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JOINT CHINOOK TECHNICAL
COMMITTEE REPORT

ANNUAL EXPLOITATION RATE ANALYSIS
AND
MODEL CALIBRATION

REPORT TCCHINOOK (02)-3

October 23, 2002

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LIST OF ACRONYMS WITH DEFINITIONS

ADF&G	Alaska Department of Fish & Game	NMFS	National Marine Fisheries Service
AEQ	Adult Equivalent	NOC	Oregon Coastal North Migrating Stocks
AWG	Analytical Working Group of the CTC	NPS	North Puget Sound
C&S	Ceremonial & Subsistence	NPS-S/F	North Puget Sound Summer/Fall chinook stock
CBC	Central British Columbia Fishing area – Kitimat to Cape Caution	NR	Not Representative
CDFO	Canadian Department of Fisheries & Oceans	NWIFC	Northwest Indian Fisheries Commission
CNR	Chinook Nonretention	ODFW	Oregon Department of Fish & Wildlife
CR	Columbia River	OTAC	Outside Troll Advisory Committee
CRITFC	Columbia River Intertribal Fish Commission	PFMC	Pacific Fisheries Management Council
CTC	Chinook Technical Committee	PS	Puget Sound
CUS	Columbia Upriver Spring chinook stock	PSC	Pacific Salmon Commission
CWT	Coded Wire Tag	PSMFC	Pacific States Marine Fisheries Commission
ESA	U.S. Endangered Species Act	PST	Pacific Salmon Treaty
est+fw	Estuary Plus Fresh Water Area	QIN	Quinalt Indian Nation
FR	Fraser River	SEAK	Southeast Alaska – Cape Suckling to Dixon Entrance
GS	Strait of Georgia	SPS	South Puget Sound
IDFG	Idaho Department of Fish & Game	SPFI	Stratified Proportional Fishery Index
IDL	InterDam Loss	SSRAA	Southern Southeast Regional Aquaculture Association
LFR	Lower Fraser River	TBR	Transboundary Rivers
LGS	Lower Strait of Georgia	TBTC	Transboundary Technical Committee
mar	Marine Area	UFR	Upper Fraser River
mar+fw	Marine Plus Fresh Water Area	USFWS	U.S. Fish & Wildlife Service
MRP	Mark-Recovery Program	UW	University of Washington
MSY	Maximum Sustainable Yield for a stock, in adult equivalents	WA/OR	Ocean areas off Washington and Oregon North of Cape Falcon
MSY ER	Exploitation Rate at the MSY escapement level for a stock, in AEQs	WAC	North Washington Coastal Area (Grays Harbor northward)
NA	Not Available	WACO	Washington, Oregon, Columbia River chinook stock
NBC	Northern British Columbia – Dixon Entrance to Kitimat including Queen Charlotte Islands	WCVI	West Coast Vancouver Island - excluding Area 20
NCBC	North Central British Columbia - Dixon Entrance to Cape Caution	WDFW	Washington Department of Fisheries and Wildlife

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EXECUTIVE SUMMARY

This report contains the results of the Chinook Technical Committee (CTC) annual exploitation rate assessment and the final pre-season chinook model calibration for 2002 (CLB 0206). Results include the Abundance Indices (AIs) for the Aggregate Abundance Based Management (AABM) fisheries and Individual Stock Based Management (ISBM) Indices for each party, and a summary of pre-season forecast methods by stock.

AABM Abundance Indices and Associated Catches

The AIs for the three AABM fisheries Southeast Alaska All Gear (SEAK), Northern British Columbia Troll and Queen Charlotte Islands Sport (NBC), and West Coast Vancouver Island Troll and Outside Sport (WCVI) are presented in Table 1. The 1999 Agreement specified that the AABM fisheries were to be managed through the use of the AIs. Pre-season AIs are used to set allowable catch limits for management for the upcoming fishing season. Subsequently, post-season AIs (from the following year's calibration) are specified to be used to track overage and underage provisions. Each calibration provides the first post-season AIs for the previous year and the pre-season AIs for the current year. The first 2001 post-season AIs, and the 2002 pre-season AIs have now been finalized.

Table 1. Abundance Indices for 1999 to 2002 for the SEAK, NBC, and WCVI AABM fisheries.

Year	SEAK		NBC		WCVI	
	Pre-season	Post-season	Pre-season	Post-season	Pre-season	Post-season
1999	1.15	1.12	1.12	0.97	0.60	0.50
2000	1.14	1.10	1.00	0.95	0.54	0.47
2001	1.14	1.29	1.02	1.22	0.66	0.68
2002	1.74		1.45		0.95	

In general, the AIs for 1999 and 2000 are low compared to AIs in the late 1980s and early 1990s but values have increased in 2001 and 2002. The AI values in 2002 are comparable to the higher values in the time series. The Agreement specifies an allowable catch for each AI for each fishery. The specified treaty catch by fishery and year and the actual (observed) catches are shown in Table 2.

Table 2. Observed catches and post-season allowable catches for 1999 to 2001, and pre-season allowable catches for 1999 to 2002, for AABM fisheries in 1999 to 2002 (T=troll; N=net; S=sport).

Year	Pacific Salmon Treaty Allowable and Observed Catches								
	SEAK (T, N, S)			NBC (T, S)			WCVI (T, S)		
	Pre-Season Allowable Catch	Post-Season Allowable Catch	Observed Catch	Pre-Season Allowable Catch	Post-Season Allowable Catch	Observed Catch	Pre-Season Allowable Catch	Post-Season Allowable Catch	Observed Catch
1999	192,750	184,200	200,219	145,600	126,100	80,200	128,300	107,000	31,085
2000	189,900	178,500	186,835	130,000	123,500	35,900	115,500	86,200	100,030
2001	189,900	250,300	189,389	132,600	158,900	40,600	141,200	145,500	114,624
2002	356,500			192,700			203,200		

The 1999 Agreement specifies that overage/underage provisions apply to both AABM and ISBM fisheries. However, in a February 12, 2002 letter to the PSC, the CTC identified major technical obstacles and policy concerns for adjusting harvest levels in response to overage and underages. The major problem identified for AABM fisheries is the confounding of forecast and management error in assessing overages and underages. The pre-season estimates of abundance used to set management goals can be substantially different than the postseason estimates (Tables 1 and 2) due to forecast error. Pre-season target catch levels used to guide managers in setting harvest efforts thus can be quite different from allowable harvest derived from the first post-season calibration (Table 2). As a result, management precision during the fishery differs from the precision of attaining the postseason target. For example, in SEAK the observed catch has been within -1.6% to 3.8% of the pre-season target, but has ranged from 23.8% below to 8.7% above the postseason target.

Until an approach for full implementation has been developed and accepted by the PSC, the Commissioners have instructed the CTC to track overages and underages relative to agreed-upon harvest objectives. Table 3 shows the differential in AABM fisheries between the post-season allowable catch and the observed catch for 1999–2001, and the cumulative differential for those years. All three AABM fisheries have cumulative underages. In SEAK, observed catches have been below final allowable catches for one of the three years; the cumulative differential is -6.0%. In NBC, observed catches have been below the final allowable catches in all three years; the cumulative differential is -61.6%. In WCVI, observed catches have been below allowable catches for two of the three years; the cumulative differential is -27.4%.

Table 3. Differences between observed Treaty catch and the post-season Treaty allowances as number of fish and percentages of allowable catch for AABM fisheries in 1999 to 2001 (T=troll; N=net; S=sport).

Year	SEAK (T, N, S)		NBC (T, S)		WCVI (T, S)	
	Number of Fish	Percent Difference	Number of Fish	Percent Difference	Number of Fish	Percent Difference
1999	+16,019	+8.7%	-45,900	-36.4%	-75,915	-70.9%
2000	+8,335	+3.1%	-87,600	-70.9%	+13,830	+16.0%
2001	-60,911	-24.3%	-118,300	-74.4%	-30,876	-21.2%
Cum.	-36,557	-6.0%	-251,800	-61.6%	-92,961	-27.4%

ISBM Indices

For the ISBM fisheries, the Agreement specified that Canada and the United States would reduce base period exploitation rates on specified stocks by 36.5% and 40.0%, resulting in ISBM indices of 0.635 and 0.60 percent, respectively. This requirement is referred to as the ‘general obligation’ and does not apply to stocks that achieve their CTC agreed escapement goal. Estimated ISBM fishery indices are shown in Table 4 for Canadian fisheries and Table 5 for U.S. fisheries. Both tables present CWT-based indices for 1999 and 2000, and chinook model-based indices for 1999 through 2002. The agreement specifies that the indices be assessed post season using the CWT based estimates when available.

Both CWT and model based estimates of ISBM indices for a given year can change over time, with the largest changes occurring in more recent years. By necessity, CWT based estimates assume average maturation rates for incomplete broods which contribute to the index in a given year. For example, for calendar year 2000 only brood 1995 is complete ('true' maturation rates used). The youngest brood contributing to the year 2000 index, 1998, will not be complete until 2003, with the analysis done by the CTC in 2004. Other factors effecting the estimates include any changes to the historic CWT database, including the addition of previously unreported CWT recoveries, agency revised CWT expansion factors, or re-estimates of terminal harvest rates of wild stocks. Model based estimates will suffer similar instability, for similar reasons. In addition, model estimates are heavily influenced by pre-season forecasts of abundance at age, while post-season estimates can alter the index for a given year considerably. Model estimates are also influenced by the use of average maturation rates for recent broods and the re-estimation of terminal harvest of wild stocks. While both CWT and model estimates tend to 'stabilize' after two or three years, estimates will continue to vary to some degree as data is updated.

CWT Based Indices in 1999 and 2000

Canadian ISBM indices from the CWT-based estimates in 1999 and 2000 show that exploitation rates were reduced more than required under the agreement for all stocks or stock groups except for the North Puget Sound Natural Spring group. The 2000 index for this stock was 1.176, considerably above the 0.635 standard. While this stock did not meet its agency goal of 2,000 returning adults in the year 2000, the estimated Canadian ISBM index may be overestimated. It is heavily influenced by recoveries of brood year 1997 Nooksack spring fish in the Strait of Georgia sport fishery (64 of 66 Canadian recoveries occurred there). The 2001 return of Nooksack spring adults was the largest since at least 1984. If the CWTd component survived as well as the natural component of the stock, the estimated age-3 cohort size in 2000 will likely increase when the age-4 CWT data becomes available, and the corresponding ISBM index will decrease.

For U.S. fisheries in 1999, all CWT-based ISBM indices, except for the Stillaguamish River, Green River, and the Lewis River stocks were above the .60 standard. In 2000, the standard was again exceeded for all stocks except the Fraser Late stock, North Puget Sound Natural Spring stock group, and the Stillaguamish and Lewis River stocks. Of the stocks for which the index was exceeded, only the Fraser Late stock met its CTC accepted escapement goal in both 1999 and 2000. However, the Lower Georgia Strait stock group met the DFO interim escapement goal of 7,400 in both 1999 and 2000. Additionally, it is likely that the U.S. index of 3.50, for this stock group, is overestimated. The index is based on CWT recoveries from Capilano and Big Qualicum hatcheries during the base period, and Cowichan recoveries in recent years. These stocks may have dissimilar distributions in U.S. waters, (Cowichan fish being more southerly distributed and more likely to be impacted in U.S. fisheries. See Appendix H).

The estimated index for the North PS Natural Spring stock group of 0.81 in 1999 is based on a total of 17 estimated CWT recoveries in southern U.S. waters of Nooksack spring chinook. That estimate may also decrease as new information becomes available in 2001. While the Green River index in 2000 is 0.70, the Green River adult escapement was above the State-Tribal agreed goal of 5,750 that year.

All CWT-based ISBM indices for the Washington coastal fall natural stock group were above the standard in both 1999 and 2000. No CTC accepted escapement goals currently exist for these stocks, but agency goals are in place for all or most of the stocks in the group. Grays Harbor fall chinook have not met their agency goal of 14,600 natural spawners since 1997. The Queets River fall chinook stock met its management agency goal of 2,500 in 2000, but not in 1999 (1999 escapement was 1,933). The Hoh River fall chinook stocks showed the highest ISBM indices of the group, 1.71 in 1999 and 2.75 in 2000.

However, while there is not yet a CTC accepted goal, Hoh River fall chinook have met their management goal of 1,200 natural escapement every year since at least 1976. The Quillayute River fall chinook stock showed the second highest indices in both years. They have exceeded their management goal of 3,000 every year since 1977.

In the Columbia River, ISBM indices were above the standard for all stocks except the Lewis River Wilds. Southern U.S. fisheries were curtailed to protect this stock in 1999 and 2000 due to anticipated low returns. Lewis River wilds did not meet their CTC accepted escapement goal of 5,700 in 1999 (ISBM index of 0.00), but better than predicted returns in 2000 resulted in an escapement well over the goal. Spawning escapements of Upriver Bright chinook exceeded the management goal of 45,000 adults over McNary dam in both 1999 and 2000 by approximately one-third. Deschutes River fall chinook escapements both years were near 3,500, below the management goal of 4,000 adults. Escapements of Columbia Upriver Summer chinook also exceeded the CTC accepted goal in both years.

The CTC has accepted escapement goals for the three stocks in the Far North Migrating Oregon Coastal Fall stock group. All CWT based indices in 1999 and 2000 were above the 0.6 standard. However, all three stocks met or exceeded their goal, except the Nehalem River stock in 2000.

Predicted ISBM Indices for 2002

Predicted ISBM indices for 2002 based on outputs from calibration 0206 are all below 0.635 for Canadian ISBM fisheries for all stock groups.

For U.S. ISBM fisheries, the index for Fraser Late is predicted to be above 0.6. However, Fraser Late escapement is predicted to be well above the CTC accepted goal. Of the five stocks in the Puget Sound Natural Summer/Fall stock group, only the Lake Washington stock has an index predicted to be above the ISBM standard. No CTC accepted goal exists yet for this stock. The predicted exploitation rate on the stock, however, is well under the maximum allowable rate prescribed in the ESA Consultation standard.

Four of the five stocks included in the Washington Coastal Fall Natural stock group are predicted to have ISBM indices above the standard in 2002. None of these stock have CTC accepted goals at this time, and no preseason abundance or escapement predictors are available. Based on a review of the escapements of these stocks, and the generally good survival of chinook predicted on the west coast, it is unlikely that, with the possible exception of Grays Harbor, these stocks will fail to meet their management goals in 2002.

Of the four chinook stocks in the Columbia River, two have CTC accepted escapement goals (Lewis River and Upriver Summers), and both are predicted to exceed those goals in 2002. The indices for both of these stocks exceeds the standard. The index of the Upriver bright stock is also anticipated to exceed the standard. However, its management goal of 46,000 is predicted to be exceeded.

The ISBM indices are predicted to be above the standard for all three stocks in the Far North Migrating Oregon Coastal Fall Stock group. No abundance or escapement predictors are available for the individual stocks in this group. However, the predicted combined escapement of just under 74,000 is over three times the combined CTC accepted escapement goal of 22,858.

Table 4. ISBM Indices for Canadian fisheries, 1999 through 2001, and the projected indices for 2002. Indices above 0.635 are in italicized bold font for stocks without CTC agreed escapement goals and for stocks that did not achieve CTC agreed escapement goals.

Stock Group	Stock	Canadian ISBM Indices					
		CWT Indices ¹		Model Indices			
		1999	2000	1999	2000	2001	2002
North / Central B. C.	Yakoun, Nass, Skeena, Area 8	NA ²	NA	0.236	0.264	0.275	0.584
West Coast Vancouver Island	WCVI (Artlish, Burman, Gold, Kauok, Tahsis, Tashish, Marble)	0.295	0.083	0.543	0.334	0.242	0.342
Fraser Early	Upper Fraser, Mid Fraser, Thompson	NA	NA	0.139	0.119	0.107	0.145
Fraser Late	Harrison River ³	0.155	0.073	0.350	0.199	0.177	0.302
Upper Strait of Georgia	Klinaklini, Kakweikan, Wakeman, Kingcome, Nimpkish	0.194	0.123	0.193	0.121	0.140	0.272
Lower Strait of Georgia	Cowichan Nanaimo	0.346	0.196	0.533	0.510	0.512	0.541
		0.313	0.154	0.249	0.101	0.121	0.190
North PS Nat Springs	Nooksack, Skagit	0.312	<i>1.176</i>	0.257	0.145	0.164	0.195
Puget Sound Natural Summer / Falls	Skagit	NA	NA	0.203	0.113	0.130	0.172
	Stillaguamish	0.157	0.111	0.396	0.230	0.251	0.375
	Snohomish	NA	NA	0.204	0.109	0.119	0.176
	Lake Washington	NA	NA	0.375	0.185	0.213	0.275
	Green River	0.220	0.154	0.375	0.185	0.213	0.275
Washington Coastal Fall Naturals	Hoko, Grays Harbor, Queets, Hoh, Quillayute	NA	NA	0.209	0.154	0.170	0.292
Col River Falls	Upriver Brights	NA	NA	0.138	0.129	0.140	0.429
	Deschutes	NA	NA	0.138	0.129	0.140	0.429
	Lewis ³	NA	NA	0.056	0.054	0.050	0.171
Col R Summers	Mid-Col Summers ³	NA	NA	0.135	0.106	0.097	0.198
Far North Migrating OR Coastal Falls	Nehalem ³ , Siletz ³ , Siuslaw ³	NA	NA	0.090	0.132	0.148	0.514

¹ The CWT based estimates, not the model estimates, are to be used in post season assessments.

² NA means not available because of insufficient data (lack of stock specific tag codes, base period CWT recoveries, etc).

³ Stock or stock group with agreed escapement goal.

Table 5. ISBM indices for U.S. fisheries, 1999 through 2001, and the projected indices for 2002. Indices above 0.60 are in italicized bold font for stocks without CTC agreed escapement goals and for stocks that did not achieve CTC agreed escapement goals.

Stock Group	Stock	US ISBM Fisheries					
		CWT Indices ¹		Model Indices			
		1999	2000	1999	2000	2001	2002
North / Central B. C.	Yakoun, Nass, Skeena, Area 8	NA ²	NA	NC ³	NC	NC	NC
West Coast Vancouver Island ⁴	WCVI (Artlish, Burman, Gold, Kauok, Tahsis, Tashish, Marble)	NA	NA	0.28	0.44	0.28	0.27
Fraser Early	Upper Fraser, Mid Fraser, Thompson	NA	NA	0.09	0.20	0.11	0.15
Fraser Late	Harrison River ⁵	0.73	0.13	0.745	0.41	0.41	0.72
Upper Strait of Georgia	Klinaklini, Kakweikan, Wakeman, Kingcome, Nimpkish	NA	NA	NC	NC	NC	NC
Lower Strait of Georgia	Cowichan, Nanaimo	3.50	0.69	0.19	0.22	0.18	0.22
North PS Nat Springs	Nooksack	0.81	0.00	0.16	0.24	0.13	0.00
	Skagit	NA	NA	ID ⁶	ID	ID	0.06
Puget Sound Natural Summer / Falls	Skagit	NA	NA	0.18	0.10	0.13	0.27
	Stillaguamish	0.10	0.04	0.16	0.15	0.11	0.20
	Snohomish	NA	NA	0.05	0.04	0.04	0.15
	Lake Washington	NA	NA	ID	ID	ID	1.25
	Green R	0.59	0.70	ID	ID	ID	0.35
Washington Coastal Fall Naturals	Hoko	NA	NA	0.43	0.33	0.30	0.48
	Grays Harbor	0.73	1.63	0.68	0.92	0.83	0.84
	Queets	0.95	0.85	0.88	0.15	0.87	1.05
	Hoh	1.71	2.75	1.40	1.21	1.25	1.26
	Quillayute	1.48	2.47	1.15	0.85	1.30	1.31
Col River Falls	Upriver Brights	1.46	2.53	1.10	1.07	0.77	0.91
	Deschutes	0.74	0.71	0.70	0.61	0.49	0.55
	Lewis ⁵	0.00	0.36	0.14	0.13	0.66	0.93
Col R Summers	Mid-Col Summers ⁵	2.08	4.82	0.46	0.32	0.40	0.82
Far North Migrating OR Coastal Falls	Nehalem ⁵	1.46	1.97	2.09	2.40	2.50	2.61
	Siletz ⁵	1.07	1.16	1.23	1.26	1.29	1.33
	Siuslaw ⁵	1.03	2.45	1.54	3.03	3.19	3.34

¹ The CWT based estimates, not the model estimates, are to be used in post season assessments.

² NA means not available because of insufficient data (lack of stock specific tag codes, base period CWT recoveries, etc).

³ NC means that the current model assumes the stock is not caught in U.S. ISBM fisheries.

⁴ Stock group not in Annex Table V.

⁵ Stock with agreed escapement goal.

⁶ ID means insufficient data available to estimate stock specific impacts.

Overages and Underages

The agreement specifies that overages be accounted for in ISBM fisheries, as well as in AABM fisheries. Estimates of the indices based upon CWTs versus the CTC model based indices can vary substantially. Pre-season ISBM projections for 2002 provide a caution to management agencies for pre-season planning, but there can be considerable uncertainty associated with them. In 2001, the CTC developed several options for implementing overage/underage provisions in both AABM and ISBM fisheries, and presented the options to the PSC commissioners. The commissioners directed the CTC to monitor and report the indices for evaluation by the PSC commissioners. The number of stocks without CTC-accepted escapement goals emphasizes the need for agencies to provide biologically-based escapement goals and supporting documentation for CTC review.

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 34% to 412% while the average accuracy has ranged from 51% to 175% during the period of 1998–2001. Forecasts for the major production stocks suggest that chinook abundance in 2002 will be greater than that reported for 2001.

The detailed description of trends in escapement has been summarized in the CTC Catch and Escapement report, covering data through 2001 (CTC 2002). The escapement review includes 51 naturally spawning escapement indicator stocks/stock aggregates. Biologically-based escapement goals have been accepted by the CTC for 16 of the 51 escapement indicator stocks/stock aggregates. For 11 of these stocks, the agreed escapement goal is defined as a range; for the remaining 5 stocks, the escapement goal is the point estimate of S_{MSY} (escapement producing maximum sustained yield). In 2001, escapements were within the goal range for 6 stocks, above the range or S_{MSY} point estimate for 9 stocks, and below the goal range for 1 stock.

1. INTRODUCTION

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

This annual report describes the methods and results of 1) the cohort analysis used to estimate exploitation rates from Coded-Wire-Tag (CWT) data, and 2) the chinook model calibration. The results of this 2002 pre-season calibration (CLB 0206) are based on completion of the CWT exploitation rate analysis for indicator stocks through 2000 fisheries, coastwide data on catch, spawning escapements and age structure through 2001, and forecasts of chinook returns expected in 2002. The results reported include:

- ◆ estimates of the abundance indices for the years 1979 through 2001 and a projection for 2002 for the AABM fisheries,
- ◆ estimates of the non-ceiling indices, referred to as the ISBM indices in this report, for 1999 to 2001 and projections for the 2002 ISBM fisheries,
- ◆ estimates for 1979 through 2001 and a projection for 2002 of stock composition in the AABM and other fisheries,
- ◆ the distribution of landed and total fishing mortality in all fisheries for the indicator stocks,
- ◆ estimates of harvest rates (fishery indices) in the AABM fisheries,
- ◆ forecast methods and results for selected stocks, and
- ◆ survival indices for selected stocks.

Note that the Chinook Technical Committee provided preseason AIs for the AABM fisheries in a memorandum to the Commission, dated April 24, 2002, based on a calibration approved at that time (CLB 0204). Subsequently, errors were found in the cohort analysis and other data, as noted in Appendix M. The CTC reconciled data deficiencies to produce the calibration reported in this document. The AIs for the AABM fisheries for 2002 are identical for CLBs 0204 and 0206.

2. METHODS

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

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

Results from the annual pre-season calibration of the chinook model are used to calculate: (a) AIs for the three AABM fisheries to determine the allowable 2002 catch of Treaty chinook; (b) the post-season AIs for previous years; and (c) pre-season and post-season ISBM indices.

Projected AIs for 2002 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 and Abundance Indices. The post-season AIs can be used to evaluate compliance for purposes of the overage-underage provision for AABM fisheries.

For the ISBM fisheries, the Agreement specifies that Canada and the United States will reduce the exploitation rate from the 1979–1982 base period by 36.5% and 40.0%, respectively, on stocks that have not achieved their CTC agreed escapement goals. The ISBM Index is used to estimate the annual reduction in exploitation rates relative to the base period. Post-season ISBM indices for 1999 and 2000 are computed using results of the exploitation rate analysis, but are preliminary since Adult Equivalent (AEQ) rates and cohort sizes at age cannot be finally estimated until all broods that contributed to the 1999 and 2000 fisheries are complete (e.g. the 1999 ISBM indices will not stabilize until 2004). The 1999 to 2002 ISBM indices are also computed using the CTC model. However, the Agreement specifies that the ISBM indices estimated through exploitation rate analysis will be used for final post-season assessment.

2.1. Exploitation Rate Assessment (Through Calendar Year 2000)

The Exploitation Rate (ER) 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 AEQs. Statistics reported in the Exploitation Rate Assessment are based on cohort analysis. Cohort analysis simply reconstructs the production of a CWT group by starting with the escapement, catch, and incidental fishing mortality of the oldest age class and working backwards in time to calculate the total abundance of ocean age-2 chinook before the beginning of fishing. These reconstructions are based on estimated CWT recoveries by stock, brood year, and age in fisheries and escapements.

The CTC currently monitors 41 CWT indicator stocks, but only 33 were used for analyses in this chapter. A listing of the 41 CWT indicator stocks is provided in Table 2.1. Those used for exploitation rate analysis and the type of analysis performed for 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 for each 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.

Table 2.1. CWT 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
	Atnarko ¹	North/Central BC	Spring/Summer	Age 0
	Kitimat River ¹	North/Central BC	Summer	Age 0
	Robertson Creek	WCVI	Fall	Age 0
	Quinsam	Georgia Strait	Fall	Age 0
	Puntledge	Georgia Strait	Summer	Age 0
	Big Qualicum	Georgia Strait	Fall	Age 0
	Cowichan	Georgia Strait	Fall	Age 0
	Chehalis (Harrison Stock) ¹	Lower Fraser River	Fall	Age 0
	Chilliwack (Harrison Stock)	Lower Fraser River	Fall	Age 0
Puget Sound	South Puget Sound Fall Yearling	South Puget Sound	Summer/Fall	Age 1
	Squaxin Pens Fall Yearling	South Puget Sound	Summer/Fall	Age 1
	University of 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
	Nooksack Fall Fingerling	North Puget Sound	Summer/Fall	Age 0
	Skagit Spring Yearling	Central Puget Sound	Spring	Age 1
	Nooksack Spring Yearling	North Puget Sound	Spring	Age 1
	White River Spring Yearling	South Puget Sound	Spring	Age 1
Washington Coast	Sooes Fall Fingerling	North Wash. Coast	Fall	Age 0
	Queets Fall Fingerling	North Wash. Coast	Fall	Age 0
Columbia River	Cowlitz Tule	Columbia R. (WA)	Fall Tule	Age 0
	Spring Creek Tule	Columbia R. (WA)	Fall Tule	Age 0
	Columbia Lower River Hatchery	Columbia River (OR)	Fall Tule	Age 0
	Upriver Bright	Upper Columbia R.	Fall Bright	Age 0
	Hanford Wild	Upper Columbia R.	Fall Bright	Age 0
	Leavenworth Spring ²	Upper Columbia R.	Spring	Age 1
	Lewis River Wild	Lower Columbia R.	Fall Bright	Age 0
	Lyons Ferry ³	Snake River	Fall Bright	Age 0
	Willamette Spring	Lower Columbia R.	Spring	Age 1
	Summers	Columbia R. (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 Subyearlings have been CWTd 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 Exp = brood exploitation rates; Distn = stock catch distribution, Esc = quantitative estimates of escapement. Base Tagging = data are 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 ¹	yes	yes	yes	yes
Quinsam	yes	yes	Total	yes	yes	yes	yes
Puntledge	yes	—	Total	yes	yes	yes	yes
Big Qualicum	yes	yes	Total	yes	yes	yes	yes
Cowichan	yes	yes	Total	yes	yes	yes	—
Chilliwack (Harrison Fall Stock)	—	yes	Total	yes	yes	yes	—
South Puget Sound Fall Yearling	yes	²	²	yes	yes	yes ³	yes
Squaxin Pens Fall Yearling	—	²	²	yes	yes	yes ³	—
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	yes	yes	yes	yes
Spring Creek Tule	yes	—	²	yes	yes	yes	—
Columbia Lower River Hatchery	yes	—	²	yes	yes	yes	yes
Upriver Bright	yes	yes	Both	yes	yes	yes	yes
Hanford Wild	—	—	—	yes	yes	yes	—
Lewis River Wild	yes	yes	Both	yes	yes	yes	yes
Lyons Ferry	—	—	—	yes	yes	yes	—
Columbia Summers	yes	yes	—	yes	yes	yes	—
Willamette Spring	yes	—	²	yes	yes	yes	yes
Salmon River	yes	yes	Ocean	yes	yes	yes	yes

1 For stocks of hatchery origin and subject to terminal fisheries directed at harvesting surplus hatchery production. Ocean fisheries do not include terminal net fisheries. Otherwise, total fishery includes terminal net fisheries.

2 Hatchery stock not used to represent naturally spawning stock.

3 Only hatchery rack recoveries are included in escapement.

2.1.1. Assumptions of the Analyses

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

The primary assumptions of the cohort analysis are:

- 1) CWT recovery data are obtained in a consistent manner from year to year or can be adjusted to make them comparable. Many of the analyses rely upon indices that are computed as the ratio of a statistic in a particular year to the value associated with a base period. Use of ratios may reduce or eliminate the effect of data biases that are consistent from year to year.
- 2) For ocean age-2 and older fish, natural mortality varies by age but is constant across years. Natural mortality rates (NM) applied by age are: age-2, 40%; age-3, 30%; age-4, 20%; and age-5 and older 10% (i.e., after fishing mortality and maturation of the age 4 cohort, 10% of the remaining immature fish die due to natural sources before becoming age 5 fish and the commencement of fishing the next year).
- 3) All stocks within a fishery have the same size distribution for each age and the size distribution at age is constant among years.
- 4) The spatial and temporal catch distribution of sublegal-size fish of a given age from a stock is the same as legal-size fish of a given age of that stock.
- 5) Incidental mortality rates per encounter are constant between years. The rates vary by fish size (legal or sub-legal) and fishery and are those published by the CTC (1997) for troll and sport fisheries.
- 6) The procedures for estimating the mortality of CWT fish of legal size during periods of chinook non-retention (CNR) assume that the stock distribution in any year remains unchanged from the period of legal catch retention in the same year. However, gear and/or area restrictions during CNR fisheries are believed to reduce the number of encounters of legal-size fish. To account for this, the number of legal encounters during the CNR fishery was adjusted by a selectivity factor. A factor of 0.34 was used for the WCVI and 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 using the fishery indices as a measure of the change in fishery harvest rates between years, the temporal and spatial distribution of stocks in and between fisheries and years is assumed to be stable.

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

1. Shakers: chinook below the legal size limit that are encountered, brought to the boat, and released during a chinook retention fishery.
2. Sublegal CNR: chinook below the legal size limit that are encountered, brought to the boat, and released during a chinook non-retention fishery. The mortality rate per encounter applied to shakers and to Sublegal chinook during CNR is the same.
3. Legal CNR: chinook above the legal size limit that are encountered, brought to the boat, and released during a chinook non-retention fishery.
4. Drop-off: Chinook above or below the legal size limit that are encountered but are lost from the gear before they reach the boat during either retention or non-retention fisheries. Drop-off mortality is assumed the same for legal and sublegal fish, but can vary by gear type.

There are several methods used to estimate the number of CNR mortalities in the model and the CWT cohort analysis. The 'season length' method uses the relative length of the chinook retention and non-retention periods. This is usually expressed in days or boat-days. Agencies can also provide direct estimates of CNR encounters for use with the method. The CWT cohort analysis can also use a method based on catchability coefficients where no associated chinook retention period exists for the fishery in question. The 'season length' method as used in the exploitation rate assessment has been previously described in CTC (1988). The chinook model also can use a method, known as the 'RT' method, based on the difference between base period exploitation rates and the current year exploitation rates, and current cohort sizes. In both the season length and RT methods, the stock composition of the legal CNR encounters is assumed to be the same as the stock composition of the legal catch. The stock composition of the shakers and sublegal CNR encounters is estimated using the non-vulnerable portions of the cohorts for stocks that contribute to the landed catch. The procedures used to estimate incidental mortality in the chinook model have been previously described by the CTC Analytic Work Group (1991).

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

Table 2.3. Situations where CWT recoveries are not useable or available for ER assessment.

Situation	Reason for data limitations
Incidental mortalities in salmon and non-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
Some 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 adult equivalent (AEQ) total fishing mortality to AEQ total fishing mortality plus escapement. The AEQ factor represents the proportion of fish of a given age that would, in the absence of fishing, subsequently leave the ocean to return to the terminal area on the spawning migration. The numerator may be partitioned into components for AEQ reported catch and AEQ incidental mortality, with each component occurring in either ocean fisheries or freshwater fisheries.

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

The brood year exploitation rate is calculated as:

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

The Adult Equivalent (AEQ) rate is calculated as:

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

$$AEQ_{BY,Maxage,f} \equiv 1.0$$

See Table 2.4 for a description of notation.

2.1.3. Brood Year Survival Rates and Indices

The brood year survival of CWTd smolts after release is calculated for most indicator stocks (Table 2.2). This survival rate is frequently referred to as the marine survival of the tag group but also includes any mortality occurring in freshwater following release. Interpretation of this survival rate is stock specific. Two measures of survival indices or patterns are computed: survival to the age-2 cohort based on CWT recoveries, and the “environmental variate” (EV) determined from the calibration of the chinook model (described in the following section). The CWT-based estimate is our most direct measure of a brood’s survival but this measure is not available until the brood is complete (i.e., all ages have returned to spawn). The model EV parameter, however, provides a more current measure of the survival rates expected in brood years contributing to present and future fisheries. For CWT data, the survival rate for a stock and brood year is the estimated age-2 cohort (from the cohort analysis) divided by the number of 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
$AvgMatRte$	average maturation rate
$Bper$	base period years (1979 through 1982)
$BYEXP$	brood year AEQ exploitation rate
$BPISBMER$	average base period ISBM exploitation rate
BY	brood year
CY	calendar year
$CYDist_{CY,F}$	proportion of total stock mortality (or escapement) in a calendar year attributable to a fishery or a set of fisheries
CY_{end}	end year for average
CY_{start}	start year for average
$Esc_{BY,a}$	escapement past all fisheries for brood year BY and age a
$ER_{s,a,f,CY}$	landed catch (or total mortality) at age a divided by cohort size at age a for stock s in fishery f in year CY
$EV_{n,BY}$	the stock productivity scalar for iteration n and brood year BY
f	a single fishery
$f\hat{I}\{F\}$	a fishery f within the set of fisheries of interest
F	ocean, terminal or other sets of fisheries or spawning escapements
$FI_{f,CY}$	fishery exploitation rate index for fishery f in year CY
$FP_{a.s.CY,f}$	Ratio of $ER_{s,a,f,CY}$ to $BPISBMER$
$MatRte_{a-1,BY}$	maturity rate at next younger age by brood year
$Maxage$	maximum age of stock (generally age 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
$TotCWTRelease_{BY}$	number of CWT fish released in the indicator group in brood year BY

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

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

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

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

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

2.1.4. Stock Distribution Patterns

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

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

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

2.1.5. Fishery Indices

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

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

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

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

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

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

- 1) the index should measure changes in fishery harvest rates if the distribution of stocks is unchanged from the base period;
- 2) the index should have an expected value of 1.0 for random variation around the base period fishery harvest rate, cohort size, and stock distributions; and
- 3) the index should weight changes in stock distribution by abundance.

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

Initially the CWT harvest rate ($h_{t,cy}$) must be set to an arbitrary value between 0 and 1. Then, the distribution parameter ($d_{t,s,a}$) is calculated, and the result is substituted into the second equation below to recursively recalculate $h_{t,cy}$ and subsequently $d_{t,s,a}$. The largest stock-age distribution parameter in a stratum is then set to 1 to create a unique solution. See Table 2.5 for notation description.

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

$$h_{t,CY} = \sum_s \sum_a r_{t,CY,s,a} / \sum_s \sum_a (d_{t,s,a} * n_{CY,s,a})$$

The resulting unique solution is inserted into the following equations.

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

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

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

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

Table 2.5. Parameter definitions for equations used for SPFI in SEAK.

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

2.1.6. ISBM Indices

In previous reports, the CTC (1996) proposed a non-ceiling fishery index as a measure of the pass-through provision in the 1985 PST. This index compares an ‘expected’ AEQ mortality (assuming base period exploitation rates and current stock abundance) with the observed AEQ mortality on a stock within a calendar year, over all non-ceiling fisheries of a party (Table 2.6). 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). Paragraph 4, chapter 3 states:

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

- (a) *their intent is that the fisheries shall be managed over time to contribute to the achievement of MSY or other agreed biologically-based escapement objectives;*
- (b) *until such times as the ISBM fisheries are managed to meet those escapement objectives, and unless otherwise recommended by the CTC, the non-ceiling index defined in TCChinook (96)-1 (February 15, 1996) will be used to measure performance of ISBM fisheries;*
- (c) *the non-ceiling index for ISBM fisheries will be computed pre-season based on forecasted abundance and fishing plans and evaluated post season for each of the escapement indicator stocks listed in Attachments I to V to this chapter;*
- (d) *for the purposes of this paragraph, until agreed escapement objectives for the stock groups listed in Attachments I to V to this Chapter have been achieved, Canada and the United States shall reduce by 36.5 and 40 percent respectively, the total adult equivalent mortality rate, relative to the 1979-82 base period, in their respective ISBM fisheries that affect those stock groups. The reduction identified in this sub-paragraph shall be referred to as the “general obligation”.*”

Table 2.6. Fisheries included in the ISBM Index by nation.

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

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

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

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

The general obligation does not apply to stocks that achieved their CTC agreed escapement goal. For 1999 and 2000, ISBM indices are presented from both model and CWT estimates. Post-season indices for 2001 and projected indices for 2002 were estimated using the CTC model.

Direct application of the CTC model alone 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 untaged stocks.

In those instances the following methods were used:

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

- 2) For 2002 many ISBM fisheries or stock/fishery combinations had no pre-season predictions of harvest rates and in some cases, no prediction of abundance. In those cases, a repeat of 2001 harvest rates, or a repeat of 2000 rates if estimates of 2001 were also unavailable, was assumed.
- 3) In 1999, 2000, and 2001, external estimates of impacts in terminal ISBM fisheries were used to generate FP 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 some CWT indicator stocks used were not representative of the fishery impacts on the stock of interest.
- 4) For the CWT-based estimates, some indicator stocks did not have 1979 – 1982 base period recoveries. For these stocks, base period exploitation rates for the model stock associated with the wild stock were used, if available.

Tables 2.7 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 2000–2002 (see pg. 13-14 for method descriptions).

Stock Group	Stock	Model Stock	Stock Specific Method	
			1999–2001	2002
Lower Strait of Georgia	Cowichan	GST	3	2
	Nanaimo		3	2
Fraser Late	Harrison	FRL	3	1, 2
North Puget Sound Natural Spring	Nooksack Spring	NKS	3	1, 2
	Skagit Spring		3	1, 2
Upper Strait of Georgia	Klinaklini Kakweikan Wakeman Kingcome Nimpkish	GSQ	Model defaults	Model defaults
Fraser Early (springs and summers)	Upper Fraser Mid Fraser Thompson	FRE	3	2
West Coast Vancouver Island Falls	Artlish Burman Gold Kauok Tahsis Tashish Marble	RBT	3	2
Puget Sound Natural Summer/Falls	Skagit	SKG	3	1
	Stillaguamish	STL	3	1
	Snohomish	SNO	3	1
	Lake WA	PSN	3	1
	Green River	PSN	3	1
North/Central BC	Yakoun Nass Skeena Area 8	NTH	Model defaults	Model defaults
Washington Coastal Fall Naturals	Hoko	WCN	3	2
	Grays Harbor		3	2
	Queets		3	2
	Hoh		3	2
	Quillayute		3	2
Col River Falls	Upriver Br	URB	3	1
	Deschutes	URB	3	2
	Lewis	LRW	3	1
Columbia River Summers	Mid-Col Summers	SUM	3	2
Far North Migrating Oregon Coastal Falls	Nehalem	SRH	3	2
	Siletz		3	2
	Siuslaw		3	2

Table 2.8. Methods used to adjust CWT data for computation of the 1999 and 2000 ISBM indices (see pg. 13-14 for method descriptions).

Stock Group	Stock	CWT Stock	Stock Specific Method
Lower Strait of Georgia	Cowichan	Cowichan	4
	Nanaimo	Big Qualicum River	3
Fraser Late	Harrison	Fraser Late	Not needed
North Puget Sound Natural Spring	Nooksack Spring	Nooksack Spring	4
	Skagit Spring	N/A	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	N/A	N/A
	Stillaguamish	Stillaguamish Fall Fing	Not needed
	Snohomish	N/A	N/A
	Lake Washington	N/A	N/A
	Green River	South PS Fall Fingerlings	Not needed
North/Central BC	Yakoun Nass Skeena Area 8	N/A	N/A
Washington Coastal Fall Naturals	Hoko	Queets	3
	Grays Harbor	Queets	3
	Queets	Queets	3
	Hoh	Queets	3
	Quillayute	Queets	3
Col River Falls	Upriver Brights	Upriver Bright	Not needed
	Deschutes	Upriver Bright	Not needed
	Lewis	Lewis River Wild	Not needed
Columbia River Summers	Mid-Columbia Summers	Columbia Summers	Not needed
Far North Migrating Oregon Coastal Falls	Nehalem	Salmon River Hatchery	3
	Siletz	Salmon River Hatchery	3
	Siuslaw	Salmon River Hatchery	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). For 2002, the model used was the same as used during the Pacific Salmon Treaty negotiations (CLB 9812) but with the exception that the actual catches, escapements, and other data through 2001 were added. In addition, CTC accepted escapement goals were used where available and the form of the Ricker production function was adjusted for those stocks with newly accepted goals (Harrison River fall white chinook).

2.2.1. Calibration Data

The first step in the annual calibration process is to gather new or revised data and update the appropriate model input files. The frequency of updates depends on the frequency of data changes made by the reporting agencies, the magnitude of the change, and the significance of the change to the current model application. For example, the file containing run size data is updated as pre-season forecasts and post-season estimates become available since model predictions are sensitive to pre-season forecasts and post-season estimates of terminal runs. Months in which forecasts are made for each stock, and the month the final return estimate becomes available, are presented in Table 2.9.

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

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

CEI (ceiling). This file contains historical catch data for the 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 in the CNR file depends on which method is used to calculate CNR mortality. It may include direct estimates of encounters during the CNR period or indicators of fishing effort in the CNR period relative to the retention period.

ENH (enhancement file). This file contains productivity parameters and smolt production for 13 hatchery stocks and one natural stock (Lower Georgia Strait Naturals) with supplementation. Smolt production is expressed as the deviation from the average production during the model base period; as a result, values in the ENH file can be negative if releases in a given year are less than the average reported for the model base period. Additional discussion of the productivity parameters may be found in the model documentation (Analytic Work Group 1991).

FCS (forecast). Postseason estimates of terminal run sizes or escapements and agency supplied pre-season forecasts (Table 2.10) are included in the FCS file. Age-specific information is used for those stocks and years for which data are available.

Table 2.9. Months that pre-season forecasts of abundance are available from agencies for the next fishing year.

Model Stock	Month Final Return Estimate Available	Month(s) Forecast Available
Alaska South SE	January	None
North/Central BC	November	None
Fraser Early	January	None
Fraser Late	February	February
WCVI Hatchery	January	February
WCVI Natural	January	February
Upper Strait of Georgia	January	None
Lower Strait of Georgia Natural	December	None
Lower Strait of Georgia Hatchery	December	None
Nooksack Fall	June	February
Puget Sound 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

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

IDL (interdam loss). The IDL file contains stock-specific conversion factors for the Columbia River Summer, Columbia Upriver Bright, Spring Creek Tule, and Snake River Fall stocks provided each year by Columbia River fishery managers. The factors represent the fraction of the stock that can be accounted for after mainstem dam passage in the Columbia River; losses can be attributed to direct mortality at the

various dams, mortality in the reservoirs between dams, fall-backs, tailrace spawning, and other factors. The interdam loss factor is equal to one minus the conversion factor.

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

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

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

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

The calibration is controlled through a file designated OP7.

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; C = model internally estimated projection.

Model Stock	Forecast Characteristics			Comments
	Forecast Type	Pre-Season Age Specific	Post-Season Age Specific	
Alaska South SE	C	-	Yes	Calibrated to escapement
North/Central BC	C	-	No	Calibrated to terminal run
Fraser Early	C	-	No	Calibrated to terminal run
Fraser Late	S	Yes	Yes	Combined forecasts for Harrison River and Chilliwack Hatchery
WCVI Hatchery + Wild (RBH and RBT model stocks)	S	Yes	Yes	Robertson Creek Hatchery forecasts plus expansion for other WCVI stocks based on ratio of terminal run sizes
Upper Georgia Strait	C	-	Partial	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 GSH hatchery systems and Squamish River
Nooksack Fall	R	No	No	1999–2000 return rate
Puget Sound Fingerling + Yearling	R	No	No	Age specific forecasts not available for all components
Puget Sound Natural	R	No	No	Calibrated to terminal run
Nooksack Spring	C	Partial	No	No data since 1987
Skagit Summer/Fall	S	Yes	Yes	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	C	No	No	Calibrated to terminal run
Washington Coastal Wild	R	No	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 tributary streams.
Willamette River Hatchery	S	Yes	Yes	Prediction is to mouth of Willamette River
Columbia Upriver Summer	S	No	No	Changed in 2001 to 5-year average
Oregon Coastal North Migrating	S	Yes	Yes	Weighted average age composition from four index rivers
Snake River Fall (model stock)	C	-	No	Calibrated to escapement to Lower Granite Preseason forecast is sometimes available.

2.2.2. Calibration Procedures

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

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

- (1) Predicted terminal runs are computed for each year using the input files discussed above and with values of all stock productivity scalars (EVs set equal to 1).
- (2) The ratio of the estimated terminal run and model predicted terminal run (SC_{BY}) is computed for each brood year. For example, if the estimated and model predicted terminal runs for the 1979 brood were 900 and 1,500 age-3 fish in 1982, 4,000 and 4,500 age-4 fish in 1983, and 1,000 and 1,500 age-5 fish in 1983, the ratio would be computed as:

$$SC_{BY} = \frac{\sum_{a=Minage}^{Maxage} (EstimatedTerminalRun)_a}{\sum_{a=Minage}^{Maxage} (ModelPredictedTerminalRun)_a}$$
$$SC_{BY} = \frac{900 + 4000 + 1000}{1500 + 4500 + 1500}$$

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

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

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

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

Several options for the calibration are provided in the OP7 control file. The options include the brood years for which the stock productivity scalars are estimated in each iteration and the type of the convergence test. For the 2002 calibration, stock productivity scalars were estimated for each brood year in each iteration. Convergence was defined to occur when the absolute value of the difference in stock productivity scalars between successive iterations did not exceed 0.05.

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

Minimum Number of Age Classes. Data for all age classes will not be available when the stock productivity scalars are estimated for recent broods. Since considerable uncertainty may exist in a

single data point, application of the calibration algorithm can be restricted to cases in which a specific minimum number of age classes are present.

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

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

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

The 2002 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 2001 using updated catch and escapement data through 2001. Average exploitation rate scalars were then computed and used as input values for 2002 fisheries in the Stage 2 calibration, except for the WCVI and FRL stocks whose forecasts already account for changes in the ocean fisheries.

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

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

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

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

- (1) the average exploitation rate scale factors for each fishery were inserted into the FP file for 2002; and
- (2) the stage 1 EVs were used as starting values for the Stage 2 calibration.

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

- (1) accuracy of the reconstructed catches in the fisheries (these values will consistently differ from the actual catches if the calibration is not able to recreate exactly the actual catches in the years 1979 through 1984, the model years prior to implementation of the ceiling algorithm);
- (2) accuracy of model predicted terminal runs or escapements relative to the data used for calibration of each stock;

- (3) comparison of model predicted age structure in terminal runs or escapements with data used for calibration (consistent biases in age structure are addressed by changing maturation rates);
- (4) patterns in the stock productivity scalars compared with marine survival patterns generated by the annual exploitation rate analysis;
- (5) comparison of CWT and model estimates of fishery harvest rate indices;
- (6) comparison of model estimates with mortality distributions for individual stocks generated from the annual CWT-based exploitation rate analysis; and
- (7) comparison of model estimated AIs with those AIs estimated by model 9812.

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. Changes From Previous Analyses

2.2.3.1. Data Changes Involved in the Exploitation Rate Analysis

Expansion factors for SEAK sport fisheries were developed from available troll expansion data and applied to sport CWT recoveries in the NE quadrant for years 1976–1979 and in all quadrants for years 1979–1982. These amended sport expansions were used to generate the estimated sport recoveries which were then incorporated into the C-files, i.e., the primary input data files in the exploitation rate analysis.

ODFW recently submitted historical catch data for the Columbia River commercial net fisheries to the PSFMC database. Prior to this year's exploitation rate analysis, assumed data had been entered manually to generate the estimated CWT recoveries in the C-files.

Escapement data for recent years was manually entered into the C-files for the Queets and Stillaguamish CWT indicator stocks. Estimated recoveries of CWTs in some terminal net fisheries in recent years were also manually entered. Escapement data for the Samish indicator stock in 2000 were not available. The incidental mortality rates applied in the WCVI and Northern troll fisheries were changed to reflect the regulation changes from barbed to barbless hooks occurring in 1996 and 1998, respectively.

Historical Alaska, WCVI and Northern troll CNR data were amended for inclusion in the PSL file used in the exploitation rate analysis and in the corresponding CEI file used in the chinook model calibration. In addition, CNR data for WCVI sport were added to the PSL file to correct an inconsistency between input to the calibration model and the exploitation rate analysis.

2.2.3.2. Coding Changes to the C-File Generation Program

The U.S. versions of MakeC (the C-file generation program) were modified to read the fishery expansion factors supplied in the Canadian MRP database for all CWT recoveries occurring in Canadian fisheries. Previously, these were calculated within the U.S. versions of the MakeC program.

The Canadian version of MakeC was modified to accommodate a CTC-agreed catch sample rule that CWT recoveries can be expanded by a factor no greater than 50. An examination of all expansions formerly applied to Canadian fishery recoveries revealed only about a half dozen cases exceeding the

maximum permitted value of 50 and these all occurred within a few years following the set of base period years.

All versions of MakeC were modified to change the annual time period for CWT recoveries observed in the WCVI and Northern troll fisheries from Jan. 1- Dec. 31 to Oct. 1 - Sept. 30. This shift in the annual time period amounts to changing the 'birthday' for CWT-marked fish caught in those fisheries and it now matches the annual time period that has always been applied to the SEAK troll fisheries. The effect of the time period shift is that fish caught between Oct. 1 and Dec. 31 of the same calendar year are aged an additional year (i.e., age = [brood year - capture year] + 1) relative to fish caught prior to Oct. 1. The age increment given to recoveries in the Oct.-Dec. time period is not applied to age 4 and older recoveries from Robertson Creek Hatchery (RBH) fish caught in the WCVI troll fishery. RBH fish of those ages caught in that area and time period are likely mature fish destined to spawn in the same year. For all stocks, as in all other C-file fisheries, recoveries determined to be older than the maximum age specified for each stock are grouped in the maximum age category, regardless of how age is calculated.

2.2.3.3. Changes to the Input Data for the Chinook Model

The Snake River wild (LYF) 2002 forecast was not available for inclusion in the model calibration.

The FRL 1997 and 1998 brood maturation rates for age-3 and age-4 fish were set to the recent 3-year average. The long-term average brood maturation rates are typically used with incomplete broods (i.e., those for which maturing age classes are still expected). However, the shorter-term averages were considered more representative of the probable maturation rates for the incomplete broods in this case. The FRL escapement goal and stock recruit parameters were updated in the BSE file to reflect the recently accepted and new Harrison River chinook escapement goal.

The RBH 1992 age-specific brood maturation rates were set to the long-term averages due to low numbers of recoveries that produced highly skewed maturation rates from the cohort analysis for that brood.

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

Enhancement data were updated from the last calibration to 1999 for all stocks specified as enhanced stocks. In addition, historical enhancement data were revised for the following stocks or stock groups: Spring Creek Hatchery, Lower Columbia River Hatchery, Lower Georgia Strait Naturals, and Lower Georgia Strait Hatcheries.

In 1999 and 2000, ADF&G revised historical estimates of CWT recoveries for 1976–1979, a period overlapping the base period used for the chinook model. These revised recovery estimates were used in this year's exploitation rate analysis and from this analysis were derived the FP values provided as input to the 2002 calibration were derived. The CTC chose not to update other input files for the 2002 calibration containing base period data (exploitation rates, etc.) to reflect the changes to the Alaskan CWT recoveries and instead, determined that revisions to base period data should be undertaken when the new (recoded) model currently under development is brought into use (anticipated for the 2003 calibration). Notwithstanding, the CWT data used to generate base period exploitation patterns for the CTC model stocks differ from those used from the current exploitation rate analysis. The CTC's initial assessment of these changes, however, is that the effect of the discrepancies should be negligible.

2.2.3.4. Coding Changes to the Chinook Model

The order of calculations involving the enhancement data was modified to avoid a potential problem resulting from the situation in which the amount of enhancement for an enhanced stock in a given year was less than the average for the base period calibration years. The only stock in the chinook model affected by the coding error was Upper Georgia Strait and only in 1983 and 1984. The solution to this problem involved changes in both the GSQ enhancement data and the program code.

2.3 General Forecast Methods

For those stocks with externally provided forecasts of abundance in 2002, management agencies used three general methods to predict terminal returns or escapements:

Sibling Models. Empirical relationships between abundance (commonly measured as terminal run size) of age a fish in calendar year CY and the comparable abundance of age $a+1$ fish in year $CY+1$ are used to predict abundance in 2002 from data collected in previous years (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 averages are used to discount abundance of smolts or parents for brood years that will be exploited in 2002 (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 2002. This simple approach is usually used where data is lacking 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.

3. RESULTS

3.1. Exploitation Rate Analysis

3.1.1. Brood Year Exploitation Rates

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 29 of the index stocks in Appendix G. In general, recent brood year survivals are lower than in earlier years of the time series for completed brood years. For some stocks, survivals for recent incomplete broods have been increasing. Correlation coefficients (r values) were computed as a measure of association between the two indices of survival (Table 3.1). A correlation approaching 1.0 indicates a strong linear relationship and provides evidence that the EV is predictive of the final cohort survival.

Conversely, a correlation approaching 0 indicates little relationship between the EV scalar and final cohort survival. The degree of correlation varied substantially among the stocks. Of the 29 stocks, 19 had r values that were significantly different from zero ($P < 0.05$). Correlation coefficients for these 19 stocks ranged from 0.47 to 0.80.

Table 3.1. Correlation (r) between total brood year survival estimated from CWTs and EV scalars for 29 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
Alaska Spring	17	0.81	<0.001
Kitsumkalum	15	0.37	0.173
Robertson Creek	22	0.67	<0.001
Quinsam	21	0.74	<0.001
Puntledge	22	0.47	0.027
Big Qualicum	22	0.50	0.017
Cowichan	10	0.26	0.466
Chilliwack	15	0.70	0.003
Skagit Spring Yearling	10	0.08	0.825
Nooksack Spring Yearling	11	0.73	0.009
South Puget Sound Fall Yearling	12	-0.11	0.733
South Puget Sound Fall Fingerling	20	0.50	0.024
George Adams Fall Fingerlings	17	0.59	0.012
Samish Fall Fingerling	13	0.65	0.015
Squaxin Pens Fall Yearling	8	0.06	0.887
Elwha	9	0.41	0.268
White River Spring Yearling	19	-0.18	0.460
Queets	16	0.46	0.072
Sooes Fall Fingerling	9	-0.22	0.567
Cowlitz Fall Tule	19	0.76	<0.001
Spring Creek Tule	22	0.63	0.002
Oregon Columbia River Tule	20	0.74	<0.001
Lewis River Wild	16	0.53	0.034
Columbia River Upriver Bright	21	0.56	0.008
Hanford Wild	10	0.78	0.006
Lyons Ferry	8	-0.99	<0.001
Columbia River Summer	16	-0.09	0.740
Willamette Spring	20	0.65	0.002
Salmon River	17	0.59	0.012

3.1.3. Stock Distribution

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

3.2 Model Output

3.2.1. AABM Abundance Indices and Associated Catches

Beginning with the 1999 fishing season, the Agreement specified that the AABM fisheries are to be managed through the use of the AIs, where specific allowable harvest corresponds to a given AI for each fishery. In 1999, 2000, and 2001 the CTC calibrations produced pre-season AIs that were used to set fishing plans with management harvest targets. In addition to the pre-season AIs, the Agreement also provided that the AIs could be adjusted in-season using CTC approved methodologies. Although the pre-season AIs are used to set fishing plans (management targets) annually, the Agreement specified that the first post-season calibration will be used to the set final allowable catch, and to track overage and underage provisions. However, the CTC did not produce a final calibration in 2000, thus the 2001 calibration (CLB 0107) is used as the first post-season AIs for both 1999 and 2000. The 2002 CTC calibration (CLB 0206) provided AIs for 1979 through 2002 (Appendix I). The AIs from 1999 to 2001 are final for both pre-season and post-season, while the pre-season AI for 2002 is final to set preliminary catches for the year (Table 3.2).

Table 3.2. Abundance Indices for 1999 to 2002 for the SEAK, NBC, and WCVI troll fisheries.

Year	SEAK		NBC		WCVI	
	Pre-season	Post-season	Pre-season	Post-season	Pre-season	Post-season
1999	1.15 ¹	1.12 ³	1.12 ¹	0.97 ³	0.60 ¹	0.50 ³
2000	1.14 ²	1.10 ³	1.00 ²	0.95 ³	0.54 ²	0.47 ³
2001	1.14 ³	1.29 ⁴	1.02 ³	1.22 ⁴	0.66 ³	0.68 ⁴
2002	1.74 ⁴		1.45 ⁴		0.95 ⁴	

¹ From CTC Chinook Model Calibration #9902.

² From CTC Chinook Model Calibration #0021.

³ From CTC Chinook Model Calibration #0107.

⁴ From CTC Chinook Model Calibration #0206.

In general, the AIs for 1999 and 2000 are low compared to AIs in the late 1980s and early 1990s but values have increased in 2001 and 2002. The AI values in 2002 are comparable to the higher values in the time series.

The Agreement specifies an allowable catch for each AI for each fishery. The specified treaty catch by fishery and year and the actual (observed) catches are shown in Table 3.3. The 2002 AI for the SEAK troll fishery is 1.74, the highest since 1991 (Figure 3.1). It is 0.60 points greater than the 2001 pre-season AI and 0.45 points greater than the 2001 first post-season AI. The projected 2002 AI for the NBC troll fishery is 1.45, the highest since 1991 (Figure 3.2). This is 0.43 points greater than the 2001 pre-season projection and 0.23 points greater than the 2001 first post-season AI of 1.22. The projected 2002 AI for the WCVI troll fishery is 0.95, the highest since 1988. This is 0.29 points greater than the pre-season AI for 2001 and 0.27 points greater than the 2001 post-season assessment.

Table 3.3 Observed catches and post-season allowable catches for 1999 to 2001, and pre-season allowable catches for 1999 to 2002, for Pacific Salmon Treaty AABM fisheries in 1999 to 2002.

Year	PST Treaty Allowable and Observed Catches								
	SEAK (T, N, S)			NBC (T, S)			WCVI (T, S)		
	Pre-Season Allowable Catch	Post-Season Allowable Catch	Observed Catch	Pre-Season Allowable Catch	Post-Season Allowable Catch	Observed Catch	Pre-Season Allowable Catch	Post-Season Allowable Catch	Observed Catch
1999	192,750	184,200	200,219	145,600	126,100	80,200	128,347	107,000	31,085
2000	189,900	178,500	186,835	130,000	123,500	35,900	115,513	86,200	100,030
2001	189,900	250,300	189,389	132,600	158,933	40,600	141,200	145,500	114,624
2002	356,500			194,133			205,356		

The Agreement specifies that overage/underage provisions apply to both AABM and ISBM fisheries. However, the CTC identified in a February 12, 2002 letter to the PSC major technical obstacles and policy concerns for adjusting harvest levels in response to overage and underages. The major problem identified for AABM fisheries is the confounding of forecast and management error in assessing overages and underages. The pre-season estimates of abundance used to set management goals can be substantially different than the post-season estimates (Table 3.2) due to forecast error. Pre-season allowable catch levels that may be used to guide managers in setting harvest efforts thus can be quite different from allowable harvest derived from the first post-season calibration (Table 3.3). As a result, management precision during the fishery differs from the precision of attaining the postseason target. For example, in SEAK the observed catch has been within -1.6% to 3.8% of the pre-season target, but has ranged from -24.3% to +8.7% of the post-season target.

Until an approach for full implementation has been developed and accepted by the PSC, the Commissioners have instructed the CTC to track overages and underages relative to agreed-upon harvest objectives. Table 3.4 shows the difference between the allowable catch and the observed catch in AABM fisheries for 1999–2001, and the cumulative differential for those years. All three AABM fisheries have cumulative underages. In SEAK, observed catches have been below final allowable catches for one of the three years; the cumulative differential is -5.7%. In NBC, observed catches have been below the final allowable catches in all three years; the cumulative differential is -61.6%. In WCVI, observed catches have been below allowable catches for two of the three years; the cumulative differential is -27.4%.

Table 3.4 Deviations in numbers of chinook salmon and percentages from final (first post-season) catch targets for Pacific Salmon Treaty AABM fisheries in 1999 to 2001.

Year	SEAK (T, N, S)		NBC (T, S)		WCVI (T, S)	
	Treaty Numbers	Treaty Percent	Treaty Numbers	Treaty Percent	Treaty Numbers	Treaty Percent
1999	+16,019	+8.7%	-45,900	-36.4%	-75,915	-70.9%
2000	+8,335	+3.1%	-87,600	-70.9%	+13,830	+16.0%
2001	-60,911	-24.3%	-118,300	-74.4%	-30,876	-21.2%
Cum.	-36,557	-6.0%	-251,800	-61.6%	-92,961	-27.4%

3.2.1.1. Stock composition of AABM fisheries, 1979 to 2002

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

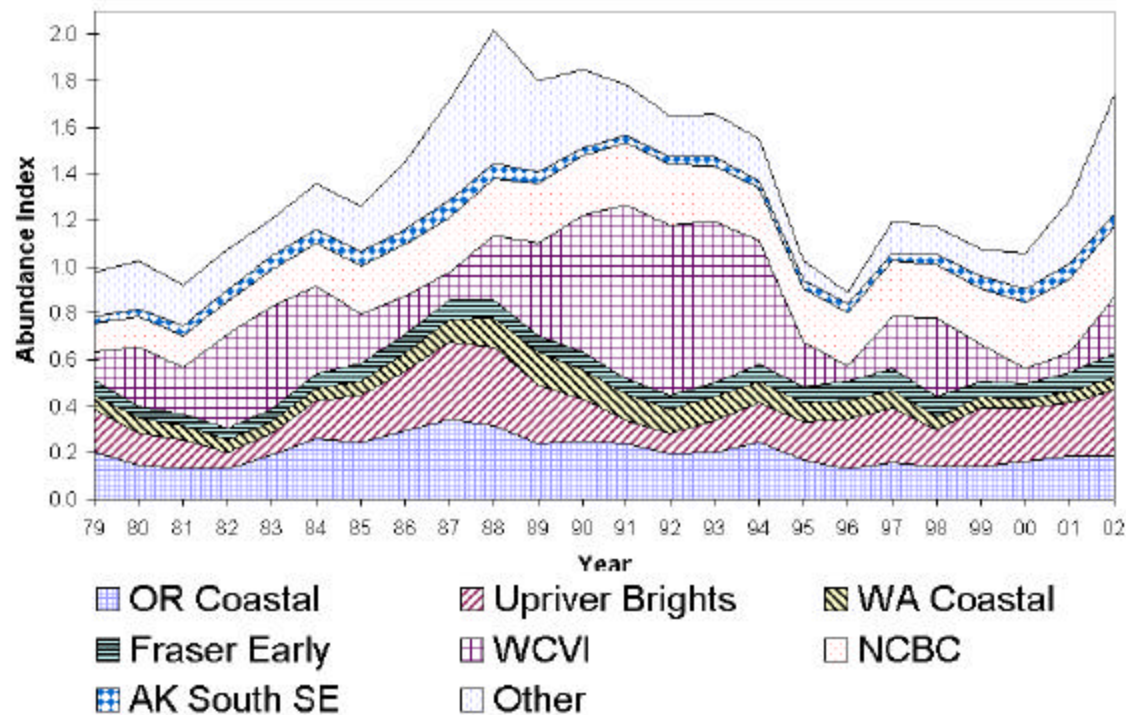


Figure 3.1. Total abundance index for the Southeast Alaska troll fishery and the annual stock composition estimated in CLB 0206.

The major stocks contributing to the SEAK index, on average, are: WCVI, Upriver Brights, NCBC, and Oregon Coastal (Figure 3.1). The stock composition for 2002 is somewhat similar to that of the 2001 post-season assessment, except that WCVI stocks are forecasted to be considerably higher than in 2000 and 2001. In 2002, the higher forecast is also a result of expected higher production from stocks in the "Other" category, primarily Upper Georgia Strait, CR Summers and mid-CR Brights.

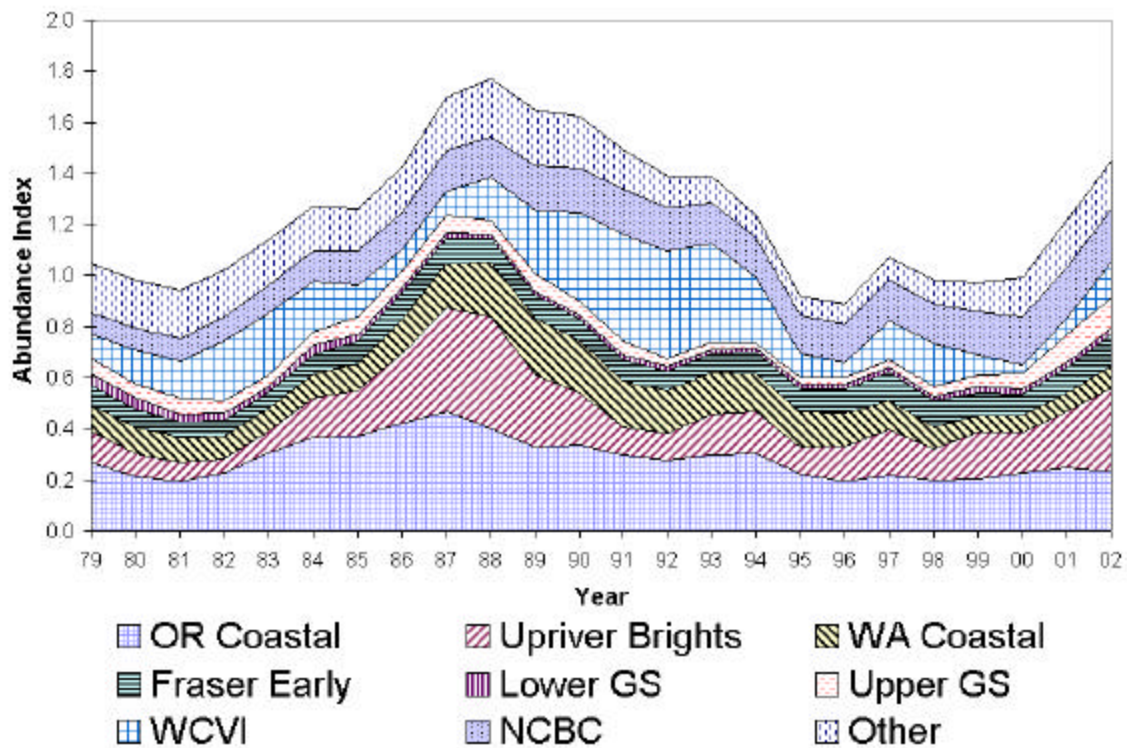


Figure 3.2. Total abundance index for the Northern BC troll fishery and the annual stock composition estimated in CLB 0206.

