	11.1%	0.7%	0.8%	7.8%	1.2%	1.0%	0.0%	6.1%	0.1%	0.2%	0.1%	0.7%	32.7%	2.3%	35.2%
87	14.5%	0.4%	0.9%	12.2%	1.8%	0.6%	0.1%	7.7%	0.0%	0.1%	0.2%	1.4%	34.6%	3.6%	21.8%
88	10.3%	0.7%	0.7%	7.4%	0.6%	0.6%	0.0%	11.1%	0.0%	0.1%	0.0%	2.1%	46.9%	2.6%	16.7%
89	11.6%	0.0%	1.3%	14.6%	0.2%	0.7%	0.4%	7.5%	0.0%	0.7%	0.0%	1.2%	41.5%	2.0%	18.2%
90	12.9%	0.0%	1.1%	9.4%	0.7%	0.7%	0.0%	7.7%	0.0%	0.0%	0.0%	1.1%	32.1%	2.2%	32.0%
91	5.7%	0.3%	0.7%	5.4%	0.0%	0.0%	0.0%	8.1%	0.0%	0.0%	0.0%	0.7%	17.9%	4.1%	57.1%
92	3.3%	0.0%	1.2%	2.7%	0.0%	2.1%	0.0%	10.4%	0.0%	0.6%	0.6%	0.0%	15.4%	6.2%	57.6%
93	10.6%	0.0%	0.0%	6.4%	0.0%	0.4%	0.7%	16.2%	0.0%	0.0%	0.0%	1.6%	14.9%	6.2%	43.0%
94	9.7%	0.9%	0.0%	7.8%	0.2%	0.9%	1.0%	6.7%	0.0%	0.0%	0.3%	0.0%	13.9%	3.4%	55.2%
95	7.2%	0.1%	1.3%	1.9%	0.0%	0.4%	0.0%	4.9%	0.0%	0.0%	0.0%	0.7%	9.1%	4.0%	70.5%
96	3.2%	0.0%	0.0%	0.0%	0.0%	0.2%	0.4%	0.0%	0.0%	0.0%	0.0%	0.8%	20.3%	5.1%	70.0%
97	10.4%	0.3%	2.4%	4.2%	0.2%	0.0%	0.7%	0.5%	0.0%	0.0%	0.4%	0.9%	19.0%	13.7%	47.3%
98	6.4%	1.2%	1.3%	2.1%	0.0%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	11.3%	5.4%	71.6%
99	1.7%	0.0%	2.9%	7.7%	0.0%	0.0%	0.7%	0.2%	0.5%	0.0%	0.3%	1.3%	15.0%	7.5%	62.3%
(79-99)	10.5%	0.4%	0.9%	6.7%	0.8%	1.0%	0.3%	6.3%	0.1%	0.3%	0.1%	0.8%	19.8%	3.8%	48.2%
(85-99)	8.5%	0.4%	1.0%	6.5%	0.4%	0.6%	0.3%	6.3%	0.0%	0.2%	0.1%	0.9%	23.8%	4.9%	46.0%

