

**PACIFIC SALMON COMMISSION  
JOINT CHINOOK  
TECHNICAL COMMITTEE REPORT**

**CATCH AND ESCAPEMENT OF CHINOOK SALMON  
UNDER PACIFIC SALMON COMMISSION JURISDICTION,  
2002  
REPORT TCCHINOOK (03)-1**

June 26, 2003

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## LIST OF ACRONYMS WITH DEFINITIONS

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

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## EXECUTIVE SUMMARY

The June 30, 1999, Pacific Salmon Treaty (PST) Annexes and Related Agreements (Agreement) substantially changed the objectives and structure of the Pacific Salmon Commission's (PSC) chinook salmon fisheries and assessment of chinook salmon stocks. The Agreement eliminated the previous ceiling and pass-through fisheries and replaced them with Aggregate Abundance Based Management (AABM) and Individual Stock Based Management (ISBM) fisheries. It also tasked the Chinook Technical Committee (CTC) with a number of assignments (Appendix to Annex IV, Chapter 3).

In this report, we provide a summary of 2002 fishery catches by region and an assessment of escapement for those stocks that have CTC agreed goals. In addition, escapement data and agency comments have been provided for all escapement indicator stocks. We will also provide a second annual report that summarizes the exploitation rate analysis and the results of the CTC model calibration as was done last year (see CTC 2002a). Model calibration results will include postseason statistics for the 2002 fisheries and preseason predictions for the 2003 fisheries.

### CHINOOK CATCH 2002

Only catches and some fishery effort estimates are presented in this report. Assessment of compliance with the Agreement for both the AABM and ISBM fisheries requires more detailed analyses using coded-wire tag (CWT) data and calibration of the CTC model. As was done in 2002, these analyses will be reported in the annual Exploitation Rate and Model Calibration Report (e.g., CTC 2002a).

### ESCAPEMENTS THROUGH 2002

The escapement review includes 50 naturally spawning escapement indicator stocks/stock aggregates. Biologically-based escapement goals have been accepted by the CTC for 17 of the 50 escapement indicator stocks/stock aggregates. For 11 of these stocks, the agency escapement goal is defined as a range; for the remaining six stocks, the escapement goal is the point estimate of  $S_{MSY}$  (escapement producing maximum sustained yield). In 2002, escapements were within the goal range for six stocks, above the range or  $S_{MSY}$  point estimate for nine stocks, and below the goal range for 1 stock. It was not possible to provide this assessment for the other stocks without agreed escapement goals. However, data for other stocks are presented to illustrate trends in escapement. Some stocks are managed to an agency goal, but these goals have not been accepted by the CTC. The CTC will continue to review analyses to develop CTC agreed goals for the remaining stocks as they are provided.



## 1 CHINOOK CATCH 2002

The June 30, 1999, Pacific Salmon Treaty (PST) Annexes and Related Agreements (Agreement) substantially changed the objectives and structure of the Pacific Salmon Commission's (PSC) chinook salmon fisheries. The Agreement eliminated the previous ceiling and pass-through fisheries and replaced them with Aggregate Abundance Based Management (AABM) and Individual Stock Based Management (ISBM) fisheries. Chinook catches are summarized in Tables 1-1 through 1-11, as well as Appendix A.

### 1.1 REVIEW OF AABM FISHERIES

The AABM fisheries, as defined in Annex IV, Chapter 3, paragraph 2, are:

- 1) Southeast Alaska (SEAK) All Gear,
- 2) North BC (NBC) Troll and Queen Charlotte Islands (QCI) sport, and
- 3) West Coast Vancouver Island (WCVI) Troll and Outside Sport.

Catches for these three fisheries are reported below in Table 1-1.

Table 1-1. Annual catches, add-on, and terminal exclusion for Pacific Salmon Treaty AABM fisheries, in thousands of chinook salmon. The Treaty catches do not include the add-on or exclusions (see Appendix A.1). Notation is T for Troll, N for Net and S for sport.

Year	SEAK (T, N, S)			NBC (T), QCI (S)		WCVI (T, S)	
	Treaty Catch		Add-on	Treaty Catch		Treaty Catch	
	Limit <sup>1</sup>	Observed		Limit <sup>1</sup>	Observed	Limit <sup>1</sup>	Observed
1999	184.2	198.8	52.2	126.1	92.9	80.7	36.4 <sup>2</sup>
2000	178.5	186.5	76.8	128.7	31.9	82.5	101.4 <sup>2</sup>
2001	250.3	186.8	77.6	158.9	43.5	145.5	117.7 <sup>2</sup>
2002	356.5	370.3	73.8	192.7	137.8	203.2	165.0 <sup>2</sup>

<sup>1</sup> Target treaty catches correspond to the postseason AIs for 1999-2001, and the preseason AI for 2002.

<sup>2</sup> Size limits in WCVI troll and sport are provided in text.

#### 1.1.1 Southeast Alaska Fisheries

The Southeast Alaska chinook fishery has been managed to achieve the annual all gear PSC quota through a plan established by the Alaska Board of Fisheries. Once the all gear quota is determined from the preseason abundance index (AI) each spring, this plan establishes gear quotas for the troll, net, and recreational fisheries. The allocation plan reserves 4.3% of the total PSC catch for purse seine, and 8,600 fish for set and drift gillnets. After the net quotas are subtracted, 80% of the remainder is reserved for troll gear and 20% for the recreational fishery. To meet the recreational target catch, the recreational fishery is managed in-season with bag limits and other constraints.

In addition, the SEAK fisheries were managed for:

- 1) An Alaska hatchery add-on calculated on the basis of a 5,000 base-year catch and a risk factor from coded-wire-tag (CWT) sampling based on a 1 in 10 chance of error.
- 2) A wild stock terminal exclusion on the Situk, Taku, and Stikine Rivers.
- 3) Compliance with provisions established by the National Marine Fisheries Service in accordance with the United States (U.S.) Endangered Species Act (ESA).
- 4) Consistency with the provisions of the PST as required by the Salmon Fishery Management Plan of the North Pacific Fishery Management Council (PFMC) established by the U.S. Magnuson-Stevens Act.

The all gear harvests in SEAK in 2002 were substantially higher than in recent years. The preseason AI of 1.74 allowed an initial all-gear catch of 356,500 fish per the Agreement. The all gear harvest was 444,049 and the treaty catch was 370,280, after subtracting an Alaska hatchery add-on of 72,645 chinook and a wild-stock terminal exclusion of 1,124 chinook salmon (Table 1-2). A breakdown by gear for total harvest, Alaska hatchery contributions and terminal exclusions is detailed in Table 1-2. The 1999 through 2001 harvests have been updated since last year, and are shown in Table 1-3. Historical harvests for 1975–2002 are shown in Appendix A.1.

Table 1-2. Harvests of chinook salmon in SEAK by gear type in 2002.

<b>Gear</b>	<b>Total Harvest</b>	<b>Alaska Hatchery Harvest</b>	<b>Alaska Hatchery Add-on</b>	<b>Wild Terminal Exclusion</b>	<b>Treaty Catch</b>
<b>Troll</b>					
Winter	29,389	1,958	1,622	0	27,767
Spring	43,650	22,896	19,968	0	23,682
Summer 1	186,998	4,872	4,035	0	182,963
Summer 2	65,266	1,564	1,294	0	63,972
Troll subtotal	325,303	31,290	26,919	0	298,384
<b>Sport</b>					
	87,057	31,431	28,040	614	58,403
<b>Net</b>					
Setnet	2,510	0	0	510	2,000
Driftnet	11,484	6,508	6,133	0	5,351
Seine	17,695	11,716	11,553	0	6,142
Net subtotal	31,689	18,224	17,686	510	13,493
<b>Total</b>					
	444,049	80,945	72,645	1,124	370,280

### *1.1.1.1 Troll Fishery*

Troll fishery regulations were similar in 2002, compared to the period of the previous report (2001). The 2002 accounting year is October 2001 through September 2002. The winter fishery continues until 45,000 total chinook salmon are harvested or through April 14, whichever is earlier. In 2002, the winter harvest quota was not reached and continued through April 14. The spring fisheries were managed so that each fishery would not exceed a predetermined number of non-Alaskan chinook salmon based on the Alaska hatchery percentage in each of the small fisheries. Also, in 2001, the first summer fishery opening began on July 1 and was managed to harvest 70% of the remaining troll gear chinook quota based on the preseason AI. After the first summer opening, the areas of high chinook abundance were closed while the fishery was directed primarily at coho (in recent years, a large portion of the troll fleet has targeted chums). In 2002, no in-season adjustment of the AI was made because the Alaska Department of Fish and Game (ADF&G) determined that the results using the methodology reviewed by the CTC and used since 1997 were poorly correlated with the first postseason calibration of the chinook model. A second summer chinook retention period began after necessary management actions for coho salmon were determined.

In 2002, the troll fishery harvested a total of 325,303 chinook salmon including 31,290 Alaska hatchery fish, of which 298,284 were treaty fish (Table 1-2). The winter fishery harvested 29,389 of which 1,958 (6.7%) were from Alaska hatcheries, with a total of 27,767 treaty fish. The spring fishery harvested a total of 43,650 of which 22,896 (52.5%) were Alaska hatchery fish and 23,692 were treaty fish.

The total summer harvest was 252,264 retained chinook salmon, of which 6,435 (2.6%) were from Alaska hatcheries (Table 1-2). In the first summer retention period (July 1–18), 186,998 (182,963 treaty) fish were taken. The areas of high chinook abundance were closed for the remainder of the summer season after the initial retention period. The second summer retention period was open from August 12 through September 5, in which 65,266 chinook were caught of which 63,972 were treaty chinook. There were a total of 10,457 boat-days of chinook effort and 10,211 boat-days of chinook non-retention effort in 2002. The 2001 troll effort has been updated; the new statistics are 7,364 boat days of chinook effort and 15,413 boat-days of chinook non-retention effort.

Table 1-3. Summary of the 1999–2002 total chinook catches (including terminal area exclusions and hatchery add-ons) in fisheries relevant to the U.S./Canada Pacific Salmon Treaty (thousands of fish). NA indicates catch figures pending.

Area	Troll				Net				Sport				First Nation Food				Total			
	02	01	00	99	02	01	00	99	02	01	00	99	02	01	00	99	02	01	00	99
<b>SEAK</b> <sup>1</sup>	325.3	153.3	158.7	146.2	31.7	38.9	41.0	32.7	87.0	68.0	63.0	72.0					444.0	260.2	262.7	250.9
<b>BRITISH COLUMBIA</b> <sup>2</sup>																				
NBC Troll <sup>1</sup> and QCI Sport	96.5	13.1	9.8	56.5					41.3	30.4	22.1	36.4					137.8	43.5	31.9	92.9
WCVI Troll <sup>1</sup> and Outer Sport <sup>3</sup>	132.9	77.5	63.4	5.3					32.1	40.2	38.0	31.1					165.0	117.7	101.4	36.4
Transboundary					5.0	5.2	5.6	4.5	0.2	0.2	0.1	0.2	1.1	1.0	1.2	1.1	6.3	6.4	6.9	5.8
NC Net, Sport, and First Nation					12.3	23.1	27.6	12.7	8.0	11.0	8.6	11.7	14.8	28.1	23.6	24.2	35.1	62.2	59.8	48.6
CC Net, Troll <sup>1</sup> , Spt, 1st Nation	0.5			2.1	4.8	4.4	4.5	4.3	7.3	7.7	7.4	10.3	3.3	4.2	4.2	3.6	15.9	16.3	16.1	20.3
Johnstone St	0.1	0.5	0.2	0.1	0.6	0.2	0.2	0.2	2.3	3.8	5.7	7.8	0.4	0.4	0.2	0.5	3.4	4.9	6.3	8.6
Juan de Fuca Strait <sup>4</sup>							0.1	0.1	24.1	23.5	11.0	14.8		0.1	0.3	0.1	24.1	23.6	11.4	15.0
WCVI Terminal					0.5		0.1	1.0	36.1	6.4	4.5	47.2	10.9	0.9	2.4	11.5	47.1	7.3	7.0	59.7
Georgia St/Fraser <sup>5</sup>	0.5		0.3	0.1	9.0	4.3	5.6	3.9	73.5	54.9	34.8	53.7	27.8	28.5	26.2	28.2	110.8	87.7	66.9	85.9
<b>Subtotal</b>	<b>230.5</b>	<b>91.1</b>	<b>73.7</b>	<b>64.1</b>	<b>32.2</b>	<b>37.2</b>	<b>43.7</b>	<b>26.7</b>	<b>224.5</b>	<b>178.1</b>	<b>132.2</b>	<b>213.2</b>	<b>58.3</b>	<b>63.2</b>	<b>58.1</b>	<b>69.2</b>	<b>545.5</b>	<b>369.6</b>	<b>307.7</b>	<b>373.2</b>
<b>WASHINGTON Inside 6</b>															0.0					
Juan de Fuca Strait (marine) <sup>7</sup>	1.8	2.0	0.3	0.5	1.1	0.9	0.6	0.6	NA	4.8	1.7	2.0					2.9	7.7	2.6	3.1
San Juans (marine) <sup>8</sup>				0.1	2.2	1.0	1.1	0.0	NA	6.5	4.4	3.5					2.2	7.5	5.5	3.6
Other Puget Sound (mar + fw) <sup>9</sup>					100.0	96.7	71.0	91.9	NA	40.2	29.5	34.1					100.0	136.9	100.5	126.0
Coastal (mar + fw) <sup>9</sup>					20.2	20.0	15.6	11.4	NA	8.6	4.5	3.2	NA	NA	0.2	0.3	20.2	28.6	20.3	14.9
<b>Subtotal</b>	<b>1.8</b>	<b>2.0</b>	<b>0.3</b>	<b>0.6</b>	<b>123.5</b>	<b>118.6</b>	<b>88.3</b>	<b>103.9</b>	<b>0.0</b>	<b>60.1</b>	<b>40.1</b>	<b>42.8</b>	<b>0.0</b>	<b>0.0</b>	<b>0.2</b>	<b>0.3</b>	<b>125.3</b>	<b>180.7</b>	<b>128.9</b>	<b>147.6</b>
<b>COLUMBIA RIVER</b> <sup>10,11,12</sup>					233.8	195.6	75.5	85.4	18.3	137.5	55.1	40.4	44.8	55.4	19.7	35.6	<b>296.9</b>	<b>388.5</b>	<b>150.3</b>	<b>161.4</b>
<b>WA/OR N OF FALCON</b> <sup>13</sup>	120.7	54.6	20.6	45.0					60.6	25.6	9.2	10.8								
<b>OREGON (Inside)</b> <sup>14</sup>	1.6	1.2	1.9	1.2						NA	33.3	30.7								
<b>GRAND TOTAL</b>	<b>679.9</b>	<b>302.2</b>	<b>255.2</b>	<b>257.1</b>	<b>421.2</b>	<b>390.3</b>	<b>248.5</b>	<b>248.7</b>	<b>390.4</b>	<b>469.3</b>	<b>332.9</b>	<b>409.9</b>	<b>103.1</b>	<b>118.6</b>	<b>78.0</b>	<b>105.1</b>	<b>1411.7</b>	<b>1199.0</b>	<b>849.6</b>	<b>933.1</b>

- 1/ Southeast Alaska and all BC troll chinook catches shown are for a October 1-September 30 catch accounting year.
- 2/ British Columbia net catches include only fish over 5 lb. round weight.
- 3/ Troll estimates based on logbook plus catch per unit effort expanded to total effort. Sport catch is estimated through creel surveys and lodge catch records.
- 4/ Juan de Fuca includes area 19B, and since 1999, area 20-1 (Port Renfrew). The Port Renfrew creel survey was initiated in 1997.
- 5/ GS sport catches from areas 13-19A, 28, 29 outside the Fraser River. Juan de Fuca Strait sport catches reported separately.
- 6/ All WA inside sport numbers are adjusted for punch card bias. See "1988 WA State Sport Catch Report" for details.
- 7/ Strait troll catch includes all catch in areas 5, 6C, and catch in area 4B outside of the PFMC management period (January-May and October-December).
- 8/ San Juan net catch includes catch in areas 6, 6A, 7, and 7A; sport catch includes area 7.
- 9/ Coastal and Puget Sound sport catches include marine and freshwater, but only adults in freshwater.
- 10/ Columbia River net catches include Oregon, Washington, and both Treaty commercial and bank sale catches. Catch includes adults and jacks.
- 11/ Columbia River sport catches include adults only, for Washington, Oregon, Idaho, and Buoy 10 anglers. Catch includes adults and jacks.
- 12/ Columbia River Indian food includes ceremonial and subsistence. Catch includes adults and jacks.
- 13/ North of Falcon troll catch includes catch in area 4B during the PFMC management period (May-September), and area 2.2 (Grays Harbor) when area 2 is open.
- 14/ Troll = late season troll off Elk River mouth (Cape Blanco); sport = estuary and inland.

### 1.1.1.2 The Net Fisheries

Net harvest of chinook salmon in the purse seine fishery is limited by a 28" (71 cm) size limit and the use of chinook non-retention (CNR) regulations. Chinook between 21" and 28" may be retained (for personal use) but never sold, while chinook below 21" may be retained at all times. Gillnet harvest of chinook is limited by a delayed season opening until late June. There are terminal exclusions for the Stikine and Taku drift gillnet fisheries and for the Situk set-gillnet fishery. The harvests during the base period (1979-1982) were 402 and 1,708 fish for the Stikine and Taku respectively (Table 1-4). The Situk base-period harvest was 2,000. Harvest over and above the base period catch is excluded from PSC limits if the agreed escapement goal for the system has been met.

The 2002 total net harvest was 31,689 chinook (Table 1-2). There were a total of 510 fish excluded (Table 1-4) and 18,730 chinook were from Alaska hatcheries. The total net harvest minus the terminal exclusion and the Alaska hatchery add-on was 13,493 chinook. The treaty harvest by gear type was 2,000 for set gillnet, 5,351 for drift gillnet, and 6,142 for purse seine.

Table 1-4. Base, total, and excluded chinook harvest for the SEAK net fisheries on the Stikine, Taku, and Situk Rivers in 2002.

<b>Stock</b>	<b>Base Harvest</b>	<b>Total Harvest</b>	<b>Exclusion Harvest</b>
Stikine	402	0	0
Taku	1,708	1,465	0
Situk	2,000	2,510	510
<b>Total</b>	<b>4,110</b>	<b>3,975</b>	<b>510</b>

### 1.1.1.3 Recreational Fisheries

Recreational harvests are monitored in-season by creel surveys throughout the region, and sampling programs are in place to recover coded-wire tagged (CWT'd) chinook and coho salmon. In 2002, regulations for the recreational fishery included a two-fish daily bag limit for resident anglers and one-fish daily bag limit with a three-fish annual limit for non-resident anglers. The minimum size limit of 28" in total length was in effect for both resident and non-resident anglers. In "terminal" areas near hatchery release sites, bag and size limit regulations were liberalized to provide for increased harvests of returning Alaska hatchery chinook salmon. The total harvest in 2002 was 87,057 chinook of which 614 were wild fish that were excluded (Table 1-6), 19,731 chinook were Alaska hatchery fish taken in mixed stock fisheries, and another 11,700 Alaska hatchery fish were taken in terminal hatchery areas. The preliminary total sport harvest estimate of 87,057, minus 28,654 combined hatchery add-on and wild terminal exclusion fish, resulted in a treaty harvest of 58,403 chinook (Table 1-2). In the summer of 2003, harvest estimates for 2002 will be updated after mail survey results are obtained.

Recreational harvest estimates for SEAK in 2001 have been updated. In 2001, the total recreational harvest was 72,300 chinook of which 900 were wild fish that were excluded in terminal areas, 18,300 were Alaska hatchery fish, and 12,600 fish were taken in terminal Alaska hatchery areas. The total sport harvest of 72,300, minus 27,600 combined hatchery add-on and wild terminal harvest fish, resulted in a treaty harvest of 44,700 chinook.

Table 1-5. Terminal base, total, and exclusion harvests for wild stocks of chinook salmon for the SEAK recreational fishery, 1999-2002.

Stock	Base Harvest	Total Harvest				Terminal Exclusion Harvest			
		1999	2000	2001	2002 <sup>1</sup>	1999 <sup>2</sup>	2000 <sup>2</sup>	2001 <sup>2</sup>	2002 <sup>2</sup>
Stikine	2,302	3,567	2,581	3,005	1,860	0	279	0	0
Taku	1,857	2,408	1,553	1,437	2,471	0	0	703	614
Situk	200	1,545	1,521	394	124	1,345	1,521	194	0
Total	4,359	7,520	5,655	4,836	4,455	2,610	1,600	894	614

<sup>1</sup> Catch data for 2002 are preliminary.

<sup>2</sup> Chapter 3, part 8 of the Agreement states: “The Parties agree; (a) to continue the procedures previously established by the Commission to allow for the exclusion of chinook salmon catches in selected terminal areas from counting against treaty catch limitations”. ADF&G will be providing additional documentation concerning terminal exclusions of chinook salmon catches in SEAK fisheries before 2004.

The ADF&G has recorded terminal exclusions of chinook from the Situk, Taku, and Stikine Rivers for 1999 through 2002 (Table 1-5). The CTC has asked the ADF&G for further documentation supporting these exclusions. The CTC notes that provision of terminal exclusions requires documentation of the following conditions, as noted in the 1991 Letter of Transmittal to governments (PSC file):

- i) spawning escapements of stocks targeted in the exclusion area are meeting or exceeding the interim escapement goal;
- ii) the harvest in the exclusion area is comprised of mature chinook returning to local stocks while minimizing the harvest of immature and non-local stocks; and
- iii) management capabilities accurately account for and sample harvest occurring exclusively in the exclusion area.

Further, the catch in any year must be compared against a base catch level that must be defined for each terminal exclusion area.

The CTC has deferred consideration of the terminal exclusions in Alaska until the further documentation is provided. Alaska will provide documentation before January 2004. The CTC notes that the Taku and Stikine exclusions involve transboundary chinook stocks that may more appropriately be considered within the Transboundary Technical Committee (TTC) and Panel as part of the development of abundance-based management plans in these rivers.

## 1.1.2 North British Columbia

### 1.1.2.1 Troll Fisheries

The NBC troll fishery opened October 4, 2001 in portions of Areas 1, 2, 101, 102, 130, and 142 around the southeast and west sides of the Queen Charlotte Islands. Only 253 chinook were caught in October. No catch occurred from November 2001 through January 2002. Additional portions of Area 1 and 101 around the north end of Graham Island were opened in February to allow access to fishing areas sheltered from the weather. This resulted in a small amount of effort and only 143 fish were caught in February and March. Effort and catch increased steadily after April. On May 12 the troll fishery was excluded from areas within one mile of Langara Island

and from areas within one mile of the Graham Island shoreline between Cape Knox and Skonun Point to avoid conflict with the sport fishery. The NBC troll fishery was closed June 8 after catching 75,582 chinook salmon since January.

A troll test fishery was conducted in the North B.C. Coast in July and August of 2002. The initial design included 10 area strata but two locations in Area 2E were abandoned due to lack of samples. The design included four time strata in July and August. The total catch included 2,211 chinook larger than 67 cm fork length (legal size), 1,732 from AABM Areas 1 to 5 and 479 from ISBM Areas 6 and 7. An additional 490 sub-legal chinook (less than 67 cm fork length) were sacrificed for DNA samples: 430 from areas 1 and 2, and 60 from Areas 6 and 7. Sub-legal chinook catch was excluded from catch totals.

Troll fisheries were conducted from August 1 to September 5 in Dixon Entrance and Hecate Strait with non-retention of chinook salmon. The NBC troll fishery re-opened for retention of chinook salmon September 8, 2002. The 1 mile ribbon boundary remained in place until September 18 to keep troll fleets away from the recreational fishery. A total of 18,765 chinook were caught from September 8 to 30, 2002.

The total NBC troll catch from October 1, 2001 to September 30, 2002 was 96,475 chinook.

#### *1.1.2.2 Recreational Fisheries*

Tidal recreational fisheries in northern and central B.C. (marine statistical Areas 1-11) are managed under one set of regulations (45 cm minimum size limit; two chinook per day and four in possession; annual bag limit of 30). Recreational fisheries also occur in freshwater, with regulations described annually in the Freshwater Salmon Supplement to the BC Tidal Waters Sport Fishing Guide (<http://www-comm.pac.dfo-mpo.gc.ca/english/sfg/>). Catch in these freshwater fisheries is included in section 1.2.

During the past decade, recreational fisheries in the marine areas of north and central BC have expanded substantially, especially in the area of the QCI (areas 1, 2W, 2E). Management and monitoring of these fisheries has also expanded. Management of these marine recreational fisheries now recognizes two basic regions: QCI, and the coastal mainland and inlets. Only the QCI recreational catch is included in the AABM totals.

Since 1995, catch in the QCI recreational fisheries have been estimated by creel surveys (supported by the Haida Nation) and independent observations by CDFO staff. In 2002, fishery management actions were relaxed after several years of restrictions intended to reduce impacts on WCVI chinook. The normal possession limits of two/day and four in possession applied. Preliminary reported catch for this fishery in 2002 was 41,300 chinook salmon.

Thus, the total NBC AABM catch (troll plus sport) between October 1, 2001 and September 30, 2002 was 137,775 fish.

### 1.1.3 West Coast Vancouver Island Troll and Outside Sport

Under the 1999 PST Agreement, the WCVI AABM fishery is defined to include the WCVI troll and the outside WCVI chinook recreational fishery. The ‘outside’ recreational fishery includes all catch in northwest WCVI (areas 25–27) prior to July 1 and the catch outside one nautical mile (NM) offshore after July 1, plus all the catch in southwest WCVI (areas 21–24) prior to August 1 and the catch outside one NM offshore after August 1.

In the 2002 season, the WCVI troll fishing opportunities were consistent with a CDFO commitment to evaluate winter fisheries as a means to improve the economic base for the fleet and local communities while increasing flexibility in harvest opportunities and reducing the harvest rates on stocks encountered in summer fisheries (Table 1–6).

Table 1-6. Fishing periods and chinook harvested and released during the 2002 accounting year in the WCVI troll fishery.

<b>Fishing period</b>	<b>Comments, harvest and release of chinook salmon</b>
October 9 - November 28, 2001	Full fleet opportunity-3,256 chinook retained and 1,096 released.
November 29 - December 31, 2001	Limited access fishery-110 chinook retained and 100 released.
January 1-31, 2002	Limited access fishery-1,869 chinook retained and 615 released.
April 14-23, 2002	Both commercial and assessment fisheries conducted. Fisheries were not conducted during late March to mid-April to avoid impacts on earliest timing upper Fraser River spring run chinook. Full fleet opportunity-2,339 chinook retained and 762 released
April 24-June 8, 2002	An assessment of coho encounter rates occurred prior to re-opening. Full fleet opportunity -103,245 chinook retained and 8,282 released
June 9-June 20, 2002	Low coho encounter rates resulted in extending the June fishery. Full fleet opportunity - 13,223 chinook were retained and 1,343 released.
June 20-July 5, 2002	Chinook retention was permitted as incidental catch during a directed sockeye troll fishery within Barkley Sound (Area 23). Incidental chinook catches have averaged less than 25 chinook per year in this fishery. Monitoring during 2002 indicated that 2 chinook were retained and 39 released.
July 28-August 3, 2002	Fisheries in areas 123 and 127 were open and directed at Fraser River sockeye. Both commercial and assessment fisheries were conducted. Preliminary data indicated that during this fishery, 0 chinook were retained, and 5,102 were released.
August 18-24, 2002	A commercial assessment fishery was carried out in Area 123 investigating the ability of plugs to minimize coho encounters. Limited access fishery – 5,032 chinook were retained and 2,969 released.
September 21-30, 2002	Both commercial and assessment fisheries were conducted. The fishery was restricted to offshore areas to avoid WCVI chinook. Full fleet opportunity – 3,845 chinook were retained and 418 released.



The minimum size limit for troll-caught chinook in all periods was 55 cm FL. Catches during these fisheries were extensively monitored to determine encounter rates of other species and of chinook under 55 cm FL, as well as for sampling size distributions, and stock compositions (via CWT, DNA and otolith samples). The total AABM catch for 2002 Area G troll fisheries between October 1, 2001 and September 30, 2002 was 132,921 chinook (20,726 released).

CWT recoveries by sport catch locations during 1997–1999 indicated that WCVI chinook are vulnerable in near shore waters during their return migration. The 2002 WCVI chinook fisheries faced conservation concerns for WCVI origin chinook stocks and interior Fraser River coho, which resulted in restrictions in offshore areas and a seasonal implementation of a chinook near shore ‘conservation corridor.’ The inner boundary of the corridor was generally defined as the surf line and the outer boundary was generally one nautical mile seaward of the surf line. The conservation corridor extended 1 mile offshore from Bonilla Point (southern limit) to Tatchu Point in the northern part of the WCVI.

During 2002, recreational fishing for all species was prohibited within the conservation corridor, depending on area and time of year. In areas 21-24 and 121-124 salmon fishing within the corridor was prohibited between August 1 and October 15. Outside of the corridor and in Areas 25 to 27, salmon fishing with non-retention of coho was permitted but restrictions included specific area closures and non-retention of chinook over 77 cm FL in the near shore areas that were open to salmon fishing. Inside of the surf line, there was generally non-retention of chinook salmon, except in terminal areas near the Conuma and Nitinat River Hatcheries. In addition, salmon fishing was prohibited within sections of Nootka Sound (Area 25) in order to protect local wild stocks.

Recreational fishery catches outside of the corridor were extensively sampled for by-catch of WCVI chinook stocks using CWT recoveries and sampling for otolith marks.

Since 1997, an outer WCVI sport fishery has occurred primarily in the Barkley Sound, outer Clayoquot Sound, and Nootka Sound areas. The majority of fishing effort occurred from mid-July through mid-September. Creel surveys were generally conducted from late May or early June to September 30 but varied with run timing. The 2002 recreational catch in the outer area of WCVI was 32,115 chinook salmon (Table 1-7).

Table 1-7. Outer WCVI recreational fishery catches of chinook by statistical area in 2002.

Statistical areas						
21/121	23/123	24/124	25/125	26/126	27	Total
5,045	20,045	5,683	69	1,099	174	32,115

Thus, the total AABM catch (troll plus sport) in 2002 was 165,036 chinook.

## 1.2 REVIEW OF ISBM FISHERIES

### 1.2.1 Canadian Fisheries

#### 1.2.1.1 Transboundary Rivers

Chinook catches in the Canadian reaches of the Stikine and Taku River gillnet (commercial and test fishery catches) and aboriginal fisheries for 1999–2002 are listed in Table 1-8. Aboriginal and recreational harvests in the Alsek River in Canada for 1999–2002 are listed in Table 1-9.

Table 1-8. Chinook catches in Canada in the Taku and Stikine Rivers in 1999–2002.

Year	Stikine				Taku			
	Commercial + Test Fishery		Aboriginal		Commercial + Test Fishery		Aboriginal	
	Jacks	Large	Jacks	Large	Jacks	Large	Jacks	Large
1999	898	3,004	463	765	259	1,485	-	50
2000	260	2,684	386	1,109	174	2,888	-	50
2001	162	2,608	44	665	347	2,633	-	125
2002	535	2,091	366	927	646	2,872	-	37

Table 1-9. Chinook catches in Canada in the Alsek River in 1999–2002.

Year	Aboriginal	Recreational
1999	238	192
2000	65	58
2001	120	157
2002	120	183

Details of these fisheries are available from the annual reports of the PSC's Transboundary Technical Committee (TTC).

#### 1.2.1.2 North Coast

In 2002, mandatory release of chinook from seine nets was maintained throughout the season. There was no gillnet catch of chinook salmon in the Queen Charlotte Islands. The gillnet catch in the Skeena/Nass (Areas 3, 4, 5) was 11,041 chinook, which included 5,924 fish caught in River Gap Slough portion of Area 4. The Tye test fishery caught an additional 1,308 chinook in the Skeena River.

Recreational fisheries, other than those off the Queen Charlotte Islands, occurred in the north coast (regulations as above). In Areas 3 and 4, a creel survey of marine recreational fishing ran from May to September in 2002. This survey accounted for 7,868 of the total estimated tidal sport catch of 8,000 chinook in these areas. The total freshwater recreational fishery harvest for

the north coast was not estimated in 2002. Reports from Fishery Officers indicate that effort was similar to 2001 but angler success was reduced, especially in the Skeena River upstream of Terrace.

Native food fisheries on the north coast harvested an estimated 14,837 chinook (5,179 tidal, 9,658 freshwater). Accurate total catches are difficult to estimate, as several First Nations have no agreement with CDFO for the provision of catch figures.

### *1.2.1.3 Central Coast*

While trolling was permitted during net fishing periods in Areas 7 and 8 in 2002, the level of participation was unknown and no catch was reported. A total of 481 chinook were landed during two test fisheries. In 2002, gillnet catch from the central coast (areas 7–10) was 4,827 chinook, including 2,333 fish caught in the Area 8 (Bella Coola) large mesh gillnet fishery.

For the 2002 Rivers Inlet (Area 9) tidal recreational fishery, the terminal area near the Wannock River remained closed to fishing. Instead of a formal creel survey, a logbook program was conducted, which indicated a lodge catch of 1,584 chinook. The total estimated catch was 2,576 chinook in Rivers Inlet. The total tidal sport catch for Areas 7 to 10 (including Rivers Inlet) was 7,330 chinook. This estimate does not include a significant sport fishery in Area 6, the approaches to Kitimat. No catch estimate is available for this fishery, though it targets Kitimat fish.

Freshwater recreational fisheries occur annually in several central coast rivers. However in 2002, catch estimates were available from the Bella Coola and Atnarko Rivers only. Estimated freshwater sport catch in these systems was 723 chinook.

Native food fisheries along the central coast occur primarily in the Bella Coola River, the Kitimat River and approach areas (Area 6). In 2002, an estimated 3,292 chinook were harvested (254 tidal, 3,038 non-tidal) in Areas 7 to 10. No estimate is available for First Nations' harvests of chinook in Area 6.

### *1.2.1.4 Johnstone Strait*

In 2002, chinook could be retained during troll fisheries for sockeye salmon in area 12. By-catch of chinook in these troll fisheries was estimated to be 100 fish.

Fishing time, location, and gear are regulated in southern BC net fisheries to conserve immature and adult chinook salmon. All gillnet fisheries were required to release live chinook. Net fisheries in Johnstone Strait targeting Fraser sockeye and southern inside chum stocks resulted in a by-catch of less than 600 chinook in 2002. There were no directed net fisheries for chinook in Johnstone Strait in 2002. For seine gear, there was non-retention and non-possession of chinook during all fisheries. The normal restrictions for the Ribbon Boundary seine fishery remained in effect in Johnstone Strait. Fish revival tanks were required as a condition of license; these tanks were used to revive fish prior to release.

In 2002, a creel survey was conducted that encompassed only the Northern Queen Charlotte Strait (Pt. Hardy area) from August 1–September 1. Based on this survey, the estimated sport catch was 2,331 chinook taken during 5,016 boat trips. Native food fisheries along Johnstone Strait harvested 400 chinook.