The major stock groups in the NBC fishery are WCVI, Upriver Brights, Oregon Coastal, NCBC, and Washington Coastal (Figure 3.2). The stock composition for 2002 is similar to that of 2001, with the exception of expected increases in Upriver Brights, WCVI and Upper Georgia Strait stocks.

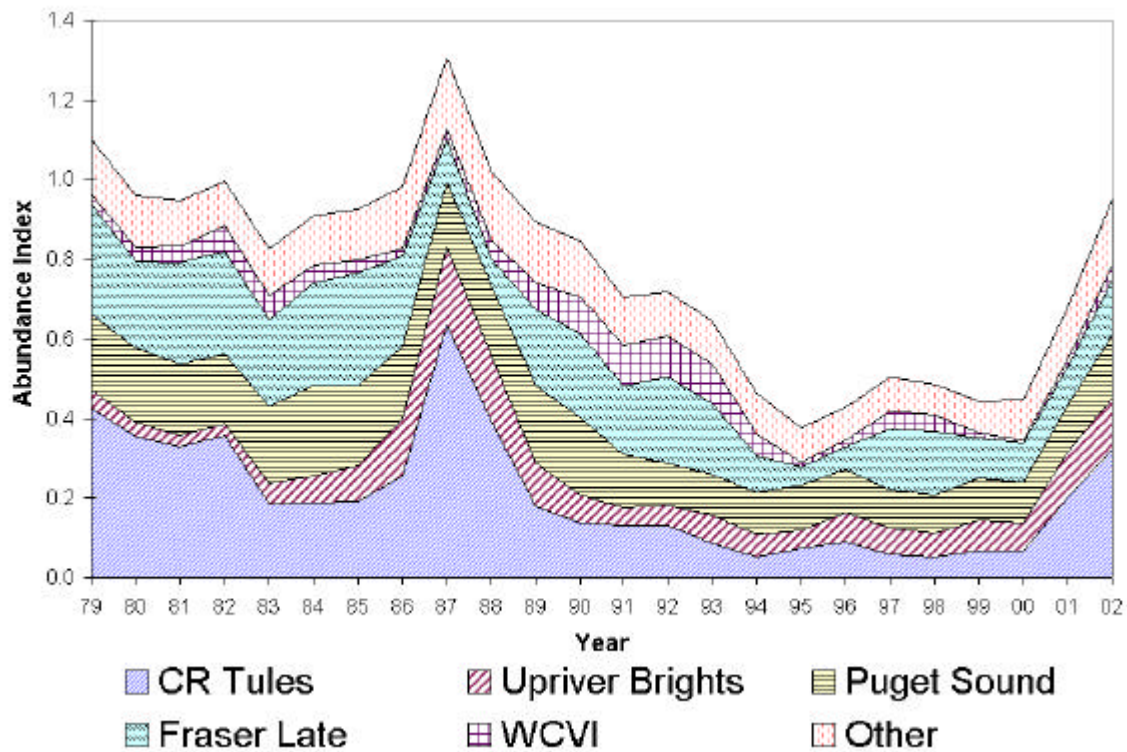


Figure 3.3. Total abundance index for the WCVI troll fishery and the annual stock composition estimated in CLB 0206.

The major stock groups in the WCVI fishery are: Fraser Late, Puget Sound, Upriver Brights, and Columbia River Tules (Figure 3.3). The increase in the projected 2002 AI is primarily due to a projected increase in Columbia River Tules.

3.2.2. 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 36.5% and 40%, resulting in ISBM indices of 63.5% and 60% percent, respectively. This requirement is referred to as the ‘general obligation’ and does not apply to stocks that achieve their CTC agreed escapement goal. Estimated ISBM fishery indices are shown in Table 3.5 for Canadian fisheries and Table 3.6 for U.S. fisheries. Both tables present CWT based indices for 1999 and 2000, and chinook-model-based indices for 1999 through 2002. The agreement specifies that the indices for 1999 and 2000 be assessed using the CWT-based estimates.

Both CWT and model based estimates of ISBM indices for a given year can change over time, with the largest changes occurring in more recent years. By necessity, CWT based estimates assume average maturation rates for incomplete broods which contribute to the index in a given year. For example, for calendar year 2000 only brood 1995 is complete (‘true’ maturation rates used). The youngest brood contributing to the year 2000 index, 1998, will not be complete until 2003, with the analysis done by the CTC in 2004. Other factors effecting the estimates include any changes to the historic CWT database, including the addition of previously unreported CWT recoveries, agency revised CWT expansion factors, or re-estimates of terminal harvest rates of wild stocks. Model based estimates will suffer similar instability, for similar reasons. In addition, model estimates are heavily influenced by pre-season forecasts of abundance at age, while post-season estimates can alter the index for a given year considerably. Model estimates are also influenced by the use of average maturation rates for recent broods and the re-estimation of terminal harvest of wild stocks. While both CWT and model estimates tend to ‘stabilize’ after two or three years, estimates will continue to vary to some degree as data is updated.

3.2.3. CWT Based Indices in 1999 and 2000

Canadian ISBM indices from the CWT-based estimates in 1999 and 2000 show that exploitation rates were reduced more than required under the agreement for all stocks or stock groups except for the North Puget Sound Natural Spring group. The 2000 index for this stock was 1.174, considerably above the 0.635 standard. While this stock did not meet its agency goal of 2,000 returning adults in the year 2000, the estimated Canadian ISBM index may be too high. It is heavily influenced by recoveries of brood year 1997 Nooksack spring fish in the Strait of Georgia sport fishery (64 of 66 Canadian recoveries occurred there). The 2001 return of Nooksack spring adults was the largest since at least 1984. If the CWTd brood survived as well as the natural component of the stock, the estimated age-3 cohort size will probably increase when the age-4 CWT data becomes available, and the ISBM index for this year will decrease.

For U.S. fisheries, all CWT-based ISBM indices, except for the Stillaguamish River, Green River, and the Lewis River stocks were above the 0.6 standard in 1999. In 2000, all stocks except the Fraser Late stock, the North Puget Sound Natural Spring stock group, the Stillaguamish River, and the Lewis River stocks were above the 0.60 standard.

Of the stocks with CTC adopted goals for which the index was exceeded, only the Fraser Late stock met its goal in both 1999 and 2000. However, the Lower Georgia Strait stock group met the DFO-interim escapement goal of 7,400 in both 1999 and 2000. Additionally, it is likely that the U.S. index of 3.50, for this stock group, is overestimated. The index is based on CWT recoveries from Capilano and Big Qualicum hatcheries during the base period, and Cowichan recoveries in recent years. These stocks may have dissimilar distributions in U.S. waters, with Cowichan fish being more southerly distributed and more likely to be impacted in U.S. fisheries (see Appendix H).

The estimated index for the North PS Natural Spring stock group of 0.81 in 1999 is based on a total of 17 estimated CWT recoveries in southern U.S. waters of Nooksack spring chinook. That estimate may also decrease as the brood becomes complete in 2001. While the Green River index in 2000 is 0.70, the Green River adult escapement was above the State-Tribal agreed goal of 5,750 that year.

All CWT-based ISBM indices for the Washington coastal fall natural stock group were above the standard in both 1999 and 2000. No CTC accepted escapement goals currently exist for these stocks, but agency goals are in place for all or most of the stocks in the group. Grays Harbor fall chinook have not met their agency goal of 14,600 natural spawners since 1997. The Queets River fall chinook stock met its management agency goal of 2,500 in 2000, but not in 1999 (1999 escapement was 1,933). The Hoh River fall chinook stock showed the highest ISBM indices of the group, 1.71 in 1999 and 2.75 in 2000. However, while there is not yet a CTC accepted goal, Hoh fall chinook have met their management goal of 1,200 natural escapement since at least 1976. The Quillayute fall chinook stock showed the second highest indices in both years. They have exceeded their management goal of 3,000 every year since 1977.

In the Columbia River, ISBM indices were above the standard for all stocks except the Lewis River wild fall stock. Southern U.S. fisheries were curtailed to protect this stock in 1999 and 2000 due to anticipated low returns. Lewis River wilds did not meet their CTC accepted escapement goal of 5,700 in 1999 (ISBM index of 0.00), but better than predicted returns in 2000 resulted in an escapement well over the goal. Spawning escapements of Upriver Bright chinook exceeded the management goal of 45,000 adults over McNary dam in both 1999 and 2000 by approximately one-third. Deschutes River fall chinook escapements both years were near 3,500, below the management goal of 4,000 adults. Escapements of Columbia Upriver Summer chinook also exceeded the CTC accepted goal in both years.

The CTC has accepted escapement goals for the three stocks in the Far North Migrating Oregon Coastal Fall stock group. All CWT based indices in 1999 and 2000 were above the 0.6 standard. However, all three stocks met or exceeded their goal, except the Nehalem River stock in 2000.

3.2.4. Predicted ISBM Indices for 2002

Predicted ISBM indices for 2002 from model runs based on calibration 0206 are all below 0.635 for Canadian ISBM fisheries for all stock groups.

For U.S. ISBM fisheries, the index for Fraser Late is predicted to be above 0.6. However, the Harrison River escapement (typically >50% of Fraser Lates) is expected to exceed the lower limit of its CTC accepted goal by a moderate margin. Of the five stocks in the Puget Sound Natural Summer/Fall stock group, only the Lake Washington stock has an index predicted to be above the ISBM standard. No CTC accepted goal exists yet for this stock. The predicted exploitation rate on the stock, however, is well under the maximum allowable rate prescribed in the ESA Consultation standard.

Four of the five stocks included in the Washington Coastal Fall Natural stock group are predicted to have ISBM indices above the standard in 2002. None of these stock have CTC accepted goals at this time, and no pre-season abundance or escapement predictors are available. Based on a review of the escapements of these stocks, and the generally good survival of chinook predicted on the west coast, it is unlikely that, with the possible exception of Grays Harbor, these stocks will fail to meet their management goals in 2002.

Of the four chinook stocks in the Columbia, two have CTC accepted escapement goals (Lewis River and Upriver Summers), and both are predicted to exceed those goals in 2002. The indices for both of these stocks exceeds the standard. The index of the Upriver bright stock is also anticipated to exceed the standard. However, its management goal of 46,000 is predicted to be exceeded.

The ISBM indices are predicted to be above the standard for all three stocks in the Far North Migrating Oregon Coastal Fall Stock group. No abundance or escapement predictors are available for the individual stocks in this group. However, the predicted combined escapement of just under 74,000 is over three times the combined CTC accepted escapement goal of 22,858.

Table 3.5. ISBM Indices for Canadian fisheries, 1999 through 2001, and the projected indices for 2002. Indices above 0.635 are in italicized bold font for stocks without CTC agreed escapement goals and for stocks that did not achieve CTC agreed escapement goals.

Stock Group	Stock	Canadian ISBM Indices					
		CWT Indices ¹		Model Indices			
		1999	2000	1999	2000	2001	2002
North / Central B. C.	Yakoun, Nass, Skeena, Area 8	NA ²	NA	0.236	0.264	0.275	0.584
West Coast Vancouver Island	WCVI (Artlish, Burman, Gold, Kauok, Tahsis, Tashish, Marble)	0.295	0.083	0.543	0.334	0.242	0.342
Fraser Early	Upper Fraser, Mid Fraser, Thompson	NA	NA	0.139	0.119	0.107	0.145
Fraser Late	Harrison River ³	0.155	0.073	0.350	0.199	0.177	0.302
Upper Strait of Georgia	Klinaklini, Kakweikan, Wakeman, Kingcome, Nimpkish	0.194	0.123	0.193	0.121	0.140	0.272
Lower Strait of Georgia	Cowichan Nanaimo	0.346	0.196	0.533	0.510	0.512	0.541
		0.313	0.154	0.249	0.101	0.121	0.190
North PS Nat Springs	Nooksack, Skagit	0.312	1.176	0.257	0.145	0.164	0.195
Puget Sound Natural Summer / Falls	Skagit	NA	NA	0.203	0.113	0.130	0.172
	Stillaguamish	0.157	0.111	0.396	0.230	0.251	0.375
	Snohomish	NA	NA	0.204	0.109	0.119	0.176
	Lake Washington	NA	NA	0.375	0.185	0.213	0.275
	Green River	0.220	0.154	0.375	0.185	0.213	0.275
Washington Coastal Fall Naturals	Hoko, Grays Harbor, Queets, Hoh, Quillayute	NA	NA	0.209	0.154	0.170	0.292
Col River Falls	Upriver Brights	NA	NA	0.138	0.129	0.140	0.429
	Deschutes	NA	NA	0.138	0.129	0.140	0.429
	Lewis ³	NA	NA	0.056	0.054	0.050	0.171
Col R Summers	Mid-Col Summers ³	NA	NA	0.135	0.106	0.097	0.198
Far North Migrating OR Coastal Falls	Nehalem ³ , Siletz ³ , Siuslaw ³	NA	NA	0.090	0.132	0.148	0.514

¹ The CWT based estimates, not the model estimates, are to be used in post season assessments.

² NA means not available because of insufficient data (lack of stock specific tag codes, base period CWT recoveries, etc).

³ Stock or stock group with agreed escapement goal.

Table 3.6. ISBM indices for U.S. fisheries, 1999 through 2001, and the projected indices for 2002. Indices above 0.60 are in italicized bold font for stocks without CTC agreed escapement goals and for stocks that did not achieve CTC agreed escapement goals.

Stock Group	Stock	US ISBM Fisheries					
		CWT Indices ¹		Model Indices			
		1999	2000	1999	2000	2001	2002
North / Central B. C.	Yakoun, Nass, Skeena, Area 8	NA ²	NA	NC ³	NC	NC	NC
West Coast Vancouver Island ⁴	WCVI (Artlish, Burman, Gold, Kauok, Tahsis, Tashish, Marble)	NA	NA	0.28	0.44	0.28	0.27
Fraser Early	Upper Fraser, Mid Fraser, Thompson	NA	NA	0.09	0.20	0.11	0.15
Fraser Late	Harrison River ⁵	0.73	0.13	0.745	0.41	0.41	0.72
Upper Strait of Georgia	Klinaklini, Kakweikan, Wakeman, Kingcome, Nimpkish	NA	NA	NC	NC	NC	NC
Lower Strait of Georgia	Cowichan, Nanaimo	3.50	0.69	0.19	0.22	0.18	0.22
North PS Nat Springs	Nooksack	0.81	0.00	0.16	0.24	0.13	0.00
	Skagit	NA	NA	ID ⁶	ID	ID	0.06
Puget Sound Natural Summer / Falls	Skagit	NA	NA	0.18	0.10	0.13	0.27
	Stillaguamish	0.10	0.04	0.16	0.15	0.11	0.20
	Snohomish	NA	NA	0.05	0.04	0.04	0.15
	Lake Washington	NA	NA	ID	ID	ID	1.25
	Green R	0.59	0.70	ID	ID	ID	0.35
Washington Coastal Fall Naturals	Hoko	NA	NA	0.43	0.33	0.30	0.48
	Grays Harbor	0.73	1.63	0.68	0.92	0.83	0.84
	Queets	0.95	0.85	0.88	0.15	0.87	1.05
	Hoh	1.71	2.75	1.40	1.21	1.25	1.26
	Quillayute	1.48	2.47	1.15	0.85	1.30	1.31
Col River Falls	Upriver Brights	1.46	2.53	1.10	1.07	0.77	0.91
	Deschutes	0.74	0.71	0.70	0.61	0.49	0.55
	Lewis ⁵	0.00	0.36	0.14	0.13	0.66	0.93
Col R Summers	Mid-Col Summers ⁵	2.08	4.82	0.46	0.32	0.40	0.82
Far North Migrating OR Coastal Falls	Nehalem ⁵	1.46	1.97	2.09	2.40	2.50	2.61
	Siletz ⁵	1.07	1.16	1.23	1.26	1.29	1.33
	Siuslaw ⁵	1.03	2.45	1.54	3.03	3.19	3.34

¹ The CWT based estimates, not the model estimates, are to be used in post season assessments.

² NA means not available because of insufficient data (lack of stock specific tag codes, base period CWT recoveries, etc).

³ NC means that the current model assumes the stock is not caught in U.S. ISBM fisheries.

⁴ Stock group not in Annex Table V.

⁵ Stock with agreed escapement goal

⁶ ID means insufficient data available to estimate stock specific impacts.

3.2.5. Overages and Underages

The Agreement specifies that overages be accounted for in ISBM fisheries, as well as in AABM fisheries. Estimates of the indices based upon CWTs versus those based on output from the chinook model can vary substantially. Pre-season ISBM projections for 2002 provide a caution to management agencies for pre-season planning, but there can also be considerable uncertainty associated with them. In 2001, the CTC developed several options for implementing overage/underage provisions in both AABM and ISBM fisheries, and presented the options to the PSC commissioners. The commissioners directed the CTC to monitor and report the indices, and the PSC commissioners will evaluate them. The number of stocks without CTC-accepted escapement goals emphasizes the need for agencies to provide biologically-based escapement goals and supporting documentation for CTC review.

3.3. Model Calibration Evaluation

The model catches and stock escapements or terminal runs estimated by CLB 0206 were summarized by calculating the average deviations of the model estimates from the observed values (Table 3.7 for the fisheries that are modeled as operating under catch ceilings or quotas for past years, and Table 3.8 for terminal run size/escapements by model stocks).

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

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

Table 3.7. Average proportion of observed catch by CLB 0206 for PST fisheries.

Model Fishery	Model Catch as Proportion of Observed Catch
Southeast Alaska Troll	0.818
Northern BC Troll	1.061
Central BC Troll	1.364
West Coast Vancouver Island Troll	1.166
Washington/Oregon Ocean Troll	1.379
Strait of Georgia Troll	1.000
Southeast Alaska Net	0.586
Northern BC Net	0.662
Central BC Net	1.210
Puget Sound North Net	0.837
Southeast Alaska Sport	0.833
North/Central BC Sport	1.700
West Coast Vancouver Island Sport	0.528
Washington/Oregon Ocean Sport	0.982
Puget Sound North Sport	1.016
Puget Sound South Sport	0.636
Strait of Georgia Sport	1.443

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 0206. The column entitled “Avg Fit” represents the 1979–2001 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 2001. For most stocks (or stock groups) included in the model calibration, n = 23 years, except for Nooksack Springs, (n = 8, years 1980–1987) and the Mid-Columbia River Bright Hatchery group (n = 21, years 1981–2001).

Model Stock	Calibration Type	Avg. Fit	SD	Min.	Max.
Alaska South SE	Escapement	1.030	0.209	0.725	1.521
Northern/Central BC	Term. Run	1.012	0.090	0.800	1.266
Fraser Early	Term. Run	1.016	0.099	0.853	1.170
Fraser Late	Escapement	1.014	0.135	0.735	1.230
WCVI Hatchery & Natural	Term. Run	1.017	0.189	0.714	1.664
Upper Strait of Georgia	Escapement	1.081	0.303	0.739	2.096
Lower Strait of Georgia Natural	Escapement	1.031	0.188	0.749	1.391
Lower Strait of Georgia Hatchery	Term. Run	1.022	0.229	0.662	1.813
Nooksack Fall	Term. Run	1.036	0.154	0.772	1.284
Puget Sound Fall Fingerling & Yearling	Term. Run	1.025	0.116	0.828	1.219
Puget Sound Natural Fall	Term. Run	1.035	0.145	0.821	1.365
Nooksack Spring	Escapement	1.059	0.218	0.863	1.545
Skagit Summer/Fall Wild	Term. Run	1.054	0.263	0.721	1.817
Stillaguamish Summer/Fall Wild	Escapement	1.059	0.224	0.735	1.698
Snohomish Summer/Fall Wild	Term. Run	1.020	0.124	0.816	1.237
Washington Coastal Fall Hatchery	Term. Run	1.049	0.184	0.816	1.463
Columbia Upriver Bright	Term. Run	1.011	0.116	0.778	1.237
Spring Creek Hatchery	Term. Run	1.019	0.153	0.799	1.478
Lower Bonneville Hatchery & Fall Cowlitz Hatchery	Term. Run	1.032	0.223	0.590	1.462
Lewis River Wild	Term. Run	1.016	0.155	0.828	1.374
Willamette Spring Hatchery	Term. Run	1.006	0.123	0.799	1.317
Spring Cowlitz Hatchery	Term. Run	1.023	0.169	0.632	1.340
Columbia River Summer	Escapement	1.025	0.126	0.765	1.293
Oregon Coastal Fall North Migrating	Escapement	1.026	0.200	0.714	1.391
Washington Coastal Fall Wild	Term. Run	1.028	0.142	0.823	1.406
Snake River Wild Fall	Escapement	1.126	0.503	0.717	2.859
Mid-Columbia River Bright Hatchery	Term. Run	1.037	0.177	0.766	1.477

The variability in these annual estimates differs between stocks. The variability tends to be greatest in less abundant stocks 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 Min and Max columns represent the smallest (Min) and largest (Max) ratio between the agency supplied value and the model estimate, respectively. The significance of these deviations depends upon the questions being evaluated. For example, a large deviation for a stock during the first few years of the calibration or for a stock that has a minor impact on a fishery of concern may not necessitate further attempts at model calibration.

Fishery mortality indices generated by CLB 0206 can be compared to the CWT-based exploitation rate analysis. Model and CWT-based fishery indices use the same equation, but the former are derived from model estimates of catch for all model stocks instead of CWT recovery data from select exploitation rate indicator stocks.

The CWT estimates are considered to be the most accurate, and a comparison of these estimates with those derived from the model provides one measure of how well the model represents changes in fisheries. Two types of fishery indices 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 ($P < 0.01$; $n = 22$ 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 3.9.

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

Index	Troll Fishery		
	SEAK	NBC	WCVI
Reported	0.889	0.871	0.918
Total	0.800	0.868	0.925

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 3.4 and 3.5). However, after 1987, the model estimate of both landed catch and total mortality indices is less than the CWT-derived estimates for most years. The model estimates also show less fluctuation from 1990 to 2000 compared to the CWT-derived indices.

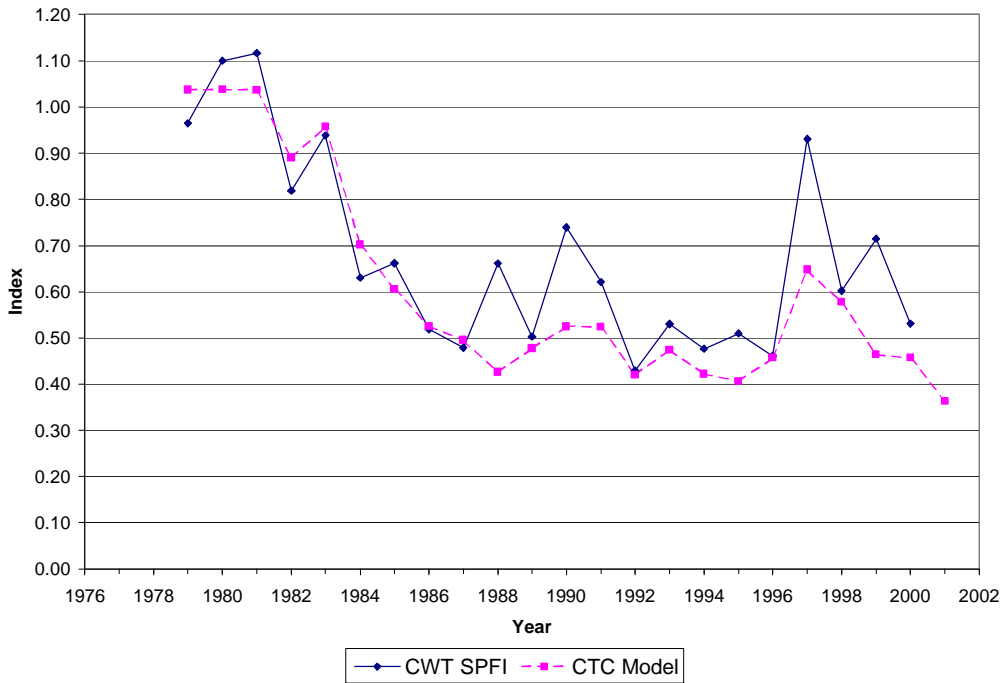


Figure 3.4. Estimated CWT (through 2000) and model reported catch fishery indices (though 2001) for SEAK troll fishery.

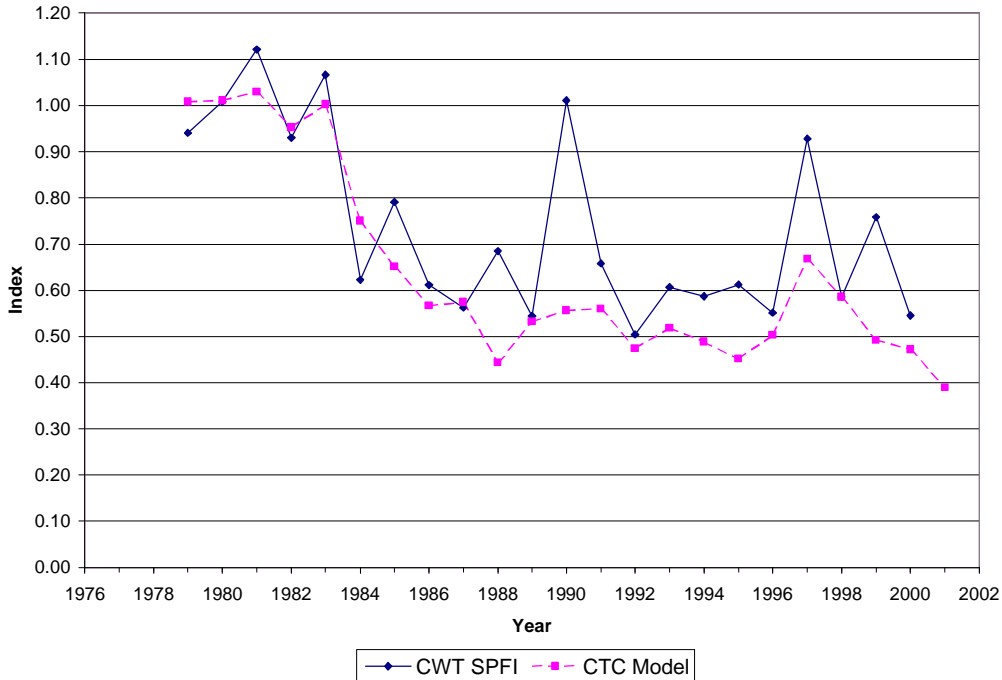


Figure 3.5. Estimated CWT (through 2000) and model total mortality fishery indices (through 2001) for SEAK troll fishery.

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

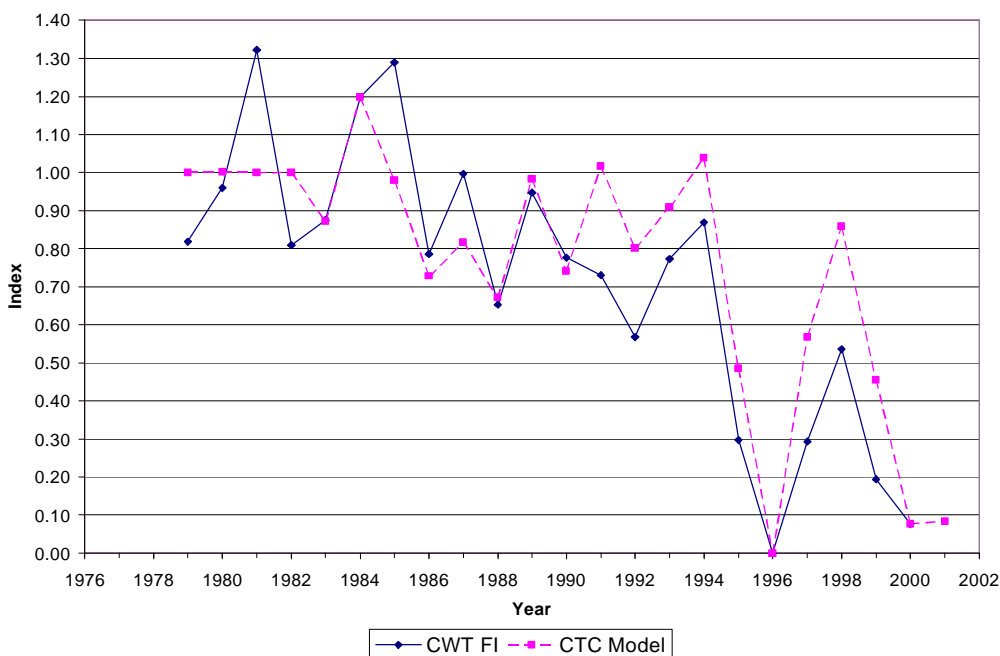


Figure 3.6. Estimated CWT (through 2000) and model reported catch fishery indices (through 2001) for the NBC troll fishery.

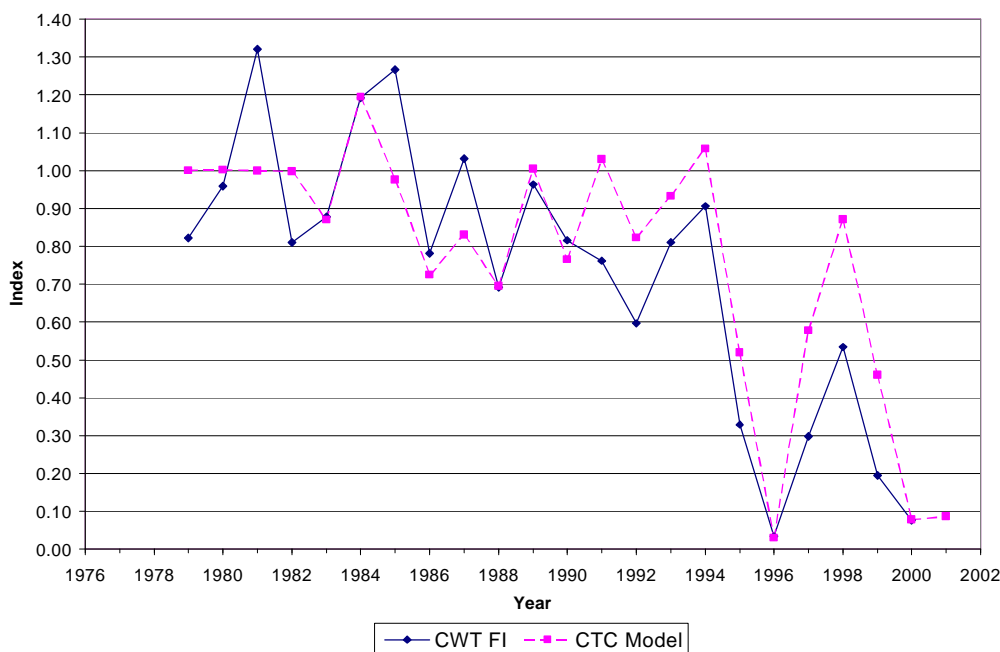


Figure 3.7. Estimated CWT (through 2000) and model total mortality fishery indices (through 2001) for the NBC troll fishery.

Since the base period, the model derived reported catch fishery index estimates and trends for the WCVI troll fishery has been similar to those derived from CWTs. However, from 1987 through 1995, the model estimates are consistently greater than the CWT-based estimates (Figures 3.8 and 3.9).

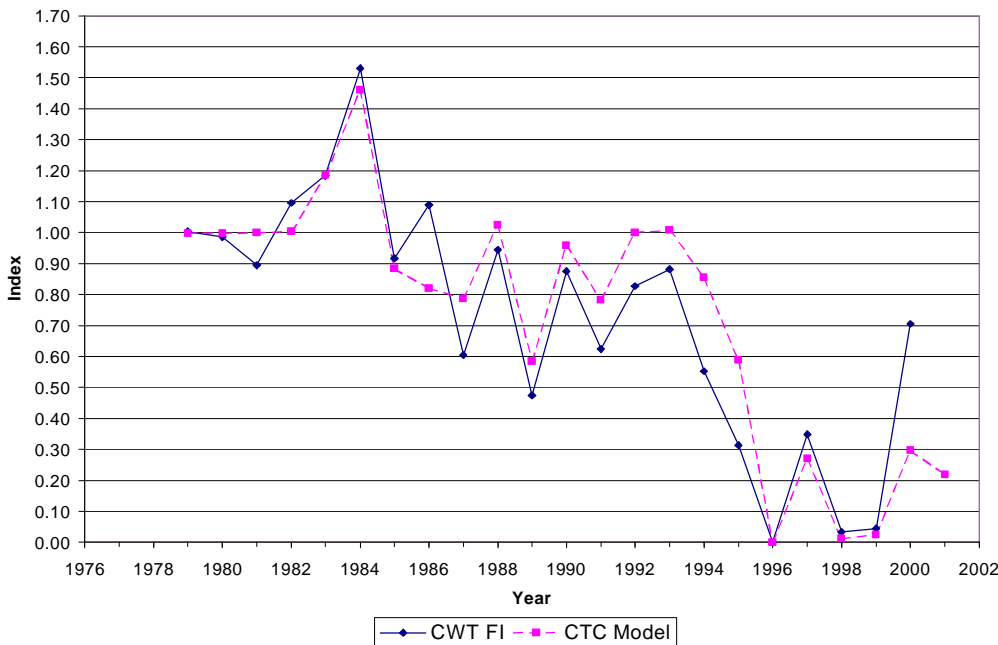


Figure 3.8. Estimated CWT (through 2000) and model reported catch fishery indices (through 2001) for the WCVI troll fishery.

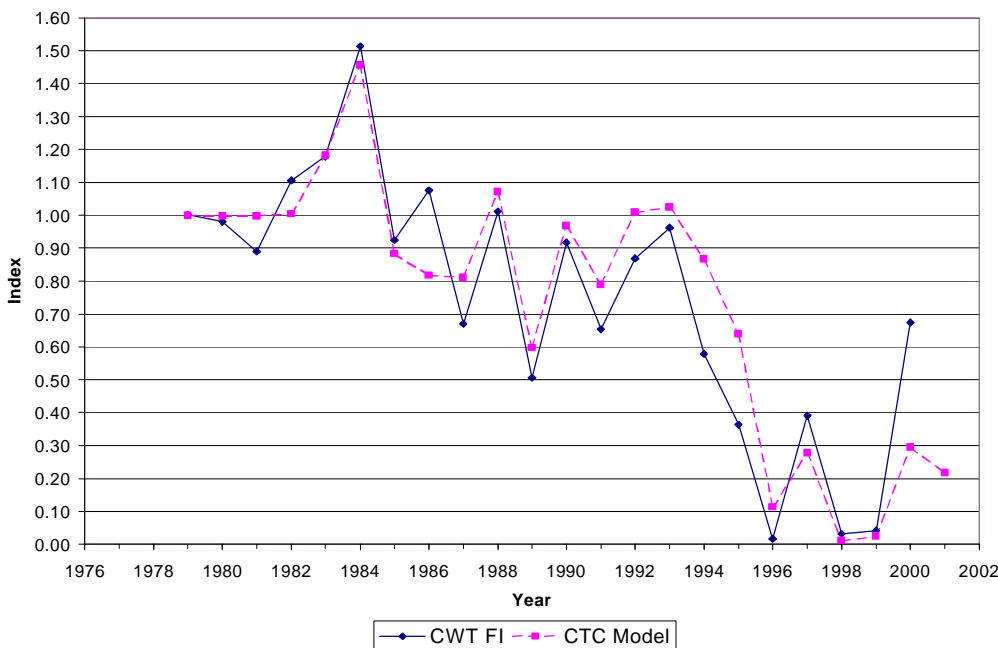


Figure 3.9. Estimated CWT (through 2000) and model total mortality fishery indices (through 2001) for the WCVI troll fishery.

3.4. Summary of Agency Stock Forecasts Used in the Model

A summary of recent forecasts for 19 stocks used in the chinook model calibration is given in Table 3.10. The table shows that as a general rule, the model predicts the agency forecasts with more precision than the agency forecasts predict the post-season estimate. For the major production stocks, these forecasts suggest that chinook abundance in 2002 will be greater than that reported for 2001. For each stock, Table 3.8 shows whether the forecast is for terminal run (ocean escapement) or spawning escapement. Methods for individual stock forecasts are detailed in Appendix D.

3.5. Summary of Escapement Relative to the Goals

Paragraph 9 of the Agreement defines criteria for identifying stocks of concern and escapement levels in those stocks that would trigger additional management action (footnote 3, page 40 of the Agreement). Of the 16 stocks with CTC agreed escapement goals (Table 3.11), the Blossom stock was the only stock to qualify as a stock of concern (three years below escapement range). However, additional management action for this stock will not occur at this time as the PSC has instructed the CTC to review and accept escapement goals for additional escapement indicator stocks and, in future years, to develop a methodology for establishing lower bounds, which will trigger additional management actions.

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

Model Stock	1999					2000					2001					2002		
	Model Forecast	Agency Forecast	Model / Agency ¹	Post Season	Agency / Post Season ²	Model Forecast	Agency Forecast	Model / Agency	Post Season	Agency / Post Season	Model Forecast	Agency Forecast	Model / Agency	Post Season	Agency / Post Season	Model Forecast	Agency Forecast	Model / Agency
N. Oregon Coastal	65,249	72,084	-9%	66,039	9%	61,457	63,259	-3%	52,889	20%	58,062	66,412	-13%	100,548	-34%	73,055	73,914	-1%
Willamette Spring	46,181	49,875	-7%	55,801	-11%	57,202	61,211	-7%	55,900	10%	59,207	59,600	-1%	84,000	-29%	73,151	77,434	-6%
Cowlitz Spring	3,363	3,950	-15%	4,801	-18%	4,922	6,050	-19%	5,598	8%	3,684	4,849	-24%	5,508	-12%	5,534	6,800	-19%
Col. Upriver Summer	21,653	20,900	4%	20,318	3%	27,214	28,038	-3%	23,002	22%	27,029	24,500	10%	54,521	-55%	70,290	77,700	-10%
Upriver Bright Fall	173,712	147,500	18%	166,100	-11%	212,317	171,100	24%	155,700	10%	150,973	127,200	19%	232,500	-45%	249,721	281,000	-11%
Spring Cr Hatch. Fall	63,203	65,800	-4%	50,100	31%	17,335	21,900	-21%	20,600	6%	56,089	56,600	-1%	125,000	-55%	153,070	144,400	6%
Lewis River Wild Fall	3,068	2,600	18%	3,400	-24%	4,053	3,500	16%	10,200	-66%	16,574	16,700	-1%	15,700	6%	18,910	18,200	4%
Nooksack Hatchery	27,206	27,000	1%	41,186	-34%	21,277	19,000	12%	33,588	-43%	33,974	36,450	-7%	36,450	0%	50,361	54,420	-7%
Skagit Natural	8,967	7,600	18%	4,924	54%	6,988	7,300	-4%	16,843	-57%	9,064	9,183	-1%	14,005	-34%	12,635	13,455	-6%
Stillaguamish Natural	1,303	NA	NA	1,098	NA	1,370	1,500	-9%	1,457	3%	1,328	1,360	-2%	1,360	0%	1,372	1,449	-5%
Snohomish Natural	5,804	5,600	4%	4,832	16%	5,997	6,000	0%	6,000	0%	5,876	5,760	2%	5,760	0%	6,524	6,700	-3%
WCVI Total	77,836	68,400	14%	98,410	-30%	21,040	15,040	40%	37,055	-59%	33,702	30,633	10%	86,787	-65%	128,068	107,727	19%
Harrison Stock ³	84,686	82,650	2%	184,099	-55%	187,970	220,400	-15%	120,744	83%	141,745	131,800	8%	141,196	-7%	132,946	160,100	-17%
Puget Sound Hatchery	66,260	69,285	-4%	116,204	-40%	67,306	69,800	-4%	76,777	-9%	102,899	105,955	-3%	105,955	0%	114,889	124,608	-8%
Puget Sound Natural	28,536	28,400	0%	31,104	-9%	10,000	15,364	-35%	20,050	-23%	19,938	18,900	5%	18,900	0%	20,008	19,801	1%
Bonneville Tules	26,112	34,800	-25%	37,300	-7%	17,095	23,700	-28%	27,000	-12%	28,732	32,200	-11%	94,200	-66%	100,401	137,600	-27%
Mid Columbia Brights	37,951	38,300	-1%	50,800	-25%	53,460	50,600	6%	37,100	36%	45,055	43,500	4%	66,400	-34%	102,085	96,200	6%
Washington Coastal Nat	42,107	43,780	-4%	24,785	77%	34,741	NA	NA	27,615	NA	34,563	35,306	-2%	27,978	26%	33,902	33,489	1%
Lyons Ferry	523	NA	NA	905	NA	1,243	NA	NA	900	NA	733	734	0%	2,652	-72%	2,066	NA	NA

¹=(model forecast - agency forecast)/agency forecast * 100

²=(agency forecast - postseason estimate)/postseason estimate * 100

³ Harrison Stock forecast includes Chilliwack

Table 3.11. Escapement assessment for stocks with CTC agreed escapement goals.

Stock	Area	Agreed Goals	Point Estimate	1999 Escapement	2000 Escapement	2001 Escapement
Situk	SEAK	500–1,000	600	1,811	2,018	672
Alsek (Klukshu)	SEAK	1,100–2,300	1,100	2,166	1,363	1,843
Taku	SEAK	30,000–55,000	35,938	20,545	30,014	41,179
Stikine	SEAK	14,000–28,000	17,368	25,968	35,447	66,515
King Salmon	SEAK	120–240	150	300	137	147
Andrew Creek	SEAK	650–1,500	850	1,210	1,286	2,260
Unuk (index)	SEAK	650–1,400	800	680	1,341	2,109
Chickamin (index)	SEAK	450–900	525	492	801	1,010
Blossom (index)	SEAK	250–500	300	212	231	204
Keta (index)	SEAK	250–500	300	276	300	343
Fraser Late (Harrison)	BC	75,100–98,500	75,100	107,016	77,035	94,683
Columbia River Summers	Col River	17,857	17,857	23,057	27,073	50,000+
Lewis	Col River	5,700	5,700	3,184	8,718	13,900
Nehalem	NOC	6,989	6,989	8,063	5,257	9,459
Siletz	NOC	2,944	2,944	4,166	4,982	10,582
Siuslaw Falls	NOC	12,925	12,925	29,610	12,999	29,748

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APPENDIX

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

LIST OF APPENDIX A TABLES

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

Area	Annex Stock Group ¹	Annex Indicator Stocks	Run Type	Escapement Indicator Stock	Escapement Objective	Model Stock	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 Type	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	Spr/Sum	Nass				
NBC-Area 4		Skeena	Spr/Sum	Skeena				
CBC-Area 8			Spr	Dean				
CBC-Area 9			Spr/Fall	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	75,100	Chilliwack
			Fall					
	Fraser Early	Upper Fraser rivers	Spr	Upper Fraser	Escapement goal range by stock	Fraser Early	93,700	
		Mid Fraser rivers	Spr/Sum	Mid Fraser				
		Thompson rivers	Sum	Thompson				
Upper Strait of Georgia	Upper Strait of Georgia	(Klinaklini, Kakwiekan, Wakeman, Kingcome, Nimpkish)	Sum/Fall	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 Type	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
		Skagit	Spr	Skagit spring				Skagit Spr Year
			Fall			Nooksack Fall	11,923	
			Fall					Samish Fing
	Puget Sound Natural Summer/ Falls	Stillaguamish	Sum/ Fall		Escapement goal ranges by stock	Stillaguam. Wild	2,000	Stillag. Fall Fing
		Snohomish	Sum/ Fall			Snohomish Wild	5,250	
		Skagit group	Sum/ Fall	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 Type	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				
			Spr/Sum	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 Type	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	Oregon Coast	62,382	Salmon River
		Siuslaw	Fall	Siuslaw	12,925			
		Siletz	Fall	Siletz	2,944			
Mid-Oregon Coast			Fall	Umpqua				
			Fall	Coquille				

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

LIST OF STOCK IDENTIFIERS FOR APPENDIX TABLE B.1

AKS: Alaska Spring
BON: Bonneville Tule
BQR: Big Qualicum
CHI: Chilliwack River Fall Hatchery
COW: Cowichan Falls
CWF: Cowlitz Fall Tule
ELW: Elwha Fall Fingerling
GAD: George Adams Fall Fingerling
HAN: Hanford Wild
HOK: Hoko Fall Fingerling
KLM: Kitsumkalum River
LRW: Lewis River Wild
LYF: Lyons Ferry
NIS: Nisqually Fall Fingerling
NKF: Nooksack Fall Fingerling
NKS: Nooksack Spring Yearling
PPS: Puntledge
QUE: Queets Fall Fingerling
QUI: Quinsam River
RBT: Robertson Creek Fall Hatchery
SAM: Samish Fall Fingerling
SKS: Skagit Spring Yearling
SOO: Sooes Fall Fingerling
SPR: Spring Creek Tule
SPS: South Puget Sound Fall Fingerling
SPY: South Puget Sound Fall Yearling
SQP: Squaxin Pens Fall Yearling
SRH: Salmon River Hatchery
STL: Stillaguamish Fall Fingerling
SUM: Columbia River Summers
URB: Columbia River Upriver Brights
UWA: U of W Fall Accelerated
WRF: White River Spring Yearling
WRY: Willamette Spring
WSH: Willamette River Spring Hatchery

Table B.1. Tag codes for exploitation rate analysis.

AKS 1978	AKS 1980	031809	031836	031901	031935	042537	032102	036219	032132	030119	030218	043606	043702	036347
031661	031753	031810	031837	031902	031936	042538	032103	036221	032135	030121	030219	043607	043704	036348
031703	031754	031811	031838	031903	031937	042539	032104	036222	036226	030122	030220	043608	043705	036349
031704	041944	031812	031839	031904	031938	042540	042626	036225	036228	030125	030221	AKS 1990	043706	043857
031705	042121	031813	031843	031905	031939	AKS 1985	042628	036310	036231	030216	030222	030227	043707	043858
031706	042202	031814	031844	031906	031940	042631	042632	036311	036232	030217	030223	030228	043708	043859
031707	044005	031815	031845	031907	031941	042633	036312	036319	036319	031947	030224	030229	043745	043904
031708	AKS	031816	031846	031908	031942	031957	042633	036313	036321	032138	030225	030230	043746	043905
031709	1981	031817	031847	031909	031943	031958	042634	036314	036322	032141	030226	030231	043747	043906
031710	031761	031818	031848	031910	031944	031959	042713	036315	036323	032201	032052	030232	043748	043907
031711	031762	031819	031849	031911	031945	031960	042731	036316	036324	032202	032203	030233	043749	043933
031712	031763	036306	031850	031912	031946	031961	042732	036317	036325	036237	032204	030332	043750	043934
031713	031801	036307	031851	031913	031948	031962	042733	042754	036326	036238	032205	031618	043821	043936
031714	031802	036308	031852	031914	040329	031963	042825	042908	036327	036329	032206	032216	043822	043937
031715	041932	036309	031853	031915	040330	032001	AKS 1986	042909	036328	036330	032207	032217	043823	043938
041938	041939	036310	031854	031916	040331	032002	042960	042737	036331	032208	032209	032218	AKS 1991	043939
041940	036303	036311	031855	031917	040332	032003	043101	042738	043247	032210	032211	032219	044028	
AKS 1979	036304	036312	031856	031918	040333	032004	043102	043027	043249	032212	032213	032220	044029	
031716	036305	036313	031857	031919	040336	032005	043104	043028	043250	032214	032215	032221	044101	
031717	042222	036314	031858	031920	040342	032006	043107	043029	043252	032216	032217	032222	044102	
041917	042223	036315	031859	031921	040343	032007	043108	043030	043255	032218	032219	032223	044104	
041943	042224	036316	031860	031922	040344	032008	043108	043031	043258	032220	032221	032224		
041945	042225	036317	031861	031923	040345	032009	043108	043032	043261	032222	032223	032225	AKS 1992	
042039	042226	036318	031862	031924	040346	032010	043108	043033	043264	032224	032225	032226	036332	
042040	042227	036319	031863	031925	040347	032011	043108	043034	043267	032226	032227	032228	036333	
042042	042228	036320	031864	031926	040348	032012	043108	043035	043270	032228	032229	032229	036334	
042043	042229	036321	031865	031927	040349	032013	043108	043036	043273	032230	032231	032230	036335	
042045	042230	036322	031866	031928	040350	032014	043108	043037	043276	032232	032233	032231	036336	
	042231	036323	031867	031929	040351	032015	043108	043038	043279	032234	032235	032232	036337	
	042232	036324	031868	031930	040352	032016	043108	043039	043282	032236	032237	032233	036338	
	042233	036325	031869	031931	040353	032017	043108	043040	043285	032238	032239	032234	036339	
	042234	036326	031870	031932	040354	032018	043108	043041	043288	032240	032241	032235	036340	
	042235	036327	031871	031933	040355	032019	043108	043042	043291	032242	032243	032236	036341	
	042236	036328	031872	031934	040356	032020	043108	043043	043294	032244	032245	032237	036342	
	042237	036329	031873	031935	040357	032021	043108	043044	043297	032246	032247	032238	036343	
	042238	036330	031874	031936	040358	032022	043108	043045	043300	032248	032249	032239	036344	
	042239	036331	031875	031937	040359	032023	043108	043046	043303	032250	032251	032240	036345	
	042240	036332	031876	031938	040360	032024	043108	043047	043306	032252	032253	032241	036346	
	042241	036333	031877	031939	040361	032025	043108	043048	043309	032254	032255	032242	036347	
	042242	036334	031878	031940	040362	032026	043108	043049	043312	032256	032257	032243	036348	
	042243	036335	031879	031941	040363	032027	043108	043050	043315	032258	032259	032244	036349	
	042244	036336	031880	031942	040364	032028	043108	043051	043318	032260	032261	032245	036350	
	042245	036337	031881	031943	040365	032029	043108	043052	043321	032262	032263	032246	036351	
	042246	036338	031882	031944	040366	032030	043108	043053	043324	032264	032265	032247	036352	
	042247	036339	031883	031945	040367	032031	043108	043054	043327	032266	032267	032248	036353	
	042248	036340	031884	031946	040368	032032	043108	043055	043330	032268	032269	032249	036354	
	042249	036341	031885	031947	040369	032033	043108	043056	043333	032270	032271	032250	036355	
	042250	036342	031886	031948	040370	032034	043108	043057	043336	032272	032273	032251	036356	
	042251	036343	031887	031949	040371	032035	043108	043058	043339	032274	032275	032252	036357	
	042252	036344	031888	031950	040372	032036	043108	043059	043342	032276	032277	032253	036358	
	042253	036345	031889	031951	040373	032037	043108	043060	043345	032278	032279	032254	036359	
	042254	036346	031890	031952	040374	032038	043108	043061	043348	032280	032281	032255	036360	
	042255	036347	031891	031953	040375	032039	043108	043062	043351	032282	032283	032256	036361	
	042256	036348	031892	031954	040376	032040	043108	043063	043354	032284	032285	032257	036362	
	042257	036349	031893	031955	040377	032041	043108	043064	043357	032286	032287	032258	036363	
	042258	036350	031894	031956	040378	032042	043108	043065	043360	032288	032289	032259	036364	
	042259	036351	031895	031957	040379	032043	043108	043066	043363	032290	032291	032260	036365	
	042260	036352	031896	031958	040380	032044	043108	043067	043366	032292	032293	032261	036366	
	042261	036353	031897	031959	040381	032045	043108	043068	043369	032294	032295	032262	036367	
	042262	036354	031898	031960	040382	032046	043108	043069	043372	032296	032297	032263	036368	
	042263	036355	031899	031961	040383	032047	043108	043070	043375	032298	032299	032264	036369	
	042264	036356	031900	031962	040384	032048	043108	043071	043378	032300	032301	032265	036370	
	042265	036357	031901	031963	040385	032049	043108	043072	043381	032302	032303	032266	036371	
	042266	036358	031902	031964	040386	032050	043108	043073	043384	032304	032305	032267	036372	
	042267	036359	031903	031965	040387	032051	043108	043074	043387	032306	032307	032268	036373	
	042268	036360	031904	031966	040388	032052	043108	043075	043390	032308	032309	032269	036374	
	042269	036361	031905	031967	040389	032053	043108	043076	043393	032310	032311	032270	036375	
	042270	036362	031906	031968	040390	032054	043108	043077	043396	032312	032313	032271	036376	
	042271	036363	031907	031969	040391	032055	043108	043078	043399	032314	032315	032272	036377	
	042272	036364	031908	031970	040392	032056	043108	043079	043402	032316	032317	032273	036378	
	042273	036365	031909	031971	040393	032057	043108	043080	043405	032318	032319	032274	036379	
	042274	036366	031910	031972	040394	032058	043108	043081	043408	032320	032321	032275	036380	
	042275	036367	031911	031973	040395	032059	043108	043082	043411	032322	032323	032276	036381	
	042276	036368	031912	031974	040396	032060	043108	043083	043414	032324	032325	032277	036382	
	042277	036369	031913	031975	040397	032061	043108	043084	043417	032326	032327	032278	036383	
	042278	036370	031914	031976	040398	032062	043108	043085	043420	032328	032329	032279	036384	

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032241	036301	032255	032307	036236	040233		072830	BON	075228	BON			023345	BQR
036350	036357	032256	032308	036239	040234	BON	072831		075229		BQR	BQR		1988
036351	036358	036217	032309	036240	040235	1976	072832	1985	075230	1993	1973	1980	BQR	
036352	036359	036218	036224	036336	040236	091605	072833	073818	075231		070432	021810	1985	02601
036353	036360	036220	036227	044624	040237	BON	072834	074051	075231		075812	021944	023742	02604
036354	036361	036223	036229	044625	040238	1977		074052	BON		076143	BLRD	023743	02604
036355	036362	044502	044242	044626	040239		BON	074053	1990			BLRDGI	BQR	02604
036356	036363	044504	044243	044662	040240	071656	1982	074054		BON		BLRDGI	1981	02605
044049	044314	044543	044525	044942	040241	071842	072328		071602	1994	BQR	022223	023745	02605
044050	044315	044544	044526	044958		BON	073121	BON	071603		1974	022306	024047	02605
044142	044407	044561	044619	044959		1978	073144	1986	071604	070545	021002	BQR	024048	02605
044143	044416	044562	044717	044960		071841	073145	074050	075227	070852		1982	024049	02605
044148	044417	044563	044718	044961		072157	073146	074527	075905	071144	BQR		024050	02632
044149	044418	044601	044737	044962		072163	073147	074528	BON		1975	022543	BQR	02632
044157	044419	044602	044738	045001			073148	074529	1991		020206	BQR	1986	BQR
044223	044420	044603	044745	045002		BON		074530		070544		1983	024260	1989
044224	044421	044604	044746	045003		1979	BON		070222	BON	BQR		024261	02066
044238	044430	044610	044747			072055	1983	BON	070223	1996	1976	022661	024262	02066
044239	044431	044611	044754	AKS		072329	073120	1987	070224		021716	022747	024263	02066
			044755	1997		072335	073322	074526	071601	071251	BQR	022748	024357	02066
AKS	AKS	AKS	044756	030126		072341	073323	075015	075657	092448	1977	022824	024358	02072
1993	1994	1995	044757	030136		072342	073353	075017	075658		BON	022825	024359	02095
030130	030138	030142	044758	030148			073354	075018	075942	1997	021726	022826	024360	02095
030131	030139	030143	044759	030149		BON	073355	075020	076020	092121	021727	BQR	BQR	02095
030132	030140	030144	044760	030150		1980	073356		076321			1984	1987	BQR
030133	030141	032051		032302		072156	BON	BON	BON		BQR	023217	024416	1990
030134	032247	032245	AKS	032303		072408	1984	075012			1978	021612	023320	02131
030135	032248	032246	1996	032304		072411		075219	070221	021613		021656	023321	02131
032137	032249	032257	032128	036230		072662	073352	075220	070234				023333	02131
032242	032250	032258	032301	036233			073819	075221	070235		BQR	023334	024761	02131
032243	032251	032259	036212	040147		BON	073820	075222	070516		1979	023335	024957	02131
032244	032252	032260	036215	040148		1981	073821		070517			023336	024962	18025
036209	032253	032305	036234	040150		072407	073822	BON	070518		021824	023337	024963	18025
036210	032254	032306	036235	040152		072729		1989	070519		021825	023338	025001	18025
						072730		075218	070520		021826			

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Table B.1. (Page 3 of 10).

180256	BQR	183057	CHI	CHI	CHI	COW	020939	181437	183110	CWF	633236	CWF	ELW	ELW
BQR	1994	183058	1981	1988	1995	1985	026103	181438	183111	1977	633237	1993	1982	1989
1991	181059	183059	022163	025747	182261	023803	COW	COW	183112	631802	633238	635539	051363	21182
021332	181060	183422	CHI	025748	182262	023804	1990	1995	183730	CWF	CWF	CWF	632721	21182
021333	181061	183423	1982	CHI	CHI	023911	020336	182026	183731	1978	1985	1994	632722	ELW
021334	181062	183424	1989	1989	1996	COW	020337	182027	183732	631942	634108	635523	ELW	1990
021335	182014	183425	022422	020242	182856	1987	020338	182028	183733	CWF	CWF	635620	1983	21201
180861	182015	BQR	CHI	020243	182857	024334	020339	182029		1979	1986	CWF	211616	ELW
180862	182121	1998	1983	CHI	CHI	024729	020340	182030		632154	634126	1995	633038	1991
180863	182122	183143	022658	1990	1997	024730	020341	182031		CWF	CWF	635851	633039	21221
BQR	BQR	183144	022659	180330	183353	024735	COW	COW		1980	1987	636005	ELW	ELW
1992	1995	183145	022660	CHI	183354	024945	1991	1996		632156	635231	CWF	1984	1992
180406	181516	183818	CHI	CHI	CHI	024946	180515	182740		632255	CWF	1996	211658	21232
180407	181517	183819	1984	1991	1998	COW	180516	182741		CWF	CWF	630224	633419	ELW
180408	181519	183820	023414	180332	1998	1988	180517	182742		1981	635250	630227	633420	1993
180409	181653	183821	023415	180334	184046	024860	180518	182743		632462	CWF	CWF	ELW	21245
180410	182347		023416	CHI	184048	025012	COW	182744		CWF	1989	1998	211919	ELW
180411	182348		023417	1992		025013	1992	182745		1982	630452	631031	211920	1994
181103	182349		023418	181211		025015	180210	COW		632503	CWF		211921	21261
181104	182350		023419	181212		025016	180550	1997		CWF	1990		633543	21261
BQR	BQR		CHI	CHI		025017	181042	182761		1983	634056		633544	63533
1993	1996		1985	1993		025523	181044	182762		CWF	CWF		633547	
180636	182757		024101	181420		025524	COW	182763		633019	634056		633548	
180637	182758		CHI	181421		COW	1989	182801		633020	1991		ELW	
180638	182759		1986	CHI		020352	181320	182802		633124	634526		1986	
180639	183418		024547	1994		020522	181321	182803		633125	CWF		212208	
181055	183419		CHI	180211		020622	181322	182804		CWF	1992		ELW	
181056	183420		1987	180212		020623	COW	182805		1984	635015		1988	
181057	183421		025542	182123		020624	1994	COW		633235			213132	
181058	BQR			182124		020938	181436	1998						
	1997							183109						

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GAD 1972 150812 151013	GAD 1985 633501 633502 633503 633504	635057 GAD 1993 635545	HAN 1986 634152	HAN 1995 636116 636117 636118	HOK 1985 211935	HOK 1995 212949	KLM 1979 021852	KLM 1986 024410 024411 024412 024413 024414	020945 020946 026137 026138	181423 181424	182518 KLM 1997 182806 182807 182808 183035 183036 183037 183038 183039 183040 183041 183042 183307	LRW 1977 631611 631618 631619	LRW 1984 633411 633412	LRW 1992 63494
GAD 1974 130303	GAD 1986 634119	GAD 1994 635023 635801	HAN 1987 635232	HAN 1996 630133	HOK 1986 212216	HOK 1996 212953	KLM 1980 021951	KLM 1987 024941 024942 024943 024944 025060 025061	KLM 1990 021133 021134 021135 021136 021137 021138 021139 021140	180608 180609 180640 180641 180642 182155 182156 182157	182518 KLM 1997 182806 182807 182808 183035 183036 183037 183038 183039 183040 183041 183042 183307	LRW 1978 631813 631858 631859 631902 631920 632002	LRW 1985 633821 633822	LRW 1993 63515
GAD 1975 130913	GAD 1987 635208	GAD 1995 636045	HAN 1988 635252	HAN 1997 630603	HOK 1987 211907	HOK 1997 212959	KLM 1981 022312 022313	KLM 1987 024941 024942 024943 024944 025060 025061	021133 021134 021135 021136 021137 021138 021139 021140	180640 180641 180642 182155 182156 182157	182518 KLM 1995 181658 181659 181660 181661 182016 182017 182018 182020 182021	LRW 1978 631813 631858 631859 631902 631920 632002	LRW 1985 633821 633822	LRW 1994 63562
GAD 1978 631752 631915	GAD 1988 635237	GAD 1996 630148	HAN 1989 630755	HAN 1998 630635	HOK 1989 211829	HOK 1998 211829	KLM 1983 022758	KLM 1988 026039 026040 026041 026042 026043 026044 026045	021133 021134 021135 021136 021137 021138 021139 021140	180640 180641 180642 182155 182156 182157	182518 KLM 1995 181658 181659 181660 181661 182016 182017 182018 182020 182021	LRW 1979 632123 632124 632125 632207 632208 632213 632214	LRW 1987 635061 635062	LRW 1997 63050 63050
GAD 1979 632041 632109	GAD 1989 630450	GAD 1997 630304	HAN 1991 634115	HAN 1990 212018	HOK 1991 212218	HOK 1990 212018	KLM 1984 023346 023347 023348 023349 023350 023351 023352 023353	KLM 1988 026039 026040 026041 026042 026043 026044 026045	021010 021011 023116	181660 181661 182016 182017 182018 182020 182021	182518 KLM 1991 181658 181659 181660 181661 182016 182017 182018 182020 182021	LRW 1979 632123 632124 632125 632207 632208 632213 632214	LRW 1987 635061 635062	LRW 1997 63050 63050
GAD 1980 632146 632161 632262	GAD 1990 630862	GAD 1997 630304	HAN 1991 634527	HAN 1990 212018	HOK 1991 212218	HOK 1990 212018	KLM 1984 023346 023347 023348 023349 023350 023351 023352 023353	KLM 1988 026039 026040 026041 026042 026043 026044 026045	021010 021011 023116	181660 181661 182016 182017 182018 182020 182021	182518 KLM 1991 181658 181659 181660 181661 182016 182017 182018 182020 182021	LRW 1979 632123 632124 632125 632207 632208 632213 632214	LRW 1987 635061 635062	LRW 1997 63050 63050
GAD 1981 632235 632331	GAD 1991 634023 634620	GAD 1997 630304	HAN 1992 635017	HAN 1990 212018	HOK 1992 212327	HOK 1990 212018	KLM 1985 023704 023705 023706 023707	KLM 1989 020940 020941 020942 020943 020944	181046 181047 181048 181049 181050 181051 181052	182020 182021	182518 KLM 1996 181830 182512 182513 182514 182515 182516 182517	LRW 1982 632737 632738	LRW 1990 634217	LRW 1991 634206

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Table B.1. (Page 5 of 10).

LYF 1984	LYF 1990	NIS 1979	NIS 1986	NIS 1995	NKF 1988	636326 NKF 1997	NKS 1981	NKS 1992	PPS 1974	022557 PPS 1983	PPS 1990	182842 PPS 1997	QUE 1977	21: QL 19
633226	634143	050722	211962	212946	635241	630604	632411	634529	021402	022710	180315	182843	050361	21:
633227	634160			635630						022711	180316	182844	QUE 1978	QL 19
633228	LYF 1992	NIS 1980	NIS 1987	NIS 1996	NKF 1989	NKF 1998	NKS 1982	NKS 1993	PPS 1975	022711	PPS 1991	PPS 1998	050520	21:
LYF 1985	635012	050839	212541	212957	051952	631028	632546	635018	020308	PPS 1984	180814	183828	050521	QL 19
633638	LYF 1998	050840	NIS 1988	636352	630225		NKS 1984	NKS 1994	PPS 1976	023357	180815		050522	QL 19
633639	631026	NIS 1981	213138	NIS 1997	NKF 1992		633452	635815	021816	023358	180816		050525	QL 19
633640		051048	NIS 1989	212956	634605		633453	635830	PPS 1977	023359	180817		QUE 1979	21:
633641		051049	211836	NIS 1998	634951		NKS 1986	NKS 1995	021634	PPS 1985	181403		050661	QL 19
633642	LYF 1986	NIS 1982	NIS 1990	630505	NKF 1993		633247	636048	PPS 1978	023727	181404		QUE 1980	21:
634259	634261	051344	211833		635142		633248	NKS 1996	021731	PPS 1986	PPS 1993		050830	QL 19
634261		051345			635143		633336	635533	PPS 1979	024701	181410		050833	21:
LYF 1987		NIS 1983	NIS 1991		635144		NKS 1987	634962	PPS 1979	024702	181411		QUE 1981	QL 19
635214		211628	212206		635144		634962	NKS 1997	021854	PPS 1987	PPS 1994		050962	21:
635216		211629			635144		635059	630604	PPS 1980	023701	182138		051016	QL 19
LYF 1988		NIS 1984	NIS 1992		NKF 1994		NKS 1988		PPS 1981	021947	182139		QUE 1982	21:
630226		211706	212323		635351		634422		PPS 1988	026034	PPS 1995		051425	QL 19
630228		211707	NIS 1993		635829		NKS 1989		PPS 1981	022302	182449		QUE 1983	21:
LYF 1989		NIS 1985	212450		635834		635261		PPS 1982	020809	182450		211621	QL 19
635544		211759	NIS 1994		NKF 1995		NKS 1990		022556	020810	PPS 1996		QUE 1985	QL 19
635547		211761	212606		NKF 1996		634123				182841			

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Table B.1. (Page 6 of 10).