Table H.56. Columbia River Upriver Bright distribution of total fishing mortalities 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
79	19.8%	0.4%	0.7%	7.7%	4.0%	3.7%	0.1%	12.0%	0.5%	0.7%	0.0%	1.3%	22.1%	2.0%	25.3%
80	21.9%	0.5%	0.8%	6.8%	1.7%	1.7%	0.1%	7.6%	1.1%	0.2%	0.0%	1.1%	6.3%	1.9%	48.3%
81	17.4%	0.0%	0.5%	5.7%	1.1%	1.3%	0.0%	3.9%	0.3%	0.5%	0.2%	0.6%	3.6%	1.1%	63.9%
82	9.0%	0.4%	0.5%	4.0%	0.3%	1.1%	0.2%	5.1%	0.0%	0.5%	0.0%	0.8%	2.5%	0.7%	74.9%
83	22.3%	0.3%	0.7%	11.6%	1.9%	3.3%	0.4%	3.8%	0.3%	0.1%	0.0%	0.4%	7.3%	0.0%	47.6%
84	18.0%	1.0%	1.6%	9.6%	2.2%	1.4%	0.2%	8.0%	0.2%	0.8%	0.2%	0.2%	14.2%	2.0%	40.4%
85	13.1%	2.1%	0.9%	8.9%	0.8%	1.3%	0.0%	8.0%	0.1%	1.1%	0.1%	0.5%	30.7%	4.5%	28.0%
86	13.1%	1.4%	0.9%	8.0%	1.2%	1.0%	0.0%	6.6%	0.1%	0.2%	0.1%	0.8%	31.4%	2.5%	32.8%
87	19.3%	0.9%	0.9%	12.9%	1.9%	0.6%	0.1%	8.4%	0.0%	0.1%	0.2%	1.5%	30.9%	3.4%	18.9%
88	11.6%	2.1%	0.8%	7.9%	0.6%	0.6%	0.0%	12.1%	0.0%	0.1%	0.0%	2.2%	44.0%	2.7%	15.4%
89	14.0%	0.0%	1.3%	15.0%	0.2%	0.7%	0.4%	7.9%	0.0%	0.7%	0.0%	1.2%	39.6%	2.0%	17.0%
90	13.6%	0.0%	1.2%	10.3%	0.8%	0.7%	0.0%	8.3%	0.0%	0.0%	0.0%	1.2%	31.0%	2.4%	30.5%
91	7.2%	1.3%	0.9%	6.3%	0.0%	0.0%	0.0%	9.4%	0.0%	0.0%	0.0%	0.9%	17.2%	4.1%	52.8%
92	4.1%	0.0%	1.7%	3.3%	0.0%	2.2%	0.0%	12.2%	0.0%	0.6%	0.8%	0.0%	15.2%	6.4%	53.6%
93	16.0%	0.0%	0.0%	7.3%	0.0%	0.3%	0.6%	17.9%	0.0%	0.0%	0.0%	1.6%	13.4%	5.7%	37.3%
94	11.5%	1.8%	0.0%	8.3%	0.2%	0.9%	1.0%	7.2%	0.0%	0.0%	0.3%	0.0%	13.3%	3.4%	52.1%
95	8.9%	0.2%	1.9%	2.5%	0.0%	0.5%	0.0%	6.6%	0.0%	0.0%	0.0%	0.7%	8.9%	4.1%	65.8%
96	4.9%	0.0%	0.0%	0.1%	0.0%	0.2%	0.6%	0.0%	0.0%	0.0%	0.0%	0.9%	20.7%	5.4%	67.2%
97	11.9%	0.4%	3.0%	4.6%	0.2%	0.0%	0.9%	0.5%	0.0%	0.1%	0.4%	1.0%	18.4%	13.9%	44.6%
98	7.9%	3.7%	1.9%	2.6%	0.0%	0.0%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	11.1%	5.5%	66.8%
99	2.2%	0.0%	3.1%	8.8%	0.0%	0.0%	0.7%	0.1%	0.5%	0.0%	0.3%	1.4%	14.9%	7.7%	60.1%
(79-99)	12.7%	0.8%	1.1%	7.2%	0.8%	1.0%	0.3%	6.9%	0.1%	0.3%	0.1%	0.9%	18.9%	3.9%	44.9%
(85-99)	10.6%	0.9%	1.2%	7.1%	0.4%	0.6%	0.3%	7.0%	0.0%	0.2%	0.1%	0.9%	22.7%	4.9%	42.9%

Table H.57. Hanford Wild Brights distribution of reported catch 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
90	8.2%	0.4%	0.0%	4.2%	0.4%	0.4%	0.0%	8.2%	0.0%	0.2%	0.9%	0.4%	22.0%	6.9%	47.7%
91	7.6%	0.0%	1.2%	8.2%	0.1%	0.0%	0.4%	4.2%	0.7%	0.0%	0.0%	0.9%	20.5%	3.9%	52.4%
92	15.6%	1.3%	1.3%	5.5%	0.0%	0.0%	0.0%	15.0%	0.0%	0.0%	0.0%	1.0%	17.3%	2.6%	40.4%
93	14.0%	0.0%	2.0%	2.8%	0.0%	0.5%	0.8%	5.1%	0.0%	1.8%	1.0%	3.6%	15.5%	7.9%	45.2%
94	13.9%	1.1%	0.0%	4.6%	0.3%	1.1%	0.0%	4.2%	0.0%	0.3%	0.0%	0.7%	11.9%	5.2%	56.8%
95	9.8%	0.0%	3.3%	3.8%	0.0%	0.0%	0.0%	2.0%	0.0%	0.0%	0.0%	0.0%	8.7%	6.3%	66.2%
96	9.5%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	26.0%	7.1%	56.9%
97	21.3%	0.9%	1.3%	5.1%	0.0%	0.0%	2.5%	1.1%	0.0%	0.0%	0.0%	1.3%	19.7%	3.6%	43.2%
98	18.2%	0.0%	0.0%	12.7%	0.0%	0.0%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	25.9%	4.1%	38.2%
99	8.4%	1.1%	1.8%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.8%	20.4%	51.6%
(90-99)	12.6%	0.5%	1.1%	5.4%	0.1%	0.2%	0.5%	4.0%	0.1%	0.2%	0.2%	0.8%	17.7%	6.8%	49.8%
(90-99)	12.6%	0.5%	1.1%	5.4%	0.1%	0.2%	0.5%	4.0%	0.1%	0.2%	0.2%	0.8%	17.7%	6.8%	49.8%