*1.2.1.5 Georgia Strait / Fraser*

During 2002, use of single barbless hooks was mandatory during all troll fisheries as part of the Salmon Area H (Strait of Georgia) license conditions. There was no directed commercial chinook troll fishery; however, chinook were retained during directed sockeye, pink, and chum fisheries. The management strategy included a provision for chinook non-retention if unacceptable bycatch levels of chinook were observed. The minimum size limit for troll caught chinook was 62 cm FL for Areas 13 to 18 and 29. In 2002, 506 chinook were retained and 205 were released.

Fishing time, location, and gear are regulated in southern BC net fisheries to conserve juvenile and adult chinook salmon. Chinook catch by net gears in the Strait of Georgia occur mainly in the Fraser River gillnet sockeye fishery, gillnet chum fishery, and gillnet test fishery. In the Fraser River area, net fishing is usually limited to gillnets, where chinook are caught incidentally during directed sockeye, pink, or chum fisheries. These fisheries were restricted in September to limit impacts on natural Harrison River chinook, Interior Fraser River coho, and steelhead salmon.

For 2002, the total Albion, Whonnock, and Cottonwood test fishery chinook catches were 3,069, 1,351, and 118 respectively. There was no selective fishery project in 2002, and chinook retained in Area 29 sockeye and chum net fisheries totaled 4,272 and 70, respectively. In addition, chinook catch from protest fisheries during the sockeye fishery was estimated to be at least 100 chinook. Thus, the estimated total lower Fraser gillnet chinook catch in 2002 was 8,980 fish.

The management objective for the Strait of Georgia (GS) recreational fishery was to maintain a 20% harvest rate reduction, relative to 1987 levels, on lower GS chinook. Consequently, the management plan implemented in 1989 was continued through 2002. This plan consisted of the following management actions plus additional actions taken during 2002 (Table 1-10).

Table 1-10. Chinook recreational daily bag limits, annual catch limits, and size limits in Southern BC marine recreational fisheries.

Fishing Area	Daily Bag Limit		Annual Bag Limit			Size Limit (cm)	
	1989 - Present	1985 - 1988	1989 – Present	1988	1985 - 1987	1989- Present	1985- 1988
Strait of Georgia (S. A. 13-18, 19A, 28, 29)	2	2	15	8	20	62	45
Juan de Fuca (S. A. 19B, 20)	2	2	20	8	20	45	45
Johnstone Strait (S. A. 12)	2	4	15	30	30	62	45

Effort and chinook catch was affected by closures to protect Interior Fraser River coho. Recreational fishing in Area 20 was permitted for chinook retention with size limits of 45 cm westward of Cadboro Point (mid-area 19) and 62 cm FL eastward of the Point.

In 2002, a GS recreational creel survey was conducted similar to that in 2001. The GS recreational fishery includes Statistical Areas 13 (from Quadra and Sonora Islands south) through Area 18, 19A (Saanich Inlet), 28, and marine portions of 29 outside the Fraser River. The estimated chinook catch in the Strait of Georgia was 52,979 fish, with effort estimated to be 164,903 boat trips.

Recreational fishery catches in the lower mainstem of the Fraser River are estimated annually by creel surveys but the sampling periods vary between years. In 2001 the lower Fraser River recreational fishery was monitored from April to early September and the estimated catch for these months was 9,635 chinook retained and 3,611 released. There were an additional 82 chinook jacks retained and 35 released. For 2002, the preliminary totals for adult chinook were 3,642 retained and 421 released, with an additional 208 jacks retained and 226 released. For both 2001 and 2002, the largest proportion (~90%) of chinook caught by recreational anglers occurred in July and August. In 2002, water levels were unusually high in May, June and early July, resulting in less angling effort and less catch than previous years. Recreational fishing occurs in several upper tributaries to the Fraser River. Fishery Officers monitor catch, while creel surveys are used for fisheries that encounter indicator stocks. Preliminary total catch in these up-river sport fisheries was estimated at 3,739 chinook during 2002. Since 1998, recreational fishing has increased in the Chilliwack River (lower Fraser River) and targets large returns of Fraser fall chinook stock (Harrison white fall chinook transplanted to Chilliwack River). Catch in this recreational fishery was monitored by creel surveys. In 2001, the final totals for adult chinook in the Chilliwack River were 8,345 retained and 29,620 released. The final totals for jack chinook were 1,616 retained and 2,841 released. The largest proportion (~80%) of chinook caught by recreational anglers occurred in October. For 2002, preliminary results were available to the end of November. The preliminary totals for adult chinook are 12,305 retained and 55,326 released. The preliminary totals for jack chinook were 501 retained and 618 released. Water levels were extremely low in the Chilliwack River during the fall of 2002 and fish were concentrated in pools, which may have increased catchability.

In Nicomen Slough/Norrish Creek, no chinook were caught or released by recreational anglers in 2001 and 2002. In the Stave River no chinook were caught in 2001; catch in 2002 is unknown as no creel survey was conducted that year. For the Chehalis River in 2001, the final totals for adult chinook were 34 retained and 656 released, while a total of 15 jacks were retained and 65 released. For the Harrison River in 2001, the final totals for adult chinook were 20 retained and 436 released; no jack chinook were retained or released. Recreational catch for the Harrison and Chehalis rivers in 2002 is unknown, since no creel surveys were conducted that year.

Freshwater recreational fisheries also occur on various streams on the east coast of Vancouver Island. Less than 100 jacks were caught in a jacks-only fishery conducted on the Cowichan River in 2002.

The major First Nations fishery in southern BC occurs in the Fraser River mainstem. Catches were estimated with catch monitoring programs in the lower river and surveys in the upper river. The preliminary estimate for the 2001 First Nation catch in the lower Fraser River is 21,783 chinook. In 2002, the preliminary lower Fraser River estimate to the end of November is 21,133 chinook. Additionally, up-river First Nation fisheries were estimated to have harvested 5,641 chinook in 2002.

First Nations food fisheries also occur in Strait of Georgia rivers. First Nation catch of chinook occurred in the Cowichan River, the principal indicator stock for the Lower Strait of Georgia fall chinook stock group. Catches were monitored by the First Nation's River Management staff and were estimated by gear counts and interviews. Catch for 2002 was estimated to be 800 adult chinook and 200 jacks.

#### 1.2.1.6 Juan de Fuca Strait

In Juan de Fuca Strait, areas of high chinook vulnerability were closed to net fisheries; fishing inside of a minimum water depth stratum was also precluded to reduce the catch of immature chinook and coho. A maximum number of immature chinook caught per set was used to limit total chinook mortality. If encounters exceeded this value, then the fishery was moved or closed.

Commercial net fisheries (seine only) targeting species other than chinook occurred in Juan de Fuca Strait in 2002. The Area 20 seine fishery released 1,409 chinook.

Recreational fishing regulations for 2002 are provided in Table 1-7. A creel survey of the Juan de Fuca fishery included Areas 19B-E (Sidney to Race Rocks), 19-F/20-5 (Race Rocks to Sheringham) and 20-1 at Port Renfrew. The estimated catch was 24,084 chinook and estimated effort was 62,380 boat trips.

#### 1.2.1.7 WCVI Terminal

Terminal WCVI sport catch occurs in inshore areas of Areas 23A (Alberni Inlet), 23B (Barkley Sound), 24 (Clayoquot Sound), 25 (Nootka Sound), 26 (Kyuquot Sound) and 27 (Quatsino Sound). It includes catch inside Areas 23/24 in August and September and in Areas 25, 26, and 27 in July-September. The 2002 sport catch from terminal areas of WCVI was 36,140 chinook salmon (Table 1-11).

Table 1-11. Terminal-area WCVI recreational fishery catches of chinook by statistical area in 2002.

Statistical areas								
21	22	23A	23B	24	25	26	27	Total
0	1,716	13,864	7,509	1,447	10,178	981	445 <sup>1</sup>	36,140

<sup>1</sup> There was no creel survey done in area 27 in 2002. It was assumed the same number of fish were caught in 2002 as in 2001.

Two chinook were landed as incidental catch in the Barkley Sound sockeye troll fishery in 2002. A total of 239 chinook were landed as incidental catch in the Barkley Sound sockeye net fishery. An experimental gillnet fishery in Area 23 targeting coho resulted in 217 chinook retained as bycatch. A First Nation fishery occurred in the terminal area of Area 23 in 2002 and harvested 10,893 chinook. Data were insufficient to estimate harvests by First Nation fisheries outside of Area 23.

## **1.2.2 Southern U.S. Fisheries**

Southern U.S. fisheries of interest to the PSC, generally those north of Cape Falcon, Oregon, are managed in accordance with legal obligations stemming from treaties between Indian tribes and the United States. In 1974, *U.S. v Washington* set forth sharing obligations to meet Treaty fishing rights in western Washington. Treaty rights of Columbia River tribes were defined by *U.S. v Oregon*, and the Columbia River Fisheries Management Plan was implemented in 1977. In reporting these fisheries, fishermen are termed “treaty” if they are fishing under the Native Treaty fishing rights and “non treaty” otherwise. Catches for 1999-2002 are tabulated in Table 1-3 and summaries are presented below. As specified in the 1999 agreement, all southern U.S. fisheries are ISBM fisheries.

### *1.2.2.1 Strait of Juan de Fuca and the San Juan Islands*

Chinook salmon were harvested in the Strait of Juan de Fuca and the San Juan Islands by recreational anglers and in commercial fisheries. Management measures were taken to protect depressed spring chinook stocks. Treaty commercial fisheries were closed during the spring chinook management period (April 16-June 15). The recreational fisheries were restricted by a 30-inch maximum size limit for chinook during the spring chinook management period and through the use of barbless hooks.

In the strait of Juan de Fuca, recreational fishing was closed to chinook salmon retention in catch reporting areas 5 & 6 except from February 16 to April 10 and during the month of November. In addition, for catch area 5 only, from July 8 to 11, and on July 22, chinook salmon landings were allowed with a one fish bag limit, up to a quota of 2,000 fish. from July 1 through September 30, the total harvest of chinook salmon in area 5 was estimated at 2,028 fish with 53,499 angler trips.

The southern and southeastern (Rosario Strait) portions of the San Juan Islands were again closed to recreational fishing in 2002 to protect migrating, mature Puget Sound chinook salmon. The remaining area was opened for retention of chinook (one fish bag limit) from July 1 to September 30. Chinook retention was also allowed in the entire area from February 16 - April 10 and for the month of November. No estimate of recreational catch is available at this time.

The preliminary estimate of the 2002 chinook catch in Strait of Juan de Fuca tribal net fisheries directed at sockeye salmon is 801. An additional 275 chinook were taken during the coho management period.

The preliminary estimate of the 2002 chinook catch in the San Juan Islands tribal net fishery directed at sockeye salmon is 2,102. Non-treaty landings totaled 129 chinook.

The preliminary estimate of the 2002 Strait of Juan de Fuca treaty troll fishery is 1,783 chinook through November. The catch estimate does not include catches from Area 4B during the May-September PFMC management period. These are included in the North of Cape Falcon troll summary.

Historic catch estimates are provided in Appendices A.8 and A.9 for the Strait of Juan de Fuca and San Juan areas respectively.

### *1.2.2.2 Puget Sound*

In the Puget Sound area, exclusive of the Strait of Juan de Fuca and the San Juan Islands, chinook salmon are harvested in recreational, and in both treaty and non-treaty commercial net fisheries. The fisheries are managed to protect depressed spring and fall chinook and coho stocks. To protect depressed summer/fall stocks, there were no directed chinook commercial net fisheries in the Skagit or Stillaguamish/Snohomish terminal areas with the exception of the tribal fishery in Tulalip Bay, which targeted hatchery-origin chinook. Additionally, some tribal ceremonial and subsistence (C&S) harvest occurred in these areas as well as an evaluation fishery to maintain annual fishery data.

In 1997, the WDFW Commission adopted a rule to require the completion of logbooks by all non-Treaty purse seine vessel operators during the 7/7A sockeye/pink fishery, and the release of all chinook. In 1999, the logbook program was expanded to include all commercial gear in the 7/7A sockeye/pink fishery, and the use of brailers or hand dip nets became mandatory for removal of salmon from seine nets. For the rest of Puget Sound, additional restrictions were also put in place to protect depressed stocks. However, harvest opportunities may occur in local terminal areas where hatchery surpluses exist.

Preliminary estimates of the 2002 tribal and non-tribal net fishery harvests in Puget Sound marine areas are 75,199 chinook, mostly taken in terminal areas where harvestable abundance was identified. Additional tribal net harvest occurred in freshwater fisheries with a preliminary estimate of 24,802. Estimates of the sport catch in 2002 are not yet available.

Historic catches for Puget Sound, exclusive of the San Juans, are provided in Appendix A.10.

### *1.2.2.3 Washington Coast*

The annual harvests in Washington Coastal fisheries for 2002 are reported in Table 1-4. Chinook salmon are harvested in treaty commercial net fisheries, Indian ceremonial and subsistence (C&S) fisheries, and in recreational fisheries. Washington coastal catch estimates include harvests in Grays Harbor, Willapa Bay, and the Quinault, Queets, Hoh and Quillayute Rivers. Harvests impact the spring/summer and fall stocks in Grays Harbor and the Quinault, Queets, Hoh and Quillayute Rivers and the fall stock in Willapa Bay.

Tribal commercial and ceremonial and subsistence fisheries harvested a total of 13,300 chinook in north coastal rivers (Quinault, Queets, Hoh, and Quillayute) in 2002.



Harvest in Grays Harbor includes catch from both the Humptulips and Chehalis rivers. The 2002 tribal net fisheries harvested an estimated 966 chinook. The 2002 non-Indian commercial net harvest in Grays Harbor was 66 chinook. Approximately 5,800 chinook were harvested by non-Indian commercial net fisheries in Willapa Bay in 2002.

From Grays Harbor north, recreational fisheries were implemented based upon preseason tribal-state agreements and were subject to in-season adjustments. Estimates of sport fishery catches for Washington coastal terminal fishing areas in 2002 are not available. Historic catch estimates for Washington Coastal inside fisheries are shown in Appendix Table A.11.

#### 1.2.2.4 *Ocean Fisheries North of Cape Falcon*

The U.S. ocean fisheries north of Cape Falcon, Oregon, are managed through the domestic regulatory process of the PFMC. Management objectives for chinook fisheries include satisfying standards for ESA-listed stocks, providing for viable ocean and terminal area fisheries, protecting depressed wild stocks, and meeting hatchery chinook brood stock needs. Lower Columbia River and Bonneville Pool Hatchery fall chinook have historically been the major contributors to ocean catches North of Cape Falcon. In 2002, fisheries were structured to reduce impacts on threatened Puget Sound chinook by constraining catches in areas of highest concentration of these stocks (parts of areas 3 and 4). Management objectives for ESA listed stocks, especially Oregon Coastal Natural coho and lower Columbia River wild fall chinook, also restricted ocean fisheries in the Southern U.S. Recreational and commercial catches for the region and are shown in Table 1-3.

Preliminary estimates of chinook catch north of Cape Falcon in 2002 are 120,700 in treaty and non-treaty troll fisheries, and a total recreational catch of 60,600. The troll catch includes catches in Area 4B during the PFMC management period (May 1 – September 30). Historic catch estimates are provided in Appendix A.13.

#### 1.2.2.5 *Columbia River*

Chinook from the Columbia River are divided into eight stock groups for management purposes. These groups are delineated by run timing and area of origin: (1) spring run originating below Bonneville Dam; (2) spring run originating above Bonneville Dam; (3) summer run originating above Bonneville Dam; (4) fall run returning to Spring Creek Hatchery; (5) fall run originating in hatchery complexes below Bonneville Dam; (6) wild fall run originating below Bonneville Dam; (7) upriver bright fall run; and (8) mid-Columbia bright fall hatchery fish.

Columbia River fisheries are constrained by escapement objectives for these stock groups and restrictions resulting from Evolutionarily Significant Units (ESUs) listed under the ESA. There are five chinook ESUs in the Columbia River: (1) Snake River falls – *threatened* April 1992; (2) Snake River spring/summer – *threatened* April 1992; (3) Upper Columbia spring – *endangered* March 1999; (4) Lower Columbia River – *threatened* March 1999; (5) Upper Willamette spring – *threatened* March 1999. The Columbia River also has several ESUs of other species that could affect the capacity to harvest chinook: (1) chum – *threatened* March 1999; (2) Snake River sockeye – *endangered* November 1991; (3) upper Columbia River steelhead – *endangered* August 1997; (4) Snake River steelhead – *threatened* August 1997; (5) Lower Columbia River

steelhead – threatened March 1998; (6) Upper Willamette steelhead – *threatened* March 1999; (7) mid Columbia steelhead – *threatened* March 1999.

Annual harvest management plans are based on the Columbia River Fishery Management Plan and agreements reached between the parties to *U.S. v Oregon*.

In 2002, the total annual harvest for all fisheries (spring, summer and fall) in the Columbia River basin was 416,900 chinook, including commercial net harvest of 233,800, recreational harvest of 138,300 and the Indian ceremonial and subsistence harvest of 44,800 chinook. Historic catch estimates are shown in Appendix A. 12.

#### *1.2.2.6 Ocean Fisheries, Cape Falcon to Humbug Mountain*

Most harvest in ocean fisheries off Oregon’s coast is comprised of a mixture of southern chinook stocks not included in the PSC agreement. These stocks do not migrate north into the PSC jurisdiction to any great extent. Some stocks originating in Oregon coastal streams do migrate into PSC fisheries, including the Northern Oregon Coast (NOC) and Mid-Oregon Coast (MOC) stock aggregates. The NOC stocks are harvested only incidentally in Oregon ocean fisheries, while the catch distribution of MOC stocks in Oregon ocean fisheries is believed to be much greater. Catch statistics are readily available for only one population of the MOC group, for a terminal area troll fishery at the mouth of the Elk River. Late Season (November-December) troll catch in the Elk River terminal troll fishery in 2002 was 1,633 chinook.

Recreational catch of these two stock groups occurs primarily in estuary and freshwater areas as mature fish return to spawn and is reported through a “punch card” accounting system. These data are only available more than two years after the current season. Therefore, we can now report only the riverine sport catch through 2000 for the NOC and MOC groups. The 2000 punch card estimate of estuary and freshwater catch for the NOC and MOC groups is 33,262 chinook. Historic catch estimates for the Elk river troll fishery and the estuary and freshwater sport fisheries targeting on MOC and NOC stocks are shown in Appendix A. 14.

## **2 ESCAPEMENTS THROUGH 2002**

### **2.1 INTRODUCTION**

The June 30, 1999, agreement of the Pacific Salmon Treaty (Pacific Salmon Treaty Fishing Annexes & Related Agreements, June 30, 1999) established a chinook management program that:

*“introduces harvest regimes that are based on estimates of chinook abundance, that are responsive to changes in chinook production, that take into account all fishery induced mortalities and that are designed to meet MSY or other agreed biologically-based escapement objectives”*

This chapter compares annual escapement estimates with maximum sustained yield (MSY) or other agreed biologically-based escapement goals established for chinook stocks. The CTC has reviewed and accepted escapement goals for 17 stocks included in this report. For these stocks, the CTC can evaluate stock status in relation to these goals. For stocks without agreed goals, the CTC must rely on the time series of escapement data and agency comments in the individual stock narratives to provide a perspective on stock status and escapement trends. The narratives provide information on escapement assessment methodology, on factors affecting annual observations such as poor visibility or floods, and on the basis for setting escapement goals. The information is included to assist the reader in understanding the relative quality of data and to present management agencies' own assessments of stock status.

### **2.2 FRAMEWORK**

#### **2.2.1 Escapement and Terminal Run Data**

This year's escapement review includes 50 naturally spawning escapement indicator stocks or stock aggregates (Table 2-1). These stocks may be distinct populations, or they may be groups of several populations aggregated by region and life history type for management purposes. Smith Inlet was dropped by CDFO as an escapement indicator stock in 2002 because of data inconsistencies and escapement methodology and is not included in this report.

##### *2.2.1.1 Sources of Escapement Data*

The escapement and terminal run data used in this report were provided by management agencies in each jurisdiction. Data for each stock are presented in Appendices B.1 – B.6.

##### *2.2.1.2 Agency Procedures for Estimating Escapement*

Methods of estimating escapement varied depending on river characteristics and agency resources. Some escapement estimates were measures of actual spawner abundance, others are estimates (or indices) of abundance measured at a point of migration beyond the effect of major fisheries. Estimates were made using weirs and counting fences, aerial, foot, or boat surveys, expansions from counts of redds, dam passage counts, electronic counting devices, or mark-recapture studies. Where appropriate, escapements of hatchery fish have been removed from the

escapement estimates so that they represent only the natural stock. Estimation methods are discussed in the specific stock descriptions (Sections 2.3.1 to 2.3.4).

Many of the Canadian escapement indicator stocks are influenced, to some degree, by enhanced production. In most cases, this enhancement is an integral part of the management program. In streams with more limited enhancement, fish collected as broodstock are excluded from the count of natural spawners, although fish produced by enhancement projects that return as adults and spawn naturally are included in these numbers (e.g., Yakoun, Lower Strait of Georgia, and Harrison).

For the Columbia upriver stocks, mainstem dam counts were reduced by the number of hatchery fish in the count in order to estimate the return of naturally spawning fish; estimated upriver harvests were also subtracted.

For Oregon coastal stocks there are no hatchery releases in the Nehalem, Siletz, Siuslaw or South Umpqua Rivers. For the MOC stock aggregate, several stocks have extensive enhancement programs. An attempt, however, is made to minimize inclusion of hatchery strays by conducting spawning surveys greater than 10 miles away from hatchery smolt release sites.

## **2.2.2 MSY or Biologically-Based Escapement Goals**

### *2.2.2.1 Origin of Goals*

Escapement goals accepted by the CTC were based on analyses that followed the guidelines developed in the CTC escapement goal report (CTC 1999). In the stock-specific narratives presented with the escapement graphs, the agencies may refer to agency goals, but only CTC-accepted escapement goals and ranges (in gray shading) are shown on the escapement graphs and used for evaluation. Table 2-1 presents the status of escapement goal reviews by the CTC.

Table 2-1. PSC chinook escapement indicator stocks/stock aggregates and status of escapement goal reviews.

Stock #	Stock Name	Region	Stock Group	Run Type	Completion Dates Esc. Goal Analysis
1	Situk	SEAK	Yakutat	Spring	Done
2	Alsek	SEAK/TBR	Yakutat	Spring	Done
3	Taku	SEAK/TBR	TBR	Spring	Done
4	Stikine	SEAK/TBR	TBR	Spring	Done
5	Chilkat	SEAK	Northern Inside	Spring	2003
6	King Salmon	SEAK	Northern Inside	Spring	Done
7	Andrew Creek	SEAK	Central Inside	Spring	Done
8	Unuk	SEAK	Southern Inside	Spring	Done
9	Chickamin	SEAK	Southern Inside	Spring	Done
10	Blossom	SEAK	Southern Inside	Spring	Done
11	Keta	SEAK	Southern Inside	Spring	Done
12	Yakoun	BC	NBC-Area 1	Summer	Indeterminate
13	Nass	BC	NBC-Area 3	Spr/Sum	Indeterminate
14	Skeena	BC	NBC-Area 4	Spr/Sum	Indeterminate
15	Dean	BC	CBC-Area 8	Spring	Indeterminate
16	Rivers Inlet	BC	CBC-Area 9	Summer	Indeterminate
17	W. Coast Van. Is. <sup>1</sup>	BC	WCVI	Fall	Indeterminate
18	Upper Georgia St.	BC	UGS	Sum/fall	Indeterminate
19	Cowichan/Nanaimo	BC	LGS	Fall	2003
20	Fraser Spring 1.3 <sup>1</sup>	BC	Fraser River	Spring	Indeterminate
21	Fraser Spring 1.2 <sup>1</sup>	BC	Fraser River	Spring	Indeterminate
22	Fraser Summer 1.3 <sup>1</sup>	BC	Fraser River	Summer	Indeterminate
23	Fraser Summer 0.3 <sup>1</sup>	BC	Fraser River	Summer	Indeterminate
24	Harrison	BC	Fraser River	Fall	Done
25	Skagit spring <sup>2</sup>	PS	PS	Spring	Indeterminate
26	Skagit sum/fall <sup>2</sup>	PS	PS	Sum/fall	Indeterminate
27	Stillaguamish <sup>2</sup>	PS	PS	Sum/fall	Indeterminate
28	Snohomish <sup>2</sup>	PS	PS	Sum/fall	Indeterminate
29	Green <sup>2</sup>	PS	PS	Fall	Indeterminate
30	Nooksack <sup>2</sup>	PS	PS	Spring	Indeterminate
31	Lake Washington	PS	PS	Fall	Indeterminate
32	Quillayute sum.	WAC	WAC	Summer	Indeterminate
33	Quillayute fall	WAC	WAC	Fall	2003
34	Queets spr/sum	WAC	WAC	Summer	Indeterminate
35	Queets fall	WAC	WAC	Fall	2003
36	Grays Harbor Spr.	WAC	WAC	Spring	Indeterminate
37	Grays Harbor Fall	WAC	WAC	Fall	2003
38	Hoh spr/sum	WAC	WAC	Summer	Indeterminate
39	Hoh Fall	WAC	WAC	Fall	Indeterminate
40	Hoko	WAC	WAC	Fall	Indeterminate
41	Col. Upriver Spring	CR	CR	Spring	Indeterminate
42	Col. Upriver Summer	CR	CR	Summer	Interim goal accepted
43	Col. Upriver Bright	CR	CR	Fall	Interim goal accepted
44	Lewis	CR	CR	Fall	Done
45	Deschutes	CR	CR	Fall	Indeterminate
46	Nehalem	ORC	NOC	Fall	Done
47	Siletz	ORC	NOC	Fall	Done
48	Siuslaw	ORC	NOC	Fall	Done
49	Umpqua	ORC	MOC	Fall	2003
50	Coquille	ORC	MOC	Fall	2003

<sup>1</sup> Habitat estimates for spawner capacity are being developed for individual populations.

<sup>2</sup> The Puget Sound Technical Recovery Team is gathering and analyzing data necessary to develop interim recovery goals for ESA listed stocks in Puget Sound. The CTC will consider the results of this work in determining biologically based goals.

## 2.3 ESCAPEMENT ASSESSMENTS

The Agreement directs the CTC to “report annually on the escapement of naturally spawning chinook stocks in relation to the agreed escapement objectives referred to below, evaluate trends in the status of stocks, and report on progress in rebuilding of naturally spawning chinook stocks” (Annex IV, Chapter 3, paragraph 1.b.iii). In this report, escapement assessments include stock specific graphs of escapements and agency comments, presented to provide a perspective on stock status and escapement trends through 2002, similar to reporting through 2001 in CTC (2002c).

The escapement goals and 2002 escapements for the 17 stocks with CTC accepted escapement goals are listed in Table 2-2. For 11 of these stocks, the agency escapement goal is defined as a range; for the remaining six stocks, the escapement goal is defined as a point estimate. In 2002, escapements were within the goal range for six stocks, above the range or  $S_{MSY}$  point estimate for 10 stocks, and below the goal range for one stock.

Table 2-2. Escapement goals and 2002 escapements for PSC chinook escapement indicator stocks with biologically-based goals accepted by the CTC.

Stock	Region	Stock Group	Escapement Goal	2002 Escapement
Situk	SEAK	Yakutat	500-1,000	1,014
Alsek	SEAK/ TBR	Yakutat	1,100-2,300	2,282
Taku	SEAK/ TBR	TBR	30,000-55,000	48,848
Stikine	SEAK/ TBR	TBR	14,000-28,000	50,875
King Salmon	SEAK	Northern Inside	120-240	153
Andrew Creek	SEAK	Central Inside	650-1,500	1,752
Unuk	SEAK	Southern Inside	650-1,400	897
Chickamin	SEAK	Southern Inside	450-900	1,013
Blossom	SEAK	Southern Inside	250-500	224
Keta	SEAK	Southern Inside	250-500	411
Harrison	BC	Fraser River	75,100-98,500	89,968
Mid Col. Upr. Summer	CR	Columbia River	17,857	96,520
Col. Upriver Brights	CR	Columbia River	40,000	116,387
Lewis	CR	Columbia River	5,700	16,380
Nehalem	ORC	NOC	6,989	18,089
Siletz	ORC	NOC	2,944	14,054
Siuslaw	ORC	NOC	12,925	41,058

Analyses of achieved escapements relative to agreed escapement objectives to determine if additional management actions are required under paragraph 9(b) in Chapter 3 of the Agreement is guided by footnote 3 to the paragraph: “By the end of 2001, the CTC will recommend, for adoption by the Commission, criteria defining the lower bound of escapements for the purposes

*of taking additional management actions pursuant to this paragraph. Until the end of 2001, the escapement level at which the MSY production is reduced by more than 15% will be defined as the lower bound of the escapement.*” A lack of clarity and consistency in the language contained in the 1999 Agreement regarding relationships between escapement objectives, the lower bounds referenced in footnote 3 to paragraph 9, and the “lower bound of the escapement range” referenced in the “criteria for stock status” column of Attachments I-V has resulted in some uncertainty as to the intent of the parties. The CTC has provided the PSC with an assessment of methods establishing lower bounds and a means of evaluating the risk of management error associated with implementing additional management actions based on lower bounds (CTC 2002b). In February 2002, the PSC instructed the CTC to postpone further work on establishing lower bounds for additional management actions under the Agreement until the CTC has accepted escapement goals for additional stocks of chinook salmon.

## **2.4 STOCK SPECIFIC GRAPHS AND DESCRIPTIONS**

Descriptions for chinook stocks are included in sections for Alaska, Canada, and Washington/Columbia River/Oregon. Each stock is described separately with a graph and narrative text. Each graph contains the name of the stock and the type of data depicted (total escapement, index counts, terminal runs, etc.). For the graphs that include estimates of the terminal run size, the harvests in terminal runs include both jacks and adults in some cases, whereas the escapement is usually reported in adults. The x-axis (ordinate) represents calendar years. Escapement goals accepted by the CTC are shown. Escapements, escapement estimation methods and agency comments are included in the narrative. Historic escapement and terminal run data are provided for SEAK stocks in Appendix B.1, for Canadian stocks in Appendix B.2, for Puget Sound in Appendix B.3, Washington Coastal stocks in Appendix B.4, for Columbia River stocks in Appendix B.5 and Oregon Coastal stocks in Appendix B.6.

### **2.4.1 SEAK/TBR Stocks**

Of the 11 SEAK/TBR stocks included in the escapement assessment, six (Situk, Chilkat, Taku, King Salmon, and Stikine rivers and Andrew Creek) include estimates of total escapement of large (adult) fish. Large fish refers to age-.3 (European notation age classes 0.3, 1.3, 2.3) and older chinook salmon or fish 660 mm mid-eye to tail fork (MEF) length; age-.1 and -.2 fish (jack males) are not included in these estimates unless >659 mm MEF. Escapement estimates for the other five systems (Alek, Unuk, Chickamin, Blossom, and Keta rivers) are index counts of large chinook, and represent a fraction of the total escapement into a single river. Index counts include either fish counts taken at weirs on a single tributary of a larger river or foot/aerial helicopter survey peak counts. The peak counts are the highest count on a single day within a year. Except for the Chilkat River, survey methods have been standardized for all systems since 1975, and in some cases since 1971. The assessment of Chilkat River chinook salmon was standardized in 1991 as an annual mark-recapture estimate of escapement.

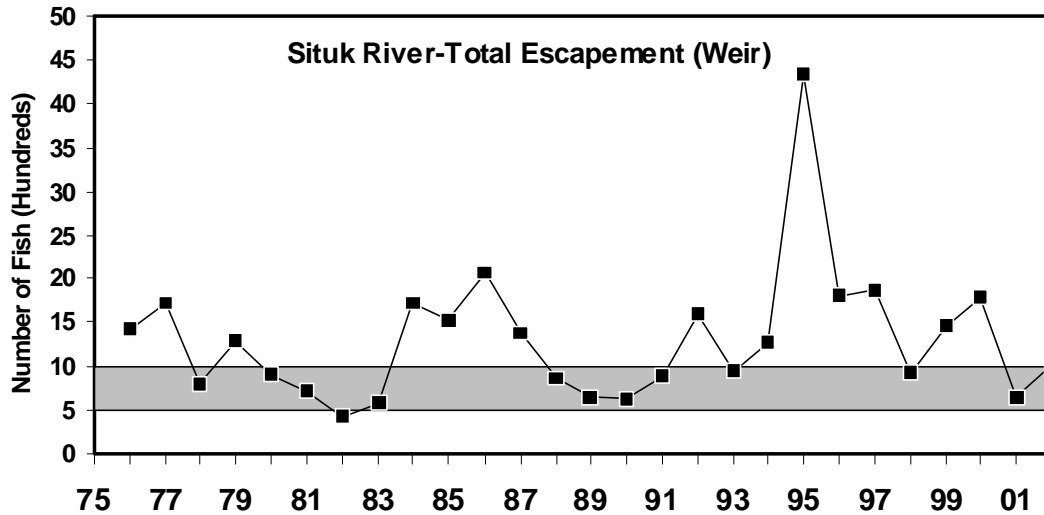
The SEAK/TBR stocks can be classified into two broad categories, inside-rearing and outside-rearing, based on ocean migrations. Outside-rearing stocks have limited marine rearing in SEAK and are caught primarily during their spring spawning migrations; these stocks include chinook salmon returning to the Situk, Alek, Taku, and Stikine Rivers. Inside-rearing stocks are vulnerable to SEAK/NBC fisheries as immature fish as well as during their spawning migrations

and include the other seven SEAK/TBR indicator stocks. Note that there is some overlap in these stocks within these two broad classifications. All SEAK/TBR indicator stocks produce primarily yearling smolt except the Situk River, which presently produces primarily sub-yearling smolt. Sub-yearling smolts comprise about 10% of the annual runs in the Keta and Blossom rivers.

ADF&G established a 15-year rebuilding program in 1981 (ADF&G 1981). ADF&G established interim point escapement goals in 1981 for all 11 systems, based on the highest observed escapement count prior to 1981. ADF&G (and CDFO for three TBR stocks) has revised escapement goals that have been reviewed and accepted by the CTC for ten stocks. A revised escapement goal has been recently completed for the Chilkat River stock and is pending review by the CTC. ADF&G uses escapement goal ranges in conformance with the ADF&G Salmon Escapement Goal Policy. These ranges are shown on the stock-specific graphs in this section. ADF&G, CDFO, Tribal organizations on the transboundary rivers, and NMFS have worked in a cooperative manner to improve the SEAK/TBR chinook stock assessment program. After CTC acceptance of the revised Chilkat River goal, all of the SEAK/TBR stocks will meet the assessment criteria detailed in the U.S. CTC Stock Assessment Review (USCTC 1997) and will have CTC accepted escapement goals.

The State of Alaska adopted a Sustainable Salmon Fisheries Policy in March of 2000 (ADF&G/ABF 2000). The term “management concern” used later in this SEAK section of this report has the same meaning as given in the policy document described above, i.e., “Management concern: a concern arising from a chronic inability, despite use of specific management measures, to maintain escapements for a stock within the bounds of the Sustainable Escapement Goal, Biological Escapement Goal, Optimal Escapement Goal, or other specified management objectives for the fishery.” “Chronic inability” means the continuing or anticipated inability to meet escapement thresholds over a four to five year period, which is roughly equivalent to a generation time of most salmon species. The term “healthy” used in this SEAK portion of this report refers to chinook salmon stocks that by State of Alaska standards are not conservation or management concerns.