212425		022303	023558	025821	180420	181649	183741			023136	024802	020949	RBT	18250
212624	QUI	022304		025822	180421	181650	183742	RBT	RBT	023142	024809	020950	1993	18250
	1974		QUI		180422	181651	183743	1973	1979	023143	024810			18250
QUE	020403	QUI	1986	QUI		181652	183744	020203	021827	023144	024951	RBT	181539	18250
1995		1982	024152	1989	QUI		183745	020406	021829	023145	024952	1990	181540	18250
212948	QUI	022518	024153	020357	1992	QUI		020506		023151	024958	021208	181541	18250
	1975	022519	024154	020358	181150	1995		020602	RBT	023203	024959	021209	181542	18250
QUE	020108		024155	020359	181151	182339			1980	023204	024960	021549	181543	18250
1996		QUI	024156	020360	181152	182340		RBT	021661	023206	024961	021550	181544	RBT
212961	QUI	1983	024157	020361	181153	182341		1974		023208	025326	021551	181545	1991
	1976	022631	024158	026062	181154	182342		020606	RBT	023304	025327	021552	181546	18220
QUE	021916	022632	024159	026063	181155	182343		020906	1981		025328	021553	RBT	18220
1997			024160	026101	181156	182344		021206	022202	RBT	025329		1994	18220
213003	QUI	QUI		026102	181157	182345		021406	022405	1985		RBT	181455	18220
	1977	1984	QUI		181158							1991	181456	18220
	021736	023322	1987	QUI		QUI		RBT	RBT	023734	RBT		181457	18220
	021737	023323		1990	QUI	1996		1975	1982	023735	1988	180620	181458	18220
	021738	023324	024419		1993	182749		020408	022541	023736	025014	180621	181459	18250
		023325	024420	020956		180629		020409	082225	023737	025836	180622	181460	18250
	QUI	023326	024421	020957	180629	182750				023738	025837	180623	181461	18250
	1978	023327	024956	020958	180630	182751		021305	RBT	023739	025838	180802	182220	18250
	021759	023328	025358	020959	180631	182752			1983	023740	025839	180803	182221	18250
		023329	025359	021448	181357	182753		RBT	022662	023741	026055	180804	182222	18250
	QUI	023329	025360	021449	181358	182754		1976	022663		026056	180805	182223	18250
	1979	023330	025361	021450	181359	182755		021629	022708	RBT	026057		182224	RBT
			025362	021451	181360			021630	022753	1986		RBT	182225	1990
	021757	QUI		026019	181361	QUI		021631	082247	024256	RBT	1992		
	021758	1985	QUI		181362	1997			082248	024257	1989	180259	RBT	18280
	QUI	023522	1988	QUI		182809		RBT		024361	020151	180260	1995	18280
	1980	023523	025814	1991	QUI	182810		1977	RBT	024362	020152	180261	182226	18280
	021657	023524	025815	021331	1994	183308		022217	1984	024363	020153	180262	182227	18280
	021943	023525	025816	180415	181644			022218		024401	020645	180624	182228	18310
	021950	023554	025817	180416	181645	QUI			023131		020646	180625	182229	18310
		023555	025818	180417	181646	1998		RBT	023132	RBT	020647	180626	182230	18310
	QUI	023556	025819	180418	181647	183739		1978	023133	1987	020648	180627	182231	18310
	1981	023557	025820	180419	181648	183740		021615	023134	024311	020948			18310
								021635	023135					

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SPR 1996	SPS 1971	631945 SPS 1979	633645 633646 634104	SPS 1992	212708 212709 212710	212742 212743 212744	212829 212830 212833	SPY 1978	630138 SPY 1989	63063C	SQP 1986	SQP 1997 630615	SRH 1977	0733: 0733:
054341	150010	631943	SPS 1986	212326 634953	212711	212745	212834	632004	633926		634162		071643 071644	SRH 1984
054342	150109	631944	211961	SPS 1993	212712	212746	212836	SPY 1979	SPY 1990		SQP 1987		SRH 1978	0733: 0743:
054343	150111		634116	212329	212713	212747	635826	632015	634257		634202		071849	0743:
054344	150114	SPS 1980	634121	635318	212714	212748	635831	632019			SQP 1988		07185C	0743:
054345	150200				212715	212749		632054	SPY 1991		635244		SRH 1979	SRH 1987
054346	150203	632145	SPS 1987	SPS 1994	212716	212750	SPS 1995	632055	634528		SQP 1989		072239	0746:
SPR 1997	SPS 1972	632233	212542	212634	212717	212751	212947	632056	SPY 1992		630455		07224C	0746:
054347	151010	SPS 1981	635221	212636	212718	212752	636102	H10204	SPY 1993		SQP 1990		SRH 1980	0746:
054348	151012	051047	635222	212639	212719	212753	636103	SPS 1996	SPY 1992		633955		072504	0746:
054349	151012	632158	SPS 1988	212640	212720	212754		212963	635217		SQP 1992		072505	SRH 1984
054350	151202	632256	213137	212643	212721	212755	630127	632248	SPY 1993		635218		072647	0751:
054351	SPS 1973	SPS 1982	635238	212645	212722	212756		632302	635721		SQP 1993		SRH 1983	0751:
054352	151312	051346	635262	212646	212723	212757	SPS 1997	632308	SPY 1981		635719		072726	0751:
054360	151313	SPS 1983	SPS 1989	212648	212724	212758	213157	SPY 1986	SPY 1995		SQP 1994		SRH 1984	0754:
054361	SPS 1974	211622	211831	212651	212725	212759		632147	635961		635855		073051	0754:
054362	011403	630261	212657	212653	212726	212760		632360	630146		SQP 1995		073052	0754:
054363	011404	SPS 1984	SPS 1990	212654	212727	212761		632416	SPY 1997		635962		SRH 1985	0754:
054404	011404	SPS 1975	SPS 1984	212658	212728	212762		SPY 1986	SPY 1996					
054405	SPS 1978	211657	212014	212660	212729	212763		634959	630146					
	130604	211657	634024	212663	212730	212763		SPY 1987	SPY 1996					
	SPS 1978	SPS 1985	SPS 1991	212701	212731	212763		635502	SPY 1997					
	631935	211901	212217	212702	212732	212763		SPY 1988						
	631936	633643	634339	212703	212733	212763								
	631940	633644		212704	212734	212763								
				212705	212735	212763								
				212706	212736	212763								
				212707	212737	212763								
					212738	212763								
					212739	212763								
					212740	212763								
					212741	212763								

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SRH 1990 075705 075706 075707 075708 075709	SRH 1995 071252	STL 1980 050843	STL 1991 212205	SUM 1975 130910	634402 634404	635702 SUM 1994 1987 635546 635703	URB 1975 130713 131101 131202	632611 632612 URB 1983 632859 632860	URB 1991 634341 URB 1992 635010	UWA 1975 110211 110212 110213 110214 110301 110302	111629 111630 111631 111632	111659 111660 UWA 1983 633025	WRF 1986 633324 633904 633905	WRF 1993 634604 WRF 1994 63587 63589
SRH 1991 071559 071560 071561 071562 071563	SRH 1997 092447	STL 1982 051427	STL 1993 212330	SUM 1977 631749 631762	SUM 1988 630262	634129 634130 635841 636044	631662 URB 1977 631741 631745	URB 1984 633221 633222	URB 1993 635540 URB 1994 635710 635711	UWA 1976 110634 110635 110636 110637 110638 110639 110640 110641 110642	110634 110635 110636 110637 110638 110639 110640 110641 110642	110634 110635 111718 111719 111720 111721 111722 111723	633863 634742 WRF 1988 630242 630244 634913	WRF 1987 63587 63589 WRF 1991 63604 WRF 1994 63015
SRH 1992 070417 070418 070419 070420 070421		STL 1986 212221	STL 1995 212954	SUM 632326 632845	SUM 631149 631347 631352	SUM 1989 630134 630217	URB 1978 631821	URB 1986 634128	URB 1995 636001	UWA 1977 111601 111602	111629 111630 111631 111632	111659 111660 UWA 1983 633025	WRF 1986 633324 633904 633905	WRF 1993 634604 WRF 1994 63587 63589
SRH 1993 070459 070460 070461 070462 070463		STL 1988 213147	STL 1996 212960	SUM 1984 633224 633225	SUM 1990 634133 635913	SUM 1997 630602 630611	URB 1979 631948	URB 1987 635226	URB 1996 636328	UWA 1978 111603 111604 111605 111606 111618 111624	111629 111630 111631 111632	111659 111660 UWA 1983 633025	WRF 1986 633324 633904 633905	WRF 1993 634604 WRF 1994 63587 63589
SRH 1994 070962		STL 1990 212026	STL 1997 213203 213223	SUM 1985 B10308 B10309 B10310	SUM 1991 634609	SUM 1998 631018 631061	URB 1980 632155 632261	URB 1988 635249	URB 1997 630517	UWA 1977 111603 111604 111605 111606 111618 111624	111629 111630 111631 111632	111659 111660 UWA 1983 633025	WRF 1986 633324 633904 633905	WRF 1993 634604 WRF 1994 63587 63589

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WRY 1974 13020E	WRY 1984 632508 633060 633108	634224 WRY 1992 634619	WSH 1975 090503 090504 090505 090506 090507 090509	WSH 1978 071925 071945 071946 072020 072021 072022 072044 072050 072051	WSH 1981 072521 072720	073736 WSH 1985 073428 073429 073902 073903 073944 073945 073948 073949 073950 073951 073952 073953	073721 075158 075159 075160 075161 075162 075163 075206 075207 075208 075210 075211	075626 075627 075628 075630 075643 075644 075656 075710 075711	070253 070254 070428 070430 070431 071535 071536 076121 076122 076123	071153 WSH 1995 070741 071254 071255 071256 071257 071259 071260 071317 076140 091803 091804	WSH 1997 092352 092446 092509 092511 092512 092513 092514 092520 092521 092522 092523 092524 092550 092627 092628 092629 092630 092632 092633	
WRY 1975 13101C	WRY 1985 633131 633648	WRY 1993 635046	WSH 1976 091621 091622 091626 091627 091628 091629 091701 091702 091703	WSH 1979 072217 072218 072224 072225 072226 072252 072253 072254	WSH 1983 072902 073024	WSH 1984 073651 073652 073653 073654 073655 073656 073663 073701 073702 073729 073730 073731 073732 073733 073734 073735	WSH 1986 074962 075002 075004 075013	WSH 1989 075347 075348 075501 075502 075504 075506 075514 075515 075516 075522 075523 075524 075525 075526 075527 075528	WSH 1991 071457 071458 071459 073722 075732 075734 075904 075921 075922 075933 075934 076114 076115 076116 076117 076118 076119	WSH 1993 070233 070442 070443 070444 070563 070616 070850 070851 076125 076338	WSH 1996 092120 092155 092156 092157 092158 092160 092240 092241 092242 092243 092244 092245 092248 092250 092251 092319 092320	
WRY 1978 631834	WRY 1986 633246 634145	WRY 1994 635827 635832	WSH 1977 071730 071731 071732 071737 071743 071919 071920 071921 071926 071927 071928	WSH 1980 072237 072418 072422 072517 072518 072528 072529 072530								
WRY 1979 632047	WRY 1987 634702 634704	WRY 1995 635633										
WRY 1980 632136	WRY 1988 630161 630162	WRY 1996 636009										
WRY 1981 632341 632604	WRY 1989 635542											
WRY 1982 632853 633009	WRY 1990 635908											
WRY 1983 633049 63305C	WRY 1991						WSH 1988	WSH 1990 075021 070240	WSH 1992 070133 070134 070862	WSH 1994 070445 070450 070855 070856 070857 070858 070860 070861 070862		

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		

T=Troll; Net=Net; S=Sport

Appendix D. Detailed description of external stock forecasts.

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Oregon Coastal North Migrating

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

The 2002 forecast is 73,914.

Columbia River Stocks

The upriver brights (URB) and lower river wild (LRW) are primarily naturally produced stocks while the Spring Creek 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 in the ocean. Minor stocks include lower river brights (LRB).

Willamette Spring

The current year forecast was made from a mix of average age-specific run sizes and age-specific linear regressions of cohort returns. The recent 5-year average age-3 run size was used as the age-3 forecast. Brood years 1975–1997 and brood years 1975–1996 were used in the regressions of age 4 on age 3 and age 5 on age 4, respectively. The preliminary forecast for 2002 ocean escapement is 77,434, compared to the 2001 return of 84,000.

Cowlitz Spring

The forecast is the sum of predicted tributary mouth returns of the Cowlitz, Kalama, and Lewis river spring chinook stocks. The current year forecast was made using age-specific linear regressions of cohort returns in previous years. Brood years 1989–1997 and brood years 1987–1996 were used in the regressions of age 4 on age 3 and age 5 on age 4, respectively. The preliminary forecast for 2002 ocean escapement is 6,800, compared to the 2001 return of 5,508.

Upriver Summer

The 2002 forecast was based on a relationship between jacks and adult returns at the Columbia River mouth. The preliminary forecast for 2002 ocean escapement is 77,700, compared to the 2001 return of 54,521.

Upriver Brights

The current year forecast was made using a mix of age-specific average cohort ratios and cohort regressions. Data from brood years 1979–1998 was used in the regression of age 3 on age 2, brood years 1981–1997 in the regression of age 4 on age 3, brood years 1978–1996 in the regression of age 5 on age 4, and brood years 1979–1995 in the regression of age 6 on age 5.

The preliminary forecast for 2002 ocean escapement is 281,000 adults, compared to the recent 5-year range of 142,300 to 232,500 adults. The 1997–2001 average forecast error is -10% with a range of 6% to -45%.

Cowlitz Fall and Bonneville Tule

The Bonneville tule and Cowlitz fall stocks comprise the LRH stock and their individual forecasts are based on an estimate of their proportion of the forecasted total LRH return. The LRH age-3 forecast was produced from 1981-98 brood cohort regressions, age-4 from 1980-97 brood cohort regressions, and age-5 from 1979-96 brood regressions. The average LRH forecast error is 79% with a range between 32% and 120% of actual. The Bonneville tule and Cowlitz fall individual forecasts are much less accurate than the composite LRH forecast.

Mid-Columbia Brights

The current year forecast for Mid-Columbia brights is the sum of the Bonneville Upriver Brights (BUB) and Pool Upriver Brights (PUB). The individual stock and age specific forecasts are a mix of age-specific cohort ratios, cohort regressions, and recent average returns. For the BUB component, the age 3 forecast was made from 1987-98 brood cohort ratios, age 4 from recent 5-year average returns, and age 5 from 1979-96 brood cohort ratios. For the PUB component, the age 3 forecast was made from 1987-98 brood cohort ratios, age 4 from 1984-97 brood cohort regressions, and age 5 from 1984-96 brood cohort regressions.

Ocean escapement in 2002 is forecast to be 96,200 adults, greater than the recent 5-year range of 36,800 to 76,400. The average 4-year forecast error is 2% with a range of -34% to 36%.

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 1979–1998 (excluding 1980) was used in the regression of age 3 on age 2, brood years 1992 and 1996 in the age-3:4 cohort ratio, and brood years 1977–1996 (excluding 1978) in the age-4:5 cohort ratio.

Ocean escapement in 2002 is projected to be 144,400 adults, slightly more than the 2001 actual return of 125,000 adults and more than twice the recent 5-year average. The average 4-year forecast error is -12% with a range of -55% to 6%.

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 1978–1997 were used in the age-2:3 cohort ratio, brood years 1992–1997 in the age-3:4 cohort ratio, brood years 1978–1996 in the regression of age 5 on ages 3 and 4, and brood years 1980–1995 in the age-5:6 cohort ratio.

Ocean escapement in 2002 is forecast at 18,700 adults, an improvement over the recent 5-year average of 9,800. The 4-year average forecast error is -18% with a range of -66% to 6%.

Puget Sound Stocks

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

Nooksack River Spring

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

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

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

Nooksack/Samish Fall

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

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

Skagit River

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

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

Summer/Fall Chinook (Wild) — Forecast year age-specific estimates are based on mean cohort return rate for each age class multiplied by the appropriate brood year escapement. The methodology is the same as that used for wild spring Chinook. The natural return in 2002 is projected to be 13,455.

Stillaguamish River

Summer Chinook (natural origin) — The wild summer chinook forecast is based on recruits per spawner of natural escapement for each age cohort multiplied by the geometric mean of estimated marine survival and freshwater indices. The recruit per spawner estimates are based on CWT analysis for brood years

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

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

Snohomish River

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

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

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

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

Southern Puget Sound Stocks

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

brood year multiplied by an average rate of return-per-spawner, or 4) hatchery releases multiplied by average rates of return-at-age, summed over the broods contributing to the forecast.

Puget Sound Fall Fingerling

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

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

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

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

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

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

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

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

Coulter Creek — the 1995–2000 average run size.

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

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

Puget Sound Natural Fall

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

Dungeness – average of 1997–2001 terminal area run size.

Hoko – average 1997–2001 terminal area run size.

Hood Canal – see forecast methodology for hatchery fish above.

Puyallup – The Puyallup natural forecast was problematic. The historic methodology is failing because of the lack of relativity between pre-1999 escapement estimates and those following. Return/spawner statistics are nonsensical between the 1999 and 2002 return years because the return and spawner components have been estimated by different methods. Examination of the old index-based escapement methodology (the basis of pre-1999 escapements and dependent run sizes) showed that there is likely an inconsistent relationship of the South Prairie Creek index to both the South Prairie Creek total escapement and the Puyallup River total escapement. It appeared that there was a generally liberal bias in the old method, which in turn, produced unrealistic run size estimates. We went ahead and produced a forecast using the old method (with the liberal 1998 run size estimate of 4,995), which yielded a forecast of 11,200, double the previous record run size in the database. This did not seem reasonable.

There are relatively good escapement estimates for the South Prairie Creek system for 1994-2001 and age samples have been collected in the basin since 1992. In-sample return by age (%) was calculated for return years 1992-2000. The only legitimate way of making a forecast that was relative to current escapements (1999-on) was to scale historic run sizes to post-1998 levels. We saw no favorable alternative to scaling the run sizes by the mean South Prairie Creek escapement/Puyallup run size ratio. Unfortunately, we have only two years of data available to create that mean (1999 = 54%, 2000 = 38%, mean = 46%), and decided to scale the 1992-98 Puyallup run sizes by that mean. **Please note that we are not recommending revising the run reconstruction dataset with this scalar - this exercise is intended only to facilitate a 2002 forecast that is relative to current escapement estimates (and resulting run sizes). Such an exercise may be appropriate when more data points are available and the consistency of the relationship can be examined more fully.**

Nisqually – average run size from 1995–1999, or 1998 escapement multiplied by 1996–2000 average return per spawner.

Puget Sound Fall Yearling

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

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

Canadian Stocks

Fraser Late

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

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

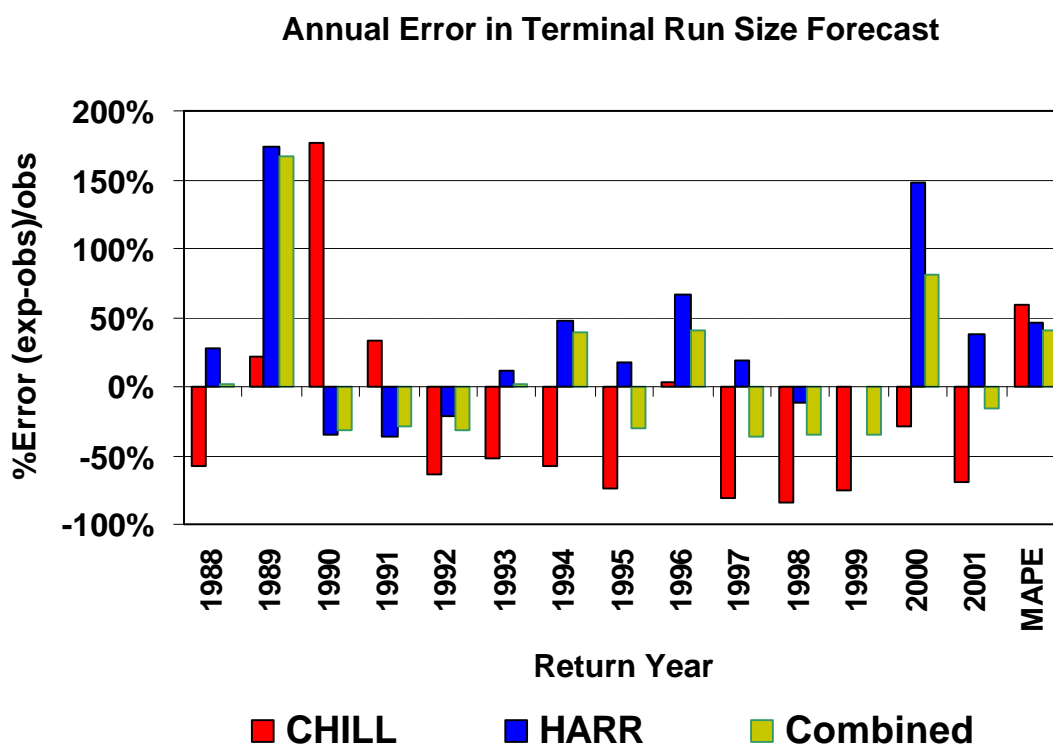
The CWT recoveries for Chilliwack Hatchery fall whites are used in a cohort analysis to obtain exploitation rates, maturation rates, and adult equivalent factors by age and brood year. These data are then used in linear sibling regression models to estimate ocean abundance at age for both the Chilliwack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

The estimates of age-specific ocean abundance for Chilliwack and Harrison chinook are combined in a spreadsheet model analogous to that previously developed for the Robertson Creek fall chinook salmon stock (RBH in the chinook calibration model). Terminal runs at age are then predicted based on changes in ocean exploitation rates and maturation rates at age. One notable difference from the RBH model, however, is that only the terminal run vs. ocean production spreadsheet models are applicable to the FRL forecasts since catch and coded-wire tag data will not be available from the past year's fisheries in Washington State. Consequently, the regression models include only brood years with complete recovery

data and the independent variable (terminal run at age) is limited to returns within the Fraser River. These latter data are available within the time required for annual forecasts.

A problem that we are continuing to investigate is a consistent and significant under-estimation of the Chilliwack terminal runs for several recent years (Figure 1). We have estimated the bias using a retrospective 'leave-one-out' analysis resulting in adjustment to the 2002 forecast using the estimated -68% average error.

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



West Coast Vancouver Island

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

RBH/Somass Forecast: Predictions of ocean abundance for RBH fall chinook were developed from the 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 RBH and Somass River chinook in the Barkley Sound sport fishery, terminal commercial and native gillnet fisheries, and spawning escapement to the Somass system. These regression models only account for production associated with the CWT groups selected to represent RBH brood years.

To account for the total production of RBH and natural Somass production, a ratio is calculated of total terminal return of all hatchery and wild chinook salmon (by age and brood year) divided by the terminal return of chinook salmon by age and brood year for the specified CWT groups. Due to the multiple age classes in chinook salmon, ratios are based on observations in the previous year within the same cohort. For example, the expansion for the age-4 cohort in 2002 would be expanded by the ratio of age-3 chinook salmon observed in 2001 and the age-2 chinook salmon observed in 2000. Note that this expansion assumes natural production from the Stamp River exhibits similar behavior and encounters similar fishing pressure as the hatchery stock.

The estimates of age-specific ocean abundance for RBH/Somass chinook are input to a spreadsheet model used to predict the terminal run size. Terminal runs at age, expected in the next year, are predicted based on changes in ocean exploitation rates (i.e., management scalars) and maturation rates at age. Over the past five years of extensive changes in ocean and terminal fisheries, this spreadsheet model has predicted the observed terminal run with a mean absolute percent error of 28%. Error rates were about half of this value in the past when survival of RBH chinook was greater and more data was available from fisheries.

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

Age Class	RBH/Somass Forecast*	WCVI Expansion Factor	Total WCVI Forecast	Comments
Age 3	17,478	2.23	38,976	Average expansion of past age-3 returns
Age 4	37,519	1.72	64,533	Age 4 expansion based on observed expansion for age-3 returns in the brood year
Age 5	950	4.44	4,218	Expansion based on average value of age-3 and age-4 returns within brood year
Total	55,948		107,727	RBH/Somass = 52% 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 2002 will be larger than in 2001 due to improved marine survival.

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. Catch by Region and Fishery, 1975–2001.

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Table E. 1. Southeast Alaska Catch

Year	Southeast Alaska						
	Troll	Net	Sport	Total	Add-on	Terminal Exclusion	Treaty Catch
1975	287,342	13,365	17,000	317,707			
1976	231,239	10,523	17,000	258,762			
1977	271,735	13,443	17,000	302,178			
1978	375,919	25,492	17,000	418,411			
1979	334,306	28,455	16,581	379,342			
1980	303,885	20,114	20,213	344,212			
1981	248,791	18,951	21,300	289,042			
1982	242,315	48,999	25,756	317,070			
1983	269,790	19,655	22,321	311,766			
1984	235,629	32,398	22,050	290,077			
1985	215,842	33,164	24,858	273,864	6,246		267,618
1986	237,703	22,099	22,551	282,353	11,091		271,262
1987	242,562	15,532	24,324	282,418	17,094		265,324
1988	231,373	21,788	26,160	279,321	22,572		256,749
1989	235,717	24,242	31,071	291,030	21,202		269,828
1990	287,939	27,712	51,218	366,869	47,602		319,267
1991	264,044	34,863	60,492	359,399	58,330		301,069
1992	183,758	32,128	42,892	258,778	36,980		221,798
1993	226,866	27,991	49,246	304,103	33,851		270,252
1994	186,201	35,654	42,365	264,220	29,291		234,929
1995	138,115	47,964	49,667	235,746	58,883		176,863
1996	141,422	37,298	57,509	236,229	71,838	8,663	155,728
1997	246,409	25,061	71,524	342,994	45,630	9,846	287,519
1998	192,066	23,511	55,013	270,590	24,708	2,420	243,462
1999	146,219	32,717	72,081	251,017	46,345	4,453	200,219
2000	158,717	41,398	63,173	263,288	73,929	2,505	186,854
2001	153,222	38,901	67,921	260,044	69,524	1,131	189,389

Troll, net, sport and total catches include catch of SEAK hatchery-origin fish; catches that count towards the all-gear ceiling (with hatchery add-on subtracted) are shown in the "treaty catch" column.

Table E. 2. North British Columbia Catch

Year	North British Columbia						
	Troll ¹	Net	Tidal Sport Areas 1,2E, 2W	Tidal Sport Areas 3-5	Freshwater Sport	First Nations	Total
1975	228,121	25,095	NA	NA	NA	4,055	257,271
1976	190,267	16,105	NA	NA	NA	2,791	209,163
1977	130,899	44,196	106	1,670	2,158	7,653	186,682
1978	146,054	27,924	125	1,668	6,610	5,843	188,224
1979	147,576	40,640	0	2,523	1,960	5,686	198,385
1980	157,198	26,895	200	3,867	4,515	10,571	203,246
1981	153,065	41,724	184	2,760	2,613	12,065	212,411
1982	173,472	44,866	215	3,760	2,726	15,655	240,694
1983	162,837	17,094	90	4,092	5,374	16,882	206,369
1984	185,134	31,304	171	2,300	3,426	15,458	237,793
1985	165,845	39,729	600	3,600	3,186	17,047	230,007
1986	175,715	23,948	1,153	3,950	4,410	24,990	234,166
1987	177,457	18,354	2,644	4,150	3,625	17,129	223,359
1988	152,369	31,433	7,059	4,300	3,745	22,635	221,541
1989	207,679	38,780	20,652	4,150	5,247	22,051	298,559
1990	154,109	28,681	16,827	4,300	4,090	27,237	235,244
1991	194,018	41,257	15,047	4,256	4,764	24,498	283,840
1992	142,340	36,040	21,358	6,250	6,182	12,468	224,638
1993	161,686	34,315	25,297	3,279	7,813	21,454	253,844
1994	164,581	22,338	28,973	3,171	3,093	16,056	238,212
1995	56,857	18,463	22,531	2,475	3,503	509	104,338
1996	21	29,290	670	3,382	1,250	13,345	47,958
1997	83,488	20,678	26,860	0	NA	14,711	145,737
1998	107,837	6,749	28,308	4,750	NA	21,000	168,644
1999	56,499	12,700	36,400	11,700	NA	24,200	141,499
2000	9,800	27,600	22,100	8,600	NA	23,600	91,300
2001	13,100	23,051	30,400	11,000	NA	28,090	105,641

¹ Since 1998, the catch accounting year for troll fisheries was set from October 1-September 30. To make comparisons to previous years more meaningful, the same catch accounting period was applied for years prior to 1998.

NA=not available

Table E. 3. Central British Columbia Catch

Year	Central British Columbia					
	Troll ¹	Net	Tidal Sport	Freshwater Sport	First Nations	Total
1975	135,470	40,985	NA	NA	NA	176,455
1976	145,204	32,669	NA	NA	NA	177,873
1977	122,689	32,409	4,773	1,544	6,317	167,732
1978	91,025	35,708	5,694	1,770	7,464	141,661
1979	107,884	50,445	5,225	1,940	7,165	172,659
1980	95,377	27,715	4,802	988	5,790	134,672
1981	69,247	18,912	3,490	1,261	4,751	97,661
1982	69,748	32,450	5,419	1,293	6,712	115,622
1983	97,447	12,565	4,271	821	5,092	120,196
1984	78,120	4,631	4,354	1,332	5,686	94,123
1985	27,090	12,427	3,943	823	4,766	49,049
1986	54,407	23,050	4,566	1,245	5,811	89,079
1987	65,776	10,906	3,933	1,563	5,496	87,674
1988	36,125	12,949	3,596	1,496	5,092	59,258
1989	21,694	6,599	3,438	4,526	7,964	44,221
1990	29,882	18,778	4,053	5,626	9,679	68,018
1991	29,843	15,952	4,409	3,335	7,744	61,283
1992	47,868	18,403	4,891	3,204	8,095	82,461
1993	23,376	10,567	6,114	2,880	8,994	51,931
1994	18,976	14,445	4,303	973	5,276	43,973
1995	5,819	11,053	2,172	1,180	3,352	23,576
1996	0	6,517	2,936	3,986	6,922	20,361
1997	12,351	3,539	8,524	1,139	9,663	35,216
1998	2,198	5,545	5,514	779	6,293	20,329
1999	2,074	4,337	10,300	NA ²	3,600	20,311
2000	0	4,500	7,400	NA ²	4,200	16,100
2001	0	4,388	6,711	1,024	4,202	16,325

¹ Since 1998, the catch accounting year for troll fisheries was set from October 1-September 30. To make comparisons to previous years more meaningful, the same catch accounting period was applied for years prior to 1998.

² freshwater catch included with tidal catch
NA=not available

Table E. 4. West Coast Vancouver Island Catch.

Year	West Coast Vancouver Island						
			Tidal Sport	Tidal Sport			
	Troll ¹	Net	Inside ²	Outside	Freshwater Sport	First Nations	Total
1975	546,214	19,233	NA	-	NA	NA	565,447
1976	665,010	17,492	NA	-	NA	NA	682,502
1977	545,742	13,745	NA	-	NA	NA	559,487
1978	568,705	25,143	NA	-	NA	NA	593,848
1979	477,222	35,623	7,964	-	NA	NA	520,809
1980	486,303	34,732	8,539	-	NA	NA	529,574
1981	423,266	36,411	11,230	-	NA	NA	470,907
1982	538,510	41,172	17,100	-	NA	NA	596,782
1983	395,636	37,535	28,000	-	NA	NA	461,171
1984	471,294	43,792	44,162	-	NA	NA	559,248
1985	345,937	11,089	21,587	-	NA	NA	378,613
1986	350,227	3,276	13,158	-	NA	NA	366,661
1987	378,931	478	38,283	-	NA	NA	417,692
1988	408,668	15,438	35,820	-	NA	NA	459,926
1989	203,751	40,321	55,239	-	NA	NA	299,311
1990	297,858	29,578	69,723	-	NA	1,199	398,358
1991	203,035	60,797	85,983	-	NA	41,322	391,137
1992	340,146	9,486	46,968	18,518	NA	8,315	423,433
1993	277,033	28,694	65,604	23,312	NA	5,078	399,721
1994	150,039	2,369	52,526	10,313	NA	1,515	216,762
1995	81,454	458	21,675	13,956	NA	5,868	123,411
1996	4	0	2,266	10,229	NA	4,308	16,807
1997	52,748	486	47,355	6,400	NA	1,199	108,188
1998	2,282	1,643	55,697	4,177	NA	1,600	65,399
1999	5,307	970	47,163	31,106	NA	11,458	96,004
2000	63,400	100	4,468	38,038	NA	2,396	108,402
2001	77,491	0	6,423	40,179	6,198	930	131,221

Troll: Areas 21, 23-27, and 121-127

Net: Areas 21, and 23-27

Sport: Areas 23a, 23b, 24-27

¹ Since 1998, the catch accounting year for troll fisheries was set from October 1-September 30. To make comparisons to previous years more meaningful, the same catch accounting period was applied for years prior to 1998.

² Prior to 1992, catch was not reported as 'inside' or 'outside'. Therefore 'inside' catch for those years represents total tidal sport catch.

NA=not available.

Table E. 5. Strait of Georgia/Fraser Catch

Year	Strait of Georgia/Fraser					
	Troll ¹	Net	Tidal Sport	Freshwater Sport ²	First Nations ³	Total
1975	174,001	66,119	398,000	NA	20,170	658,290
1976	200,229	73,018	490,000	NA	19,189	782,436
1977	248,082	85,222	372,000	NA	23,310	728,614
1978	217,955	50,247	500,000	NA	19,541	787,743
1979	255,057	49,038	350,000	NA	14,931	669,026
1980	273,077	31,161	204,100	NA	15,252	523,590
1981	239,266	19,985	197,239	NA	11,987	468,477
1982	179,040	22,971	124,390	96	35,687	362,184
1983	105,133	17,520	198,433	NA	15,756	336,842
1984	90,280	19,851	369,445	7,880	22,784	510,240
1985	55,888	31,006	234,838	1,874	10,895	334,501
1986	44,043	32,359	181,896	1,573	15,646	275,517
1987	38,084	13,016	121,081	4,876	14,525	191,582
1988	20,224	8,373	119,117	7,546	15,589	170,849
1989	28,444	23,833	132,846	918	5,983	192,024
1990	34,304	15,298	111,914	2,341	17,948	181,805
1991	32,412	15,407	115,523	1,616	22,185	187,143
1992	37,250	9,159	116,581	1,677	20,038	184,705
1993	33,293	16,153	127,576	1,930	20,597	199,549
1994	12,916	14,078	70,839	2,475	22,476	122,784
1995	138	6,263	62,173	9,158	20,790	98,522
1996	2	9,591	89,589	6,749	17,781	123,712
1997	908	28,342	56,332	3,937	29,497	119,016
1998	105	6,779	20,923	22,644	18,926	69,377
1999	80	3,906	43,588	10,071	28,226	85,871
2000	270	5,584	32,750	2,031	26,213	66,848
2001	0	4,301	31,259	23,678	28,460	87,698

Troll: Areas 13-18 and 29

Net: Areas 14-19, 28 and 29

Sport: Areas 13-18, 19a, 28 and 29

¹ Since 1998, the catch accounting year for troll fisheries was set from October 1-September 30. To make comparisons to previous years more meaningful, the same catch accounting period was applied for years prior to 1998.

² Prior to 1990, catch includes catch from Fraser systems only; catch records not available those years from non-Fraser systems.

³ No catch records are available for non-Fraser catch prior to 1990.

NA=not available

Table E. 6. Johnstone Strait Catch.

Year	Johnstone Strait					
	Troll ¹ Area 12	Net	Tidal Sport	Freshwater Sport	First Nations	Total
1975	18,065	30,295	NA	NA	NA	48,360
1976	30,838	31,855	NA	NA	NA	62,693
1977	26,868	49,511	NA	NA	NA	76,379
1978	13,052	55,148	NA	NA	NA	68,200
1979	13,052	31,291	NA	NA	NA	44,343
1980	11,743	30,325	NA	NA	NA	42,068
1981	13,035	28,620	NA	NA	NA	41,655
1982	11,234	29,454	NA	NA	NA	40,688
1983	14,653	28,364	NA	NA	NA	43,017
1984	9,260	18,361	NA	NA	NA	27,621
1985	3,567	38,073	NA	NA	NA	41,640
1986	3,951	17,866	NA	NA	NA	21,817
1987	1,780	13,863	NA	NA	NA	15,643
1988	1,566	6,292	NA	NA	NA	7,858
1989	1,825	29,486	NA	NA	NA	31,311
1990	2,298	18,433	NA	NA	NA	20,731
1991	1,228	15,071	10,075	NA	1,287	27,661
1992	2,721	9,571	14,715	NA	29	27,036
1993	4,172	15,530	NA	NA	20	19,722
1994	2,231	8,991	NA	NA	0	11,222
1995	4	970	NA	NA	71	1,045
1996	0	447	NA	NA	107	554
1997	1,380	819	NA	NA	179	2,378
1998	990	60	2,366	NA	138	3,554
1999	89	156	7,813	NA	469	8,527
2000	197	220	5,719	NA	212	6,348
2001	500 ²	200	3,759	NA	370	4,329

Troll: Area 12

Net: Areas 11-13

Sport: Based on April - August creel census in Area 12 and northern half of Area 13

¹ Since 1998, the catch accounting year for troll fisheries was set from October 1-September 30. To make comparisons to previous years more meaningful, the same catch accounting period was applied for years prior to 1998.

² Preliminary estimate

NA=not available

Table E. 7. Canada - Strait of Juan de Fuca Catch.

Year	Canada - Strait of Juan de Fuca				
	Net	Tidal Sport	Freshwater Sport ¹	First Nations	Total
1975	9,799	NA	NA	NA	9,799
1976	13,004	NA	NA	NA	13,004
1977	25,344	NA	NA	NA	25,344
1978	9,725	NA	NA	NA	9,725
1979	8,665	NA	NA	NA	8,665
1980	3,438	37,900	NA	NA	41,338
1981	9,982	29,832	NA	NA	39,814
1982	7,072	30,646	NA	NA	37,718
1983	328	30,228	NA	NA	30,556
1984	6,237	24,353	NA	NA	30,590
1985	17,164	27,843	NA	NA	45,007
1986	17,727	34,387	NA	NA	52,114
1987	6,782	24,878	NA	NA	31,660
1988	4,473	31,233	NA	NA	35,706
1989	21,238	32,539	NA	NA	53,777
1990	7,405	30,127	NA	42	37,574
1991	8,893	19,017	NA	250	28,160
1992	10,023	21,090	NA	302	31,415
1993	2,287	13,967	NA	317	16,571
1994	8,931	14,372	NA	600	23,903
1995	631	14,405	NA	751	15,787
1996	362	19,012	NA	20	19,394
1997	307	17,080	NA	42	17,429
1998	115	9,709	NA	1,500	11,324
1999	128	14,808	NA	52	14,988
2000	100	10,973	NA	272	11,345
2001	0	23,463	NA	135	23,598

Net: Area 20

Sport: Areas 19b and 20

¹ While catch records are poor, in-river sport catch is believed to be small

NA=not available

Table E. 8. Washington - Strait of Juan de Fuca Catch.

Year	Washington - Strait of Juan de Fuca			
	Troll	Net	Sport	Total
1975	5,752	8,048	81,681	95,481
1976	10,488	6,072	75,308	91,868
1977	8,915	14,930	53,238	77,083
1978	10,006	11,224	62,299	83,529
1979	7,804	10,939	67,094	85,837
1980	10,682	11,320	56,415	78,417
1981	15,638	18,541	51,352	85,531
1982	19,024	22,547	29,842	71,413
1983	18,489	16,141	58,060	92,690
1984	15,650	12,120	48,003	75,773
1985	11,808	12,784	44,267	68,859
1986	30,000	17,000	69,000	116,000
1987	45,000	11,000	53,000	109,000
1988	49,000	10,000	39,000	98,000
1989	65,000	10,000	52,000	127,000
1990	47,162	5,294	50,903	103,359
1991	37,127	3,390	39,667	80,184
1992	31,452	927	38,438	70,817
1993	9,794	1,482	32,434	43,710
1994	3,346	5,864	1,661	10,871
1995	6,397	4,769	6,349	17,515
1996	9,757	604	4,825	15,186
1997	829	492	12,238	13,559
1998	338	265	2,159	2,762
1999	544	589	1,990	3,123
2000	332	640	1,670	2,642
2001	1,974	931	NA	NA

Troll: Areas 5 and 6C; Area 4B from Jan. 1 - April 30 and Oct. 1 - Dec. 31

Net: Areas 4B, 5, and 6C

Sport: Areas 5 and 6, 4B Neah Bay "add-on" fishery

NA=not available

Table E. 9. Washington - San Juan Catch.

Year	Washington - San Juans			
	Troll	Net	Sport	Total
1975	3	90,100	31,988	122,091
1976	0	66,832	34,505	101,337
1977	62	84,316	14,049	98,427
1978	3	87,565	15,083	102,651
1979	5	53,750	17,367	71,122
1980	0	64,338	12,231	76,569
1981	4	50,695	9,727	60,426
1982	0	38,763	6,953	45,716
1983	2	28,497	15,166	43,665
1984	83	33,432	25,759	59,274
1985	872	33,579	12,610	47,061
1986	0	21,000	15,000	36,000
1987	0	29,000	14,000	43,000
1988	0	32,000	9,000	41,000
1989	1,000	16,000	9,000	26,000
1990	666	8,608	7,370	16,644
1991	135	11,753	5,115	17,003
1992	172	14,011	6,788	20,971
1993	243	14,002	6,916	21,161
1994	73	13,908	5,795	19,776
1995	9	5,333	7,863	13,205
1996	153	3,934	12,674	16,761
1997	29	29,593	9,155	38,777
1998	376	3,804	3,069	7,249
1999	114	3	3,421	3,538
2000	22	1,091	4,447	5,560
2001	0	970	NA	NA

Troll: Areas 6, 6A, 7, and 7A

Net: Areas 6, 6A, 7 and 7A

Sport: Area 7

NA=not available

Table E. 10. Washington - Other Puget Sound Catch.

Year	Washington - Other Puget Sound		
	Net	Sport	Total
1975	131,982	173,086	305,068
1976	141,281	151,246	292,527
1977	145,470	97,761	243,231
1978	150,298	116,979	267,277
1979	128,073	156,402	284,475
1980	171,516	142,799	314,315
1981	145,152	106,048	251,200
1982	149,274	85,703	234,977
1983	134,492	123,752	258,244
1984	180,248	102,740	282,988
1985	184,907	92,603	277,510
1986	153,000	88,000	241,000
1987	127,000	59,000	186,000
1988	133,000	63,000	196,000
1989	156,000	75,000	231,000
1990	179,593	71,000	250,593
1991	89,495	48,859	138,354
1992	63,460	51,656	115,116
1993	54,968	41,034	96,002
1994	63,577	44,181	107,758
1995	63,593	61,509	125,102
1996	61,658	58,538	120,196
1997	47,522	43,961	91,483
1998	50,915	30,016	80,931
1999	91,947	34,116	126,063
2000	70,995	29,516	100,511
2001	96,682	NA	NA

Net: Areas 6B, 6D, 7B, 7C, and 7E; Areas 8-13 (including all sub-areas); Areas 74C - 83F

Sport: Areas 8-13 and all Puget Sound Rivers

NA=not available

Table E. 11. Washington - Inside Coastal Catch.

Year	Washington - Inside Coastal		
	Net	Sport	Total
1975	34,859	1,716	36,575
1976	51,995	2,219	54,214
1977	72,467	2,043	74,510
1978	32,662	3,399	36,061
1979	36,501	2,199	38,700
1980	47,681	1,476	49,157
1981	36,880	786	37,666
1982	33,271	1,114	34,385
1983	16,210	1,452	17,662
1984	16,239	1,319	17,558
1985	25,162	1,955	27,117
1986	29,000	3,000	32,000
1987	51,000	3,000	54,000
1988	74,000	7,000	81,000
1989	85,000	6,000	91,000
1990	57,770	5,000	62,770
1991	54,397	6,070	60,467
1992	64,223	6,577	70,800
1993	59,285	9,180	68,465
1994	46,059	7,454	53,513
1995	46,490	9,881	56,371
1996	55,408	12,059	67,467
1997	28,269	6,619	34,888
1998	20,266	6,569	26,835
1999	10,417	3,165	13,582
2000	15,659	4,482	20,141
2001	19,384	NA	NA

Net: Areas 2A - 2M; Areas 72B - 73H

Sport: All coastal rivers, Area 2.1, and Area 2.2 (when Area 2 is open)

NA=not available

Table E. 12. Columbia River Catch.

Year	Columbia River			
	Net	Ceremonial & Subsistence	Sport	Total
1975	323,000		34,870	357,870
1976	288,400		42,527	330,927
1977	255,600		58,838	314,438
1978	189,100		56,582	245,682
1979	169,691	7,865	38,700	216,256
1980	146,103	10,370	37,857	194,330
1981	94,904	10,985	48,496	154,385
1982	160,269	17,902	67,481	245,652
1983	70,371	15,979	60,918	147,268
1984	140,320	17,929	83,772	242,021
1985	159,577	16,213	62,484	238,274
1986	284,448	26,693	82,950	394,091
1987	492,685	25,337	123,145	641,167
1988	507,147	29,836	118,643	655,626
1989	289,647	27,377	110,936	427,960
1990	167,198	25,320	107,713	300,231
1991	119,276	13,471	113,153	245,900
1992	58,794	18,372	70,732	147,898
1993	51,867	24,295	80,667	156,829
1994	35,291	10,168	42,023	87,482
1995	29,708	14,269	53,335	97,312
1996	57,026	30,494	36,311	123,831
1997	48,108	32,336	35,744	116,188
1998	31,240	19,482	30,642	81,364
1999	55,873	29,363	35,397	120,633
2000	51,426	19,646	27,233	98,305
2001	183,913	13,635	57,732	255,280

Table E. 13. Washington/Oregon North of Cape Falcon Catch.

Year	Washington/Oregon North of Cape Falcon			
	Troll	Net	Sport	Total
1975	268,971	1,212	265,785	535,968
1976	371,239	203	215,319	586,761
1977	244,491	4	197,563	442,058
1978	150,673	4	104,306	254,983
1979	133,035	3	84,977	218,015
1980	125,709	1,215	59,099	186,023
1981	109,519	209	96,151	205,879
1982	154,720	267	114,952	269,939
1983	63,584	62	51,789	115,435
1984	15,392	0	6,980	22,372
1985	55,408	493	30,189	86,090
1986	52,000	0	23,000	75,000
1987	81,000	4,000	44,000	129,000
1988	108,000	3,000	19,000	130,000
1989	74,600	1,000	20,900	96,500
1990	65,800	0	32,900	98,700
1991	51,600	0	13,300	64,900
1992	69,000	0	18,900	87,900
1993	55,900	0	13,600	69,500
1994	4,500	0	0	4,500
1995	9,500	0	600	10,100
1996	12,300	0	200	12,500
1997	20,500	0	4,100	24,600
1998	20,300	0	2,200	22,500
1999	45,000	0	10,800	55,800
2000	20,600	0	9,200	29,800
2001	54,600	0	25,600	80,200

Troll: OR Area 2; WA Areas 1, 2, 3 and 4: Area 4B from May 1 through Sept. 30 (during PFMC management)

Net: WA Areas 1, 2, 3, 4, 4A

Sport: OR Area 2; WA Areas 1, 1.1, 1.2, 2, 3, 4 and 2.2 (when Area 2 is open)

Table E. 14. Oregon Catch.

Year	Oregon		
	Troll	Sport	Total
1975	300	19,000	19,300
1976	1,000	21,000	22,000
1977	3,000	34,000	37,000
1978	1,000	37,000	38,000
1979	800	31,000	31,800
1980	300	22,000	22,300
1981	300	28,000	28,300
1982	500	23,000	23,500
1983	700	19,000	19,700
1984	1,088	27,000	28,088
1985	1,700	25,000	26,700
1986	1,900	33,000	34,900
1987	3,600	46,000	49,600
1988	4,800	49,000	53,800
1989	4,500	45,000	49,500
1990	0	38,000	38,000
1991	0	44,500	44,500
1992	384	39,000	39,384
1993	649	52,000	52,649
1994	371	33,590	33,961
1995	206	48,366	48,572
1996	989	56,202	57,191
1997	513	37,659	38,172
1998	858	37,990	38,848
1999	1,246	30,780	32,026
2000	1,890	NA	NA
2001	1,324	NA	NA

Troll: Late season off Elk River mouth.

Sport: Estuary and inland.

Appendix F. Brood year exploitation rates by stock.

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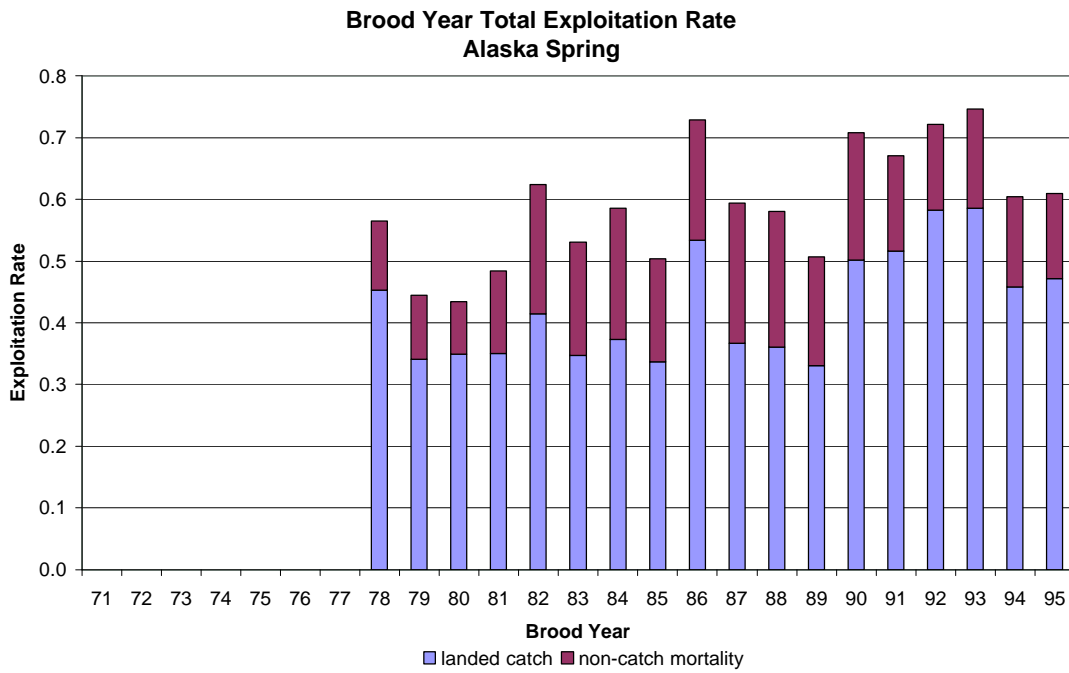


Figure F.1. Southeast Alaska springs total brood year exploitation rates

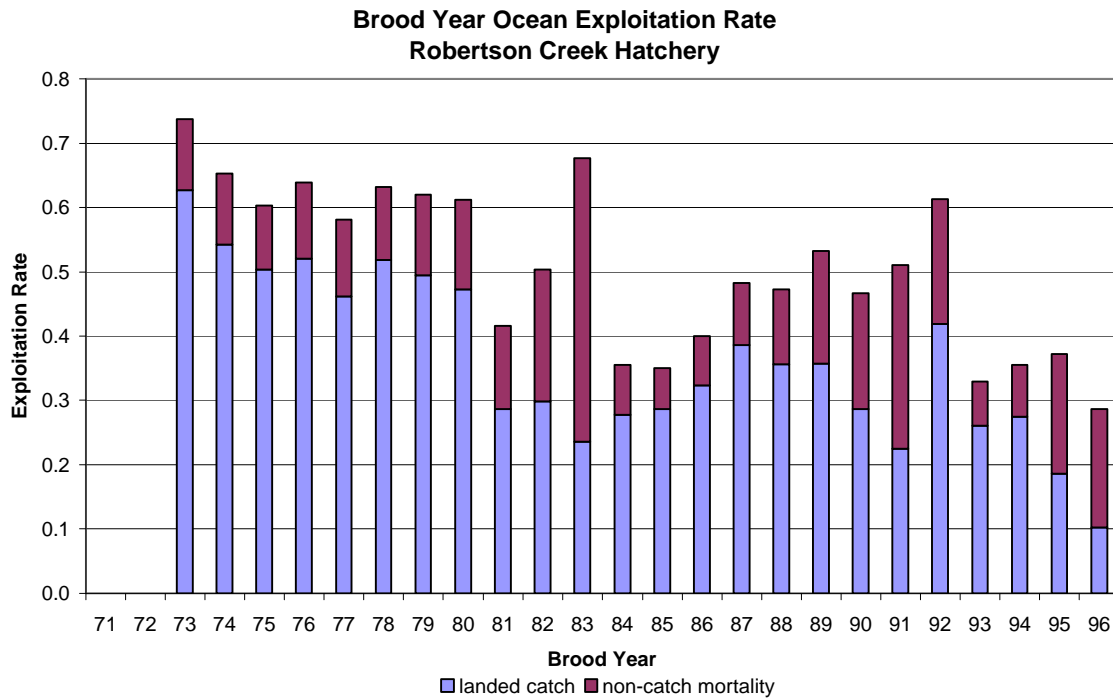


Figure F.2. Robertson Creek (West Coast Vancouver Island) ocean brood year exploitation rates.

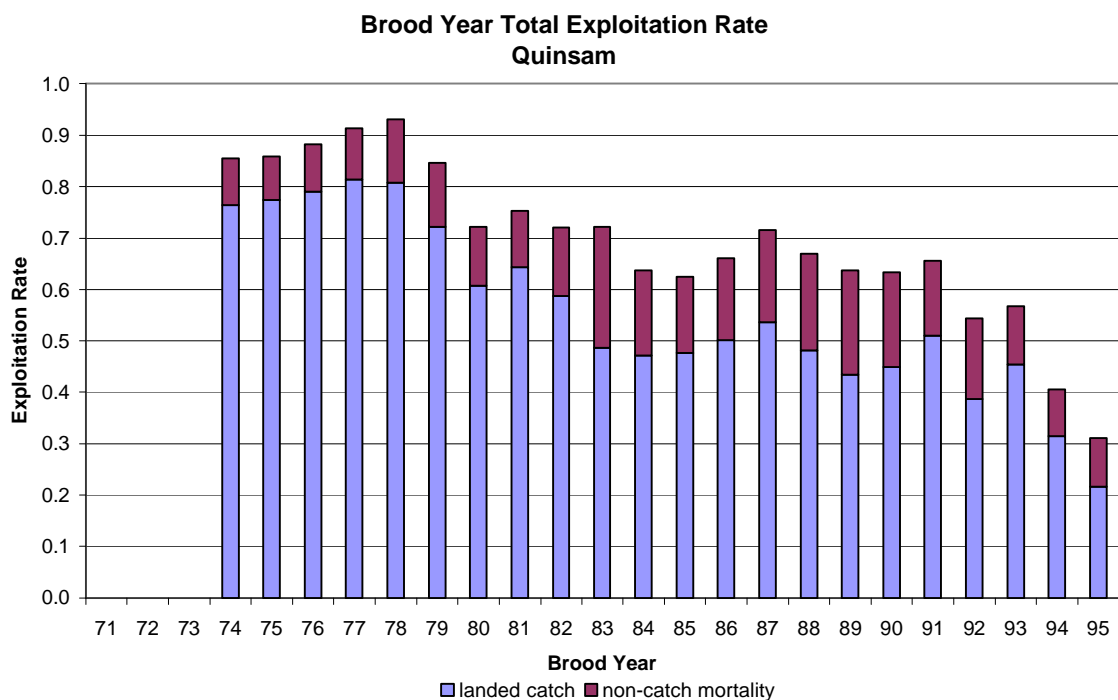


Figure F.3. Quinsam River (Upper Georgia Strait) total brood year exploitation rates.

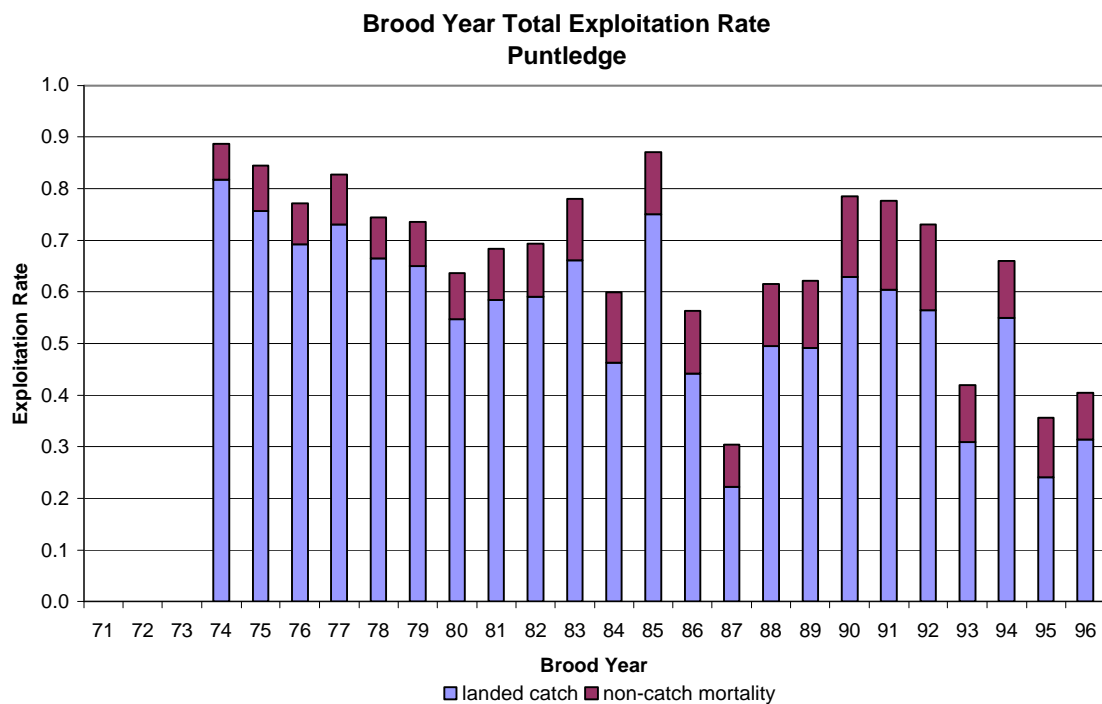


Figure F.4. Puntledge River (Lower Georgia Strait) total brood year exploitation rates.

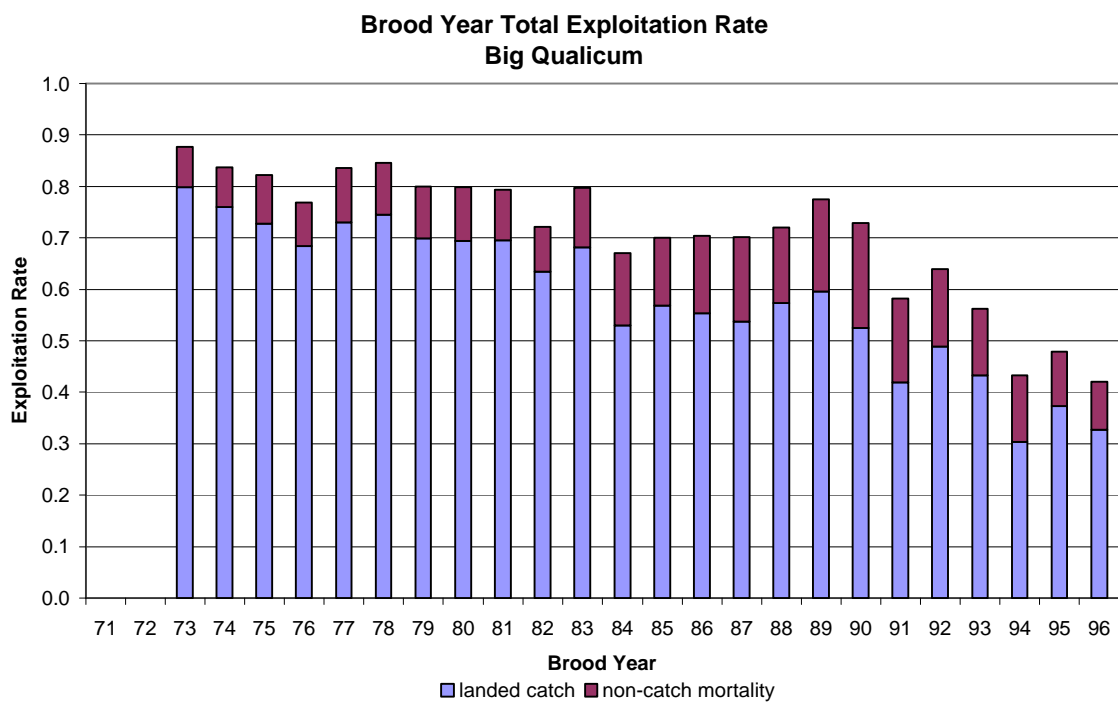


Figure F.5. Big Qualicum River (Lower Georgia Strait) total brood year exploitation rates.

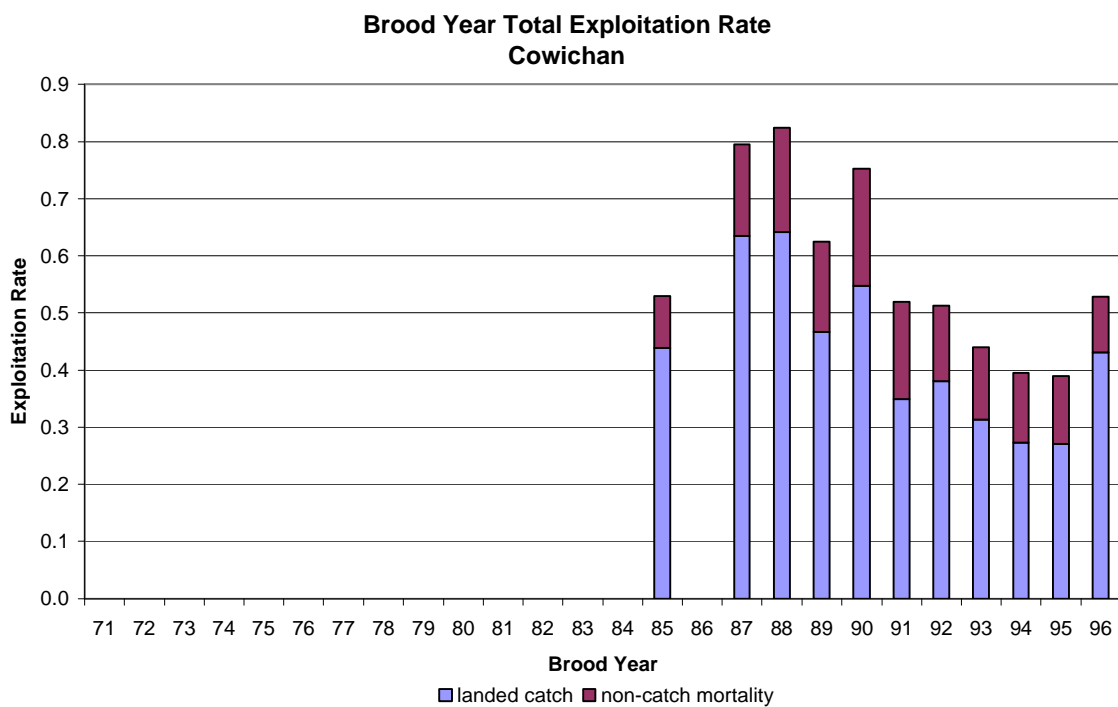


Figure F.6. Cowichan River (Lower Georgia Strait) total brood year exploitation rates.

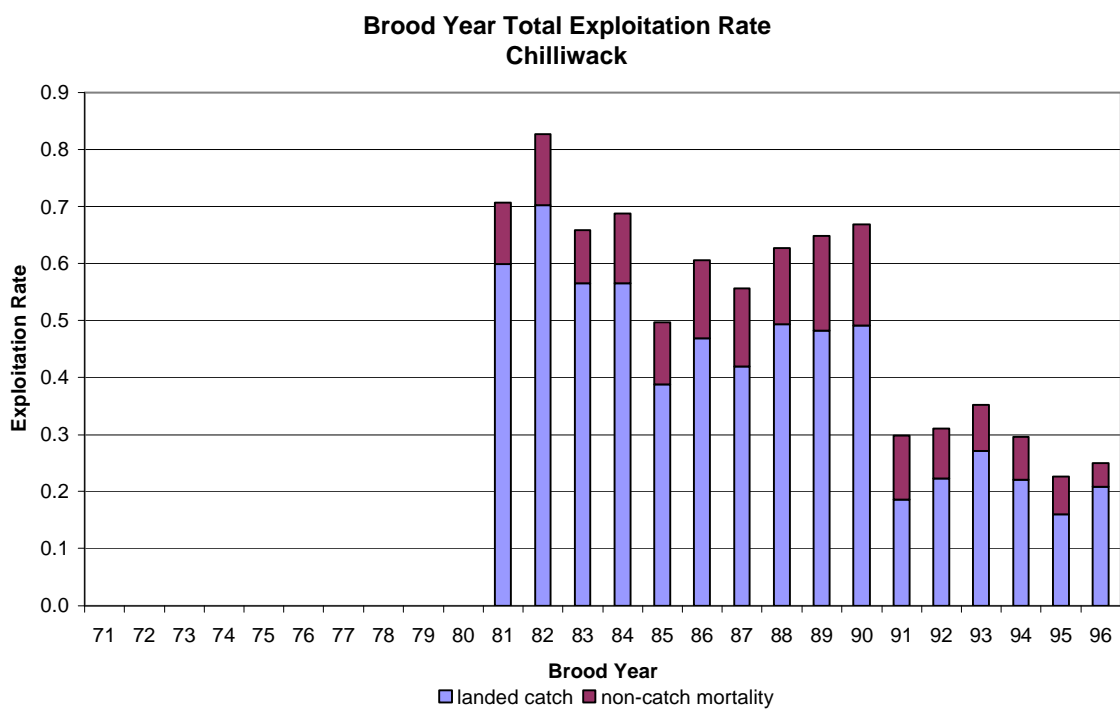


Figure F.7. Chilliwack River (Lower Fraser River) total brood year exploitation rates.