Table H.58. Hanford Wild Brights distribution of total fishing mortalities 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
90	9.1%	1.5%	0.4%	5.0%	0.4%	0.4%	0.0%	8.7%	0.0%	0.2%	0.8%	0.6%	21.2%	6.9%	44.7%
91	9.3%	0.0%	1.3%	8.9%	0.1%	0.0%	0.4%	4.5%	0.8%	0.0%	0.0%	1.0%	19.7%	4.0%	49.9%
92	17.5%	4.0%	1.4%	6.6%	0.0%	0.0%	0.0%	16.1%	0.0%	0.0%	0.0%	0.9%	15.5%	2.3%	35.6%
93	20.1%	0.0%	2.0%	2.9%	0.0%	0.5%	0.7%	5.9%	0.0%	1.6%	0.9%	3.6%	14.0%	7.7%	40.2%
94	16.7%	2.5%	0.0%	4.9%	0.2%	1.0%	0.0%	4.4%	0.0%	0.2%	0.0%	0.6%	11.2%	5.2%	53.0%
95	11.6%	0.0%	3.6%	4.8%	0.0%	0.0%	0.0%	2.6%	0.0%	0.3%	0.0%	0.0%	8.4%	6.3%	62.6%
96	12.3%	0.0%	0.0%	0.1%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.3%	7.3%	54.4%
97	23.2%	1.5%	1.5%	5.5%	0.0%	0.0%	2.7%	1.3%	0.0%	0.0%	0.0%	1.5%	18.7%	3.6%	40.6%
98	21.6%	0.0%	0.0%	15.1%	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	24.1%	4.1%	34.3%
99	11.0%	2.6%	1.9%	7.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.4%	20.1%	47.7%
(90-99)	15.2%	1.2%	1.2%	6.1%	0.1%	0.2%	0.5%	4.3%	0.1%	0.2%	0.2%	0.8%	16.8%	6.7%	46.3%
(90-99)	15.2%	1.2%	1.2%	6.1%	0.1%	0.2%	0.5%	4.3%	0.1%	0.2%	0.2%	0.8%	16.8%	6.7%	46.3%

Table H.59. Salmon River distribution of 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: Canada Net	Other Fisheries: Canada Sport	Other Fisheries: U.S. Troll	Other Fisheries: U.S. Net	Other Fisheries: U.S. Sport	Escapement
81	14.3%	0.0%	0.4%	27.9%	0.6%	1.8%	0.0%	3.7%	0.0%	0.0%	0.7%	1.3%	0.0%	17.1%	32.1%
82	10.7%	1.6%	0.3%	14.4%	1.1%	0.8%	0.0%	7.0%	0.0%	0.0%	0.0%	2.6%	0.0%	21.4%	40.1%
83	20.8%	0.6%	0.0%	21.4%	0.6%	0.0%	0.0%	10.4%	0.0%	0.0%	0.0%	0.0%	0.0%	15.6%	30.6%
84	10.9%	0.0%	0.1%	16.8%	3.5%	0.4%	0.0%	3.4%	0.0%	0.8%	0.0%	0.3%	0.4%	21.3%	42.2%
85	12.2%	6.3%	0.2%	19.1%	1.1%	0.3%	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	19.8%	39.6%
86	16.3%	0.0%	0.2%	8.8%	4.6%	0.6%	0.0%	2.1%	0.0%	0.0%	0.0%	0.0%	0.0%	16.0%	51.3%
87	10.4%	0.0%	0.3%	15.2%	0.4%	0.0%	0.0%	2.4%	0.0%	0.0%	0.0%	2.6%	0.0%	24.1%	44.7%
88	9.8%	0.0%	0.0%	6.4%	0.6%	0.0%	0.0%	3.9%	0.0%	0.0%	0.0%	0.8%	0.0%	15.9%	62.6%
89	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%
90	11.9%	0.7%	0.0%	10.7%	0.3%	0.7%	0.9%	7.8%	0.0%	0.3%	0.0%	3.1%	0.0%	25.7%	38.1%
91	18.5%	0.0%	0.5%	15.2%	0.1%	0.7%	0.7%	5.8%	0.0%	0.0%	0.0%	0.2%	0.0%	24.9%	33.5%
92	2.6%	0.6%	0.1%	6.6%	0.8%	0.4%	1.5%	15.4%	0.0%	0.0%	0.0%	1.8%	0.0%	16.0%	54.3%
93	7.7%	0.2%	0.1%	15.4%	0.2%	0.0%	0.8%	17.7%	0.0%	0.5%	0.0%	3.3%	0.0%	23.1%	30.9%
94	8.8%	0.2%	1.0%	14.9%	0.2%	0.1%	1.4%	4.7%	0.0%	0.0%	0.0%	1.5%	0.0%	17.9%	49.4%
95	6.9%	0.2%	0.6%	4.6%	0.1%	0.1%	0.6%	0.9%	0.0%	0.0%	0.1%	0.1%	0.0%	30.5%	55.3%
96	11.2%	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%	31.6%
97	27.7%	0.0%	1.7%	3.3%	0.1%	0.0%	0.3%	0.2%	0.0%	0.0%	0.0%	1.4%	0.0%	19.2%	46.1%
98	10.4%	0.4%	0.4%	11.3%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	32.6%	44.4%
99	11.7%	0.0%	0.0%	5.7%	0.0%	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	33.1%	47.5%
(81-99)	12.2%	0.6%	0.3%	12.1%	0.7%	0.3%	0.4%	4.8%	0.0%	0.1%	0.0%	1.5%	0.0%	23.8%	43.2%
(85-99)	11.6%	0.6%	0.3%	9.9%	0.6%	0.2%	0.5%	4.4%	0.0%	0.1%	0.0%	1.6%	0.0%	25.1%	45.1%