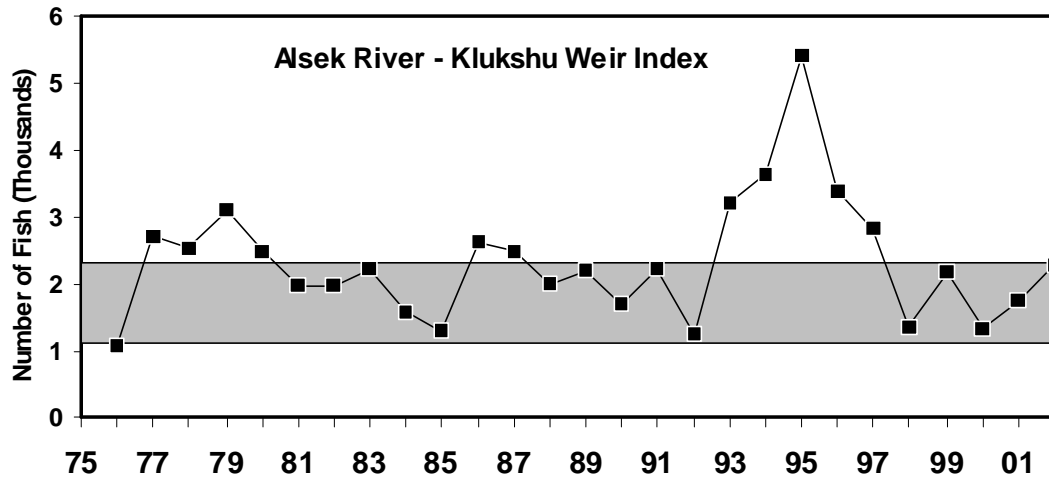




**Escapement Methodology:** The Situk River is a non-glacial system located near Yakutat, Alaska, that supports a moderate-sized, outside-rearing stock of chinook salmon. Escapements are based on weir counts minus upstream sport fishery harvests, which are estimated from an on-site creel survey and a postseason mail-out survey. The weir, located just upstream from the mouth, has been operated annually since 1976, and was also operated from 1928-1955. Counts of large chinook salmon are reported as the spawning stock. Jacks (1- and 2-ocean-age fish) are also counted and, since 1989, jack counts (not included in the graph above) have ranged between 1,200 and 4,000 fish.

**Escapement Goal Basis:** In 1991, ADF&G revised the Situk River chinook salmon escapement goal to 600 large spawners based upon a spawner-recruit analysis (McPherson 1991), which was reviewed and adopted by the CTC. In 1997, ADF&G revised the Situk River escapement goal range to 500-1,000 large spawners to conform to the department's escapement goal policy and to provide a more realistic maximum sustained yield range for management. The CTC reviewed and accepted this change in 1998.

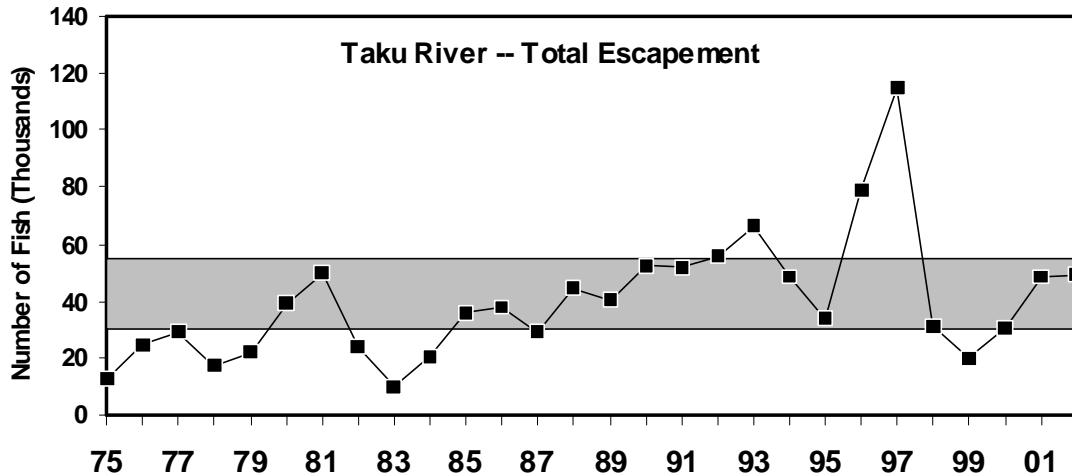
**Agency Comments:** During the 27-year period of 1976-2002, the Situk River chinook salmon escapements have been below the goal range only once, in 1982. Directed U. S. sport, commercial and subsistence fisheries located both inside the river and lagoon and in nearby surf waters target this stock under a management plan directed at achieving MSY escapement levels. Total annual terminal harvest rates from all gear groups have averaged about 60% during the 1990s. Escapements from 1996-2002 have averaged about 1,360 chinook salmon, well above the escapement goal range. In 2002 the escapement was 1,014 large chinook salmon, and above the upper end of the escapement goal range. ADF&G considers the Situk River stock of chinook salmon to be healthy, but underutilized in some years.



**Escapement Methodology:** The Asek River is a large, glacial, transboundary river, which originates in the SW Yukon and NW British Columbia and flows into the Gulf of Alaska, east of Yakutat, Alaska. It supports a moderate-sized, outside-rearing stock of chinook salmon. Since 1976, chinook salmon escapements in the Asek drainage have been principally monitored by a weir operated at the Klukshu River (shown above), one of 51 tributaries of the Tatshenshini River, the principle salmon-producing branch of the Asek River. The weir counts from the Klukshu River represent an index of the overall chinook salmon escapement into the Asek River drainage.

**Escapement Goal Basis:** Several escapement goals were set prior to 1998 by the U.S. and Canada, all without a detailed technical analysis of production data for this stock. In 1998, a joint analysis (McPherson, Etherton, and Clark, 1998) recommended a revised Klukshu River chinook salmon escapement goal of 1,100 to 2,300 chinook salmon and this revised goal was accepted by ADF&G and the CTC in 1998. Internal review by CDFO (PSARC) suggested it was premature to agree on the upper end of this range, since returns from a record weir count in 1995 were pending. The Transboundary Technical Committee (TTC) has agreed on a minimum escapement goal of 1,100 at the Klukshu River weir. The upper end of the range will be re-evaluated by CDFO and ADF&G in the near future.

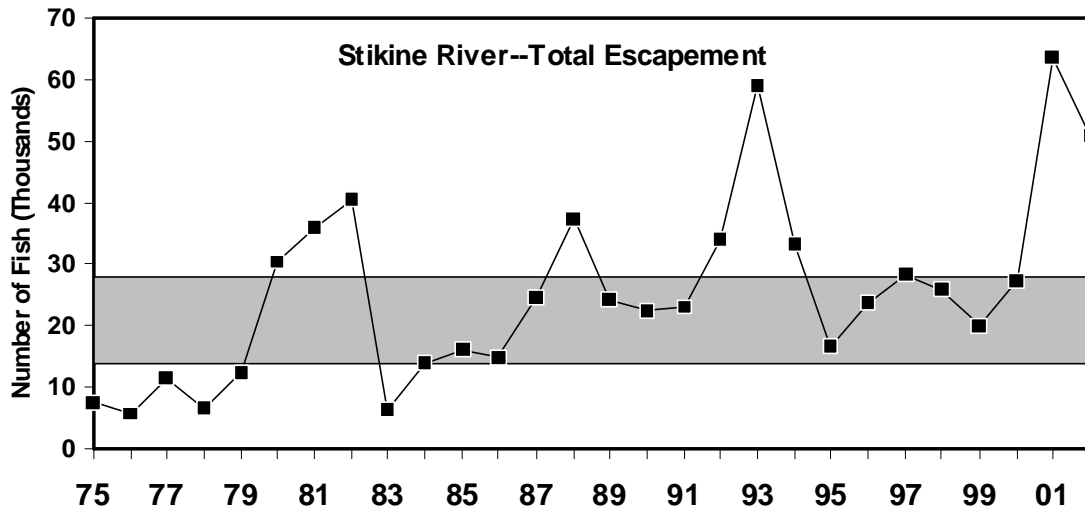
**Joint Agency Comments:** Directed Canadian sport and aboriginal fisheries take place in-river while directed U. S. commercial and subsistence fisheries are located both inside the river and lagoon and in nearby surf waters. Total annual harvest rates have averaged 20% to 25% since 1981 (McPherson, Etherton and Clark 1998). Escapements in the Klukshu River have averaged 2,335 chinook salmon over the 27-year period of 1976-2002. The 2002 escapement was 2,282 chinook salmon. The joint ADF&G-CDFO assessment is that the Asek River stock of chinook salmon is healthy. An expansion factor (about 5.0 at present) is being developed from the joint adult mark-recapture program that is ongoing and was implemented in 1998. It is hoped that information from this program will form the basis for future evaluation of a system-wide escapement goal. Studies to collect these data have been implemented and must continue in order to develop a new abundance-based management regime for Asek River chinook salmon by 2004 as per the Agreement.



**Escapement Methodology:** The Taku River is a large, glacial, transboundary river originating in northern British Columbia and flowing into Taku Inlet east of Juneau, Alaska. It supports a large, outside-rearing stock of chinook salmon. Escapements of large fish (shown above) were estimated with joint U.S.-Canada mark-recapture experiments in 1989, 1990, and 1995-2002. Aerial survey counts in other years were expanded by a factor of 5.2 (McPherson et al. 2000).

**Escapement Goal Basis:** Prior to 1999, several system-wide or index goals were developed by the U.S. and Canada, and were based on limited data. ADF&G and CDFO staff developed a new escapement goal range of 30,000 to 55,000 large spawners (total escapement) in an analysis of adult and smolt production completed and accepted by the CTC, ADF&G, CDFO (including PSARC) and the TTC in 1999 (McPherson et al. 2000).

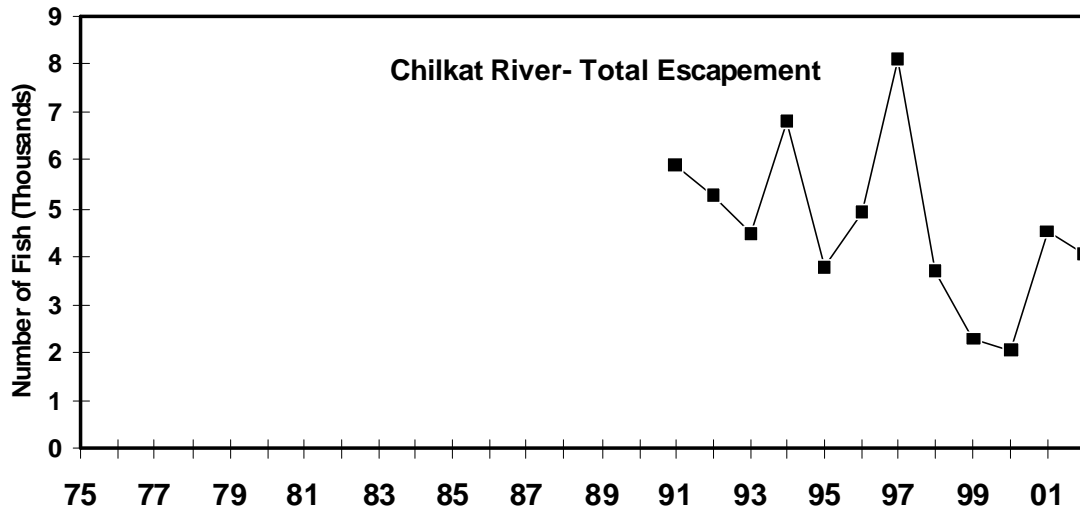
**Joint Agency Comments:** Estimated harvest rates on this stock range from 12% to 22% under the current management regime (McPherson et al. 2000). Smolt were marked with coded-wire tags from 1976 through 1981 and annually since 1993 (1991 brood). Data from recoveries of these CWTs in fisheries and inriver permits estimation of harvest and smolt production. The precision of harvest rate estimates will continue to improve over time. Historically, a significant terminal marine gillnet fishery occurred in the spring in Taku Inlet along with a spring SEAK troll fishery. Currently, there is no commercial fishery targeting this stock, although incidental harvests occur in other U.S. and Canadian commercial fisheries; however, sport fisheries in the U. S. and in Canada do target this stock. The Parties are actively developing the background data for potential implementation of an abundance-based management regime for Taku River chinook salmon, as specified in the June 1999 Agreement. Estimated escapements to the Taku River were within or above the escapement goal range from 1988 through 2002, except in 1999. In 2002, an estimated 48,848 large fish escaped into the Taku River, just below the upper end of the escapement goal range. The joint ADFG-CDFO assessment is that the Taku River stock is healthy.



**Escapement Methodology:** The Stikine River is a transboundary river originating in British Columbia and flowing to the sea near Wrangell, Alaska. The Stikine River is a large, glacial river that supports a large, outside-rearing stock of chinook salmon. Escapements in the Stikine River have been indexed using data gathered at the Little Tahltan River, a main spawning tributary located in the upper drainage. From 1975 through 1984, the index was made using survey counts and since 1985 counts were made using a weir. Since 1996, cooperative studies by ADF&G, CDFO, the Tahltan and Iskut Bands, and NMFS involving mark-recapture experiments, coupled with radio telemetry, were used to estimate in-river abundance in the entire Stikine River watershed. A comparison of index survey and weir counts with estimates from mark-recapture experiments indicates that Little Tahltan River counts represent 17% to 20% of the total in-river return to the Stikine River (Pahlke and Etherton 1999).

**Escapement Goal Basis:** Prior to 1999, several system-wide or index goals were developed by the U.S. and Canada, and were based on limited data. In a cooperative analysis by ADF&G and CDFO, recent results from mark-recapture experiments were used to expand index survey and weir counts into in-river returns to the watershed prior to 1996. In 1999, these data along with estimated harvests were used in a stock-recruit analysis to establish an escapement goal range for the Stikine River of 14,000 to 28,000 large chinook salmon (Bernard et al. 2000). This biological escapement goal range has been adopted by the CTC, ADF&G, and the joint TTC.

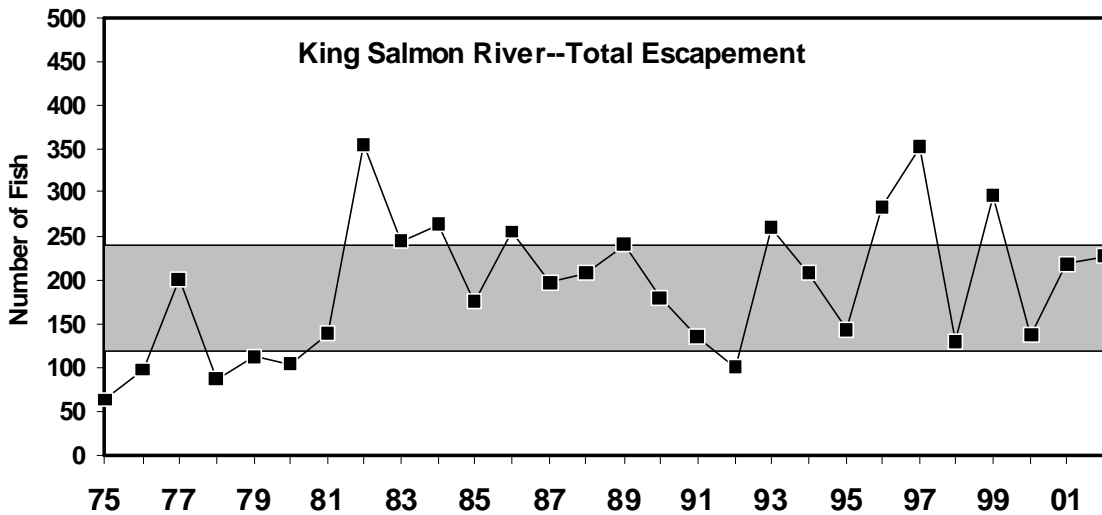
**Joint Agency Comments:** Under the current management regime, total harvest rates on Stikine River chinook salmon are believed to range between 10% and 33% with an average of about 18% (Bernard et al. 2000). Prior to the early 1980s, harvests of this stock occurred in a significant terminal U.S. marine gillnet fishery operated near the mouth of the river. Currently, there are no directed U.S. commercial marine fisheries targeting this stock, but incidental harvests occur in some U.S. commercial fisheries and in a small U. S. marine sport fishery. In-river harvests occur in Canadian gillnet and aboriginal fisheries. Management agencies have recently embarked on joint programs to tag smolt and adults that will provide improved estimates of harvest, escapement, and smolt and adult production. The preliminary escapement estimate for 2002 is 50,875 large spawners, the third highest on record and the result of very good returns from the 1996 and 1997 broods.



**Escapement Methodology:** The Chilkat River is a glacial system located near Haines, Alaska, that supports a moderate-sized, inside-rearing stock of chinook salmon. Escapements are based on estimates of large spawners from a mark-recapture program. Escapements have been estimated in this program annually since 1991 (Ericksen 2000). From 1975-1992, aerial survey counts were conducted on two small tributaries with relatively clear water; results from these estimates appeared inconsistent. Radio telemetry studies conducted in 1991 and 1992 found that spawners in these two tributaries represented less than 5% of the total escapement and the aerial surveys were discontinued.

**Escapement Goal Basis:** There is no CTC agreed escapement goal for this stock. The 1981 escapement goal was set at 2,000 large fish, based on an assumed fraction of the total escapement represented by the survey counts. Recent analysis (McPherson et al. 2003) recommended a revised escapement goal of 1,750 to 3,500 chinook salmon and this revised goal is under review by ADF&G and pending review by the CTC.

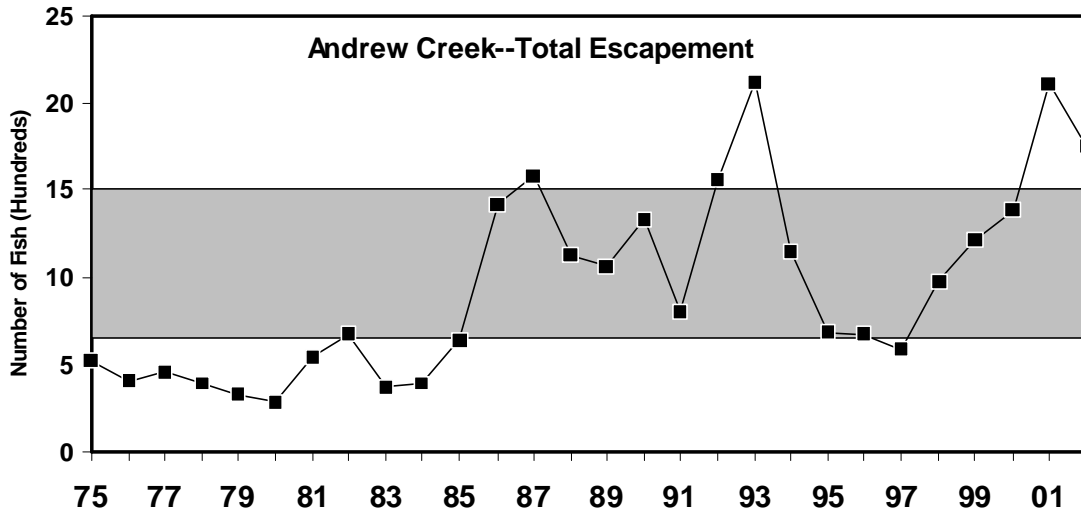
**Agency Comments:** Relatively small U. S. marine sport and in-river subsistence fisheries target this stock. This stock is also caught incidentally in SEAK commercial drift gillnet and troll fisheries. Limited coded-wire tag information on this stock suggests that exploitation is between 10% and 30%. During the 12-year period of 1991-2002, the Chilkat River chinook salmon escapements have averaged 4,651 large spawners. Escapements from 1997 to 2002 have averaged 4,108 chinook salmon. The escapement in 2002 was estimated at 4,050 large spawners, well above the upper end of the revised agency escapement goal range. Escapements since 1991 have been above the lower end of the agency escapement goal range in all years and above the upper end in all but two years. The escapement database for this stock since 1991 is relatively precise with coefficients of variation for annual escapements averaging 15%. Estimates of the number of female spawners and spawners by age are also well above minimum U.S. CTC data standards. The database is limited by the number of years of spawner estimates and by incomplete harvest/exploitation rate data.



**Escapement Methodology:** The King Salmon River is a small clear-water system located on Admiralty Island southeast of Juneau that supports a small, inside-rearing stock. Escapements of large chinook salmon are based upon weir counts (1983-1992) or expansions of index counts (1971-1982; 1993-2002). A weir was operated for 10 years (1983-1992) along with the surveys and, on average, 67.5% of the total escapement was counted in the surveys (McPherson and Clark 2001). Jacks (2-ocean-age fish) represented an average of 22% of the weir counts from 1983-1992 and are not included in the graph above.

**Escapement Goal Basis:** In 1981, ADF&G set the index goal at 200 large fish based upon peak survey counts of 200 spawners in 1957 and 211 spawners in 1973. In 1997, ADF&G revised the goal to 120-240 total large fish based upon a spawner-recruit analysis for the 1971-1991 brood years (McPherson and Clark 2001). This range is ADF&G's most current estimate of maximum sustained yield escapement and has been accepted by the CTC as a biologically-based escapement goal.

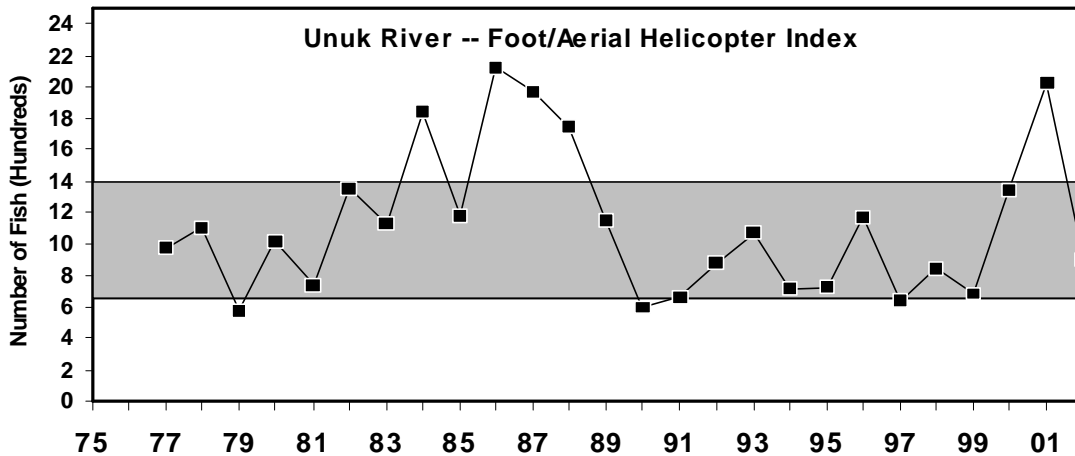
**Agency Comments:** There is no terminal fishery targeting this stock, though harvests of immature and mature fish occur in SEAK fisheries. During the 27 year-period 1975-2002, 14 of the annual escapements were within the 1997 management range, six were below the range and eight exceeded the range. Since 1990, one escapement was below the 1997 range by 17% (1992) and the remaining 13 have been within or exceeded the range. The 2002 escapement was 153 large spawners, which is within the escapement goal range. Survey conditions in 2002 were normal. The ADF&G considers the King Salmon River stock of chinook salmon to be healthy.



**Escapement Methodology:** Andrew Creek, near Petersburg, Alaska, is a clear-water U. S. tributary of the lower Stikine River that supports a moderate-sized, inside-rearing stock of chinook salmon. Data shown in the above graph are total estimated escapements of large chinook salmon based upon weir counts (1976-1984) or expansions of index counts. During nine years of weir operations (1976-1984), standardized surveys were also conducted in four years and, on average, 53% of the total escapement was counted in surveys (Pahlke 2000). An expansion factor (1.89 or 1/0.53) was used to expand the survey counts for 1975 and 1985-2002 into estimates of total escapement. Jacks have represented an average of 19% of the weir counts and are not included in the above graph.

**Escapement Goal Basis:** In the early 1980s, ADF&G set the Andrew Creek chinook salmon escapement goal at 750 large fish (total escapement). In 1997, an initial stock-recruit analysis was developed that underwent review by ADF&G and the CTC. This analysis was completed in 1998 and the technical report (Clark, McPherson, and Gaudet 1998) recommended a revised biological escapement goal range of 650 to 1,500 large chinook salmon that was accepted and adopted by the ADF&G and the CTC.

**Agency Comments:** Historically, a significant, terminal, marine gillnet fishery occurred in the spring, targeting Stikine River and other nearby chinook salmon stocks. Currently, there is no terminal fishery targeting this stock. Harvests of immature and mature fish occur primarily in SEAK and to a small extent in NBC fisheries, based on CWT recoveries of chinook salmon from SEAK hatcheries using Andrew Creek brood stock. Escapements since 1986 have all been above the lower end of the biological escapement goal range of 650 to 1,500 except in 1997 when the escapement of 586 chinook salmon represented 90% of the lower end of the biological escapement goal range. The 2002 escapement of 1,752 chinook salmon was above the upper end of the escapement goal range. The ADF&G considers the Andrew Creek stock of chinook salmon to be healthy.

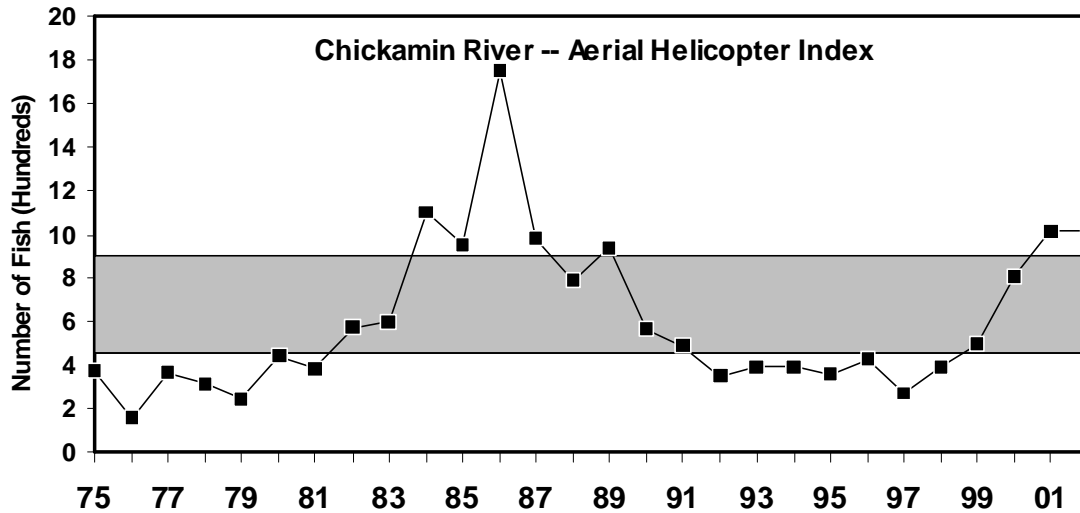


**Escapement Methodology:** The Unuk River empties into Behm Canal near Ketchikan, Alaska, and is a glacial system with non-glacial spawning tributaries which support a moderate-sized, inside-rearing stock of chinook salmon. Reported escapements are indices of peak counts of large fish from six tributaries using standardized methodology since 1977 (Pahlke 2000). Survey counts show a relatively stable pattern of index escapements over the duration of 1977 to 2002. Mark-recapture studies were performed in 1994 and annually since 1997. Escapements over the most recent five years of estimates (i.e., 1998-2002) have averaged 6,300 total large spawners and 1,200 large spawners in peak survey counts (Weller and McPherson *In Press*). A radio telemetry study in 1994 found that the surveys are conducted in stream reaches where 80% of the spawning occurs (Pahlke et al. 1996). These mark-recapture studies and associated expansion factors will allow conversion of this entire database to total escapement estimates in 2003.

**Escapement Goal Basis:** In 1994, ADF&G revised the Unuk escapement goal to 875 large index spawners based upon a spawner-recruit analysis (McPherson and Carlile 1997), which the CTC reviewed and accepted. In 1997, ADF&G revised the goal to a range of 650-1,400 large index spawners as recommended in the McPherson and Carlile (1997) report and in compliance with the ADF&G Escapement Goal Policy. The CTC reviewed and accepted this change in 1998.

**Agency Comments:** There is no terminal fishery targeting this stock; harvests of immature and mature fish occur in SEAK and NBC fisheries. Estimated total exploitation rates average about 20% to 30% under current management (McPherson and Carlile 1997). Coded-wire tagging of this stock was conducted for the 1982–1986 (Pahlke 1995) and the 1992–present broods. Unuk wild and hatchery stock tagging both indicate that marine survival decreased through about 1998, relative to levels in the mid-1980s, but that survival has increased for the 1994–1996 broods. In the 26 years since 1977, the index counts have been within the escapement goal range, except for five which were above and three which were slightly below the range. The 2002 survey count was 897 large spawners, within the escapement goal range. However, survey conditions were not optimal in 2002. The total escapement in 2002 as estimated through a mark-recapture study was 6,988 large chinook salmon. ADF&G judges the Unuk stock of chinook salmon to be healthy.

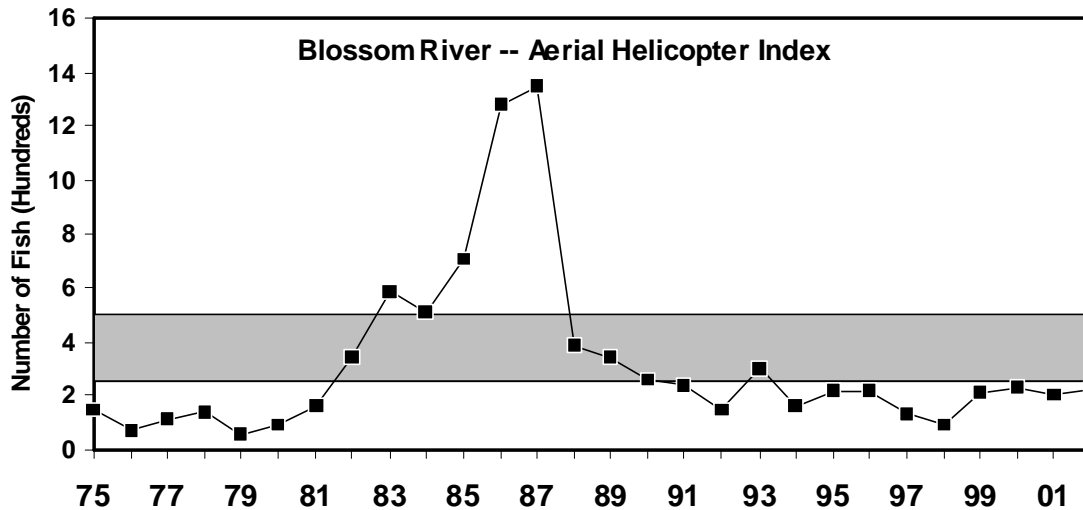




**Escapement Methodology:** The Chickamin River drains into Behm Canal near Ketchikan, Alaska, and is a glacial system with non-glacial spawning tributaries which support a moderate-sized, inside-rearing stock of chinook salmon. Reported escapements are survey counts of large fish in eight tributaries using standardized methodology (Pahlke 2000). Mark-recapture studies in 1995 and 1996 found that between 15% and 25% of the total escapement is counted during peak surveys (Pahlke 1996; Pahlke 1997). A radio telemetry study in 1996 indicated that the annual surveys are conducted in stream reaches where over 80% of all spawning occurs. Mark-recapture experiments to estimate total escapement have occurred annually since 2001.

**Escapement Goal Basis:** In 1994, ADF&G revised the goal to 525 large index spawners based upon a spawner-recruit analysis (McPherson and Carlile 1997), which the CTC reviewed and accepted. In 1997, ADF&G revised the goal to 450-900 large index spawners as recommended in the McPherson and Carlile (1997) report and in compliance with the ADF&G Escapement Goal Policy (ADF&G 1997). The CTC reviewed and accepted this change in 1998.

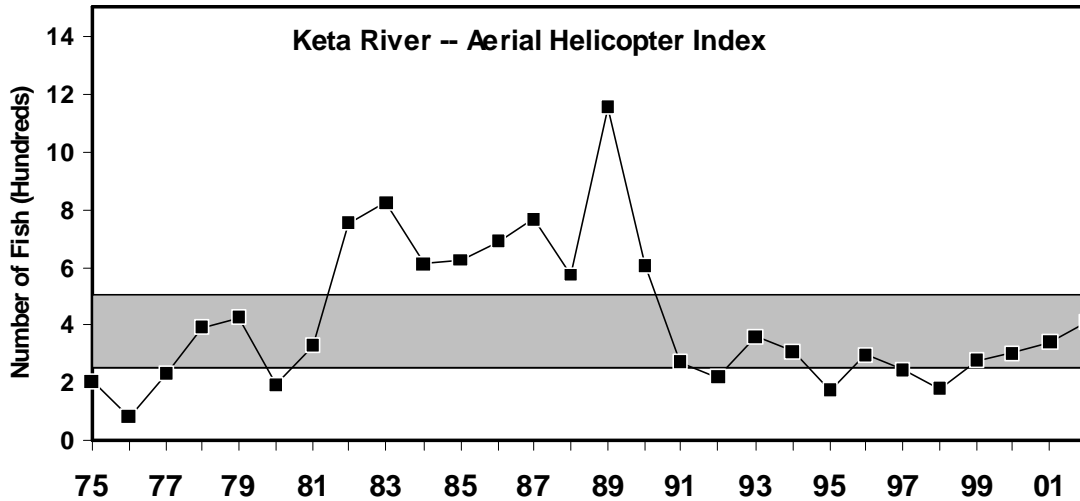
**Agency Comments:** There is no terminal fishery targeting this stock; harvests of immature and mature fish occur in marine SEAK and NBC fisheries. There are no subsistence or freshwater fisheries on any Behm Canal chinook stocks. Coded-wire tagging was conducted for the 1982-1986 broods (Pahlke 1995). Estimated total exploitation rates ranged from 35% to 40% under the current management regime (McPherson and Carlile 1997). Between 1975 and 1981, survey counts were all below 450 large fish by an average of 30%. From 1982 to 1991, index counts were all above 450 large fish and exceeded the upper limit of the escapement goal range of 900 large fish in five of those years. The 1992-1998 index counts were all below the lower end of the escapement goal range by an average of 15%. Survey counts in 1999 and 2000 were within the range. The last two years the survey count has been slightly above the upper end of the escapement goal range. In 2002, the survey count was 1,013 which is about 20% of the preliminary mark-recapture estimate of 5,378. The ADF&G considers the Chickamin River stock of chinook salmon to be healthy.



**Escapement Methodology:** The Blossom River empties into Behm Canal near Ketchikan, Alaska, and is a clear-water river that supports a small, inside-rearing stock of chinook salmon. Recent studies indicate that about 10% of the annual run is comprised of progeny from under-yearling smolt. Escapements are indices (peak counts) of large fish made by helicopter surveys conducted using standardized methodology since 1975 (Pahlke 2000). Only in 1998 was the total escapement estimated with mark-recapture methodology.