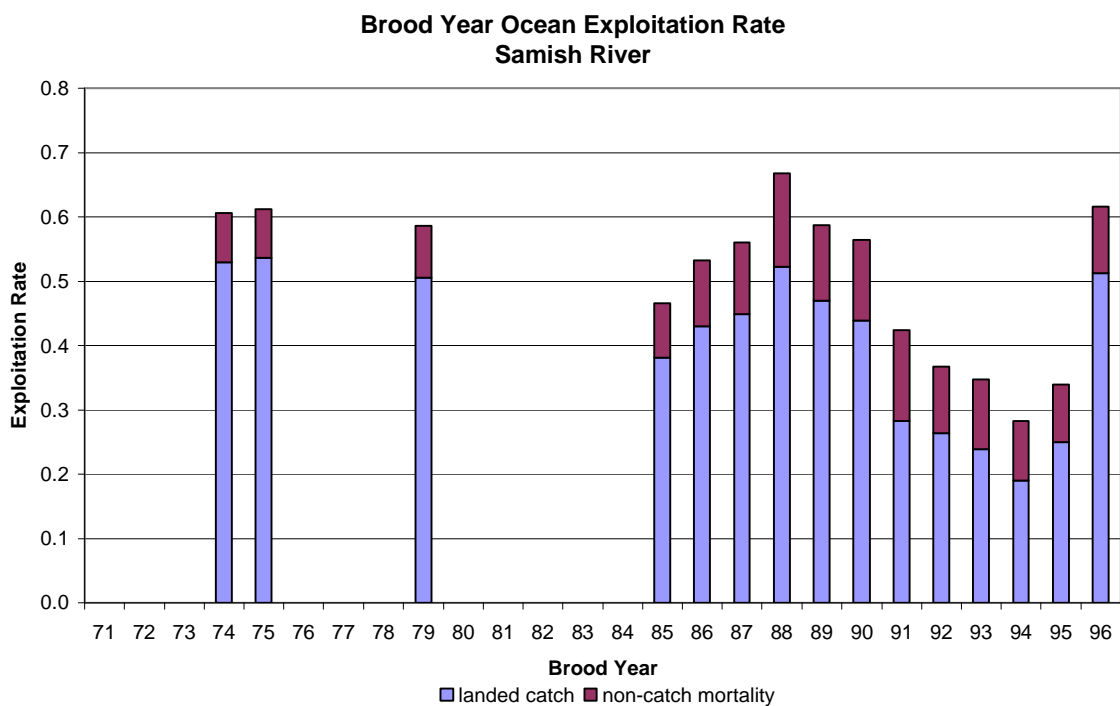


Figure F.8. Samish River (North Puget Sound) ocean brood year exploitation rates

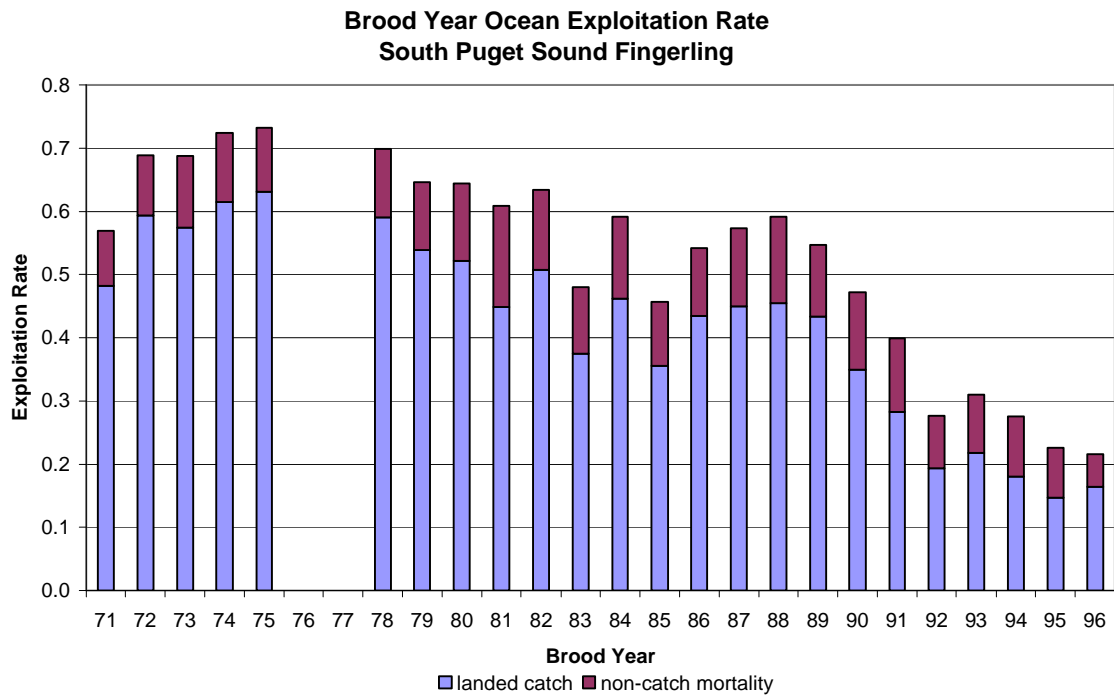


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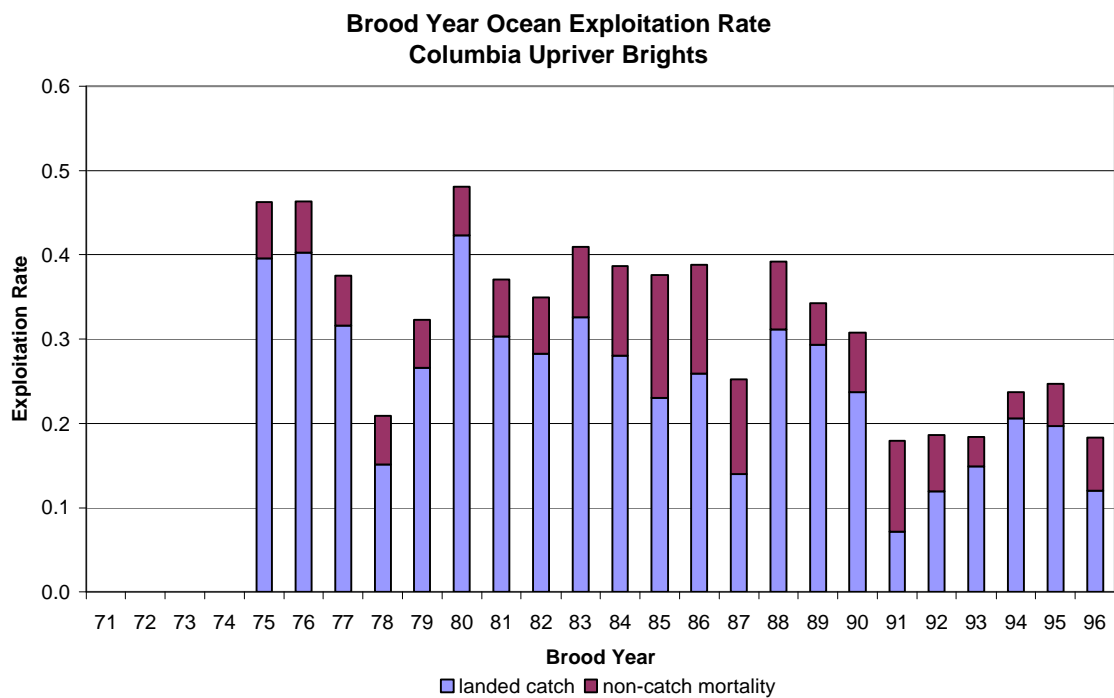


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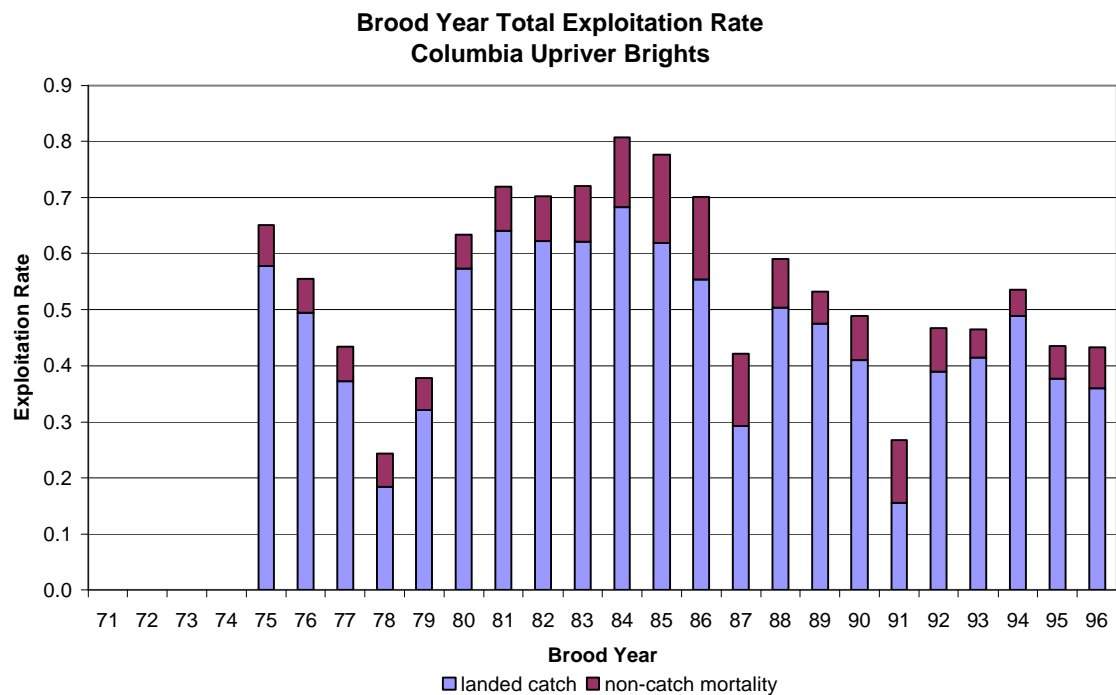


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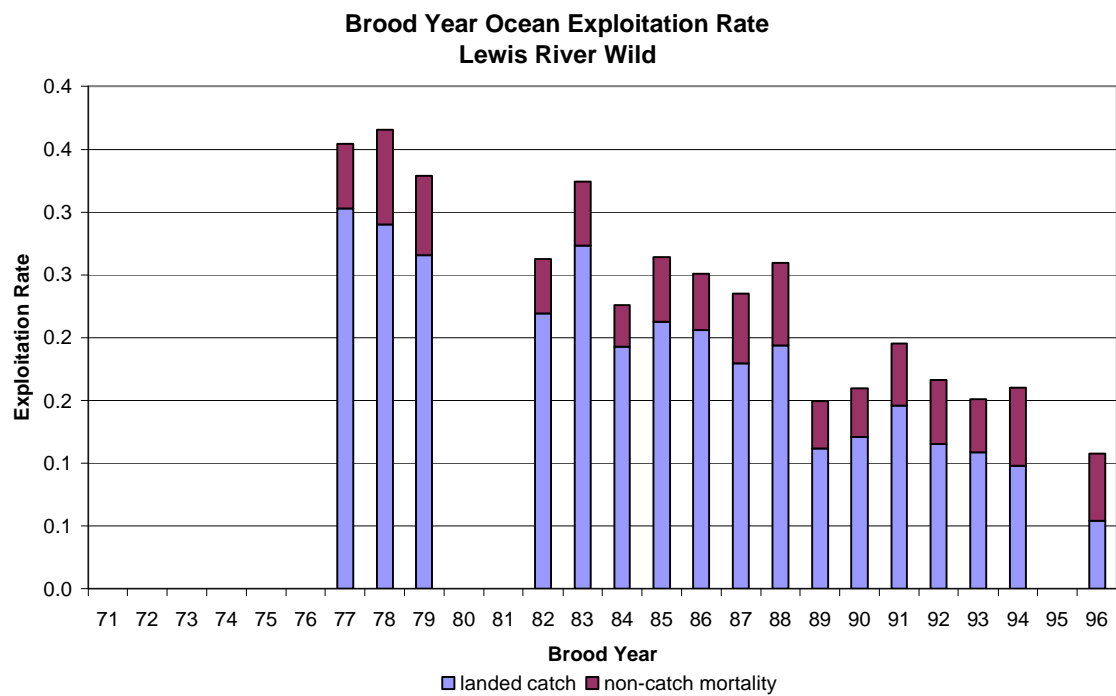


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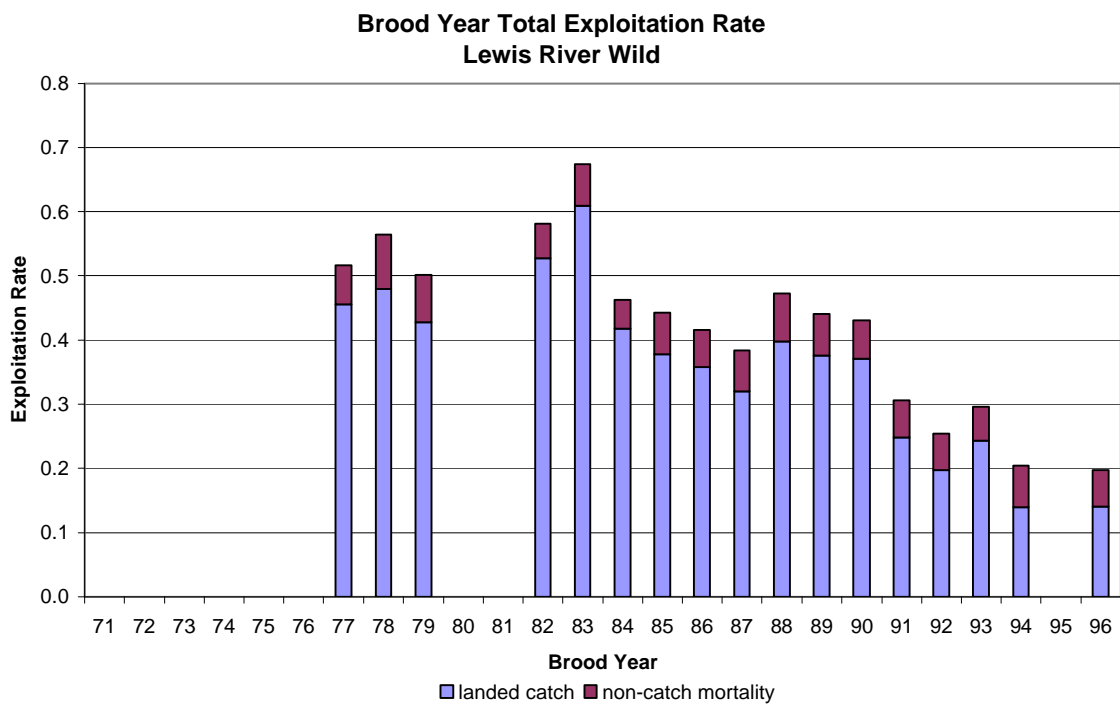


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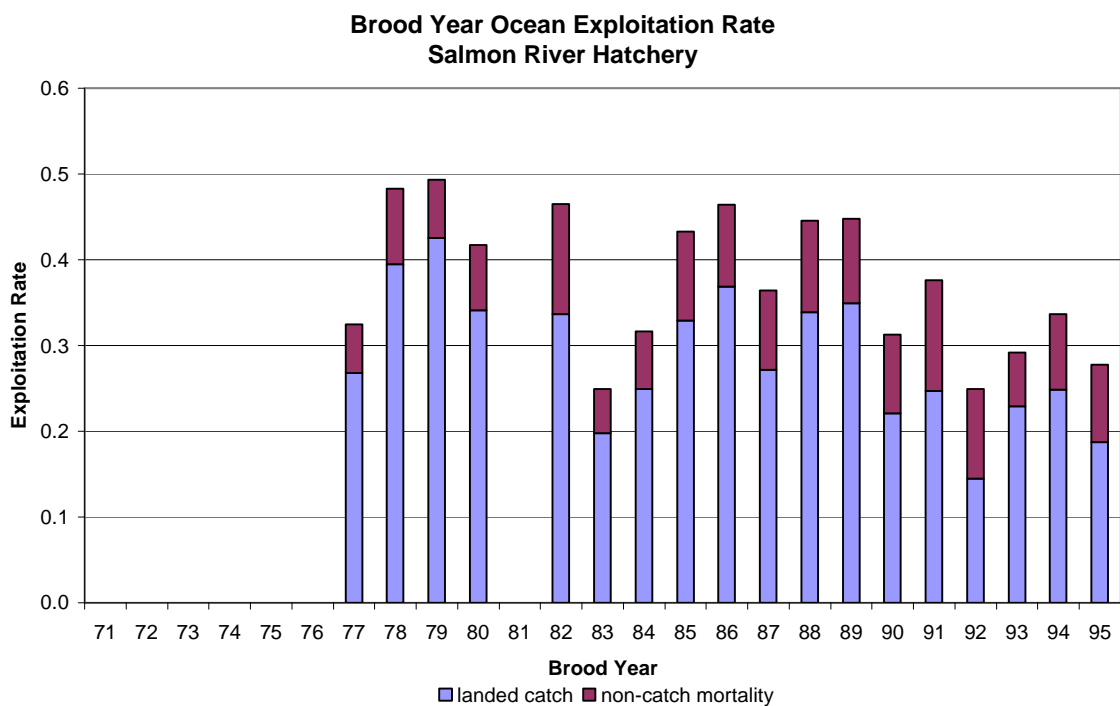


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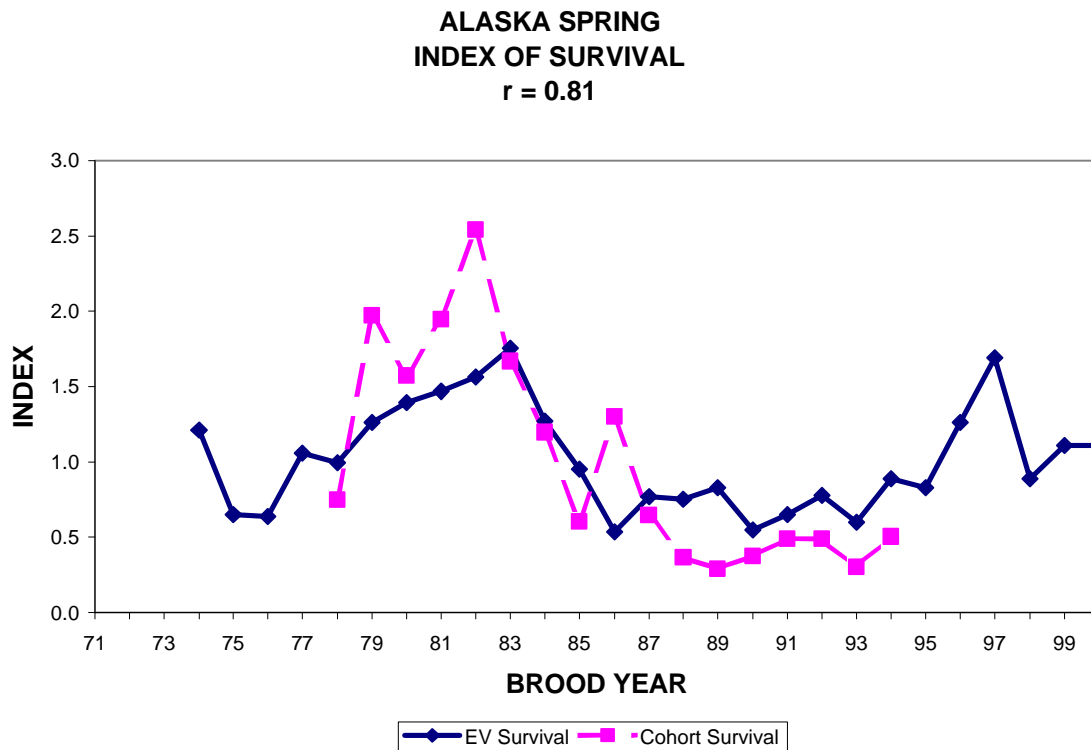


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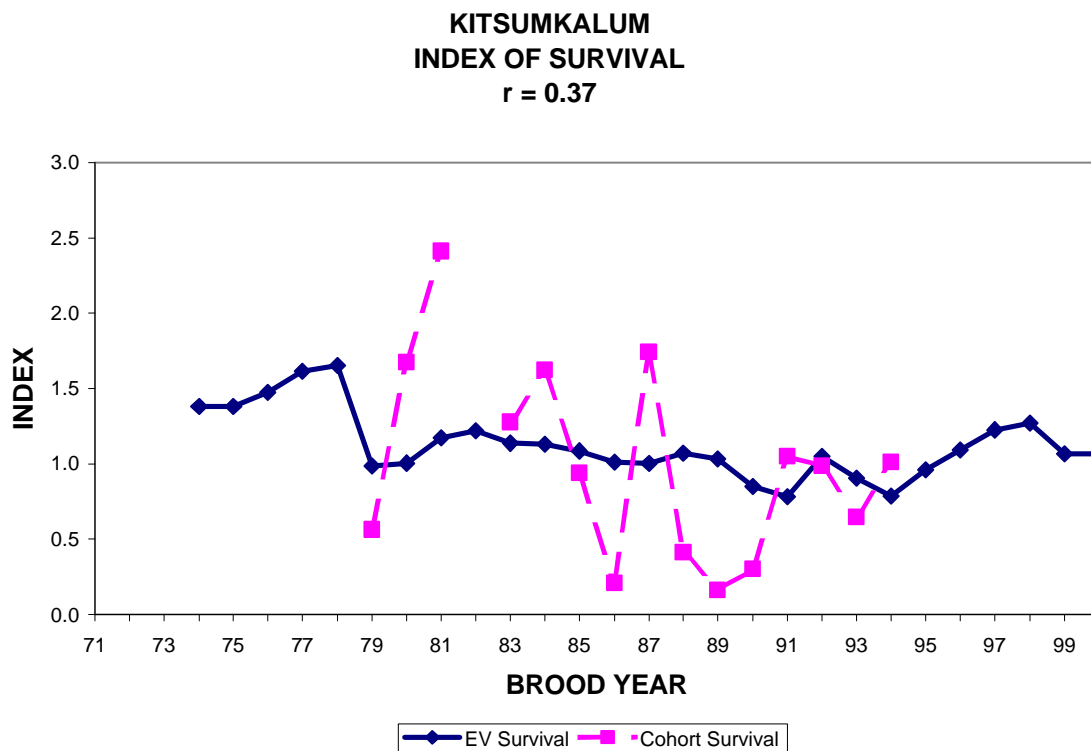


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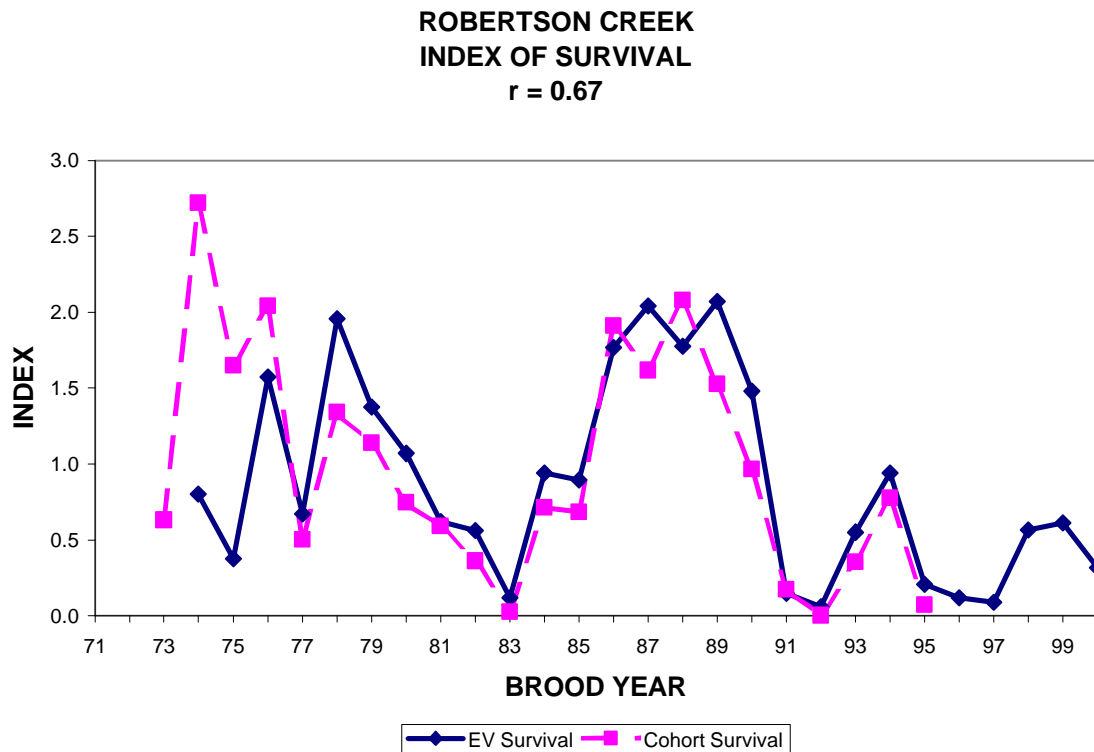


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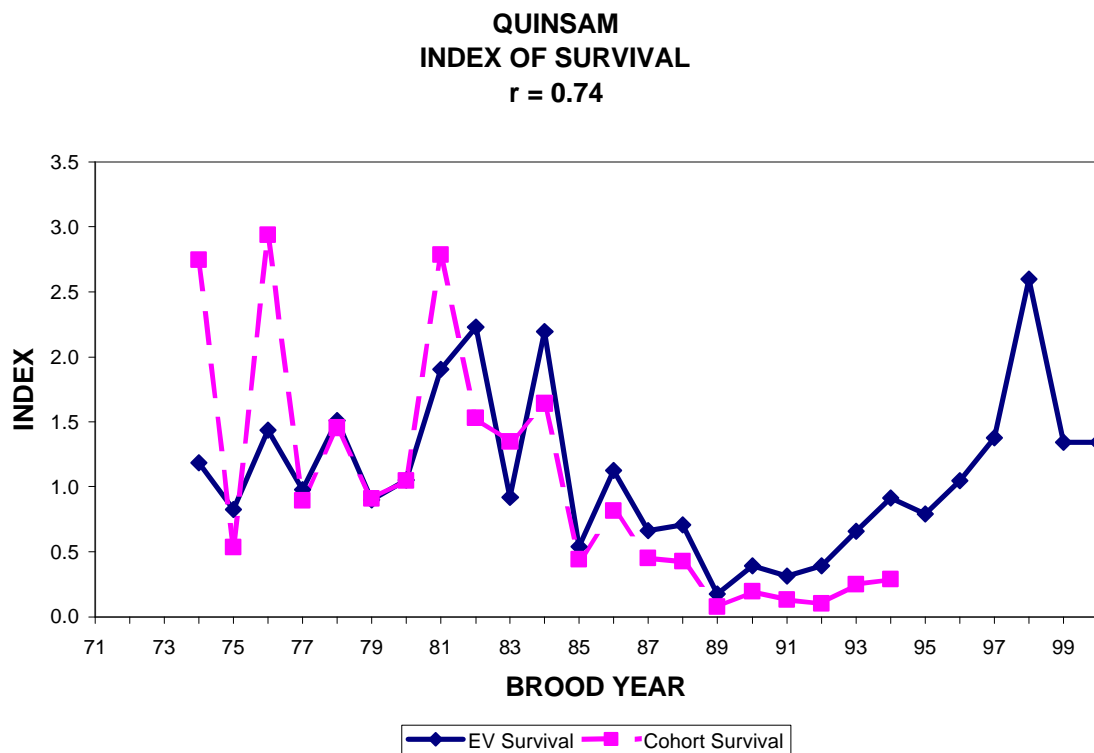


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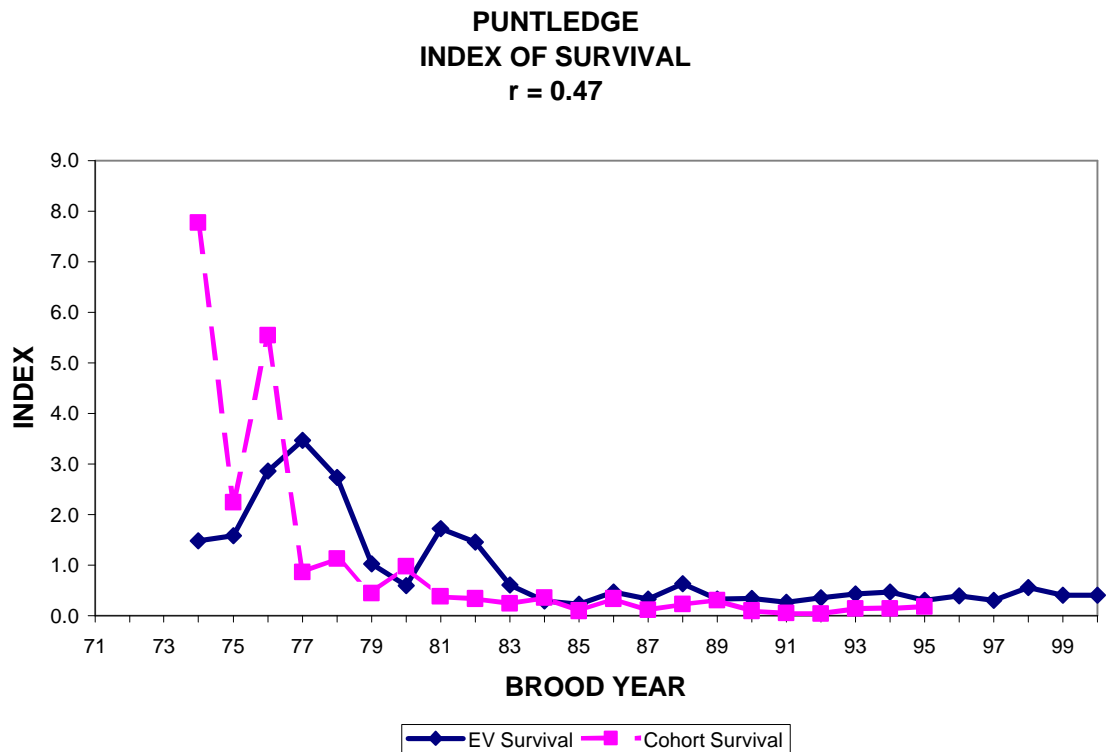
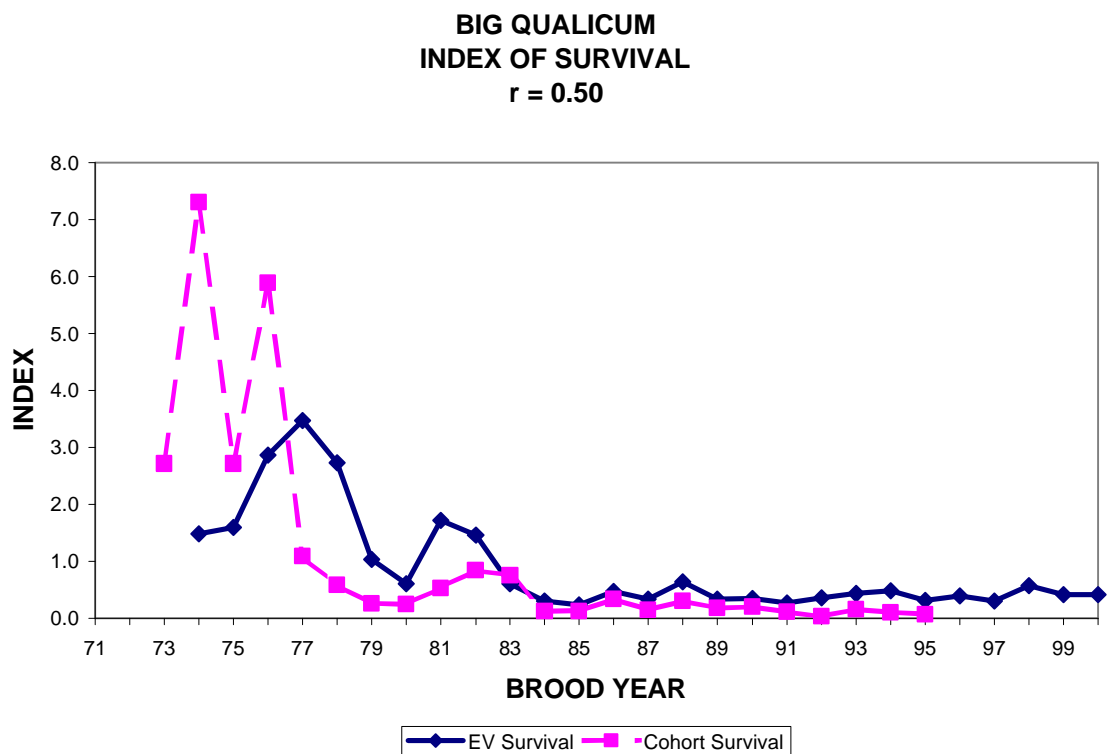


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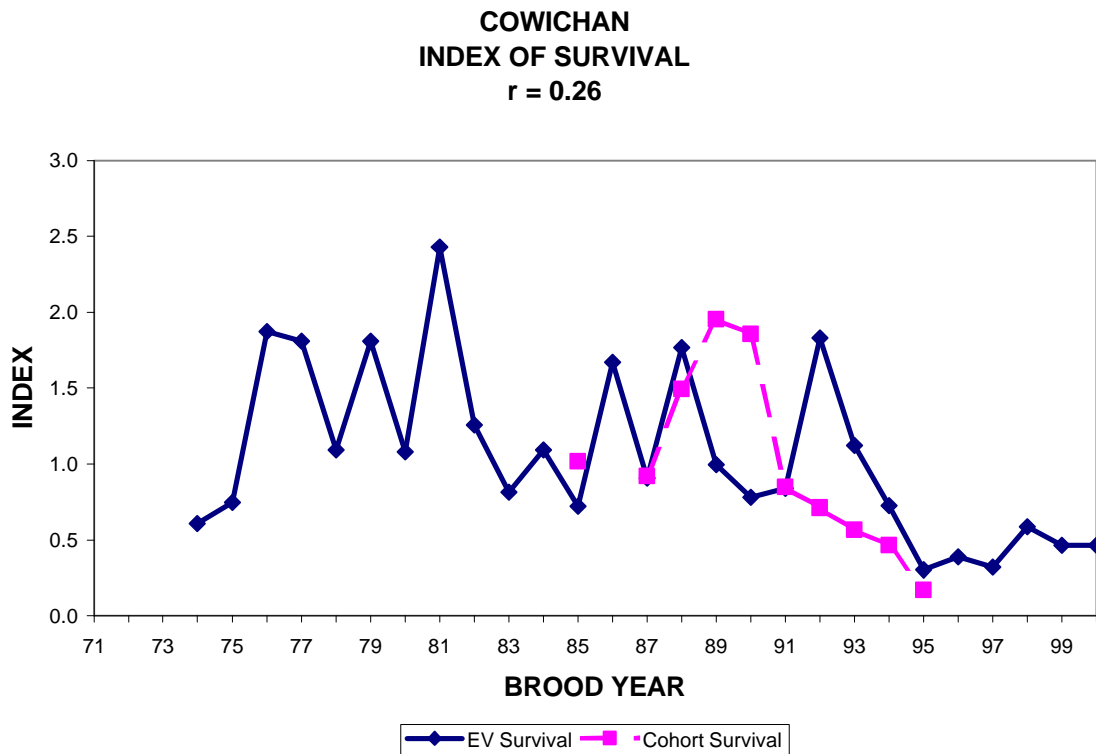


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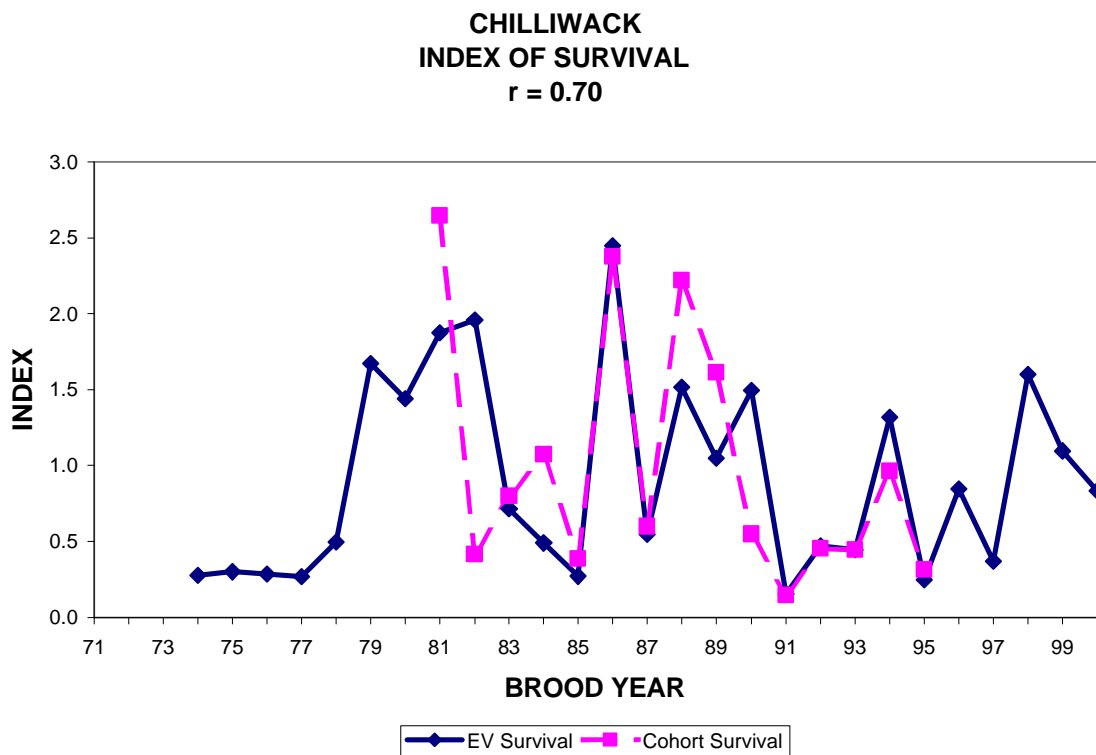


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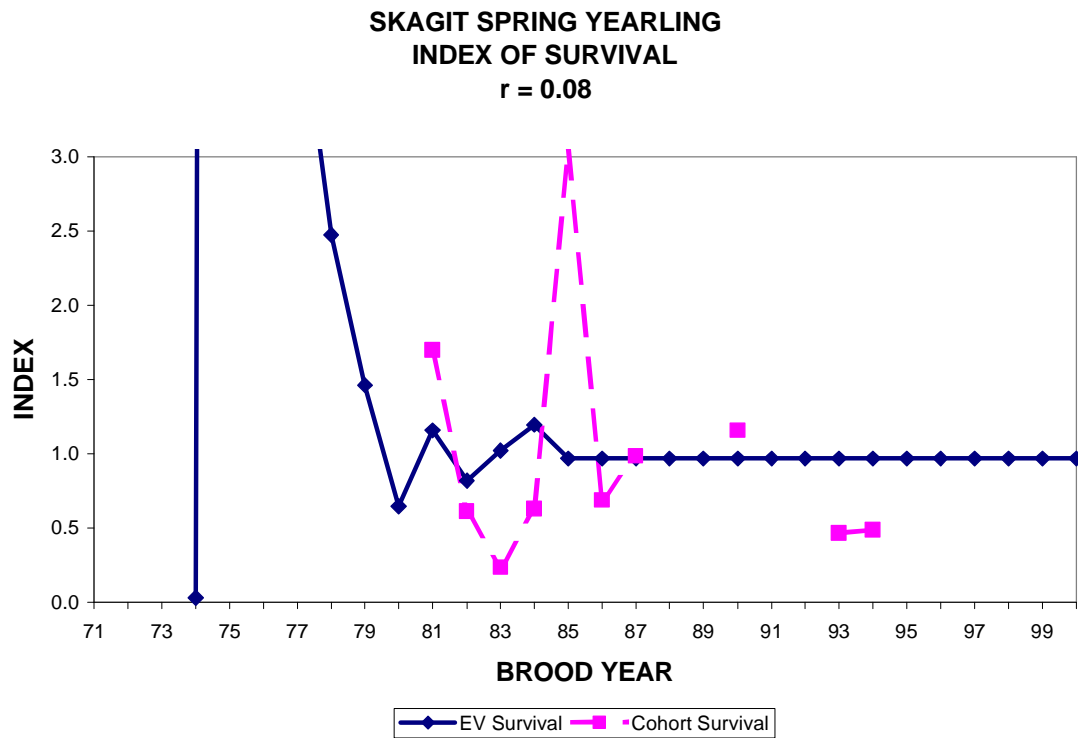


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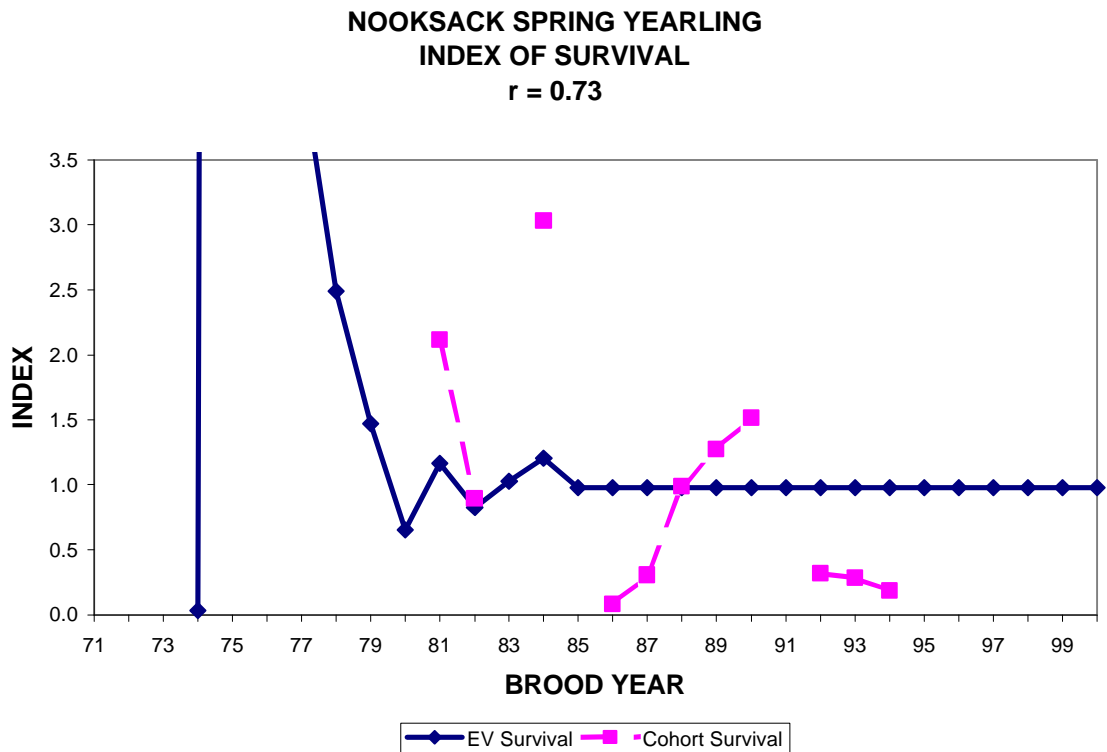


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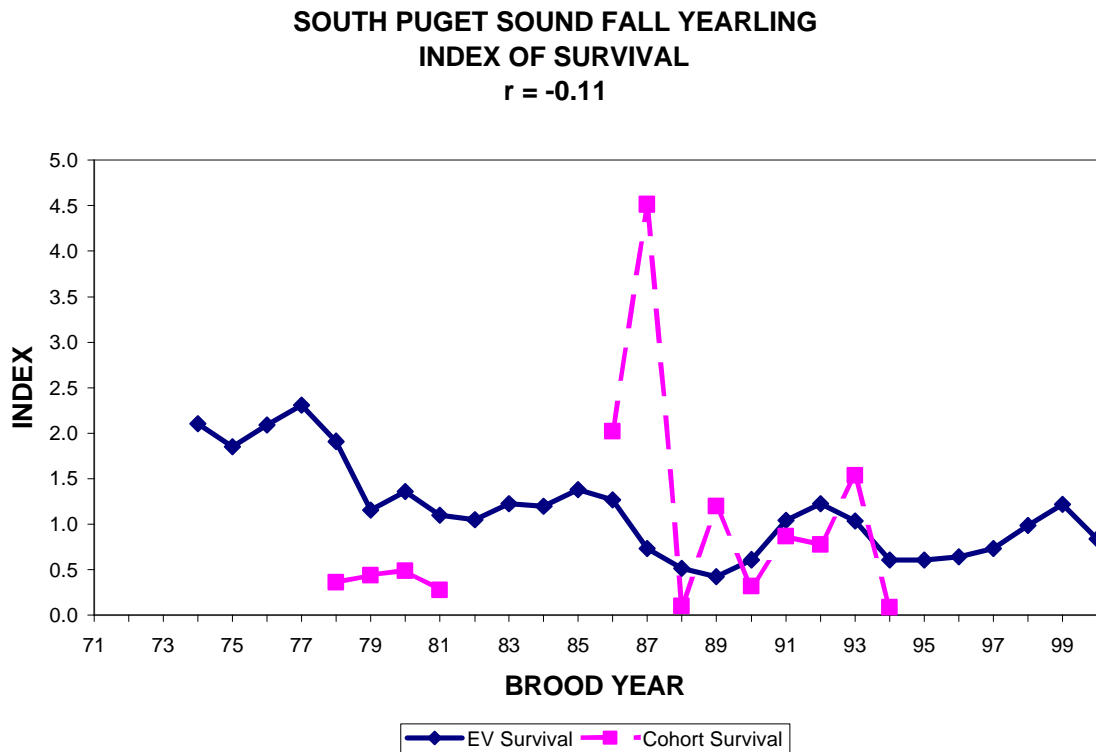


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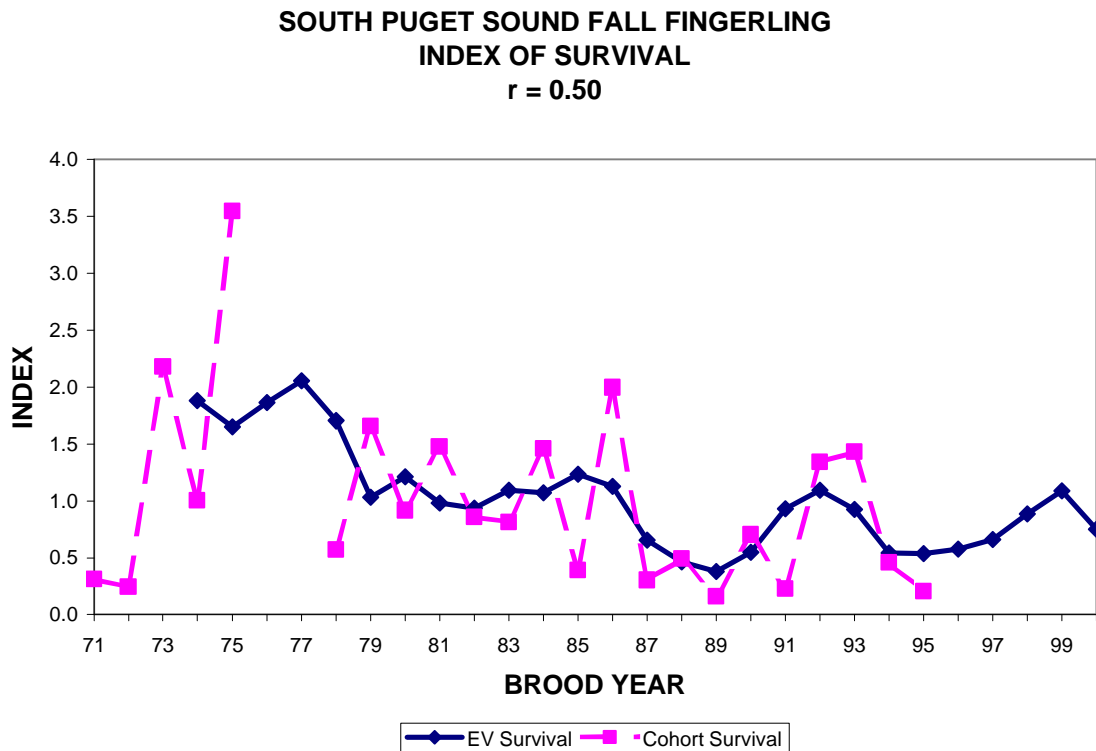


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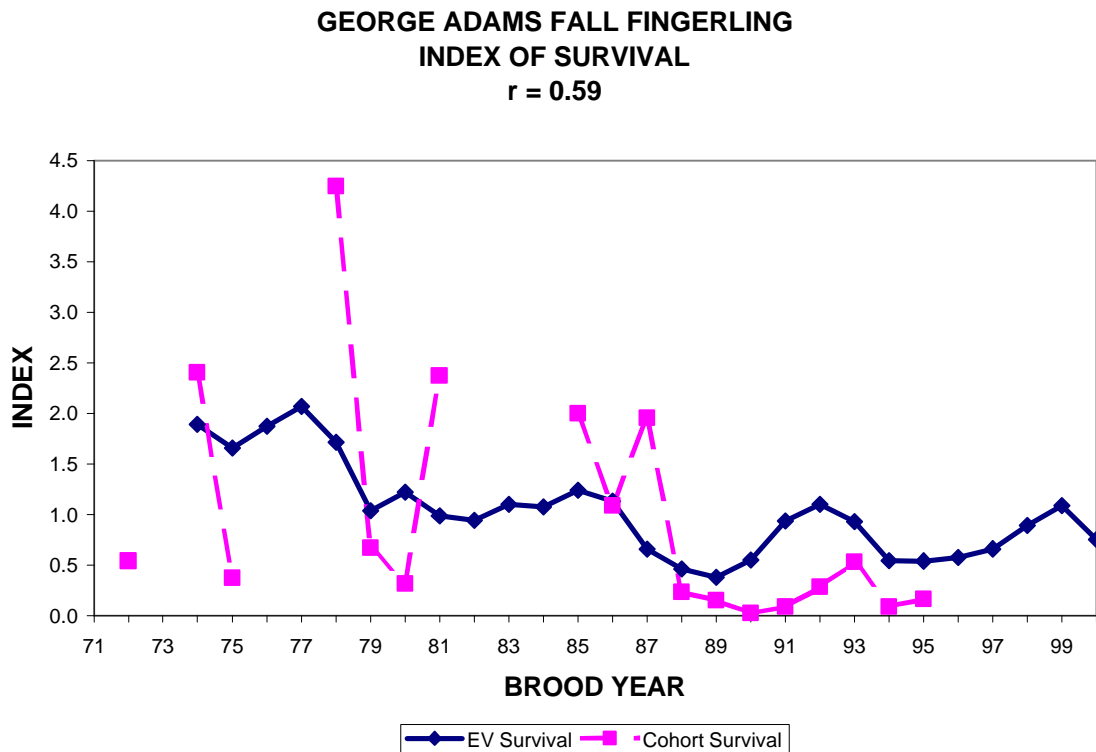


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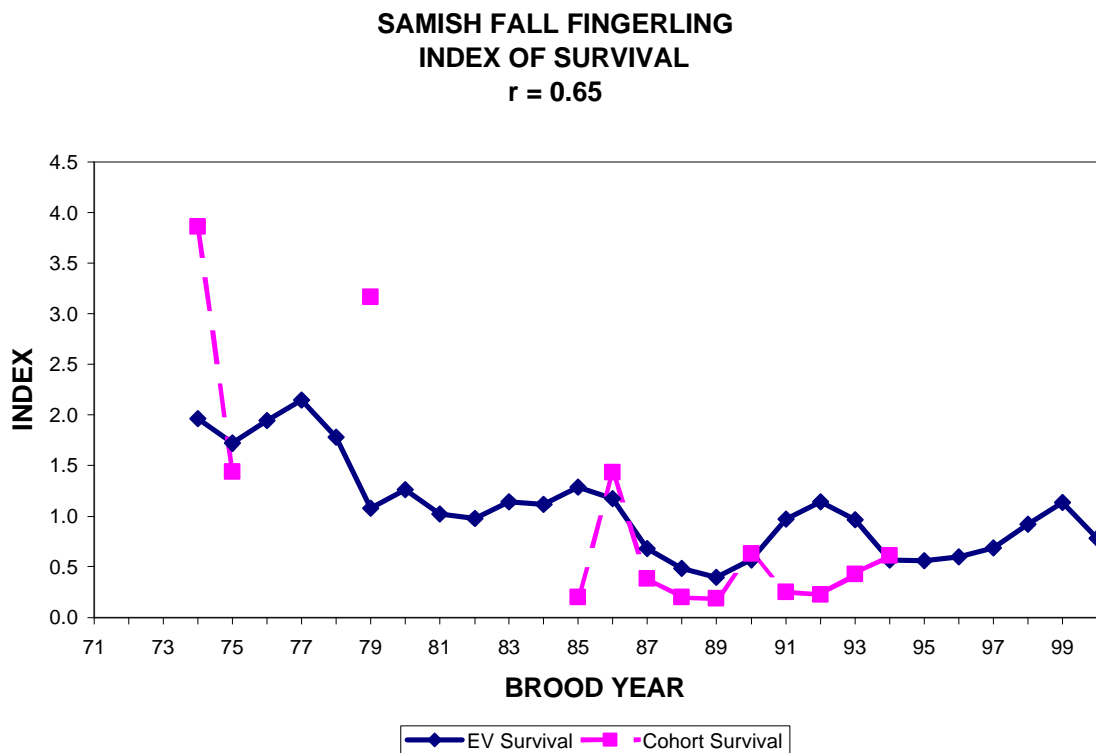


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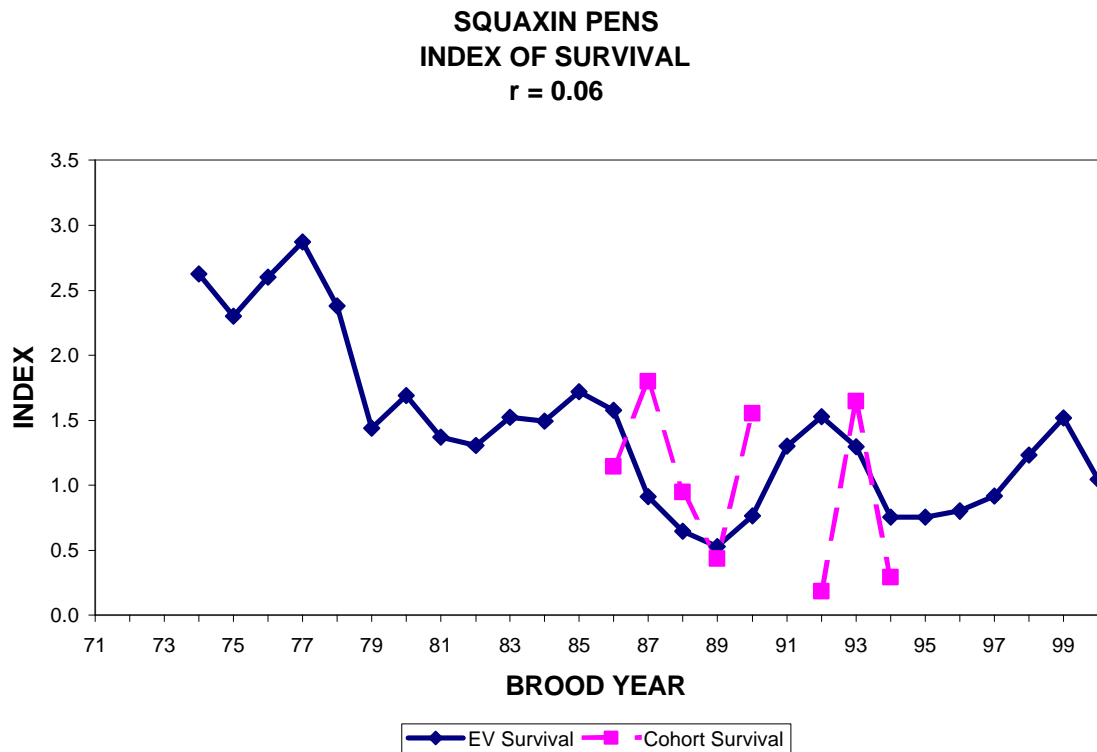


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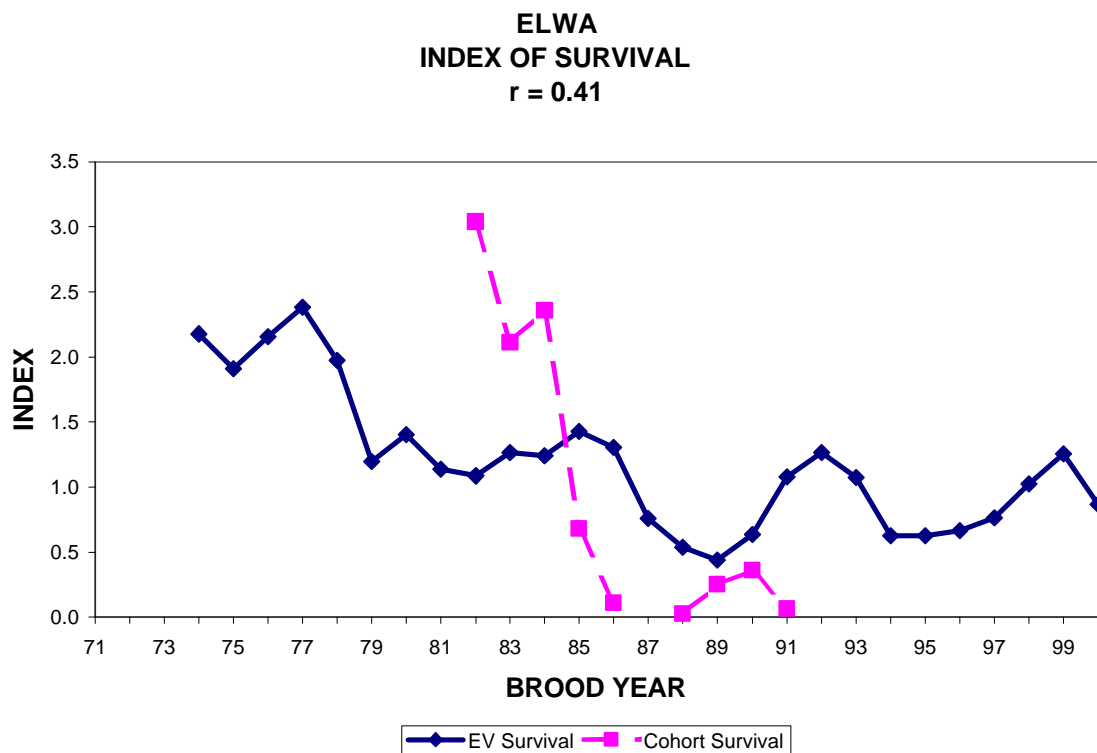


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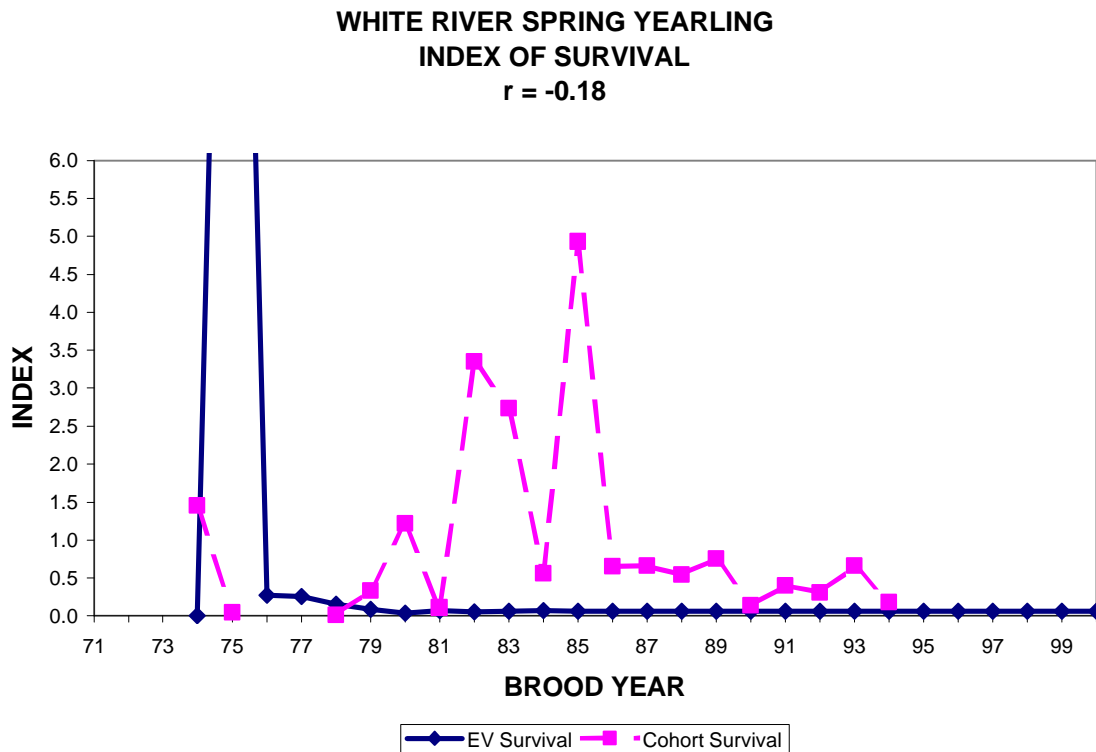


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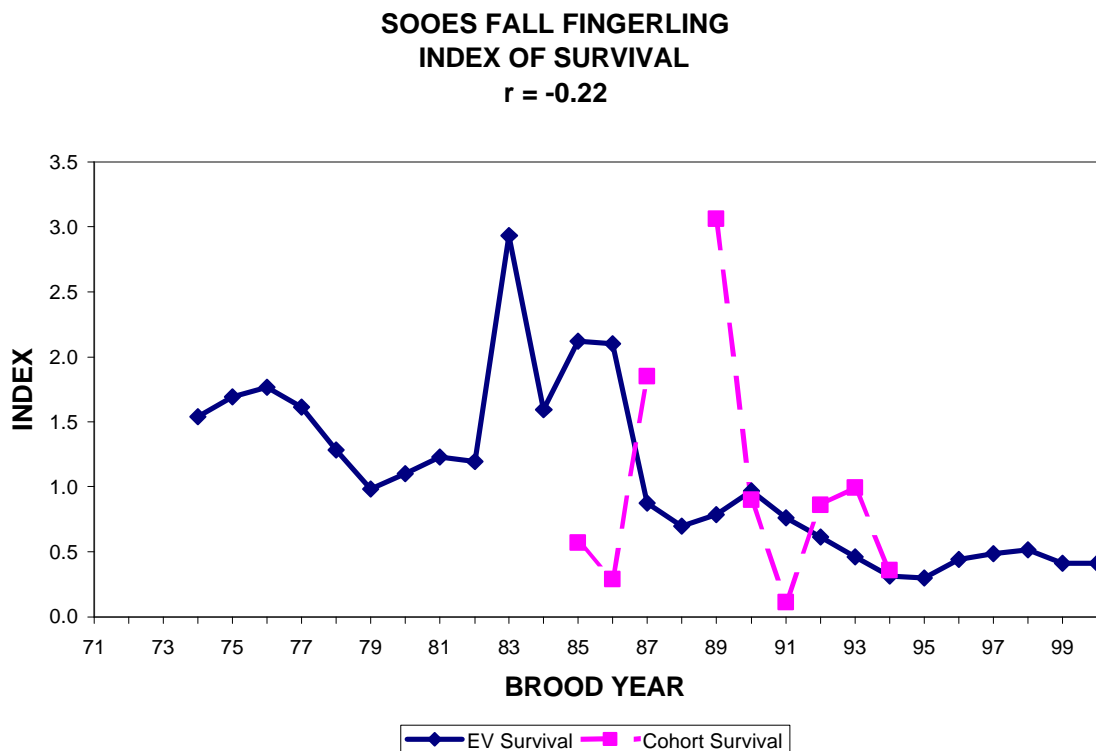


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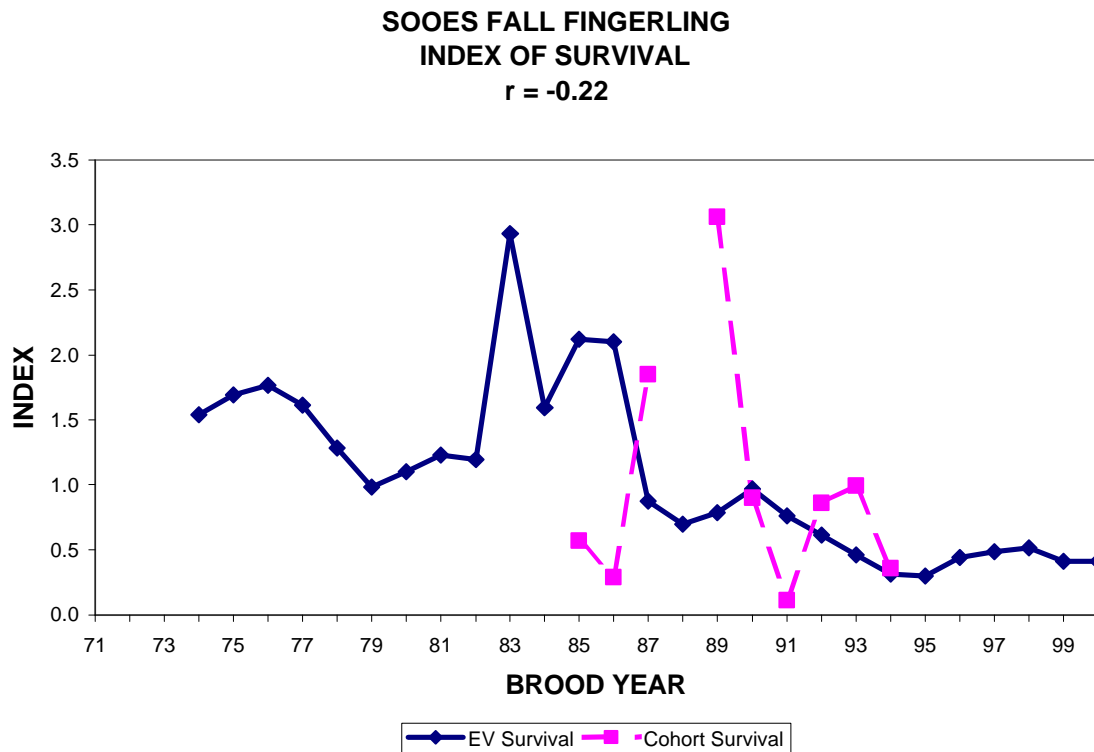


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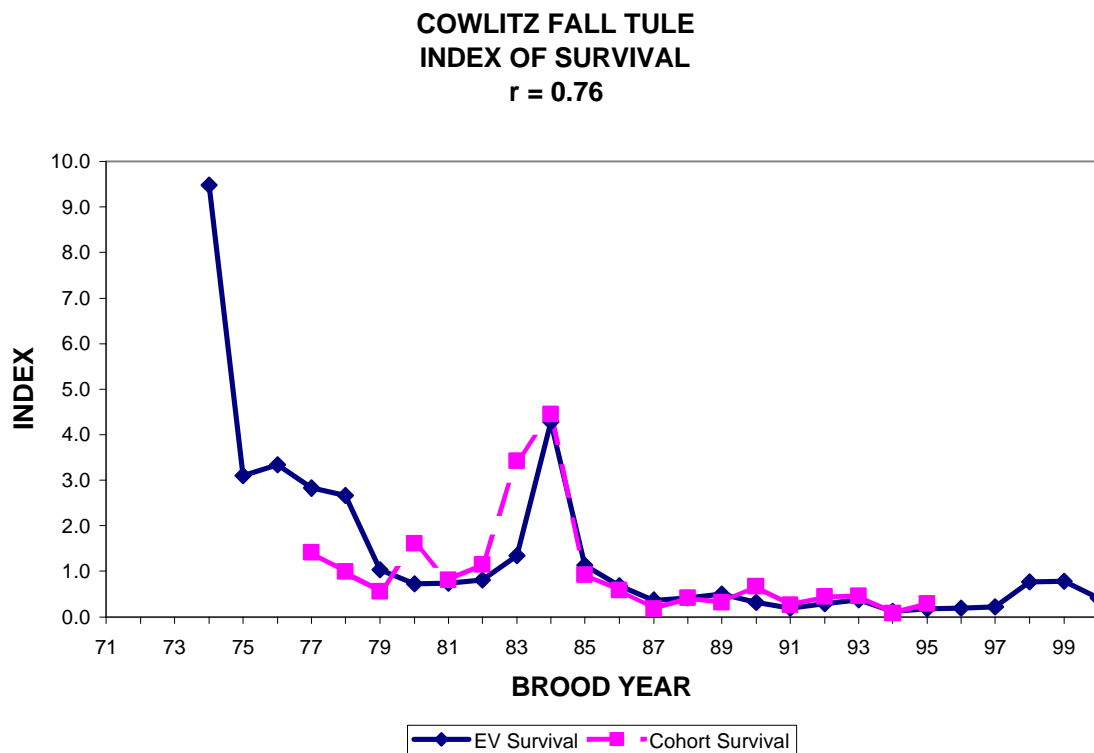


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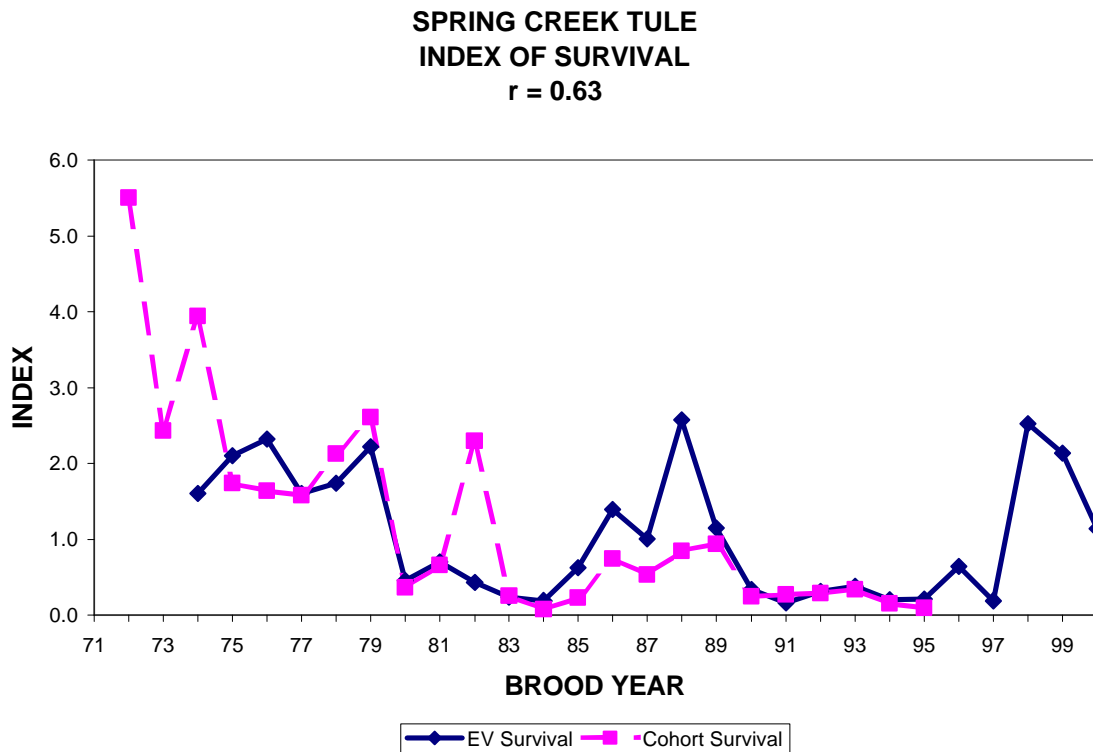