Table H.60. Salmon River distribution of total fishing mortalities 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
81	16.6%	0.0%	0.4%	28.8%	0.9%	1.9%	0.0%	4.2%	0.0%	0.0%	0.7%	1.5%	0.0%	16.4%	28.6%
82	15.0%	1.9%	0.4%	16.7%	1.2%	0.7%	0.0%	7.2%	0.0%	0.0%	0.0%	2.4%	0.0%	20.1%	34.5%
83	27.1%	0.7%	0.0%	20.8%	0.7%	0.0%	0.0%	9.7%	0.0%	0.0%	0.0%	0.0%	0.0%	14.4%	26.5%
84	12.5%	0.0%	0.2%	17.7%	3.4%	0.4%	0.0%	3.5%	0.0%	0.7%	0.0%	0.2%	0.4%	21.6%	39.4%
85	15.3%	11.7%	0.1%	18.0%	1.1%	0.3%	0.0%	1.6%	0.0%	0.0%	0.0%	0.1%	0.0%	18.5%	33.2%
86	23.5%	0.0%	0.2%	11.0%	4.3%	0.5%	0.0%	3.0%	0.0%	0.0%	0.0%	0.5%	0.0%	14.6%	42.4%
87	17.7%	0.0%	0.2%	15.5%	0.5%	0.0%	0.0%	2.7%	0.0%	0.0%	0.0%	2.5%	0.0%	22.3%	38.5%
88	15.4%	0.0%	0.0%	8.7%	0.9%	0.0%	0.0%	5.1%	0.0%	0.0%	0.0%	0.9%	0.0%	15.1%	53.8%
89	19.0%	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%	35.3%
90	18.7%	2.0%	0.0%	13.0%	0.3%	0.6%	0.8%	8.0%	0.0%	0.2%	0.0%	3.0%	0.0%	22.5%	30.9%
91	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%	22.8%	28.2%
92	4.9%	1.8%	0.2%	8.4%	0.9%	0.3%	1.8%	17.7%	0.0%	0.0%	0.0%	2.0%	0.0%	15.1%	46.8%
93	11.2%	0.6%	0.1%	17.7%	0.2%	0.0%	0.8%	19.2%	0.0%	0.4%	0.0%	3.3%	0.0%	20.6%	25.8%
94	16.0%	0.4%	1.0%	15.2%	0.2%	0.1%	1.5%	4.8%	0.0%	0.0%	0.0%	1.5%	0.0%	16.7%	42.8%
95	10.5%	0.2%	0.8%	6.8%	0.2%	0.1%	0.8%	1.2%	0.0%	0.0%	0.2%	0.1%	0.0%	29.6%	49.5%
96	20.2%	0.0%	0.0%	2.8%	0.0%	0.0%	0.1%	0.7%	0.0%	0.0%	0.0%	4.7%	0.0%	46.0%	25.5%
97	32.0%	0.0%	1.8%	3.5%	0.1%	0.0%	0.3%	0.2%	0.0%	0.0%	0.0%	1.5%	0.0%	18.7%	41.8%
98	12.2%	1.3%	0.5%	12.7%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	32.3%	40.6%
99	17.2%	0.1%	0.0%	6.6%	0.0%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	31.8%	42.2%
(81-99)	17.3%	1.1%	0.3%	13.5%	0.8%	0.3%	0.5%	5.3%	0.0%	0.1%	0.0%	1.5%	0.0%	22.1%	37.2%
(85-99)	17.2%	1.2%	0.4%	11.5%	0.6%	0.2%	0.6%	5.0%	0.0%	0.1%	0.0%	1.6%	0.0%	23.1%	38.5%

Appendix I. Abundance indices for the AABM fisheries.

Abundance Indices for 1979 through 2001 for SEAK, NBC, and WCVI.

Year	SEAK	NBC	WCVI
1979	0.98	1.05	1.10
1980	1.02	0.98	0.96
1981	0.92	0.94	0.95
1982	1.08	1.03	0.99
1983	1.22	1.15	0.81
1984	1.36	1.27	0.91
1985	1.27	1.26	0.92
1986	1.46	1.43	0.98
1987	1.72	1.70	1.30
1988	2.03	1.78	1.02
1989	1.82	1.65	0.90
1990	1.90	1.65	0.85
1991	1.87	1.53	0.72
1992	1.70	1.41	0.73
1993	1.72	1.42	0.66
1994	1.62	1.27	0.47
1995	1.07	0.94	0.38
1996	0.92	0.91	0.44
1997	1.27	1.12	0.53
1998	1.22	1.00	0.50
1999	1.12	0.97	0.50
2000	1.10	0.95	0.47
2001	1.14	1.02	0.66

Appendix J. Stock composition of the AABM fisheries.