**Escapement Goal Basis:** In 1994, ADF&G revised the Blossom goal to 300 large index spawners based upon a spawner-recruit analysis (McPherson and Carlile 1997), which the CTC reviewed and accepted in 1994. In 1997, ADF&G revised the goal to a range of 250-500 large index spawners in conformance with the McPherson and Carlile (1997) report and in compliance with the ADF&G Escapement Goal Policy. This range is ADF&G’s most current estimate of maximum sustained yield escapement. The CTC reviewed and accepted this change in 1998.

**Agency Comments:** There is no terminal fishery targeting this stock; harvests of immature and mature fish occur in SEAK and NBC fisheries. Between 1975 and 1981, survey counts were below the current escapement goal range of 250-500, averaging 110 large fish. These smaller escapements subsequently seeded large runs with resultant large escapements during the six-year period of 1982-1987, with counts averaging 796 fish. This six-year period of larger escapements has been followed by a 15-year period (1988-2002) of reduced, but relatively stable, run abundance. Counts since 1995 have averaged 191 large spawners. The 2002 survey count was 224 large spawners, which is 10% below the lower end of the MSY escapement goal range (i.e., 26 fish). ADF&G considers the Blossom River stock of chinook salmon to be a management concern. Analysis of the improved stock assessment data for the Blossom River and the other three Behm Canal stocks will be completed in 2003 and may change this assessment. All waters of Behm Canal are closed to chinook salmon fishing year round.



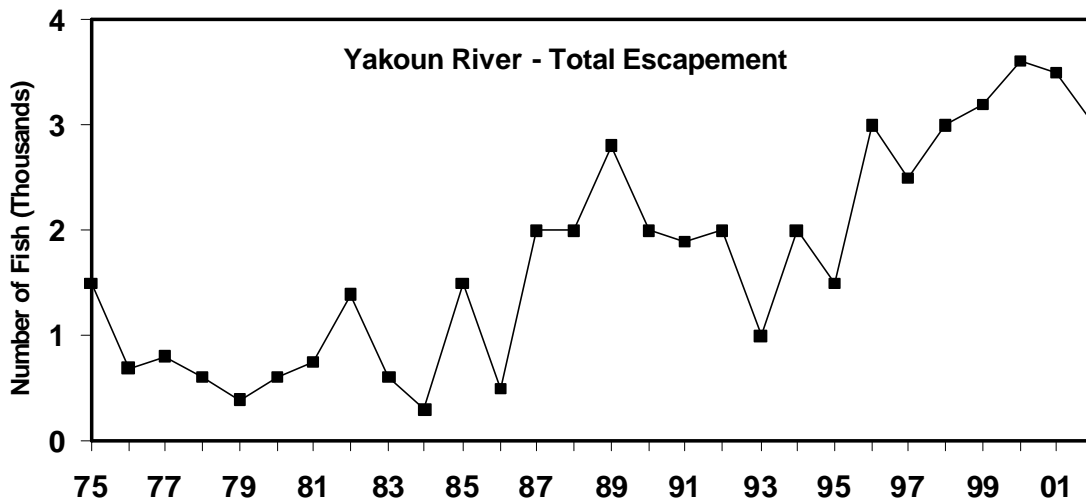
**Escapement Methodology:** The Keta River is located near Ketchikan, Alaska, and is a clear-water system that supports a small, inside-rearing stock. Recent studies indicate that about 10% of the annual run originates from under-yearling smolt. The escapements are indices (peak counts) of large fish made by helicopter survey that have been conducted using standardized methodology since 1975 (Pahlke 1997a). Total escapement was estimated with mark-recapture methodology in 1998, 1999, and 2000 (Freeman et al. 2001).

**Escapement Goal Basis:** In 1994, ADF&G revised the escapement goal to 300 large index spawners based upon a spawner-recruit analysis (McPherson and Carlile 1997), which the CTC reviewed and accepted in 1994. In 1997, ADF&G revised the escapement goal to a range of 250-500 large index spawners in conformance with the McPherson and Carlile (1997) report and in compliance with the ADF&G Escapement Goal Policy (ADF&G 1997). The CTC reviewed and accepted this change in 1998.

**Agency Comments:** There is no terminal fishery targeting this stock; harvests of immature and mature fish occur in SEAK and NBC fisheries. Between 1975 and 1981, annual survey counts were within or below the goal of 250-500, averaging 265 large spawners. Production from the 1975-1981 escapements was high and survey counts from 1982 to 1990 averaged 734 large fish. This was followed by a 12-year period (1991-2002) of lower survey counts, averaging 282 large fish. ADF&G believes the reduction was due to reduced marine survival coupled with density dependent mortality (McPherson and Carlile 1997). The survey count in 2002 was 411 large spawners, which is near the middle of the escapement goal range. ADF&G estimated total escapements of 446, 968 and 943 large spawners in mark-recapture projects in 1998, 1999, and 2000, respectively. These projects were funded using LOA chinook funds to estimate an expansion factor of 3.0 (SE = 0.52) for this stock (Freeman et al. 2001). This expansion factor was used to develop total estimates of large spawners for survey counts prior to 1998, which appear in Freeman et al. (2001), along with associated estimates of precision. The expanded estimate for 2002 is 1,233 large spawners. ADF&G judges this stock to be healthy.

## 2.4.2 Canadian Stocks

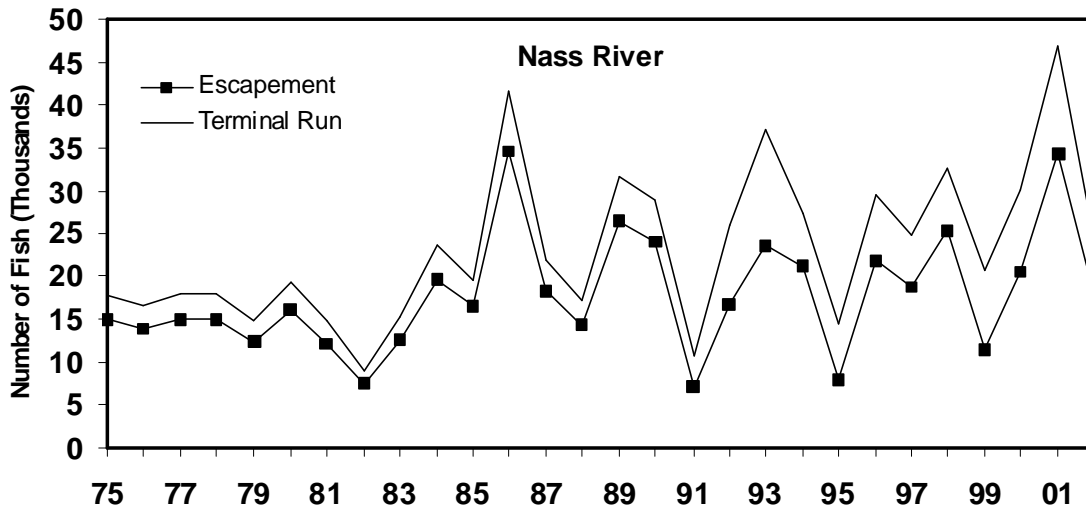
Since the beginning of the chinook rebuilding program of the 1985 PST, escapement goals for Canadian chinook stocks were generally based on doubling the average escapements recorded between 1979-1982. The doubling was based on the premise that Canadian chinook stocks were over-fished and that doubling the escapement would still be less than the optimal escapement estimated for the aggregate of all Canadian chinook populations (see stock-recruitment curve in “Technical Basis of PSC Catch Ceilings,” Figure 1, Attachment 4, PSC file 72006; PSC Office, Vancouver, BC). Doubling was also expected to be a large enough change in escapements to allow detection of the change in numbers of spawners and the subsequent production. The escapement goals of the Canadian indicator stocks are currently being reviewed so that these interim goals may be replaced with goals based on quantitative stock assessments and/or evaluations of habitat capacity. The CTC has accepted a revised goal for the Harrison River stock of chinook.



**Escapement Methodology:** The Yakoun River is the only significant chinook-producing stream on the Queen Charlotte Islands. Chinook spawn primarily at the outlet of Yakoun Lake and are a summer-run stock. Visual estimates of escapement are made by foot surveys of the system. These estimates are then expanded into a total estimate of spawning escapement in the system. The escapement surveys have been consistent between years but their accuracy (i.e. total escapement) is unknown.

**Escapement Goal Basis:** There is no CTC agreed escapement goal for this stock.

**Agency Comments:** The increase in the Yakoun chinook escapements have been attributed to reductions in NBC chinook fisheries. A small enhancement program also exists on the system.



**Escapement Methodology:** The “Nass Area” represents those chinook streams feeding into the Portland Inlet from the Kwinamass River north. The Nass River, the largest river in this area, is the Area 3 indicator stock representing a group of approximately 25 streams. These streams extend over a diverse range of habitats and a large geographical area. Outside of the Nass River, Portland Inlet chinook streams generally have only very small returns, typically representing less than 10% of the total return to the “Nass Area”. Prior to 1992, CDFO observations of escapement were based on visual counts which varied considerably between streams and between years. The escapements used in past escapement analyses represent local fishery managers’ estimates based on stream walks and aerial surveys, the frequency of which were dependent on resource and staff availability and weather.

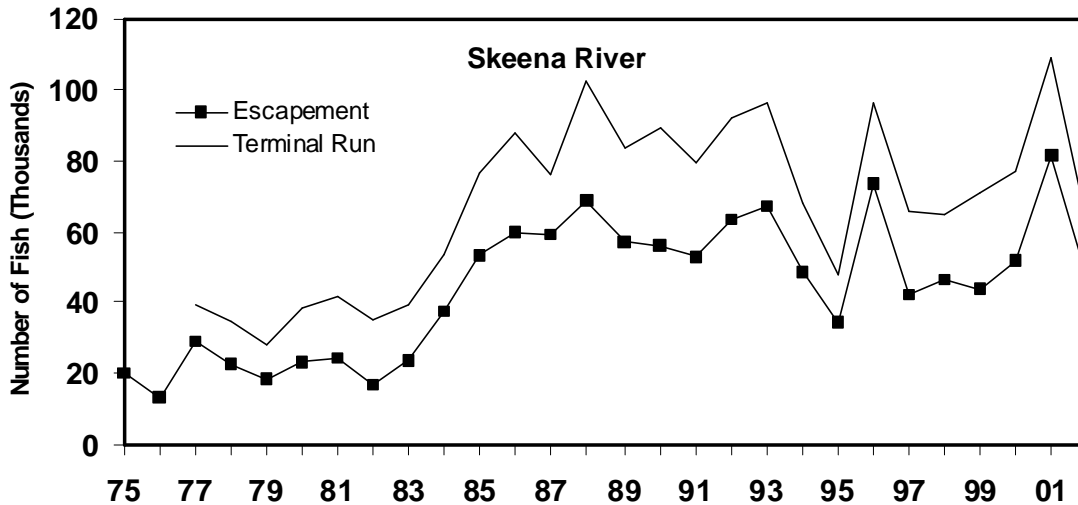
Since 1992, the Nisga’a Tribal Council has conducted mark-recapture programs to estimate the total spawning escapement in the Nass River. Local DFO guardians also conducted independent visual surveys of escapement on the Nass River tributaries in 1992 and 1993. Visual estimates of Nass River tributaries were discontinued in 1994. Other Area 3 rivers continue to be estimated using visual surveys. A fence has been used to enumerate chinook on the Kinkolith River since 2001. A mark-recapture estimate of the Kwinamass River was initiated in 2002 to calibrate historic visual estimates. The Nass mark-recapture program uses two fish wheels in the lower Nass canyon to apply tags and two wheels in the upper canyon for recovery. Tags are also recovered in up-river fisheries and on the spawning grounds. A modified Petersen mark-recapture estimator, stratified by size category (500-730 cm nose-fork length (NF), >731 cm NF), is used to estimate the total population of chinook passing the tagging location. Reports of each year’s program are available from LGL Ltd. (Sidney, BC) or CDFO (e.g., Link and Nass 1999).

Because of these major changes in escapement methodology, the Nisga’a Tribal Council and CDFO have agreed to standardize the escapement time series. The consulting firm LGL Ltd., in conjunction with the Nisga’a Tribal Council, has developed a revised escapement data set using the two years (1992-1993) of the CDFO field estimates that overlapped with their radio-tracking and mark-recapture studies. The difference between the two estimates was used to develop a “multiplier” for previous CDFO visual estimates. Estimates of the terminal run of chinook to the

Nass River were similarly derived. The harvest rate in the lower river Native fishery in 1992 and 1993 averaged 35% while fishing seven days per week. Estimates of the historical terminal run assumed the harvest rate in past years was four-sevenths of 35% since typically fishing was allowed four days per week. The method and data used are documented in the Fisheries Operational Guidelines (FOG, March 9, 2000, Tribal Office, New Aiyansh, BC) that was prepared for the Nisga'a Tripartite Comprehensive Claims Negotiation. It is these revised estimates that are used in calculating "Nass Area" escapement and terminal run.

**Escapement Goal Basis:** There is no CTC agreed escapement goal for this stock. The FOG states two goals for managing fisheries: an operational target escapement of 20,000 chinook on the spawning grounds, and a minimum escapement of 10,000 chinook. If escapements are projected to be below 10,000 chinook, then no fishing on Nass River chinook would be recommended. No biological-basis for an escapement goal has been developed for this system.

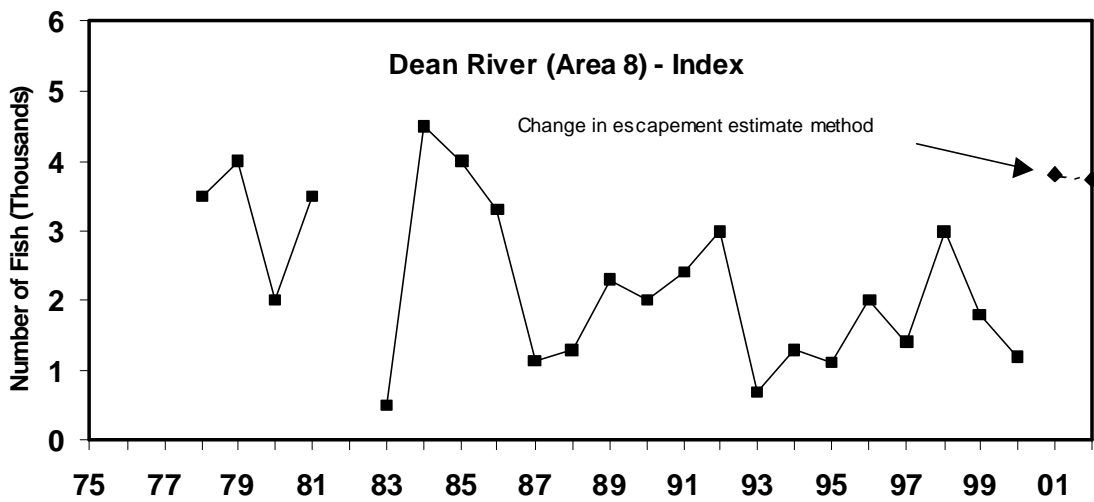
**Agency Comments:** The Nisga'a Fisheries Working group, including CDFO, has accepted the historical escapement and terminal run values provided for Nass River chinook. Further revisions of these values are expected. The terminal harvest rate for 2002 was 26%, which is similar to the five-year average.



**Escapement Methodology:** The Skeena chinook stock index represents 40 streams which are consistently surveyed. As a system, the Skeena supports over 75 separate chinook spawning populations, but three spawning populations (Kitsumkalum, Morice, and Bear Rivers) account for about 70% of the total spawner abundance. A second group of populations (Ecstall, Kispiox, and Babine Rivers) have annual returns ranging from 1,000 to 5,000 spawners, and comprise about 13% of the stock. Escapement estimates are generally based on visual observations from helicopter, fixed wing aircraft and/or from stream walking surveys. The Kitsumkalum River is the exploitation rate indicator stock for the Skeena chinook complex. Spawning escapements in the Kitsumkalum have been estimated using a mark-recapture program since 1984. Escapement values presented are for total escapement into the Skeena River system.

**Escapement Goal Basis:** There is no CTC agreed escapement goal for this stock. Biologically-based goals for this complex of chinook spawning populations have not yet been developed. Future assessments will partition this large aggregate into stocks by run timing, life history and geographic areas.

**Agency Comments:** Terminal catch in the Skeena River would normally include commercial gillnet catch in the terminal exclusion area (River Gap Slough, Area 4), in-river sport catch, and Native catch. In-river sport creel surveys were not conducted in 2002. Consequently, sport catch has not been included in the 2002 total terminal run estimate.

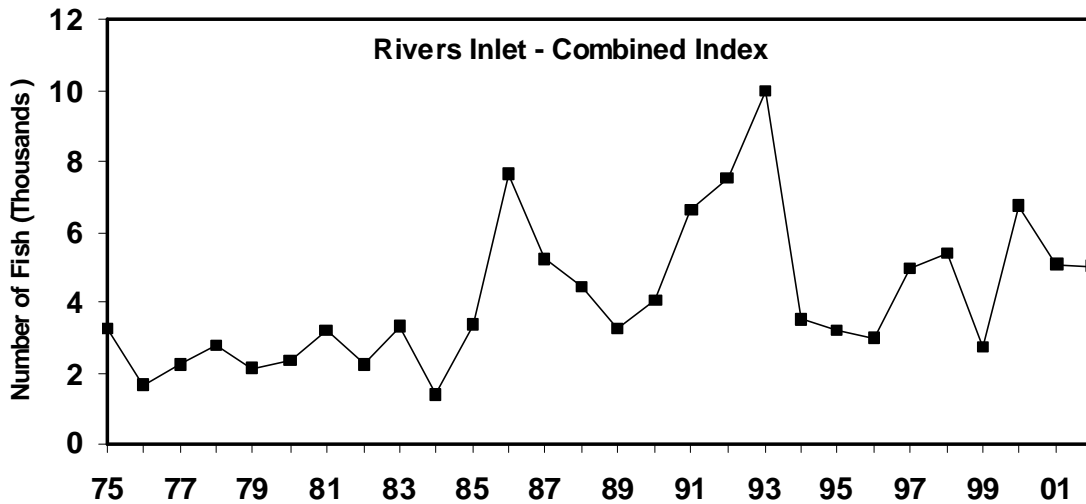


**Escapement Methodology:** The Area 8 chinook stock consists of seven non-enhanced systems, but the Dean River is the main spawning population. Of all chinook-producing streams in the Central Coast, the Dean is the best indicator in terms of consistent survey coverage and methodology. Chinook returning to the Dean River have an early summer timing; most of this stock are in the lower river by July. Escapement enumeration in the Dean River has been quite consistent over the past several years and surveys have documented fish distributed throughout the system. Fishing guides operating throughout the lower river monitor spawning activity of chinook. When spawning activity appears to be at peak numbers in late August, helicopter surveys are conducted. Up until 2000, counts of spawning chinook were made during 1-3 surveys and the peak count used as the escapement index. Survey counts were sometimes expanded to account for sections of the river that could not be surveyed in any year, but the counts were not extrapolated to total escapement of chinook to the river.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this stock.

**Agency Comments:** Based on the large contribution of the Dean River to Area 8 escapements and due to gaps in escapement data for other streams in Area 8, the Dean River alone will be used to represent stock strength in Area 8. Funds allocated for implementation of the 1999 PST Agreement have been allocated to improve chinook surveys in the Dean River. In 2002, a total of six aerial counts and 2 stream walks were conducted to determine an area-under-the curve escapement estimate. The resulting escapement estimate of 3,731 fish was slightly lower than the previous year. However, this may be an underestimate considering the unseasonably high water conditions experienced during the inspections.





**Escapement Methodology:** The Wannock, Chuckwalla, and Kilbella Rivers are the primary chinook streams in Area 9 (Rivers Inlet area). Small tributaries of Owikeno Lake also contain chinook but these populations are much smaller. The Wannock River contains the largest chinook population, averaging 5,200 chinook in the 1990s, while the Chuckwalla and Kilbella together, averaged around 300. The Wannock River drains Owikeno Lake, is about six kilometers long, and is wide and turbid. The Chuckwalla and Kilbella rivers are much longer, drain from coastal mountains, and their visibility is much more variable depending on local weather (glacial flour to clear). The timing of these stocks also differs: the Wannock has late summer/fall run timing, the other two are early summer chinook stocks.

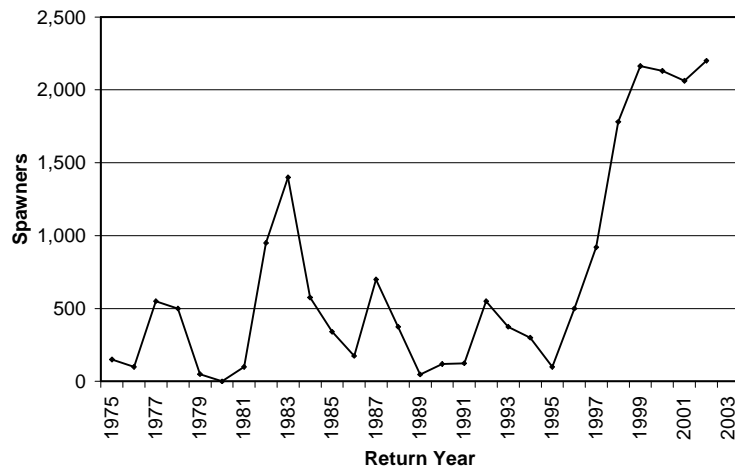
Escapement estimates in the Chuckwalla and Kilbella rivers are derived from aerial surveys and brood stock collection programs, whereas Wannock escapement is derived from sampling of carcasses along the spawning area. The number of carcasses sampled is expanded to estimate total spawning escapement. Since 1986 documentation has been provided for each expansion, but previous documentation is very limited. Mark recapture programs were conducted in the Wannock River from 1991-1993, but tag recovery proved very difficult. Given the uncertainty in the mark-recapture estimates and to maintain consistency with past years, DFO has maintained the expanded carcass estimates for comparison between years. However, during 1991-1993, it is possible that the greater effort and increased financial support for escapement surveys may have increased the escapement estimate that was based on carcass numbers.

**Escapement Goal Basis:** There are currently no CTC agreed escapement goals for any of these stocks.

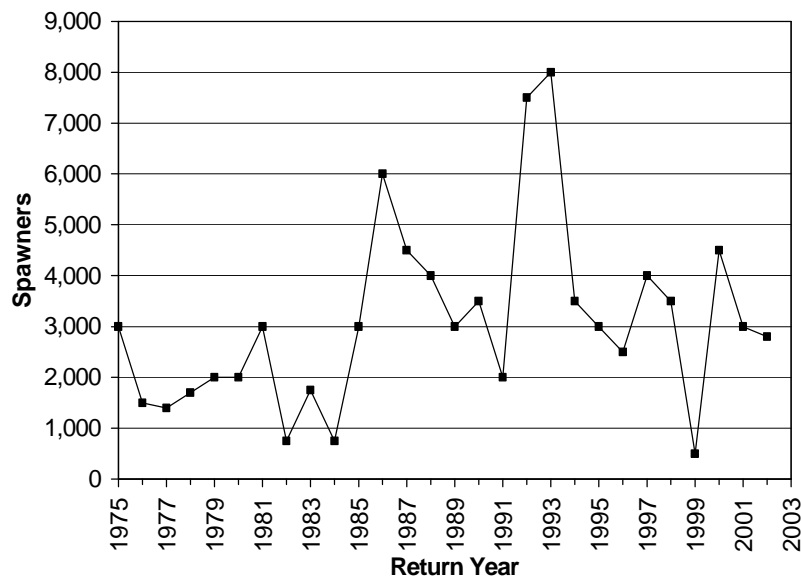
**Agency Comments:** Since summer (Chuckwalla and Kilbella) and fall (Wannock) chinook are likely to have different ocean exploitation and productivity, separate assessments may be more accurate than a combined assessment. For example, the increase in recent escapement of Kilbella and Chuckwalla chinook is dramatic when compared to that of the Wannock (see graphs below). These increases are due to improved returns of hatchery fish and reductions to ocean fisheries. In 2002, escapements to these systems remained above average with 1,628 chinook returning to the Kilbella River and 603 to the Chuckwalla River.

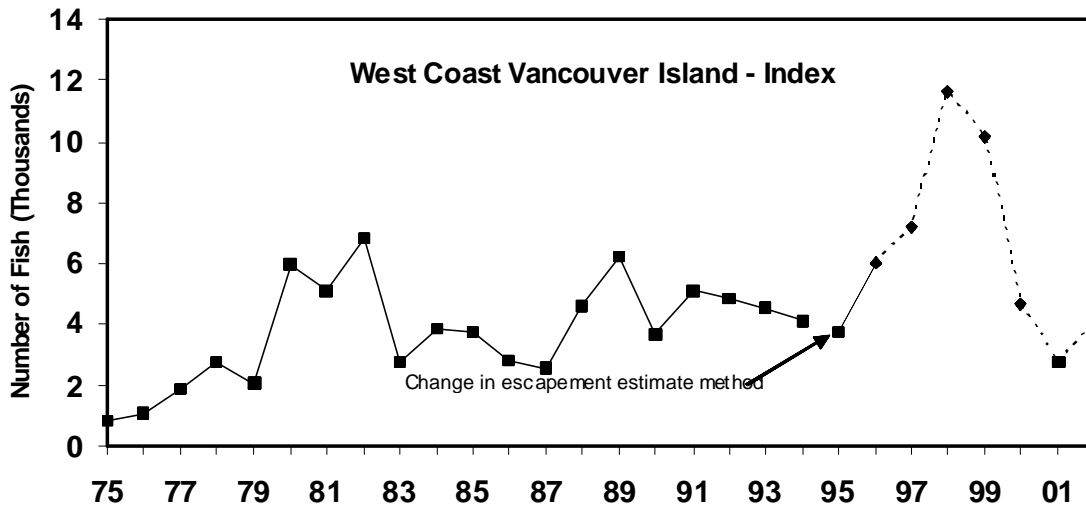
Escapement to the Wannock did not change significantly through 1997 and 1998, but declined sharply in 1999 to an estimated 500 fish. During 2000, the Wannock River chinook stock was a significant conservation concern. Sport fishing restrictions were implemented in the terminal area and new assessment programs were implemented (radio-tagging and mark-recapture programs). The escapement estimated for 2000 was 4,500 chinook based on carcass sampling and this compares to a final mark-recapture estimate of 7,443 chinook. Escapement to the Wannock declined to 3,000 fish in 2001 and 2,800 in 2002.

**Chuckwalla + Kilbella - Index/AUC Total Estimate**



**Wannock-Total Estimate**





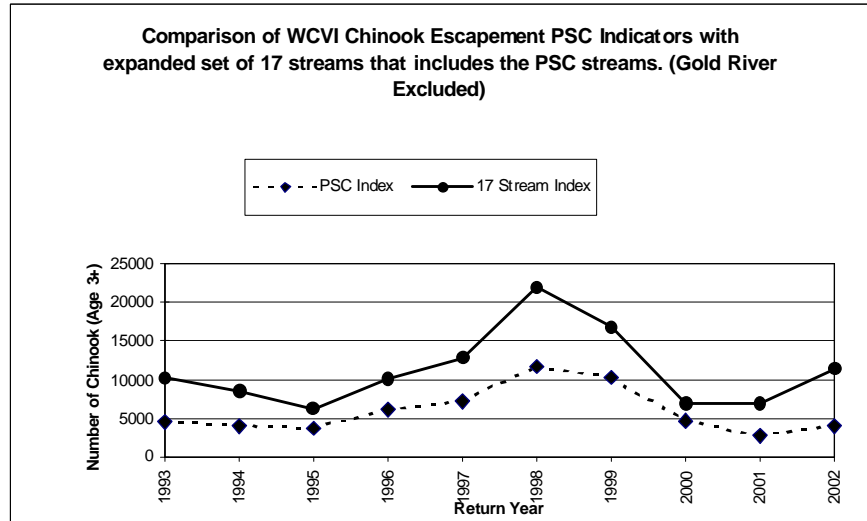
**Escapement Methodology:** The WCVI index is an aggregate of six rivers (Marble, Tahsis, Burman, Artlish, Kaouk, and Tahsish), which were chosen by assessing historic data for consistency of surveys. Up until 2002, Gold River had also been included, as part of a seven-stream index. However, some recent data indicate that escapement to this system may be largely hatchery in origin. Thus this stock may not be a valid ‘wild’ escapement indicator. Consequently, pending further review, the Gold was removed from the indicator index, and historical index values recalculated. Removal of the Gold from the index did not significantly change the trends in abundance displayed by the seven-stream index.

The reliability of assessments has increased through the years in all streams (a combination of more surveys and better timing and methods). Survey methods consist mainly of walks in lower reaches (greater frequency of use in early years), helicopter flights at key spawning periods, and snorkel surveys. More intensive and systematic surveys, based mainly on snorkel swims, were introduced in 1995. Estimates since 1995 have been based on multiple surveys per stream, conducted by trained crews, and total escapements have been estimated using the Area-Under-the-Curve method. These estimates are more reliable and are likely to account for a higher portion of the actual escapements. Escapement values presented include the brood stock removed for the small enhancement programs in some streams.

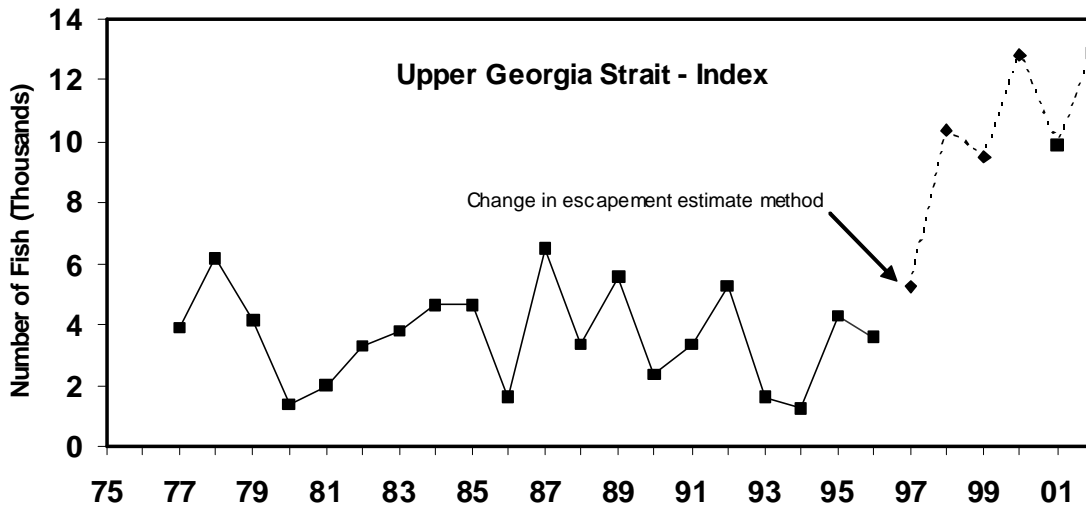
**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this stock group.

**Agency Comments:** The CDFO notes the need for biologically based escapement goals for individual populations in this stock group. The CDFO has been working to develop habitat-based escapement goals for some of these individual rivers. Further, the number of rivers surveyed annually has been expanded. In Area 24 (Clayoquot Sound) intensive snorkel surveys have been conducted on three natural systems since 1993. In 1995, this program of intensive swim surveys was expanded to 27 streams distributed throughout the WCVI. In total, 22 streams are now monitored with a consistent survey method.

The figure below compares the six-stream PSC index with an expanded set of 17 streams that include the PSC streams (less the Gold). After three years of decline (1999-2001) the six-stream index showed an increase in 2002. Escapements of all stocks increased in 2002 except for two wild systems in Area 24 (Bedwell/Ursus and Moyeha), two wild systems in Area 26 (Artlish and Kaouk) and one system in Area 27 (Colonial/Cayeagle).



The returns to WCVI hatcheries in 2002 were up approximately 35% from 2001. However the increases were not as dramatic as those between 2000 and 2001. The preliminary estimate of escapement to the Robertson Creek Hatchery/Somass stock in 2002 is 50,000 adults, thus exceeding the preseason forecast of 42,000. The return of age-2 males (2000 brood) was less than last year but still the second highest since 1992. The proportion of females was up from <10% in 2001 to approximately 35-40% in 2002.



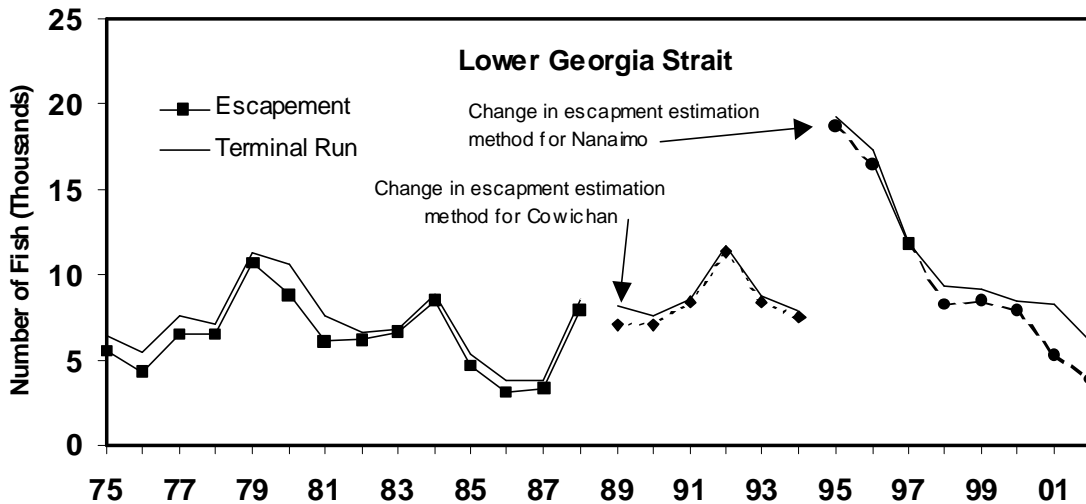
**Escapement Methodology:** The UGS stock index consists of four river systems (Klinaklini, Kakweiken, Wakeman, Kingcome) in Johnstone Strait mainland inlets and the Nimpkish River on northeast Vancouver Island. The accuracy of escapement estimates in the mainland inlet systems is likely poor due to their glacial nature and remote access. Escapement estimates have primarily been based on aerial counts. Swim surveys and stream walks have been conducted in the Nimpkish River.

**Klinaklini:** An intensive assessment program on the Klinaklini system began in 1997 with a fish wheel on the mainstem and a fence on Devereux Creek. Fish captured at the fish wheel are tagged and released to estimate efficiency of the wheel and total escapement. Escapement estimates for the system are based on expanded fish wheel catch and counts at the fence. Prior to 1997 only aerial surveys (two flights over lower Devereux Creek and Dice Creek) were used to assess the system. From experience on these flights, observers could only see a limited amount of spawners that typically hold in clear pools early in the season. The apparent increase in escapements since 1997 reflect the more accurate estimates provided by the new methodology, rather than real increases in abundance.

**Nimpkish:** A more structured assessment program for the Nimpkish system was also established in 1997. The hatchery had been conducting swims and broodstock capture for several years but had not established an assessment program or documented methods. In 1997 these programs were reviewed. Since then escapement estimates have changed little but the confidence of these estimates has improved dramatically.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this stock group.