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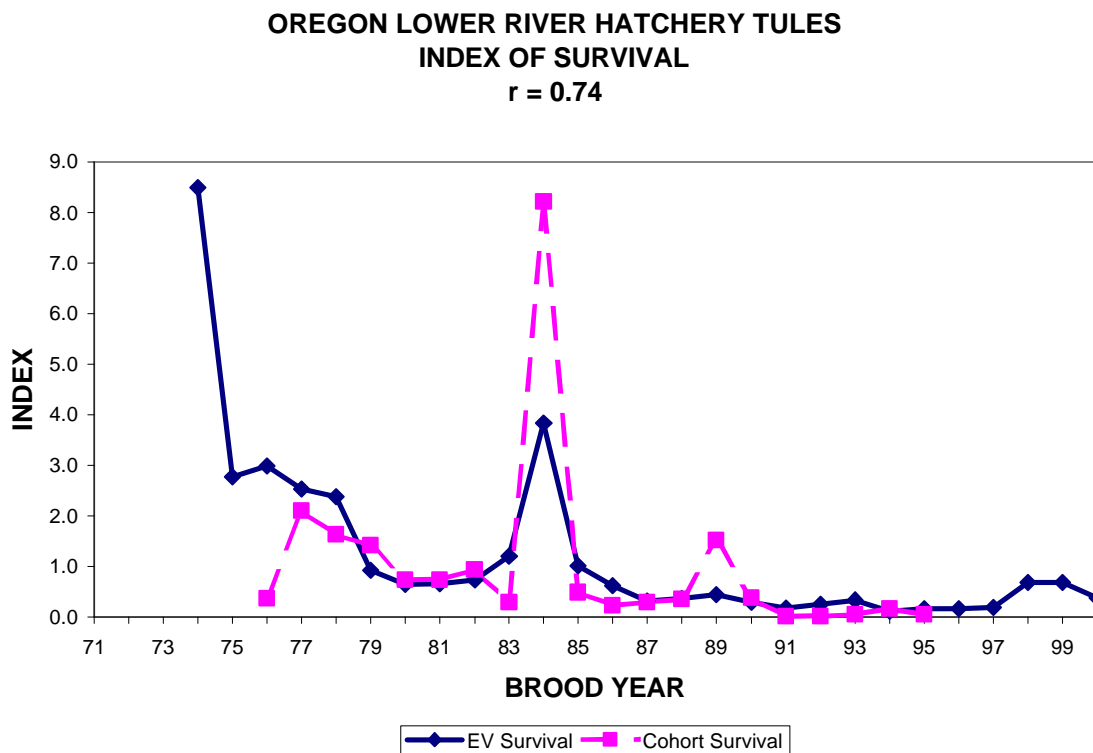


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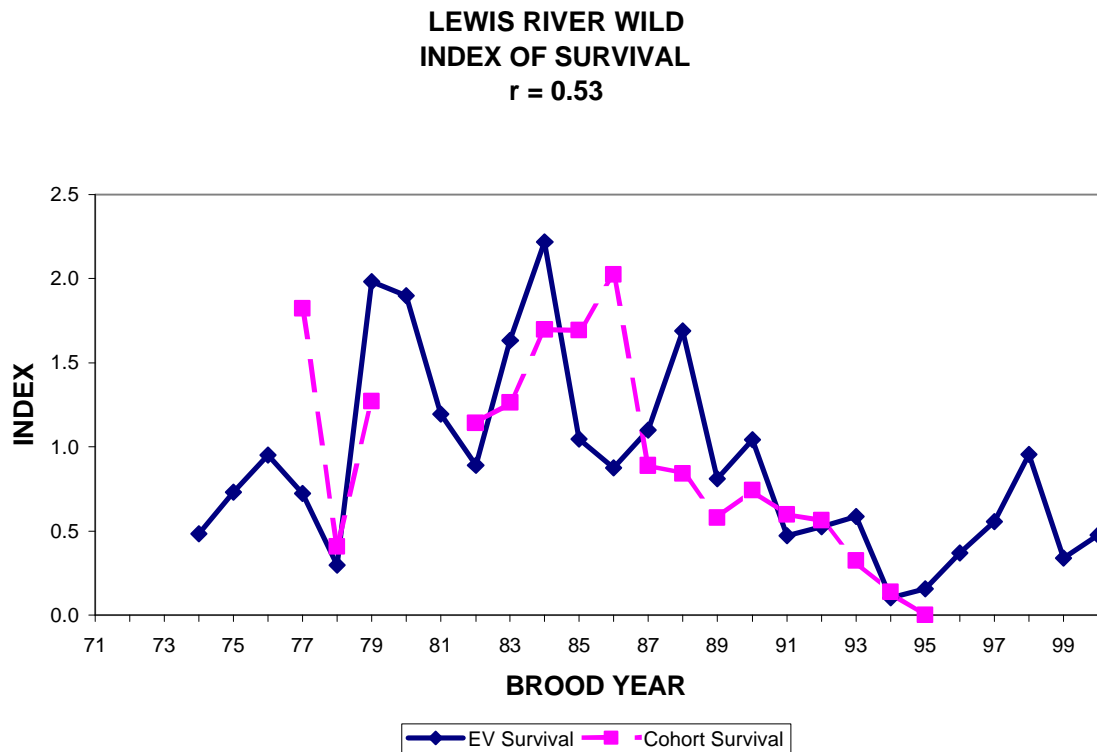


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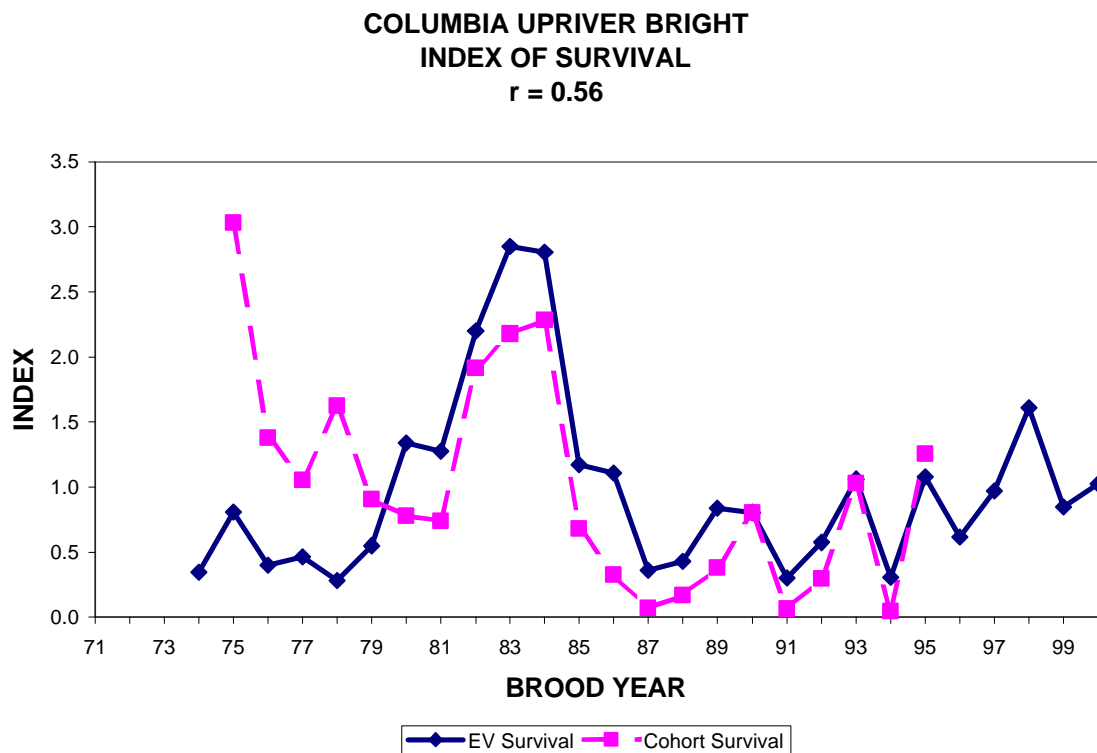


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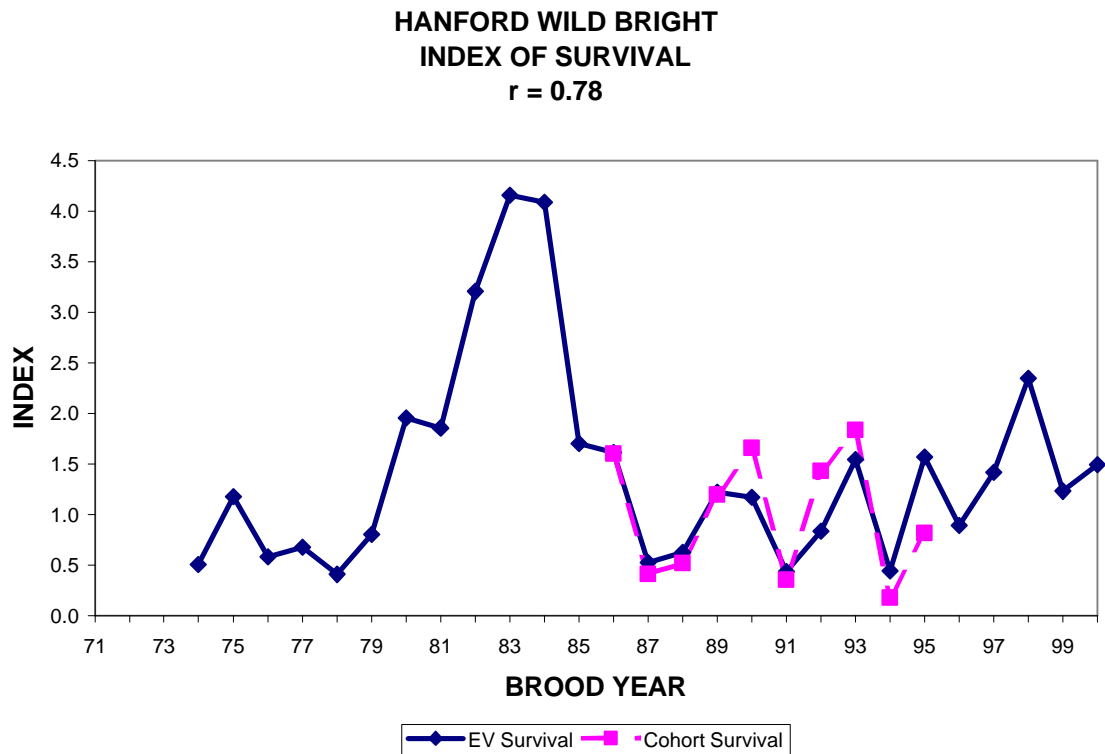


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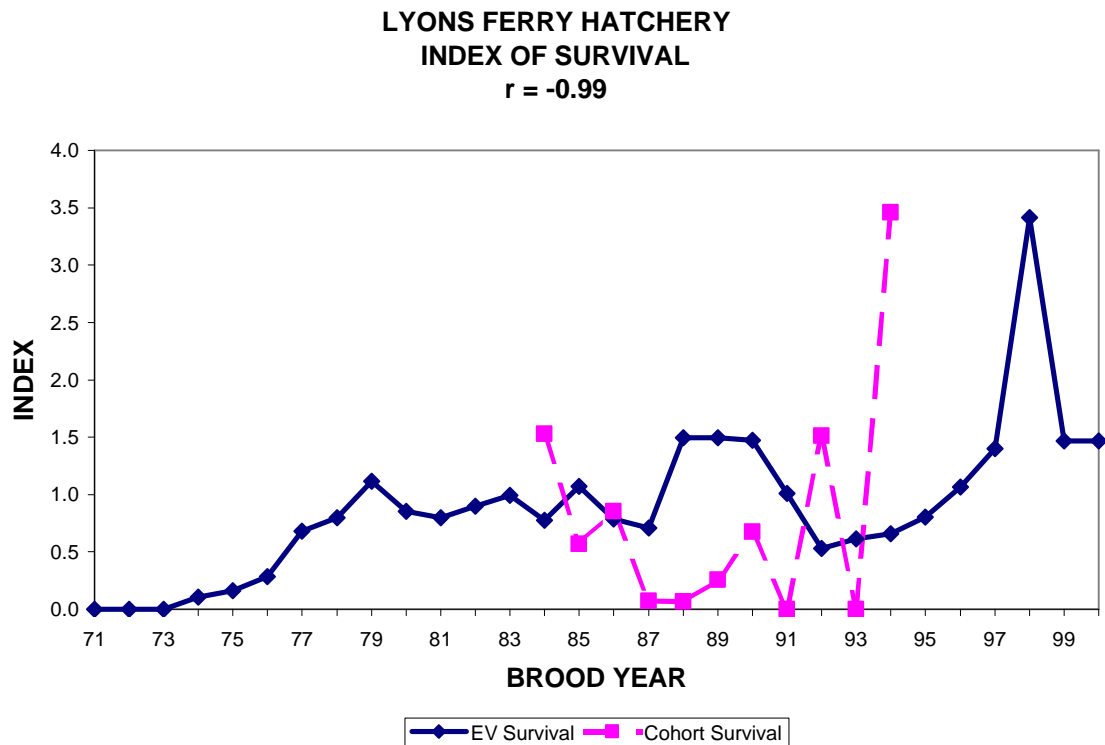


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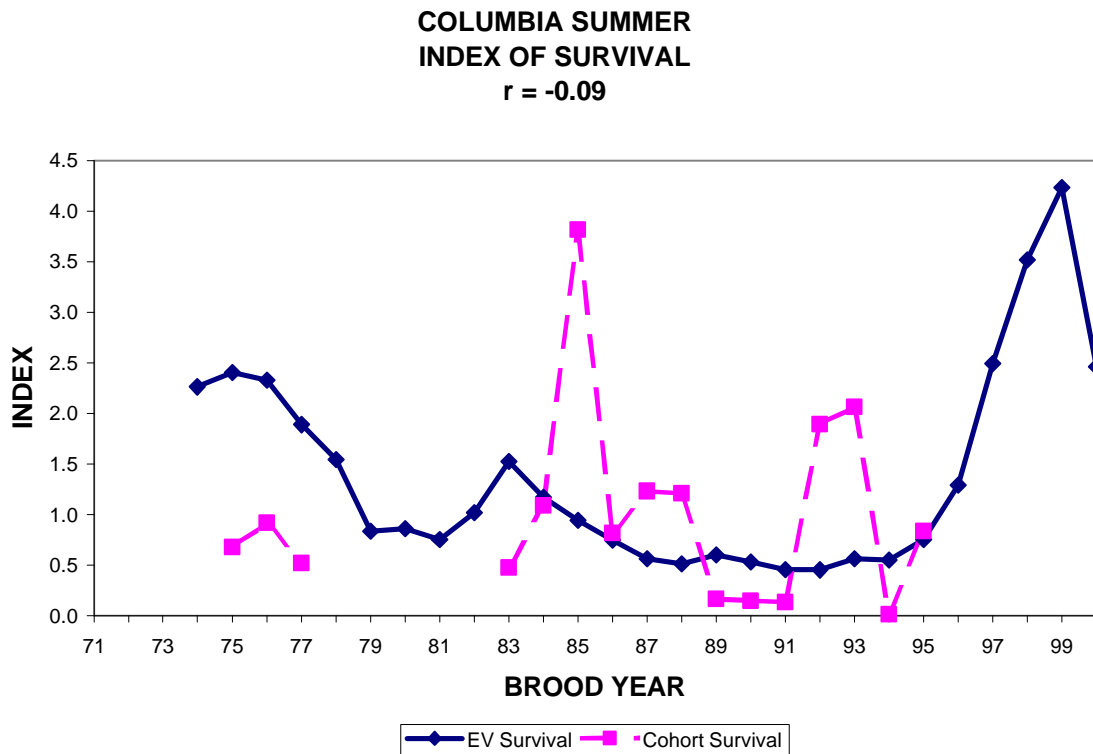


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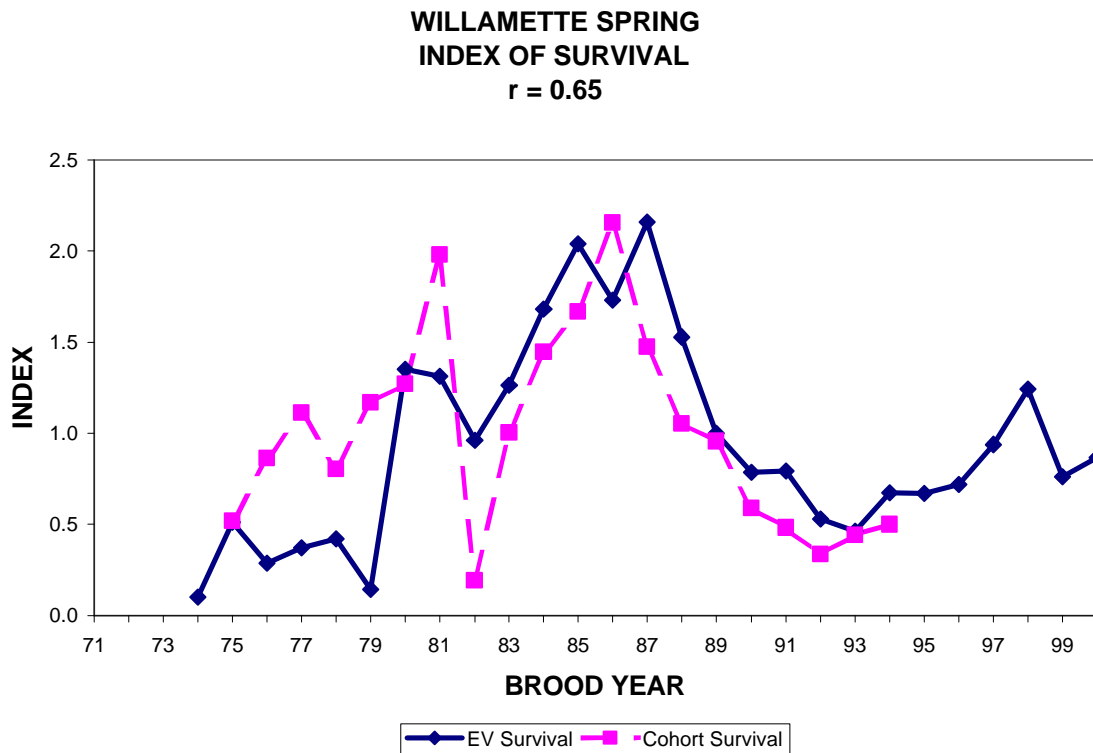


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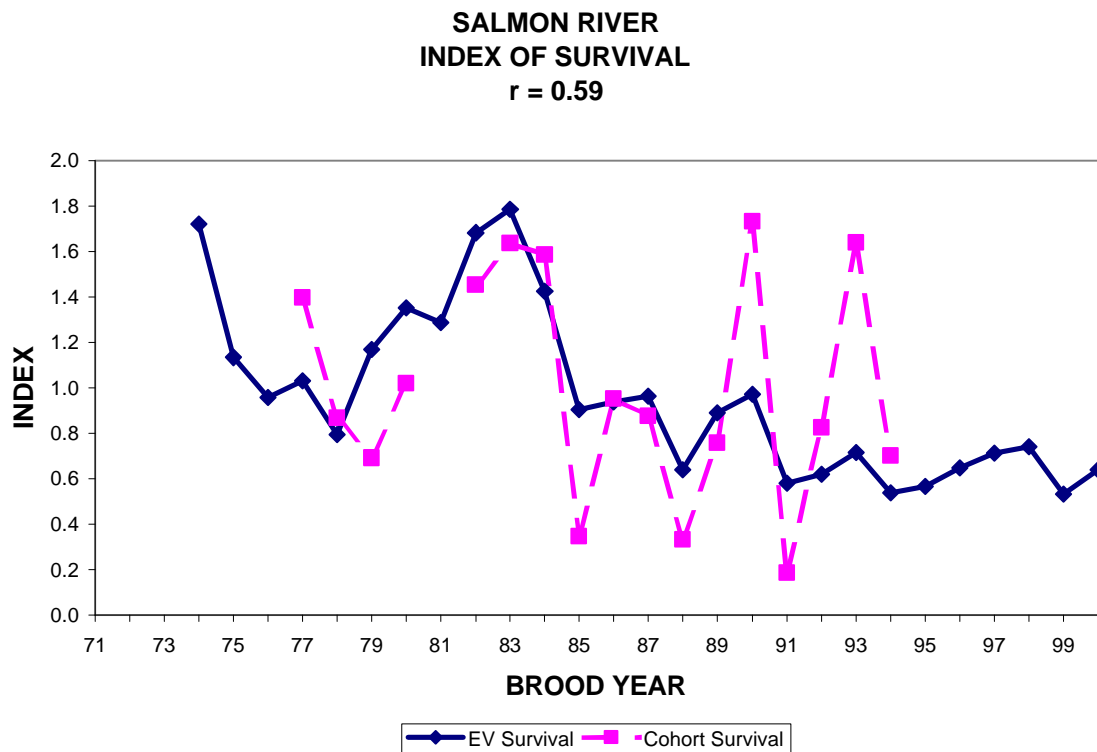


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Table H.1. Alaska Spring distribution of reported catch and escapement.

[illegible]

Table H.2. Alaska Spring distribution of total fishing mortalities and escapement.

[illegible]

Table H.3. Kitsumkalum distribution of reported catch and escapement (NA=not available).

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1984	51.5%	0.0%	0.0%	18.2%	0.0%	30.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	NA ¹
1985	26.1%	0.0%	1.6%	7.1%	0.0%	13.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	51.6%
1986	10.2%	0.0%	0.0%	13.9%	0.0%	8.8%	2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	64.8%
1987	7.4%	0.0%	0.0%	9.1%	0.0%	7.8%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	71.4%
1988	18.9%	0.6%	1.8%	3.0%	0.0%	22.6%	7.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	45.7%
1989	10.8%	0.5%	6.7%	5.0%	0.0%	11.2%	6.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	59.0%
1990	10.9%	0.0%	1.7%	6.7%	0.3%	7.2%	7.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	65.7%
1991	15.5%	0.0%	3.7%	8.8%	0.7%	16.5%	13.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	41.4%
1992	13.9%	0.0%	1.9%	7.0%	0.0%	9.4%	6.6%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	60.7%
1993	10.8%	1.3%	2.2%	9.9%	0.0%	18.5%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	53.0%
1994	11.1%	0.0%	0.0%	5.6%	0.0%	19.0%	6.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	57.9%
1995	12.6%	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%
1996	9.2%	0.2%	5.9%	0.0%	0.0%	18.2%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	61.6%
1997	12.0%	0.0%	7.4%	0.0%	0.0%	8.2%	10.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	61.6%
1998	8.8%	0.0%	3.1%	0.0%	0.0%	1.2%	5.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	81.5%
1999	13.3%	0.0%	9.9%	0.0%	0.0%	0.9%	6.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	69.2%
2000	6.5%	0.0%	6.7%	0.0%	0.0%	9.9%	5.4%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	71.2%
(84-00)	14.7%	0.2%	3.3%	6.0%	0.1%	13.7%	5.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	56.4%
(85-00)	12.4%	0.2%	3.5%	5.2%	0.1%	12.6%	6.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	59.9%

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

Table H.4. Kitsumkalum distribution of total fishing mortalities and escapement (NA=not available).

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1984	53.2%	0.0%	0.0%	20.8%	0.0%	26.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	NA ¹
1985	29.6%	0.0%	1.5%	7.7%	0.0%	12.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	48.5%
1986	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%
1987	12.9%	0.0%	2.7%	9.8%	0.0%	7.2%	4.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	62.5%
1988	25.2%	1.5%	4.4%	7.3%	0.0%	18.0%	7.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	36.4%
1989	14.1%	1.3%	6.9%	5.3%	0.0%	10.5%	6.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	55.2%
1990	11.9%	0.0%	1.9%	7.9%	0.3%	6.9%	8.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	63.1%
1991	20.9%	0.0%	4.1%	10.6%	0.9%	14.7%	12.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	36.2%
1992	15.3%	0.0%	2.0%	7.9%	0.0%	9.1%	6.9%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	58.4%
1993	11.8%	2.4%	2.0%	11.4%	0.0%	17.6%	4.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.2%
1994	13.3%	0.0%	0.0%	6.7%	0.0%	17.8%	8.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	54.1%
1995	13.9%	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%
1996	10.8%	0.2%	6.4%	0.2%	0.0%	20.4%	5.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	57.0%
1997	13.4%	0.0%	8.4%	0.0%	0.0%	8.6%	11.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	57.7%
1998	10.6%	0.0%	3.5%	0.0%	0.0%	1.4%	6.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	78.4%
1999	14.0%	0.0%	15.6%	0.0%	0.0%	1.1%	9.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	59.7%
2000	9.0%	0.0%	8.2%	0.0%	0.0%	10.0%	6.5%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	65.9%
(84-00)	17.2%	0.3%	4.1%	7.0%	0.1%	13.1%	6.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	51.9%
(85-00)	14.9%	0.3%	4.4%	6.1%	0.1%	12.2%	6.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	55.2%

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

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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	19.7%	0.8%	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%
1980	27.9%	6.6%	0.9%	8.0%	8.1%	4.4%	0.1%	6.9%	0.1%	11.3%	3.4%	0.0%	0.0%	0.0%	22.2%
1981	30.3%	1.6%	0.8%	12.1%	8.2%	4.8%	0.5%	5.3%	0.6%	13.6%	5.7%	0.0%	0.0%	0.0%	16.5%
1982	25.7%	3.5%	0.7%	13.7%	7.6%	5.1%	0.1%	5.8%	0.8%	15.1%	6.5%	0.0%	0.0%	0.0%	15.5%
1983	36.8%	3.2%	0.6%	10.3%	7.9%	2.3%	0.3%	5.2%	0.3%	18.0%	4.5%	0.0%	0.2%	0.0%	10.3%
1984	27.3%	3.9%	0.2%	14.5%	3.0%	2.7%	0.0%	6.6%	0.8%	17.6%	15.8%	0.0%	0.2%	0.0%	7.5%
1985	14.2%	6.0%	0.0%	17.7%	0.5%	4.5%	0.0%	2.0%	0.8%	3.6%	17.7%	0.0%	2.0%	0.0%	31.2%
1986	14.7%	4.4%	0.0%	8.0%	1.1%	3.1%	0.7%	4.4%	0.0%	1.5%	26.4%	0.0%	0.0%	1.1%	34.7%
1987	6.7%	1.2%	0.6%	6.2%	2.9%	2.4%	0.5%	2.2%	0.5%	1.1%	21.0%	0.0%	0.3%	0.1%	54.3%
1988	10.1%	2.1%	0.9%	6.5%	1.2%	2.0%	1.1%	4.1%	0.6%	8.0%	18.6%	0.0%	0.3%	0.2%	44.2%
1989	8.6%	2.0%	0.4%	7.8%	0.8%	1.1%	1.0%	1.6%	0.7%	20.4%	18.5%	0.0%	0.1%	0.1%	36.8%
1990	15.9%	1.4%	1.1%	7.3%	2.0%	1.7%	0.9%	6.3%	0.3%	10.4%	10.7%	0.0%	0.0%	0.1%	41.8%
1991	17.0%	1.0%	3.0%	9.1%	2.7%	0.6%	0.8%	4.4%	0.3%	14.9%	13.7%	0.0%	0.0%	0.1%	32.3%
1992	13.8%	3.0%	1.7%	7.1%	3.0%	0.9%	1.5%	18.8%	0.1%	0.8%	8.0%	0.0%	0.1%	0.1%	41.1%
1993	14.1%	1.1%	2.5%	7.1%	1.9%	0.4%	1.4%	13.7%	0.5%	8.3%	15.6%	0.1%	0.0%	0.1%	33.2%
1994	15.8%	2.3%	3.7%	9.5%	1.1%	1.1%	1.1%	5.3%	0.4%	12.8%	21.3%	0.0%	0.0%	0.1%	25.6%
1995	15.3%	0.0%	4.0%	3.1%	0.3%	0.3%	0.9%	1.5%	1.4%	7.3%	12.5%	0.0%	0.2%	0.0%	53.2%
1996	5.6%	0.0%	1.9%	0.0%	0.7%	0.0%	2.8%	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	87.6%
1997	10.5%	3.4%	3.9%	4.5%	1.8%	0.4%	2.8%	0.1%	0.5%	6.5%	20.0%	0.1%	0.0%	0.0%	45.1%
1998	16.8%	1.6%	5.0%	6.1%	0.0%	0.0%	2.0%	0.0%	0.6%	4.2%	19.0%	0.0%	0.0%	0.0%	44.8%
1999	12.3%	0.4%	7.4%	3.3%	0.2%	0.0%	2.9%	0.0%	0.8%	7.0%	22.2%	0.0%	0.0%	0.0%	43.5%
2000	5.6%	0.0%	0.0%	0.0%	0.0%	0.0%	3.4%	0.0%	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	88.4%
(79-00)	16.6%	2.3%	1.8%	7.9%	3.0%	2.1%	1.1%	4.6%	0.7%	8.4%	13.0%	0.0%	0.2%	0.1%	38.2%
(85-00)	12.3%	1.9%	2.3%	6.5%	1.3%	1.2%	1.5%	4.0%	0.7%	6.7%	15.3%	0.0%	0.2%	0.1%	46.1%

Table H.6. Robertson Creek 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	23.3%	0.7%	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%
1980	29.1%	6.7%	1.0%	8.3%	8.4%	4.4%	0.1%	7.2%	0.1%	10.7%	3.4%	0.0%	0.0%	0.0%	20.6%
1981	34.4%	1.5%	1.0%	12.3%	8.4%	4.5%	0.5%	5.4%	0.6%	12.0%	5.3%	0.0%	0.0%	0.0%	14.1%
1982	30.0%	3.3%	0.8%	13.7%	7.6%	4.8%	0.1%	5.8%	0.8%	13.5%	6.1%	0.0%	0.0%	0.0%	13.5%
1983	41.6%	3.0%	0.6%	9.9%	7.5%	2.2%	0.3%	5.1%	0.3%	16.0%	4.3%	0.0%	0.2%	0.0%	9.0%
1984	28.7%	3.8%	0.2%	14.6%	3.0%	2.6%	0.0%	6.9%	0.8%	16.5%	15.7%	0.0%	0.2%	0.0%	7.0%
1985	14.9%	17.2%	0.0%	15.9%	0.4%	3.7%	0.0%	1.8%	0.7%	3.0%	15.3%	0.0%	1.9%	0.0%	25.2%
1986	18.8%	12.2%	0.0%	8.7%	1.2%	2.9%	1.4%	4.4%	0.0%	1.2%	21.7%	0.0%	0.0%	1.1%	26.3%
1987	10.5%	2.9%	1.1%	7.5%	3.5%	2.3%	0.6%	2.7%	0.5%	1.0%	19.8%	0.0%	0.3%	0.1%	47.3%
1988	11.3%	4.7%	1.2%	7.3%	1.3%	1.9%	1.2%	4.6%	0.7%	7.3%	18.3%	0.0%	0.4%	0.2%	39.6%
1989	11.8%	5.9%	0.6%	9.1%	1.0%	1.1%	1.1%	1.9%	0.8%	18.1%	17.2%	0.0%	0.1%	0.1%	31.3%
1990	19.3%	4.1%	1.3%	8.8%	2.3%	1.6%	0.9%	6.7%	0.3%	9.1%	9.9%	0.0%	0.0%	0.1%	35.7%
1991	20.1%	2.3%	3.2%	9.9%	2.9%	0.6%	0.8%	4.8%	0.3%	13.4%	13.0%	0.0%	0.0%	0.1%	28.6%
1992	16.8%	8.3%	1.6%	7.4%	3.0%	0.8%	1.4%	18.6%	0.1%	0.6%	7.2%	0.0%	0.1%	0.0%	34.0%
1993	16.1%	2.5%	2.5%	7.5%	2.1%	0.4%	1.4%	14.3%	0.5%	7.5%	15.1%	0.0%	0.0%	0.1%	29.9%
1994	17.8%	5.0%	3.6%	9.3%	1.0%	1.0%	1.1%	5.2%	0.4%	11.6%	20.7%	0.0%	0.0%	0.1%	23.2%
1995	16.9%	0.0%	4.5%	3.6%	0.4%	0.5%	1.1%	1.8%	1.5%	6.7%	14.9%	0.0%	0.2%	0.0%	47.8%
1996	9.2%	0.0%	4.5%	2.8%	0.8%	0.0%	2.5%	0.8%	1.8%	0.0%	2.1%	0.0%	0.0%	0.0%	75.5%
1997	13.5%	8.9%	4.4%	5.0%	2.0%	0.4%	3.0%	0.2%	0.6%	5.6%	18.1%	0.1%	0.0%	0.0%	38.1%
1998	17.2%	4.0%	5.0%	6.1%	0.0%	0.0%	2.3%	0.0%	0.6%	3.9%	19.0%	0.0%	0.0%	0.0%	41.9%
1999	13.0%	0.7%	7.5%	3.3%	0.2%	0.0%	3.3%	0.0%	0.9%	6.9%	23.0%	0.0%	0.0%	0.0%	41.3%
2000	6.5%	0.0%	0.0%	0.0%	0.0%	0.0%	6.5%	0.0%	2.9%	0.0%	0.0%	0.0%	0.0%	0.0%	84.1%
(79-00)	19.1%	4.4%	2.1%	8.3%	3.1%	1.9%	1.4%	4.8%	0.8%	7.6%	12.5%	0.0%	0.2%	0.1%	33.7%
(85-00)	14.6%	4.9%	2.6%	7.0%	1.4%	1.1%	1.8%	4.2%	0.8%	6.0%	14.7%	0.0%	0.2%	0.1%	40.6%

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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	6.6%	9.2%	0.9%	7.1%	13.2%	24.9%	4.0%	0.0%	9.0%	5.6%	0.0%	0.0%	0.0%	0.0%	19.5%
1980	15.5%	9.5%	2.4%	10.4%	16.4%	12.9%	5.3%	0.0%	6.6%	8.7%	0.0%	0.0%	0.0%	0.0%	12.4%
1981	12.7%	4.3%	1.4%	15.2%	14.1%	12.0%	7.4%	0.7%	13.7%	7.5%	0.0%	0.0%	0.0%	0.0%	11.1%
1982	18.5%	11.0%	3.1%	8.4%	7.1%	21.6%	2.5%	0.4%	4.3%	8.5%	0.0%	0.0%	0.0%	0.0%	14.6%
1983	23.3%	2.2%	2.3%	15.9%	12.3%	18.3%	2.9%	0.8%	5.1%	9.0%	0.0%	0.0%	0.0%	0.0%	8.1%
1984	15.0%	7.5%	5.0%	5.7%	4.9%	14.7%	4.0%	0.8%	7.7%	6.4%	0.0%	0.0%	0.0%	0.0%	28.4%
1985	26.3%	6.1%	4.4%	5.1%	3.6%	10.9%	1.0%	0.1%	4.4%	8.2%	0.0%	0.0%	0.0%	0.0%	29.9%
1986	14.9%	4.2%	2.8%	6.6%	7.2%	19.7%	2.9%	0.0%	6.2%	6.2%	0.0%	0.0%	0.0%	0.0%	29.4%
1987	10.7%	4.4%	2.9%	6.3%	6.1%	17.1%	6.5%	0.4%	4.0%	7.3%	0.4%	0.0%	0.0%	0.0%	34.0%
1988	20.0%	1.7%	1.0%	6.5%	2.4%	5.5%	2.9%	0.7%	3.7%	4.0%	0.9%	0.0%	0.0%	0.1%	50.6%
1989	12.7%	3.0%	2.8%	3.9%	1.9%	4.9%	3.2%	0.3%	7.3%	12.9%	0.0%	0.0%	0.1%	0.0%	46.9%
1990	17.4%	3.0%	0.6%	6.6%	4.8%	11.0%	8.9%	1.4%	3.5%	4.7%	0.0%	0.0%	0.0%	0.0%	38.1%
1991	10.7%	2.4%	1.4%	5.6%	9.0%	10.2%	11.9%	0.5%	4.4%	3.5%	0.8%	0.0%	0.0%	0.0%	39.6%
1992	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%
1993	8.2%	4.2%	1.2%	5.7%	5.7%	19.3%	8.8%	1.2%	10.6%	3.3%	0.0%	0.0%	0.0%	0.0%	31.7%
1994	6.3%	1.4%	4.2%	9.4%	1.4%	14.6%	5.2%	0.0%	6.3%	4.2%	0.0%	0.0%	0.0%	0.0%	47.0%
1995	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%
1996	6.8%	0.4%	0.0%	0.0%	0.0%	17.4%	4.5%	0.0%	6.0%	0.4%	0.0%	0.0%	0.0%	0.0%	64.5%
1997	10.0%	2.9%	2.5%	4.1%	3.4%	2.3%	8.8%	0.7%	8.6%	0.2%	5.0%	0.0%	0.0%	0.0%	51.6%
1998	13.9%	2.2%	2.0%	0.0%	0.0%	0.4%	8.6%	0.0%	5.5%	0.0%	0.0%	0.0%	0.2%	0.0%	67.3%
1999	8.6%	2.8%	4.1%	1.2%	0.2%	1.5%	9.5%	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	70.6%
2000	13.1%	2.2%	4.8%	0.3%	0.0%	0.0%	5.5%	0.0%	2.8%	0.5%	0.0%	0.0%	0.0%	0.0%	70.8%
(79-00)	13.2%	4.1%	2.4%	6.5%	5.6%	11.9%	5.8%	0.4%	6.0%	4.8%	0.3%	0.0%	0.0%	0.0%	39.1%
(85-00)	12.4%	3.0%	2.3%	5.0%	3.4%	9.8%	6.4%	0.4%	5.3%	3.7%	0.4%	0.0%	0.0%	0.0%	47.9%

Table H.8. Quinsam 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	8.7%	9.1%	1.4%	7.8%	13.8%	23.6%	4.2%	0.1%	8.4%	5.5%	0.0%	0.0%	0.0%	0.0%	17.4%
1980	16.2%	9.3%	2.6%	10.7%	16.7%	12.8%	5.6%	0.0%	6.4%	8.4%	0.0%	0.0%	0.0%	0.0%	11.3%
1981	13.5%	4.1%	1.6%	15.6%	14.2%	11.8%	7.6%	0.7%	13.6%	7.2%	0.0%	0.0%	0.0%	0.0%	10.2%
1982	22.7%	10.6%	3.5%	8.3%	7.1%	20.7%	2.5%	0.3%	4.0%	7.7%	0.0%	0.0%	0.0%	0.0%	12.6%
1983	27.1%	2.0%	2.8%	15.4%	12.0%	17.3%	3.1%	0.7%	4.6%	8.1%	0.0%	0.0%	0.0%	0.0%	6.8%
1984	16.3%	7.4%	5.8%	5.9%	5.0%	14.5%	4.1%	0.9%	7.7%	6.1%	0.0%	0.0%	0.0%	0.0%	26.3%
1985	27.8%	13.4%	4.3%	4.6%	3.3%	9.8%	0.9%	0.1%	3.9%	7.1%	0.0%	0.0%	0.0%	0.0%	24.8%
1986	16.6%	10.6%	3.1%	6.5%	7.1%	18.2%	3.0%	0.0%	5.5%	5.6%	0.0%	0.0%	0.0%	0.0%	23.7%
1987	15.8%	11.7%	2.8%	6.7%	6.6%	14.1%	5.6%	0.4%	3.4%	5.9%	0.3%	0.0%	0.0%	0.0%	26.6%
1988	21.0%	4.0%	1.1%	6.9%	2.5%	5.5%	3.1%	0.8%	3.9%	3.9%	0.9%	0.0%	0.0%	0.2%	46.2%
1989	14.1%	8.3%	2.9%	4.0%	1.9%	4.6%	3.2%	0.3%	7.6%	11.8%	0.0%	0.0%	0.1%	0.0%	41.1%
1990	18.5%	7.5%	0.6%	7.2%	5.3%	10.3%	8.7%	1.5%	3.6%	4.3%	0.0%	0.0%	0.0%	0.0%	32.6%
1991	12.0%	6.8%	1.4%	6.0%	9.5%	9.2%	11.4%	0.6%	4.5%	3.2%	0.7%	0.0%	0.0%	0.0%	34.8%
1992	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%
1993	9.2%	8.7%	1.3%	6.4%	6.4%	17.6%	8.4%	1.3%	11.0%	2.8%	0.0%	0.0%	0.0%	0.0%	26.9%
1994	7.8%	3.4%	4.4%	10.3%	1.6%	13.8%	5.6%	0.0%	6.9%	3.8%	0.0%	0.0%	0.0%	0.0%	42.3%
1995	8.4%	6.4%	0.0%	11.1%	0.0%	16.6%	9.5%	0.0%	6.4%	2.0%	0.0%	0.0%	0.0%	0.0%	39.5%
1996	7.5%	0.7%	0.0%	1.4%	0.0%	20.3%	5.1%	0.0%	6.8%	0.3%	0.0%	0.0%	0.0%	0.0%	58.0%
1997	10.9%	5.2%	2.9%	4.3%	3.5%	2.3%	10.7%	0.8%	8.9%	1.4%	4.9%	0.0%	0.0%	0.0%	44.3%
1998	14.8%	6.3%	2.4%	0.0%	0.0%	0.3%	11.6%	0.0%	5.9%	0.2%	0.0%	0.0%	0.2%	0.0%	58.4%
1999	10.1%	5.5%	5.5%	1.4%	0.2%	1.7%	11.7%	0.0%	1.7%	0.0%	0.0%	0.0%	0.0%	0.0%	62.2%
2000	14.7%	3.8%	5.6%	0.2%	0.0%	0.0%	6.9%	0.0%	3.1%	1.7%	0.0%	0.0%	0.0%	0.0%	64.1%
(79-00)	15.0%	6.7%	2.6%	6.9%	5.7%	11.5%	6.3%	0.4%	6.0%	4.5%	0.3%	0.0%	0.0%	0.0%	34.1%
(85-00)	14.0%	6.5%	2.5%	5.5%	3.6%	9.5%	7.0%	0.4%	5.4%	3.5%	0.4%	0.0%	0.0%	0.0%	41.6%

Table H.9. Puntledge 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	1.8%	0.7%	0.2%	3.1%	8.3%	6.6%	0.3%	0.9%	39.5%	6.5%	0.0%	0.0%	0.0%	0.0%	32.0%
1980	2.7%	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%
1981	0.8%	0.0%	0.0%	5.4%	7.2%	3.6%	4.0%	0.0%	60.2%	5.4%	0.0%	0.0%	0.0%	0.0%	13.3%
1982	0.9%	0.7%	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%
1983	1.0%	0.2%	0.0%	7.5%	16.0%	5.1%	3.0%	2.4%	25.5%	2.6%	0.0%	0.0%	0.0%	0.0%	36.6%
1984	0.0%	1.2%	0.0%	2.0%	5.9%	3.9%	1.2%	2.3%	26.6%	2.7%	0.0%	0.0%	0.0%	0.0%	54.3%
1985	10.9%	0.8%	2.3%	6.3%	1.6%	8.6%	6.3%	0.0%	33.6%	5.5%	0.0%	0.0%	0.0%	0.0%	24.2%
1986	6.6%	0.0%	5.0%	2.8%	3.9%	9.9%	0.0%	2.8%	42.5%	1.7%	0.0%	0.0%	0.0%	0.0%	24.9%
1987	2.7%	2.0%	0.0%	12.0%	2.0%	6.0%	10.0%	0.0%	16.7%	0.0%	4.7%	0.0%	0.0%	0.0%	44.0%
1988	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%
1989	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	45.5%	0.0%	0.0%	0.0%	0.0%	0.0%	51.5%
1990	9.4%	0.0%	0.0%	0.0%	3.5%	11.8%	3.5%	0.0%	9.4%	4.7%	0.0%	0.0%	0.0%	0.0%	57.6%
1991	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%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	3.5%	0.0%	37.2%	15.1%	0.0%	0.0%	0.0%	0.0%	37.2%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	6.6%	10.5%	0.0%	44.7%	0.0%	0.0%	0.0%	0.0%	0.0%	38.2%
1994	7.1%	0.0%	0.0%	0.0%	0.0%	7.1%	0.0%	0.0%	53.6%	3.6%	0.0%	0.0%	0.0%	0.0%	28.6%
1995	5.9%	2.9%	0.0%	0.0%	0.0%	14.7%	0.0%	0.0%	32.4%	0.0%	0.0%	0.0%	0.0%	0.0%	44.1%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	2.6%	7.9%	0.0%	34.2%	2.6%	0.0%	0.0%	0.0%	0.0%	52.6%
1997	0.0%	0.0%	0.0%	9.8%	0.0%	7.8%	13.7%	0.0%	7.8%	0.0%	0.0%	0.0%	0.0%	0.0%	60.8%
1998	21.2%	6.1%	0.0%	0.0%	0.0%	0.0%	15.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	57.6%
1999	9.1%	0.0%	0.0%	0.0%	0.0%	1.8%	9.1%	0.0%	11.6%	0.0%	0.0%	0.0%	0.0%	0.0%	68.3%
2000	1.6%	0.8%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	25.6%	0.0%	0.0%	0.0%	0.0%	0.0%	70.5%
(79-00)	4.7%	0.8%	0.4%	2.5%	3.0%	5.6%	5.1%	0.7%	29.3%	3.5%	0.2%	0.0%	0.0%	0.0%	44.2%
(85-00)	6.0%	0.9%	0.5%	2.0%	0.7%	5.9%	6.4%	0.2%	27.3%	2.5%	0.3%	0.0%	0.0%	0.0%	47.5%

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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	2.4%	0.7%	0.3%	3.6%	9.3%	6.6%	0.3%	1.1%	39.3%	6.4%	0.0%	0.0%	0.0%	0.0%	30.1%
1980	3.1%	0.0%	0.5%	2.2%	6.4%	4.6%	1.5%	5.5%	38.5%	5.9%	0.0%	0.0%	0.0%	0.0%	31.7%
1981	0.9%	0.0%	0.0%	6.0%	8.0%	3.4%	4.1%	0.0%	60.0%	5.4%	0.0%	0.0%	0.0%	0.0%	12.3%
1982	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%
1983	2.0%	0.2%	0.0%	8.2%	17.0%	5.1%	3.1%	2.6%	25.5%	2.6%	0.0%	0.0%	0.0%	0.0%	33.8%
1984	0.0%	1.1%	0.0%	2.6%	6.6%	4.0%	1.5%	2.6%	27.6%	2.9%	0.0%	0.0%	0.0%	0.0%	51.1%
1985	14.1%	1.3%	3.4%	6.7%	1.3%	8.7%	6.7%	0.0%	31.5%	5.4%	0.0%	0.0%	0.0%	0.0%	20.8%
1986	6.9%	0.0%	6.4%	2.9%	4.4%	9.8%	0.0%	2.9%	43.1%	1.5%	0.0%	0.0%	0.0%	0.0%	22.1%
1987	2.9%	5.8%	0.0%	14.5%	2.9%	5.8%	9.9%	0.0%	15.7%	0.0%	4.1%	0.0%	0.0%	0.0%	38.4%
1988	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%
1989	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	52.6%	0.0%	0.0%	0.0%	0.0%	0.0%	44.7%
1990	10.9%	0.0%	0.0%	0.0%	4.3%	12.0%	4.3%	0.0%	9.8%	5.4%	0.0%	0.0%	0.0%	0.0%	53.3%
1991	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%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	7.3%	3.1%	0.0%	42.7%	13.5%	0.0%	0.0%	0.0%	0.0%	33.3%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	5.9%	10.6%	0.0%	49.4%	0.0%	0.0%	0.0%	0.0%	0.0%	34.1%
1994	9.4%	0.0%	0.0%	0.0%	0.0%	6.3%	0.0%	0.0%	56.3%	3.1%	0.0%	0.0%	0.0%	0.0%	25.0%
1995	5.1%	2.6%	0.0%	0.0%	0.0%	15.4%	0.0%	0.0%	35.9%	2.6%	0.0%	0.0%	0.0%	0.0%	38.5%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	7.1%	0.0%	40.5%	2.4%	0.0%	0.0%	0.0%	0.0%	47.6%
1997	0.0%	0.0%	0.0%	10.2%	0.0%	8.5%	18.6%	0.0%	8.5%	1.7%	0.0%	0.0%	0.0%	0.0%	52.5%
1998	18.6%	18.6%	0.0%	0.0%	0.0%	0.0%	18.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	44.2%
1999	10.0%	0.0%	0.0%	0.0%	0.0%	2.2%	12.2%	0.0%	13.3%	0.0%	0.0%	0.0%	0.0%	0.0%	62.2%
2000	2.2%	1.4%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	29.5%	0.0%	0.0%	0.0%	0.0%	0.0%	65.5%
(79-00)	5.1%	1.7%	0.5%	2.8%	3.4%	5.6%	5.8%	0.7%	31.2%	3.6%	0.2%	0.0%	0.0%	0.0%	39.4%
(85-00)	6.4%	2.1%	0.6%	2.2%	0.8%	5.9%	7.3%	0.2%	29.7%	2.6%	0.3%	0.0%	0.0%	0.0%	41.9%

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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	3.7%	1.0%	0.4%	1.7%	9.4%	4.1%	0.4%	2.2%	39.0%	8.0%	0.1%	0.0%	0.3%	0.1%	29.8%
1980	1.5%	1.7%	0.4%	4.4%	6.6%	3.4%	1.4%	4.2%	39.3%	9.5%	0.0%	0.0%	0.0%	0.0%	27.8%
1981	1.9%	0.3%	0.4%	1.4%	11.7%	4.6%	0.8%	1.6%	54.9%	9.8%	0.3%	0.0%	0.0%	0.0%	12.5%
1982	4.6%	0.4%	0.7%	4.6%	6.0%	8.8%	0.4%	4.5%	26.0%	12.4%	0.0%	0.0%	0.0%	0.0%	31.7%
1983	5.5%	0.3%	0.3%	5.0%	6.9%	4.5%	1.0%	1.1%	36.2%	14.6%	0.0%	0.0%	0.0%	0.6%	24.0%
1984	1.4%	0.2%	0.0%	1.4%	6.8%	3.7%	6.0%	1.4%	51.7%	6.2%	0.0%	0.0%	0.0%	0.0%	21.1%
1985	4.1%	0.3%	0.6%	1.8%	3.8%	6.8%	1.8%	1.5%	34.2%	12.5%	0.0%	0.0%	2.7%	0.0%	29.9%
1986	2.1%	0.2%	0.0%	0.8%	12.8%	8.2%	2.9%	1.4%	45.1%	7.6%	0.0%	0.0%	0.0%	0.0%	18.9%
1987	8.9%	0.0%	1.0%	4.0%	2.5%	2.6%	2.7%	4.2%	31.5%	5.2%	0.0%	0.8%	0.7%	0.0%	35.9%
1988	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%
1989	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%
1990	4.3%	2.1%	0.0%	6.1%	1.6%	6.5%	2.4%	3.0%	22.8%	11.3%	0.0%	0.2%	0.0%	1.9%	37.7%
1991	2.6%	0.2%	0.0%	2.1%	1.1%	2.9%	2.0%	2.0%	45.1%	5.7%	0.0%	0.5%	0.5%	0.0%	35.3%
1992	2.3%	0.0%	2.5%	5.4%	6.0%	1.6%	7.8%	3.4%	41.0%	4.0%	0.0%	0.0%	0.4%	0.0%	25.6%
1993	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%
1994	4.6%	0.0%	0.0%	1.3%	1.7%	3.8%	2.1%	2.5%	34.3%	2.1%	0.0%	0.0%	2.5%	0.0%	45.2%
1995	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%
1996	2.9%	0.0%	0.0%	0.0%	0.0%	0.7%	1.1%	0.0%	46.4%	0.0%	0.0%	0.0%	0.0%	1.1%	47.8%
1997	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%
1998	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%
1999	6.1%	1.7%	0.0%	2.2%	2.6%	0.0%	2.2%	0.0%	12.2%	0.0%	3.0%	0.0%	0.9%	0.0%	69.1%
2000	15.1%	0.9%	0.0%	0.0%	0.0%	0.5%	3.3%	0.0%	11.8%	0.0%	0.0%	0.0%	0.0%	0.0%	68.4%
(79-00)	4.4%	0.7%	0.3%	2.5%	3.9%	3.9%	2.5%	1.9%	34.4%	5.9%	0.5%	0.1%	0.4%	0.3%	38.4%
(85-00)	4.9%	0.7%	0.3%	2.3%	2.5%	3.5%	2.8%	1.7%	31.9%	4.3%	0.6%	0.1%	0.5%	0.3%	43.6%

Table H.12. Big Qualicum 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	4.8%	1.0%	0.5%	1.9%	10.4%	4.1%	0.4%	2.5%	38.5%	7.8%	0.1%	0.0%	0.3%	0.1%	27.7%
1980	1.7%	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%
1981	2.4%	0.3%	0.4%	1.5%	12.6%	4.6%	0.9%	1.7%	54.2%	9.6%	0.3%	0.0%	0.0%	0.0%	11.4%
1982	5.9%	0.5%	0.8%	4.8%	6.3%	8.7%	0.4%	4.7%	26.1%	12.1%	0.0%	0.0%	0.0%	0.0%	29.7%
1983	5.7%	0.3%	0.7%	5.1%	7.1%	4.7%	1.3%	1.2%	37.1%	14.2%	0.0%	0.0%	0.0%	1.0%	21.7%
1984	2.4%	0.2%	0.0%	1.7%	7.4%	3.7%	7.0%	1.7%	50.9%	6.1%	0.0%	0.0%	0.0%	0.0%	19.0%
1985	7.1%	1.1%	0.9%	2.0%	4.4%	6.7%	2.3%	1.6%	32.8%	12.1%	0.0%	0.0%	3.4%	0.0%	25.6%
1986	3.5%	0.9%	0.0%	0.8%	13.6%	7.9%	2.9%	1.4%	45.3%	7.0%	0.0%	0.0%	0.0%	0.0%	16.8%
1987	10.7%	0.0%	1.0%	4.3%	2.8%	2.5%	2.9%	4.8%	31.4%	5.0%	0.0%	0.9%	0.8%	0.0%	33.0%
1988	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%
1989	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%
1990	4.6%	5.3%	0.0%	7.1%	1.8%	6.3%	2.6%	3.3%	24.1%	10.6%	0.0%	0.1%	0.0%	1.9%	32.2%
1991	3.8%	0.4%	0.0%	2.5%	1.4%	2.8%	2.0%	2.2%	48.5%	5.0%	0.0%	0.6%	0.4%	0.0%	30.3%
1992	3.9%	0.0%	2.7%	6.0%	6.3%	1.5%	7.7%	3.6%	43.5%	3.4%	0.0%	0.0%	0.4%	0.0%	21.1%
1993	1.6%	2.5%	0.0%	1.6%	4.5%	2.7%	3.1%	1.9%	48.2%	6.2%	0.0%	0.0%	0.0%	1.0%	26.6%
1994	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%
1995	7.4%	0.0%	0.0%	2.2%	0.0%	8.7%	3.9%	0.0%	21.8%	3.1%	0.0%	0.0%	0.0%	0.0%	52.8%
1996	3.4%	0.0%	0.0%	0.6%	0.0%	0.9%	0.9%	0.3%	51.8%	0.3%	0.0%	0.0%	0.0%	1.2%	40.5%
1997	3.6%	0.0%	0.0%	5.8%	1.8%	1.8%	2.7%	0.0%	30.9%	2.7%	4.5%	0.0%	0.0%	0.0%	46.2%
1998	8.1%	1.1%	0.0%	0.0%	0.0%	0.0%	9.1%	0.0%	22.6%	0.5%	0.0%	0.0%	0.0%	0.0%	58.6%
1999	7.1%	3.5%	0.0%	2.8%	3.1%	0.0%	2.8%	0.0%	13.8%	0.0%	3.5%	0.0%	0.8%	0.0%	62.6%
2000	17.9%	1.7%	0.0%	0.0%	0.0%	0.4%	4.7%	0.0%	13.2%	0.0%	0.0%	0.0%	0.0%	0.0%	62.0%
(79-00)	5.4%	1.4%	0.4%	2.9%	4.3%	3.9%	2.9%	2.1%	35.7%	5.9%	0.5%	0.1%	0.5%	0.3%	33.9%
(85-00)	6.0%	1.7%	0.3%	2.7%	2.7%	3.5%	3.3%	1.9%	33.7%	4.4%	0.6%	0.1%	0.6%	0.3%	38.2%

Table H.13. Chilliwack 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1985	0.5%	0.0%	0.0%	0.3%	2.3%	0.8%	0.2%	34.2%	28.7%	5.9%	0.0%	3.9%	4.1%	3.7%	15.3%
1986	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%
1987	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%
1988	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%
1989	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%
1990	0.8%	0.0%	0.0%	0.0%	0.1%	1.4%	0.3%	8.7%	14.2%	4.0%	2.2%	5.8%	11.4%	5.1%	46.0%
1991	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%
1992	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%
1993	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	14.8%	18.2%	1.8%	0.5%	8.8%	0.0%	1.2%	54.0%
1994	0.3%	0.1%	0.0%	0.6%	0.3%	1.4%	0.0%	5.7%	11.9%	3.9%	2.1%	1.4%	3.1%	3.3%	65.9%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.1%	8.5%	6.3%	0.5%	0.4%	1.1%	1.1%	1.6%	79.5%
1996	0.2%	0.0%	0.0%	0.0%	0.0%	1.2%	0.0%	0.0%	16.5%	0.1%	0.6%	4.7%	1.0%	3.0%	72.8%
1997	0.7%	0.0%	0.0%	0.1%	0.4%	0.6%	0.6%	10.0%	15.1%	1.6%	2.0%	5.0%	2.4%	3.2%	58.4%
1998	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	3.8%	0.1%	0.2%	3.0%	0.2%	0.4%	91.6%
1999	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.2%	0.3%	10.0%	0.0%	1.8%	11.1%	0.6%	0.9%	75.0%
2000	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	4.8%	5.6%	0.0%	1.8%	3.4%	0.0%	0.3%	83.7%
(85-00)	0.3%	0.0%	0.0%	0.2%	0.4%	0.6%	0.2%	12.2%	16.7%	2.7%	0.8%	5.4%	2.9%	2.7%	55.0%
(85-00)	0.3%	0.0%	0.0%	0.2%	0.4%	0.6%	0.2%	12.2%	16.7%	2.7%	0.8%	5.4%	2.9%	2.7%	55.0%

Table H.14. Chilliwack 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1985	1.1%	0.0%	0.0%	0.4%	2.2%	0.7%	0.2%	33.9%	28.7%	5.6%	0.0%	3.9%	5.2%	4.5%	13.7%
1986	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%
1987	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%
1988	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%
1989	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%
1990	0.9%	0.0%	0.0%	0.0%	0.1%	1.3%	0.3%	10.8%	15.2%	3.5%	2.2%	6.3%	16.0%	6.6%	36.8%
1991	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%
1992	0.4%	0.0%	0.0%	0.1%	0.7%	0.3%	0.2%	21.5%	19.4%	0.9%	0.2%	9.3%	1.0%	3.8%	42.2%
1993	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	16.5%	21.0%	1.7%	0.4%	9.3%	0.0%	1.2%	49.0%
1994	0.4%	0.3%	0.0%	0.8%	0.4%	1.5%	0.0%	7.2%	13.4%	4.5%	2.5%	1.6%	4.8%	4.7%	58.1%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.2%	12.7%	7.3%	0.9%	0.6%	1.3%	1.5%	2.5%	72.3%
1996	0.3%	0.0%	0.0%	0.0%	0.0%	1.5%	0.0%	2.1%	18.7%	0.3%	0.8%	5.3%	1.3%	5.3%	64.7%
1997	0.8%	0.0%	0.0%	0.2%	0.4%	0.6%	0.8%	12.5%	16.8%	1.8%	1.9%	5.5%	2.5%	3.9%	52.2%
1998	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%	4.3%	0.1%	0.3%	3.4%	0.3%	0.8%	89.8%
1999	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.2%	0.3%	11.8%	0.0%	1.8%	13.0%	0.7%	1.0%	70.9%
2000	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	5.4%	6.4%	0.0%	2.3%	4.0%	0.0%	1.0%	80.2%
(85-00)	0.4%	0.0%	0.0%	0.2%	0.4%	0.6%	0.2%	13.9%	18.1%	2.6%	0.9%	5.8%	3.6%	3.4%	49.8%
(85-00)	0.4%	0.0%	0.0%	0.2%	0.4%	0.6%	0.2%	13.9%	18.1%	2.6%	0.9%	5.8%	3.6%	3.4%	49.8%

Table H.15. Cowichan, 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1990	0.0%	0.0%	0.0%	0.0%	1.4%	4.7%	0.3%	1.3%	52.7%	13.1%	0.0%	0.7%	3.2%	2.2%	20.4%
1991	0.0%	0.0%	0.0%	0.1%	0.2%	0.5%	1.0%	2.3%	40.7%	3.6%	0.5%	0.6%	2.6%	0.6%	47.2%
1992	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%
1993	0.2%	0.0%	0.0%	0.1%	0.4%	0.5%	1.3%	6.8%	52.4%	3.0%	1.4%	0.5%	0.8%	0.4%	32.1%
1994	0.5%	0.0%	0.0%	0.3%	0.2%	2.2%	0.0%	3.6%	33.9%	5.6%	0.8%	0.3%	3.3%	0.4%	48.8%
1995	0.3%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	3.4%	28.8%	0.5%	0.6%	0.0%	1.9%	0.7%	62.8%
1996	0.2%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	33.3%	0.3%	0.9%	0.0%	0.7%	2.8%	61.4%
1997	0.9%	0.0%	0.0%	0.0%	0.0%	0.5%	0.6%	2.8%	25.9%	0.2%	1.1%	0.0%	3.6%	3.0%	61.5%
1998	4.8%	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%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	41.9%	1.4%	3.5%	1.1%	7.6%	0.8%	42.7%
2000	1.4%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	22.3%	0.0%	5.8%	0.0%	0.0%	0.9%	67.8%
(90-00)	0.8%	0.0%	0.0%	0.1%	0.3%	1.0%	0.5%	2.8%	38.1%	2.9%	1.6%	0.3%	2.6%	1.2%	47.8%
(90-00)	0.8%	0.0%	0.0%	0.1%	0.3%	1.0%	0.5%	2.8%	38.1%	2.9%	1.6%	0.3%	2.6%	1.2%	47.8%

Table H.16. Cowichan 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1990	0.0%	0.0%	0.0%	0.1%	1.4%	3.6%	0.7%	2.8%	59.0%	10.0%	0.1%	0.8%	4.6%	2.5%	14.2%
1991	0.1%	0.0%	0.0%	0.2%	0.3%	0.5%	1.1%	3.3%	47.1%	3.3%	0.6%	0.6%	2.9%	0.6%	39.4%
1992	0.1%	0.1%	0.0%	0.4%	1.0%	0.9%	0.8%	8.9%	60.7%	3.3%	1.2%	0.2%	1.3%	1.2%	20.0%
1993	0.3%	0.0%	0.0%	0.1%	0.5%	0.5%	1.2%	7.4%	57.1%	2.7%	1.3%	0.5%	0.8%	0.4%	27.3%
1994	0.5%	0.0%	0.0%	0.4%	0.2%	2.0%	0.0%	4.1%	38.7%	5.8%	0.8%	0.5%	4.1%	0.6%	42.4%
1995	0.3%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	5.0%	32.3%	1.5%	0.8%	0.0%	2.3%	0.9%	55.4%
1996	0.3%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.3%	38.1%	0.5%	1.1%	0.0%	0.9%	3.8%	54.6%
1997	1.2%	0.0%	0.0%	0.0%	0.0%	0.4%	0.7%	3.6%	29.5%	1.1%	1.1%	0.0%	4.3%	3.6%	54.5%
1998	5.1%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.5%	35.0%	0.3%	1.9%	0.0%	4.6%	0.0%	51.5%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	46.3%	1.1%	4.0%	1.1%	10.1%	0.7%	35.3%
2000	1.9%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	25.9%	0.0%	6.6%	0.0%	0.0%	1.3%	62.1%
(90-00)	0.9%	0.1%	0.0%	0.1%	0.3%	0.9%	0.6%	3.4%	42.7%	2.7%	1.8%	0.3%	3.3%	1.4%	41.5%
(90-00)	0.9%	0.1%	0.0%	0.1%	0.3%	0.9%	0.6%	3.4%	42.7%	2.7%	1.8%	0.3%	3.3%	1.4%	41.5%

Table H.17. Samish Fall Fingerling distribution of reported catch and escapement (NA=not available).

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1989	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%	0.3%	6.8%	17.2%	3.5%	1.9%	7.5%	36.0%	9.8%	16.5%
1990	0.1%	0.0%	0.0%	0.5%	0.1%	0.2%	0.0%	19.0%	13.2%	1.4%	2.1%	9.2%	31.2%	7.5%	15.7%
1991	0.0%	0.0%	0.0%	0.0%	0.1%	0.3%	0.0%	13.4%	11.3%	2.6%	3.2%	9.1%	23.0%	10.7%	26.4%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.5%	11.4%	14.6%	2.1%	0.9%	10.2%	15.6%	17.2%	27.4%
1993	0.0%	0.0%	0.0%	0.3%	0.2%	0.5%	0.3%	12.3%	19.1%	2.3%	8.5%	3.9%	16.6%	12.5%	23.6%
1994	0.2%	0.0%	0.0%	0.4%	0.0%	0.4%	0.0%	11.9%	13.8%	1.9%	5.4%	2.2%	38.6%	4.0%	21.2%
1995	0.3%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	5.8%	5.1%	0.3%	3.4%	3.4%	27.2%	15.0%	38.8%
1996	0.0%	0.1%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	10.7%	0.1%	0.7%	1.9%	33.9%	24.1%	28.1%
1997	0.5%	0.1%	0.0%	0.3%	0.7%	0.8%	0.3%	2.0%	8.2%	0.1%	1.8%	0.9%	34.5%	9.8%	40.0%
1998	3.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	10.9%	0.0%	1.7%	0.7%	44.0%	4.1%	33.2%
1999	3.6%	0.0%	0.0%	1.2%	0.0%	0.0%	3.2%	1.6%	10.9%	0.0%	10.1%	1.6%	39.1%	3.6%	25.0%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	40.0%	20.0%	0.0%	30.7%	1.3%	8.0%	0.0%	NA ¹
(89-00)	0.7%	0.0%	0.0%	0.2%	0.1%	0.3%	0.4%	10.5%	12.9%	1.2%	5.9%	4.3%	29.0%	9.8%	24.7%
(89-00)	0.7%	0.0%	0.0%	0.2%	0.1%	0.3%	0.4%	10.5%	12.9%	1.2%	5.9%	4.3%	29.0%	9.8%	24.7%

¹ Values represent estimates of stock distribution only in this year.

Table H.18. Samish Fall Fingerling distribution of total fishing mortalities and escapement (NA=not available).

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1989	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%	0.2%	9.1%	18.4%	3.1%	1.9%	8.0%	33.1%	11.0%	14.4%
1990	0.1%	0.0%	0.0%	0.6%	0.1%	0.2%	0.0%	20.4%	13.9%	1.3%	2.1%	9.5%	29.3%	8.1%	14.4%
1991	0.0%	0.0%	0.0%	0.0%	0.1%	0.4%	0.0%	14.5%	12.2%	2.5%	3.2%	9.5%	21.6%	11.9%	24.1%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.6%	11.6%	15.4%	1.8%	0.8%	10.0%	14.2%	23.7%	21.9%
1993	0.0%	0.0%	0.0%	0.3%	0.2%	0.4%	0.3%	14.0%	21.7%	2.0%	8.0%	4.1%	15.3%	13.4%	20.1%
1994	0.5%	0.0%	0.0%	0.5%	0.0%	0.4%	0.0%	13.1%	15.1%	1.9%	5.6%	2.3%	36.9%	4.5%	19.1%
1995	0.2%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	7.2%	5.3%	0.7%	4.7%	3.3%	23.9%	22.0%	31.8%
1996	0.0%	0.1%	0.0%	0.1%	0.0%	0.4%	0.0%	1.0%	11.6%	0.2%	0.8%	1.9%	33.1%	27.6%	23.3%
1997	0.6%	0.4%	0.0%	0.4%	0.9%	0.8%	0.4%	2.5%	9.4%	0.4%	1.7%	1.1%	33.6%	11.6%	36.6%
1998	3.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	11.8%	0.0%	1.8%	0.8%	43.2%	5.4%	31.8%
1999	4.1%	0.0%	0.0%	1.1%	0.0%	0.0%	3.4%	1.5%	12.0%	0.0%	10.5%	1.9%	37.6%	4.5%	23.3%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	37.0%	21.0%	0.0%	33.3%	1.2%	7.4%	0.0%	NA ¹
(89-00)	0.8%	0.0%	0.0%	0.3%	0.1%	0.3%	0.4%	11.1%	14.0%	1.2%	6.2%	4.5%	27.4%	12.0%	21.7%
(89-00)	0.8%	0.0%	0.0%	0.3%	0.1%	0.3%	0.4%	11.1%	14.0%	1.2%	6.2%	4.5%	27.4%	12.0%	21.7%

¹ Values represent estimates of stock distribution only in this year.