LIST OF TABLES

Southeast Alaska All Gear

Model Stock	2000 Percent Fishery	Average (1985 - 1999) Percent Fishery	Percent Stock (C)	Percent Stock (C&E)	Escapement Indicator Stocks
Columbia Upriver Bright	24.38%	18.03%	27.20%	14.37%	Columbia Upriver Bright
WCVI Hatchery	4.56%	17.75%	34.73%	14.65%	NA
North/Central BC	22.39%	15.64%	33.72%	11.23%	Yakoun
					Nass
					Skeena
					Area 6 Index
					Area 8 Index
					Rivers Inlet
					Smith Inlet
Oregon Coastal North Migrating	11.59%	13.08%	28.42%	14.14%	Oregon Coastal
Fraser Early	6.26%	5.58%	20.42%	6.16%	Upper Fraser
					Middle Fraser
					Thompson
WCVI Wild	0.75%	4.91%	34.81%	14.50%	WCVI
Alaska South SE	7.72%	4.23%	95.86%	36.83%	King Salmon
					Andrew Creek
					Blossom
					Keta
					Unuk
					Chickamin
Mid-Columbia Brights	4.57%	4.02%	28.02%	11.09%	Not Represented
Upper Georgia Strait	6.05%	3.95%	32.12%	19.21%	Upper Georgia Strait
Washington Coastal Wild	2.71%	3.70%	14.32%	8.97%	Grays Harbor Fall
					Quillayute Fall
					Hoh Fall
					Queets Fall
WA Coastal Hatchery	1.29%	2.86%	13.51%	8.38%	NA
Willamette River Hatchery	2.07%	1.95%	8.82%	4.23%	NA
Columbia Upriver Summer	2.82%	1.52%	29.32%	9.85%	Columbia Upriver Summer
Lewis River Wild	0.43%	0.93%	13.54%	6.41%	Lewis River
Lower GS Hatchery	0.83%	0.44%	2.07%	1.38%	NA
Lower Georgia Strait	0.34%	0.33%	2.33%	1.53%	Lower Georgia Strait
Fraser Late	0.47%	0.24%	0.34%	0.13%	Harrison
Fall Cowlitz Hatchery	0.06%	0.17%	5.60%	2.35%	NA
PS Hatchery Fingerling	0.24%	0.16%	0.43%	0.25%	NA
Skagit Summer/Fall	0.12%	0.11%	3.35%	1.04%	Skagit Summer/Fall
Spring Cowlitz Hatchery	0.05%	0.09%	1.14%	0.76%	NA
Puget Sound Natural	0.06%	0.08%	0.42%	0.24%	Green
Stillaguamish Summer/Fall	0.08%	0.06%	11.91%	4.91%	Stillaguamish
Nooksack Fall	0.03%	0.05%	0.13%	0.10%	NA
Snake River Fall	0.06%	0.05%	7.29%	5.00%	Not Represented
Snohomish Summer/Fall	0.05%	0.04%	2.59%	0.84%	Snohomish
PS Yearling	0.04%	0.03%	0.47%	0.33%	NA
Nooksack Spring	0.00%	0.00%	0.00%	0.00%	Not Represented
Spring Creek Hatchery	0.00%	0.00%	0.00%	0.00%	NA
Lower Bonneville Hatchery	0.00%	0.00%	0.00%	0.00%	NA