**Agency Comments:** Assessment of stock status is highly uncertain. Recent increases in escapements are likely to reflect improved estimation of escapements and reduced fishing impacts. Differences in ocean distributions and run timing indicate that future assessments should separate the mainland inlet systems from the Nimpkish chinook.



**Escapement Methodology:** LGS rivers monitored for naturally spawning chinook escapement are the Cowichan and Nanaimo rivers. Prior to 1989, escapement estimates from the Cowichan River, were derived from swim surveys and overflights by Fishery Officers and hatchery staff. This methodology was applied also to the Nanaimo River prior to 1995. Since 1989 and 1995 in respective streams, counting fence and carcass mark-recapture surveys have been established. While the accuracy of these estimation procedures will vary, total chinook returns to the Cowichan and Nanaimo rivers have been estimated since 1975. Chinook return to the Cowichan River in late summer and fall but chinook return to the Nanaimo River in spring and early summer, followed by a separate fall run. The Nanaimo spring/summer run is smaller than the fall component.

**Escapement Goal Basis:** There is no CTC agreed escapement goal for this stock. A recent assessment of the Cowichan chinook stock suggests a biologically based goal for the naturally spawning component of 7,400 chinook. CDFO will present documentation of this assessment and a proposed goal for both the Cowichan and Nanaimo chinook in 2003 to PSARC and the CTC for review.

**Agency Comments:** The Cowichan chinook stock showed considerable increase in 1995 and 1996. One explanation for these returns is that they can be attributed to substantial increases in enhanced contribution since 1992; however, the wild component of the run has also increased. Hatchery and wild chinook are differentiated by patterns of daily growth rings on otoliths. Recovery of the Nanaimo fall population has not been as successful as in the Cowichan. There is a smaller hatchery on the Nanaimo River, but survival of this hatchery stock has usually been lower than for the Cowichan chinook.

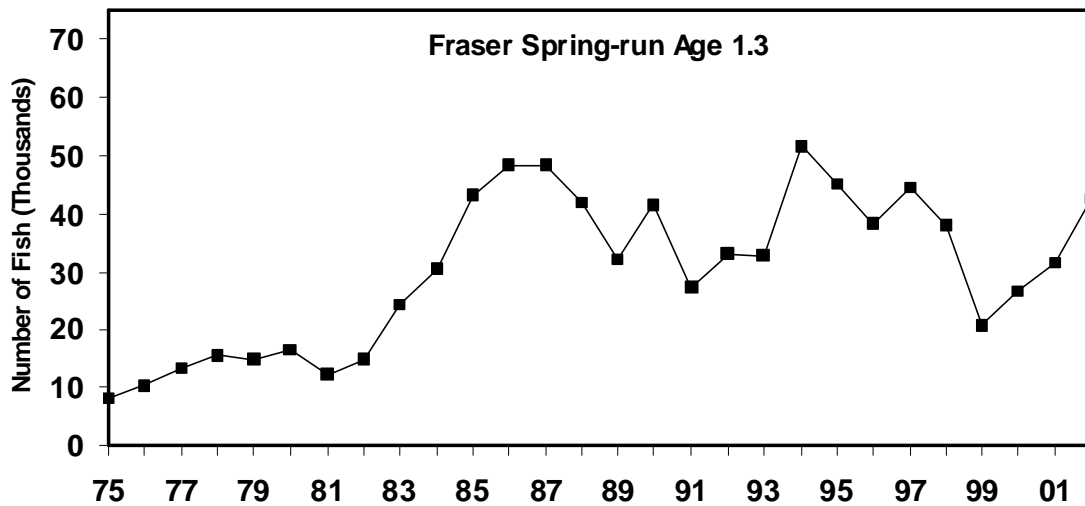
Recent reductions in the LGS chinook escapements likely result from reduced marine survival noted since the 1991 brood year on Cowichan hatchery chinook. However, reduced exploitation rates on this stock (by approximately 50%) are compensating for this reduced survival (Riddell et al. 2000). Escapement to the Cowichan declined 17% from that in 2001, while escapement to the Nanaimo River decreased by 43%. While unusually low water flows may have exacerbated this low escapement, they are not believed to have significantly impeded returns.

### **2.4.3 Fraser River Stocks**

The Fraser River watershed is the largest Canadian producer of chinook salmon. Fraser chinook are comprised of a large number of local populations as described in CTC (2002c).

Much of our understanding of the status of Fraser chinook is based on spawner escapement data. Most data are from visual surveys, which are generally biased to low counts although many estimates are considered to be reasonably precise. Visual survey data are generated from aerial over-flight surveys and the escapement estimate is usually obtained by dividing the peak count by 0.65 (Farwell et al. 1999). The CDFO continues to evaluate the appropriateness of this expansion factor and area-under-the-curve methodology through calibration studies. Counting fences and mark-recapture projects exist for some systems, although most of the time series of escapement data from these projects are relatively short.

For populations other than the Harrison River, habitat-based models are being developed to estimate spawning capacity. This habitat-based assessment will initially focus on spawning habitat, although approaches that incorporate juvenile rearing habitat will also be considered.

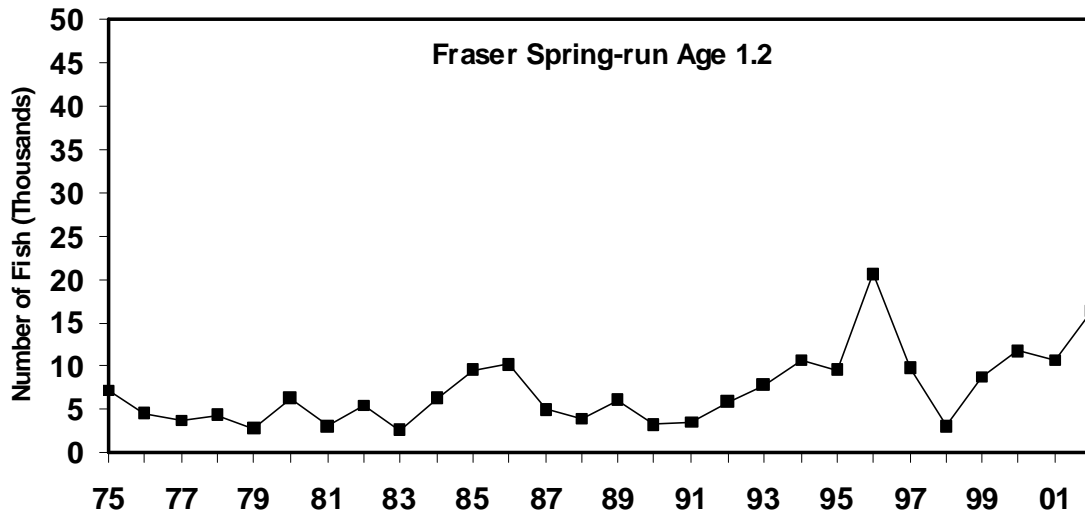


**Escapement Methodology:** The Fraser Spring-Run Age 1.3 aggregate includes 31 populations that spawn in the Fraser River and its tributaries. Chinook in the Fraser Spring-Run Age 1.3 aggregate are stream-type, spending one year in freshwater before migrating to the sea. Most chinook broods in this aggregate return at total age 5, although a portion (<10%) return at age 4 or 6. These stocks have a predominantly spring run-timing, returning to the Lower Fraser between late-March and mid-July, with the peak of migration occurring in June. The aggregate includes the Upper Pitt River and Birkenhead River stocks in the Lower Fraser, and the spring-run chinook of the Mid and Upper Fraser, North Thompson, and South Thompson, but excluding those of the Lower Thompson (CTC 2002c). Stocks upstream of Prince George include the McGregor and Torpy River systems. In recent years, fence counts have been employed at the Chilako River in the Upper Fraser and at the Salmon River in Salmon Arm (South Thompson). Fence counts were discontinued at the Salmon River (Prince George) in 1998. Estimates for all other systems were generated from aerial surveys, typically, by dividing the peak count by 0.65.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this aggregate.

**Agency Comments:** Work is currently underway to evaluate habitat-based escapement goal methodology, and to calibrate aerial over-flight counts with area-under-the-curve methodology and intensive Petersen mark-recaptures. Total aggregate escapement increased considerably in 2002.

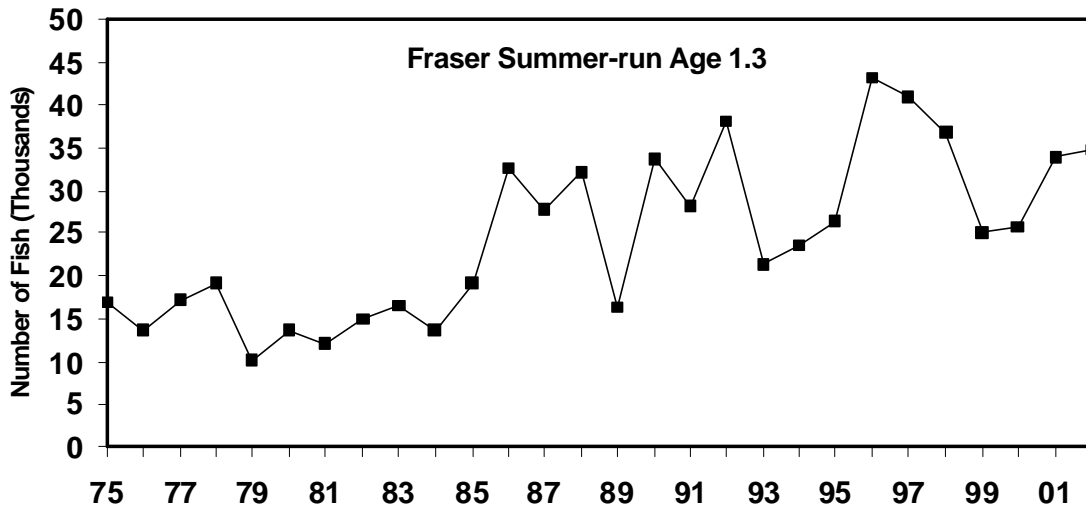




**Escapement Methodology:** The Fraser Spring-Run Age 1.2 aggregate includes six smaller body size populations that spawn in the Lower Thompson River tributaries, Louis Creek of the North Thompson and the spring-run fish of Bessette Creek in the South Thompson CTC (2002c). Chinook in this aggregate are stream-type, spending one year in freshwater before migrating to the sea. Broods return predominately as total age 4 adults, although a portion (<10%) return at age 3 or 5. Chinook in the Fraser Spring-Run Age 1.2 aggregate return to the Lower Fraser between March and early July. Escapement estimates for each system are generated from visual surveys, either from aerial over-flights or stream walks and by dividing the peak counts by 0.65. The Nicola watershed is a site for calibrating peak count expansion, area-under-the curve, and mark-recapture methods.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this aggregate.

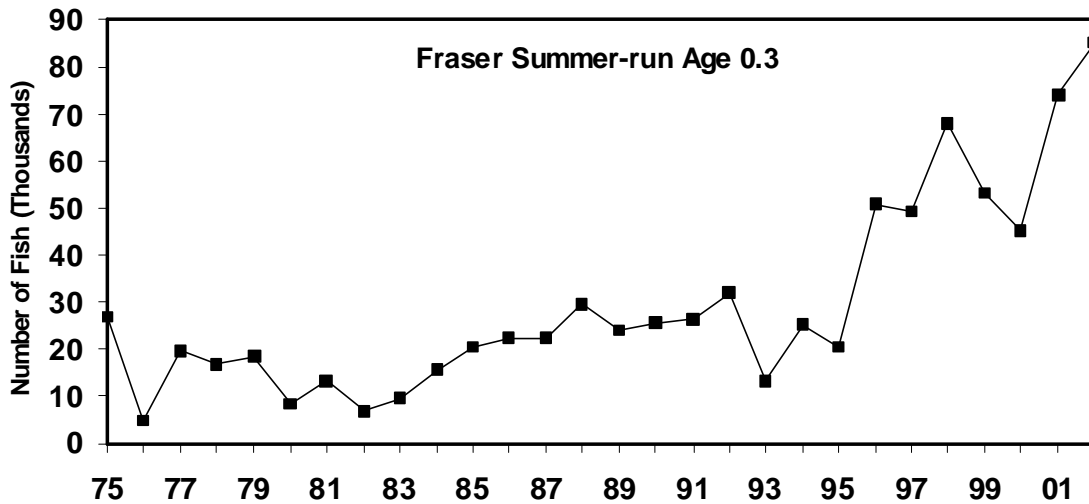
**Agency Comments:** Work is currently underway to evaluate habitat-based escapement goal methodology, and to calibrate aerial over-flight counts with area-under-the-curve methodology and intensive Petersen mark-recaptures. Overall escapement of this aggregate increased considerably in 2002.



**Escapement Methodology:** The Fraser Summer-Run Age 1.3 stock complex includes 11 populations, spawning in large rivers, mostly below the outlets of large lakes. These include the Stuart and Nechako rivers upstream of Prince George, Chilko and Quesnel rivers in the mid Fraser and the Clearwater and North Thompson rivers in the North Thompson watershed (CTC 2002c). Chinook in this aggregate return to the Lower Fraser between early June and early August. These stocks are dominated by yearling smolt production. Most broods return at total age 5 although a portion (~20%) return at age 4 or 6. Escapement estimates are generated from aerial surveys by dividing the peak count by 0.65, except for the Stuart system where a mark-recapture estimate is generated, and for the Nechako River where multiple aerial counts are analyzed with the area-under-the-curve method.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for the aggregate.

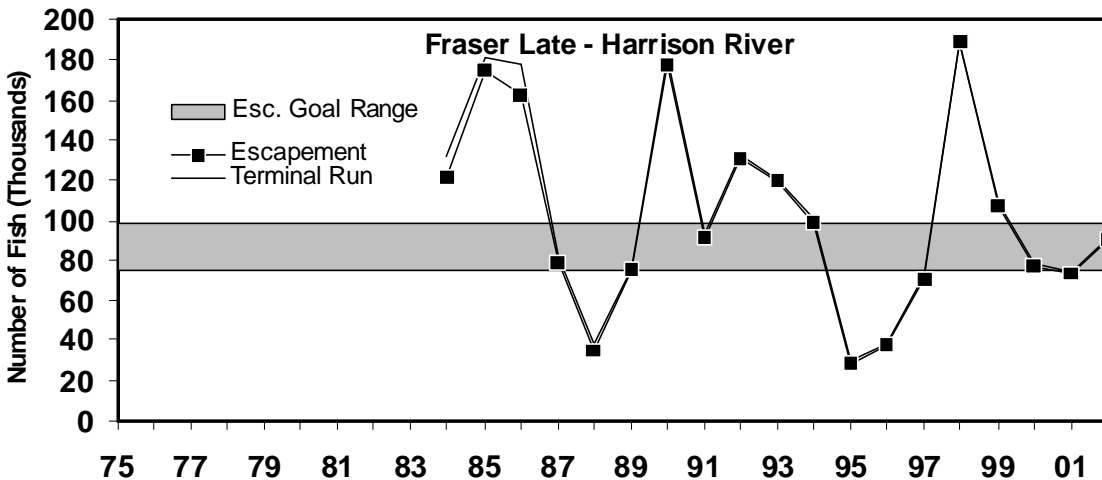
**Agency Comments:** Work is currently underway to evaluate habitat-based escapement goal methodology, and to calibrate aerial over-flight counts with area-under-the-curve methodology and intensive Petersen mark-recaptures. Aggregate escapement has been increasing over the past 15 years. Overall escapement of this aggregate increased slightly in 2002.



**Escapement Methodology:** The Fraser Summer-Run Age 0.3 aggregate includes five populations of chinook spawning in the South Thompson watershed upstream of Kamloops and one in the lower Fraser. These include the Lower Shuswap, Lower Adams, Little River and the South Thompson River mainstem, in the BC interior, and Maria Slough in the lower Fraser (CTC 2002c). Chinook in this aggregate return to the Lower Fraser between early July and early September. These stocks are dominated by under-yearling smolt (ocean-type: entering the ocean during their first fall). Most broods return at total age 4 although significant numbers (~35%) return at age 2 (jacks), 3 or 5. Most escapements are estimated by expanding peak visual survey counts (as in previous three Fraser aggregates). Further, the lower Shuswap River is a site for calibrating peak count expansion, area-under-the-curve, and mark-recapture methods.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for the aggregate.

**Agency Comments:** Work is currently underway to evaluate habitat-based escapement goal methodology, and to calibrate aerial over-flight counts with area-under-the-curve methodology and intensive Petersen mark-recaptures. Recent fishery reductions, designed in part to conserve interior Fraser watershed coho, sockeye and steelhead salmon, have resulted in dramatic increases in escapement since 1995, including a large increase in 2002.

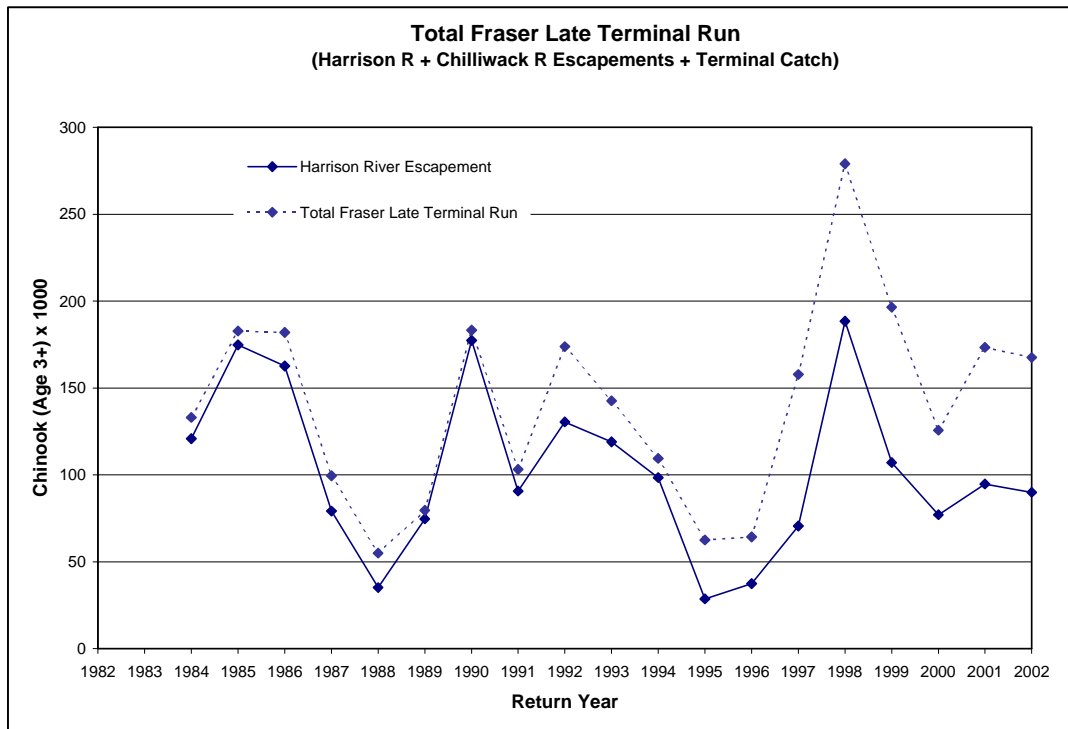


**Escapement Methodology:** The lower Fraser stock is dominated by fall returning Harrison-origin chinook that includes natural spawners in the Harrison River and Harrison-origin fish that were introduced to the Chilliwack River. In 1984, the Harrison River population was selected as an escapement indicator stock for assessment of chinook rebuilding. Since then, mark-recapture studies have been conducted annually to obtain reliable estimates of spawning escapements. Previous to 1984, escapements to the Harrison had been estimated through a variety of visual counting and estimation methods. Comparison of visual-based estimates with mark-recapture estimates of spawning escapements to the Harrison River indicate that quantitative estimates may be 4-8 times larger than the visual estimates. Estimates of fall chinook escapement to the Chilliwack River are based on a procedure long established by the Chilliwack Hatchery staff for expanding the number of carcasses counted in standardized reaches of the river.

**Escapement Goal Basis:** Due to their natural abundance and importance in numerous British Columbia and Washington State fisheries, Harrison River chinook were designated as an escapement indicator stock (i.e. 'key stream' indicator) to aid in fulfilling commitments under the 1985 Pacific Salmon Treaty. In 1986, an interim escapement goal for Harrison River chinook was established at 241,700 fish, based on doubling of the escapement estimate obtained from a mark-recapture program in 1984. In 2001, an escapement goal range was developed for Harrison chinook using a Ricker stock-recruit approach and is described in CTC(2002c). The escapement goal range that was proposed was 75,100-98,500 with the upper bound equal to the upper 75% confidence limit derived from a bootstrap procedure. This range was reviewed and accepted by the CTC. Estimated spawning escapements in the Harrison have exceeded this escapement goal range in eight years from 1984 to the present. They have fluctuated substantially with no apparent increasing trend within the time series.

**Agency Comments:** Harrison River origin chinook are white fleshed fish that return to spawn during the fall. They are unusual in that fry migrate into the lower Fraser River and estuary shortly after emergence. This stock spends 2-4 years in the coastal marine environment before returning to spawn. The Harrison River stock is one of the largest naturally spawning chinook populations in the world and makes important contributions to fisheries in the Strait of Georgia, southern BC, and upper Washington State.

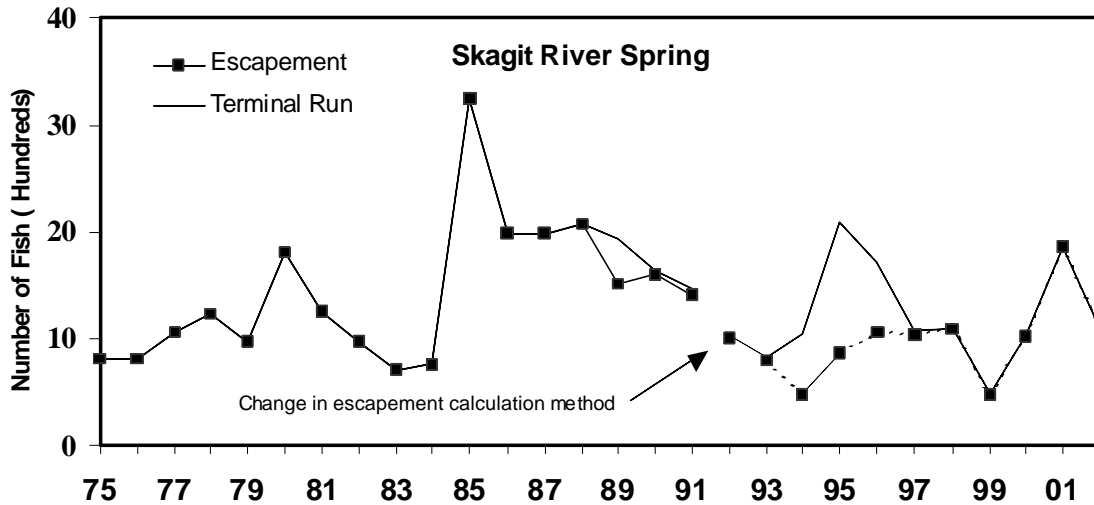
The near final estimate of the 2001 Harrison River escapement is 73,134 age 3 and older chinook and 14,607 age 2 male chinook. The 2002 preliminary estimates are 89,470 age 3 and older, as well as 41,784 age 2 male chinook. There is large uncertainty around estimates of age 2 escapement (average 95% C.I. for 2001 and 2002 is  $\pm 85\%$ ). The preliminary estimate of the 2001 Chilliwack River spawning escapement is 68,247 age 3 and older and 18,994 age 2 male chinook. In 2002, the preliminary escapement estimate is 63,472 age 3 and older and 5,595 age 2 male chinook. The difference between the two lines in the figure below reflects the increasing contribution of Chilliwack River and hatchery returns to the total terminal run of fall white chinook. The Chilliwack River spawning estimates used in the total terminal run series are based on those produced by the Chilliwack hatchery staff. A mark-recapture program conducted in 2000 and 2001 was discontinued in 2002.



#### **2.4.4 Washington, Oregon and Columbia River Stocks**

The PSC escapement indicator stocks in Washington, Oregon, and Idaho are separated into five groups: Puget Sound, Washington Coastal, Columbia River, North Oregon Coastal, and Mid Oregon Coastal. The indicator stocks include a variety of run timings and ocean distributions. In general, the marine catch of Puget Sound spring and fall stocks occurs in Puget Sound, the Strait of Georgia, and the West Coast of Vancouver Island. The marine harvest of Washington Coastal, Willamette Spring, and Columbia River summer and upriver fall stocks occurs primarily in West Coast Vancouver Island, North/Central British Columbia, and Southeast Alaska. The ocean migration of Columbia Upriver Spring and Washington Coastal spring stocks is largely unknown. Very few Columbia Upriver Spring CWT recoveries have been recovered in ocean fisheries; Washington Coastal spring stocks have been infrequently tagged. Both Oregon groups are fall stocks, with the Northern group migrating to far northern fisheries, while the Middle group migration has a more southerly distribution.

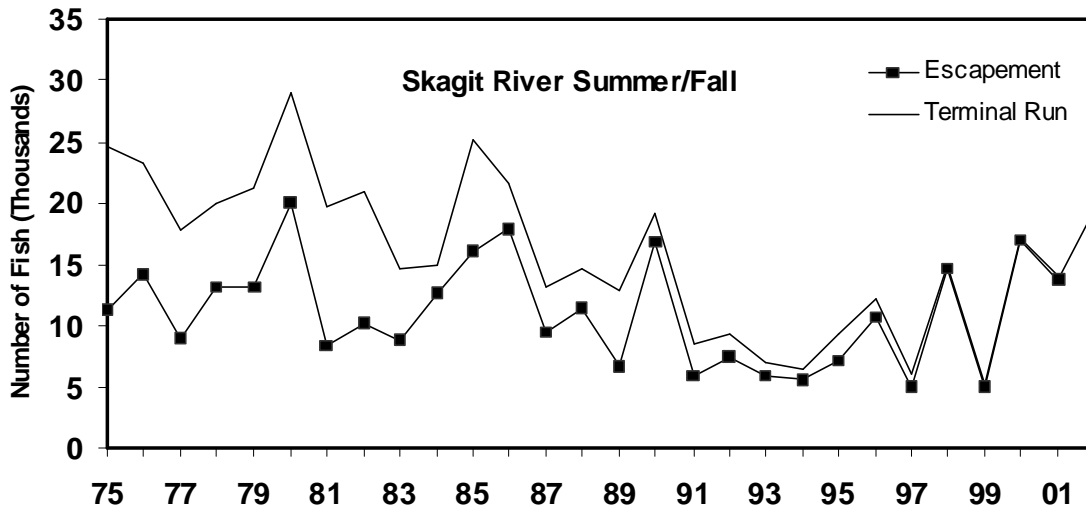
Biologically based escapement goals have been reviewed and accepted by the CTC for three North Oregon Coastal (Nehalem, Siletz, and Siuslaw) stocks and three Columbia River stocks (Lewis River, an interim goal for Mid- Columbia River Summers, and an interim goal for Upriver Brights).



**Escapement Methodology:** The Skagit River drains into northern Puget Sound near Mount Vernon, and is the largest drainage basin in Puget Sound. It supports three stocks of spring chinook, which use the upper Sauk, Suiattle, and upper Cascade rivers. Spring chinook total escapements are estimated annually from redd counts made during aerial and raft surveys. The counts are expanded by the area-under-the-curve method (Smith and Castle 1994). This method assumes 2.5 adult spawners for each estimated redd. Redds counted by air are reduced by 5% to account for “false” redds counted during the surveys. Escapements in stream areas that are not included in redd counts are estimated by using peak live and dead fish counts from foot surveys.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this escapement indicator stock.

**Agency Comments:** Due to changes in spawning index areas, beginning in 1992 for the Cascade stock and 1994 for the Sauk and Suiattle stocks, escapements are not directly comparable to previous numbers. There is no production supplementation program for Skagit River spring chinook. However, each year, wild broodstock are collected, spawned, and approximately 150,000 yearling spring chinook are released with coded-wire tags. The state-tribal escapement goal of 3,000 adults is the average of the estimated escapements from 1959-1968 (PFMC 1997). In 2002, the conservation objective for this stock was for a total AEQ exploitation rate across all fisheries not to exceed 42%. While no postseason estimate is available, the preseason expectation was for a total rate of 23% (PFMC 2003). In 2002, the preliminary escapement estimate is 1,065 and the preliminary terminal run estimate is 1,081.

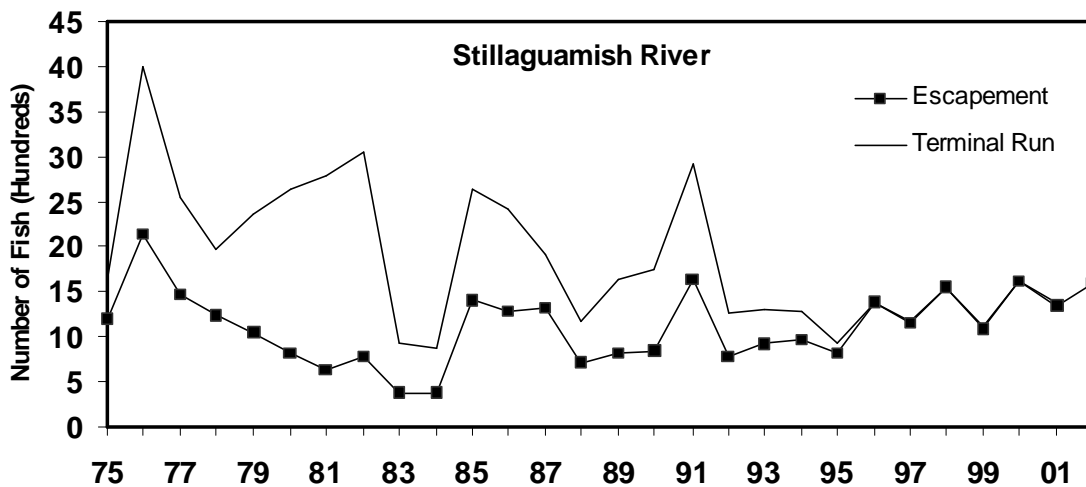


**Escapement Methodology:** The Skagit River drains into northern Puget Sound near Mount Vernon, and is the largest drainage basin in Puget Sound. It supports two stocks of summer chinook (Upper Skagit and Lower Sauk rivers) and one stock of fall chinook (Lower Skagit). The summer/fall chinook total escapements are estimated annually from redd counts made using aerial surveys. The counts are expanded by the area-under-the-curve method (Smith and Castle 1994). This method assumes a 21-day redd life and 2.5 adult spawners for each estimated redd. The estimate is then reduced by 5% to account for “false” redds counted during aerial surveys. Escapements in stream areas that are not included in aerial counts are estimated using cumulative redd counts.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this group.

**Agency Comments:** Efforts were recently funded through the USCTC funding to improve escapement estimates of Skagit summer/fall chinook. They included: development of variance estimates, determination of age and sex composition of the escapement, and evaluation of the 21-day redd life assumption and 2.5 fish/redd expansion value. The state-tribal escapement goal for this stock is 14,850, the average of the 1965-1976 escapements (Ames and Phinney 1977). In 2002, the preliminary escapement estimate is 19,591 chinook. Little terminal harvest has occurred since 1997. In 2002, the conservation objective for this stock was for a total AEQ exploitation rate across all fisheries not to exceed 52%. A postseason estimate of the total AEQ ER is not available. The predicted exploitation rate was 26%. The preliminary terminal run estimate is 19,807.

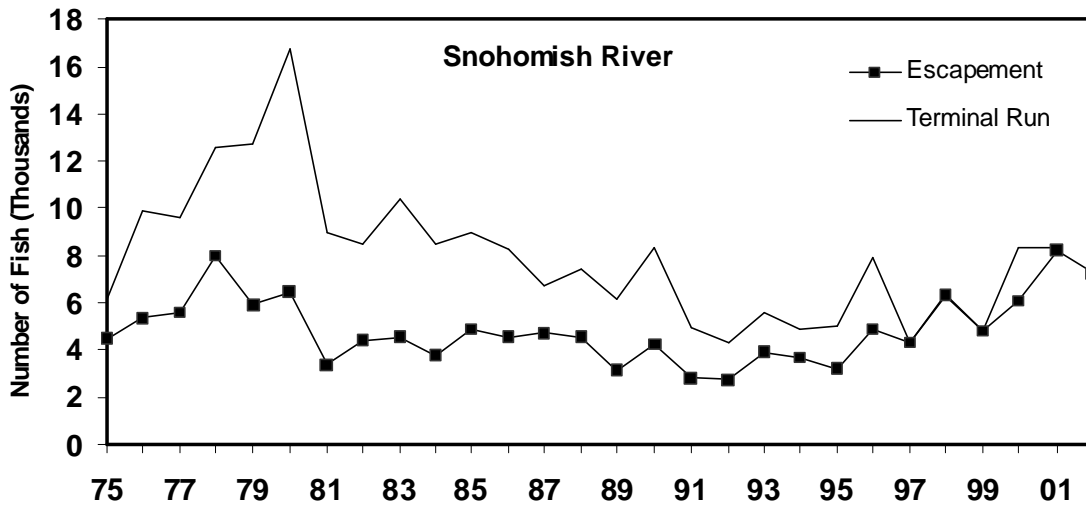




**Escapement Methodology:** The Stillaguamish River drains into northern Puget Sound between Everett and Mount Vernon. A stock of summer chinook uses the North Fork, while a stock of fall chinook spawns in the South Fork, the main-stem, and several tributaries. Total escapements in the main-stem are estimated annually from redd counts made during aerial surveys. The counts are expanded by the area-under-the-curve method (Smith and Castle 1994). This method assumes a 21-day redd life and 2.5 adult spawners for each estimated redd. The estimate is then reduced by 5% to account for “false” redds counted during aerial surveys. Escapements in the tributaries are estimated by using cumulative redd counts from foot or boat surveys.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this escapement indicator stock.

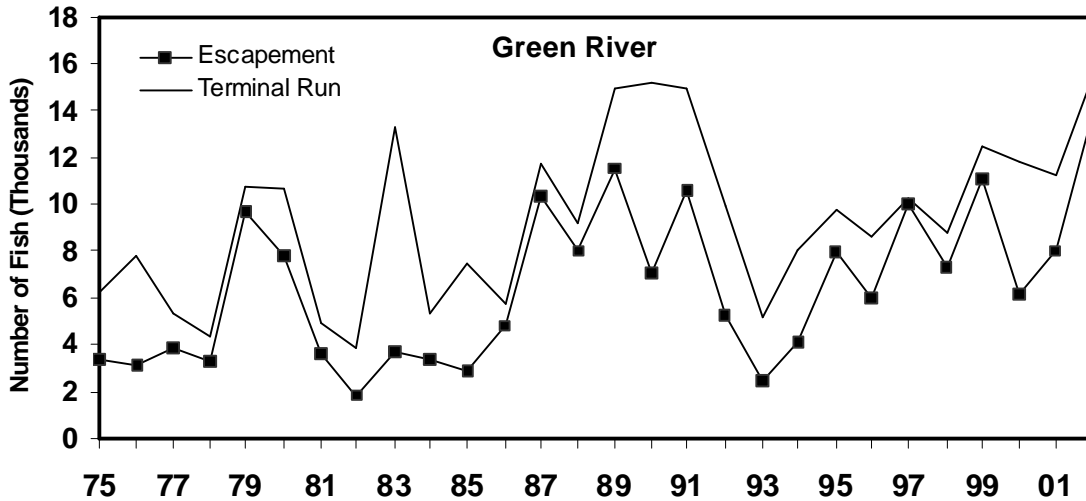
**Agency Comments:** Broodstock are collected annually in the river to maintain a coded-wire tag indicator stock program and to augment natural production. From 1989 to 1996, approximately 35% of the escapement was comprised of returns from this program. The state-tribal escapement goal of 2,000 fish is the average of the 1973-1976 escapements (Ames and Phinney 1977). In 2002, the preliminary escapement estimate is 1,588 chinook. There have been no terminal harvests since 1996. The 2002 conservation objective for the combined summer/fall stock was for an AEQ exploitation rate not to exceed 25% across all fisheries. While no postseason estimate is available, the preseason estimate of the total AEQ exploitation rate was 14%. The preliminary terminal run estimate is 1,593.