Table H.19. Squaxin Pens Fall Yearling distribution of reported catch and escapement (NA=not available)¹.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1990	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	3.3%	0.7%	1.2%	0.6%	4.0%	32.8%	54.8%	2.5%
1991	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.2%	1.5%	0.6%	0.0%	9.2%	32.6%	48.4%	3.5%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.5%	2.3%	3.4%	1.2%	0.8%	7.1%	22.3%	57.1%	4.7%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	9.7%	5.4%	1.4%	2.3%	14.0%	3.4%	49.4%	13.4%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	24.9%	5.3%	3.6%	4.7%	6.5%	22.5%	10.7%	21.9%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	47.5%	30.5%	22.0%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.9%	0.0%	0.0%	1.1%	4.7%	89.8%	2.5%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.4%	0.0%	0.0%	0.0%	2.8%	8.0%	85.2%	0.6%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%	2.9%	91.3%	2.9%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.5%	0.0%	0.0%	0.0%	0.0%	0.0%	62.5%	25.0%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	2.1%	96.5%	NA
(90-00)	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	5.5%	1.7%	0.7%	0.8%	4.5%	16.2%	61.5%	9.0%
(90-00)	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	5.5%	1.7%	0.7%	0.8%	4.5%	16.2%	61.5%	9.0%

¹ Values represent estimates of stock distribution only.Table H.20. Squaxin Pens Fall Yearling distribution of total fishing mortalities and escapement (NA=not available)¹.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1990	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	3.2%	0.8%	1.0%	0.6%	4.0%	31.7%	56.6%	2.0%
1991	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.3%	1.6%	0.5%	0.0%	9.2%	30.6%	50.7%	3.0%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.5%	2.0%	3.0%	0.9%	0.6%	6.0%	22.1%	61.1%	3.5%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	10.6%	5.8%	1.3%	2.0%	13.7%	3.5%	50.4%	11.9%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	23.4%	5.3%	4.3%	4.8%	6.4%	20.7%	15.4%	19.7%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.4%	0.0%	0.0%	0.4%	21.9%	71.1%	5.7%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	0.0%	0.0%	0.9%	5.2%	90.0%	2.0%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.0%	0.0%	0.0%	0.0%	2.1%	6.4%	88.0%	0.4%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	2.3%	93.0%	2.3%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	0.5%	0.5%	96.1%	2.0%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	1.6%	97.0%	NA
(90-00)	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	4.4%	1.7%	0.7%	0.7%	4.3%	13.3%	70.0%	4.8%
(90-00)	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	4.4%	1.7%	0.7%	0.7%	4.3%	13.3%	70.0%	4.8%

¹ Values represent estimates of stock distribution only.

Table H.21. Stillaguamish Fall Fingerling distribution of reported catch and escapement (NA=not available).

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1984	0.0%	0.0%	0.0%	3.6%	19.3%	2.4%	3.6%	7.2%	15.7%	24.1%	0.0%	0.0%	4.8%	19.3%	NA ¹
1985	8.2%	0.0%	0.0%	4.1%	0.0%	4.1%	0.0%	29.9%	10.3%	11.3%	9.3%	0.0%	9.3%	13.4%	NA ¹
1986	5.2%	0.0%	0.0%	0.0%	0.0%	4.1%	0.0%	29.9%	18.6%	0.0%	0.0%	0.0%	15.5%	19.6%	7.2%
1990	0.4%	0.0%	0.0%	0.7%	6.2%	4.0%	0.0%	16.2%	7.5%	4.2%	4.9%	4.2%	7.1%	10.4%	34.3%
1991	0.3%	0.0%	0.0%	0.0%	0.0%	0.1%	0.4%	5.9%	4.4%	0.9%	2.6%	5.2%	6.8%	7.9%	65.4%
1992	0.0%	0.0%	0.0%	0.3%	0.0%	2.4%	0.0%	17.0%	5.1%	2.5%	4.0%	5.7%	11.9%	28.1%	23.0%
1993	0.0%	0.0%	0.0%	0.6%	0.4%	1.0%	1.4%	11.4%	8.7%	1.4%	9.6%	5.3%	1.5%	22.7%	36.0%
1994	2.4%	0.0%	0.0%	0.7%	0.0%	1.3%	0.0%	6.7%	7.8%	0.9%	5.3%	0.0%	2.4%	5.8%	66.7%
1995	2.6%	0.0%	0.0%	0.0%	0.0%	9.9%	0.0%	2.3%	4.2%	1.0%	8.6%	1.0%	2.3%	13.8%	54.0%
1996	0.9%	0.0%	0.0%	0.0%	0.0%	8.1%	1.3%	0.0%	6.1%	0.6%	7.5%	0.0%	0.3%	19.0%	56.1%
1997	9.2%	0.4%	0.0%	0.5%	0.0%	1.4%	1.1%	7.1%	4.7%	0.0%	5.1%	0.0%	2.0%	15.5%	52.9%
1998	10.9%	0.2%	0.3%	1.1%	0.0%	0.0%	0.7%	1.1%	1.9%	0.1%	2.4%	0.0%	2.0%	2.2%	77.2%
1999	1.0%	0.3%	0.0%	0.0%	0.0%	0.8%	0.5%	1.8%	9.0%	0.0%	12.0%	0.0%	0.5%	4.0%	70.2%
2000	4.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.1%	2.2%	0.0%	1.5%	0.5%	0.4%	0.5%	82.9%
(84-00)	3.3%	0.1%	0.0%	0.8%	1.8%	2.8%	0.6%	10.3%	7.6%	3.4%	5.2%	1.6%	4.8%	13.0%	44.7%
(85-00)	3.5%	0.1%	0.0%	0.6%	0.5%	2.9%	0.4%	10.5%	7.0%	1.8%	5.6%	1.7%	4.8%	12.5%	48.2%

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

Table H.22. Stillaguamish Fall Fingerling distribution of total fishing mortalities and escapement(NA=not available).

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1984	0.9%	0.0%	0.0%	3.7%	16.8%	1.9%	2.8%	10.3%	13.1%	19.6%	0.9%	0.0%	3.7%	26.2%	NA ¹
1985	8.7%	0.0%	0.0%	4.3%	0.0%	3.5%	0.0%	30.4%	8.7%	10.4%	8.7%	0.0%	7.8%	17.4%	NA ¹
1986	6.6%	0.0%	0.0%	0.0%	0.0%	3.8%	0.0%	29.2%	18.9%	0.0%	0.0%	0.0%	14.2%	20.8%	6.6%
1990	0.6%	0.0%	0.0%	0.8%	6.1%	3.6%	0.2%	16.9%	8.3%	3.8%	4.9%	5.1%	7.4%	12.9%	29.4%
1991	0.2%	0.0%	0.0%	0.0%	0.0%	0.1%	0.5%	6.7%	5.1%	1.0%	2.7%	6.0%	6.8%	10.1%	60.6%
1992	0.0%	0.0%	0.0%	0.4%	0.0%	2.1%	0.0%	16.6%	4.9%	2.0%	3.6%	5.3%	10.4%	38.6%	16.1%
1993	0.0%	0.0%	0.0%	0.9%	0.5%	1.0%	1.3%	13.8%	10.0%	1.3%	9.0%	5.9%	1.4%	23.7%	31.2%
1994	2.9%	0.0%	0.0%	0.6%	0.0%	1.3%	0.0%	7.3%	8.6%	1.0%	5.7%	0.0%	2.3%	7.1%	63.1%
1995	2.5%	0.0%	0.0%	0.0%	0.0%	10.2%	0.0%	3.6%	4.2%	1.7%	12.3%	0.9%	2.1%	23.1%	39.3%
1996	1.1%	0.0%	0.0%	0.0%	0.0%	8.9%	1.1%	1.1%	6.5%	0.6%	8.8%	0.0%	0.2%	25.7%	45.9%
1997	9.9%	0.8%	0.0%	0.6%	0.0%	1.4%	1.2%	7.8%	5.1%	0.4%	5.0%	0.0%	1.8%	18.5%	47.6%
1998	12.1%	0.7%	0.4%	1.9%	0.0%	0.0%	0.9%	1.0%	2.1%	0.1%	2.8%	0.0%	1.9%	3.3%	72.8%
1999	1.2%	1.4%	0.0%	0.0%	0.0%	0.7%	0.5%	1.6%	10.2%	0.0%	12.6%	0.0%	0.5%	6.3%	65.1%
2000	5.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.1%	2.4%	0.0%	1.6%	0.5%	0.4%	0.7%	81.7%
(84-00)	3.7%	0.2%	0.0%	0.9%	1.7%	2.7%	0.6%	11.0%	7.7%	3.0%	5.6%	1.7%	4.4%	16.7%	40.0%
(85-00)	4.0%	0.2%	0.0%	0.7%	0.5%	2.8%	0.4%	11.0%	7.3%	1.7%	6.0%	1.8%	4.4%	16.0%	43.0%

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

Table H.23. George Adams Fall Fingerling 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1982	0.0%	0.0%	0.0%	0.0%	0.5%	0.3%	0.0%	20.8%	4.4%	0.4%	0.0%	3.0%	38.1%	10.7%	21.9%
1983	0.0%	0.0%	0.0%	0.0%	1.6%	1.6%	0.0%	15.8%	3.5%	4.2%	0.5%	0.2%	29.6%	25.9%	17.2%
1984	0.0%	0.1%	0.0%	0.5%	3.2%	0.7%	0.4%	18.1%	5.7%	1.2%	0.0%	2.2%	31.3%	20.6%	15.9%
1989	0.0%	0.1%	0.0%	0.0%	0.0%	0.2%	0.0%	8.5%	3.8%	4.5%	1.7%	12.9%	38.7%	17.2%	12.2%
1990	0.1%	0.0%	0.0%	0.4%	0.3%	0.5%	0.0%	19.4%	4.7%	1.0%	5.0%	15.0%	28.4%	18.4%	6.8%
1991	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	18.4%	2.2%	0.4%	4.5%	8.6%	33.3%	18.0%	14.3%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	15.6%	2.1%	5.2%	0.0%	20.3%	9.4%	39.6%	7.3%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.9%	4.3%	0.0%	7.8%	8.7%	4.3%	22.6%	18.3%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	14.0%	7.0%	72.1%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.0%	7.9%	3.9%	0.5%	3.9%	1.0%	4.4%	18.7%	57.6%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	0.0%	0.0%	12.6%	0.0%	4.7%	5.9%	0.0%	13.8%	60.6%
1997	1.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.2%	3.0%	0.3%	1.4%	3.0%	0.8%	18.8%	66.5%
1998	0.7%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.9%	0.0%	1.1%	1.8%	1.8%	6.9%	86.4%
1999	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	2.2%	0.0%	7.8%	4.3%	12.7%	9.5%	62.4%
2000	0.3%	0.0%	0.0%	0.2%	0.0%	0.1%	0.0%	18.2%	3.3%	0.0%	9.9%	3.0%	0.0%	8.5%	56.5%
(82-00)	0.2%	0.0%	0.0%	0.1%	0.4%	0.6%	0.0%	12.1%	4.3%	1.2%	3.2%	6.0%	16.5%	17.1%	38.4%
(85-00)	0.3%	0.0%	0.0%	0.1%	0.0%	0.5%	0.0%	10.6%	4.2%	1.0%	4.0%	7.0%	12.3%	16.6%	43.4%

Table H.24. George Adams 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1982	0.0%	0.0%	0.0%	0.0%	0.6%	0.4%	0.0%	20.8%	4.4%	0.5%	0.0%	2.9%	37.0%	13.0%	20.5%
1983	0.0%	0.0%	0.0%	0.0%	1.2%	1.1%	0.0%	12.6%	2.5%	3.1%	0.4%	0.1%	25.4%	42.5%	11.0%
1984	0.0%	0.1%	0.0%	0.6%	3.2%	0.7%	0.5%	18.2%	5.6%	1.1%	0.0%	2.3%	30.6%	22.5%	14.6%
1989	0.0%	0.3%	0.0%	0.1%	0.1%	0.3%	0.0%	10.3%	4.0%	4.1%	1.9%	13.1%	35.7%	19.9%	10.4%
1990	0.8%	0.0%	0.0%	0.5%	0.4%	0.5%	0.0%	21.3%	4.9%	1.0%	4.7%	15.5%	25.9%	18.7%	5.9%
1991	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	19.4%	2.3%	0.4%	4.5%	8.7%	31.6%	19.7%	13.2%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	16.6%	1.8%	4.6%	0.0%	20.3%	8.3%	41.5%	6.5%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.6%	5.1%	0.0%	7.3%	8.0%	4.4%	26.3%	15.3%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.2%	0.0%	0.0%	0.0%	16.3%	12.2%	63.3%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	9.5%	4.2%	1.1%	5.7%	0.8%	4.2%	27.8%	44.5%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	2.7%	0.0%	1.3%	14.1%	0.0%	5.3%	6.4%	0.0%	15.6%	54.6%
1997	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.5%	3.0%	0.8%	1.3%	3.0%	0.8%	24.2%	60.6%
1998	0.7%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.9%	0.0%	1.2%	1.7%	1.9%	26.6%	66.6%
1999	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	2.6%	0.0%	8.0%	5.1%	12.8%	12.4%	57.9%
2000	0.4%	0.0%	0.0%	0.3%	0.0%	0.2%	0.0%	17.9%	3.6%	0.0%	11.7%	3.2%	0.0%	17.3%	45.5%
(82-00)	0.3%	0.0%	0.0%	0.1%	0.4%	0.6%	0.0%	12.5%	4.5%	1.1%	3.5%	6.1%	15.7%	22.7%	32.7%
(85-00)	0.4%	0.1%	0.0%	0.1%	0.0%	0.5%	0.0%	11.3%	4.5%	1.0%	4.3%	7.1%	11.8%	21.8%	37.0%

Table H.25. Nisqually Fall Fingerling distribution of reported catch and escapement¹.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1983	0.0%	0.0%	0.0%	2.5%	0.0%	0.0%	0.0%	16.4%	12.4%	6.0%	0.0%	4.5%	10.9%	45.8%	1.5%
1984	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	28.9%	1.5%	2.5%	0.0%	1.5%	38.1%	21.8%	5.6%
1985	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	30.3%	0.0%	6.1%	3.0%	7.6%	31.8%	16.7%	4.5%
1986	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.0%	12.4%	1.8%	0.0%	0.0%	36.3%	15.0%	19.5%
1987	0.0%	0.0%	0.0%	0.0%	2.0%	1.3%	0.0%	10.7%	13.4%	0.7%	0.0%	5.4%	34.9%	18.8%	12.8%
1988	0.0%	0.0%	0.0%	0.7%	2.2%	0.7%	2.2%	5.4%	17.7%	4.7%	0.0%	8.7%	17.3%	10.5%	30.0%
1989	0.0%	0.0%	0.0%	0.3%	0.0%	0.7%	0.0%	4.4%	2.5%	3.6%	6.3%	13.3%	42.6%	18.3%	8.0%
1990	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	22.5%	3.1%	0.2%	5.8%	10.1%	37.9%	12.1%	8.2%
1991	0.0%	0.0%	0.0%	2.0%	0.0%	0.0%	0.0%	8.0%	3.2%	2.4%	2.0%	16.3%	22.3%	26.3%	17.5%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.8%	7.6%	2.9%	2.6%	4.2%	7.3%	18.1%	16.8%	39.5%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	12.5%	3.9%	2.2%	1.9%	3.0%	22.5%	19.3%	33.7%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	4.5%	2.2%	2.4%	0.5%	0.7%	22.1%	21.3%	46.3%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.2%	5.4%	1.7%	0.1%	3.1%	2.7%	32.4%	24.5%	29.7%
1996	0.2%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	3.3%	0.0%	1.1%	1.7%	42.0%	21.3%	29.4%
1997	0.0%	0.3%	0.0%	0.0%	0.0%	0.3%	0.7%	2.5%	0.7%	0.0%	2.6%	0.8%	19.3%	24.9%	47.9%
1998	0.2%	0.0%	0.0%	0.5%	0.0%	0.0%	0.3%	0.4%	1.4%	0.0%	0.7%	0.8%	34.4%	12.3%	48.9%
1999	0.2%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.7%	3.0%	0.0%	3.1%	3.5%	36.6%	20.7%	32.0%
2000	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.6%	3.5%	0.0%	6.1%	1.7%	36.1%	19.3%	17.4%
(83-00)	0.1%	0.0%	0.0%	0.3%	0.2%	0.3%	0.2%	10.6%	4.9%	1.9%	2.2%	5.0%	29.8%	20.3%	24.0%
(85-00)	0.1%	0.0%	0.0%	0.2%	0.3%	0.4%	0.3%	9.1%	4.7%	1.7%	2.5%	5.2%	30.4%	18.6%	26.6%

¹ Values represent estimates of stock distribution only.

Table H.26. Nisqually Fall Fingerling distribution of total fishing mortalities and escapement¹.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1983	0.0%	0.0%	0.0%	1.7%	0.0%	0.0%	0.0%	14.7%	8.9%	4.8%	0.0%	3.1%	9.2%	56.7%	1.0%
1984	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	28.9%	1.3%	2.6%	0.0%	1.7%	35.3%	25.5%	4.7%
1985	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	28.6%	0.0%	4.8%	3.6%	7.1%	31.0%	21.4%	3.6%
1986	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.7%	12.6%	1.6%	0.0%	0.0%	33.1%	19.7%	17.3%
1987	0.0%	0.0%	0.0%	0.0%	2.7%	1.1%	0.0%	14.5%	11.8%	0.5%	0.0%	5.9%	29.6%	23.7%	10.2%
1988	0.0%	0.0%	0.0%	0.8%	2.2%	0.8%	3.2%	5.7%	19.2%	3.8%	0.0%	8.4%	16.5%	17.0%	22.4%
1989	0.0%	0.0%	0.0%	0.4%	0.0%	0.6%	0.0%	5.4%	3.0%	3.2%	6.0%	14.6%	40.4%	19.1%	7.2%
1990	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	23.4%	3.2%	0.1%	5.9%	10.3%	35.8%	13.5%	7.6%
1991	0.0%	0.0%	0.0%	2.1%	0.0%	0.0%	0.0%	8.8%	3.5%	2.1%	1.8%	17.0%	20.5%	28.6%	15.5%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	1.2%	7.2%	2.9%	1.9%	3.9%	6.8%	18.2%	28.5%	29.3%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	14.7%	4.5%	2.0%	1.9%	3.4%	21.7%	21.9%	29.0%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	4.2%	2.1%	2.4%	0.5%	0.6%	17.8%	40.0%	32.3%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.2%	7.8%	1.9%	0.3%	4.0%	2.8%	29.8%	27.4%	25.4%
1996	0.2%	0.0%	0.0%	0.0%	0.0%	1.2%	0.0%	0.6%	3.6%	0.0%	1.4%	1.8%	38.8%	26.1%	26.3%
1997	0.0%	0.6%	0.0%	0.0%	0.0%	0.3%	0.8%	2.9%	0.7%	0.4%	2.5%	0.8%	17.7%	32.6%	40.6%
1998	0.2%	0.0%	0.0%	0.6%	0.0%	0.0%	0.5%	0.4%	1.5%	0.0%	0.7%	0.8%	30.7%	23.7%	40.8%
1999	0.3%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.6%	3.4%	0.0%	3.1%	3.9%	34.7%	25.3%	28.6%
2000	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	14.9%	3.5%	0.0%	6.4%	1.7%	34.0%	23.1%	16.0%
(83-00)	0.1%	0.0%	0.0%	0.3%	0.3%	0.3%	0.3%	11.1%	4.9%	1.7%	2.3%	5.0%	27.5%	26.3%	19.9%
(85-00)	0.1%	0.0%	0.0%	0.3%	0.3%	0.3%	0.4%	9.7%	4.9%	1.5%	2.6%	5.4%	28.1%	24.5%	22.0%

¹ Values represent estimates of stock distribution only.

Table H.27. South Puget Sound Fall Fingerling 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1982	0.2%	0.0%	0.0%	0.1%	0.8%	0.4%	0.1%	22.9%	13.8%	1.6%	0.1%	2.8%	24.9%	21.3%	10.8%
1983	0.1%	0.0%	0.0%	0.7%	1.8%	0.6%	0.1%	17.3%	4.6%	2.6%	0.3%	1.6%	27.4%	28.6%	14.3%
1984	0.1%	0.2%	0.0%	0.7%	1.4%	0.2%	0.1%	20.5%	8.5%	1.0%	0.3%	1.4%	24.6%	22.5%	18.4%
1985	0.8%	0.0%	0.0%	0.0%	0.3%	0.4%	0.2%	18.6%	6.3%	1.6%	0.8%	1.9%	29.3%	18.2%	21.6%
1986	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	18.4%	7.5%	1.7%	0.0%	4.0%	10.7%	22.4%	34.0%
1987	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.7%	12.7%	3.9%	0.0%	7.2%	13.7%	10.9%	38.9%
1988	0.1%	0.0%	0.0%	0.2%	0.5%	0.8%	0.5%	5.4%	7.5%	3.8%	4.2%	7.3%	26.2%	14.7%	28.6%
1989	0.1%	0.0%	0.0%	0.2%	0.3%	0.1%	0.0%	7.4%	4.5%	3.9%	2.5%	11.0%	21.4%	16.2%	32.3%
1990	0.0%	0.0%	0.1%	0.3%	0.3%	0.3%	0.0%	22.7%	3.7%	1.0%	4.3%	9.0%	23.7%	12.3%	22.4%
1991	0.4%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	15.2%	1.8%	1.0%	2.6%	11.5%	26.5%	13.2%	27.7%
1992	0.6%	0.1%	0.0%	0.0%	0.9%	0.5%	0.0%	17.2%	3.7%	2.6%	2.2%	9.0%	23.7%	18.1%	21.5%
1993	0.2%	0.1%	0.0%	0.0%	0.1%	0.6%	0.0%	15.7%	3.8%	2.2%	4.6%	5.4%	15.8%	20.9%	30.4%
1994	0.0%	0.0%	0.0%	0.5%	0.0%	0.2%	0.0%	8.9%	3.0%	4.1%	1.3%	0.8%	16.3%	10.0%	54.9%
1995	0.2%	0.0%	0.0%	0.1%	0.0%	0.9%	0.0%	3.7%	1.8%	0.2%	1.1%	1.4%	5.6%	11.7%	73.4%
1996	0.1%	0.0%	0.0%	0.0%	0.0%	0.4%	0.1%	0.0%	4.1%	0.1%	1.8%	2.9%	6.3%	14.8%	69.4%
1997	0.5%	0.0%	0.0%	0.3%	0.0%	0.5%	0.0%	5.2%	1.8%	0.0%	1.5%	1.6%	2.9%	13.2%	72.5%
1998	1.3%	0.0%	0.0%	0.9%	0.0%	0.0%	0.2%	0.5%	1.7%	0.0%	0.7%	1.0%	8.0%	6.1%	79.6%
1999	0.5%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.7%	2.3%	0.0%	3.9%	3.0%	9.0%	5.1%	75.5%
2000	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%	1.7%	0.0%	3.2%	0.3%	9.1%	5.3%	70.0%
(82-00)	0.3%	0.0%	0.0%	0.2%	0.3%	0.4%	0.1%	11.7%	5.0%	1.7%	1.9%	4.4%	17.1%	15.0%	41.9%
(85-00)	0.3%	0.0%	0.0%	0.2%	0.2%	0.4%	0.1%	10.2%	4.2%	1.6%	2.2%	4.8%	15.5%	13.3%	47.0%

Table H.28. South Puget Sound 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1982	0.2%	0.0%	0.0%	0.2%	0.9%	0.3%	0.1%	23.2%	12.8%	1.5%	0.1%	2.8%	23.7%	24.6%	9.4%
1983	0.1%	0.0%	0.0%	0.7%	1.8%	0.5%	0.1%	16.8%	3.9%	2.3%	0.2%	1.6%	25.3%	35.6%	11.2%
1984	0.1%	0.2%	0.0%	0.7%	1.4%	0.2%	0.1%	20.8%	8.3%	0.9%	0.3%	1.5%	23.8%	24.8%	16.9%
1985	0.8%	0.0%	0.0%	0.0%	0.3%	0.3%	0.2%	18.5%	6.3%	1.6%	0.9%	1.9%	28.4%	20.7%	20.2%
1986	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	18.5%	7.1%	1.6%	0.0%	4.0%	9.9%	28.0%	29.6%
1987	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	21.2%	10.6%	3.4%	0.0%	9.2%	11.6%	15.2%	28.7%
1988	0.4%	0.0%	0.0%	0.2%	1.0%	0.6%	0.5%	9.9%	9.5%	3.0%	3.6%	8.0%	22.5%	20.9%	19.7%
1989	0.1%	0.0%	0.0%	0.3%	0.4%	0.1%	0.0%	8.8%	5.2%	3.6%	2.5%	12.2%	20.4%	17.4%	29.0%
1990	0.0%	0.1%	0.1%	0.3%	0.3%	0.3%	0.0%	23.9%	3.8%	0.9%	4.4%	9.2%	22.4%	13.8%	20.6%
1991	0.5%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	16.6%	1.9%	0.9%	2.6%	12.2%	25.2%	14.5%	25.5%
1992	0.6%	0.2%	0.0%	0.0%	0.9%	0.5%	0.0%	17.4%	3.8%	2.4%	2.1%	9.0%	21.0%	24.1%	17.9%
1993	0.3%	0.1%	0.0%	0.0%	0.1%	0.6%	0.0%	18.2%	4.5%	2.0%	4.4%	5.8%	14.8%	22.6%	26.5%
1994	0.0%	0.0%	0.0%	0.5%	0.0%	0.2%	0.0%	9.4%	3.3%	4.8%	1.4%	0.7%	15.5%	17.3%	46.8%
1995	0.2%	0.0%	0.0%	0.1%	0.0%	1.0%	0.0%	5.4%	2.1%	0.6%	1.7%	1.5%	5.7%	17.2%	64.5%
1996	0.2%	0.0%	0.0%	0.0%	0.0%	0.4%	0.1%	0.9%	4.7%	0.2%	2.1%	3.2%	6.2%	17.8%	64.1%
1997	0.5%	0.0%	0.0%	0.3%	0.0%	0.6%	0.0%	6.2%	1.9%	0.3%	1.5%	1.7%	2.8%	16.4%	67.7%
1998	1.4%	0.0%	0.0%	0.9%	0.0%	0.0%	0.3%	0.5%	1.9%	0.0%	0.8%	1.1%	7.7%	11.6%	73.7%
1999	0.6%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.7%	2.7%	0.0%	4.1%	3.3%	9.1%	7.8%	71.6%
2000	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.9%	2.0%	0.0%	4.2%	0.3%	8.9%	11.6%	62.5%
(82-00)	0.4%	0.0%	0.0%	0.2%	0.4%	0.4%	0.1%	13.0%	5.1%	1.6%	1.9%	4.7%	16.1%	19.0%	37.2%
(85-00)	0.4%	0.0%	0.0%	0.2%	0.2%	0.4%	0.1%	11.6%	4.5%	1.6%	2.3%	5.2%	14.5%	17.3%	41.8%

Table H.29. South Puget Sound Fall Yearling distribution of reported catch and escapement (NA=not available)¹.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1982	0.0%	0.0%	0.0%	0.0%	2.5%	0.0%	0.0%	2.8%	3.2%	0.0%	0.0%	1.1%	14.5%	67.4%	8.5%
1983	0.0%	0.0%	0.0%	0.0%	1.8%	0.0%	0.0%	5.8%	0.5%	0.0%	0.0%	0.0%	9.8%	76.3%	5.8%
1984	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.2%	1.6%	0.0%	0.0%	0.0%	33.3%	43.8%	14.1%
1990	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	0.0%	0.3%	0.0%	0.5%	0.0%	1.4%	32.5%	54.5%	10.7%
1991	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.6%	0.7%	0.0%	0.0%	3.7%	12.8%	57.6%	19.6%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.6%	0.8%	0.0%	1.2%	4.6%	28.4%	48.6%	11.9%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	1.1%	0.0%	0.0%	1.4%	10.4%	57.9%	27.9%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.5%	2.2%	0.7%	0.0%	15.6%	63.3%	16.9%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.4%	2.5%	0.0%	2.0%	0.4%	10.4%	68.4%	10.0%
1996	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	0.0%	1.3%	0.6%	3.2%	89.4%	3.3%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	1.1%	0.0%	0.4%	1.3%	4.0%	66.6%	25.2%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.2%	4.5%	83.1%	10.1%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	14.6%	0.0%	0.0%	7.3%	2.4%	70.7%	4.9%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.1%	7.2%	2.9%	79.7%	NA
(82-00)	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	2.6%	2.0%	0.2%	1.1%	2.2%	13.2%	66.2%	12.1%
(85-00)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.9%	2.1%	0.2%	1.4%	2.7%	11.5%	67.3%	12.8%

¹ Values represent estimates of stock distribution only.

Table H.30. South Puget Sound Fall Yearling distribution of total fishing mortalities and escapement (NA=not available)¹.

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1982	0.0%	0.0%	0.0%	0.0%	2.2%	0.0%	0.0%	3.3%	2.7%	0.0%	0.0%	0.8%	12.8%	71.7%	6.5%
1983	0.0%	0.0%	0.0%	0.0%	1.8%	0.0%	0.0%	5.5%	0.4%	0.0%	0.0%	0.0%	8.8%	78.8%	4.7%
1984	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.9%	1.8%	0.0%	0.0%	0.0%	31.4%	47.1%	12.8%
1990	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.8%	0.1%	0.4%	0.0%	1.6%	30.7%	56.7%	9.5%
1991	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.4%	0.6%	0.0%	0.0%	3.5%	11.4%	62.6%	16.5%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.9%	0.9%	0.0%	1.2%	4.8%	26.9%	51.2%	10.2%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	1.0%	0.0%	0.0%	1.2%	6.7%	75.0%	15.0%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.6%	2.3%	0.6%	0.0%	14.5%	67.0%	14.1%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.9%	2.0%	0.4%	2.4%	0.3%	8.1%	74.1%	6.9%
1996	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	1.9%	0.0%	1.5%	0.5%	2.8%	89.9%	2.8%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	1.0%	0.0%	0.3%	1.2%	3.4%	72.0%	20.6%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	3.6%	86.6%	8.0%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.6%	0.0%	0.0%	4.8%	2.4%	80.7%	2.4%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.3%	7.0%	2.3%	81.4%	NA
(82-00)	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	2.6%	1.6%	0.2%	1.1%	2.0%	11.8%	71.0%	9.3%
(85-00)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.9%	1.6%	0.3%	1.4%	2.4%	10.3%	72.5%	9.6%

¹ Values represent estimates of stock distribution only.

Table H.31. Nooksack Spring Yearling distribution of reported catch and escapement (NA=not available).

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1986	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.9%	4.7%	0.0%	0.0%	0.0%	1.6%	84.7%
1989	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.3%	0.0%	0.0%	0.0%	13.5%	7.2%	73.0%
1990	0.0%	0.0%	0.0%	0.0%	0.0%	4.9%	0.0%	0.0%	14.6%	9.8%	0.0%	2.4%	4.9%	34.1%	29.3%
1991	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	2.1%	32.5%	5.9%	7.0%	2.1%	8.4%	5.2%	36.0%
1992	0.4%	0.2%	0.0%	0.0%	1.0%	0.6%	0.4%	17.7%	12.6%	1.1%	2.4%	1.0%	0.4%	8.0%	54.4%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	4.6%	15.4%	6.4%	7.9%	0.8%	5.6%	12.0%	46.8%
1994	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.1%	34.3%	1.0%	0.0%	0.2%	6.3%	3.3%	49.2%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0%	0.0%	0.0%	0.0%	3.2%	7.7%	64.1%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	12.4%	0.0%	3.2%	0.5%	0.0%	3.2%	79.5%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	14.2%	2.7%	5.3%	0.0%	3.5%	15.9%	58.4%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	4.7%	4.7%	0.0%	21.2%	1.2%	8.2%	0.0%	1.2%	7.1%	51.8%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.8%	26.0%	0.0%	1.1%	2.8%	4.5%	2.3%	60.5%
2000	0.0%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	18.4%	64.9%	0.0%	7.9%	0.0%	0.0%	7.0%	NA ¹
(86-00)	0.1%	0.2%	0.0%	0.0%	0.1%	0.9%	0.5%	3.9%	22.2%	2.5%	3.3%	0.8%	4.0%	8.8%	52.9%
(86-00)	0.1%	0.2%	0.0%	0.0%	0.1%	0.9%	0.5%	3.9%	22.2%	2.5%	3.3%	0.8%	4.0%	8.8%	52.9%

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

Table H.32. Nooksack Spring Yearling distribution of total fishing mortalities and escapement (NA=not available).

Catch Year	Alaska Troll	Alaska Net	Alaska Sport	North Troll	Central Troll	N/CBC Net	N/CBC Sport	WCVI Troll	GeoSt Tr&Sp	Other Fisheries					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1986	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	1.7%	12.7%	4.6%	0.8%	0.4%	7.6%	3.8%	67.9%
1989	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%
1990	0.0%	0.0%	0.0%	0.0%	1.4%	4.2%	0.0%	9.7%	26.4%	8.3%	1.4%	1.4%	2.8%	27.8%	16.7%
1991	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	2.4%	36.8%	5.6%	7.1%	2.4%	7.7%	6.8%	30.6%
1992	2.0%	0.6%	0.0%	0.0%	1.0%	0.6%	0.4%	19.8%	14.1%	1.0%	2.5%	1.0%	0.4%	10.0%	46.6%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	5.0%	18.4%	5.9%	8.0%	0.8%	5.3%	12.8%	43.3%
1994	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.1%	36.0%	0.9%	0.0%	0.2%	6.0%	4.0%	47.3%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	26.4%	0.6%	0.6%	0.0%	3.4%	12.9%	56.2%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.5%	14.5%	0.0%	4.5%	0.5%	0.0%	5.5%	73.5%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.6%	2.3%	5.5%	0.0%	3.1%	21.9%	51.6%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	5.1%	6.1%	0.0%	22.4%	2.0%	8.2%	0.0%	1.0%	10.2%	44.9%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%	29.9%	0.0%	1.5%	3.6%	4.1%	4.1%	54.3%
2000	0.0%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	15.9%	63.8%	0.0%	7.2%	0.0%	0.0%	8.7%	NA ¹
(86-00)	0.2%	0.4%	0.0%	0.0%	0.2%	0.8%	0.6%	4.8%	25.0%	2.4%	3.6%	0.8%	4.3%	10.6%	46.2%
(86-00)	0.2%	0.4%	0.0%	0.0%	0.2%	0.8%	0.6%	4.8%	25.0%	2.4%	3.6%	0.8%	4.3%	10.6%	46.2%

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

Table H.33. Skagit Spring Yearling 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1985	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.7%	29.2%	26.7%	0.0%	0.0%	10.0%	15.8%	11.7%
1986	1.4%	0.0%	0.0%	0.0%	4.3%	6.7%	0.0%	6.2%	41.6%	2.9%	5.7%	0.0%	3.3%	7.7%	20.1%
1987	0.0%	0.0%	0.0%	4.7%	0.0%	6.6%	0.0%	3.8%	10.4%	5.7%	0.0%	1.9%	22.6%	20.8%	23.6%
1988	0.0%	0.0%	0.0%	0.0%	0.0%	6.1%	0.0%	1.8%	14.9%	7.6%	9.6%	1.8%	20.6%	14.5%	23.1%
1989	0.0%	0.0%	0.0%	0.0%	0.8%	0.1%	0.0%	3.4%	17.5%	3.3%	1.8%	4.5%	30.4%	8.3%	29.9%
1990	0.0%	0.0%	0.0%	0.0%	0.4%	1.9%	1.0%	4.9%	14.1%	4.0%	8.7%	3.3%	15.4%	22.9%	23.4%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	2.0%	19.5%	1.6%	10.2%	0.0%	2.4%	21.1%	42.1%
1998	0.6%	0.0%	0.0%	0.0%	0.0%	0.2%	3.5%	1.3%	9.2%	0.0%	6.9%	0.0%	2.7%	17.5%	58.2%
1999	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	2.3%	14.7%	0.0%	8.5%	0.3%	2.0%	17.1%	53.4%
2000	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	10.3%	26.1%	0.0%	5.5%	0.0%	1.8%	19.7%	34.5%
(85-00)	0.4%	0.0%	0.0%	0.5%	0.6%	2.3%	0.6%	4.3%	19.7%	5.2%	5.7%	1.2%	11.1%	16.5%	32.0%
(85-00)	0.4%	0.0%	0.0%	0.5%	0.6%	2.3%	0.6%	4.3%	19.7%	5.2%	5.7%	1.2%	11.1%	16.5%	32.0%

Table H.34. Skagit Spring 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1985	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	6.9%	29.2%	24.6%	0.0%	0.0%	9.2%	18.5%	10.8%
1986	1.8%	0.0%	0.0%	0.0%	4.0%	6.6%	0.0%	6.2%	42.0%	2.7%	5.8%	0.0%	3.1%	9.3%	18.6%
1987	0.0%	0.0%	0.0%	5.0%	0.0%	5.0%	0.0%	3.1%	7.5%	4.4%	0.0%	1.3%	17.5%	40.6%	15.6%
1988	0.0%	0.0%	0.0%	0.0%	0.0%	5.7%	0.0%	2.2%	17.6%	7.1%	9.3%	2.1%	19.5%	16.1%	20.4%
1989	0.0%	0.0%	0.0%	0.0%	0.8%	0.1%	0.0%	4.0%	19.5%	3.3%	1.9%	4.9%	28.2%	10.3%	26.9%
1990	0.0%	0.0%	0.0%	0.0%	0.4%	1.9%	1.1%	5.1%	14.8%	3.7%	8.6%	3.6%	14.6%	24.6%	21.6%
1997	0.3%	0.0%	0.0%	0.0%	0.0%	0.8%	1.1%	2.7%	19.3%	2.4%	9.5%	0.0%	1.8%	31.4%	30.6%
1998	0.7%	0.0%	0.0%	0.0%	0.0%	0.2%	4.0%	1.2%	10.3%	0.2%	6.8%	0.0%	2.5%	21.4%	52.8%
1999	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	2.1%	14.6%	0.0%	8.5%	0.3%	1.8%	23.2%	47.7%
2000	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	9.4%	26.2%	0.0%	5.8%	0.0%	1.7%	23.2%	31.5%
(85-00)	0.5%	0.0%	0.0%	0.5%	0.5%	2.1%	0.8%	4.3%	20.1%	4.8%	5.6%	1.2%	10.0%	21.9%	27.6%
(85-00)	0.5%	0.0%	0.0%	0.5%	0.5%	2.1%	0.8%	4.3%	20.1%	4.8%	5.6%	1.2%	10.0%	21.9%	27.6%

Table H.35. White River Spring Yearling 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1982	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	0.0%	0.0%	0.0%	73.2%	23.2%	1.2% ¹
1983	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	0.0%	4.3%	0.0%	0.0%	0.0%	1.6%	11.3%	59.7%	21.5%
1984	0.0%	0.0%	0.0%	0.0%	5.8%	0.0%	0.0%	4.5%	5.2%	0.0%	0.0%	2.6%	9.0%	25.2%	47.7%
1985	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%	2.2%	0.0%	30.8%	50.6%	13.5%
1986	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.6%	2.2%	1.9%	0.0%	0.3%	18.7%	50.2%	25.7%
1987	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	0.4%	0.0%	3.3%	11.1%	42.4%	41.2%
1988	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	2.5%	0.2%	0.8%	1.3%	13.0%	48.4%	33.6%
1989	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	1.2%	1.0%	0.0%	5.8%	13.1%	41.5%	36.2%
1990	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%
1991	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	1.3%	0.0%	1.3%	4.1%	10.8%	38.3%	43.4%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	2.4%	1.9%	2.3%	0.8%	2.4%	7.9%	45.6%	36.2%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%	2.9%	3.6%	30.5%	62.4%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	0.9%	0.0%	0.0%	1.4%	45.2%	50.7%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.8%	29.5%	69.3%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	0.0%	0.0%	0.3%	42.9%	55.9%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.7%	40.4%	55.8%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	1.6%	27.0%	69.8%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	2.3%	0.0%	0.0%	0.0%	0.0%	30.2%	65.1%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.4%	0.0%	0.0%	0.0%	0.0%	2.7%	18.9%	73.0%
(82-00)	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%	1.2%	1.3%	0.5%	0.3%	1.6%	12.0%	38.6%	43.9%
(85-00)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	1.1%	0.6%	0.3%	1.7%	8.4%	39.1%	47.7%

¹ Values represent estimates of stock distribution only.

Table H.36. White River Spring 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1982	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	0.0%	0.9%	1.9%	0.0%	0.0%	0.9%	60.4%	34.0%	0.9% ¹
1983	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	4.3%	0.0%	0.0%	0.0%	1.4%	10.4%	63.5%	19.0%
1984	0.0%	0.0%	0.0%	0.0%	4.7%	0.0%	0.0%	3.9%	4.3%	0.0%	0.0%	1.7%	6.9%	46.6%	31.9%
1985	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%	1.9%	0.0%	25.9%	60.0%	9.7%
1986	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	0.6%	2.1%	1.8%	0.0%	0.4%	17.4%	54.4%	22.8%
1987	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.4%	0.0%	2.5%	8.1%	61.9%	26.1%
1988	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	2.9%	0.2%	0.8%	1.4%	12.7%	52.1%	29.7%
1989	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	1.3%	1.0%	0.0%	6.0%	11.8%	46.9%	31.7%
1990	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%	50.7%	27.2%
1991	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	1.3%	0.0%	1.3%	4.1%	9.7%	46.2%	36.5%
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	2.7%	2.1%	2.1%	0.7%	2.7%	7.5%	49.0%	32.8%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	2.8%	3.1%	39.3%	54.2%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.8%	0.0%	0.0%	1.6%	52.4%	43.3%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.9%	41.4%	57.1%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%	0.3%	48.5%	50.1%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.5%	49.5%	47.0%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	1.4%	33.8%	63.3%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	1.8%	0.0%	0.0%	0.0%	0.0%	45.9%	50.5%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.1%	0.0%	0.0%	0.0%	0.0%	2.6%	23.1%	69.2%
(82-00)	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%	1.3%	1.2%	0.5%	0.2%	1.6%	10.4%	47.3%	37.0%
(85-00)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	1.1%	0.6%	0.3%	1.7%	7.5%	47.2%	40.7%

¹ Values represent estimates of stock distribution only.

Table H.37. Hoko Fall Fingerling 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1989	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%
1990	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%
1991	15.6%	0.0%	0.0%	5.0%	1.1%	0.3%	0.6%	6.9%	0.4%	0.6%	0.5%	0.2%	1.0%	8.2%	59.6%
1992	7.9%	1.4%	1.2%	4.4%	1.2%	1.4%	0.7%	9.8%	0.5%	0.0%	2.1%	0.0%	0.2%	2.5%	66.7%
1993	6.9%	0.0%	2.0%	6.6%	0.0%	3.3%	0.0%	14.8%	0.3%	2.0%	0.0%	0.0%	0.3%	4.6%	59.2%
1994	13.7%	1.8%	2.4%	14.9%	0.6%	1.5%	0.0%	11.6%	2.1%	1.5%	2.1%	0.0%	0.0%	0.0%	47.7%
1995	12.7%	0.0%	4.1%	6.1%	0.0%	0.3%	0.4%	2.9%	0.8%	0.1%	0.0%	0.0%	0.0%	0.7%	71.8%
1996	10.8%	0.0%	3.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	85.0%
1997	14.0%	0.0%	0.0%	1.7%	0.2%	0.0%	0.6%	0.9%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	82.1%
1998	8.9%	0.0%	0.4%	5.9%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.3%	0.0%	0.0%	0.0%	84.3%
1999	6.5%	0.0%	0.7%	4.2%	0.0%	0.0%	0.6%	0.0%	0.3%	0.0%	1.1%	0.0%	0.1%	0.0%	86.5%
2000	4.2%	0.2%	1.6%	0.0%	0.0%	0.0%	0.0%	0.2%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	92.6%
(89-00)	10.1%	0.5%	1.4%	5.4%	0.4%	1.3%	0.2%	6.2%	0.7%	1.8%	0.6%	0.1%	0.3%	4.4%	66.7%
(89-00)	10.1%	0.5%	1.4%	5.4%	0.4%	1.3%	0.2%	6.2%	0.7%	1.8%	0.6%	0.1%	0.3%	4.4%	66.7%

Table H.38. Hoko 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1989	12.0%	2.3%	0.3%	8.5%	1.1%	4.8%	0.0%	13.7%	1.7%	11.4%	0.3%	0.6%	0.6%	21.9%	20.8%
1990	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%
1991	18.8%	0.0%	0.1%	5.2%	1.1%	0.3%	0.5%	7.0%	0.4%	0.6%	0.4%	0.1%	1.0%	8.8%	55.6%
1992	8.8%	3.8%	1.6%	5.6%	1.1%	1.4%	0.6%	10.4%	0.6%	0.0%	2.1%	0.0%	0.2%	2.7%	61.0%
1993	12.6%	0.9%	2.3%	7.7%	0.0%	2.9%	0.0%	14.9%	0.6%	1.7%	0.0%	0.0%	0.3%	4.9%	51.4%
1994	20.7%	3.6%	2.8%	13.7%	0.5%	1.3%	0.0%	10.9%	2.1%	1.6%	2.1%	0.0%	0.0%	0.0%	40.7%
1995	16.3%	0.0%	4.7%	7.8%	0.0%	0.4%	0.5%	3.7%	0.8%	0.1%	0.0%	0.0%	0.0%	1.0%	64.7%
1996	14.1%	0.0%	4.4%	0.7%	0.0%	0.0%	0.0%	1.3%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	79.1%
1997	16.4%	0.0%	0.0%	1.9%	0.2%	0.0%	0.7%	1.1%	0.0%	0.1%	0.5%	0.0%	0.0%	0.0%	79.1%
1998	9.9%	0.0%	0.3%	6.4%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.3%	0.0%	0.0%	0.0%	82.9%
1999	8.2%	0.0%	0.8%	4.9%	0.0%	0.0%	0.7%	0.0%	0.3%	0.0%	1.2%	0.0%	0.1%	0.0%	83.8%
2000	6.1%	0.2%	4.5%	0.0%	0.0%	0.0%	0.0%	0.2%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	87.7%
(89-00)	13.5%	1.3%	1.9%	5.9%	0.4%	1.1%	0.2%	6.7%	0.7%	1.4%	0.6%	0.1%	0.3%	4.5%	61.4%
(89-00)	13.5%	1.3%	1.9%	5.9%	0.4%	1.1%	0.2%	6.7%	0.7%	1.4%	0.6%	0.1%	0.3%	4.5%	61.4%

Table H.39. Sooes Fall Fingerling 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1989	7.0%	0.6%	0.0%	0.0%	0.0%	4.5%	0.0%	1.9%	0.0%	1.9%	8.3%	0.0%	0.0%	0.0%	75.8%
1990	9.9%	2.8%	4.3%	14.2%	1.4%	0.7%	0.0%	17.7%	7.1%	2.1%	0.0%	1.4%	0.0%	3.5%	34.8%
1991	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%
1992	8.8%	0.0%	0.0%	9.5%	2.0%	0.0%	0.0%	19.3%	1.0%	3.4%	1.7%	0.3%	0.0%	2.4%	51.7%
1993	5.0%	0.0%	0.0%	7.6%	2.1%	2.1%	2.1%	16.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.8%	63.9%
1994	17.0%	3.0%	4.0%	10.5%	1.0%	0.0%	1.0%	8.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	55.5%
1995	8.5%	0.0%	0.0%	4.6%	0.0%	0.7%	0.0%	9.8%	0.0%	0.0%	0.0%	0.0%	2.6%	0.0%	73.9%
1996	8.8%	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%
1997	10.5%	0.0%	5.2%	5.6%	0.7%	0.3%	0.0%	0.0%	1.4%	0.0%	2.8%	0.0%	23.7%	0.0%	49.8%
1998	9.0%	0.0%	1.5%	17.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	72.3%
1999	12.8%	0.0%	12.8%	4.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	69.0%
2000	0.0%	0.0%	2.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.7%	0.0%	0.0%	0.0%	86.9%
(89-00)	9.1%	0.5%	2.5%	6.9%	0.6%	0.9%	0.3%	6.5%	0.8%	0.8%	2.0%	0.2%	2.3%	1.0%	65.7%
(89-00)	9.1%	0.5%	2.5%	6.9%	0.6%	0.9%	0.3%	6.5%	0.8%	0.8%	2.0%	0.2%	2.3%	1.0%	65.7%

Table H.40. Sooes 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1989	10.7%	2.1%	0.5%	3.2%	0.0%	3.7%	0.0%	4.8%	0.0%	2.1%	7.5%	0.0%	0.0%	1.6%	63.6%
1990	11.6%	7.0%	4.1%	16.3%	1.7%	0.6%	0.0%	17.4%	6.4%	1.7%	0.0%	1.7%	0.0%	2.9%	28.5%
1991	13.9%	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%
1992	11.2%	0.3%	0.3%	10.6%	2.1%	0.0%	0.0%	20.4%	1.2%	3.0%	1.5%	0.3%	0.0%	2.4%	46.5%
1993	8.2%	0.4%	0.0%	7.8%	2.0%	2.0%	2.0%	16.8%	0.0%	0.0%	0.0%	0.4%	0.0%	1.2%	59.4%
1994	20.6%	7.5%	3.5%	9.6%	0.9%	0.0%	0.9%	7.5%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	48.7%
1995	14.4%	0.0%	0.0%	6.1%	0.0%	1.1%	0.0%	12.8%	0.0%	0.6%	0.0%	0.0%	2.2%	0.0%	62.8%
1996	15.6%	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%	82.7%
1997	11.8%	0.0%	5.9%	5.9%	0.7%	0.3%	0.0%	0.0%	1.3%	0.3%	3.0%	0.0%	23.9%	0.0%	46.9%
1998	10.4%	0.0%	1.8%	18.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	68.9%
1999	14.1%	0.0%	14.1%	4.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	65.7%
2000	0.0%	0.0%	3.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.6%	0.0%	0.0%	0.0%	83.9%
(89-00)	11.9%	1.4%	2.8%	7.9%	0.6%	0.8%	0.2%	7.3%	0.7%	0.8%	2.1%	0.2%	2.4%	1.1%	59.7%
(89-00)	11.9%	1.4%	2.8%	7.9%	0.6%	0.8%	0.2%	7.3%	0.7%	0.8%	2.1%	0.2%	2.4%	1.1%	59.7%

Table H.41. Queets Fall Fingerling 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1981	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%
1982	12.2%	2.4%	0.0%	22.9%	0.0%	0.8%	1.2%	12.2%	0.0%	0.0%	0.0%	0.0%	25.3%	0.0%	22.9%
1983	33.3%	0.0%	0.0%	6.8%	0.0%	0.8%	0.0%	7.6%	0.0%	2.3%	0.0%	0.8%	25.8%	0.0%	22.7%
1984	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%
1985	15.6%	0.0%	0.0%	31.6%	0.0%	0.0%	0.0%	2.0%	0.0%	1.6%	0.0%	0.0%	14.4%	1.2%	33.6%
1986	19.3%	0.0%	1.0%	11.4%	1.7%	0.0%	0.0%	6.9%	0.0%	1.0%	0.0%	0.0%	9.3%	0.0%	49.3%
1987	22.5%	0.2%	0.0%	11.7%	0.9%	0.6%	0.9%	0.7%	0.0%	0.0%	0.0%	0.6%	22.7%	0.6%	38.7%
1988	15.1%	0.8%	0.6%	7.9%	2.5%	0.4%	0.0%	4.0%	0.0%	0.0%	1.1%	0.0%	16.7%	3.3%	47.6%
1989	11.1%	0.0%	0.0%	9.1%	0.5%	0.2%	1.1%	7.6%	0.0%	0.0%	0.0%	0.0%	27.8%	1.6%	41.1%
1990	12.7%	0.0%	0.0%	5.5%	0.3%	0.3%	1.8%	6.6%	0.0%	0.0%	0.0%	0.0%	13.8%	0.0%	58.9%
1991	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%
1992	8.3%	0.8%	2.2%	7.7%	0.0%	0.2%	1.9%	17.5%	0.0%	0.0%	0.0%	0.0%	19.2%	0.8%	41.4%
1993	15.8%	0.0%	0.7%	14.0%	0.3%	0.0%	2.1%	12.2%	0.0%	0.0%	0.0%	0.5%	16.0%	2.8%	35.6%
1994	15.7%	0.3%	0.5%	20.9%	0.2%	0.4%	1.5%	3.9%	0.3%	0.0%	1.0%	0.0%	20.6%	0.0%	34.8%
1995	17.4%	0.0%	1.6%	6.0%	0.0%	0.1%	2.0%	0.7%	0.3%	0.0%	0.4%	0.7%	33.4%	0.0%	37.4%
1996	10.2%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	17.5%	0.6%	70.3%
1997	34.6%	0.3%	0.0%	5.9%	0.8%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	20.7%	0.0%	37.5%
1998	33.5%	0.0%	4.1%	26.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	13.9%	7.2%	15.0%
1999	26.3%	0.0%	5.5%	5.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	26.7%	0.4%	35.7%
2000	26.2%	0.0%	11.1%	11.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	21.1%	0.0%	30.1%
(81-00)	18.9%	0.3%	1.5%	12.4%	0.5%	0.3%	0.8%	5.3%	0.0%	0.3%	0.1%	0.3%	21.0%	1.1%	37.3%
(85-00)	19.1%	0.2%	1.9%	11.6%	0.5%	0.1%	0.8%	4.2%	0.0%	0.2%	0.2%	0.1%	19.3%	1.2%	40.8%

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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1981	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%
1982	14.8%	2.3%	0.0%	23.6%	0.0%	0.8%	1.1%	11.8%	0.0%	0.0%	0.0%	0.0%	24.3%	0.0%	21.3%
1983	50.8%	0.0%	0.0%	5.4%	0.0%	0.5%	0.0%	5.4%	0.0%	1.6%	0.0%	0.5%	19.5%	0.0%	16.2%
1984	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%
1985	20.1%	0.0%	0.0%	33.4%	0.0%	0.0%	0.0%	2.0%	0.0%	1.4%	0.0%	0.0%	12.6%	1.7%	28.7%
1986	28.9%	0.0%	1.2%	10.8%	1.5%	0.0%	0.0%	6.4%	0.0%	0.9%	0.0%	0.0%	8.7%	0.0%	41.7%
1987	28.9%	0.5%	0.0%	11.6%	0.8%	0.5%	1.0%	1.3%	0.0%	0.0%	0.0%	0.5%	20.2%	0.7%	34.1%
1988	18.1%	2.4%	0.6%	9.5%	2.4%	0.4%	0.1%	5.3%	0.0%	0.0%	1.0%	0.0%	14.9%	3.4%	41.8%
1989	16.7%	0.0%	0.2%	10.6%	0.6%	0.3%	1.2%	8.9%	0.0%	0.0%	0.0%	0.0%	24.4%	1.7%	35.5%
1990	15.4%	0.1%	0.1%	6.4%	0.3%	0.3%	1.9%	7.1%	0.0%	0.0%	0.0%	0.0%	13.3%	0.0%	55.1%
1991	24.5%	0.0%	1.2%	10.2%	0.0%	0.0%	1.4%	5.0%	0.0%	0.0%	0.0%	0.0%	14.6%	0.5%	42.6%
1992	15.1%	2.2%	2.4%	8.7%	0.0%	0.1%	1.8%	18.0%	0.0%	0.0%	0.0%	0.0%	16.3%	0.8%	34.6%
1993	20.0%	0.0%	0.7%	15.3%	0.3%	0.0%	2.0%	13.0%	0.0%	0.0%	0.0%	0.4%	14.3%	2.9%	31.1%
1994	23.8%	0.6%	0.4%	20.4%	0.2%	0.3%	1.4%	3.9%	0.2%	0.0%	0.9%	0.0%	17.9%	0.0%	30.0%
1995	22.0%	0.0%	1.7%	7.4%	0.0%	0.2%	2.5%	0.8%	0.2%	0.0%	0.6%	0.7%	30.3%	0.0%	33.5%
1996	18.6%	0.0%	1.5%	0.9%	0.0%	0.0%	0.1%	0.4%	0.0%	0.0%	0.0%	0.0%	15.9%	0.5%	62.2%
1997	38.1%	0.5%	0.0%	6.1%	0.7%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	19.5%	0.0%	35.0%
1998	35.6%	0.0%	4.3%	26.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.8%	7.1%	13.6%
1999	34.0%	0.0%	7.3%	5.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	22.8%	0.7%	30.0%
2000	29.2%	0.0%	10.8%	11.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20.1%	0.0%	28.7%
(81-00)	24.5%	0.5%	1.6%	13.0%	0.4%	0.3%	0.9%	5.4%	0.0%	0.2%	0.1%	0.3%	18.8%	1.2%	32.8%
(85-00)	24.3%	0.4%	2.0%	12.2%	0.4%	0.1%	0.8%	4.5%	0.0%	0.1%	0.2%	0.1%	17.4%	1.2%	36.1%

Table H.43. Cowlitz Fall Tule 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1981	5.9%	0.0%	0.0%	2.4%	0.0%	1.3%	6.4%	16.1%	0.0%	2.4%	0.0%	9.7%	15.0%	12.9%	27.9%
1982	3.7%	0.0%	0.2%	1.4%	0.5%	2.1%	0.0%	14.5%	0.0%	1.2%	0.9%	18.5%	9.7%	12.5%	34.9%
1983	3.7%	0.0%	0.0%	6.7%	3.7%	0.5%	0.0%	17.8%	0.4%	0.5%	0.0%	6.9%	4.8%	18.7%	36.2%
1984	4.5%	0.0%	0.0%	7.2%	2.1%	0.1%	0.8%	24.4%	0.0%	1.7%	0.0%	4.4%	15.1%	3.6%	35.9%
1985	3.7%	0.3%	0.0%	4.0%	0.0%	4.4%	0.0%	11.4%	0.4%	1.2%	0.0%	4.4%	6.5%	13.7%	49.9%
1986	0.4%	0.1%	0.0%	0.2%	0.6%	0.8%	0.0%	12.6%	0.4%	1.1%	0.0%	12.9%	31.0%	12.5%	27.4%
1987	3.7%	0.2%	0.0%	3.9%	1.2%	0.0%	0.0%	9.7%	0.0%	0.8%	1.0%	11.3%	23.0%	16.1%	29.0%
1988	1.9%	0.3%	0.0%	1.9%	0.0%	0.1%	0.0%	15.8%	0.0%	0.6%	0.0%	15.5%	23.9%	12.4%	27.6%
1989	3.3%	0.0%	0.7%	4.5%	0.0%	0.3%	0.0%	6.6%	0.0%	1.0%	0.0%	17.8%	7.1%	10.6%	48.1%
1990	4.4%	0.0%	0.0%	1.8%	2.9%	2.6%	0.0%	14.2%	0.0%	0.7%	0.0%	9.5%	0.0%	12.0%	51.8%
1991	9.7%	0.0%	0.0%	3.2%	1.6%	0.0%	0.0%	5.6%	0.0%	0.0%	3.2%	10.5%	11.3%	9.7%	45.2%
1992	2.2%	0.0%	0.0%	0.0%	2.2%	0.0%	1.6%	17.7%	0.0%	0.0%	0.0%	7.0%	5.4%	4.8%	59.1%
1993	3.7%	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%
1994	4.2%	0.0%	0.0%	1.9%	0.0%	0.0%	0.0%	1.9%	0.0%	0.0%	0.0%	3.3%	0.0%	0.0%	88.7%
1995	0.6%	0.0%	0.0%	1.8%	0.0%	1.2%	0.0%	1.8%	0.0%	0.0%	2.4%	4.7%	2.4%	1.8%	83.4%
1996	3.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.2%	0.0%	0.0%	5.9%	1.1%	3.7%	83.3%
1997	4.9%	0.0%	9.8%	3.0%	0.0%	0.0%	0.0%	4.9%	2.4%	0.0%	0.0%	5.5%	0.0%	1.2%	68.3%
1998	3.7%	0.0%	0.0%	7.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.9%	0.0%	2.5%	76.5%
1999	4.5%	0.0%	3.8%	0.0%	0.0%	0.0%	2.3%	3.8%	0.0%	0.0%	0.0%	9.0%	0.0%	18.0%	58.6%
2000	3.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.3%	0.0%	0.0%	11.5%	13.5%	5.2%	7.3%	52.1%
(81-00)	3.8%	0.0%	0.7%	2.7%	0.7%	0.7%	0.6%	9.6%	0.3%	0.6%	0.9%	9.9%	8.2%	9.8%	51.4%
(85-00)	3.6%	0.1%	0.9%	2.3%	0.5%	0.6%	0.2%	7.5%	0.3%	0.3%	1.1%	9.9%	7.5%	9.3%	55.8%

Table H.44. Cowlitz Fall Tule 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1981	6.3%	0.0%	0.0%	2.4%	0.0%	1.2%	6.3%	17.3%	0.0%	2.2%	0.0%	11.5%	14.4%	12.9%	25.4%
1982	4.4%	0.0%	0.4%	1.6%	0.4%	2.2%	0.0%	16.0%	0.0%	1.2%	1.0%	20.4%	9.6%	12.8%	30.1%
1983	4.4%	0.0%	0.0%	7.2%	3.9%	0.5%	0.0%	18.9%	0.3%	0.5%	0.0%	7.8%	4.7%	18.7%	33.2%
1984	4.6%	0.0%	0.0%	7.5%	2.3%	0.1%	0.9%	25.5%	0.0%	1.8%	0.0%	4.7%	14.7%	3.7%	34.2%
1985	4.1%	1.1%	0.0%	4.5%	0.0%	4.5%	0.0%	12.7%	0.4%	1.2%	0.0%	5.1%	6.4%	14.5%	45.7%
1986	0.5%	0.2%	0.0%	0.2%	0.7%	0.8%	0.0%	14.0%	0.3%	1.0%	0.0%	14.6%	30.1%	12.7%	24.9%
1987	6.1%	0.5%	0.0%	4.6%	1.4%	0.0%	0.0%	11.2%	0.0%	0.7%	0.9%	12.0%	21.3%	15.5%	25.7%
1988	2.0%	0.8%	0.0%	2.1%	0.0%	0.1%	0.0%	17.5%	0.0%	0.6%	0.0%	16.1%	22.8%	12.4%	25.7%
1989	4.4%	0.0%	0.7%	4.7%	0.0%	0.3%	0.0%	7.2%	0.0%	1.0%	0.0%	18.8%	6.9%	10.8%	45.4%
1990	4.4%	0.0%	0.0%	2.4%	3.4%	2.7%	0.0%	15.5%	0.0%	1.0%	0.0%	10.1%	0.0%	12.8%	47.8%
1991	12.3%	0.0%	0.0%	3.6%	1.4%	0.0%	0.0%	6.5%	0.0%	0.0%	3.6%	11.6%	10.9%	9.4%	40.6%
1992	2.5%	0.0%	0.0%	0.0%	2.5%	0.0%	2.0%	20.2%	0.0%	0.0%	0.0%	7.9%	5.4%	5.4%	54.2%
1993	4.4%	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%
1994	5.0%	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%	3.7%	0.0%	0.0%	86.7%
1995	1.1%	0.0%	0.0%	2.8%	0.0%	1.1%	0.0%	2.2%	0.0%	2.2%	3.3%	5.5%	2.2%	1.7%	77.9%
1996	4.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%	0.0%	0.0%	6.9%	1.1%	4.0%	80.9%
1997	5.1%	0.0%	10.9%	3.4%	0.0%	0.0%	0.0%	5.7%	2.9%	1.1%	0.0%	5.7%	0.0%	1.1%	64.0%
1998	4.7%	0.0%	0.0%	8.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.6%	0.0%	3.5%	72.9%
1999	7.0%	0.0%	4.2%	0.0%	0.0%	0.0%	2.8%	3.5%	0.0%	0.0%	0.0%	9.8%	0.0%	18.2%	54.5%
2000	3.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.5%	0.0%	0.0%	14.0%	16.8%	4.7%	6.5%	46.7%
(81-00)	4.6%	0.1%	0.8%	3.0%	0.8%	0.7%	0.6%	10.6%	0.3%	0.7%	1.1%	10.9%	7.9%	9.9%	47.8%
(85-00)	4.5%	0.2%	1.0%	2.6%	0.6%	0.7%	0.3%	8.4%	0.4%	0.6%	1.4%	10.9%	7.2%	9.4%	52.1%

Table H.45. Lower River Hatchery 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1980	0.8%	0.0%	0.0%	0.0%	0.5%	1.3%	0.0%	16.0%	3.4%	6.4%	1.3%	18.3%	9.8%	22.4%	19.8%
1981	0.0%	0.0%	0.0%	0.0%	0.5%	0.1%	0.0%	30.6%	1.8%	2.4%	0.3%	22.6%	1.9%	11.6%	28.2%
1982	0.0%	0.0%	0.0%	0.3%	1.8%	0.0%	0.0%	26.0%	0.8%	0.3%	0.5%	18.5%	16.4%	9.0%	26.5%
1983	0.0%	0.0%	0.0%	0.0%	2.3%	0.3%	0.1%	35.0%	1.4%	0.6%	0.4%	11.2%	6.8%	8.5%	33.4%
1984	0.0%	0.0%	0.0%	0.0%	3.2%	0.0%	0.0%	49.9%	1.3%	1.6%	0.3%	5.9%	11.3%	3.7%	22.7%
1985	0.0%	0.0%	0.0%	0.0%	0.9%	0.4%	0.0%	28.3%	1.1%	1.2%	0.7%	15.5%	4.1%	5.8%	42.0%
1986	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.1%	8.9%	2.3%	7.3%	2.6%	6.7%	13.1%	11.3%	46.9%
1987	0.0%	0.0%	0.0%	0.2%	1.6%	0.0%	0.0%	27.0%	0.5%	0.2%	2.5%	16.5%	20.7%	9.5%	21.3%
1988	0.3%	0.0%	0.0%	0.3%	0.6%	0.0%	0.0%	28.8%	1.0%	0.0%	2.4%	11.5%	24.3%	3.2%	27.7%
1989	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.4%	0.0%	2.0%	0.0%	22.4%	5.9%	5.1%	49.2%
1990	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	19.8%	0.0%	1.7%	0.0%	16.3%	0.3%	11.1%	50.3%
1991	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	10.0%	0.7%	2.5%	2.0%	9.1%	2.3%	15.0%	58.2%
1992	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	16.3%	0.0%	1.0%	1.9%	28.0%	0.8%	11.0%	40.5%
1993	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	18.4%	0.0%	0.0%	4.5%	19.7%	2.0%	11.1%	43.6%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	27.6%	10.3%	0.0%	0.0%	0.0%	0.0%	0.0%	62.1%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.3%	10.0%	86.7%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.1%	6.5%	0.0%	85.5%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.5%	2.9%	0.0%	3.9%	8.7%	1.0%	11.2%	55.8%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.0%	1.0%	0.0%	0.0%	5.1%	1.0%	2.0%	23.2%	63.6%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.0%	0.0%	8.9%	6.6%	3.3%	9.9%	69.2%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.9%	2.3%	0.0%	16.8%	1.8%	2.3%	4.5%	56.4%
(80-00)	0.1%	0.0%	0.0%	0.0%	0.6%	0.1%	0.2%	18.7%	1.4%	1.3%	2.6%	11.8%	6.6%	9.4%	47.1%
(85-00)	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.3%	14.7%	1.3%	1.0%	3.2%	10.8%	5.7%	8.9%	53.7%