North Troll and Sport

Model Stock	2000 Percent Fishery	Average (1985–1999) Percent Fishery	Percent Stock (C)	Percent Stock (C&E)	Escapement Indicator Stocks
North/Central BC	64.83%	30.07%	46.90%	16.33%	Yakoun
					Nass
					Skeena
					Area 6 Index
					Area 8 Index
					Rivers Inlet
					Smith Inlet
Oregon Coastal North Migrating	3.86%	16.25%	30.10%	15.92%	Oregon Coastal
Columbia Upriver Bright	5.26%	10.98%	14.13%	7.76%	Columbia Upriver Bright
WCVI Hatchery	0.66%	9.23%	14.38%	6.64%	NA
Fraser Early	1.66%	4.85%	15.99%	5.23%	Upper Fraser
					Middle Fraser
					Thompson
Washington Coastal Wild	0.89%	4.56%	15.17%	10.09%	Grays Harbor Fall
					Quillayute Fall
					Hoh Fall
					Queets Fall
Upper Georgia Strait	8.96%	4.25%	28.20%	17.34%	Upper Georgia Strait
Willamette River Hatchery	1.13%	3.98%	13.95%	7.40%	NA
WA Coastal Hatchery	0.43%	3.52%	14.97%	9.41%	NA
WCVI Wild	0.11%	2.52%	14.24%	6.49%	WCVI
Mid-Columbia Brights	1.02%	2.39%	14.55%	6.16%	Not Represented
Columbia Upriver Summer	2.94%	1.39%	20.99%	7.54%	Columbia Upriver Summer
Lower GS Hatchery	2.20%	1.33%	5.18%	3.50%	NA
Fraser Late	1.91%	0.93%	0.96%	0.43%	Harrison
Lower Georgia Strait	0.95%	0.92%	5.10%	3.48%	Lower Georgia Strait
Lewis River Wild	0.22%	0.46%	4.75%	2.67%	Lewis River
Skagit Summer/Fall	0.71%	0.45%	11.89%	3.79%	Skagit Summer/Fall
Nooksack Fall	0.57%	0.39%	0.83%	0.64%	NA
PS Hatchery Fingerling	0.70%	0.35%	0.76%	0.44%	NA
Spring Cowlitz Hatchery	0.09%	0.26%	2.64%	1.91%	NA
Snohomish Summer/Fall	0.32%	0.22%	10.76%	3.81%	Snohomish
Fall Cowlitz Hatchery	0.05%	0.16%	3.94%	1.88%	NA
Puget Sound Natural	0.14%	0.16%	0.67%	0.40%	Green
Alaska South SE	0.08%	0.13%	2.91%	1.05%	King Salmon
					Andrew Creek
					Blossom
					Keta
					Unuk
					Chickamin
PS Yearling	0.18%	0.13%	1.62%	1.15%	NA
Snake River Fall	0.02%	0.05%	6.80%	4.88%	Not Represented
Stillaguamish Summer/Fall	0.10%	0.05%	7.01%	3.03%	Stillaguamish
Spring Creek Hatchery	0.01%	0.01%	0.06%	0.05%	NA
Nooksack Spring	0.00%	0.01%	1.42%	0.57%	Not Represented
Lower Bonneville Hatchery	0.00%	0.00%	0.00%	0.00%	NA

Central Troll

	2000	Average (1985–1999)			
	Percent	Percent	Percent	Percent	
Model Stock	Fishery	Fishery	Stock (C)	Stock (C&E)	Escapement Indicator Stocks
Fraser Late	30.95%	21.91%	3.16%	1.85%	Harrison
WCVI Hatchery	4.13%	17.12%	4.75%	2.20%	NA
Columbia Upriver Bright	10.73%	8.18%	1.58%	0.91%	Columbia Upriver Bright
North/Central BC	10.18%	5.90%	2.10%	0.70%	Yakoun
					Nass
					Skeena
					Area 6 Index
					Area 8 Index
					Rivers Inlet
					Smith Inlet
Upper Georgia Strait	9.22%	4.83%	5.56%	3.53%	Upper Georgia Strait
WCVI Wild	0.69%	4.62%	4.66%	2.13%	WCVI
Lower Bonneville Hatchery	2.61%	4.56%	1.15%	0.63%	NA
Washington Coastal Wild	2.61%	3.35%	1.77%	1.22%	Grays Harbor Fall
					Quillayute Fall
					Hoh Fall
					Queets Fall
Fraser Early	4.40%	3.24%	1.61%	0.56%	Upper Fraser
					Middle Fraser
					Thompson
Lower GS Hatchery	4.68%	2.95%	2.00%	1.47%	NA
WA Coastal Hatchery	1.24%	2.64%	1.78%	1.12%	NA
Columbia Upriver Summer	4.81%	2.16%	5.27%	2.10%	Columbia Upriver Summer
Lower Georgia Strait	1.93%	1.89%	1.87%	1.41%	Lower Georgia Strait
Mid-Columbia Brights	2.06%	1.84%	1.74%	0.82%	Not Represented
Nooksack Fall	1.24%	1.68%	0.59%	0.49%	NA
Oregon Coastal North Migrating	1.65%	1.63%	0.52%	0.28%	Oregon Coastal
PS Hatchery Fingerling	2.48%	1.20%	0.42%	0.28%	NA
Skagit Summer/Fall	1.38%	0.89%	3.35%	1.35%	Skagit Summer/Fall
Puget Sound Natural	0.55%	0.62%	0.40%	0.28%	Green
Lewis River Wild	0.28%	0.59%	0.86%	0.53%	Lewis River
Snohomish Summer/Fall	0.69%	0.44%	2.67%	1.37%	Snohomish
PS Yearling	0.41%	0.32%	0.60%	0.48%	NA
Spring Creek Hatchery	0.41%	0.22%	0.15%	0.12%	NA
Willamette River Hatchery	0.28%	0.22%	0.13%	0.07%	NA
Spring Cowlitz Hatchery	0.14%	0.14%	0.21%	0.19%	NA
Stillaguamish Summer/Fall	0.14%	0.10%	2.65%	1.33%	Stillaguamish
Snake River Fall	0.14%	0.05%	1.03%	0.81%	Not Represented
Nooksack Spring	0.00%	0.02%	0.58%	0.28%	Not Represented
Fall Cowlitz Hatchery	0.00%	0.01%	0.06%	0.04%	NA
Alaska South SE	0.00%	0.00%	0.02%	0.01%	King Salmon
					Andrew Creek
					Blossom
					Keta
					Unuk
					Chickamin