**Escapement Methodology:** The Snohomish River is located in northern Puget Sound near Everett. It produces two stocks of summer/ fall chinook, the Skykomish River stock and the Snoqualmie River stock. In most areas of the Snohomish River, summer/fall chinook total escapements are estimated annually from redd counts made by aerial surveys. The counts are expanded by the area-under-the-curve method (Smith and Castle 1994). This method assumes a 21-day redd life and 2.5 adult spawners for each estimated redd. The estimate is then reduced by 5% to account for “false” redds counted during the surveys. Cumulative carcass counts, live counts, cumulative redd counts, or peak redd ratio comparisons are used to estimate escapements in stream areas that are not included in aerial counts, i.e. tributaries (USCTC 1997).

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this stock.

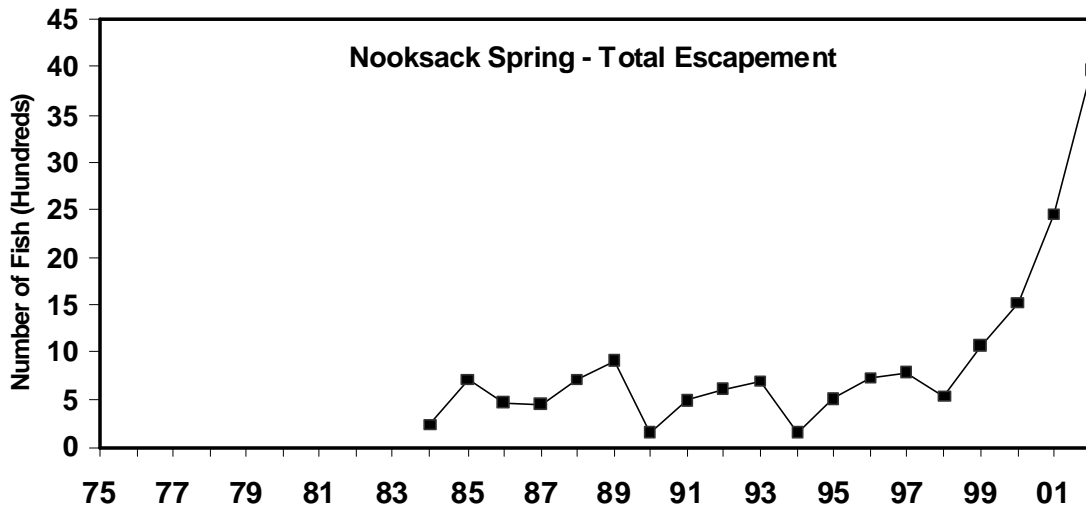
**Agency Comments:** Some terminal area harvest of Snohomish River chinook occurs in Area 8 incidental to net and sport fisheries targeting Tulalip Hatchery chinook salmon. Historic terminal run size and catch estimates derived from run reconstruction are being revised to reflect the results of otolith marking studies. The state-tribal escapement goal for this stock is 5,250 fish (the average of the 1965-1976 escapements). In 2002, the preliminary escapement estimate is 7,220 chinook. The conservation objective was for a total AEQ exploitation rate across all fisheries of 32%. The preseason prediction of that rate was 19%. The preliminary terminal run estimates for 2002 is 7,245.



**Escapement Methodology:** The Green River flows through Seattle into central Puget Sound. The basin has few tributaries available to anadromous fish; the only one with significant natural chinook spawning is Newaukem Creek. Total escapement to the Green River system is estimated from a combination of aerial and float counts of redds in index and supplemental areas in the main-stem, combined with foot surveys in Newaukem Creek. Escapement estimation using cumulative redd counts assumes a 21-day redd life and 2.5 adult spawners for each redd (Ames and Phinney 1977). These estimates are then expanded to account for unsurveyed spawning areas in the main-stem. Finally, these estimates are added to the estimated numbers of naturally spawning hatchery-origin chinook in Soos Creek derived from carcass counts to compute the total escapement estimates for the Green River shown in the graph above.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this escapement indicator stock.

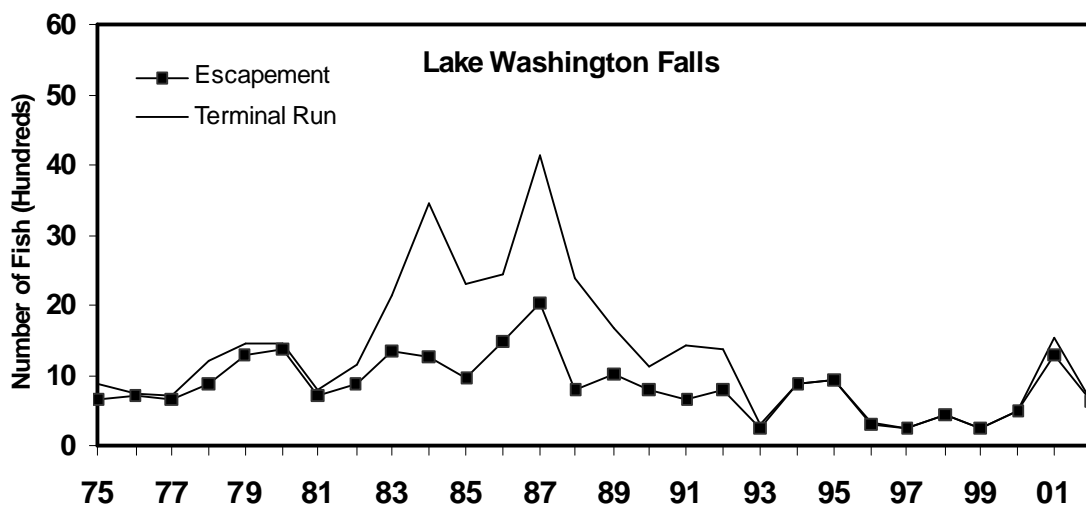
**Agency Comments:** There is a large hatchery program in this basin and these fish comprise a large portion of the return. Tagging studies were conducted in 1975 and 1976 to estimate numbers of returning adults; results were in close agreement with estimates made from aerial surveys. No attempt is made to adjust the estimate of natural escapement for the presence of hatchery origin fish. The USCTC has funded recent efforts to improve escapement estimates of Green River fall chinook, including evaluation of the spatial and temporal distribution of escapement, alternative methods of estimating escapement, and the validity of the 21-day redd life assumption and 2.5 fish/redd expansion value. The state-tribal escapement goal of 5,750 naturally spawning adults is the average of the 1965-1976 escapements (Ames and Phinney 1977). In 2002, the preliminary escapement estimate is 13,950 chinook. The 2002 conservation objective for this stock was for a southern U.S. pre-terminal AEQ exploitation rate not to exceed 15%, with an escapement goal of at least 5,800 adults. The preliminary terminal run estimate for 2002 is 15,553.



**Escapement Methodology:** The Nooksack River is the most northerly river in Puget Sound. There are two populations of spring chinook; one spawns in the North Fork and the other spawns in the South Fork. Turbid water often makes visual observation of spawning fish difficult. Carcass counts in the North Fork are multiplied by an expansion factor to estimate the spawning escapement. In the South Fork, escapement is estimated using fish counts and redd survey counts assuming a 21-day redd life and 2.5 adult spawners for each redd (Ames and Phinney 1977). Escapement estimates for the North and South Forks are summed to derive the total estimate presented in the graph above.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this escapement indicator stock.

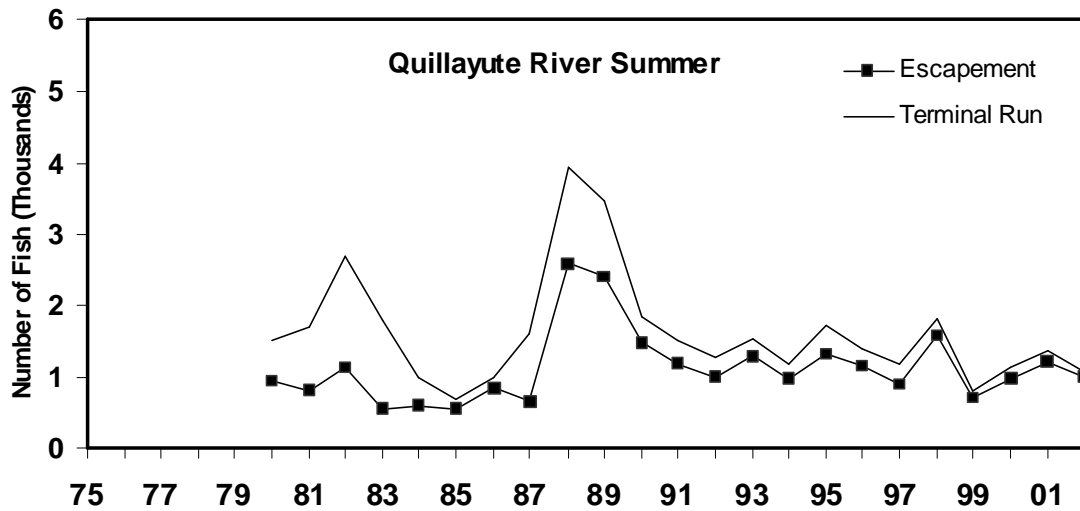
**Agency Comments:** The Kendall Creek Hatchery, located on the North Fork, is the site of recovery efforts directed at the North Fork chinook. The recovery program involves several strategies, including on-station and off-station releases, with the latter comprised of both acclimated and unacclimated releases. All fish are marked to estimate survival rates for the various release methods. Although recovery programs on the South Fork were implemented in the past, they have been discontinued. Methodologies are being developed to discriminate North Fork fish spawning in the South Fork from fish spawned in the South Fork. The conservation objective for 2002 for Nooksack spring chinook was for an AEQ exploitation rate across all southern U.S. fisheries not to exceed 6%. A postseason estimate of the AEQ exploitation rate is not available. The preseason estimate is 7%. The state-tribal escapement goal established for this stock is 2,000 spawners. In 2002, the preliminary escapement estimate for the North Fork is 3,687 chinook and for the South Fork is 282. This increase from previous years is primarily due to supplemental hatchery releases. There are no freshwater terminal fisheries on these stocks.



**Escapement Methodology:** Drainage from Lake Washington flows through the Lake Washington Ship Canal into Central Puget Sound in Seattle. Natural spawning of chinook in the Lake Washington basin occurs primarily in Bear Creek, Cottage Creek, and the Cedar River. Annual surveys are conducted by walking in the north tributaries (Bear and Cottage creeks) and by float on the Cedar River. Escapement estimates are based on area under the curve estimates of live spawners. The entire Cedar River is surveyed, but only index areas are surveyed in the north tributaries with no expansion for un-surveyed areas.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this escapement indicator stock.

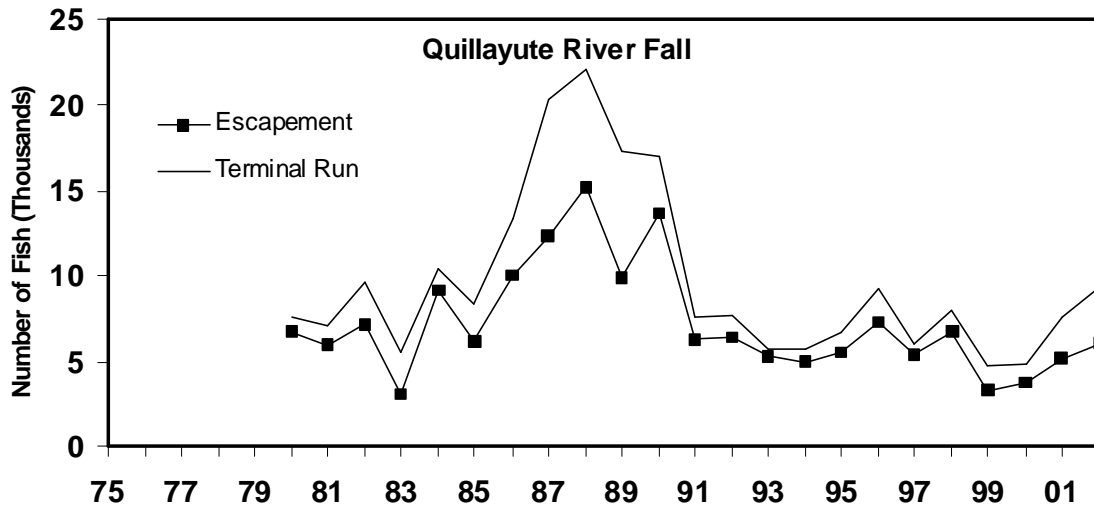
**Agency Comments:** Substantial artificial production occurs in Issaquah Creek and at the University of Washington. In 1994, spawning estimates were reviewed, and an attempt was made to find a consistent method to estimate escapement. A state-tribal escapement goal of 1,200 has been established for the Cedar River spawners. The single targeted goal represents an index count for the Cedar River. This objective reflects the average of observed spawning escapements from 1965-1969. In 2002, the preliminary escapement estimate for the Lake Washington Falls is 637 chinook. The conservation objective for 2002 for Cedar River spring chinook was for an AEQ exploitation rate of 15% in pre-terminal southern U.S. fisheries. The pre-season expected AEQ exploitation rate was 12%. The 2002 estimate for the terminal run is 647. There have not been freshwater terminal fisheries on this stock since 1995.



**Escapement Methodology:** The Quillayute River is located on the northwestern Washington coast. It is a short stretch of river formed when the Bogachiel and Sol Duc rivers meet near the town of La Push before emptying directly into the Pacific Ocean. The river system supports a stock of naturally spawning summer chinook whose total natural escapement estimate includes hatchery strays. Prior to 1980 escapements were based on estimated gillnet exploitation rates. In this report, the CTC, after review, decided to remove the data points from this period because these estimates are of poor quality for evaluating escapement trends. Since 1980, total annual escapement has been estimated by redd count surveys (QDNR 1982) conducted by foot, boat, and helicopter. Frequent surveys are made in index areas throughout the spawning season. Surveys are conducted in areas outside index areas once or twice a year during peak spawning times and expanded by similar timed data from index areas. Redd counts in non-surveyed streams are approximated by assigning a redd per mile value from an index area. Escapement is estimated by multiplying estimated redds by 2.5 to account for number of fish per redd. Total natural escapement estimates include hatchery strays and, beginning in 1987, fish taken for hatchery broodstock programs.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this stock.

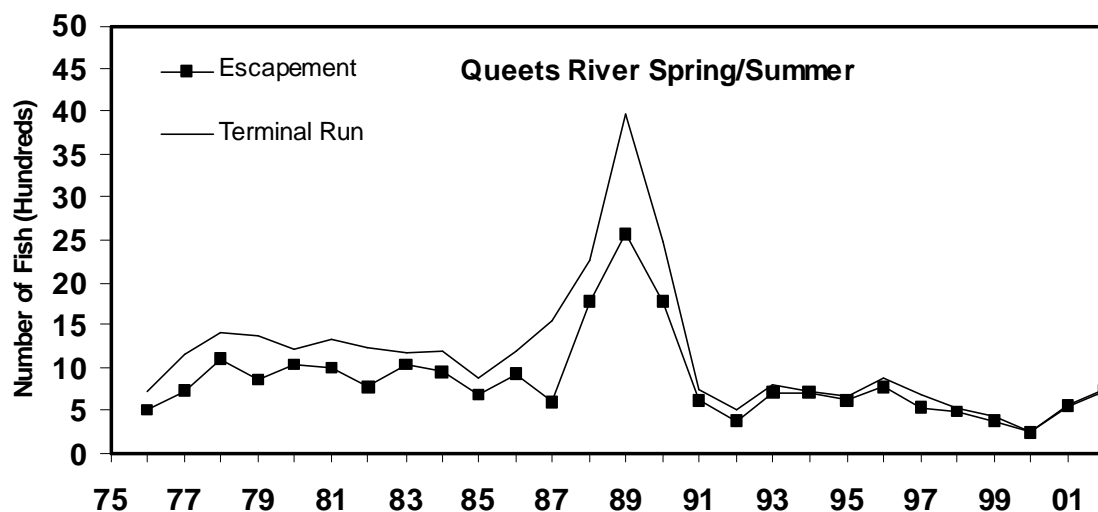
**Agency Comments:** A summer chinook hatchery program using native stock operated from the mid-1970s to the mid-1980s. Spring chinook of non-native origin were introduced in a hatchery program in the early 1970s. Coded-wire tag analyses since then have demonstrated significant straying of these spring chinook into the summer chinook spawning population. Estimates from 1991-1995 averaged 47% hatchery origin strays in the naturally spawning population. In 1996, fry plants were eliminated and the smolt plants were reduced. Summer chinook are managed for a fixed escapement goal of 1,200 adults and jacks combined (PFMC 2003). Preliminary estimates of the terminal run size and escapement for 2002 are 1,064 adult chinook and 1,002 adult chinook, respectively. This continues a trend of stable returns near the management goal for this stock.



**Escapement Methodology:** The Quillayute River is located on the northwestern Washington coast near the town of La Push. The river system supports a stock of naturally spawning fall chinook. Prior to 1980 escapements were based on estimated gillnet exploitation rates. In this report, the CTC, after review, decided to remove the data points from this period because these estimates are of poor quality for evaluating escapement trends. Since 1980, total annual escapement has been estimated by redd count surveys (QDNR 1982) conducted by foot, boat, and helicopter. Frequent surveys are made in index areas throughout the season. Surveys are conducted in areas outside index areas once or twice a year during peak spawning times and expanded by data from index areas. Escapement is estimated by multiplying the estimated redds by 2.5 to account for number of fish per redd. Redd counts in non-surveyed streams are approximated by assigning a redd-per-mile value from an index area.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this stock.

**Agency Comments:** No hatchery production of fall chinook currently occurs in the Quillayute River basin; the program was discontinued in the late 1980s. Since 1991, the returning run size has fluctuated within a range comparable to run sizes observed prior to 1984. The preliminary estimate of the escapement of this stock in 2002 is 6,057 adults. The estimate of the terminal run is 9,331. Terminal fisheries are managed for a harvest rate of 40%, with an escapement floor of 3,000 fish (PFMC 2003). This objective is designed to actively probe at and above estimates of escapements that produce maximum sustained harvest (MSH), while minimizing potential detrimental effects of existing fisheries. Stock production analyses of spawning escapements from 1968-1982 were used to determine the initial escapement floor.

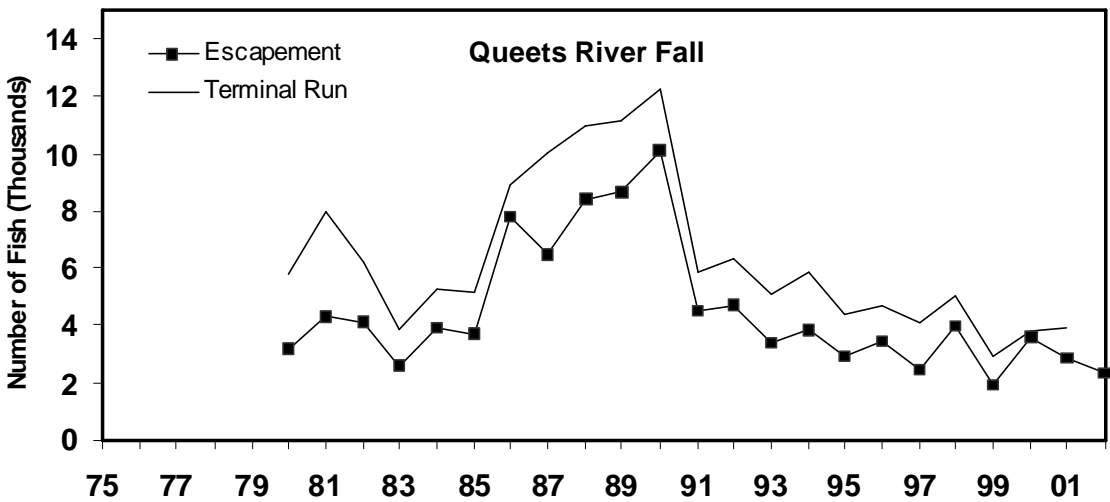


**Escapement Methodology:** The Queets River is located on the northwestern coast of Washington, entering the Pacific Ocean near the village of Queets. Major tributaries to the Queets include the Clearwater and Salmon Rivers. The river system supports a naturally spawning stock of spring/summer chinook that is not enhanced by hatchery supplementation. Since 1974, annual escapement has been estimated by redd count surveys (QDNR 1982) conducted by foot, boat, and helicopter. Frequent surveys are made in index areas throughout the spawning season. Surveys are conducted in areas outside index areas during peak spawning times and expanded by data from index areas. Escapement is estimated by multiplying estimated redds by 2.5 to account for number of fish per redd. Redd counts in non-surveyed streams are approximated by assigning a redd-per-mile value from an index area.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this stock.

**Agency Comments:** The escapements between 1976 and 1987 were relatively stable, ranging from 500 to 1,100 fish. The escapements and terminal returns in 1988, 1989, and 1990 were almost double the previous period. Escapements and terminal run declined since 1996, but have rebounded somewhat in 2001 and 2002. The 2002 preliminary terminal run size is estimated to be 755 adult chinook and the preliminary escapement estimate is 738 adult chinook. Terminal fisheries are managed to harvest 30% of the river run size, with an escapement floor of 700 fish (PFMC 2003). This objective is designed to actively probe at and above the estimates of escapement that produce MSH, while minimizing potential detrimental effects of existing fisheries. Since year 2000 sport anglers have been required to release all chinook during the summer, and tribal fisheries have been limited to one tribal netting day for ceremonial and subsistence purposes. Stock production analysis of spawning escapement for brood years 1969-1976 were used to determine the initial escapement floor.

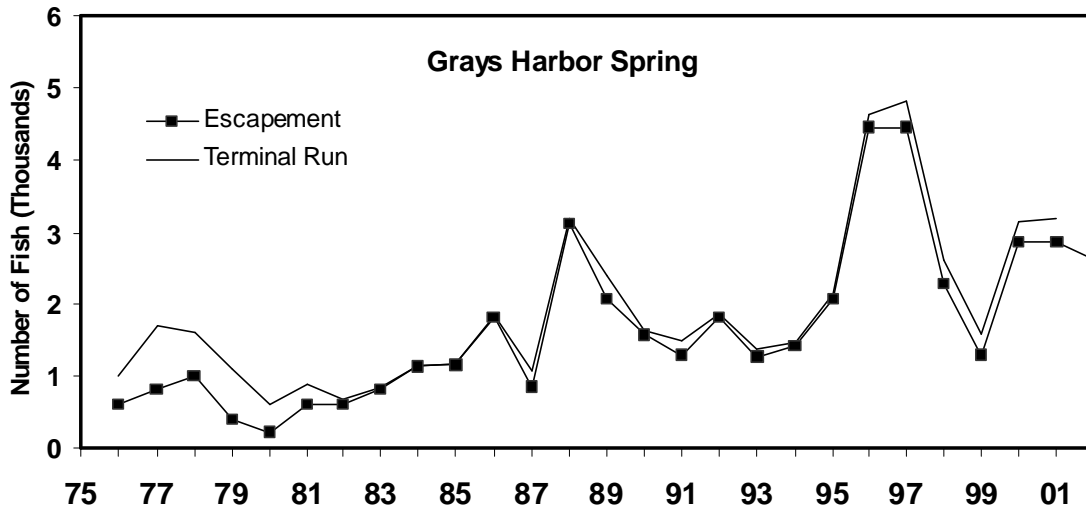




**Escapement Methodology:** The Queets River is located on the northwestern coast of Washington, and enters the Pacific Ocean near the village of Queets. The river system supports a naturally spawning stock of fall chinook, and is not enhanced by hatchery supplementation, although an exploitation rate indicator stock program has involved rearing of progeny taken from broodstock collected from the spawning grounds. Prior to 1980 escapements were based on estimated gillnet exploitation rates. In this report, the CTC, after review, decided to remove the data points from this period because these estimates are of poor quality for evaluating escapement trends. Since 1980, total annual escapement has been estimated by redd count surveys (QDNR 1982) conducted by foot, boat, and helicopter. Frequent surveys are made in index areas throughout the spawning season. Surveys are conducted in areas outside index areas during peak spawning times and expanded by data from index areas. Escapement is estimated by multiplying estimated redds by 2.5 to account for number of fish per redd. Redd counts in non-surveyed streams are approximated by assigning a redd-per-mile value from an index area.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this stock.

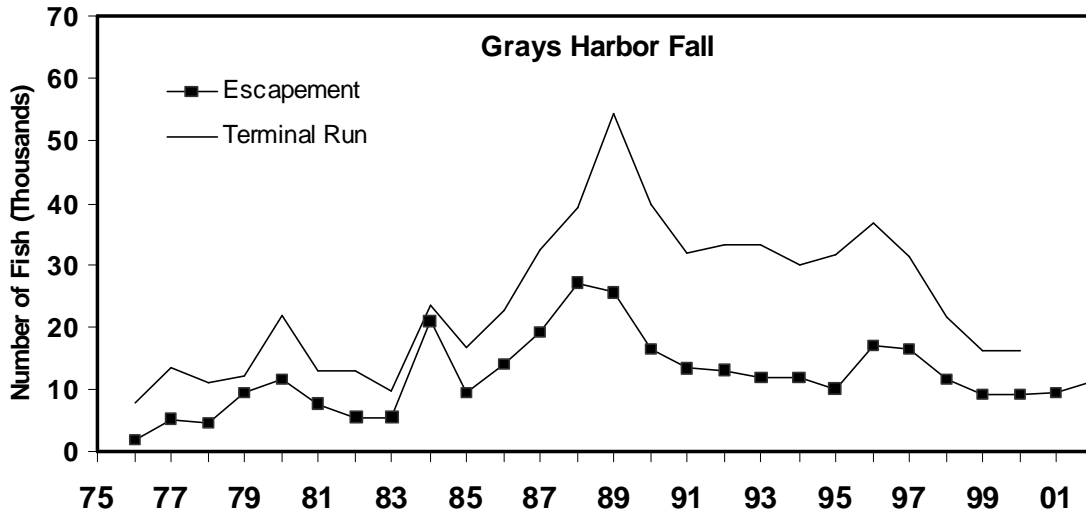
**Agency Comments:** Between 1975 and 1985, the escapement was relatively stable between 1,500 and 4,000 chinook. The 1986–1990 escapements were double the levels estimated for 1975-1985. Escapements since 1991 have been comparable to the 1975-1985 levels. In 2002, the preliminary escapement estimate is 2,288 adult chinook, and the estimate of terminal run size is not available. Terminal fisheries are managed to harvest 40% of the river return, with an escapement floor of 2,500 spawners (PFMC 2003). This objective is designed to actively probe at and above estimates of the escapements that produce MSH, while minimizing potential detrimental effects of existing fisheries. Stock production analyses of spawning escapements from 1967-1982 were used to determine the initial escapement floor.



**Escapement Methodology:** Grays Harbor is located on the Washington coast. Two river systems, the Humptulips and the Chehalis River, flow into Grays Harbor; only the Chehalis River supports a stock of natural-origin spring chinook. Since the early 1980s, annual escapement into the Chehalis has been estimated from redd counts. Surveys are conducted by foot, boat, and helicopter. Weekly surveys are made in index areas and adjusted by standardized factors to account for spawning timing, season total redds, redd life, and number of fish per redd. One-time surveys are conducted in areas outside index areas during peak spawning times and expanded by data from index areas. Redd counts in non-surveyed streams are approximated by assigning a redd-per-mile value from an index area.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for Grays Harbor spring chinook.

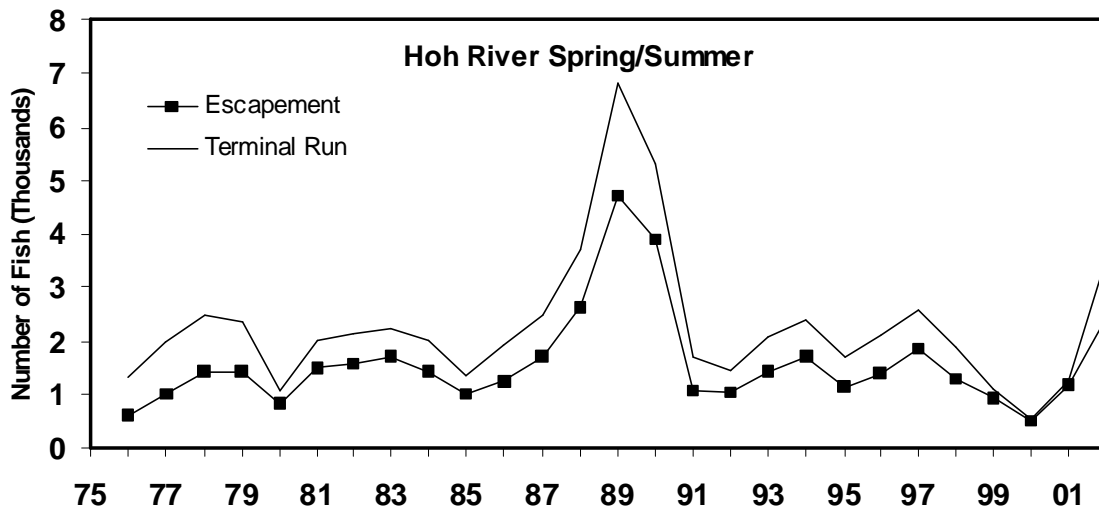
**Agency Comments:** There are some tribal net fisheries and a small recreational fishery on the Chehalis River. Historically the recreational fishery harvested fewer than 50 fish, but the fishery has increased in recent years to take 100 to 200 fish annually (PFMC 2003). Broodstock programs in Grays Harbor produce hatchery chinook, which return and spawn naturally because there are no adult collection facilities. Hatchery-origin chinook that spawn naturally in the Chehalis River are included in the natural escapement estimate because little or no tagging occurs to allow differentiation between the two. The preliminary estimate of the escapement of this stock in 2002 is 2,600 adults. An estimate of the terminal return for 2002 is not available at this time. The Grays Harbor spring chinook stock is managed for a fixed natural spawning escapement goal of 1,400 fish (PFMC 2003). This single targeted goal was developed as a MSY proxy. This objective is derived from actual spawning data from the mid- to late 1970's, expanded to include additional habitat not covered by spawner surveys.



**Escapement Methodology:** The Humptulips and Chehalis Rivers both support fall chinook. Before 1984 escapements were based on fish counts. Since 1984, total annual escapement has been estimated by redd count surveys conducted by foot, boat, and helicopter. Weekly surveys are made in index areas and adjusted by standardized factors to account for spawning timing, season total redds, redd life, and number of fish per redd. One-time surveys are conducted in areas outside index areas during peak spawning times and expanded by data from index areas. Redd counts in non-surveyed streams are approximated by assigning a redd-per-mile value from an index area.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this group of stocks.

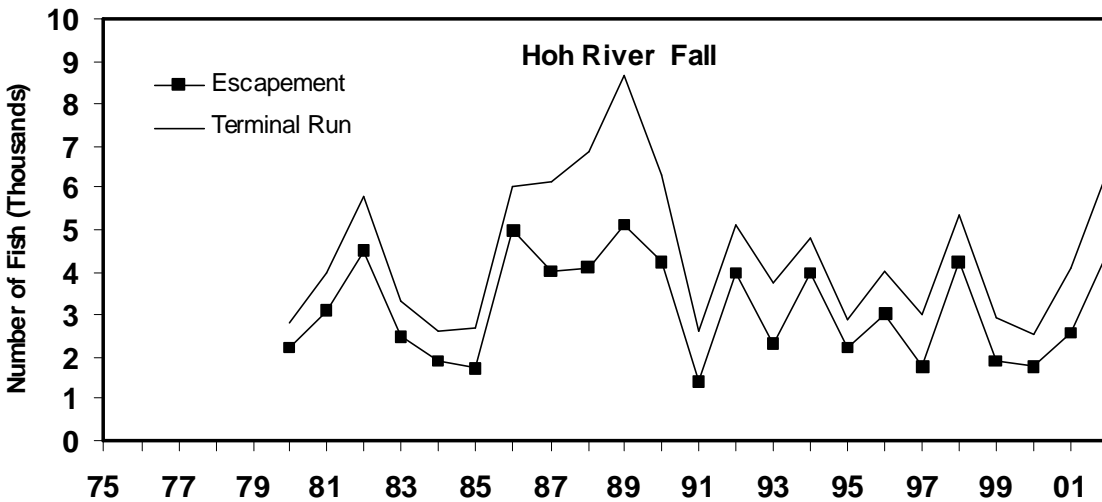
**Agency Comments:** Terminal fisheries include both directed commercial and recreational harvests. Broodstock programs in Grays Harbor produce hatchery chinook, which return and spawn naturally because there are no adult collection facilities. Hatchery-origin chinook that spawn naturally are included in the natural escapement estimate because little or no tagging occurs to allow differentiation. Grays Harbor fall chinook are managed for a maximum sustained production escapement goal of 14,600 spawners for the Chehalis and Humptulips systems combined (PFMC 2003). The preliminary escapement estimate for 2002 is 11,300; estimates of the terminal run in 2001 and 2002 are not available. This single targeted goal was developed as an MSY proxy. The objective represents assumed optimal spawner density based on estimated available habitat. Escapements have been below agency goals since 1998.



**Escapement Methodology:** The Hoh River is located on the northwestern coast of Washington north of the town of Kalaloch, and flows directly into the Pacific Ocean. The river system supports a naturally-spawning stock of spring/summer chinook which is not enhanced by hatchery supplementation. Annual escapement has been estimated by redd count surveys conducted by foot, boat, and helicopter. Since the mid 1990s additional foot and boat surveys have replaced helicopter surveys. Frequent surveys are made in index areas throughout the spawning season. One or two-time surveys are conducted in areas outside index areas during peak spawning times and expanded by data from index areas. Escapement is estimated by multiplying estimated redds by 2.5 to account for the number of fish per redd. Redd counts in non-surveyed streams are approximated by assigning a redd-per-mile value from an index area.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this stock.