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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1980	0.4%	0.0%	0.0%	0.1%	0.7%	0.9%	0.0%	28.7%	2.1%	4.5%	1.0%	24.2%	7.0%	18.7%	11.5%
1981	0.0%	0.0%	0.0%	0.0%	0.5%	0.1%	0.0%	31.5%	1.7%	2.2%	0.3%	25.8%	1.8%	11.8%	24.3%
1982	0.0%	0.0%	0.0%	0.3%	1.9%	0.0%	0.0%	27.2%	0.8%	0.3%	0.5%	20.6%	15.7%	9.2%	23.6%
1983	0.0%	0.0%	0.0%	0.0%	2.4%	0.3%	0.1%	36.9%	1.4%	0.5%	0.4%	12.3%	6.7%	9.6%	29.4%
1984	0.0%	0.0%	0.0%	0.0%	3.4%	0.0%	0.0%	51.6%	1.3%	1.6%	0.2%	6.3%	11.1%	4.1%	20.4%
1985	0.0%	0.0%	0.0%	0.0%	0.9%	0.4%	0.0%	30.3%	1.1%	1.2%	0.7%	17.6%	4.1%	6.0%	37.8%
1986	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.2%	8.4%	1.8%	6.2%	2.8%	6.2%	12.4%	27.9%	33.5%
1987	0.0%	0.0%	0.0%	0.2%	1.9%	0.0%	0.0%	33.0%	0.5%	0.2%	2.3%	17.2%	18.5%	8.6%	17.6%
1988	0.3%	0.0%	0.0%	0.3%	0.6%	0.0%	0.0%	31.2%	1.0%	0.0%	2.4%	11.8%	23.2%	3.2%	25.9%
1989	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	17.0%	0.0%	1.8%	0.0%	25.3%	5.4%	5.4%	45.1%
1990	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	22.9%	0.0%	1.5%	0.0%	18.3%	0.3%	11.8%	44.9%
1991	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	12.4%	1.0%	2.4%	2.4%	10.8%	2.4%	16.9%	51.4%
1992	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	19.6%	0.0%	0.8%	1.8%	30.5%	0.8%	10.7%	35.2%
1993	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%	20.9%	0.0%	0.0%	4.3%	20.9%	1.9%	11.3%	40.0%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	31.3%	12.5%	0.0%	0.0%	0.0%	0.0%	0.0%	56.3%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.2%	0.0%	0.0%	3.2%	9.7%	83.9%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.5%	6.3%	0.0%	84.1%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20.4%	3.1%	0.4%	3.6%	9.3%	0.9%	11.1%	51.1%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.5%	0.9%	0.0%	0.0%	5.6%	0.9%	1.9%	24.3%	58.9%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.2%	0.0%	0.0%	9.8%	7.9%	3.5%	10.2%	66.3%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.9%	2.8%	0.0%	20.7%	2.0%	2.0%	7.2%	49.4%
(80-00)	0.0%	0.0%	0.0%	0.0%	0.7%	0.1%	0.4%	21.1%	1.5%	1.3%	2.8%	13.2%	6.1%	10.4%	42.4%
(85-00)	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.5%	16.7%	1.5%	1.1%	3.5%	11.8%	5.4%	10.3%	48.8%

Table H.47. Spring Creek Tule 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	0.0%	0.0%	0.0%	0.1%	0.6%	0.3%	0.0%	23.5%	1.4%	2.4%	0.1%	17.5%	23.0%	13.1%	17.9%
1980	0.1%	0.0%	0.0%	0.1%	0.5%	0.1%	0.0%	25.7%	2.8%	1.0%	0.1%	23.4%	23.5%	10.2%	12.6%
1981	0.0%	0.0%	0.0%	0.1%	0.2%	0.1%	0.0%	21.0%	1.5%	1.9%	0.1%	23.5%	20.7%	12.6%	18.3%
1982	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	22.0%	1.0%	0.2%	0.0%	19.6%	35.6%	8.3%	12.7%
1983	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	29.8%	1.1%	0.0%	0.5%	8.4%	20.2%	9.8%	29.7%
1984	0.0%	0.0%	0.0%	0.0%	2.4%	0.0%	0.0%	27.4%	0.0%	1.3%	0.4%	6.0%	25.9%	7.4%	29.1%
1985	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	14.2%	0.0%	0.2%	0.7%	13.8%	27.2%	4.0%	39.7%
1986	0.0%	0.0%	0.0%	0.0%	2.9%	0.0%	0.0%	20.7%	1.6%	1.6%	2.5%	2.5%	36.3%	8.0%	23.9%
1987	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%
1988	0.0%	0.0%	0.0%	0.5%	0.3%	0.2%	0.0%	23.2%	0.9%	1.9%	2.2%	18.2%	31.0%	10.3%	11.3%
1989	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	14.4%	0.4%	0.4%	3.2%	24.7%	34.5%	8.3%	13.8%
1990	0.0%	0.0%	0.0%	0.2%	0.3%	0.1%	0.0%	17.6%	0.7%	0.8%	4.5%	14.3%	23.1%	13.1%	25.3%
1991	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%	13.1%	0.2%	0.4%	1.3%	16.9%	34.3%	11.0%	22.5%
1992	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	11.9%	0.6%	0.5%	2.5%	26.6%	14.6%	11.8%	31.3%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	17.7%	0.0%	0.4%	4.2%	17.6%	21.4%	10.5%	28.3%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	18.6%	0.0%	0.8%	3.9%	3.5%	28.9%	0.8%	43.4%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.7%	0.0%	0.2%	2.7%	1.8%	37.9%	0.0%	50.7%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.2%	6.1%	57.6%	3.4%	29.7%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	18.3%	0.0%	0.0%	4.2%	8.1%	38.0%	17.8%	13.6%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.5%	2.8%	15.0%	12.7%	68.6%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.3%	0.0%	3.6%	16.0%	38.3%	8.8%	32.6%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.8%	0.0%	0.0%	12.7%	11.4%	44.2%	19.7%	4.2%
(79-00)	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	15.6%	0.6%	0.6%	2.4%	13.5%	30.4%	10.1%	26.3%
(85-00)	0.0%	0.0%	0.0%	0.1%	0.3%	0.0%	0.0%	12.0%	0.3%	0.4%	3.2%	12.4%	32.5%	10.0%	28.6%

Table H.48. Spring Creek Tule 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	0.0%	0.0%	0.0%	0.1%	0.7%	0.2%	0.0%	25.0%	1.3%	2.3%	0.1%	19.5%	21.6%	14.0%	15.3%
1980	0.1%	0.0%	0.0%	0.1%	0.5%	0.1%	0.0%	26.7%	2.5%	0.9%	0.1%	25.0%	22.2%	11.1%	10.7%
1981	0.0%	0.0%	0.0%	0.1%	0.2%	0.1%	0.0%	21.7%	1.4%	1.8%	0.2%	25.1%	20.0%	13.1%	16.4%
1982	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	22.6%	1.0%	0.2%	0.0%	22.1%	34.0%	8.2%	11.4%
1983	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	31.5%	1.1%	0.0%	0.5%	9.1%	18.9%	12.1%	26.4%
1984	0.0%	0.0%	0.0%	0.0%	2.4%	0.0%	0.0%	27.2%	0.0%	1.2%	0.4%	6.1%	24.6%	12.6%	25.5%
1985	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	15.3%	0.0%	0.2%	0.6%	16.1%	27.0%	4.1%	36.6%
1986	0.0%	0.0%	0.0%	0.0%	3.0%	0.0%	0.0%	21.9%	1.5%	1.8%	2.7%	2.7%	35.5%	8.9%	22.2%
1987	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%
1988	0.0%	0.0%	0.0%	0.5%	0.3%	0.3%	0.0%	26.3%	1.0%	1.5%	2.4%	19.1%	27.6%	12.0%	9.0%
1989	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	16.6%	0.5%	0.4%	3.2%	26.8%	32.1%	8.3%	11.9%
1990	0.0%	0.0%	0.0%	0.2%	0.4%	0.1%	0.0%	19.9%	0.7%	0.8%	4.7%	15.5%	21.2%	14.7%	21.7%
1991	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%	15.3%	0.3%	0.4%	1.3%	18.7%	32.2%	11.7%	19.7%
1992	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	14.0%	0.7%	0.5%	2.4%	28.9%	13.8%	11.7%	27.6%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	19.8%	0.0%	0.3%	4.2%	19.2%	19.9%	11.5%	25.1%
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	21.9%	0.0%	0.9%	4.1%	3.9%	28.5%	1.0%	39.7%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.7%	0.0%	2.2%	3.9%	2.1%	36.6%	0.0%	45.5%
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	3.8%	7.1%	57.8%	3.6%	27.6%
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	21.4%	0.0%	1.1%	3.9%	8.6%	34.8%	18.4%	11.8%
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.6%	3.5%	15.4%	14.4%	65.8%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.3%	0.0%	3.7%	18.6%	38.1%	8.9%	30.1%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.5%	0.0%	0.0%	15.2%	11.8%	39.0%	23.1%	3.4%
(79-00)	0.0%	0.0%	0.0%	0.1%	0.4%	0.0%	0.0%	17.0%	0.6%	0.8%	2.6%	14.8%	29.1%	11.1%	23.5%
(85-00)	0.0%	0.0%	0.0%	0.1%	0.3%	0.0%	0.0%	13.8%	0.3%	0.6%	3.5%	13.7%	31.2%	10.8%	25.8%

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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	12.2%	0.0%	1.1%	6.7%	2.2%	8.3%	0.0%	15.0%	7.2%	1.7%	0.0%	0.0%	4.4%	4.4%	36.7%
1980	34.4%	0.0%	0.9%	8.5%	3.8%	1.2%	0.0%	16.3%	0.0%	0.0%	0.0%	1.5%	0.6%	0.0%	32.9%
1987	13.7%	0.0%	0.0%	5.6%	4.8%	4.0%	3.2%	0.0%	0.0%	0.0%	0.0%	20.2%	15.3%	0.0%	33.1%
1988	1.2%	0.4%	0.0%	8.0%	0.0%	8.0%	2.0%	16.7%	0.0%	1.6%	4.4%	3.6%	15.9%	3.2%	35.1%
1989	4.8%	0.5%	0.6%	4.8%	0.6%	0.3%	0.6%	14.5%	1.4%	2.2%	2.3%	13.8%	8.2%	2.5%	43.1%
1990	9.5%	0.0%	0.0%	6.8%	1.1%	1.3%	0.0%	20.0%	0.6%	0.4%	0.0%	5.7%	11.0%	2.5%	41.0%
1991	3.5%	0.0%	0.0%	2.2%	0.5%	1.6%	0.0%	5.7%	0.0%	1.1%	0.7%	3.4%	4.0%	2.2%	75.0%
1992	12.0%	0.0%	0.0%	3.3%	2.0%	1.0%	0.0%	14.4%	0.7%	0.0%	0.0%	6.4%	1.3%	1.3%	57.5%
1993	5.8%	0.0%	0.0%	1.4%	0.0%	2.4%	0.0%	14.5%	0.0%	0.0%	1.9%	5.3%	3.4%	1.4%	63.8%
1994	13.2%	0.0%	0.0%	0.0%	0.0%	0.0%	13.2%	0.0%	0.0%	0.0%	0.0%	0.0%	10.5%	0.0%	63.2%
1995	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.6%	0.0%	0.0%	0.0%	2.0%	1.3%	0.0%	89.5%
1996	13.8%	0.3%	0.0%	0.0%	0.0%	2.9%	0.0%	0.0%	2.3%	0.0%	0.0%	2.9%	0.0%	4.3%	73.5%
1997	8.6%	0.1%	3.6%	0.3%	0.0%	0.4%	0.9%	1.8%	0.0%	0.0%	0.0%	3.3%	0.2%	0.9%	79.9%
1998	8.6%	0.3%	1.0%	0.5%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.6%	2.1%	1.3%	0.5%	84.4%
1999	11.1%	0.5%	1.5%	0.5%	0.0%	0.9%	3.9%	0.9%	0.0%	0.0%	5.3%	10.4%	1.7%	4.6%	58.6%
2000	32.3%	1.2%	4.6%	0.4%	0.0%	0.0%	2.6%	8.6%	0.4%	0.2%	10.8%	6.1%	1.9%	8.6%	22.4%
(79-00)	11.7%	0.2%	0.8%	3.1%	0.9%	2.0%	1.7%	8.3%	0.8%	0.4%	1.6%	5.4%	5.1%	2.3%	55.6%
(85-00)	10.0%	0.2%	0.8%	2.4%	0.6%	1.6%	1.9%	7.3%	0.4%	0.4%	1.9%	6.1%	5.4%	2.3%	58.6%

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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	15.1%	0.0%	0.9%	7.5%	3.3%	7.5%	1.4%	16.5%	6.6%	1.4%	0.0%	0.5%	3.8%	4.2%	31.1%
1980	34.6%	0.0%	0.8%	8.7%	3.9%	1.1%	0.0%	16.9%	0.0%	0.0%	0.0%	1.7%	0.6%	0.0%	31.7%
1987	16.0%	0.0%	0.0%	8.0%	3.7%	4.3%	2.5%	7.4%	0.0%	0.0%	0.6%	19.8%	11.7%	0.6%	25.3%
1988	2.0%	1.0%	0.0%	10.6%	0.0%	7.9%	2.0%	21.5%	0.0%	1.3%	4.3%	3.6%	13.9%	3.0%	29.0%
1989	6.9%	2.0%	0.7%	5.3%	0.7%	0.3%	0.5%	16.0%	1.4%	1.9%	2.3%	14.5%	7.3%	2.4%	37.9%
1990	10.3%	0.0%	0.0%	7.8%	1.1%	1.4%	0.0%	20.8%	0.6%	0.3%	0.0%	5.7%	10.5%	2.6%	38.7%
1991	3.8%	0.0%	0.0%	2.3%	0.5%	1.7%	0.0%	6.3%	0.0%	1.1%	0.7%	3.6%	4.0%	2.3%	73.7%
1992	16.3%	0.0%	0.0%	3.4%	1.8%	0.9%	0.0%	15.0%	0.6%	0.0%	0.0%	6.4%	1.2%	1.5%	52.8%
1993	6.5%	0.0%	0.0%	1.4%	0.0%	2.8%	0.0%	15.8%	0.0%	0.0%	1.9%	5.6%	3.3%	1.4%	61.4%
1994	16.7%	0.0%	0.0%	0.0%	0.0%	0.0%	16.7%	0.0%	0.0%	0.0%	0.0%	0.0%	9.5%	0.0%	57.1%
1995	3.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.5%	0.0%	3.6%	0.0%	2.4%	2.4%	0.0%	81.5%
1996	21.9%	0.7%	0.0%	0.2%	0.0%	3.2%	1.7%	0.0%	2.7%	0.2%	0.0%	3.2%	0.0%	4.1%	62.0%
1997	9.6%	0.1%	4.0%	0.3%	0.0%	0.5%	1.3%	2.0%	0.0%	0.0%	0.0%	3.6%	0.2%	1.0%	77.5%
1998	9.8%	0.8%	1.2%	0.6%	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%	0.7%	2.3%	1.3%	0.5%	82.1%
1999	14.2%	1.4%	1.9%	0.5%	0.0%	0.9%	4.2%	0.8%	0.0%	0.0%	5.5%	10.8%	1.6%	4.7%	53.6%
2000	36.0%	1.9%	4.6%	0.4%	0.0%	0.0%	3.1%	7.9%	0.3%	0.2%	11.0%	6.0%	1.7%	7.9%	18.9%
(79-00)	13.9%	0.5%	0.9%	3.6%	0.9%	2.0%	2.1%	9.6%	0.8%	0.6%	1.7%	5.6%	4.6%	2.3%	50.9%
(85-00)	12.4%	0.6%	0.9%	2.9%	0.6%	1.7%	2.3%	8.6%	0.4%	0.6%	1.9%	6.2%	4.9%	2.3%	53.7%

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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1980	7.1%	0.9%	0.3%	10.9%	0.3%	0.8%	0.1%	4.6%	0.0%	0.1%	0.0%	0.9%	0.6%	15.7%	57.6%
1981	8.9%	1.1%	0.2%	11.9%	0.7%	0.2%	0.0%	2.7%	0.0%	0.0%	0.0%	0.7%	3.1%	18.3%	52.1%
1982	4.2%	1.4%	0.1%	6.6%	0.1%	0.3%	0.1%	4.1%	0.0%	0.0%	0.0%	1.1%	7.2%	24.7%	50.0%
1983	13.1%	0.1%	0.0%	11.9%	0.3%	0.0%	0.0%	1.9%	0.8%	0.0%	0.0%	1.9%	6.5%	21.2%	42.5%
1984	4.2%	0.3%	0.3%	2.1%	0.1%	0.1%	0.1%	1.9%	0.1%	0.0%	0.0%	1.0%	6.2%	23.9%	59.7%
1985	5.2%	0.1%	0.0%	0.5%	0.2%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.3%	18.2%	20.5%	54.6%
1986	3.3%	0.1%	0.0%	6.7%	0.6%	2.5%	0.0%	5.5%	0.0%	0.0%	0.6%	0.0%	9.2%	17.2%	54.4%
1987	9.9%	0.0%	0.6%	13.2%	0.8%	1.1%	0.0%	0.9%	0.0%	0.0%	1.3%	2.5%	6.3%	26.9%	36.4%
1988	9.2%	0.3%	0.4%	6.2%	0.6%	0.1%	0.0%	3.0%	0.0%	0.0%	0.0%	2.2%	6.9%	28.6%	42.5%
1989	4.4%	0.0%	0.2%	1.8%	0.0%	0.1%	0.0%	1.4%	0.5%	0.2%	0.5%	1.5%	12.5%	20.3%	56.7%
1990	6.5%	0.3%	0.2%	1.4%	0.2%	0.5%	0.2%	2.1%	0.0%	0.1%	0.7%	1.3%	17.0%	27.6%	41.9%
1991	3.1%	0.6%	0.6%	1.7%	0.0%	0.2%	0.0%	0.4%	0.2%	0.0%	0.2%	0.7%	6.0%	43.0%	43.3%
1992	3.6%	0.7%	0.2%	1.7%	0.0%	0.2%	0.2%	2.7%	0.0%	0.1%	0.2%	2.4%	5.9%	31.5%	50.7%
1993	8.2%	0.0%	0.0%	1.2%	0.0%	0.0%	0.1%	1.4%	0.0%	0.0%	0.2%	1.5%	0.8%	43.1%	43.5%
1994	4.1%	0.1%	1.0%	0.7%	0.2%	0.2%	0.1%	0.6%	0.0%	0.0%	0.0%	0.2%	5.1%	38.9%	48.7%
1995	2.8%	0.1%	0.4%	1.0%	0.0%	0.3%	0.0%	0.3%	0.0%	0.0%	0.1%	0.0%	0.3%	43.7%	50.9%
1996	2.2%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	1.2%	7.8%	88.5%
1997	3.6%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.8%	15.8%	79.0%
1998	4.2%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.4%	16.4%	78.4%
1999	3.8%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.7%	16.0%	78.6%
2000	6.3%	0.1%	0.6%	0.1%	0.0%	0.0%	0.2%	0.3%	0.0%	0.0%	0.3%	0.2%	2.0%	45.3%	44.7%
(80-00)	5.6%	0.3%	0.3%	3.8%	0.2%	0.3%	0.1%	1.6%	0.1%	0.0%	0.2%	0.9%	5.6%	26.0%	55.0%
(85-00)	5.0%	0.2%	0.3%	2.3%	0.2%	0.3%	0.0%	1.2%	0.0%	0.0%	0.3%	0.8%	5.8%	27.7%	55.8%

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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1980	9.5%	0.9%	0.4%	13.1%	0.4%	0.8%	0.1%	5.3%	0.0%	0.1%	0.0%	1.2%	0.7%	15.3%	52.2%
1981	11.2%	1.1%	0.3%	13.5%	0.8%	0.2%	0.0%	3.0%	0.0%	0.0%	0.0%	0.8%	3.0%	18.1%	47.9%
1982	5.9%	1.5%	0.2%	7.7%	0.1%	0.4%	0.1%	4.7%	0.0%	0.0%	0.0%	1.3%	7.0%	24.8%	46.3%
1983	19.3%	0.1%	0.0%	13.1%	0.3%	0.0%	0.0%	2.0%	0.8%	0.0%	0.0%	2.2%	5.9%	19.8%	36.5%
1984	4.8%	0.3%	0.4%	2.5%	0.1%	0.1%	0.1%	2.1%	0.1%	0.0%	0.0%	1.2%	6.3%	24.6%	57.4%
1985	8.1%	0.3%	0.0%	0.5%	0.2%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.3%	17.6%	20.7%	51.7%
1986	5.1%	0.4%	0.0%	7.6%	0.7%	2.6%	0.0%	6.2%	0.0%	0.0%	0.7%	0.0%	8.8%	17.2%	50.7%
1987	18.9%	0.0%	1.0%	15.4%	1.2%	1.0%	0.0%	1.5%	0.0%	0.0%	1.2%	3.2%	5.3%	23.0%	28.4%
1988	12.7%	0.9%	0.6%	8.1%	0.8%	0.0%	0.0%	3.8%	0.0%	0.0%	0.0%	2.4%	6.7%	26.9%	37.1%
1989	5.8%	0.0%	0.3%	2.2%	0.0%	0.1%	0.0%	1.7%	0.6%	0.1%	0.6%	1.8%	12.4%	20.7%	53.8%
1990	10.5%	0.8%	0.3%	2.0%	0.2%	0.5%	0.2%	2.7%	0.0%	0.1%	0.7%	1.5%	15.8%	26.7%	37.9%
1991	4.4%	1.4%	0.7%	2.2%	0.0%	0.2%	0.0%	0.4%	0.2%	0.0%	0.2%	0.8%	5.9%	43.1%	40.4%
1992	8.1%	1.7%	0.3%	2.1%	0.0%	0.1%	0.2%	3.3%	0.0%	0.1%	0.3%	2.9%	5.5%	30.4%	45.2%
1993	13.9%	0.0%	0.0%	1.5%	0.0%	0.0%	0.1%	1.7%	0.0%	0.0%	0.2%	1.7%	0.8%	41.3%	38.8%
1994	5.9%	0.4%	1.2%	0.9%	0.3%	0.2%	0.1%	0.8%	0.0%	0.0%	0.0%	0.2%	5.0%	39.2%	45.8%
1995	5.3%	0.1%	0.5%	1.5%	0.0%	0.4%	0.0%	0.5%	0.0%	0.0%	0.2%	0.1%	0.3%	43.7%	47.4%
1996	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%
1997	4.4%	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.8%	16.5%	77.1%
1998	5.8%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.2%	0.4%	17.2%	75.7%
1999	8.0%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.7%	16.1%	73.4%
2000	11.0%	0.1%	1.1%	0.1%	0.0%	0.0%	0.3%	0.3%	0.0%	0.0%	0.3%	0.2%	2.0%	44.1%	40.5%
(80-00)	8.7%	0.5%	0.4%	4.5%	0.2%	0.3%	0.1%	1.9%	0.1%	0.0%	0.2%	1.1%	5.3%	25.6%	51.0%
(85-00)	8.2%	0.4%	0.5%	2.8%	0.2%	0.3%	0.1%	1.5%	0.1%	0.0%	0.3%	1.0%	5.6%	27.2%	51.9%

Table H.53. Lewis River Wild 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1981	6.7%	0.0%	0.0%	3.3%	1.4%	0.2%	2.1%	6.0%	0.0%	0.7%	0.0%	2.0%	4.2%	15.7%	57.6%
1982	6.2%	1.3%	0.2%	3.0%	1.4%	0.8%	0.0%	10.7%	0.4%	0.8%	0.0%	4.1%	6.2%	23.0%	41.8%
1986	5.5%	0.0%	0.0%	1.6%	2.2%	0.9%	0.0%	6.7%	0.0%	0.0%	2.5%	3.3%	26.3%	12.1%	38.9%
1987	3.5%	0.0%	0.0%	4.7%	1.3%	0.0%	0.0%	8.3%	0.0%	0.0%	0.9%	2.7%	25.5%	6.2%	46.9%
1988	4.2%	0.0%	0.0%	2.9%	0.0%	0.5%	0.0%	8.9%	0.0%	0.1%	0.0%	4.7%	23.1%	16.8%	38.8%
1989	1.8%	0.1%	0.2%	4.5%	0.2%	0.7%	0.5%	5.1%	0.0%	0.8%	0.5%	4.9%	9.5%	7.3%	64.0%
1990	4.9%	0.0%	0.0%	1.7%	0.4%	0.6%	0.6%	12.2%	0.0%	0.0%	0.8%	3.9%	3.4%	5.2%	66.3%
1991	6.0%	0.1%	0.0%	3.8%	0.5%	0.0%	1.1%	5.9%	0.0%	0.7%	0.0%	2.4%	15.8%	7.1%	56.6%
1992	1.6%	0.0%	0.0%	3.8%	1.8%	0.0%	0.7%	6.1%	0.0%	0.0%	0.0%	2.9%	4.5%	23.5%	55.0%
1993	3.6%	0.0%	1.0%	4.9%	0.0%	0.3%	0.0%	7.5%	0.0%	1.6%	0.0%	0.8%	6.7%	9.3%	64.2%
1994	6.4%	0.0%	0.0%	3.2%	0.0%	0.0%	0.0%	3.2%	0.0%	1.6%	0.0%	0.8%	1.6%	0.0%	83.2%
1995	6.6%	0.0%	2.3%	3.2%	0.0%	0.4%	0.0%	5.3%	0.0%	0.0%	0.0%	0.0%	0.0%	24.7%	57.5%
1996	7.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.8%	0.9%	4.7%	84.5%
1997	13.7%	0.0%	0.0%	3.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.5%	79.6%
1998	8.1%	0.0%	0.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	2.0%	84.8%
1999	11.8%	0.0%	0.0%	5.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	82.4%
2000	3.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.9%	0.0%	80.0%
(81-00)	5.9%	0.1%	0.2%	3.1%	0.5%	0.3%	0.3%	5.1%	0.0%	0.4%	0.3%	2.1%	8.6%	9.5%	63.7%
(85-00)	5.9%	0.0%	0.2%	3.1%	0.4%	0.2%	0.2%	4.6%	0.0%	0.3%	0.3%	1.9%	9.1%	8.2%	65.5%

Table H.54. Lewis River Wild 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1981	7.9%	0.0%	0.0%	3.6%	1.6%	0.2%	2.2%	7.0%	0.0%	0.7%	0.0%	2.5%	4.2%	16.3%	53.7%
1982	7.7%	1.2%	0.2%	3.3%	1.5%	0.7%	0.0%	11.1%	0.4%	0.7%	0.0%	4.3%	6.1%	23.3%	39.5%
1986	7.1%	0.0%	0.0%	2.2%	2.2%	1.0%	0.0%	7.9%	0.0%	0.0%	2.6%	3.7%	25.3%	12.1%	36.0%
1987	5.1%	0.0%	0.0%	5.3%	1.4%	0.0%	0.0%	9.5%	0.0%	0.0%	1.0%	2.9%	24.8%	6.4%	43.7%
1988	5.0%	0.0%	0.0%	3.5%	0.0%	0.5%	0.0%	10.6%	0.0%	0.1%	0.0%	5.1%	22.2%	17.2%	35.8%
1989	2.4%	0.2%	0.3%	5.1%	0.2%	0.7%	0.4%	5.9%	0.0%	0.8%	0.5%	5.4%	9.4%	7.6%	60.9%
1990	7.2%	0.0%	0.0%	1.9%	0.5%	0.7%	0.6%	13.4%	0.0%	0.0%	0.8%	4.1%	3.2%	5.5%	62.1%
1991	7.1%	0.3%	0.0%	4.1%	0.4%	0.0%	1.2%	6.4%	0.0%	0.7%	0.0%	2.5%	15.5%	7.3%	54.5%
1992	1.7%	0.0%	0.0%	4.3%	1.9%	0.0%	0.7%	6.7%	0.0%	0.0%	0.0%	3.1%	4.5%	24.4%	52.6%
1993	4.4%	0.0%	1.2%	5.7%	0.0%	0.2%	0.0%	8.4%	0.0%	1.5%	0.0%	1.5%	6.6%	9.6%	60.9%
1994	9.1%	0.0%	0.0%	4.9%	0.0%	0.0%	0.0%	3.8%	0.0%	1.5%	0.0%	0.8%	1.5%	0.0%	78.5%
1995	7.8%	0.0%	2.3%	3.9%	0.0%	0.5%	0.0%	6.4%	0.0%	0.2%	0.0%	0.0%	0.0%	24.9%	53.9%
1996	8.5%	0.0%	0.0%	0.3%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	3.0%	0.9%	4.8%	82.2%
1997	15.9%	0.0%	0.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.9%	77.3%
1998	9.0%	0.0%	0.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	2.0%	84.0%
1999	17.9%	0.0%	0.0%	7.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	75.0%
2000	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	18.2%	0.0%	78.8%
(81-00)	7.5%	0.1%	0.2%	3.6%	0.6%	0.3%	0.3%	5.7%	0.0%	0.4%	0.3%	2.3%	8.5%	9.7%	60.5%
(85-00)	7.4%	0.0%	0.3%	3.6%	0.4%	0.2%	0.2%	5.3%	0.0%	0.3%	0.3%	2.1%	8.9%	8.4%	62.4%

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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	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%
1980	21.1%	0.5%	0.5%	6.5%	1.6%	1.7%	0.1%	7.3%	1.0%	0.2%	0.0%	1.1%	6.4%	1.8%	50.2%
1981	16.3%	0.0%	0.4%	5.6%	1.1%	1.3%	0.0%	3.7%	0.4%	0.5%	0.2%	0.5%	3.6%	1.0%	65.7%
1982	6.4%	0.4%	0.2%	3.5%	0.2%	1.1%	0.1%	4.6%	0.0%	0.4%	0.0%	0.6%	2.5%	0.7%	79.2%
1983	16.0%	0.2%	0.0%	10.7%	1.8%	3.5%	0.2%	3.6%	0.2%	0.1%	0.0%	0.4%	8.1%	0.0%	55.1%
1984	15.1%	1.1%	0.1%	8.6%	2.0%	1.5%	0.2%	7.2%	0.2%	0.8%	0.2%	0.2%	15.2%	1.7%	46.1%
1985	9.3%	1.2%	0.2%	8.8%	0.8%	1.3%	0.0%	7.9%	0.1%	1.2%	0.1%	0.4%	32.8%	4.5%	31.4%
1986	11.2%	0.7%	0.1%	7.8%	1.2%	1.0%	0.0%	6.2%	0.1%	0.2%	0.1%	0.7%	32.8%	2.4%	35.6%
1987	14.6%	0.4%	0.4%	12.3%	1.8%	0.6%	0.1%	7.7%	0.0%	0.1%	0.3%	1.4%	34.8%	3.7%	21.8%
1988	10.3%	0.7%	0.5%	7.4%	0.6%	0.6%	0.0%	11.1%	0.0%	0.1%	0.0%	2.1%	46.9%	2.6%	17.0%
1989	11.7%	0.0%	0.2%	14.9%	0.2%	0.7%	0.6%	7.7%	0.0%	0.7%	0.0%	1.2%	42.2%	2.0%	17.8%
1990	13.2%	0.0%	1.0%	9.7%	0.7%	0.7%	0.0%	8.0%	0.0%	0.0%	0.0%	1.2%	33.2%	2.3%	30.0%
1991	6.2%	0.4%	2.5%	5.8%	0.0%	0.0%	0.0%	8.7%	0.0%	0.0%	0.0%	0.7%	19.3%	4.4%	52.0%
1992	2.9%	0.0%	0.0%	2.9%	0.0%	2.3%	0.0%	11.3%	0.0%	0.6%	1.0%	0.0%	16.8%	6.8%	55.3%
1993	10.9%	0.0%	0.0%	6.6%	0.0%	0.4%	0.6%	16.7%	0.0%	0.0%	0.0%	1.7%	15.4%	6.4%	41.4%
1994	9.4%	0.9%	0.0%	7.9%	0.2%	0.9%	1.7%	6.8%	0.0%	0.0%	0.7%	0.0%	14.1%	3.5%	54.0%
1995	8.0%	0.1%	1.7%	2.0%	0.0%	0.4%	0.0%	5.3%	0.0%	0.0%	0.0%	0.7%	9.8%	4.3%	67.8%
1996	3.4%	0.0%	0.0%	0.0%	0.0%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	0.9%	21.5%	5.1%	68.6%
1997	10.9%	0.3%	2.4%	4.4%	0.2%	0.0%	0.6%	0.5%	0.0%	0.0%	0.1%	1.0%	19.9%	10.5%	49.3%
1998	7.7%	1.4%	2.0%	2.4%	0.0%	0.0%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	12.9%	5.9%	67.0%
1999	10.1%	0.0%	3.0%	3.6%	0.0%	0.0%	0.7%	0.0%	0.4%	0.0%	0.3%	1.1%	13.0%	9.2%	58.6%
2000	17.8%	0.0%	2.5%	0.0%	0.0%	0.0%	0.4%	1.0%	0.0%	0.0%	3.0%	0.3%	22.1%	4.5%	48.5%
(79-00)	11.4%	0.4%	0.8%	6.3%	0.7%	1.0%	0.3%	6.2%	0.1%	0.3%	0.3%	0.8%	20.3%	3.9%	47.2%
(85-00)	9.8%	0.4%	1.0%	6.0%	0.4%	0.6%	0.3%	6.2%	0.0%	0.2%	0.3%	0.8%	24.2%	4.9%	44.8%

Table H.56. Columbia River Upriver Bright 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1979	19.8%	0.3%	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%
1980	22.2%	0.5%	0.6%	6.8%	1.7%	1.7%	0.1%	7.6%	1.1%	0.2%	0.0%	1.1%	6.3%	1.9%	48.3%
1981	17.4%	0.0%	0.4%	5.7%	1.1%	1.3%	0.0%	3.9%	0.3%	0.5%	0.2%	0.6%	3.6%	1.1%	64.0%
1982	9.0%	0.4%	0.3%	4.0%	0.3%	1.1%	0.2%	5.2%	0.0%	0.5%	0.0%	0.8%	2.5%	0.7%	75.1%
1983	22.5%	0.3%	0.0%	11.7%	1.9%	3.4%	0.2%	3.8%	0.2%	0.1%	0.0%	0.4%	7.4%	0.0%	48.1%
1984	18.3%	1.1%	0.2%	9.8%	2.2%	1.4%	0.2%	8.2%	0.2%	0.8%	0.2%	0.2%	14.4%	2.1%	40.9%
1985	13.2%	2.1%	0.3%	9.0%	0.8%	1.3%	0.0%	8.1%	0.1%	1.1%	0.1%	0.5%	30.9%	4.5%	28.2%
1986	13.2%	1.4%	0.1%	8.0%	1.2%	1.0%	0.0%	6.6%	0.1%	0.2%	0.1%	0.8%	31.6%	2.5%	33.2%
1987	19.4%	0.9%	0.4%	13.0%	2.0%	0.6%	0.1%	8.5%	0.0%	0.1%	0.3%	1.5%	31.1%	3.4%	18.9%
1988	11.6%	2.1%	0.5%	7.9%	0.6%	0.6%	0.0%	12.1%	0.0%	0.1%	0.0%	2.2%	44.0%	2.7%	15.7%
1989	14.2%	0.0%	0.2%	15.2%	0.2%	0.7%	0.5%	8.1%	0.0%	0.7%	0.0%	1.2%	40.3%	2.0%	16.6%
1990	13.8%	0.0%	1.1%	10.6%	0.8%	0.7%	0.0%	8.6%	0.0%	0.0%	0.0%	1.2%	32.0%	2.5%	28.6%
1991	7.6%	1.3%	3.3%	6.6%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	0.0%	1.0%	18.3%	4.3%	47.5%
1992	3.6%	0.0%	0.0%	3.6%	0.0%	2.4%	0.0%	13.3%	0.0%	0.6%	1.2%	0.0%	16.6%	6.9%	51.7%
1993	16.3%	0.0%	0.0%	7.5%	0.0%	0.3%	0.5%	18.4%	0.0%	0.0%	0.0%	1.6%	13.8%	5.9%	35.8%
1994	11.2%	1.8%	0.0%	8.4%	0.2%	0.9%	1.7%	7.3%	0.0%	0.0%	0.6%	0.0%	13.5%	3.5%	50.9%
1995	9.9%	0.1%	2.4%	2.6%	0.0%	0.5%	0.0%	7.0%	0.0%	0.0%	0.0%	0.8%	9.5%	4.3%	62.8%
1996	5.2%	0.0%	0.0%	0.1%	0.0%	0.2%	0.5%	0.0%	0.0%	0.0%	0.0%	1.0%	21.7%	5.4%	65.9%
1997	12.5%	0.5%	3.1%	4.8%	0.2%	0.0%	0.9%	0.6%	0.0%	0.1%	0.1%	1.0%	19.1%	10.7%	46.5%
1998	9.4%	4.2%	2.7%	2.8%	0.0%	0.0%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%	12.5%	5.9%	61.7%
1999	12.6%	0.0%	3.1%	3.8%	0.0%	0.0%	0.8%	0.0%	0.4%	0.0%	0.3%	1.2%	12.6%	9.4%	55.8%
2000	19.6%	0.0%	2.7%	0.0%	0.0%	0.0%	0.5%	1.0%	0.0%	0.0%	3.4%	0.3%	21.4%	4.6%	46.4%
(79-00)	13.7%	0.8%	1.0%	6.8%	0.8%	1.0%	0.3%	6.8%	0.1%	0.3%	0.3%	0.8%	19.3%	3.9%	44.0%
(85-00)	12.1%	0.9%	1.2%	6.5%	0.4%	0.6%	0.4%	6.8%	0.0%	0.2%	0.4%	0.9%	23.1%	4.9%	41.6%

Table H.57. Hanford Wild Brights 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1990	8.2%	0.4%	0.0%	4.2%	0.4%	0.4%	0.0%	8.2%	0.0%	0.2%	3.6%	0.4%	22.0%	6.9%	44.8%
1991	8.4%	0.0%	1.3%	9.1%	0.2%	0.0%	0.5%	4.6%	0.8%	0.0%	0.0%	1.0%	22.7%	4.3%	47.1%
1992	16.6%	1.4%	1.4%	5.9%	0.0%	0.0%	0.0%	15.9%	0.0%	0.0%	0.0%	1.0%	18.3%	2.8%	36.7%
1993	14.0%	0.0%	2.1%	2.9%	0.0%	0.5%	1.3%	5.2%	0.0%	1.8%	1.8%	3.6%	15.8%	8.1%	42.9%
1994	14.2%	1.1%	0.0%	4.7%	0.3%	1.1%	0.0%	4.3%	0.0%	0.3%	0.0%	0.7%	12.2%	5.3%	55.8%
1995	10.8%	0.0%	3.6%	4.2%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%	0.0%	9.6%	6.9%	62.6%
1996	9.8%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	27.5%	7.5%	54.7%
1997	14.4%	0.6%	0.9%	3.5%	0.0%	0.0%	1.8%	0.8%	0.0%	0.0%	0.0%	0.9%	13.5%	7.2%	56.4%
1998	11.4%	0.0%	0.0%	8.2%	0.0%	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	16.7%	6.1%	56.1%
1999	10.0%	1.2%	2.0%	6.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.2%	6.4%	62.4%
2000	17.2%	0.5%	1.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	28.2%	6.2%	45.9%
(90-00)	12.3%	0.5%	1.2%	4.5%	0.1%	0.2%	0.5%	3.8%	0.1%	0.2%	0.5%	0.7%	18.0%	6.2%	51.4%
(90-00)	12.3%	0.5%	1.2%	4.5%	0.1%	0.2%	0.5%	3.8%	0.1%	0.2%	0.5%	0.7%	18.0%	6.2%	51.4%

Table H.58. Hanford Wild Brights 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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1990	9.2%	1.5%	0.4%	5.0%	0.4%	0.4%	0.0%	8.8%	0.0%	0.2%	3.5%	0.6%	21.3%	6.9%	41.9%
1991	10.3%	0.0%	1.4%	9.8%	0.2%	0.0%	0.5%	5.0%	0.9%	0.0%	0.0%	1.1%	21.7%	4.4%	44.7%
1992	18.5%	4.2%	1.5%	7.0%	0.0%	0.0%	0.0%	17.0%	0.0%	0.0%	0.0%	0.9%	16.4%	2.4%	32.1%
1993	20.4%	0.0%	2.1%	3.0%	0.0%	0.5%	1.1%	6.0%	0.0%	1.6%	1.8%	3.7%	14.2%	7.8%	37.8%
1994	17.2%	2.5%	0.0%	5.1%	0.3%	1.0%	0.0%	4.6%	0.0%	0.3%	0.0%	0.6%	11.4%	5.3%	51.7%
1995	12.8%	0.0%	4.1%	5.3%	0.0%	0.0%	0.0%	2.8%	0.0%	0.3%	0.0%	0.0%	9.1%	6.9%	58.6%
1996	12.9%	0.0%	0.0%	0.2%	0.0%	0.6%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	26.6%	7.6%	51.9%
1997	15.7%	1.0%	1.0%	3.5%	0.0%	0.0%	2.3%	0.9%	0.0%	0.1%	0.0%	0.9%	13.1%	7.3%	54.0%
1998	13.1%	0.0%	0.0%	9.2%	0.0%	0.0%	1.7%	0.0%	0.0%	0.0%	0.0%	0.0%	16.2%	6.4%	53.5%
1999	13.2%	2.9%	2.2%	7.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.7%	6.3%	57.4%
2000	21.0%	0.9%	2.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	26.8%	6.3%	42.9%
(90-00)	14.9%	1.2%	1.4%	5.0%	0.1%	0.2%	0.5%	4.1%	0.1%	0.2%	0.5%	0.7%	17.0%	6.1%	47.9%
(90-00)	14.9%	1.2%	1.4%	5.0%	0.1%	0.2%	0.5%	4.1%	0.1%	0.2%	0.5%	0.7%	17.0%	6.1%	47.9%

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					Escapement
										Canada Net	Canada Sport	U.S. Troll	U.S. Net	U.S. Sport	
1981	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%
1982	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%
1983	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%
1984	10.9%	0.0%	0.0%	16.8%	3.5%	0.4%	0.0%	3.4%	0.0%	0.8%	0.0%	0.3%	0.4%	21.4%	42.2%
1985	12.2%	6.3%	0.0%	19.1%	1.1%	0.3%	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	19.8%	39.7%
1986	16.4%	0.0%	0.0%	8.9%	4.6%	0.6%	0.0%	2.1%	0.0%	0.0%	0.0%	0.0%	0.0%	16.0%	51.4%
1987	10.4%	0.0%	0.0%	15.3%	0.4%	0.0%	0.0%	2.4%	0.0%	0.0%	0.0%	2.6%	0.0%	24.1%	44.8%
1988	9.8%	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%
1989	8.4%	0.0%	0.0%	11.4%	0.0%	0.2%	0.0%	3.9%	0.0%	1.2%	0.0%	3.4%	0.0%	24.7%	46.8%
1990	11.9%	0.7%	0.0%	10.6%	0.3%	0.7%	1.3%	7.8%	0.0%	0.3%	0.0%	3.0%	0.0%	25.6%	37.9%
1991	18.5%	0.0%	0.5%	15.2%	0.1%	0.7%	0.8%	5.8%	0.0%	0.0%	0.0%	0.2%	0.0%	24.9%	33.4%
1992	2.6%	0.5%	0.0%	6.6%	0.8%	0.4%	1.8%	15.3%	0.0%	0.0%	0.0%	1.8%	0.0%	15.9%	54.3%
1993	7.7%	0.2%	0.2%	15.4%	0.2%	0.0%	1.1%	17.7%	0.0%	0.5%	0.0%	3.2%	0.0%	23.0%	30.8%
1994	8.8%	0.2%	1.0%	14.8%	0.2%	0.1%	2.1%	4.6%	0.0%	0.0%	0.0%	1.5%	0.0%	17.7%	49.0%
1995	6.9%	0.2%	0.3%	4.6%	0.1%	0.1%	0.6%	0.9%	0.0%	0.0%	0.2%	0.1%	0.0%	30.6%	55.5%
1996	11.2%	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%
1997	27.7%	0.0%	1.6%	3.3%	0.1%	0.0%	0.4%	0.2%	0.0%	0.0%	0.0%	1.4%	0.0%	19.2%	46.1%
1998	10.4%	0.4%	0.4%	11.1%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	32.5%	44.4%
1999	12.7%	0.1%	0.0%	2.7%	0.0%	0.0%	2.2%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	36.8%	45.0%
2000	12.4%	0.0%	0.5%	2.2%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	21.7%	62.4%
(81-00)	12.2%	0.5%	0.3%	11.4%	0.7%	0.3%	0.6%	4.5%	0.0%	0.1%	0.0%	1.4%	0.0%	23.8%	44.0%
(85-00)	11.7%	0.5%	0.3%	9.2%	0.5%	0.2%	0.7%	4.1%	0.0%	0.1%	0.0%	1.5%	0.0%	25.1%	46.0%

Table H.60. Salmon River 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
1981	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%
1982	15.0%	1.9%	0.3%	16.7%	1.2%	0.7%	0.0%	7.2%	0.0%	0.0%	0.0%	2.4%	0.0%	20.1%	34.5%
1983	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%
1984	12.5%	0.0%	0.0%	17.7%	3.4%	0.4%	0.0%	3.5%	0.0%	0.7%	0.0%	0.2%	0.4%	21.7%	39.5%
1985	15.4%	11.7%	0.0%	18.0%	1.1%	0.3%	0.0%	1.6%	0.0%	0.0%	0.0%	0.1%	0.0%	18.5%	33.2%
1986	23.6%	0.0%	0.0%	11.0%	4.3%	0.5%	0.0%	3.0%	0.0%	0.0%	0.0%	0.5%	0.0%	14.6%	42.5%
1987	17.7%	0.0%	0.0%	15.6%	0.5%	0.0%	0.0%	2.8%	0.0%	0.0%	0.0%	2.5%	0.0%	22.4%	38.6%
1988	15.4%	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%
1989	18.9%	0.0%	0.0%	16.2%	0.0%	0.1%	0.0%	4.6%	0.0%	1.0%	0.0%	3.3%	0.0%	20.6%	35.2%
1990	18.7%	2.0%	0.0%	12.9%	0.3%	0.6%	1.2%	8.0%	0.0%	0.2%	0.0%	3.0%	0.0%	22.4%	30.7%
1991	24.0%	0.0%	0.6%	16.5%	0.1%	0.7%	0.8%	6.1%	0.0%	0.0%	0.0%	0.2%	0.0%	22.8%	28.2%
1992	4.9%	1.5%	0.0%	8.4%	1.0%	0.3%	2.2%	17.7%	0.0%	0.0%	0.0%	2.0%	0.0%	15.1%	46.9%
1993	11.3%	0.6%	0.2%	17.6%	0.2%	0.0%	1.0%	19.1%	0.0%	0.4%	0.0%	3.3%	0.0%	20.6%	25.7%
1994	15.8%	0.4%	1.0%	15.0%	0.2%	0.1%	2.2%	4.7%	0.0%	0.0%	0.0%	1.5%	0.0%	16.6%	42.5%
1995	10.5%	0.2%	0.4%	6.8%	0.2%	0.1%	0.8%	1.2%	0.0%	0.0%	0.3%	0.1%	0.0%	29.7%	49.6%
1996	20.4%	0.0%	0.0%	2.7%	0.0%	0.0%	0.1%	0.7%	0.0%	0.0%	0.0%	4.7%	0.0%	45.8%	25.6%
1997	32.0%	0.0%	1.7%	3.4%	0.1%	0.0%	0.4%	0.2%	0.0%	0.0%	0.0%	1.5%	0.0%	18.7%	41.9%
1998	12.2%	1.3%	0.5%	12.2%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	32.3%	40.8%
1999	18.9%	0.1%	0.0%	3.1%	0.0%	0.0%	3.4%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	35.2%	38.8%
2000	17.2%	0.0%	0.6%	2.7%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	21.4%	57.2%
(81-00)	17.4%	1.0%	0.3%	12.7%	0.8%	0.3%	0.7%	5.0%	0.0%	0.1%	0.0%	1.4%	0.0%	22.2%	38.0%
(85-00)	17.3%	1.1%	0.3%	10.7%	0.6%	0.2%	0.8%	4.7%	0.0%	0.1%	0.0%	1.5%	0.0%	23.2%	39.4%

Appendix I. Abundance Indices for 1979 through 2002 for SEAK, NBC, and WCVI AABM fisheries,
from calibration #0206.

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	1.02	0.99
1983	1.21	1.14	0.83
1984	1.36	1.27	0.91
1985	1.26	1.26	0.92
1986	1.45	1.43	0.98
1987	1.72	1.70	1.30
1988	2.02	1.77	1.02
1989	1.80	1.65	0.89
1990	1.85	1.62	0.84
1991	1.79	1.49	0.70
1992	1.65	1.39	0.72
1993	1.66	1.39	0.65
1994	1.55	1.24	0.46
1995	1.02	0.92	0.38
1996	0.89	0.89	0.43
1997	1.19	1.07	0.50
1998	1.17	0.98	0.48
1999	1.08	0.97	0.44
2000	1.06	0.99	0.45
2001	1.29	1.22	0.68
2002	1.74	1.45	0.95

Appendix J. Model estimates of the stock composition of the AABM, and other troll and sport fisheries. “Percent of Catch” represents the stock composition of a specific fishery; “Percent of Catch, All Fisheries” represents the proportion of the total catch of a stock that is caught in a specific fishery; “Percent of Return” represents the proportion of total return (catch + escapement) caught in a specific fishery.

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Table J. 1. Southeast Alaska All Gear.

Model Stock	2001	Average (1985 - 2000)			Escapement Indicator Stocks
	Catch as Percent of Fishery	Catch as Percent of Fishery	Catch as Percent of All Fisheries	Catch as Percent of Total Return	
WCVI Hatchery	5.34%	17.45%	36.75%	15.27%	NA
North/Central BC	22.54%	16.66%	35.37%	11.81%	Yakoun Nass Skeena Area 6 Index Area 8 Index Rivers Inlet Smith Inlet
Columbia Upriver Bright	16.83%	15.60%	24.10%	12.14%	Columbia Upriver Bright
Oregon Coastal North Migrating	12.03%	13.27%	29.74%	14.60%	Oregon Coastal
Fraser Early	6.90%	5.67%	22.28%	6.27%	Upper Fraser Middle Fraser Thompson
Alaska South SE	7.48%	4.80%	96.23%	39.51%	King Salmon Andrew Creek Blossom Keta Unuk Chickamin
WCVI Wild	1.05%	4.79%	36.72%	15.09%	WCVI
Upper Georgia Strait	8.47%	4.34%	34.68%	20.50%	Upper Georgia Strait
Mid-Columbia Brights	5.02%	4.17%	29.27%	11.49%	Not Represented
Washington Coastal Wild	2.18%	3.67%	15.26%	9.32%	Grays Harbor Fall Quillayute Fall Hoh Fall Queets Fall
WA Coastal Hatchery	1.50%	2.84%	14.33%	8.69%	NA
Willamette River Hatchery	2.54%	2.01%	9.42%	4.41%	NA
Columbia Upriver Summer	5.71%	1.91%	30.43%	11.80%	Columbia Upriver Summer
Lewis River Wild	0.66%	0.88%	14.37%	6.26%	Lewis River
Lower Georgia Strait Hatchery	0.65%	0.47%	2.32%	1.51%	NA
Lower Georgia Strait	0.23%	0.33%	2.60%	1.66%	Lower Georgia Strait
Fraser Late	0.16%	0.26%	0.41%	0.15%	Harrison
Puget Sound Hatchery Fingerling	0.20%	0.17%	0.47%	0.26%	NA
Fall Cowlitz Hatchery	0.02%	0.17%	6.21%	2.54%	NA
Skagit Summer/Fall	0.11%	0.11%	3.82%	1.10%	Skagit Summer/Fall
Spring Cowlitz Hatchery	0.03%	0.09%	1.16%	0.78%	NA
Puget Sound Natural	0.04%	0.08%	0.46%	0.26%	Green
Stillaguamish Summer/Fall	0.09%	0.07%	13.97%	5.59%	Stillaguamish
Nooksack Fall	0.04%	0.06%	0.14%	0.11%	NA
Snake River Fall	0.12%	0.05%	7.57%	4.86%	Not Represented
Snohomish Summer/Fall	0.05%	0.04%	3.07%	0.90%	Snohomish
Puget Sound Yearling	0.03%	0.03%	0.53%	0.36%	NA
Spring Creek Hatchery	0.00%	0.00%	0.00%	0.00%	NA
Lower Bonneville Hatchery	0.00%	0.00%	0.00%	0.00%	NA
Nooksack Spring	0.00%	0.00%	0.00%	0.00%	Not Represented

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

Model Stock	2001	Average (1985 - 2000)			Escapement Indicator Stocks
	Catch as Percent of Fishery	Catch as Percent of Fishery	Catch as Percent of All Fisheries	Catch as Percent of Total Return	
North/Central BC	60.72%	32.47%	46.26%	16.18%	Yakoun Nass Skeena Area 6 Index Area 8 Index Rivers Inlet Smith Inlet
Oregon Coastal North Migrating	3.80%	15.84%	28.89%	15.34%	Oregon Coastal
Columbia Upriver Bright	4.14%	9.27%	11.92%	6.32%	Columbia Upriver Bright
WCVI Hatchery	1.29%	8.94%	13.82%	6.43%	NA
Fraser Early	1.59%	4.74%	15.53%	5.04%	Upper Fraser Middle Fraser Thompson
Upper Georgia Strait	11.52%	4.57%	27.44%	16.91%	Upper Georgia Strait
Washington Coastal Wild	0.66%	4.39%	14.59%	9.69%	Grays Harbor Fall Quillayute Fall Hoh Fall Queets Fall
WA Coastal Hatchery	0.48%	3.39%	14.41%	9.04%	NA
Willamette River Hatchery	1.18%	3.87%	13.49%	7.13%	NA
WCVI Wild	0.26%	2.43%	13.68%	6.28%	WCVI
Mid-Columbia Brights	1.22%	2.36%	13.89%	5.93%	Not Represented
Columbia Upriver Summer	6.42%	1.74%	20.74%	8.60%	Columbia Upriver Summer
Lower Georgia Strait Hatchery	2.16%	1.37%	5.15%	3.46%	NA
Fraser Late	0.83%	0.92%	0.97%	0.42%	Harrison
Lower Georgia Strait	0.76%	0.90%	5.08%	3.41%	Lower Georgia Strait
Skagit Summer/Fall	0.60%	0.46%	12.22%	3.71%	Skagit Summer/Fall
Lewis River Wild	0.25%	0.44%	4.83%	2.57%	Lewis River
Nooksack Fall	0.70%	0.40%	0.83%	0.64%	NA
Puget Sound Hatchery Fingerling	0.55%	0.35%	0.75%	0.43%	NA
Spring Cowlitz Hatchery	0.07%	0.25%	2.54%	1.86%	NA
Snohomish Summer/Fall	0.28%	0.22%	11.13%	3.71%	Snohomish
Puget Sound Natural	0.10%	0.16%	0.65%	0.39%	Green
Fall Cowlitz Hatchery	0.02%	0.15%	3.95%	1.85%	NA
Alaska South SE	0.07%	0.13%	2.61%	1.01%	King Salmon Andrew Creek Blossom Keta Unuk Chickamin
Puget Sound Yearling	0.19%	0.13%	1.58%	1.11%	NA
Stillaguamish Summer/Fall	0.08%	0.05%	6.90%	2.96%	Stillaguamish
Snake River Fall	0.04%	0.04%	6.51%	4.53%	Not Represented
Spring Creek Hatchery	0.01%	0.01%	0.06%	0.05%	NA
Nooksack Spring	0.00%	0.01%	1.40%	0.55%	Not Represented
Lower Bonneville Hatchery	0.00%	0.00%	0.00%	0.00%	NA

Table J. 3. Central B.C. Troll.

Model Stock	2001	Average (1985 - 2000)			Escapement Indicator Stocks
	Catch as Percent of Fishery	Catch as Percent of Fishery	Catch as Percent of All Fisheries	Catch as Percent of Total Return	
Fraser Late	17.81%	21.81%	3.02%	1.75%	Harrison
WCVI Hatchery	9.13%	16.68%	4.45%	2.08%	NA
Columbia Upriver Bright	10.05%	7.40%	1.39%	0.79%	Columbia Upriver Bright
North/Central BC	9.74%	6.32%	1.97%	0.66%	Yakoun
					Nass
					Skeena
					Area 6 Index
					Area 8 Index
					Rivers Inlet
					Smith Inlet
Upper Georgia Strait	11.57%	5.29%	5.15%	3.31%	Upper Georgia Strait
WCVI Wild	1.83%	4.47%	4.37%	2.01%	WCVI
Lower Bonneville Hatchery	2.44%	4.43%	1.07%	0.59%	NA
Fraser Early	4.72%	3.37%	1.52%	0.53%	Upper Fraser
					Middle Fraser
					Thompson
Washington Coastal Wild	2.13%	3.32%	1.66%	1.14%	Grays Harbor Fall
					Quillayute Fall
					Hoh Fall
					Queets Fall
Lower Georgia Strait Hatchery	4.87%	3.09%	1.89%	1.39%	NA
Columbia Upriver Summer	10.20%	2.88%	4.94%	2.37%	Columbia Upriver Summer
WA Coastal Hatchery	1.67%	2.60%	1.67%	1.05%	NA
Mid-Columbia Brights	3.35%	1.90%	1.62%	0.77%	Not Represented
Lower Georgia Strait	1.67%	1.88%	1.78%	1.34%	Lower Georgia Strait
Oregon Coastal North Migrating	1.67%	1.69%	0.49%	0.26%	Oregon Coastal
Nooksack Fall	1.22%	1.69%	0.56%	0.46%	NA
Puget Sound Hatchery Fingerling	1.83%	1.26%	0.40%	0.27%	NA
Skagit Summer/Fall	1.07%	0.93%	3.16%	1.27%	Skagit Summer/Fall
Puget Sound Natural	0.30%	0.62%	0.38%	0.27%	Green
Lewis River Wild	0.46%	0.55%	0.80%	0.49%	Lewis River
Snohomish Summer/Fall	0.46%	0.45%	2.54%	1.29%	Snohomish
Puget Sound Yearling	0.30%	0.32%	0.57%	0.45%	NA
Spring Creek Hatchery	0.76%	0.24%	0.14%	0.12%	NA
Willamette River Hatchery	0.30%	0.23%	0.12%	0.07%	NA
Spring Cowlitz Hatchery	0.00%	0.14%	0.20%	0.18%	NA
Stillaguamish Summer/Fall	0.15%	0.11%	2.50%	1.25%	Stillaguamish
Snake River Fall	0.30%	0.05%	0.97%	0.73%	Not Represented
Nooksack Spring	0.00%	0.02%	0.56%	0.27%	Not Represented
Fall Cowlitz Hatchery	0.00%	0.01%	0.06%	0.03%	NA
Alaska South SE	0.00%	0.00%	0.02%	0.01%	King Salmon
					Andrew Creek
					Blossom
					Keta
					Unuk
					Chickamin

Table J. 4. WCVI Troll and Outside Sport.

Model Stock	2001	Average (1985–2000)			Escapement Indicator Stocks
	Catch as Percent of Fishery	Catch as Percent of Fishery	Catch as Percent of All Fisheries	Catch as Percent of Total Return	
Fraser Late	13.89%	21.35%	21.42%	12.26%	Harrison
Lower Bonneville Hatchery	20.12%	16.19%	34.13%	18.40%	NA
Columbia Upriver Bright	11.67%	9.66%	13.65%	7.37%	Columbia Upriver Bright
Puget Sound Hatchery Fingerling	8.44%	8.34%	18.41%	12.22%	NA
WCVI Hatchery	2.06%	6.69%	12.05%	6.01%	NA
Nooksack Fall	3.10%	5.39%	13.32%	10.92%	NA
Oregon Coastal North Migrating	3.61%	4.96%	10.28%	5.40%	Oregon Coastal
Spring Creek Hatchery	15.73%	4.41%	17.47%	14.41%	NA
Puget Sound Natural	1.71%	4.03%	17.51%	12.29%	Green
Mid-Columbia Brights	4.35%	2.69%	15.98%	7.23%	Not Represented
Columbia Upriver Summer	5.50%	2.11%	27.95%	12.68%	Columbia Upriver Summer
Washington Coastal Wild	1.09%	2.01%	7.39%	4.98%	Grays Harbor Fall
					Quillayute Fall
					Hoh Fall
					Queets Fall
WCVI Wild	0.42%	1.83%	11.97%	5.86%	WCVI
Willamette River Hatchery	1.60%	1.62%	5.89%	3.41%	NA
WA Coastal Hatchery	0.80%	1.60%	7.50%	4.76%	NA
Fraser Early	1.03%	1.29%	4.27%	1.41%	Upper Fraser
					Middle Fraser
					Thompson
Fall Cowlitz Hatchery	0.15%	0.87%	29.13%	15.19%	NA
Puget Sound Yearling	0.62%	0.87%	11.73%	9.23%	NA
Skagit Summer/Fall	0.81%	0.85%	22.11%	8.29%	Skagit Summer/Fall
Lewis River Wild	0.71%	0.77%	11.03%	5.91%	Lewis River
Spring Cowlitz Hatchery	0.20%	0.52%	5.46%	5.00%	NA
Lower Georgia Strait Hatchery	0.59%	0.44%	1.83%	1.31%	NA
Snohomish Summer/Fall	0.37%	0.41%	18.10%	8.36%	Snohomish
North/Central BC	0.37%	0.34%	0.70%	0.23%	Yakoun
					Nass
					Skeena
					Area 6 Index
					Area 8 Index
					Rivers Inlet
					Smith Inlet
Lower Georgia Strait	0.21%	0.30%	1.79%	1.31%	Lower Georgia Strait
Snake River Fall	0.59%	0.21%	28.43%	20.60%	Not Represented
Stillaguamish Summer/Fall	0.10%	0.10%	16.09%	7.83%	Stillaguamish
Upper Georgia Strait	0.10%	0.09%	0.69%	0.44%	Upper Georgia Strait
Nooksack Spring	0.05%	0.05%	10.15%	4.58%	Not Represented
Alaska South SE	0.00%	0.00%	0.00%	0.00%	King Salmon
					Andrew Creek
					Blossom
					Keta
					Unuk
					Chickamin

Table J. 5. Georgia Strait Sport and Troll.

Model Stock	2001	Average (1985–2000)			Escapement Indicator Stocks
	Catch as Percent of Fishery	Catch as Percent of Fishery	Catch as Percent of All Fisheries	Catch as Percent of Total Return	
Fraser Late	38.78%	49.05%	42.21%	23.04%	Harrison
Nooksack Fall	9.76%	10.96%	21.90%	17.42%	NA
Lower Georgia Strait Hatchery	15.28%	9.90%	35.59%	25.27%	NA
Lower Georgia Strait	5.41%	6.94%	36.52%	26.46%	Lower Georgia Strait
Puget Sound Hatchery Fingerling	6.67%	4.51%	8.48%	5.37%	NA
Fraser Early	5.42%	3.67%	10.18%	2.97%	Upper Fraser Middle Fraser Thompson
Upper Georgia Strait	5.86%	2.33%	13.68%	8.31%	Upper Georgia Strait
Puget Sound Natural	1.25%	2.12%	7.76%	5.11%	Green
Puget Sound Yearling	2.26%	1.99%	21.38%	16.29%	NA
Lower Bonneville Hatchery	1.63%	1.87%	3.27%	1.48%	NA
Columbia Upriver Bright	1.53%	1.10%	1.24%	0.64%	Columbia Upriver Bright
Washington Coastal Wild	0.71%	1.04%	3.19%	2.04%	Grays Harbor Fall Quillayute Fall Hoh Fall Queets Fall
Skagit Summer/Fall	0.99%	0.85%	19.66%	6.84%	Skagit Summer/Fall
WA Coastal Hatchery	0.51%	0.83%	3.12%	1.96%	NA
WCVI Hatchery	0.40%	0.80%	1.35%	0.53%	NA
Snohomish Summer/Fall	0.46%	0.41%	17.47%	6.79%	Snohomish
Spring Creek Hatchery	1.14%	0.35%	1.21%	0.99%	NA
Mid-Columbia Brights	0.55%	0.30%	1.56%	0.66%	Not Represented
Nooksack Spring	0.38%	0.27%	53.17%	23.81%	Not Represented
WCVI Wild	0.08%	0.22%	1.34%	0.51%	WCVI
Columbia Upriver Summer	0.62%	0.21%	2.37%	1.01%	Columbia Upriver Summer
Stillaguamish Summer/Fall	0.23%	0.17%	22.82%	10.55%	Stillaguamish
Willamette River Hatchery	0.07%	0.06%	0.19%	0.10%	NA
Lewis River Wild	0.00%	0.02%	0.19%	0.12%	Lewis River
North/Central BC	0.00%	0.02%	0.07%	0.02%	Yakoun Nass Skeena Area 6 Index Area 8 Index Rivers Inlet Smith Inlet
Spring Cowlitz Hatchery	0.00%	0.02%	0.13%	0.10%	NA
Fall Cowlitz Hatchery	0.00%	0.00%	0.04%	0.02%	NA
Snake River Fall	0.00%	0.00%	0.11%	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

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

Model Stock	2001	Average (1985–2000)			Escapement Indicator Stocks
	Catch as Percent of Fishery	Catch as Percent of Fishery	Catch as Percent of All Fisheries	Catch as Percent of Total Return	
Lower Bonneville Hatchery	29.04%	31.86%	35.67%	17.49%	NA
Fraser Late	11.27%	23.56%	11.76%	6.00%	Harrison
Spring Creek Hatchery	41.23%	16.43%	29.14%	24.40%	NA
Puget Sound Hatchery Fingerling	2.79%	4.15%	4.19%	2.56%	NA
Columbia Upriver Bright	4.10%	4.03%	2.71%	1.45%	Columbia Upriver Bright
Spring Cowlitz Hatchery	1.08%	3.47%	19.98%	15.35%	NA
Nooksack Fall	0.98%	2.47%	2.78%	2.22%	NA
Fall Cowlitz Hatchery	0.34%	2.29%	35.94%	18.31%	NA
Oregon Coastal North Migrating	1.36%	2.07%	2.05%	1.04%	Oregon Coastal
Puget Sound Natural	0.56%	1.93%	3.99%	2.51%	Green
Willamette River Hatchery	1.25%	1.87%	3.38%	1.77%	NA
Lewis River Wild	1.17%	1.36%	10.92%	4.67%	Lewis River
Mid-Columbia Brights	1.44%	1.14%	3.19%	1.37%	Not Represented
Washington Coastal Wild	0.41%	1.10%	1.81%	1.17%	Grays Harbor Fall Quillayute Fall Hoh Fall Queets Fall
WA Coastal Hatchery	0.30%	0.89%	1.86%	1.13%	NA
Columbia Upriver Summer	1.36%	0.53%	3.35%	1.41%	Columbia Upriver Summer
Snake River Fall	0.81%	0.36%	21.24%	14.79%	Not Represented
Fraser Early	0.27%	0.16%	0.31%	0.09%	Upper Fraser Middle Fraser Thompson
Puget Sound Yearling	0.10%	0.15%	1.00%	0.73%	NA
Alaska South SE	0.07%	0.09%	0.76%	0.29%	King Salmon Andrew Creek Blossom Keta Unuk Chickamin
Lower Georgia Strait Hatchery	0.04%	0.03%	0.08%	0.05%	NA
WCVI Hatchery	0.01%	0.03%	0.03%	0.01%	NA
Lower Georgia Strait	0.02%	0.02%	0.08%	0.05%	Lower Georgia Strait
WCVI Wild	0.00%	0.01%	0.02%	0.01%	WCVI
Skagit Summer/Fall	0.00%	0.00%	0.03%	0.01%	Skagit Summer/Fall
Snohomish Summer/Fall	0.00%	0.00%	0.02%	0.01%	Snohomish
Upper Georgia Strait	0.00%	0.00%	0.00%	0.00%	Upper Georgia Strait
North/Central BC	0.00%	0.00%	0.00%	0.00%	Yakoun Nass Skeena Area 6 Index Area 8 Index Rivers Inlet Smith Inlet
Stillaguamish Summer/Fall	0.00%	0.00%	0.00%	0.00%	Stillaguamish
Nooksack Spring	0.00%	0.00%	0.00%	0.00%	Not Represented

Appendix K. Abundance indices and stock composition of AABM fisheries, from Calibration #0206.

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Table K.1. Abundance indices (AIs) for the Southeast Alaska troll fishery by stock and year (stock groups 1-15). Numbers represent the stock or stock group contribution to the total AI: the summation across all 30 stocks and stock groups equals the AI total for each calendar year.