WCVI Troll and Outside Sport

	2000	Average (1985–1999)			
	Percent	Percent	Percent	Percent	
Model Stock	Fishery	Fishery	Stock (C)	Stock (C&E)	Escapement Indicator Stocks
Fraser Late	31.20%	21.34%	21.53%	12.82%	Harrison
Lower Bonneville Hatchery	5.23%	16.45%	35.38%	19.07%	NA
Columbia Upriver Bright	13.11%	10.63%	15.28%	8.50%	Columbia Upriver Bright
PS Hatchery Fingerling	14.47%	7.94%	19.21%	12.74%	NA
WCVI Hatchery	0.80%	7.04%	12.47%	6.22%	NA
Nooksack Fall	3.96%	5.35%	13.90%	11.35%	NA
Oregon Coastal North Migrating	4.77%	4.76%	10.61%	5.58%	Oregon Coastal
Spring Creek Hatchery	4.88%	4.18%	18.11%	15.10%	NA
Puget Sound Natural	3.26%	4.01%	18.35%	12.82%	Green
Mid-Columbia Brights	2.68%	2.57%	16.70%	7.54%	Not Represented
Washington Coastal Wild	1.86%	2.02%	7.59%	5.17%	Grays Harbor Fall
					Quillayute Fall
					Hoh Fall
					Queets Fall
WCVI Wild	0.14%	1.92%	12.34%	6.05%	WCVI
Columbia Upriver Summer	3.17%	1.63%	28.90%	11.17%	Columbia Upriver Summer
WA Coastal Hatchery	0.86%	1.60%	7.69%	4.91%	NA
Willamette River Hatchery	2.00%	1.54%	6.04%	3.51%	NA
Fraser Early	1.27%	1.25%	4.37%	1.47%	Upper Fraser
					Middle Fraser
					Thompson
Fall Cowlitz Hatchery	0.25%	0.91%	30.23%	15.89%	NA
PS Yearling	1.00%	0.87%	12.17%	9.62%	NA
Skagit Summer/Fall	1.01%	0.81%	22.28%	8.75%	Skagit Summer/Fall
Lewis River Wild	0.94%	0.77%	10.64%	6.03%	Lewis River
Spring Cowlitz Hatchery	0.36%	0.53%	5.79%	5.18%	NA
Lower GS Hatchery	0.69%	0.42%	1.88%	1.36%	NA
Snohomish Summer/Fall	0.58%	0.40%	17.79%	8.67%	Snohomish
North/Central BC	0.52%	0.32%	0.72%	0.24%	Yakoun
					Nass
					Skeena
					Area 6 Index
					Area 8 Index
					Rivers Inlet
					Smith Inlet
Lower Georgia Strait	0.30%	0.30%	1.83%	1.37%	Lower Georgia Strait
Snake River Fall	0.33%	0.22%	29.37%	22.50%	Not Represented
Stillaguamish Summer/Fall	0.17%	0.10%	16.47%	8.12%	Stillaguamish
Upper Georgia Strait	0.11%	0.08%	0.73%	0.46%	Upper Georgia Strait
Nooksack Spring	0.08%	0.04%	10.10%	4.75%	Not Represented
Alaska South SE	0.00%	0.00%	0.00%	0.00%	King Salmon
					Andrew Creek
					Blossom
					Keta
					Unuk
					Chickamin