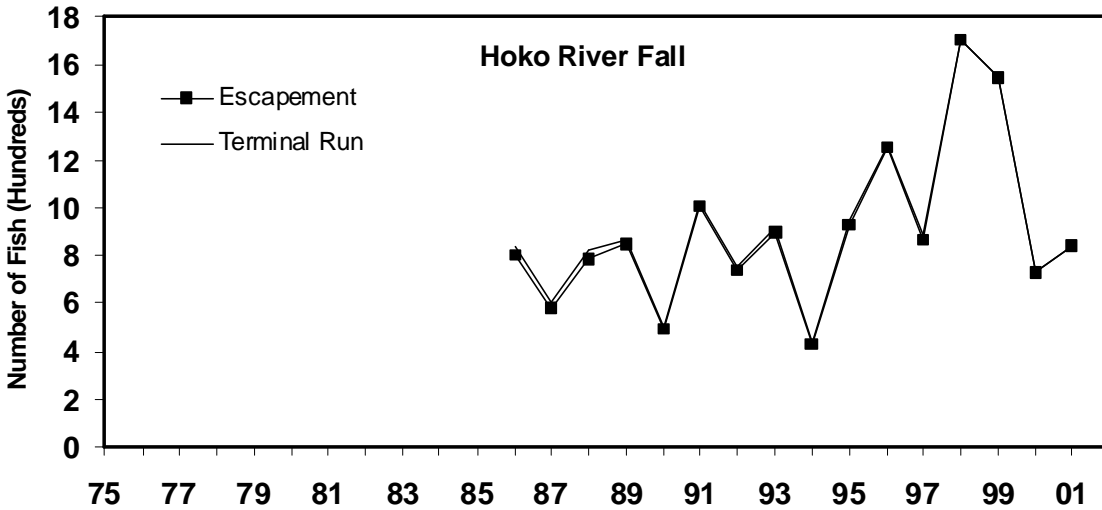
**Agency Comments:** Like many of the other Washington coastal stocks, the escapements have been relatively stable except for much larger returns in 1988, 1989, and 1990. The terminal return for this stock declined from 1997 to 2000, but has rebounded since then. In 2002, the preliminary estimates of terminal run size and escapement improved to 3,511 adult chinook and 2,400 adult chinook, respectively. Terminal fisheries are managed to harvest 31% of the river run, with an escapement floor of 900 fish (PFMC 2003). The escapement in 2002 is well above this escapement floor. This objective is designed to allow a wide range of spawner escapements from which to eventually develop an MSY objective or proxy while protecting the long-term productivity of the stock. Stock production analysis of spawning escapement for brood years 1969-1976 were utilized to determine the initial escapement floor.



**Escapement Methodology:** The Hoh River is located on the northwestern coast of Washington north of the town of Kalaloch, and flows directly into the Pacific Ocean. The river system supports a naturally spawning stock of fall chinook, and is not enhanced by hatchery supplementation. Prior to 1980 escapements were based on estimated gillnet exploitation rates. In this report, the CTC, after review, decided to remove the data points from this period because these estimates are of poor quality for evaluating escapement trends. Since 1980, total annual escapement has been estimated by redd count surveys (QDNR 1982) conducted by foot, boat, and helicopter. Frequent surveys are made in index areas throughout the spawning season. One or two-time surveys are conducted in areas outside index areas during peak spawning times and expanded by similar timed data from index areas. Escapement is estimated by multiplying estimated redds by 2.5 to account for number of fish per redd. Redd counts in non-surveyed streams are approximated by assigning a redd-per-mile value from an index area.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this stock.

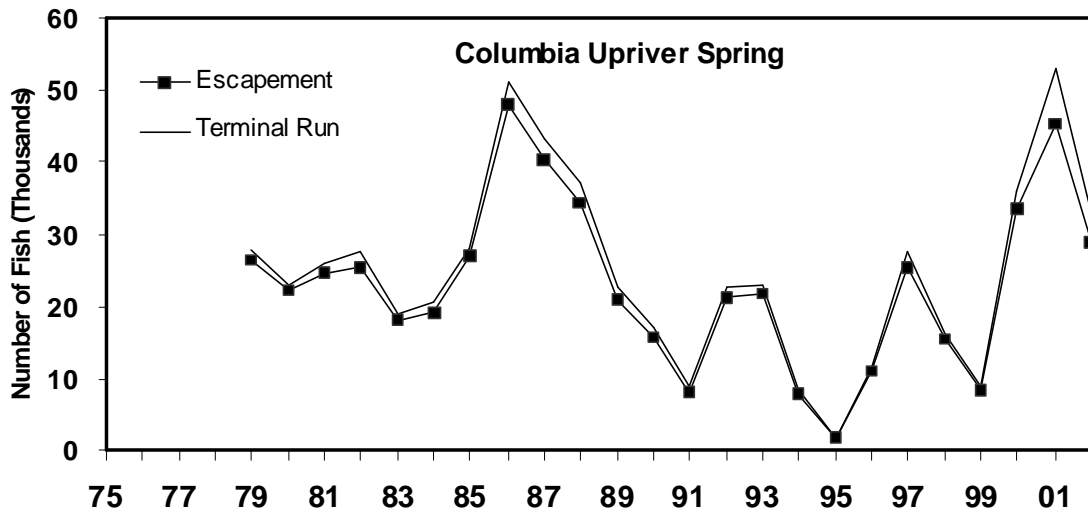
**Agency Comments:** The natural escapement estimates include fish taken for broodstock in the 1980s. This stock is managed to harvest 40% of the terminal run, with an escapement floor of 1,200 spawners (PFMC 2003). This objective is designed to actively probe at and above estimates of the escapements that produce MSH, while minimizing potential detrimental effects of existing fisheries. Stock production analyses of spawning escapements from 1968-1982 were utilized to determine the initial escapement floor. In 2002, improvements in recruitment resulted in preliminary estimates of a terminal run size of 6,431 adult chinook and an escapement of 4,500 adult chinook.



**Escapement Methodology:** The Hoko River is located on the Strait of Juan de Fuca. Spawner escapement surveys are conducted on foot, on a weekly basis, from September through December. Methods for expanding the redd counts vary each year depending on visibility and flooding. The total run size is calculated by taking the sum of redds in the upper main-stem and tributaries, added to the expanded number of redds in the lower main-stem. Expansions are used only in the lower main-stem because a 10-year data series is only available for the lower main-stem; better visibility in the upper main-stem allows for direct counts in high-flow periods. Limiting the expansions to the lower main-stem also keeps methods consistent over the years. The total natural escapement is calculated by multiplying the number of redds by 2.5 adults per redd. Natural escapement estimates do not include the broodstock taken by the Hoko Hatchery.

**Escapement Goal Basis:** There is currently no CTC agreed escapement goal for this stock.

**Agency Comments:** There are no directed fisheries on chinook returning to rivers entering the Strait of Juan de Fuca. The escapement goal established by state and tribal managers is 850 naturally spawning adults. This single targeted goal was developed as a MSY proxy. The escapement goal was calculated by estimating the amount of available spawning habitat, then expanded utilizing assumed optimal redds per mile and fish per redd values (Ames and Phinney 1977). The escapement and terminal run size estimates for 2002 are currently unavailable.

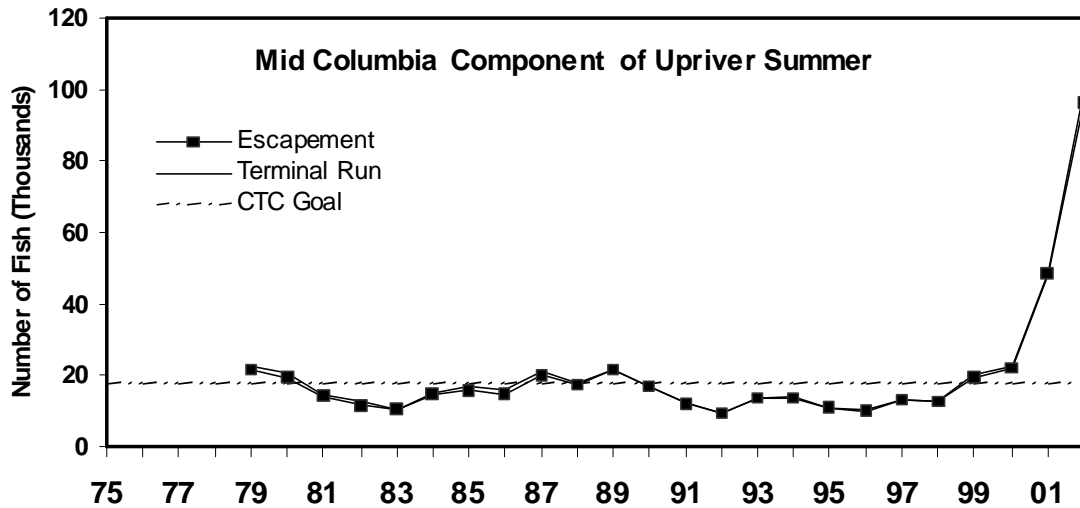


**Escapement Methodology:** Spring chinook escapement past Bonneville Dam is the dam count from March 15 through May 31 multiplied by the proportion of wild spawners estimated from run reconstruction, minus an estimate of wild harvest above Bonneville Dam. The majority of production above McNary Dam is now from Columbia River hatcheries.

**Escapement Goal Basis:** There is no CTC agreed escapement goal for this stock group.

**Agency Comments:** Historically, the Snake River produced most of this stock. In 1992, Snake River spring/summer naturally spawning chinook were listed under the U.S. Endangered Species Act. In past escapement assessments, the CTC used the goal of 84,000 natural spawners passing Bonneville Dam. This was the estimated wild portion (70%) of the 120,000 total spring chinook specified in the original 5-year plan for U.S. v Oregon. The interim management goal for the Columbia River Fish Management Plan (CRFMP 1988) for Columbia River Springs is 115,000 hatchery and wild adult chinook counted at Bonneville Dam and 25,000 naturally produced plus 10,000 hatchery produced adults counted at Lower Granite Dam. Terminal harvests have been severely constrained since 1977, with incidental harvests in lower river fisheries averaging 2% and total harvest in treaty Indian fisheries averaging 6% (TAC 1999). Juvenile mortality and habitat loss are the major sources of mortality. In the last couple of years though these harvest rates have been approximately 19% (2001 and 2002 TAC BA Tables).

There were record low returns of Columbia Upriver Springs in 1994 and 1995. However, water run-off levels in 1996, 1997 and 1998 were 3 of the largest in 70 years, resulting in good spill in water flow over the dams and favorable in-river conditions. Cooler temperatures also improved in-river conditions. The 2001 return was the largest run since Bonneville Dam was completed in 1938. In addition to good conditions for out-migrants, the ocean conditions have greatly improved during the early life cycle of the juvenile chinook entering the ocean. In 2002, the run was smaller, but still one of the largest runs since the mid-80s, when ocean conditions were also favorable.

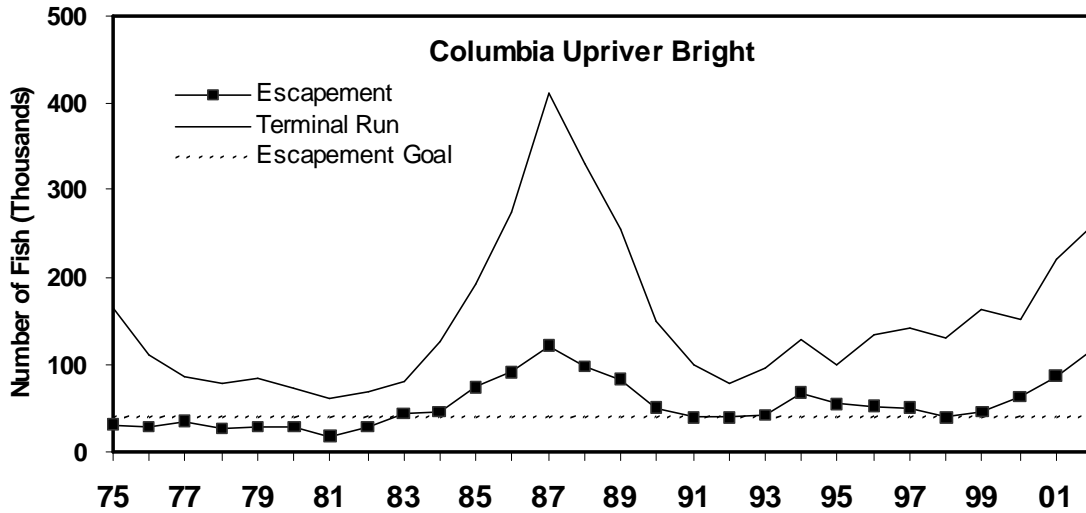


**Escapement Methodology:** Estimates of naturally spawning Mid-Columbia summer chinook escapement past Bonneville Dam (between June 1 to July 31) are based on the dam count, Zone 6 harvests, and the reconstructed proportion of upper Columbia River naturally spawning fish. Production is primarily from natural spawning in the Wenatchee, Methow, and Okanogan Rivers. The escapement indicator stock is Columbia Upriver Summers, which is comprised of both Mid-Columbia summer chinook, and Snake River summer chinook. The graph above is for only the Mid-Columbia component of this stock, because the interim escapement goal is for this component. This interim goal was developed using the Chinook model, which only includes Mid-Columbia chinook. In recent years, the total escapements for Columbia Upriver Summers were mistakenly graphed with the interim goal for mid-Columbia summer chinook.

**Escapement Goal Basis:** The CTC (1999) has developed an interim biologically based MSY escapement goal of 17,857 wild mid-Columbia summer chinook past Bonneville Dam based on PSC chinook model data. The methods used to reconstruct the escapements for developing the goal are different than the current methods used to estimate mid-Columbia escapements, graphed above. Also, the historical time series of escapement estimates in the TAC run reconstruction have changed. Therefore, the escapement goal should be revisited.

**Agency Comments:** Most Columbia upriver summer chinook migrate to sea as sub-yearlings, but some migrate in late fall or as yearlings the following spring. Productivity is limited primarily by loss of downstream migrants and habitat degradation related to timber harvests, lack of screens on water diversions, high water temperatures, low flows, and sediment-laden irrigation water returns (CBFWA 1990). The 2002 run was one of the largest since 1975. Water run-off levels in 1996, 1997 and 1998 were higher than average, resulting in good spill and in-river conditions. Ocean survival has improved vastly in the last few years. This likely improved the early ocean survival of 1997 and 1998 brood yearling migrants. Most harvest impacts occur in ocean fisheries. Escapements have exceeded 92% of the terminal run since 1974. Treaty Indian C&S harvest rates have averaged less than 3% since 1986 (TAC 1999). In 2002, there was a directed sport fishery on summers for the first time since 1973.

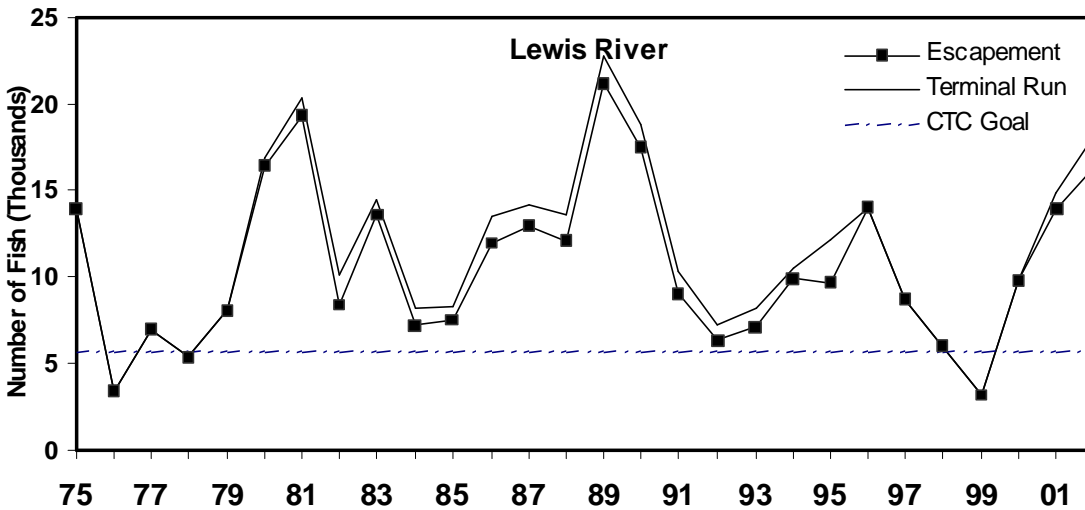




**Escapement Methodology:** Columbia Upriver Bright escapement graphed above is the adult count at McNary Dam minus the total of sport catch in the Hanford Reach and brood stock at Priest Rapids, Ringold, and Lyons Ferry hatchery facilities. Fall chinook at McNary Dam are those counted after August 9. Terminal run graphed above is the total return of Upriver Brights to the Columbia River mouth, minus the total return of Deschutes River fall chinook to the mouth of the Deschutes River.

**Escapement Goal Basis:** Based on a Ricker stock-recruitment function, the CRFMP stated an interim escapement goal of 40,000 natural spawning URBs past McNary Dam, including 38,700 for Hanford Reach and 1,100 Snake River. In 1990, the escapement goal was increased to 45,000 for increased hatchery programs. In 1994, a management goal of 46,000 was established, and in 1995, the management goal was retained while the escapement goal was reduced to 43,500. In 2002, the original CRFMP escapement goal of 40,000 was agreed to by the CTC as an interim biologically based escapement goal for PSC purposes.

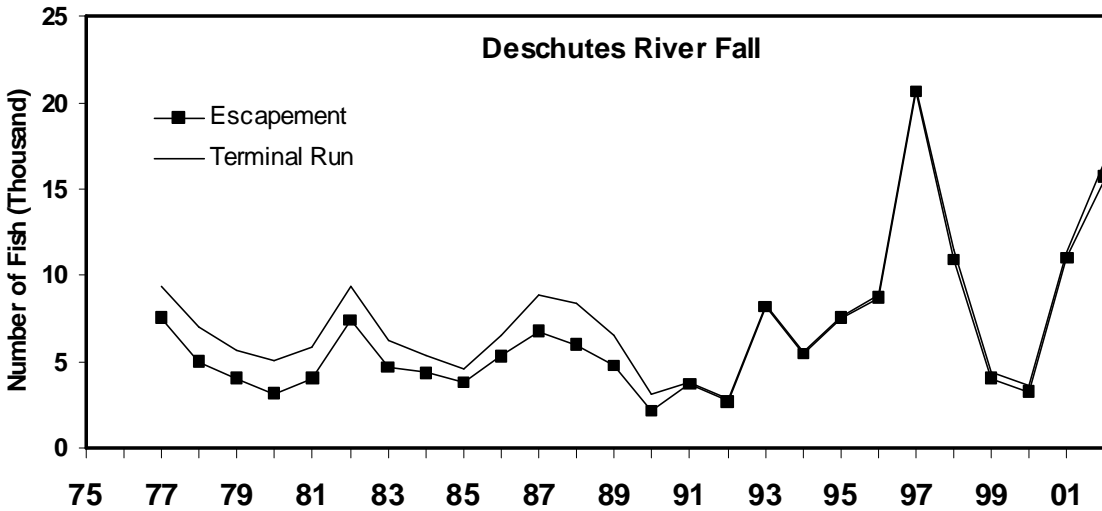
**Agency Comments:** The 2002 escapement of 116,387 was the largest since the peak escapement and terminal run in 1987.



**Escapement Methodology:** Most natural bright fall chinook production below Bonneville Dam occurs in the North Fork Lewis River. The Lewis River Wild stock is the main component of the Lower River Wild management unit for fall chinook, which also includes small amounts of wild production from the Cowlitz and Sandy River basins. In this report, the escapements and goal are for the Lewis River component. Annual escapement estimates are obtained by expanding peak counts from weekly counts of live and dead fish in the 6.4 km area below Merwin Dam (rkm 31.4) by the ratio of 5.2685 (total spawners/peak count). This expansion factor is from a 1976 carcass tagging and recapture study (McIsaac 1990). From 1999-2001, LOA funds were used to conduct a study to estimate and verify the expansion factor. A coded-wire tag program for wild fish has been in place since the 1977 brood. Methods of CWT recovery, escapement counting, and expansion of the index area fish counts have been consistent since 1964. All naturally spawning adult fish, both from hatchery and natural production, are included in the escapement. The terminal run is escapement plus the adult sport catch in the Lewis River.

**Escapement Goal Basis:** The escapement goal of 5,700 fall chinook in the Lewis River was developed by McIsaac (1990), based on spawner-recruit analysis of the 1964-1982 broods and coded-wire tag recoveries from the 1977-1979 broods. This analysis was updated in CTC (1999) based on analysis of brood years 1964-1991 and the goal of 5,700 was reaffirmed and accepted as a biologically based goal.

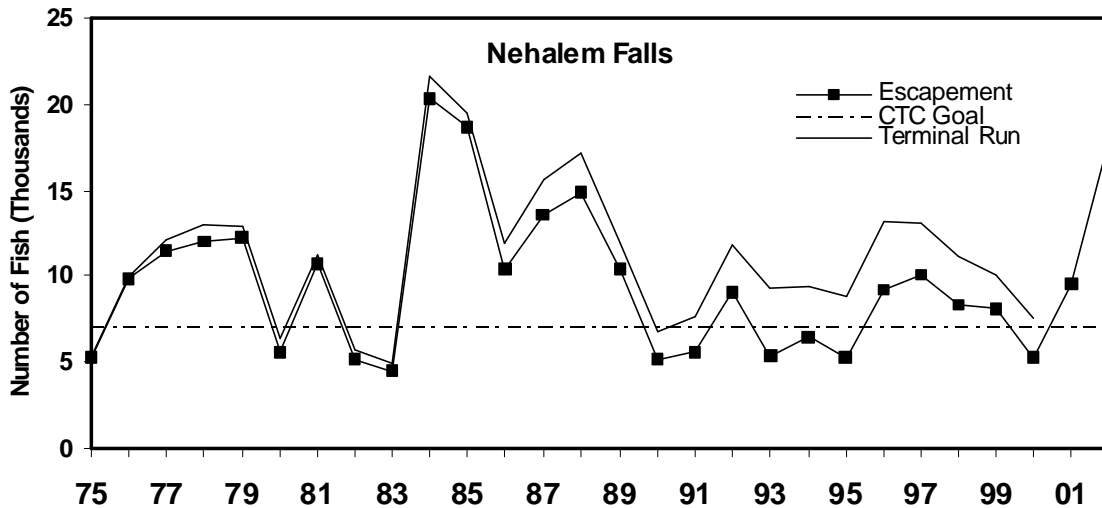
**Agency Comments:** The Lewis River escapements have been above their escapement goal during the PST except in 1999. The PFMC "Review of 1999 Ocean Salmon fisheries" states "The ocean escapement of Lewis River Wild stock in 1999 was the lowest on record and due, in part, to flooding in 1995 and 1996." The 2002 return and escapement of Lewis River fall chinook was the largest since 1990 (PFMC 2003).



**Escapement Methodology:** Fall chinook are found throughout the Deschutes River below the Pelton Re-regulating Dam (rkm 161). From 1975 through 2000, escapement estimates were based on a mark-recapture project above Sherars Falls and a helicopter survey of redds below the falls. Marked fish were recaptured during carcass surveys and the population above Sherars falls was estimated using Chapman’s modification of the Peterson mark-recapture estimate. The proportion of redds below the falls was then used to expand the mark-recapture estimate for spawning in the entire river. Starting in 2001, the escapement shown is from a USCTC funding mark-recapture project that provides an estimate for the entire river. The terminal run is the escapement plus Deschutes River harvest.

**Escapement Goal Basis:** The Deschutes chinook salmon stock does not have a PSC agreed upon escapement goal.

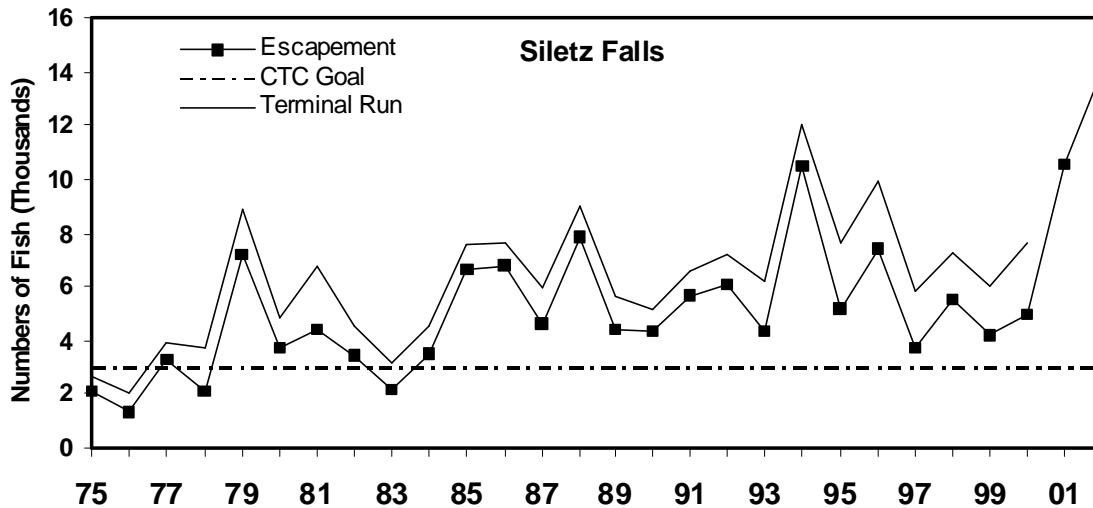
**Agency Comments:** Local management agencies use a management goal of 4,000 adult chinook, which includes an escapement goal of 2,000 fish above Sherars Falls. This goal is based on average spawning escapement. The 2002 escapement of Deschutes fall chinook was at least 3 times the management goal, based on either the expansion of escapements above Sherars Falls, or the total river mark recapture estimate. It was also the second largest escapement, and the largest since the peak in 1997.



**Escapement Methodology:** The Nehalem River fall chinook stock is an escapement indicator stock for the Nehalem/Ecola gene conservation group (GCG). This GCG includes both summer and fall run populations from the Nehalem River, as well as a fall run from the Ecola River. This GCG is part of the NOC aggregate of stocks used in the CTC assessments. Each year multiple foot surveys are conducted on a weekly basis at numerous sites in the basin. There are six established standard survey sites ranging from 0.5 to 1.0 mile in length each that are surveyed every year. Additionally, numerous randomly selected sites are also surveyed each year. Counts of live and dead chinook are made for each survey section. The measurement unit used to index escapement is the maximum (peak) count obtained during the season. Peak counts from all survey sites are summed and divided by the sum of the miles in the survey sections to derive a density index (fish/mile). The density in standard survey sites is considered biased and is adjusted by results from the random surveys. The total number of adult spawners is estimated by multiplying the density index by the total mileage of chinook spawning habitat and an observation efficiency factor. The total mileage of spawning habitat in the Nehalem River is 120.8 miles and the observation efficiency factor is 0.5. Data used to provide the estimated escapements shown above were made from spawning ground surveys that were not statistically designed and may therefore be biased. Because the MSY goal was derived from these data, the goal may be biased in the same direction. Research is currently underway to provide an unbiased estimate of the terminal run and spawning escapement, which will conform to the stock assessment criteria established by the USCTC (1997).

**Escapement Goal Basis:** The CTC has accepted a biologically based escapement goal of 6,989 adult spawners (90% CI: 5,789-9,405). This goal was derived from stock-recruitment analysis on brood years 1967-1991(CTC 1999).

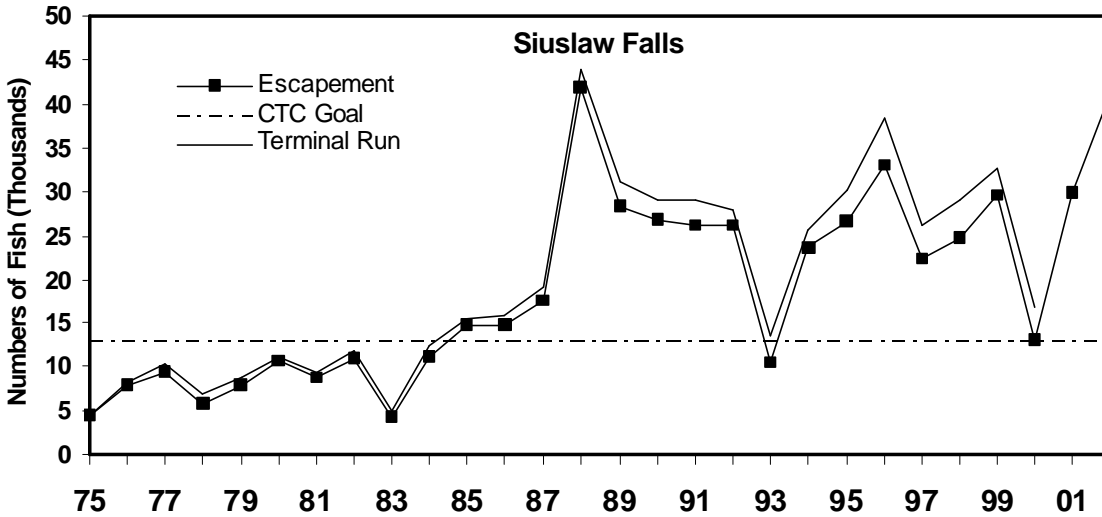
**Agency Comments:** Following a general trend for Oregon Coastal stocks, the Nehalem escapement in 2002 increased over the escapement in 2001. We estimated the spawner abundance as 18,089 large (adult) chinook, well in excess of the MSY escapement goal, and nearly double the 2001 estimate of 9,459. Punch card data used to estimate the recreational sport catch are unavailable for 2001 and 2002, hence terminal run sizes are not available for those years.



**Escapement Methodology:** The Siletz River fall chinook stock is an escapement indicator stock for the North-Mid Coast GCG, which includes 14 rivers ranging from the Tillamook Bay area down the coast to the Siuslaw River. This GCG is part of the NOC aggregate of stocks used in the CTC assessments. Within this group, both spring and fall run populations exist. The Siletz River has both a spring and fall run of chinook. Each year multiple foot surveys are conducted on a weekly basis at numerous sites in the basin. There are four established standard survey sites ranging from 0.9 to 1.6 miles each that are surveyed every year. Additionally, numerous randomly selected sites are also surveyed each year. Counts of live and dead chinook are made for each survey section. The measurement unit used to index escapement is the maximum (peak) count obtained during the season. Peak counts from all survey sites are summed and then divided by the sum of the miles in the survey sections to derive a density index (fish/mile). The density estimate in standard survey sites is considered biased and is adjusted by results from the random surveys. The total number of adult spawners is estimated by multiplying the density index by the total mileage of chinook spawning habitat and an observation efficiency factor. The total mileage of spawning habitat in the Siletz River is 98.5 miles and the observation efficiency factor is 0.5. Data used to provide the estimated escapements shown above were made from spawning ground surveys that were not statistically designed and may therefore be biased. Because the MSY goal was derived from these data, the goal may be biased in the same direction.

**Escapement Goal Basis:** The CTC has adopted a biologically based escapement goal of 2,944 adult spawners (90% CI: 2,527-3,481). This goal was derived from stock-recruitment analysis on brood years 1973-1991(CTC 1999).

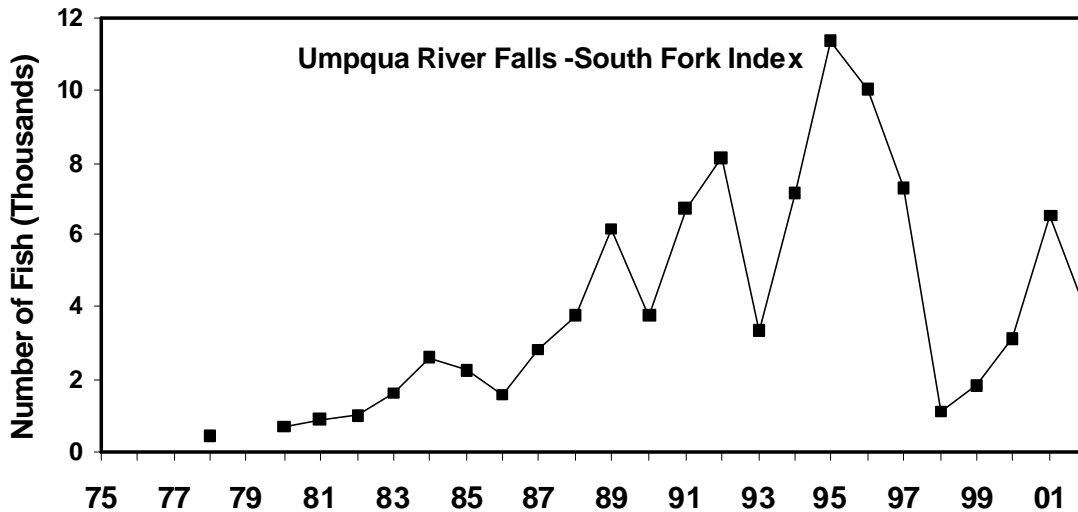
**Agency Comments:** Following the general trend for Oregon coastal fall chinook stocks, the Siletz River spawner abundance in 2002 continued its increase and is estimated at 14,054. This is a record high for this stock, as was the 2001 estimate. All four standard surveys were conducted in 2002. The concern raised in 2001 that the spawner abundance estimate was biased high because only three of the usual four standard sites were surveyed is reduced by the 2002 results that show a continued increasing trend. Punch card data to estimate the recreational sport catch are unavailable for 2001 and 2002, hence terminal run sizes are not available for those years.



**Escapement Methodology:** The Siuslaw River fall chinook stock is the southern most escapement indicator stock for the North-Mid Coast GCG. . This GCG is part of the NOC aggregate of stocks used in the CTC assessments. Only a fall run is endemic to this river. Each year multiple foot surveys are conducted on a weekly basis at numerous sites in the basin. There are eight established standard survey sites ranging from 0.5 to 1.2 miles in length that are surveyed every year. Additionally, numerous randomly selected sites are also chosen each year. Counts of live and dead chinook are made for each survey section. The measurement unit used to index escapement is the maximum (peak) count obtained during the season. Peak counts from all survey sites are summed and divided by the sum of the miles in the survey sections to derive a density index (fish/mile). The density in standard survey sites is considered biased and is adjusted by results from the random surveys. The total number of adult spawners is estimated by multiplying the density index by the total mileage of chinook spawning habitat and an observation efficiency factor. The total mileage of spawning habitat in the Siuslaw River is 237.9 miles and the observation efficiency factor is 0.5. Data used to provide the estimated escapements shown above were made from spawning ground surveys that were not statistically designed and may therefore be biased. Because the MSY goal was derived from these data, the goal is thought to be biased in the same direction.

**Escapement Goal Basis:** The CTC has accepted a biologically based escapement goal of 12,925 adult spawners (90% CI: 9,541-20,958). This goal was derived from stock-recruitment analysis on brood years 1967-1991(CTC 1999).