Year	Alaska South SE	North Central	Fraser Early	Fraser Late	WCVI Hatchery	WCVI Natural	Georg. St. Upper	Georg. St. Lwr. Nat.	Georg. St. Lwr. Hat.	Nooksack Fall	Pug. Snd. Fing.	Pug. Snd. Nat. F.	Pug. Snd. Year.	Nooksack Spring	Skagit Wild	AI Total
1979	0.03	0.12	0.07	0.00	0.05	0.07	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98
1980	0.03	0.13	0.05	0.00	0.11	0.15	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02
1981	0.04	0.14	0.05	0.00	0.09	0.12	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.92
1982	0.05	0.14	0.05	0.00	0.20	0.21	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.08
1983	0.06	0.16	0.05	0.00	0.30	0.14	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.21
1984	0.06	0.19	0.06	0.00	0.28	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.36
1985	0.06	0.21	0.08	0.00	0.16	0.06	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.26
1986	0.07	0.22	0.08	0.00	0.12	0.04	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.45
1987	0.07	0.24	0.08	0.00	0.09	0.03	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.72
1988	0.06	0.25	0.08	0.00	0.22	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.02
1989	0.04	0.26	0.07	0.00	0.32	0.08	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80
1990	0.03	0.26	0.07	0.00	0.49	0.10	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.85
1991	0.03	0.27	0.07	0.00	0.61	0.14	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.79
1992	0.04	0.26	0.06	0.00	0.58	0.15	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.65
1993	0.04	0.24	0.06	0.00	0.53	0.16	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.66
1994	0.03	0.22	0.07	0.00	0.41	0.13	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.55
1995	0.03	0.23	0.07	0.00	0.15	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02
1996	0.03	0.23	0.08	0.00	0.05	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89
1997	0.04	0.24	0.09	0.00	0.17	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.19
1998	0.04	0.23	0.08	0.00	0.27	0.07	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17
1999	0.05	0.24	0.07	0.00	0.13	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.08
2000	0.06	0.28	0.07	0.00	0.05	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.06
2001	0.07	0.32	0.09	0.00	0.07	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.29
2002	0.05	0.31	0.11	0.00	0.20	0.04	0.11	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.74
Average	0.05	0.22	0.07	0.00	0.23	0.08	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.36

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

Year	Stillaguamish Wild	Snohomish Wild	WA Co. Hat	Upriver Brights	Spring Ck. Hat.	L. Bonn. Hat.	Fall Cow. Hat.	Lewis R. Wild	Willamette R.	Spr. Cow. Hat.	Col. R. Summer	Oregon Coastal	WA Co. Wild	Lyons Ferry	Mid. Col. R. Brights	AI Total
1979	0.00	0.00	0.03	0.18	0.00	0.00	0.03	0.02	0.02	0.00	0.06	0.20	0.03	0.00	0.00	0.98
1980	0.00	0.00	0.03	0.14	0.00	0.00	0.03	0.02	0.03	0.00	0.06	0.15	0.04	0.00	0.00	1.02
1981	0.00	0.00	0.02	0.11	0.00	0.00	0.02	0.02	0.03	0.01	0.05	0.13	0.04	0.00	0.01	0.92
1982	0.00	0.00	0.02	0.06	0.00	0.00	0.02	0.01	0.03	0.00	0.04	0.13	0.04	0.00	0.01	1.08
1983	0.00	0.00	0.02	0.09	0.00	0.00	0.01	0.01	0.04	0.00	0.03	0.19	0.03	0.00	0.02	1.21
1984	0.00	0.00	0.02	0.21	0.00	0.00	0.01	0.01	0.04	0.00	0.03	0.26	0.04	0.00	0.02	1.36
1985	0.00	0.00	0.02	0.24	0.00	0.00	0.01	0.01	0.03	0.00	0.03	0.25	0.04	0.00	0.01	1.26
1986	0.00	0.00	0.03	0.35	0.00	0.00	0.00	0.01	0.04	0.00	0.03	0.29	0.05	0.00	0.02	1.45
1987	0.00	0.00	0.04	0.50	0.00	0.00	0.00	0.02	0.05	0.01	0.05	0.34	0.06	0.00	0.07	1.72
1988	0.00	0.00	0.05	0.54	0.00	0.00	0.01	0.04	0.06	0.00	0.05	0.32	0.07	0.00	0.14	2.02
1989	0.00	0.00	0.06	0.33	0.00	0.00	0.01	0.04	0.05	0.00	0.04	0.24	0.08	0.00	0.12	1.80
1990	0.00	0.00	0.05	0.25	0.00	0.00	0.00	0.02	0.07	0.00	0.03	0.25	0.07	0.00	0.08	1.85
1991	0.00	0.00	0.05	0.13	0.00	0.00	0.00	0.01	0.05	0.00	0.02	0.24	0.06	0.00	0.05	1.79
1992	0.00	0.00	0.05	0.10	0.00	0.00	0.00	0.01	0.03	0.00	0.02	0.20	0.05	0.00	0.04	1.65
1993	0.00	0.00	0.05	0.18	0.00	0.00	0.00	0.01	0.02	0.00	0.02	0.20	0.05	0.00	0.05	1.66
1994	0.00	0.00	0.05	0.21	0.00	0.00	0.00	0.01	0.02	0.00	0.02	0.24	0.05	0.00	0.05	1.55
1995	0.00	0.00	0.04	0.13	0.00	0.00	0.00	0.01	0.02	0.00	0.02	0.17	0.04	0.00	0.04	1.02
1996	0.00	0.00	0.04	0.13	0.00	0.00	0.00	0.01	0.01	0.00	0.02	0.13	0.04	0.00	0.05	0.89
1997	0.00	0.00	0.03	0.18	0.00	0.00	0.00	0.01	0.02	0.00	0.02	0.16	0.04	0.00	0.09	1.19
1998	0.00	0.00	0.02	0.12	0.00	0.00	0.00	0.01	0.02	0.00	0.02	0.14	0.04	0.00	0.06	1.17
1999	0.00	0.00	0.02	0.21	0.00	0.00	0.00	0.00	0.02	0.00	0.03	0.14	0.03	0.00	0.06	1.08
2000	0.00	0.00	0.02	0.19	0.00	0.00	0.00	0.00	0.03	0.00	0.05	0.16	0.02	0.00	0.05	1.06
2001	0.00	0.00	0.02	0.23	0.00	0.00	0.00	0.01	0.04	0.00	0.08	0.19	0.03	0.00	0.07	1.29
2002	0.00	0.00	0.02	0.34	0.00	0.00	0.00	0.02	0.03	0.00	0.14	0.19	0.03	0.00	0.15	1.74
Average	0.00	0.00	0.03	0.21	0.00	0.00	0.01	0.01	0.03	0.00	0.04	0.21	0.04	0.00	0.05	1.36

Table K.2. Abundance indices (AIs) for the Northern BC troll fishery by stock and year (stock groups 1-15). Numbers represent the stock or stock group contribution to the total AI; the summation across all 30 stocks and stock groups equals the AI total for each calendar year.

Year	Alaska South SE	North Central	Fraser Early	Fraser Late	WCVI Hatchery	WCVI Natural	Georg. St. Upper	Georg. St. Lwr. Nat.	Georg. St. Lwr. Hat.	Nooksack Fall	Pug. Snd. Fing.	Pug. Snd. Nat. F.	Pug. Snd. Year.	Nooksack Spring	Skagit Wild	AI Total
1979	0.00	0.08	0.08	0.02	0.04	0.06	0.06	0.02	0.02	0.01	0.00	0.00	0.00	0.02	0.01	1.05
1980	0.00	0.09	0.07	0.02	0.06	0.08	0.06	0.02	0.03	0.01	0.00	0.00	0.00	0.00	0.01	0.98
1981	0.00	0.09	0.06	0.02	0.06	0.08	0.06	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.01	0.94
1982	0.00	0.10	0.06	0.02	0.13	0.11	0.05	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.01	1.02
1983	0.00	0.11	0.07	0.02	0.17	0.08	0.04	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	1.14
1984	0.00	0.12	0.07	0.02	0.14	0.05	0.05	0.01	0.03	0.01	0.00	0.00	0.00	0.00	0.01	1.27
1985	0.00	0.13	0.09	0.02	0.09	0.03	0.07	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.01	1.26
1986	0.00	0.15	0.10	0.01	0.06	0.02	0.07	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.01	1.43
1987	0.00	0.15	0.10	0.01	0.07	0.02	0.07	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	1.70
1988	0.00	0.16	0.09	0.01	0.13	0.04	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	1.77
1989	0.00	0.17	0.09	0.01	0.20	0.05	0.07	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	1.65
1990	0.00	0.17	0.09	0.01	0.29	0.06	0.05	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	1.62
1991	0.00	0.17	0.08	0.01	0.34	0.08	0.05	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.49
1992	0.00	0.17	0.08	0.01	0.33	0.09	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.39
1993	0.00	0.16	0.08	0.01	0.30	0.09	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.39
1994	0.00	0.16	0.08	0.00	0.20	0.06	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.24
1995	0.00	0.15	0.09	0.00	0.07	0.02	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.92
1996	0.00	0.15	0.09	0.01	0.04	0.01	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.89
1997	0.00	0.16	0.11	0.01	0.12	0.03	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.07
1998	0.00	0.16	0.10	0.01	0.13	0.03	0.04	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.98
1999	0.00	0.17	0.09	0.01	0.07	0.01	0.05	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.97
2000	0.00	0.19	0.09	0.01	0.03	0.01	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.99
2001	0.00	0.20	0.10	0.01	0.06	0.01	0.11	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	1.22
2002	0.00	0.21	0.12	0.01	0.12	0.02	0.12	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	1.45
Average	0.00	0.15	0.09	0.01	0.13	0.05	0.05	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	1.24

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

Year	Stillaguamish Wild	Snohomish Wild	WA Co. Hat	Upriver Brights	Spring Ck. Hat.	L. Bonn. Hat.	Fall Cow. Hat.	Lewis R. Wild	Willamette R.	Spr. Cow. Hat.	Col. R. Summer	Oregon Coastal	WA Co. Wild	Lyons Ferry	Mid. Col. R. Brights	AI Total
1979	0.00	0.01	0.04	0.12	0.00	0.00	0.02	0.01	0.06	0.01	0.04	0.27	0.06	0.00	0.00	1.05
1980	0.00	0.01	0.04	0.09	0.00	0.00	0.02	0.01	0.07	0.01	0.03	0.21	0.06	0.00	0.00	0.98
1981	0.00	0.00	0.04	0.07	0.00	0.00	0.02	0.01	0.07	0.01	0.03	0.19	0.06	0.00	0.01	0.94
1982	0.00	0.00	0.03	0.05	0.00	0.00	0.01	0.01	0.09	0.01	0.02	0.23	0.06	0.00	0.01	1.02
1983	0.00	0.00	0.03	0.07	0.00	0.00	0.00	0.01	0.09	0.01	0.02	0.31	0.06	0.00	0.02	1.14
1984	0.00	0.00	0.03	0.14	0.00	0.00	0.00	0.01	0.08	0.01	0.02	0.37	0.06	0.00	0.01	1.27
1985	0.00	0.00	0.03	0.17	0.00	0.00	0.00	0.00	0.08	0.00	0.02	0.37	0.07	0.00	0.01	1.26
1986	0.00	0.00	0.05	0.26	0.00	0.00	0.00	0.01	0.10	0.01	0.03	0.42	0.09	0.00	0.02	1.43
1987	0.00	0.00	0.07	0.35	0.00	0.00	0.00	0.02	0.13	0.01	0.03	0.47	0.11	0.00	0.06	1.70
1988	0.00	0.00	0.09	0.35	0.00	0.00	0.01	0.02	0.14	0.01	0.03	0.40	0.12	0.00	0.09	1.77
1989	0.00	0.00	0.10	0.21	0.00	0.00	0.00	0.01	0.14	0.01	0.02	0.33	0.13	0.00	0.07	1.65
1990	0.00	0.00	0.09	0.15	0.00	0.00	0.00	0.01	0.14	0.00	0.02	0.34	0.12	0.00	0.05	1.62
1991	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.01	0.10	0.00	0.02	0.30	0.10	0.00	0.03	1.49
1992	0.00	0.00	0.09	0.07	0.00	0.00	0.00	0.01	0.07	0.01	0.01	0.28	0.08	0.00	0.03	1.39
1993	0.00	0.00	0.09	0.12	0.00	0.00	0.00	0.00	0.06	0.00	0.01	0.30	0.08	0.00	0.03	1.39
1994	0.00	0.00	0.08	0.13	0.00	0.00	0.00	0.01	0.05	0.00	0.01	0.30	0.07	0.00	0.03	1.24
1995	0.00	0.00	0.07	0.08	0.00	0.00	0.00	0.01	0.04	0.00	0.01	0.22	0.07	0.00	0.03	0.92
1996	0.00	0.00	0.06	0.10	0.00	0.00	0.00	0.01	0.04	0.00	0.01	0.20	0.07	0.00	0.04	0.89
1997	0.00	0.00	0.05	0.12	0.00	0.00	0.00	0.00	0.05	0.00	0.01	0.22	0.07	0.00	0.06	1.07
1998	0.00	0.00	0.03	0.08	0.00	0.00	0.00	0.00	0.05	0.00	0.02	0.20	0.05	0.00	0.04	0.98
1999	0.00	0.00	0.03	0.14	0.00	0.00	0.00	0.00	0.06	0.00	0.03	0.20	0.04	0.00	0.04	0.97
2000	0.00	0.00	0.03	0.13	0.00	0.00	0.00	0.00	0.08	0.00	0.05	0.23	0.04	0.00	0.03	0.99
2001	0.00	0.00	0.03	0.17	0.00	0.00	0.00	0.01	0.08	0.00	0.07	0.25	0.04	0.00	0.05	1.22
2002	0.00	0.00	0.03	0.23	0.00	0.00	0.00	0.01	0.06	0.00	0.08	0.24	0.05	0.00	0.10	1.45
Average	0.00	0.00	0.05	0.14	0.00	0.00	0.00	0.01	0.08	0.00	0.03	0.28	0.07	0.00	0.04	1.24

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Table K.3. **Abundance indices (AIs) for the WCVI troll fishery by stock and year (stock groups 1-15).** Numbers represent the portion of the AI total estimated for each stock group; the summation across all 30 stock groups equals the AI total for each.

	Alaska	North	Fraser	Fraser	WCVI	WCVI	Georg. St.	Georg. St.	Georg. St.	Nooksack	Pug. Snd.	Pug. Snd.	Pug. Snd.	Nooksack	Skagit	AI
Year	South SE	Central	Early	Late	Hatchery	Natural	Upper	Lwr. Nat.	Lwr. Hat.	Fall	Fing.	Nat. F.	Year.	Spring	Wild	Total
1979	0.00	0.00	0.01	0.28	0.01	0.02	0.00	0.01	0.01	0.07	0.04	0.02	0.02	0.00	0.02	1.10
1980	0.00	0.00	0.01	0.21	0.01	0.02	0.00	0.01	0.01	0.08	0.04	0.02	0.02	0.00	0.02	0.96
1981	0.00	0.00	0.01	0.25	0.02	0.02	0.00	0.00	0.01	0.08	0.04	0.01	0.02	0.00	0.01	0.95
1982	0.00	0.00	0.01	0.26	0.04	0.03	0.00	0.00	0.00	0.08	0.04	0.02	0.02	0.00	0.01	0.99
1983	0.00	0.00	0.01	0.22	0.04	0.02	0.00	0.00	0.00	0.09	0.05	0.02	0.01	0.00	0.01	0.83
1984	0.00	0.00	0.01	0.26	0.03	0.01	0.00	0.00	0.01	0.11	0.05	0.02	0.02	0.00	0.01	0.91
1985	0.00	0.00	0.01	0.29	0.02	0.01	0.00	0.00	0.01	0.10	0.05	0.02	0.01	0.00	0.01	0.92
1986	0.00	0.00	0.01	0.23	0.01	0.01	0.00	0.00	0.00	0.08	0.05	0.03	0.01	0.00	0.01	0.98
1987	0.00	0.00	0.01	0.11	0.02	0.01	0.00	0.00	0.00	0.05	0.05	0.03	0.01	0.00	0.01	1.30
1988	0.00	0.00	0.01	0.07	0.04	0.01	0.00	0.00	0.00	0.05	0.06	0.04	0.01	0.00	0.01	1.02
1989	0.00	0.00	0.01	0.19	0.06	0.01	0.00	0.00	0.00	0.06	0.07	0.05	0.01	0.00	0.01	0.89
1990	0.00	0.00	0.01	0.21	0.08	0.02	0.00	0.00	0.00	0.07	0.06	0.05	0.01	0.00	0.01	0.84
1991	0.00	0.00	0.01	0.17	0.08	0.02	0.00	0.00	0.00	0.04	0.05	0.03	0.00	0.00	0.00	0.70
1992	0.00	0.00	0.01	0.22	0.08	0.02	0.00	0.00	0.00	0.03	0.04	0.03	0.00	0.00	0.00	0.72
1993	0.00	0.00	0.01	0.18	0.08	0.02	0.00	0.00	0.00	0.03	0.04	0.02	0.00	0.00	0.00	0.65
1994	0.00	0.00	0.01	0.09	0.04	0.01	0.00	0.00	0.00	0.02	0.05	0.02	0.00	0.00	0.00	0.46
1995	0.00	0.00	0.01	0.05	0.01	0.00	0.00	0.00	0.00	0.02	0.06	0.03	0.00	0.00	0.00	0.38
1996	0.00	0.00	0.01	0.06	0.01	0.00	0.00	0.00	0.00	0.02	0.05	0.02	0.00	0.00	0.00	0.43
1997	0.00	0.00	0.01	0.15	0.03	0.01	0.00	0.00	0.00	0.02	0.05	0.02	0.00	0.00	0.00	0.50
1998	0.00	0.00	0.01	0.16	0.03	0.01	0.00	0.00	0.00	0.02	0.05	0.02	0.00	0.00	0.00	0.48
1999	0.00	0.00	0.01	0.10	0.01	0.00	0.00	0.00	0.00	0.02	0.06	0.02	0.00	0.00	0.01	0.44
2000	0.00	0.00	0.01	0.10	0.01	0.00	0.00	0.00	0.00	0.02	0.06	0.01	0.00	0.00	0.01	0.45
2001	0.00	0.00	0.01	0.09	0.02	0.00	0.00	0.00	0.00	0.02	0.07	0.01	0.01	0.00	0.01	0.68
2002	0.00	0.00	0.01	0.14	0.03	0.01	0.00	0.00	0.00	0.04	0.09	0.02	0.01	0.00	0.01	0.95
Average	0.00	0.00	0.01	0.17	0.03	0.01	0.00	0.00	0.00	0.05	0.05	0.02	0.01	0.00	0.01	0.77

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

Year	Stillaguamish Wild	Snohomish Wild	WA Co. Hat	Upriver Brights	Spring Ck. Hat.	L. Bonn. Hat.	Fall Cow. Hat.	Lewis R. Wild	Willamette R.	Spr. Cow. Hat.	Col. R. Summer	Oregon Coastal	WA Co. Wild	Lyons Ferry	Mid. Col. R. Brights	AI Total
1979	0.00	0.01	0.01	0.05	0.17	0.17	0.08	0.01	0.01	0.01	0.03	0.03	0.01	0.00	0.00	1.10
1980	0.00	0.01	0.01	0.04	0.13	0.16	0.06	0.01	0.01	0.01	0.03	0.03	0.01	0.00	0.00	0.96
1981	0.00	0.01	0.01	0.03	0.12	0.15	0.05	0.01	0.01	0.01	0.02	0.02	0.01	0.00	0.00	0.95
1982	0.00	0.01	0.01	0.02	0.13	0.19	0.04	0.01	0.02	0.01	0.02	0.03	0.01	0.00	0.01	0.99
1983	0.00	0.01	0.01	0.05	0.03	0.13	0.02	0.01	0.02	0.01	0.02	0.04	0.01	0.00	0.01	0.83
1984	0.00	0.01	0.01	0.07	0.04	0.13	0.01	0.00	0.01	0.01	0.02	0.04	0.01	0.00	0.00	0.91
1985	0.00	0.00	0.01	0.09	0.03	0.15	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.00	0.00	0.92
1986	0.00	0.00	0.01	0.13	0.01	0.23	0.01	0.01	0.02	0.01	0.02	0.05	0.02	0.00	0.01	0.98
1987	0.00	0.00	0.01	0.16	0.01	0.61	0.01	0.01	0.02	0.01	0.02	0.05	0.02	0.00	0.03	1.30
1988	0.00	0.00	0.02	0.13	0.03	0.34	0.02	0.02	0.02	0.01	0.02	0.05	0.02	0.00	0.04	1.02
1989	0.00	0.00	0.02	0.08	0.03	0.13	0.01	0.01	0.02	0.01	0.02	0.04	0.02	0.00	0.03	0.89
1990	0.00	0.00	0.01	0.05	0.04	0.09	0.01	0.01	0.02	0.01	0.01	0.04	0.02	0.00	0.02	0.84
1991	0.00	0.00	0.01	0.03	0.05	0.08	0.01	0.00	0.02	0.01	0.01	0.03	0.02	0.00	0.01	0.70
1992	0.00	0.00	0.02	0.04	0.04	0.08	0.01	0.01	0.01	0.01	0.01	0.03	0.01	0.00	0.01	0.72
1993	0.00	0.00	0.01	0.06	0.02	0.06	0.01	0.00	0.01	0.00	0.01	0.04	0.01	0.00	0.01	0.65
1994	0.00	0.00	0.01	0.05	0.01	0.03	0.00	0.01	0.01	0.00	0.01	0.04	0.01	0.00	0.01	0.46
1995	0.00	0.00	0.01	0.03	0.02	0.05	0.00	0.00	0.01	0.00	0.01	0.03	0.01	0.00	0.01	0.38
1996	0.00	0.00	0.01	0.05	0.02	0.06	0.00	0.00	0.01	0.00	0.01	0.02	0.01	0.00	0.02	0.43
1997	0.00	0.00	0.01	0.05	0.02	0.04	0.00	0.00	0.01	0.00	0.01	0.03	0.01	0.00	0.02	0.50
1998	0.00	0.00	0.00	0.05	0.02	0.03	0.00	0.00	0.01	0.00	0.01	0.02	0.01	0.00	0.02	0.48
1999	0.00	0.00	0.00	0.06	0.03	0.04	0.00	0.00	0.01	0.00	0.01	0.02	0.01	0.00	0.02	0.44
2000	0.00	0.00	0.00	0.06	0.03	0.04	0.00	0.00	0.01	0.00	0.03	0.03	0.01	0.00	0.01	0.45
2001	0.00	0.00	0.01	0.08	0.09	0.11	0.00	0.01	0.01	0.00	0.05	0.03	0.01	0.00	0.03	0.68
2002	0.00	0.00	0.01	0.09	0.18	0.15	0.00	0.01	0.01	0.01	0.07	0.03	0.01	0.01	0.04	0.95
Average	0.00	0.00	0.01	0.06	0.05	0.14	0.02	0.01	0.01	0.01	0.02	0.03	0.01	0.00	0.02	0.77

Appendix L. Fishery Indices by stock, age and fishery, 1975–2000.

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Table L. 1. Alaska Troll SPFI: Landed Catch.

YEAR	SPFI	WIN/SPR	JUNE IN	JUNE OUT	JULY IN	JULY OUT	FALL
1979	0.96	1.21	0.71	1.18	0.57	0.91	0.91
1980	1.10	0.64	1.27	0.88	0.98	1.33	1.33
1981	1.12	1.20	0.68	1.03	1.25	1.15	1.15
1982	0.82	0.95	1.34	0.91	1.20	0.61	0.61
1983	0.94	0.89	0.73	0.68	1.07	1.19	1.19
1984	0.63	0.33	1.19	1.06	0.37	0.49	0.49
1985	0.66	0.40	0.79	0.66	0.80	0.76	0.76
1986	0.52	0.40	0.47	0.20	0.75	1.34	1.34
1987	0.48	0.49	0.67	0.19	1.53	0.63	0.63
1988	0.66	1.22	0.33	0.01	1.44	0.65	0.65
1989	0.50	0.73	0.71	0.12	0.69	0.58	0.58
1990	0.74	0.58	1.24	0.12	1.60	1.12	1.12
1991	0.62	1.31	1.29	0.23	0.74	0.71	0.71
1992	0.43	0.94	0.94	0.07	0.38	0.37	0.37
1993	0.53	0.67	0.56	0.02	0.41	0.82	0.82
1994	0.48	0.60	0.23	0.04	0.40	0.67	0.67
1995	0.51	0.45	0.68	0.06	1.19	0.79	0.79
1996	0.46	0.57	1.24	0.10	0.61	0.53	0.53
1997	0.93	0.58	1.86	0.19	0.22	1.55	1.55
1998	0.60	0.76	0.79	0.07	0.73	0.95	0.95
1999	0.71	1.00	0.95	0.12	0.16	0.98	0.98
2000	0.53	0.83	0.68	0.08	0.07	1.14	1.14
Stock Identifiers:							
Alaska Southeast	Age 4	Age 5	Age 6				
Quinsam	Age 4	Age 5					
Robertson Creek	Age 3	Age 4	Age 5				
Salmon River Hatchery	Age 4	Age 5					
Columbia Upriver Brights	Age 4	Age 5					
Willamette Spring Hatchery	Age 4	Age 5					

Table L. 2. Alaska Troll SPFI: Total Mortality

YEAR	SPFI	WIN/SPR	JUNE IN	JUNE OUT	JULY IN	JULY OUT	FALL
1979	0.94	1.17	0.70	1.17	0.54	0.88	0.88
1980	1.01	0.61	1.16	0.84	0.81	1.20	1.20
1981	1.12	1.21	0.71	1.06	1.12	1.17	1.17
1982	0.93	1.01	1.43	0.94	1.54	0.75	0.75
1983	1.07	0.87	0.78	0.70	0.93	1.62	1.62
1984	0.62	0.34	1.16	1.06	0.36	0.48	0.48
1985	0.79	0.42	0.77	0.64	0.77	1.06	1.06
1986	0.61	0.44	0.48	0.19	0.83	1.68	1.68
1987	0.56	0.51	0.63	0.18	2.34	0.76	0.76
1988	0.68	1.15	0.34	0.01	1.66	0.67	0.67
1989	0.54	0.70	0.68	0.12	0.93	0.62	0.62
1990	1.01	0.73	1.32	0.14	1.54	1.66	1.66
1991	0.66	1.24	1.20	0.22	1.03	0.76	0.76
1992	0.50	0.89	0.87	0.06	0.42	0.56	0.56
1993	0.61	0.65	0.52	0.02	0.45	1.01	1.01
1994	0.59	0.59	0.28	0.04	0.54	0.91	0.91
1995	0.61	0.46	0.72	0.06	1.23	0.99	0.99
1996	0.55	0.57	1.22	0.11	0.66	0.68	0.68
1997	0.93	0.57	1.72	0.19	0.25	1.53	1.53
1998	0.59	0.75	0.76	0.07	0.63	0.91	0.91
1999	0.76	0.97	0.92	0.12	0.22	1.06	1.06
2000	0.54	0.77	0.63	0.08	0.09	1.21	1.21
Stock Identifiers:							
Alaska Southeast	Age 4	Age 5	Age 6				
Quinsam	Age 4	Age 5					
Robertson Creek	Age 3	Age 4	Age 5				
Salmon River Hatchery	Age 4	Age 5					
Columbia Upriver Brights	Age 4	Age 5					
Willamette Spring Hatchery	Age 4	Age 5					

Table L. 3. North Troll: Landed Catch

REPORTED CATCH EXPLOITATION RATES														
	AKS	QUI	QUI	RBT	RBT	RBT	SRH	SRH	SRH	URB	URB	URB	WSH	
Year	Age 4	Age 3	Age 4	Age 3	Age 4	Age 5	Age 3	Age 4	Age 5	Age 3	Age 4	Age 5	Age 4	
79	NA	0.019	NA	0.047	0.066	0.070	NA	NA	NA	0.006	0.054	NA	0.032	
80	NA	0.026	0.059	0.043	0.070	0.070	0.062	NA	NA	0.015	0.046	0.059	0.058	
81	NA	0.071	0.086	0.029	0.085	0.168	0.101	0.146	NA	NA	0.053	0.061	0.057	
82	0.003	0.026	0.035	0.035	0.107	NA	0.028	0.118	0.077	0.019	0.033	0.019	0.017	
83	0.006	0.039	0.086	0.039	0.058	0.058	0.027	0.083	0.095	0.026	0.059	NA	0.033	
84	0.004	0.007	0.026	0.015	0.111	0.198	NA	0.080	0.196	0.014	0.093	NA	0.012	
85	0.003	0.007	0.031	0.033	0.158	NA	0.027	NA	0.212	0.018	0.081	0.078	0.005	
86	0.003	0.030	0.045	NA	0.086	NA	0.006	0.057	NA	0.015	0.062	0.076	NA	
87	0.002	0.011	0.034	0.019	NA	NA	0.010	0.049	0.177	0.016	0.090	0.133	0.014	
88	0.007	0.006	0.037	0.013	0.051	NA	NA	0.040	0.058	0.005	0.049	0.090	0.020	
89	0.003	0.014	0.024	0.014	0.072	0.102	0.007	0.034	0.167	NA	0.047	0.195	0.009	
90	0.007	0.011	0.055	0.012	0.059	0.056	0.009	0.031	0.155	NA	0.056	0.108	0.008	
91	0.002	0.013	0.034	0.015	0.062	0.112	0.007	0.051	0.161	NA	NA	NA	0.007	
92	0.001	NA	0.097	0.012	0.048	0.067	0.007	0.032	0.075	NA	NA	NA	0.003	
93	0.001	NA	NA	0.007	0.051	0.081	0.007	0.076	0.184	0.000	0.052	NA	0.005	
94	0.000	NA	NA	0.013	0.061	0.088	0.011	0.068	0.168	NA	0.044	0.094	0.003	
95	0.000	NA	NA	NA	0.034	0.025	0.006	0.000	0.067	NA	NA	0.026	0.005	
96	0.000	NA	NA	0.000	NA	NA	0.000	0.000	0.000	0.000	0.000	NA	0.000	
97	NA	0.012	0.020	0.008	0.034	NA	0.007	0.015	0.035	NA	0.029	NA	0.007	
98	0.000	0.000	0.000	NA	0.048	NA	0.005	0.070	0.102	0.000	NA	0.073	0.000	
99	0.000	0.003	0.006	NA	0.018	0.033	0.002	0.015	0.019	0.000	0.032	NA	0.000	
100	0.000	0.000	0.002	NA	NA	NA	0.001	0.015	0.021	NA	0.000	0.000	0.000	
Base	0.003	0.035	0.060	0.038	0.082	0.103	0.064	0.132	0.077	0.013	0.046	0.046	0.041	

-continued-

Table L.3 part 2 of 2

REPORTED CATCH EXPLOITATION RATE INDEX															
Year	AKS Age 4	QUI Age 3	QUI Age 4	RBT Age 3	RBT Age 4	RBT Age 5	SRH Age 3	SRH Age 4	SRH Age 5	URB Age 3	URB Age 4	URB Age 5	WSH Age 4	Fishery	
79	NA	0.526	NA	1.221	0.809	0.680	NA	NA	NA	0.459	1.173	NA	0.776	0.818	
80	NA	0.729	0.986	1.112	0.856	0.682	0.976	NA	NA	1.122	0.986	1.270	1.427	0.960	
81	NA	1.999	1.435	0.754	1.034	1.638	1.590	1.105	NA	NA	1.138	1.312	1.392	1.322	
82	1.000	0.747	0.579	0.913	1.301	NA	0.433	0.895	1.000	1.419	0.704	0.419	0.405	0.809	
83	1.790	1.098	1.441	1.015	0.704	0.562	0.422	0.625	1.238	1.941	1.281	NA	0.800	0.875	
84	1.214	0.211	0.434	0.400	1.359	1.927	NA	0.608	2.547	1.024	2.002	NA	0.300	1.199	
85	0.771	0.211	0.510	0.863	1.928	NA	0.422	NA	2.753	1.388	1.745	1.680	0.130	1.289	
86	0.738	0.835	0.744	NA	1.042	NA	0.089	0.435	NA	1.119	1.351	1.645	NA	0.786	
87	0.628	0.304	0.562	0.481	NA	NA	0.160	0.373	2.302	1.209	1.949	2.863	0.337	0.996	
88	1.976	0.164	0.615	0.325	0.623	NA	NA	0.301	0.755	0.368	1.063	1.953	0.483	0.653	
89	1.023	0.407	0.401	0.358	0.883	0.997	0.106	0.260	2.167	NA	1.008	4.217	0.225	0.947	
90	2.017	0.301	0.915	0.308	0.719	0.545	0.138	0.235	2.011	NA	1.214	2.331	0.186	0.777	
91	0.709	0.353	0.569	0.381	0.758	1.093	0.107	0.389	2.088	NA	NA	NA	0.171	0.730	
92	0.161	NA	1.615	0.299	0.590	0.657	0.104	0.244	0.973	NA	NA	NA	0.062	0.568	
93	0.301	NA	NA	0.174	0.619	0.793	0.106	0.574	2.391	0.000	1.126	NA	0.128	0.773	
94	0.064	NA	NA	0.325	0.749	0.857	0.172	0.515	2.180	NA	0.952	2.038	0.073	0.869	
95	0.000	NA	NA	NA	0.414	0.248	0.100	0.000	0.868	NA	NA	0.557	0.114	0.297	
96	0.000	NA	NA	0.000	NA	NA	0.000	0.000	0.000	0.000	0.000	NA	0.000	0.000	
97	NA	0.353	0.341	0.218	0.417	NA	0.117	0.112	0.454	NA	0.637	NA	0.164	0.293	
98	0.000	0.000	0.000	NA	0.584	NA	0.071	0.532	1.322	0.000	NA	1.573	0.000	0.536	
99	0.000	0.079	0.102	NA	0.217	0.326	0.029	0.112	0.247	0.000	0.685	NA	0.000	0.194	
100	0.000	0.000	0.029	NA	NA	NA	0.016	0.111	0.277	NA	0.000	0.000	0.007	0.077	

Stock Identifiers

AKS = ALASKA SPRING
SRH = SALMON RIVER HATCHERY

QUI = QUINSAM
URB = COLUMBIA UPRIVER BRIGHT

RBT = ROBERTSON CREEK
WSH = WILLAMETTE SPRING

Table L. 4. North Troll: Total Mortality.

TOTAL MORTALITY EXPLOITATION RATES														
Year	AKS Age 4	QUI Age 3	QUI Age 4	RBT Age 3	RBT Age 4	RBT Age 5	SRH Age 3	SRH Age 4	SRH Age 5	URB Age 3	URB Age 4	URB Age 5	WSH Age 4	
79	NA	0.022	NA	0.054	0.068	0.070	NA	NA	NA	0.008	0.055	NA	0.036	
80	NA	0.029	0.061	0.048	0.072	0.070	0.069	NA	NA	0.017	0.046	0.060	0.066	
81	NA	0.079	0.087	0.033	0.086	0.170	0.111	0.149	NA	NA	0.054	0.063	0.066	
82	0.004	0.029	0.036	0.041	0.109	NA	0.034	0.120	0.077	0.022	0.033	0.019	0.021	
83	0.007	0.043	0.088	0.044	0.059	0.059	0.032	0.084	0.095	0.029	0.061	NA	0.038	
84	0.005	0.009	0.027	0.022	0.113	0.202	NA	0.083	0.199	0.017	0.094	NA	0.014	
85	0.003	0.009	0.031	0.045	0.161	NA	0.032	NA	0.214	0.021	0.082	0.078	0.006	
86	0.003	0.033	0.045	NA	0.088	NA	0.009	0.059	NA	0.018	0.064	0.076	NA	
87	0.003	0.016	0.037	0.023	NA	NA	0.014	0.051	0.184	0.029	0.095	0.136	0.021	
88	0.008	0.010	0.039	0.016	0.054	NA	NA	0.042	0.058	0.015	0.052	0.094	0.026	
89	0.004	0.018	0.026	0.019	0.075	0.104	0.016	0.038	0.171	NA	0.051	0.199	0.011	
90	0.009	0.018	0.058	0.019	0.063	0.058	0.018	0.034	0.160	NA	0.061	0.113	0.010	
91	0.003	0.019	0.036	0.023	0.065	0.115	0.018	0.054	0.165	NA	NA	NA	0.009	
92	0.001	NA	0.104	0.020	0.052	0.070	0.011	0.034	0.078	NA	NA	NA	0.004	
93	0.001	NA	NA	0.016	0.054	0.084	0.017	0.080	0.190	0.005	0.056	NA	0.007	
94	0.001	NA	NA	0.025	0.065	0.090	0.023	0.072	0.172	NA	0.047	0.099	0.004	
95	0.000	NA	NA	NA	0.036	0.028	0.013	0.002	0.072	NA	NA	0.028	0.007	
96	0.001	NA	NA	0.003	NA	NA	0.004	0.002	0.005	0.000	0.000	NA	0.000	
97	NA	0.015	0.020	0.012	0.035	NA	0.010	0.016	0.035	NA	0.030	NA	0.007	
98	0.000	0.000	0.000	NA	0.050	NA	0.011	0.073	0.104	0.001	NA	0.073	0.000	
99	0.000	0.003	0.006	NA	0.018	0.035	0.003	0.015	0.019	0.003	0.033	NA	0.000	
100	0.000	0.000	0.002	NA	NA	NA	0.002	0.015	0.021	NA	0.000	0.000	0.000	
Base	0.004	0.040	0.061	0.044	0.084	0.103	0.072	0.135	0.077	0.016	0.047	0.047	0.047	

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Table L.4 part 2 of 2

TOTAL MORTALITY EXPLOITATION RATE INDEX															
Year	AKS Age 4	QUI Age 3	QUI Age 4	RBT Age 3	RBT Age 4	RBT Age 5	SRH Age 3	SRH Age 4	SRH Age 5	URB Age 3	URB Age 4	URB Age 5	WSH Age 4	Fishery	
79	NA	0.549	NA	1.226	0.811	0.675	NA	NA	NA	0.532	1.178	NA	0.762	0.822	
80	NA	0.735	0.991	1.079	0.856	0.677	0.969	NA	NA	1.098	0.985	1.266	1.396	0.959	
81	NA	1.980	1.424	0.755	1.031	1.647	1.558	1.107	NA	NA	1.144	1.324	1.394	1.321	
82	1.000	0.737	0.585	0.939	1.302	NA	0.473	0.893	1.000	1.370	0.692	0.410	0.448	0.810	
83	1.703	1.079	1.436	1.006	0.705	0.576	0.453	0.626	1.238	1.856	1.295	NA	0.795	0.878	
84	1.171	0.229	0.439	0.502	1.355	1.951	NA	0.613	2.591	1.039	2.005	NA	0.299	1.192	
85	0.779	0.229	0.506	1.022	1.927	NA	0.441	NA	2.788	1.338	1.747	1.647	0.127	1.267	
86	0.726	0.839	0.728	NA	1.049	NA	0.127	0.438	NA	1.111	1.360	1.613	NA	0.781	
87	0.660	0.412	0.598	0.529	NA	NA	0.198	0.378	2.387	1.840	2.019	2.889	0.436	1.032	
88	2.130	0.263	0.642	0.368	0.640	NA	NA	0.314	0.755	0.923	1.118	1.994	0.556	0.691	
89	1.009	0.453	0.421	0.435	0.892	1.007	0.230	0.280	2.224	NA	1.084	4.224	0.238	0.963	
90	2.367	0.447	0.951	0.428	0.749	0.559	0.256	0.254	2.083	NA	1.304	2.387	0.206	0.816	
91	0.790	0.484	0.582	0.522	0.779	1.112	0.254	0.404	2.150	NA	NA	NA	0.190	0.762	
92	0.250	NA	1.695	0.452	0.620	0.680	0.159	0.255	1.014	NA	NA	NA	0.076	0.597	
93	0.266	NA	NA	0.359	0.646	0.815	0.240	0.593	2.466	0.328	1.190	NA	0.145	0.811	
94	0.142	NA	NA	0.568	0.778	0.876	0.322	0.530	2.239	NA	0.992	2.098	0.087	0.906	
95	0.086	NA	NA	NA	0.432	0.270	0.182	0.016	0.942	NA	NA	0.595	0.155	0.329	
96	0.133	NA	NA	0.073	NA	NA	0.062	0.013	0.062	0.000	0.000	NA	0.006	0.034	
97	NA	0.377	0.334	0.278	0.420	NA	0.137	0.116	0.454	NA	0.645	NA	0.155	0.298	
98	0.000	0.000	0.000	NA	0.596	NA	0.154	0.539	1.348	0.072	NA	1.542	0.000	0.534	
99	0.000	0.071	0.100	NA	0.213	0.335	0.039	0.109	0.247	0.207	0.699	NA	0.000	0.195	
100	0.000	0.000	0.028	NA	NA	NA	0.028	0.112	0.277	NA	0.000	0.000	0.006	0.076	

Stock Identifiers

AKS = ALASKA SPRING
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Table L. 5. WCVI Troll: Landed Catch.

	REPORTED CATCH	EXPLOITATION	RATE INDEX																							
	CWF	GAD	GAD	LRH	LRH	LRW	RBT	RBT	RBT	SAM	SAM	SPR	SPR	SPS	SPS	SRH	SRH	SRH	SUM	URB	URB	UWA	UWA	WSH	CHI	CHI
Year	Age 4	Age 3	Age 4	Age 3	Age 4	Age 4	Age 3	Age 4	Age 5	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 5	Age 4	Age 3	Age 4	Age 3	Age 4	Age 4	Age 3	Age 4
79	NA	NA	NA	0.172	NA	NA	0.030	0.057	NA	NA	0.205	0.174	0.176	NA	0.250	NA	NA	NA	NA	0.036	0.077	0.063	0.166	0.034	NA	NA
80	NA	NA	NA	0.098	0.150	NA	0.036	0.066	NA	NA	NA	0.213	0.292	NA	NA	0.039	NA	NA	0.088	0.034	0.045	0.127	0.121	0.033	NA	NA
81	0.125	0.036	NA	0.194	0.154	0.058	0.019	0.027	0.029	NA	NA	0.169	0.141	0.050	NA	NA	0.021	NA	0.174	0.005	0.042	0.092	0.190	0.016	NA	NA
82	0.195	0.066	0.206	0.198	0.250	0.081	0.020	0.034	NA	0.052	NA	0.165	0.251	0.090	0.200	NA	NA	NA	NA	0.026	0.020	0.123	0.219	0.022	NA	NA
83	0.225	NA	0.289	0.288	0.323	0.068	0.009	0.031	0.074	NA	0.195	0.263	0.207	0.107	0.194	0.024	0.015	NA	NA	0.009	0.019	0.075	0.201	0.005	NA	NA
84	0.216	0.105	NA	0.363	0.538	NA	0.034	0.047	0.051	NA	NA	0.240	0.310	0.099	0.222	NA	0.017	NA	NA	0.021	0.063	0.182	0.155	0.011	NA	NA
85	0.150	NA	0.172	0.210	0.217	NA	0.016	0.000	NA	NA	NA	0.099	0.234	0.050	0.162	NA	NA	NA	NA	0.018	0.049	0.096	0.216	0.008	NA	NA
86	0.211	NA	NA	0.212	0.218	0.032	NA	0.026	NA	NA	NA	0.213	0.197	0.054	0.263	NA	0.009	NA	NA	0.037	0.034	0.091	0.237	NA	NA	NA
87	0.141	NA	NA	0.158	NA	0.100	0.007	NA	NA	NA	NA	0.081	NA	0.046	0.124	0.005	0.010	NA	0.000	0.024	0.045	0.040	0.086	NA	NA	NA
88	0.138	0.022	NA	0.190	0.262	0.073	0.012	0.027	NA	0.029	NA	0.178	NA	0.018	0.168	NA	0.030	NA	0.141	0.002	0.090	NA	0.167	0.015	NA	NA
89	0.086	0.013	0.101	0.048	0.108	0.039	0.004	0.016	0.000	0.010	0.126	0.104	0.087	0.021	0.093	0.006	NA	NA	0.094	NA	0.042	NA	NA	0.009	NA	NA
90	0.118	0.055	0.195	0.195	0.080	0.083	0.017	0.026	0.047	0.019	0.182	0.165	0.160	0.045	0.200	0.012	0.020	NA	0.169	NA	0.077	NA	NA	0.014	NA	NA
91	NA	NA	0.194	0.133	NA	0.051	0.016	0.026	0.022	0.012	0.120	0.107	0.140	0.025	0.129	0.016	0.016	NA	0.055	NA	NA	NA	NA	0.001	NA	NA
92	0.188	NA	0.094	0.111	NA	0.022	0.044	0.115	0.156	0.050	0.056	0.077	0.163	0.045	0.175	0.023	0.123	NA	0.097	NA	NA	NA	NA	0.003	NA	NA
93	NA	NA	NA	0.184	0.130	NA	0.030	0.105	0.073	0.054	0.090	0.097	0.220	0.064	0.134	0.021	0.055	NA	NA	0.016	0.092	NA	NA	0.007	NA	NA
94	0.019	NA	NA	NA	NA	0.015	0.016	0.034	0.042	0.004	0.145	0.148	0.140	0.013	0.113	NA	0.017	NA	NA	NA	0.047	NA	NA	0.004	NA	NA
95	NA	0.011	NA	NA	NA	0.030	NA	0.020	0.011	0.007	0.080	0.063	0.075	0.017	0.063	0.001	NA	NA	NA	NA	NA	NA	NA	0.002	NA	NA
96	0.000	0.000	0.000	0.000	NA	NA	0.000	NA	NA	0.000	0.000	0.000	NA	0.000	0.000	0.000	0.000	NA	0.000	0.000	0.000	NA	NA	0.000	NA	NA
97	0.056	NA	0.041	0.122	NA	NA	0.000	0.003	NA	0.001	0.049	0.118	0.156	0.002	0.068	0.000	0.002	NA	0.010	NA	0.004	NA	NA	0.000	NA	NA
98	NA	NA	NA	NA	NA	NA	NA	0.000	NA	NA	0.018	0.008	0.000	0.000	0.007	0.000	0.000	NA	NA	0.000	NA	NA	NA	0.001	NA	NA
99	NA	0.002	NA	0.014	NA	NA	NA	NA	0.000	NA	0.016	0.003	NA	0.001	0.014	0.000	0.000	NA	0.005	0.000	0.000	NA	NA	0.000	NA	NA
100	NA	NA	0.231	0.006	0.358	NA	NA	NA	NA	NA	NA	0.022	0.205	0.002	0.146	0.000	0.000	NA	0.080	NA	0.012	NA	NA	0.001	NA	NA
Base	0.160	0.051	0.206	0.166	0.185	0.069	0.026	0.046	0.029	0.052	0.205	0.180	0.215	0.070	0.225	0.039	0.021	-1.000	0.131	0.025	0.046	0.101	0.174	0.026	-1.000	-1.000

	REPORTED CATCH	EXPLOITATION	RATE INDEX																								
	CWF	GAD	GAD	LRH	LRH	LRW	RBT	RBT	RBT	SAM	SAM	SPR	SPR	SPS	SPS	SRH	SRH	SRH	SUM	URB	URB	UWA	UWA	WSH	CHI	CHI	Fishery
Year	Age 4	Age 3	Age 4	Age 3	Age 4	Age 4	Age 3	Age 4	Age 5	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 5	Age 4	Age 3	Age 4	Age 3	Age 4	Age 4	Age 3	Age 4	Fishery
79	NA	NA	NA	1.039	NA	NA	1.157	1.243	NA	NA	1.000	0.962	0.818	NA	1.110	NA	NA	NA	NA	1.434	1.674	0.625	0.954	1.303	NA	NA	1.003
80	NA	NA	NA	0.592	0.813	NA	1.375	1.424	NA	NA	NA	1.182	1.361	NA	NA	1.000	NA	NA	0.672	1.334	0.975	1.254	0.695	1.258	NA	NA	0.986
81	0.782	0.709	NA	1.172	0.832	0.839	0.709	0.589	1.000	NA	NA	0.938	0.654	0.714	NA	NA	1.000	NA	1.328	0.196	0.908	0.905	1.091	0.607	NA	NA	0.895
82	1.218	1.291	1.000	1.197	1.355	1.161	0.759	0.744	NA	1.000	NA	0.917	1.166	1.286	0.890	NA	NA	NA	NA	1.036	0.442	1.215	1.259	0.832	NA	NA	1.096
83	1.405	NA	1.403	1.740	1.750	0.979	0.344	0.678	2.512	NA	0.952	1.459	0.964	1.521	0.865	0.612	0.737	NA	NA	0.376	0.418	0.744	1.152	0.192	NA	NA	1.184
84	1.346	2.050	NA	2.193	2.914	NA	1.286	1.011	1.729	NA	NA	1.331	1.443	1.407	0.988	NA	0.817	NA	NA	0.835	1.360	1.802	0.888	0.431	NA	NA	1.530
85	0.934	NA	0.836	1.266	1.176	NA	0.614	0.000	NA	NA	NA	0.551	1.087	0.707	0.719	NA	NA	NA	NA	0.732	1.074	0.950	1.237	0.307	NA	NA	0.916
86	1.313	NA	NA	1.279	1.181	0.463	NA	0.566	NA	NA	NA	1.182	0.916	0.773	1.168	NA	0.417	NA	NA	1.475	0.745	0.895	1.360	NA	NA	NA	1.089
87	0.878	NA	NA	0.954	NA	1.442	0.270	NA	NA	NA	NA	0.449	NA	0.653	0.552	0.117	0.489	NA	0.000	0.969	0.986	0.397	0.494	NA	NA	NA	0.605
88	0.860	0.426	NA	1.146	1.419	1.047	0.445	0.576	NA	0.551	NA	0.989	NA	0.261	0.747	NA	1.421	NA	1.079	0.083	1.968	NA	0.961	0.563	NA	NA	0.944
89	0.538	0.250	0.491	0.290	0.588	0.566	0.168	0.342	0.000	0.193	0.614	0.579	0.406	0.302	0.413	0.150	NA	NA	0.720	NA	0.919	NA	NA	0.353	NA	NA	0.474
90	0.734	1.084	0.947	1.175	0.434	1.202	0.667	0.563	1.596	0.370	0.885	0.916	0.743	0.641	0.891	0.314	0.964	NA	1.290	NA	1.665	NA	NA	0.542	NA	NA	0.875
91	NA	NA	0.943	0.805	NA	0.740	0.605	0.553	0.753	0.227	0.585	0.593	0.654	0.359	0.574	0.410	0.790	NA	0.422	NA	NA	NA	NA	0.051	NA	NA	0.624
92	1.174	NA	0.455	0.670	NA	0.317	1.686	2.496	5.314	0.970	0.272	0.427	0.760	0.644	0.779	0.594	5.913	NA	0.738	NA	NA	NA	NA	0.125	NA	NA	0.827
93	NA	NA	NA	1.113	0.704	NA	1.154	2.266	2.480	1.045	0.437	0.537	1.025	0.906	0.597	0.541	2.660	NA	NA	0.620	2.012	NA	NA	0.286	NA	NA	0.882
94	0.119	NA	NA	NA	NA	0.222	0.608	0.742	1.422	0.077	0.707	0.818	0.652	0.190	0.501	NA	0.837	NA	NA	NA	1.014	NA	NA	0.167	NA	NA	0.552
95	NA	0.215	NA	NA	NA	0.430	NA	0.441	0.370	0.144	0.390	0.349	0.347	0.240	0.278	0.016	NA	NA	NA	NA	NA	NA	NA	0.094	NA	NA	0.314
96	0.000	0.000	0.000	0.000	NA	NA	0.000	NA	NA	0.000	0.000	0.000	NA	0.000	0.000	0.000	0.000	NA	0.000	0.000	0.000	0.000	NA	0.000	NA	NA	0.000
97	0.346	NA	0.199	0.737	NA	NA	0.000	0.065	NA	0.021	0.241	0.654	0.725	0.025	0.300	0.000	0.081	NA	0.075	NA	0.092	NA	NA	0.000	NA	NA	0.348
98	NA	NA	NA	NA	NA	NA	NA	0.000	NA	NA	0.087	0.046	0.000	0.000	0.033	0.000	0.000	NA	NA	0.015	NA	NA	NA	0.022	NA	NA	

Stock Identifiers

CWF = COWLITZ FALL TULE
SPR = SPRING CREEK TULE
WSH = WILLAMETTE SPRING

GAD = G ADAMS FALL FING
SPS = SO SOUND FALL FING
CHI = CHILLAWACK

LRH = LOWER RIVER TULE 'Oregon Lower River Tule
SRH = SALMON RIVER HATCHERY

LRW = LEWIS RIVER WILD
SUM = COL RIVER SUMMERS

RBT = ROBERTSON CREEK
URB = COLUMBIA UPRIVER BRIGHT

SAM = SAMISH FALL FING
UWA = U OF W FALL ACCEL

Table L. 6. WCVI Troll: Total Mortality.

TOTAL MORTALITY EXPLOITATION RATES																																																				
	CWF		GAD		GAD		LRH		LRH		LRW		RBT		RBT		RBT		SAM		SAM		SPR		SPR		SPS		SPS		SRH		SRH		SRH		SUM		URB		URB		UWA		UWA		WSH		CHI		CHI	
Year	Age 4	Age 3	Age 4	Age 3	Age 4	Age 4	Age 3	Age 4	Age 5	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4							
79	NA	NA	NA	NA	0.189	NA	NA	0.035	0.059	NA	NA	0.210	0.191	0.183	NA	0.257	NA	NA	NA	NA	NA	NA	0.040	0.079	0.069	0.171	0.037	NA	NA																							
80	NA	0.129	0.043	NA	0.108	0.150	NA	0.040	0.068	NA	NA	NA	0.232	0.301	NA	NA	0.041	NA	NA	NA	NA	0.090	0.037	0.046	0.138	0.123	0.037	NA	NA																							
81	0.129	0.043	NA	NA	0.214	0.158	0.060	0.020	0.029	0.029	NA	NA	0.184	0.146	0.058	NA	NA	0.023	NA	0.179	0.006	0.043	0.099	0.190	0.018	NA	NA																									
82	0.203	0.078	0.210	0.222	0.259	0.083	0.023	0.036	NA	0.060	NA	0.191	0.260	0.101	0.206	NA	NA	NA	NA	NA	0.028	0.020	0.139	0.228	0.025	NA	NA																									
83	0.230	NA	0.294	0.316	0.334	0.070	0.011	0.032	0.076	NA	0.201	0.282	0.212	0.119	0.200	0.025	0.017	NA	NA	0.011	0.021	0.084	0.206	0.006	NA	NA																										
84	0.221	0.115	NA	0.395	0.553	NA	0.038	0.049	0.053	NA	NA	0.253	0.318	0.112	0.229	NA	0.018	NA	NA	0.024	0.064	0.196	0.158	0.013	NA	NA																										
85	0.153	NA	0.180	0.240	0.225	NA	0.017	0.000	NA	NA	NA	0.117	0.241	0.057	0.167	NA	NA	NA	NA	0.021	0.051	0.104	0.224	0.009	NA	NA																										
86	0.214	NA	NA	0.217	0.223	0.032	NA	0.026	NA	NA	NA	0.235	0.202	0.064	0.268	NA	0.009	NA	NA	0.041	0.036	0.101	0.245	NA	NA	NA																										
87	0.149	NA	NA	0.233	NA	0.105	0.009	NA	NA	NA	NA	0.090	NA	0.066	0.132	0.006	0.012	NA	0.000	0.034	0.050	0.048	0.089	NA	NA	NA																										
88	0.151	0.032	NA	0.251	0.293	0.078	0.014	0.028	NA	0.041	NA	0.198	NA	0.029	0.179	NA	0.032	NA	0.147	0.015	0.099	NA	0.175	0.018	NA	NA																										
89	0.092	0.024	0.107	0.063	0.120	0.042	0.006	0.016	0.000	0.021	0.132	0.127	0.092	0.030	0.098	0.008	NA	NA	0.099	NA	0.047	NA	NA	0.011	NA	NA																										
90	0.127	0.071	0.202	0.225	0.093	0.089	0.021	0.028	0.049	0.028	0.189	0.188	0.170	0.070	0.214	0.016	0.021	NA	0.175	NA	0.082	NA	NA	0.017	NA	NA																										
91	NA	NA	0.208	0.145	NA	0.055	0.020	0.027	0.023	0.025	0.127	0.125	0.149	0.040	0.137	0.019	0.018	NA	0.057	NA	NA	NA	NA	0.002	NA	NA																										
92	0.195	NA	0.101	0.147	NA	0.024	0.060	0.124	0.162	0.057	0.059	0.103	0.175	0.057	0.182	0.030	0.129	NA	0.103	NA	NA	NA	NA	0.005	NA	NA																										
93	NA	NA	NA	0.233	0.150	NA	0.045	0.112	0.076	0.069	0.097	0.122	0.233	0.083	0.145	0.030	0.060	NA	NA	0.026	0.098	NA	NA	0.009	NA	NA																										
94	0.019	NA	NA	NA	NA	0.017	0.022	0.038	0.044	0.016	0.152	0.172	0.150	0.018	0.116	NA	0.019	NA	NA	NA	0.050	NA	NA	0.005	NA	NA																										
95	NA	0.019	NA	NA	NA	0.034	NA	0.023	0.012	0.015	0.090	0.085	0.090	0.025	0.069	0.002	NA	NA	NA	NA	NA	NA	NA	0.003	NA	NA																										
96	0.000	0.004	0.005	0.000	NA	NA	0.001	NA	NA	0.004	0.003	0.000	NA	0.005	0.005	0.001	0.001	NA	0.000	0.000	0.000	NA	NA	0.000	NA	NA																										
97	0.056	NA	0.044	0.164	NA	NA	0.000	0.003	NA	0.005	0.052	0.151	0.175	0.009	0.073	0.000	0.002	NA	0.010	NA	0.004	NA	NA	0.000	NA	NA																										
98	NA	NA	NA	NA	NA	NA	NA	0.000	NA	NA	0.018	0.008	0.000	0.000	0.007	0.000	0.000	NA	NA	0.000	NA	NA	NA	0.001	NA	NA																										
99	NA	0.002	NA	0.014	NA	NA	NA	NA	0.000	NA	0.016	0.003	NA	0.001	0.014	0.000	0.000	NA	0.005	0.000	0.000	NA	NA	0.000	NA	NA																										
100	NA	NA	0.236	0.006	0.358	NA	NA	NA	NA	NA	NA	0.022	0.205	0.002	0.148	0.000	0.000	NA	0.080	NA	0.012	NA	NA	0.001	NA	NA																										
Base	0.166	0.060	0.210	0.183	0.189	0.071	0.030	0.048	0.029	0.060	0.210	0.199	0.222	0.080	0.232	0.041	0.023	-1.000	0.135	0.028	0.047	0.112	0.178	0.029	-1.000	-1.000																										

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TOTAL MORTALITY	EXPLOITATION		RATE		INDEX		LRW	RBT	RBT	RBT	SAM	SAM	SPR	SPR	SPS	SPS	SRH	SRH	SRH	SUM	URB	URB	UWA	UWA	WSH	CHI	CHI	Fishery	
	Year	Age 4	Age 3	Age 4	Age 3	Age 4																							Age 3
79	NA	NA	NA	NA	1.032	NA	NA	1.185	1.241	NA	NA	1.000	0.958	0.823	NA	1.112	NA	NA	NA	NA	1.432	1.679	0.620	0.960	1.264	NA	NA	1.002	
80	NA	NA	NA	NA	0.590	0.793	NA	1.356	1.415	NA	NA	NA	1.163	1.353	NA	NA	1.000	NA	NA	NA	0.671	1.332	0.981	1.240	0.693	1.272	NA	NA	0.980
81	0.775	0.710	NA	NA	1.167	0.835	0.844	0.693	0.601	1.000	NA	NA	0.921	0.656	0.732	NA	NA	1.000	NA	1.329	0.221	0.909	0.891	1.067	0.612	NA	NA	0.890	
82	1.225	1.290	1.000	NA	1.212	1.372	1.156	0.767	0.743	NA	1.000	NA	0.957	1.168	1.268	0.888	NA	NA	NA	NA	1.015	0.431	1.249	1.280	0.852	NA	NA	1.106	
83	1.387	NA	1.396	NA	1.729	1.768	0.973	0.381	0.673	2.573	NA	0.953	1.413	0.954	1.485	0.864	0.610	0.765	NA	NA	0.378	0.441	0.751	1.156	0.201	NA	NA	1.179	
84	1.333	1.911	NA	NA	2.161	2.923	NA	1.270	1.018	1.793	NA	NA	1.266	1.430	1.395	0.991	NA	0.808	NA	NA	0.844	1.359	1.754	0.887	0.439	NA	NA	1.514	
85	0.920	NA	0.855	NA	1.309	1.189	NA	0.580	0.000	NA	NA	NA	0.584	1.084	0.718	0.721	NA	NA	NA	NA	0.754	1.076	0.937	1.258	0.300	NA	NA	0.924	
86	1.289	NA	NA	NA	1.186	1.182	0.450	NA	0.546	NA	NA	NA	1.180	0.910	0.806	1.156	NA	0.385	NA	NA	1.456	0.756	0.903	1.375	NA	NA	NA	1.076	
87	0.896	NA	NA	NA	1.271	NA	1.468	0.294	NA	NA	NA	NA	0.452	NA	0.830	0.569	0.137	0.527	NA	0.000	1.206	1.061	0.431	0.498	NA	NA	NA	0.670	
88	0.913	0.524	NA	NA	1.374	1.550	1.090	0.472	0.590	NA	0.686	NA	0.995	NA	0.357	0.771	NA	1.424	NA	1.087	0.526	2.100	NA	0.984	0.611	NA	NA	1.012	
89	0.554	0.399	0.508	NA	0.342	0.637	0.595	0.187	0.339	0.000	0.354	0.629	0.634	0.413	0.373	0.423	0.187	NA	NA	0.736	NA	0.988	NA	NA	0.369	NA	NA	0.506	
90	0.768	1.184	0.961	NA	1.231	0.494	1.249	0.712	0.582	1.657	0.471	0.900	0.945	0.763	0.875	0.924	0.381	0.950	NA	1.298	NA	1.731	NA	NA	0.588	NA	NA	0.917	
91	NA	NA	0.990	NA	0.793	NA	0.771	0.662	0.574	0.776	0.419	0.606	0.626	0.670	0.498	0.592	0.457	0.798	NA	0.424	NA	NA	NA	NA	0.058	NA	NA	0.653	
92	1.174	NA	0.479	NA	0.802	NA	0.333	2.025	2.580	5.493	0.951	0.283	0.514	0.786	0.711	0.788	0.729	5.704	NA	0.766	NA	NA	NA	NA	0.162	NA	NA	0.869	
93	NA	NA	NA	NA	1.274	0.791	NA	1.510	2.347	2.599	1.151	0.461	0.611	1.050	1.034	0.626	0.729	2.643	NA	NA	0.935	2.083	NA	NA	0.310	NA	NA	0.962	
94	0.115	NA	NA	NA	NA	NA	0.243	0.731	0.786	1.480	0.266	0.720	0.864	0.675	0.228	0.502	NA	0.843	NA	NA	NA	1.061	NA	NA	0.174	NA	NA	0.579	
95	NA	0.319	NA	NA	NA	NA	0.482	NA	0.472	0.412	0.249	0.429	0.426	0.403	0.307	0.300	0.046	NA	NA	NA	NA	NA	NA	NA	0.118	NA	NA	0.364	
96	0.000	0.074	0.025	0.000	0.000	NA	NA	0.036	NA	NA	0.064	0.016	0.000	NA	0.062	0.023	0.024	0.026	NA	0.000	0.000	0.000	NA	NA	0.011	NA	NA	0.017	
97	0.335	NA	0.207	0.897	NA	NA	NA	0.005	0.063	NA	0.082	0.245	0.758	0.789	0.119	0.317	0.008	0.075	NA	0.076	NA	0.089	NA	NA	0.000	NA	NA	0.391	
98	NA	NA	NA	NA	NA	NA	NA	NA	0.000	NA	NA	0.085	0.041	0.000	0.000	0.032	0.000	0.000	NA	NA	0.014	NA	NA	NA	0.020	NA	NA	0.031	
99	NA	0.038	NA	0.076	NA	NA	NA	NA	NA	0.000	NA	0.077	0.014	NA	0.011	0.059	0.000	0.000	NA	0.037	0.000	0.000	NA	NA	0.000	NA	NA	0.042	
100	NA	NA	1.123	0.035	1.893	NA	NA	NA	NA	NA	NA	NA	0.112	0.922	0.027	0.640	0.000	0.000	NA	0.595	NA	0.255	NA	NA	0.042	NA	NA	0.674	

Stock Identifiers

CWF = COWLITZ FALL TULE
 SPR = SPRING CREEK TULE
 WSH = WILLAMETTE SPRING

GAD = G ADAMS FALL FING
 SPS = SO SOUND FALL FING
 CHI = CHILLAWACK

LRH = LOWER RIVER TULE 'Oregon Lower River Tule
 SRH = SALMON RIVER HATCHERY

Appendix M. Abundance Indices for 1979 through 2002 for SEAK, NBC, and WCVI AABM fisheries, from calibration #0204 from which the 2002 pre-season AIs were generated and approved by the CTC April 24, 2002. Due to data discrepancies found after that date, the AIs were replaced with those generated from calibration #0206 (Appendix L). Note that the 2002 pre-season AIs did not differ between the two calibrations.

Year	SEAK	NBC	WCVI
1979	0.98	1.05	1.10
1980	1.02	0.98	0.96
1981	0.93	0.95	0.95
1982	1.08	1.02	0.99
1983	1.20	1.13	0.81
1984	1.34	1.26	0.91
1985	1.26	1.26	0.92
1986	1.44	1.42	0.98
1987	1.71	1.69	1.30
1988	2.01	1.77	1.02
1989	1.79	1.64	0.89
1990	1.83	1.61	0.84
1991	1.77	1.48	0.70
1992	1.64	1.38	0.72
1993	1.64	1.38	0.64
1994	1.54	1.23	0.46
1995	1.02	0.91	0.38
1996	0.87	0.87	0.42
1997	1.18	1.07	0.50
1998	1.16	0.98	0.48
1999	1.06	0.97	0.45
2000	1.07	0.99	0.45
2001	1.28	1.22	0.68
2002	1.74	1.45	0.95

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Description of problems in calibration 0204 that resulted in an additional calibration and changes to the Abundance Indices

Examination of the results from calibration 0204 and the cohort analysis indicated that problems existed in data used in the cohort analysis. Problems were suspected because for a number of the Washington stocks, no year 2000 escapements were reported by the cohort analysis. This obvious problem led to the eventual detection and correction of a number of other problems as well. The problems fell into two categories: 1) missing CWT data; and 2) errors within the code in the program ('makec') that generates the 'C-files' which are the primary data input files required by the cohort analysis program ('cohshk').

1) Missing data

- a) estimated escapement recoveries were missing in the 'C-files' for a number of the Washington stocks because they had not been reported to the PSMFC database by the recovering agencies.
- b) Quinalt Department of Natural Resources recovery data from 1998 through to 2000 had not been submitted to PSMFC for transfer to Canada and incorporation into the database file ('chin.dat') containing all the US recovery data used by makec.

2) Problems in the makec program code

- a) a specific library call had not been enabled in two of the US versions of makec preventing them from being able to access year 2000 Canadian fishery CWT recoveries in the Canadian MRP database for certain Washington stocks. The consequence of this problem was that no 2000 recoveries from Canadian fisheries were incorporated into the affected US C-files. Other versions of makec in use had been modified so that the necessary library call was enabled and for most stocks, year 2000 recoveries were correctly incorporated into the respective C-files.
- b) a logic error was detected in that part of the makec code that was modified for this year's analysis to change the age increment time period (i.e. 'birthday') for CWT recoveries in the WCVI troll and northern BC troll fisheries from Jan. 1 (i.e. stat week 1-1) to Oct. 1 (i.e. stat week 10-1) starting in 1998. This error potentially affected all versions of makec although a thorough examination of some sets of C-files revealed only a small number of cases where a few age-4 recoveries were incorrectly assigned a recovery age of 5. The error was due to the fact that once age at recovery was calculated upon the first instance of a recovery occurring within the period Oct. - Dec. of a given recovery year, all subsequent recoveries in the same stratum were assigned the new age even though they may have been recovered before Oct. 1. Prior to the modification of the annual period in the two troll fisheries, the structure of the Canadian database was such that recalculation of the age at recovery was not needed once the first instance of a new age at recovery was encountered within a recovery year. Only when a new recovery year was encountered was it formerly necessary for the program to re-calculate age at recovery.
- c) During the process of correcting the error in the troll aging logic, it was noted that in the year 2000, stat week 10-1 (approximating the first week of October) occurred entirely in September rather than in October. Since stat week is used as the recovery time period rather than date for troll CWT recoveries, code was added to the makec programs so that the annual 'birthday' for aging recoveries in the AK, Northern troll and WCVI troll fisheries was forced to be stat week 10-2 in the year 2000.