GS Sport and Troll

Model Stock	2000 Percent Fishery	Average (1985–1999) Percent Fishery	Percent Stock (C)	Percent Stock (C&E)	Escapement Indicator Stocks
Fraser Late	57.87%	49.33%	42.77%	24.41%	Harrison
Nooksack Fall	6.55%	10.98%	23.14%	18.38%	NA
Lower GS Hatchery	10.62%	9.64%	37.10%	26.58%	NA
Lower Georgia Strait	4.50%	7.11%	37.97%	27.88%	Lower Georgia Strait
PS Hatchery Fingerling	5.75%	4.41%	8.98%	5.70%	NA
Fraser Early	3.53%	3.56%	10.55%	3.14%	Upper Fraser
					Middle Fraser
					Thompson
Puget Sound Natural	1.19%	2.15%	8.20%	5.42%	Green
Upper Georgia Strait	3.26%	2.14%	14.63%	8.81%	Upper Georgia Strait
PS Yearling	1.81%	2.02%	22.46%	17.22%	NA
Lower Bonneville Hatchery	0.64%	1.93%	3.45%	1.57%	NA
Columbia Upriver Bright	0.82%	1.20%	1.42%	0.76%	Columbia Upriver Bright
Washington Coastal Wild	0.64%	1.07%	3.38%	2.17%	Grays Harbor Fall
					Quillayute Fall
					Hoh Fall
					Queets Fall
WA Coastal Hatchery	0.29%	0.84%	3.25%	2.06%	NA
Skagit Summer/Fall	0.69%	0.84%	20.11%	7.16%	Skagit Summer/Fall
WCVI Hatchery	0.19%	0.82%	1.45%	0.56%	NA
Snohomish Summer/Fall	0.37%	0.41%	17.67%	7.19%	Snohomish
Spring Creek Hatchery	0.37%	0.33%	1.27%	1.05%	NA
Mid-Columbia Brights	0.17%	0.30%	1.68%	0.70%	Not Represented
Nooksack Spring	0.31%	0.26%	54.55%	25.13%	Not Represented
WCVI Wild	0.03%	0.22%	1.44%	0.54%	WCVI
Stillaguamish Summer/Fall	0.19%	0.16%	23.93%	11.14%	Stillaguamish
Columbia Upriver Summer	0.14%	0.15%	2.45%	0.89%	Columbia Upriver Summer
Willamette River Hatchery	0.05%	0.06%	0.20%	0.11%	NA
Lewis River Wild	0.00%	0.02%	0.20%	0.13%	Lewis River
North/Central BC	0.00%	0.02%	0.08%	0.02%	Yakoun
					Nass
					Skeena
					Area 6 Index
					Area 8 Index
					Rivers Inlet
					Smith Inlet
Spring Cowlitz Hatchery	0.01%	0.02%	0.14%	0.11%	NA
Fall Cowlitz Hatchery	0.00%	0.00%	0.04%	0.03%	NA
Snake River Fall	0.00%	0.00%	0.10%	0.07%	Not Represented
Oregon Coastal North Migrating	0.00%	0.00%	0.00%	0.00%	Oregon Coastal
Alaska South SE	0.00%	0.00%	0.00%	0.00%	King Salmon
					Andrew Creek
					Blossom
					Keta
					Unuk
					Chickamin

Washington/Oregon Troll and Sport

	2000	Average (1985–1999)			
	Percent	Percent	Percent	Percent	
Model Stock	Fishery	Fishery	Stock (C)	Stock (C&E)	Escapement Indicator Stocks
Lower Bonneville Hatchery	10.07%	32.29%	34.77%	17.62%	NA
Fraser Late	34.50%	23.89%	11.20%	6.19%	Harrison
Spring Creek Hatchery	18.77%	15.64%	29.22%	24.85%	NA
Columbia Upriver Bright	7.65%	4.47%	2.98%	1.67%	Columbia Upriver Bright
PS Hatchery Fingerling	8.03%	3.99%	4.16%	2.59%	NA
Spring Cowlitz Hatchery	2.66%	3.53%	19.88%	15.36%	NA
Nooksack Fall 2.06%	2.47%	2.81%	2.25%	NA	
Fall Cowlitz Hatchery	0.82%	2.38%	35.40%	18.61%	NA
Oregon Coastal North Migrating	2.71%	1.95%	2.01%	1.03%	Oregon Coastal
Puget Sound Natural	1.79%	1.93%	3.96%	2.54%	Green
Willamette River Hatchery	2.52%	1.81%	3.32%	1.78%	NA
Lewis River Wild	2.37%	1.34%	9.45%	4.55%	Lewis River
Washington Coastal Wild	1.13%	1.11%	1.81%	1.19%	Grays Harbor Fall
					Quillayute Fall
					Hoh Fall
					Queets Fall
Mid-Columbia Brights	1.54%	1.08%	3.21%	1.39%	Not Represented
WA Coastal Hatchery	0.51%	0.90%	1.82%	1.13%	NA
Columbia Upriver Summer	1.19%	0.41%	3.30%	1.21%	Columbia Upriver Summer
Snake River Fall	0.67%	0.37%	20.62%	5.41%	Not Represented
PS Yearling	0.24%	0.15%	0.99%	0.74%	NA
Fraser Early	0.41%	0.15%	0.29%	0.09%	Upper Fraser
					Middle Fraser
					Thompson
Alaska South SE	0.20%	0.08%	0.82%	0.30%	King Salmon
					Andrew Creek
					Blossom
					Keta
					Unuk
					Chickamin
Lower GS Hatchery	0.11%	0.03%	0.07%	0.05%	NA
WCVI Hatchery	0.00%	0.03%	0.03%	0.01%	NA
Lower Georgia Strait	0.05%	0.02%	0.07%	0.05%	Lower Georgia Strait
WCVI Wild	0.00%	0.01%	0.03%	0.01%	WCVI
Skagit Summer/Fall	0.00%	0.00%	0.02%	0.01%	Skagit Summer/Fall
Snohomish Summer/Fall	0.00%	0.00%	0.02%	0.01%	Snohomish
Stillaguamish Summer/Fall	0.00%	0.00%	0.00%	0.00%	Stillaguamish
North/Central BC	0.00%	0.00%	0.00%	0.00%	Yakoun
					Nass
					Skeena
					Area 6 Index
					Area 8 Index
					Rivers Inlet
					Smith Inlet
Upper Georgia Strait	0.00%	0.00%	0.00%	0.00%	Upper Georgia Strait
Nooksack Spring	0.00%	0.00%	0.00%	0.00%	Not Represented