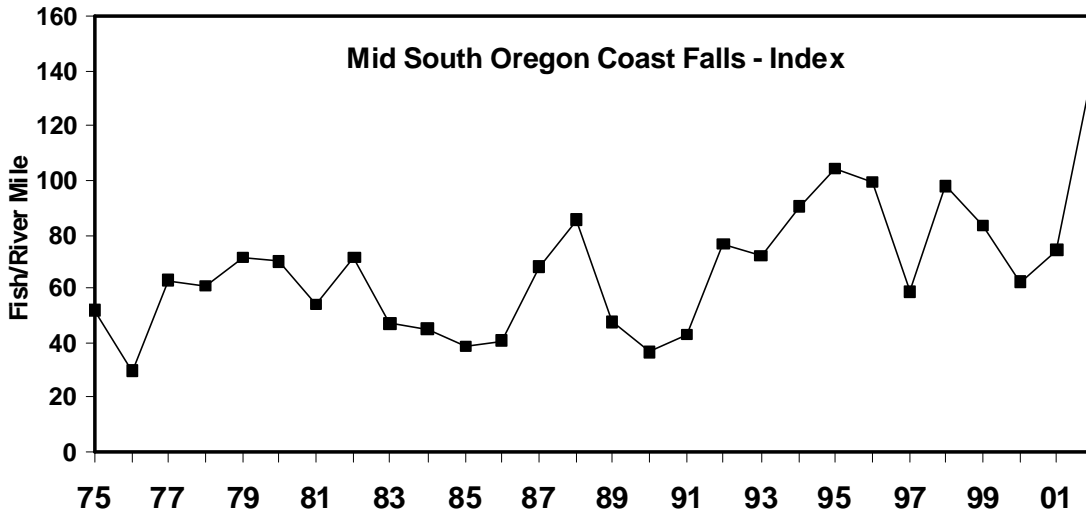
**Agency Comments:** Following the general trend in 2002 for other coastal fall chinook stocks, the escapement in the Siuslaw was very large. The estimated spawner abundance was 41,058 adult chinook, and is well above that needed to achieve MSY. Punch card data to estimate the recreational sport catch are unavailable for 2001 and 2002, hence terminal run sizes are not available for those years.



**Escapement Methodology:** The Umpqua River system is an extensive and diverse watershed that includes both coastal Douglas fir rainforest as well as an interior valley, oak savanna, environment. There are at least five distinct chinook populations in this watershed with both spring (river) and fall (ocean) run types that together comprise the Umpqua GCG. The Smith River fall population returns to a lower river tributary located in a moist coastal rainforest environment. The remaining four interior populations are located in a much dryer oak savanna environment. The South Umpqua tributary population is currently the only group with sufficient data available to evaluate stock status for the fall run populations from this GCG. This GCG is part of the MOC aggregate of stocks. Two aerial flights are made each fall (October– November) when viewing conditions are acceptable. Redds are counted on the South Fork and Cow Creek tributaries. The annual index is the cumulative total number of fresh redds counted during these aerial flights. The annual index is then expanded by 3.45 fish per redd to derive the estimated spawning escapement for this tributary of the Umpqua River.

**Escapement Goal Basis:** No escapement goals have been proposed for this stock.

**Agency Comments:** The spring run populations are generally not intercepted in PSC fisheries and are currently not proposed for CTC analysis. Coded-wire tagged fall run chinook from the Umpqua River are harvested in PSC fisheries, and should be evaluated by the CTC. Four years of USCTC funded research has allowed the calibration of the redd counts to derive a fish per redd expansion factor so that annual escapements estimates can be made. The average expansion factor from these studies is 3.45 fish per redd. The coefficient of variation of the expansion factor was found to be 14%, which shows that the average expansion factor is a reliable statistic to use for annual estimates of escapement. Aerial survey counts have been funded by Douglas County (OR); the County was unable to fund the aerial surveys in 2002.



**Escapement Methodology:** This composite index represents populations classified as the Mid-South Coast GCG. This GCG is part of the MOC aggregate of stocks. The index is composed of spawning survey data from four rivers, the Coos, Coquille and Sixes Rivers and Floras Creek. To date there is no escapement indicator stock designated for this GCG. Foot or boat surveys are made weekly at several standard sites in each of these river basins throughout the survey period. Survey sites are generally 0.5 to 1.5 miles long and are chosen to be at least 10 miles distant from where hatchery smolts were released. Counts of live and dead chinook are made for each survey section. The measurement unit used is the maximum (peak) count obtained during the season. For each river, all peak counts are summed and divided by the sum of the survey miles for that river to derive a peak spawner density index for the river. The composite stock index is a simple unweighted average of the four river density indices.

**Escapement Goal Basis:** No goals have been proposed for populations within this GCG at this time.

**Agency Comments:** Research funded by the CTC is underway that will provide information to designate the Coquille chinook production river system as the escapement indicator stock for this stock aggregate. This field research began in 2001 and will continue at least through 2003, and will provide precise estimates of spawner escapement and increased spawning ground survey coverage. ODFW will complete a biologically based escapement goal analysis and submit the analysis to the CTC in 2004.



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## **APPENDICES**

Appendix A.1. Southeast Alaska (SEAK) chinook catches, 1975-2002.

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	32,720	72,081	251,020	52,200	4,453	194,367
2000	158,717	41,400	63,173	263,290	76,800	2,481	186,009
2001	153,280	38,904	72,291	264,475	77,600	1,528	185,347
2002	325,303	31,689	87,057	444,049	72,645	1,124	370,280

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.

“-“ = not applicable.

Appendix A.2. North British Columbia (NBC) chinook catches, 1975-2002.

Year	North British Columbia						
	Troll <sup>1</sup>	Net	Tidal Sport		Freshwater Sport	First Nations	Total
			Areas 1,2E, 2W	Areas 3-5			
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
2002	96,475	12,349	41,300	8,000	NA	14,837	172,961

<sup>1</sup> 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

Appendix A.3. Central British Columbia (CBC) chinook catches, 1975-2002.

Year	Central British Columbia					
	Troll <sup>1</sup>	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 <sup>2</sup>	3,600	20,311
2000	0	4,500	7,400	NA <sup>2</sup>	4,200	16,100
2001	0	4,388	7,650	1,024	4,202	16,325
2002	481	4,827	7,330	723	3,292	16,653

<sup>1</sup> 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.

<sup>2</sup> freshwater catch included with tidal catch

NA=not available

Appendix A.4. West Coast Vancouver Island (WCVI) chinook catches, 1975-2002.

Year	West Coast Vancouver Island						
	Troll <sup>1</sup>	Net	Tidal Sport Inside <sup>2</sup>	Tidal Sport 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
2002	132,921	456	36,140	32,115	77	10,893	212,602

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

Net: Areas 21, and 23-27

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

<sup>1</sup> 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.

<sup>2</sup> 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; "--" = not applicable.



Appendix A.5. Strait of Georgia/Fraser chinook catches, 1975-2002.

Year	Strait of Georgia/Fraser					
	Troll <sup>1</sup>	Net	Tidal Sport	Freshwater Sport <sup>2</sup>	First Nations <sup>3</sup>	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
2002	506	8,980	52,979	20,495	27,774	110,734

Troll: Areas 13-18 and 29

Net: Areas 14-19, 28 and 29

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

<sup>1</sup> 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.

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

<sup>3</sup> No catch records are available for non-Fraser catch prior to 1990.

NA=not available

Appendix A.6. Johnstone Strait chinook catches, 1975-2002.

Year	Johnstone Strait					
	Troll <sup>1</sup> 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 <sup>2</sup>	200	3,759	NA	370	4,329
2002	100	600	2,331	NA	400	3,431

Troll: Area 12

Net: Areas 11-13

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

<sup>1</sup> 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.

<sup>2</sup> Preliminary estimate

NA=not available

Appendix A.7. Canada - Strait of Juan de Fuca chinook catches, 1975-2002.

Year	Canada - Strait of Juan de Fuca				
	Net	Tidal Sport	Freshwater Sport <sup>1</sup>	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
2002	0	24,084	NA	NA	24,084

Net: Area 20

Sport: Areas 19b and 20

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

NA=not available

Appendix A.8. Washington - Strait of Juan de Fuca chinook catches, 1975-2002.

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	4,819	7,724
2002	1,783	1,076	2,028	4,887

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

Appendix A.9. Washington - San Juan chinook catches, 1975-2002.

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	6,522	7,492
2002	0	2,231	NA	NA

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

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

Sport: Area 7

NA=not available

Appendix A.10. Washington - Other Puget Sound chinook catches, 1975-2002.

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	40,170	136,852
2002	100,001	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

Appendix A.11. Washington - Inside Coastal chinook catches, 1975-2002.

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	11,400	3,165	13,582
2000	15,600	4,482	20,141
2001	20,000	8,645	28,029
2002	20,132	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

Appendix A.12. Columbia River chinook catches, 1975-2002.

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 <sup>1</sup>	49,800	19,500	35,800	105,100
1999 <sup>1</sup>	85,400	35,600	40,400	161,400
2000 <sup>1</sup>	75,500	19,700	55,100	150,300
2001 <sup>1</sup>	195,600	55,400	137,500	388,500
2002 <sup>1</sup>	233,800	44,800	138,300	416,900

<sup>1</sup> Catches after 1998 include both adults and jacks caught in the Columbia River. Prior to that the catch only includes adults.



Appendix A.13. Washington/Oregon North of Cape Falcon chinook catches, 1975-2002.

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
2002	120,700	0	60,600	181,300

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)

Appendix A.14. Oregon chinook catches, 1975-2002.

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	1,233	30,735	31,968
2000	1,860	33,262	35,122
2001	1,184	NA	NA
2002	1,633	NA	NA

Troll: Late season off Elk River mouth.

Sport: Estuary and inland.

NA = not available.

Appendix B.1. Southeast Alaska and Transboundary river escapements and terminal runs of PSC Chinook Technical Committee wild chinook escapement indicator stocks, 1975-2002.

Year	Southeast Alaska					
	Situk esc.	t. run	King Salmon esc.	Andrew esc.	Blossom Index esc.	Keta Index esc.
1975			62	520	146	203
1976	1,421	3,184	96	404	68	84
1977	1,732	2,981	199	456	112	230
1978	808	1,745	84	388	143	392
1979	1,284	3,089	113	327	54	426
1980	905	2,504	104	282	89	192
1981	702	1,868	139	536	159	329
1982	434	949	354	672	345	754
1983	592	1,290	245	366	589	822
1984	1,726	2,725	265	389	508	610
1985	1,521	2,916	175	640	709	624
1986	2,067	2,873	255	1,416	1,278	690
1987	1,379	2,874	196	1,576	1,349	768
1988	868	1,599	208	1,128	384	575
1989	637	1,377	240	1,060	344	1,155
1990	628	1,643	179	1,328	257	606
1991	889	2,089	134	800	239	272
1992	1,595	3,801	99	1,556	150	217
1993	952	2,539	259	2,120	303	362
1994	1,271	6,072	207	1,144	161	306
1995	4,330	14,966	144	686	217	175
1996	1,800	8,090	284	670	220	297
1997	1,878	6,592	357	586	132	246
1998	924	5,340	132	974	91	180
1999	1,461	7,159	300	1,210	212	276
2000	1,785	4,941	137	1,380	231	300
2001	656	2,318	147	2,108	204	343
2002	1,014	NE	153	1,752	224	411
Goal LL <sup>a</sup>	500		120	650	250	250
Goal UL <sup>a</sup>	1,000		240	1,500	500	500

(continued)

Year	Transboundary Rivers					
	Alesek (Klukshu) Index esc.	Taku esc.	Stikine esc.	Unuk Index esc.	Chickamin Index esc.	Chilkat esc.
1975		12,920	7,571		370	
1976	1,064	24,582	5,723		157	
1977	2,698	29,496	11,445	974	363	
1978	2,530	17,124	6,835	1,106	308	
1979	3,104	21,617	12,610	576	239	
1980	2,487	39,239	30,573	1,016	445	
1981	1,963	49,559	36,057	731	384	
1982	1,969	23,847	40,488	1,351	571	
1983	2,237	9,795	6,424	1,125	599	
1984	1,572	20,778	13,995	1,837	1,102	
1985	1,283	35,916	16,037	1,184	956	
1986	2,607	38,110	14,889	2,126	1,745	
1987	2,491	28,935	24,632	1,973	975	
1988	1,994	44,524	37,554	1,746	786	
1989	2,202	40,329	24,282	1,149	934	
1990	1,698	52,143	22,619	591	564	
1991	2,223	51,645	23,206	655	487	5,897
1992	1,243	55,889	34,129	874	346	5,284
1993	3,221	66,125	58,962	1,068	389	4,472
1994	3,620	48,368	33,094	711	388	6,795
1995	5,397	33,805	16,784	722	356	3,790
1996	3,382	79,019	23,886	1,167	422	4,920
1997	2,829	114,938	28,185	636	272	8,100
1998	1,347	31,039	25,968	840	391	3,675
1999	2,166	19,734	19,947	680	492	2,271
2000	1,319	30,529	27,531	1,341	801	2,035
2001	1,738	49,509	63,523	2,019	1,010	4,517
2002	2,282	48,848	50,875	897	1,013	4,050
Goal LL <sup>a</sup>	1,100	30,000	14,000	650	450	
Goal UL <sup>a</sup>	2,300	55,000	28,000	1,400	900	

<sup>a</sup> Goal LL is the lower end of the agreed escapement goal range and Goal UL is the upper end of the agreed escapement goal range.

Appendix B.2. Canadian escapements and terminal runs of PSC Chinook Technical Committee wild chinook escapement indicator stocks, 1975-2002.

Year	Northern B.C.							
	Area 1 Yakoun esc.	Area 3 <sup>1</sup> Nass esc.		Area 4 Skeena esc.		Area 8 Dean Index	Area 9 Rivers Inlet	Area 10 Smith Inlet
			t. run		t. run			
1975	1,500	14,895	17,874	20,319			3,280	960
1976	700	13,819	16,583	13,078			1,640	1,000
1977	800	15,076	18,091	29,018	39,606		2,225	1,050
1978	600	15,076	18,091	22,661	35,055	3,500	2,800	2,100
1979	400	12,234	14,681	18,488	28,166	4,000	2,150	500
1980	600	16,135	19,362	23,429	38,626	2,000	2,325	1,200
1981	750	12,220	14,664	24,523	42,018	3,500	3,175	1,020
1982	1,400	7,593	9,112	17,092	35,185		2,250	1,500
1983	600	12,576	15,091	23,562	39,510	500	3,320	1,050
1984	300	19,694	23,633	37,598	53,516	4,500	1,400	770
1985	1,500	16,425	19,710	53,599	76,544	4,000	3,371	230
1986	500	34,642	41,570	59,968	87,566	3,300	7,623	532
1987	2,000	18,231	21,877	59,120	76,349	1,144	5,239	1,050
1988	2,000	14,284	17,141	68,705	102,563	1,300	4,429	1,050
1989	2,800	26,456	31,747	57,202	83,439	2,300	3,265	225
1990	2,000	23,999	28,798	55,976	89,447	2,000	4,039	510
1991	1,900	7,013	10,790	52,753	79,343	2,400	6,635	500
1992	2,000	16,837	26,015	63,392	92,184	3,000	7,500	500
1993	1,000	23,676	37,178	66,977	96,018	700	10,000	500
1994	2,000	21,169	27,382	48,712	68,127	1,300	3,500	700
1995	1,500	7,844	14,560	34,390	48,351	1,100	3,196	400
1996	3,000	21,899	29,599	73,684	96,453	2,000	3,000	250
1997	2,500	18,700	24,875	42,539	65,350	1,400	4,980	100
1998	3,000	25,304	32,548	46,744	65,167	3,000	5,367	1,100
1999	3,200	11,538	20,603	43,775	70,993	1,800	2,739	500
2000	3,600	20,406	30,133	51,720	77,320	1,200	6,700	500
2001	3,500	34,315	46,911	81,504	108,640	3,795	5,062	300
2002	3,000	17,477	23,624	47,748	62,980	3,731	5,031	- <sup>2</sup>

<sup>1</sup> Escapement and terminal run sizes are currently under review.

<sup>2</sup> The Docee River was dropped as an escapement indicator due to an inability to obtain reliable escapement estimates.

(continued)

Appendix B.2. (Page 2 of 2).

Year	Southern B.C.			Fraser River							
	W. Coast Vancouver Island esc.	Lower Georgia Strait esc.	t. run	Upper Georgia Strait esc.	Fraser Spring Age 1.2 esc.	Fraser Spring Age 1.3 esc.	Fraser Summer Age 0.3 esc.	Fraser Summer Age 1.3 esc.	Fraser Spr/sum t. run	Harrison esc.	t. run
1975	800	5,475	6,390		7,179	8,184	26,875	16,875	119,081		
1976	1,075	4,340	5,390		4,600	10,307	4,925	13,630	98,691		
1977	1,835	6,530	7,590	3,880	3,675	13,261	19,600	17,240	132,553		
1978	2,750	6,495	7,035	6,150	4,305	15,725	16,700	19,200	109,119		
1979	2,048	10,686	11,209	4,127	2,770	14,985	18,275	10,205	101,252		
1980	5,974	8,819	10,519	1,367	6,255	16,521	8,350	13,625	71,504		
1981	5,050	6,007	7,607	1,945	2,975	12,274	13,120	12,202	62,668		
1982	6,812	6,186	6,657	3,260	5,510	15,010	6,850	15,088	85,140		
1983	2,700	6,582	6,862	3,770	2,641	24,225	9,500	16,604	72,526		
1984	3,862	8,456	8,861	4,600	6,380	30,370	15,522	13,595	95,681	120,837	131,740
1985	3,700	4,589	5,242	4,600	9,477	43,168	20,375	19,099	121,941	174,778	181,367
1986	2,760	3,105	3,776	1,630	10,275	48,446	22,460	32,505	144,617	162,596	177,662
1987	2,570	3,276	3,781	6,450	5,049	48,271	22,404	27,646	128,699	79,038	81,799
1988	4,560	7,957	8,638	3,300	4,003	41,783	29,567	32,066	129,587	35,116	38,285
1989	6,220	7,087	8,142	5,550	6,126	31,994	24,200	16,200	106,843	74,685	76,294
1990	3,660	7,023	7,627	2,320	3,225	41,560	25,425	33,747	135,124	177,375	180,837
1991	5,060	8,343	8,613	3,340	3,495	27,296	26,250	28,097	116,555	90,638	93,363
1992	4,830	11,377	11,637	5,268	5,937	33,038	32,200	38,011	130,249	130,411	132,042
1993	4,530	8,418	8,713	1,574	7,870	32,796	13,300	21,385	110,237	118,998	120,600
1994	4,080	7,463	7,808	1,237	10,696	51,655	25,350	23,657	145,303	98,334	100,839
1995	3,710	18,732	19,265	4,227	9,670	45,237	20,550	26,371	134,478	28,616	29,840
1996	6,026	16,465	17,275	3,600	20,726	38,398	50,900	43,142	185,559	37,394	38,568
1997	7,197	11,742	11,933	5,266	9,878	44,373	49,250	40,882	202,795	70,514	72,061
1998	11,643	8,246	9,319	10,350	3,003	37,862	68,033	36,750	169,333	188,425	189,103
1999	10,186	8,481	9,181	9,500	8,751	20,740	53,204	25,138	140,939	107,016	107,884
2000	4,675	7,933	8,500	12,850	11,731	26,773	45,161	25,869	155,209	77,035	78,098
2001	2,737	5,315	8,280	9,885	10,607	31,512	74,132	33,980	177,008	73,134	74,419
2002	4,036	3,840	6,022	12,865	16,423	42,408	85,132	34,886	219,958	89,968	91,122

Appendix B.3. Puget Sound escapements and terminal runs of PSC Chinook Technical Committee wild chinook escapement indicator stocks, 1975-2002.

Year	Puget Sound													
	Skagit Spring		Skagit Sum/fall		Stillaguamish		Snohomish		Green		Nooksak Spring esc.		Lake Washington Fall	
	esc.	t. run	esc.	t. run	esc.	t. run	esc.	t. run	esc.	t. run	N. Fork	S. Fork	esc.	t. run
1975	803	803	11,320	24,625	1,198	1,635	4,485	6,123	3,394	6,238			656	881
1976	812	812	14,120	23,306	2,140	4,002	5,315	9,889	3,140	7,732			719	759
1977	1,049	1,049	8,917	17,693	1,475	2,549	5,565	9,618	3,804	5,366			675	728
1978	1,220	1,220	13,075	20,030	1,232	1,959	7,931	12,591	3,304	4,349			890	1,202
1979	968	968	13,106	21,243	1,042	2,366	5,903	12,706	9,704	10,730			1,289	1,430
1980	1,803	1,803	20,058	28,938	821	2,647	6,460	16,688	7,743	10,608			1,360	1,431
1981	1,250	1,250	8,283	19,675	630	2,783	3,368	8,968	3,606	4,912			721	792
1982	965	965	10,210	21,022	773	3,058	4,379	8,470	1,840	3,850			885	1,148
1983	710	710	8,723	14,671	387	925	4,549	10,386	3,679	13,290			1,332	2,124
1984	747	747	12,628	15,005	374	883	3,762	8,480	3,353	5,381	45	188	1,252	3,436
1985	3,249	3,249	16,002	25,075	1,409	2,641	4,873	9,005	2,908	7,444	258	445	949	2,305
1986	1,978	1,978	17,908	21,585	1,277	2,416	4,534	8,267	4,792	5,784	226	257	1,470	2,419
1987	1,979	1,979	9,409	13,037	1,321	1,906	4,689	6,670	10,338	11,724	181	266	2,038	4,124
1988	2,064	2,064	11,468	14,647	717	1,176	4,513	7,389	7,994	9,207	456	263	792	2,373
1989	1,515	1,924	6,684	12,787	811	1,642	3,138	6,142	11,512	15,000	303	608	1,011	1,688
1990	1,592	1,627	16,792	19,172	842	1,739	4,209	8,345	7,035	15,200	10	152	787	1,128
1991	1,411	1,448	5,826	8,425	1,632	2,913	2,783	4,964	10,548	14,967	108	379	661	1,415
1992	1,001	1,025	7,348	9,201	780	1,247	2,708	4,319	5,267	9,941	498	122	790	1,349
1993	788	818	5,801	6,879	928	1,299	3,866	5,602	2,476	5,202	449	244	245	304
1994	470	1,027	5,549	6,479	954	1,285	3,626	4,885	4,078	7,963	45	118	888	891
1995	855	2,079	7,077	9,301	822	920	3,176	5,000	7,939	9,743	230	290	930	944
1996	1,051	1,728	10,613	12,193	1,384	1,384	4,851	7,921	6,026	8,668	535	203	303	308
1997	1,041	1,064	4,872	6,055	1,156	1,167	4,295	4,337	9,967	10,264	617	180	227	229
1998	1,086	1,091	14,609	14,885	1,540	1,558	6,304	6,344	7,312	8,824	370	157	432	432
1999	471	476	4,924	5,171	1,098	1,101	4,799	4,817	11,025	12,447	892	164	241	241
2000	1,021	1,025	16,930	17,112	1,622	1,622	6,092	8,400	6,170	11,866	1,242	283	476	476
2001	1,856	1,866	13,793	14,006	1,349	1,388	8,164	8,395	7,975	11,167	2,185	268	1,269	1,516
2002	1,065	1,081	19,591	19,807	1,588	1,593	7,220	7,245	13,950	15,553	3,687	282	637	647

Appendix B.4. Washington Coast escapements and terminal runs of PSC Chinook Technical Committee wild chinook escapement indicator stocks, 1975-2002.

Year	Washington Coast																	
	Quillayute Summer		Quillayute fall		Hoh spr/sum		Hoh Fall		Hoko Fall		Queets spr/sum		Queets fall		Grays Harbor spring		Grays Harbor fall	
	esc.	t. run	esc.	t. run	esc.	t. run	esc.	t. run	esc.	t. run	esc.	t. run	esc.	t. run	esc.	t. run	esc.	t. run
1975																		
1976	1,300	1,700	2,500	4,700	600	1,300	2,500	3,100			505	737	1,200	2,500	600	1,000	1,836	7,847
1977	3,800	5,300	3,300	7,600	1,000	2,000	2,100	3,800			732	1,155	3,600	5,500	800	1,700	5,195	13,477
1978	2,300	2,700	4,700	6,200	1,400	2,472	1,900	2,900			1,110	1,406	2,200	3,100	1,000	1,600	4,555	10,907
1979	2,100	3,900	3,900	6,600	1,400	2,326	1,700	2,200			870	1,369	3,900	4,700	400	1,100	9,581	12,258
1980	964	1,500	6,700	7,600	800	1,079	2,200	2,800			1,038	1,213	3,200	5,800	200	600	11,656	22,002
1981	815	1,700	5,963	7,102	1,498	2,005	3,100	4,000			988	1,329	4,300	8,000	600	900	7,577	13,182
1982	1,126	2,700	7,107	9,651	1,553	2,125	4,500	5,800			781	1,244	4,100	6,200	610	669	5,606	13,084
1983	548	1,800	3,069	5,530	1,696	2,233	2,500	3,300			1,044	1,173	2,600	3,800	800	850	5,482	9,852
1984	618	1,000	9,128	10,447	1,430	2,005	1,900	2,600			958	1,189	3,900	5,300	1,128	1,130	21,058	23,466
1985	550	700	6,145	8,367	978	1,353	1,725	2,720			677	886	3,702	5,153	1,157	1,159	9,537	16,852
1986	853	1,000	10,006	13,380	1,248	1,912	4,981	6,000	801	839	925	1,193	7,805	8,890	1,795	1,826	13,988	22,677
1987	666	1,600	12,352	20,349	1,710	2,480	4,006	6,147	581	606	598	1,543	6,504	10,045	841	1,071	19,175	32,553
1988	2,599	3,943	15,168	22,115	2,605	3,708	4,128	6,873	784	821	1,765	2,267	8,390	11,000	3,106	3,208	27,216	39,346
1989	2,407	3,472	9,951	17,260	4,697	6,820	5,148	8,682	845	862	2,568	3,954	8,689	11,154	2,068	2,393	25,599	54,354
1990	1,483	1,840	13,711	16,914	3,886	5,294	4,236	6,327	493	498	1,780	2,480	10,103	12,297	1,567	1,630	16,581	39,869
1991	1,188	1,500	6,292	7,631	1,078	1,693	1,420	2,611	1,008	1,024	630	761	4,486	5,888	1,289	1,489	13,432	32,038
1992	1,009	1,271	6,342	7,750	1,018	1,443	4,003	5,136	741	750	375	505	4,695	6,338	1,813	1,851	13,175	33,124
1993	1,292	1,531	5,254	5,735	1,411	2,065	2,280	3,766	894	908	713	788	3,383	5,107	1,254	1,352	11,824	33,291
1994	974	1,187	4,932	5,692	1,699	2,372	3,967	4,806	429	440	705	727	3,805	5,866	1,403	1,479	11,817	30,239
1995	1,333	1,731	5,532	6,716	1,132	1,686	2,202	2,898	929	949	625	662	2,876	4,355	2,070	2,156	9,952	31,653
1996	1,170	1,388	7,316	9,293	1,371	2,083	3,022	4,020	1,256	1,258	776	891	3,441	4,693	4,462	4,642	16,988	36,733
1997	890	1,177	5,405	6,047	1,826	2,582	1,773	3,029	868	888	540	693	2,477	4,122	4,460	4,812	16,342	31,290
1998	1,599	1,829	6,752	7,940	1,287	1,880	4,257	5,369	1,702	1,702	492	537	3,951	5,009	2,283	2,586	11,476	21,648
1999	713	818	3,334	4,758	928	1,081	1,924	2,941	1,550	1,550	373	426	1,933	2,885	1,285	1,561	9,196	16,053
2000	989	1,149	3,730	4,794	492	529	1,749	2,510	730	730	248	250	3,572	3,752	2,867	3,140	9,260	16,050
2001	1,225	1,372	5,136	7,559	1,159	1,231	2,560	4,113	838	838	548	565	2,871	3,918	2,860	3,200	9,483	
2002	1,002	1,064	6,057	9,331	2,400	3,511	4,500	6,431			738	755	2,288		2,600		11,300	



Appendix B.5. Columbia River escapements and terminal runs of PSC Chinook Technical Committee wild chinook escapement indicator stocks, 1975-2002.

Year	Columbia Upriver Spring		Columbia Upriver Summers <sup>1</sup>						Columbia Upriver Fall Chinook						
	esc.	t.run	Mid-Columbia		Snake River		Total		Lewis River <sup>2</sup>		Deschutes River <sup>3</sup>			Brights <sup>4</sup>	
			esc.	t.run	esc.	t.run	esc.	t.run	esc.	t.run	esc.	esc.	t.run	esc.	t.run
1975									13,859	13,859	Mark	Above Falls		29,600	164,367
1976									3,371	3,371	Recapture	Expanded		27,700	109,590
1977									6,930	6,930			7,484	35,600	85,755
1978									5,363	5,363			5,049	7,020	25,800
1979	24,340	25,443	21,630	22,664	2,714	2,164	24,344	24,828	8,023	8,023			4,091	5,683	28,700
1980	19,458	20,163	19,609	20,531	2,688	3,426	22,297	23,957	16,394	16,856			3,159	5,110	27,700
1981	20,520	21,694	13,984	14,904	3,306	5,235	17,290	20,140	19,297	20,298			4,085	5,922	18,114
1982	22,024	23,831	11,741	12,694	4,210	6,583	15,951	19,277	8,370	10,126			7,406	9,422	27,226
1983	16,121	16,900	10,372	10,654	3,895	6,144	14,267	16,799	13,540	14,489			4,681	6,177	42,681
1984	16,153	17,450	14,669	15,003	5,429	6,005	20,098	21,008	7,132	8,128			4,404	5,374	45,452
1985	24,327	25,272	15,852	16,885	5,062	4,949	20,914	21,834	7,491	8,241			3,785	4,592	72,758
1986	36,635	39,096	14,770	15,557	6,154	7,976	20,924	23,533	11,983	13,504			5,355	6,508	90,961
1987	34,790	37,318	19,824	21,078	5,891	10,615	25,715	31,694	12,935	14,173			6,776	8,833	121,171
1988	30,171	32,701	17,131	18,090	6,145	11,175	23,276	29,265	12,059	13,636			5,982	8,373	97,781
1989	18,915	20,622	21,674	21,781	3,169	4,307	24,843	26,088	21,199	22,813			4,777	6,507	83,100
1990	14,718	15,887	16,726	16,827	5,093	6,643	21,819	23,471	17,506	18,784			2,224	3,194	48,891
1991	7,757	8,319	12,212	12,342	3,809	4,559	16,021	16,901	9,066	10,354			3,678	3,832	39,625
1992	18,871	20,183	9,497	9,588	3,014	4,833	12,511	14,421	6,307	7,129			2,777	2,814	38,879
1993	19,090	20,428	13,543	13,887	7,889	6,797	21,432	20,684	7,025	8,106			8,235	8,246	41,853
1994	7,606	8,055	13,925	14,155	795	1,073	14,720	15,227	9,939	10,541			5,455	5,524	66,470
1995	1,668	1,775	10,909	11,247	692	1,004	11,601	12,251	9,718	12,155			7,581	7,617	53,470
1996	10,569	11,175	9,929	10,289	2,607	3,697	12,536	13,986	13,971	13,971			8,759	8,837	51,973
1997	25,054	27,015	12,927	13,092	10,709	11,535	23,636	24,627	8,670	8,670			20,678	20,811	49,074
1998	14,724	15,615	12,495	12,735	4,355	6,230	16,850	18,965	5,929	5,929			10,923	11,428	40,012
1999	8,270	8,712	19,588	19,963	3,260	4,125	22,848	24,088	3,184	3,184			3,997	4,370	44,867
2000	32,162	34,329	22,353	22,585	3,933	5,314	26,286	27,898	9,820	9,820			3,230	3,637	62,675
2001	30,354	38,468	48,317	49,074	13,735	18,137	62,052	67,211	13,900	14,900			11,057	11,161	11,391
2002	27,455	31,313	96,520	99,527	22,159	27,923	118,679	127,449	16,380	18,230			15,711	12,246	16,681
Goal			17,857						5,700						40,000

<sup>1</sup> Columbia Upriver Summers are a single escapement indicator stock with an agency management goal of 85,000. Mid-Columbia summers and Snake River summers exhibit different life history types. Only the Mid-Columbia component is included in the Columbia River Summer model stock. Based on a S-R analysis of model data, the interim goal for Mid-Columbia Summers is 17,857 until better data can be compiled.

<sup>2</sup> This is the number of naturally spawning adult fish in the Lewis River. The terminal run given is the escapement plus the Lewis River sport catch of wild adults.

<sup>3</sup> The first column gives the estimate based on a mark-recapture project for the entire river. The second column is the estimate based on using the ratio of redds above and below Sherar's Falls. The agencies' management goal is 4000 spawners.

<sup>4</sup> The CRFMP stated an interim escapement goal of 40,000 natural spawning URBs at McNary Dam, including 38,700 for Hanford Reach and 1,100 Snake River. In 1990, the escapement goal was increased to 45,000 for increased hatchery programs. In 1994, a management goal of 46,000 was established, and in 1995, the management goal was retained while the escapement goal was reduced to 43,500. In 2002, the CRFMP escapement goal of 40,000 was agreed to by the CTC. Escapement numbers given are McNary adult dam count minus adult sport and broodstock above the dam. The terminal run is the Columbia River mouth terminal run of Upriver Brights minus the Deschutes River fall chinook terminal run.

Appendix B.6. Oregon Coastal escapements and terminal runs of PSC Chinook Technical Committee wild chinook escapement indicator stocks, 1975-2002.

Year	Oregon							
	Nehalem		Siletz		Siuslaw		Umpqua River Redd Count Index	Mid-Oregon Coast Density Index
	esc.	t. run	esc.	t. run	esc.	t. run		
1975	5,197	5,303	2,062	2,689	4,427	4,548	na	52
1976	9,807	9,908	1,326	2,036	7,999	8,153	na	30
1977	11,478	12,093	3,314	3,919	9,492	10,362	na	63
1978	12,059	12,960	2,062	3,703	5,872	6,879	400	61
1979	12,205	12,841	7,217	8,907	8,040	8,799	na	71
1980	5,555	6,379	3,680	4,823	10,630	11,183	697	70
1981	10,752	11,272	4,435	6,755	8,724	9,342	890	54
1982	5,085	5,675	3,415	4,514	10,870	11,774	1,011	71
1983	4,431	4,892	2,136	3,152	4,186	4,885	1,628	47
1984	20,341	21,623	3,461	4,571	11,168	12,437	2,594	45
1985	18,670	19,432	6,628	7,531	14,822	15,553	2,246	39
1986	10,389	11,873	6,748	7,639	14,844	15,775	1,573	41
1987	13,560	15,654	4,577	5,906	17,603	19,031	2,795	68
1988	14,889	17,138	7,805	8,992	41,746	43,975	3,778	85
1989	10,389	11,903	4,401	5,644	28,279	31,065	6,162	48
1990	5,104	6,726	4,313	5,148	26,799	28,893	3,761	37
1991	5,557	7,649	5,633	6,597	26,100	29,011	6,717	43
1992	9,060	11,780	6,044	7,217	26,090	27,958	8,149	76
1993	5,345	9,309	4,342	6,244	10,446	13,567	3,364	72
1994	6,486	9,400	10,475	11,990	23,570	25,584	7,128	90
1995	5,194	8,797	5,164	7,626	26,715	30,216	11,388	104
1996	9,211	13,241	7,394	9,917	33,051	38,485	10,019	99
1997	10,026	13,053	3,726	5,814	22,305	26,195	7,286	59
1998	8,245	11,134	5,516	7,247	24,708	28,907	1,104	98
1999	8,063	10,008	4,166	6,002	29,610	32,556	1,804	83
2000	5,257	7,491	4,982	7,626	12,999	16,830	3,140	62
2001	9,459		10,582		29,748		6,510	74
2002	18,089		14,054		41,058		3,831	145
Goal	6,989		2,944		12,925			