

**THE PACIFIC SALMON COMMISSION**

**CHINOOK TECHNICAL REPORT ON**

**PRELIMINARY 1990 CATCH AND ESCAPEMENT**

**REPORT TCCHINOOK (91) - 1**

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## 1.0 1990 CHINOOK SALMON CATCHES IN FISHERIES WITH CEILINGS

Estimates of 1990 catch for each fishery managed under a harvest ceiling established by the Treaty are presented below. These data are preliminary, but major changes are not expected.

(Compiled with information available as of February 2, 1991)  
(numbers x 1,000)

AREA AND FISHERY a/	CEILING	CATCH	DIFFERENCE	
			#'s	%
SE Alaska (T,N,S) b/	302	310.0	+ 8.0	+2.6%
Northern B.C. (T,N,S) c/	302	256.2	- 45.8	-15.2%
West Coast Vancouver I. (T)	360	295.6	- 64.4	-17.9%
Georgia Strait (T,S)	275	144.3	-130.7	-47.5%

a/ T=Troll; N=Net; S=Sport

b/ The actual total catch was 353,300 chinook, including a hatchery addon of 43,300.

c/ Includes 6,958 chinook caught in terminal areas in 1990, which Canada proposes to exclude from the ceiling. If excluded, the catch would be 249,200, a difference of 52,800 (17.5%).

Catches in all chinook fisheries of interest to the Pacific Salmon Commission are documented in Table 1.

## 2.0 CUMULATIVE DEVIATIONS FROM CATCH CEILINGS

A 7.5% cumulative management range was established by the Commission in 1987. Catches and deviations from catch ceilings since 1987 (in thousands of fish) are as follows:

AREA AND FISHERY	CEILING	1987	1988	1989	1990	TOTAL DEVIATIONS	CUMULATIVE DEVIATIONS	
		CATCH a/	CATCH a/	CATCH a/	CATCH a/		#'s	%
SE Alaska (T,N,S) b/	263 e/	266.1	253.7	264.3	310.0	+3.1	+3.1	+1.2%
North/Central B.C. (T,N,S)	263 e/	283.0	245.9	307.0 c/	256.2 c/	+1.1	+1.1	+0.4%
West Coast Vancouver I. (T)	360	379.0	407.2	203.5	295.6	-154.7 d/	-27.0	-7.5%
Georgia Strait (T,S)	275	159.0	138.7	162.0	144.3	-496.0 d/	-20.6	-7.5%

a/ Compiled with information available as of 2/5/91.

b/ S.E. Alaska catches exclude hatchery add-ons of 16,000, 25,000, 23,700, and 43,300 for 1987, 1988, 1989, and 1990 respectively.

c/ Includes 5,385 chinook caught in terminal areas in 1989, and 6,958 chinook caught in 1990, for a total of 12,344, which Canada proposes to exclude from the respective catches. This would result in a cumulative deviation of -11,244 (-4.3%).

d/ Negative deviations below the 7.5% management range can not be accumulated.

e/ The 1990 ceiling was 302,000.

### 3.0 REVIEW OF FISHERIES WITH CATCH CEILINGS

#### 3.1 S.E. Alaska Fisheries

In 1990, Southeast Alaska fisheries were managed under the following provisions established by the Pacific Salmon Commission:

- (1) an all-gear base catch ceiling of 263,000 plus 39,000 chinook salmon;
- (2) an Alaska hatchery addon to be calculated in-season on the basis of coded-wire-tag sampling; and
- (3) a 7.5% management range, calculated in numbers of fish, for cumulative deviations from the base catch ceiling beginning in 1987. This is equivalent to +/- 19,700 chinook for a 263,000 base catch ceiling.

Preliminary data for 1990 indicate the following:

- (1) The total all-gear catch (commercial and recreational) was 353,300 chinook salmon, including an all-gear base catch of 310,000 plus a hatchery addon of 43,300.
- (2) The 1990 Alaska hatchery addon, calculated on the basis of coded-wire-tag recoveries, was 43,300 chinook. This yielded a total 1990 catch ceiling of 345,300 chinook. The addon was calculated as the estimated total Alaska hatchery harvest of 52,900 chinook reduced by 5,000 for pre-Treaty hatchery harvest and 4,500 for estimation error risk adjustment.
- (3) The deviation of the 1990 Southeast Alaska chinook catch from the base ceiling was 8,000. Combined with a positive deviation of 3,100 in 1987, a negative deviation of -9,300 in 1988, and a positive deviation of 1,300 in 1989, the cumulative deviation for Southeast Alaska is 3,100 chinook or +1.2%.

The 1990 Southeast Alaska all-gear harvest of 353,300 chinook salmon consisted of a commercial harvest of 315,100 (89.2%) and a projected recreational harvest of 38,200 (10.8%). Alaska hatcheries contributed an estimated 52,900 chinook salmon or 15.0% of the total harvest.

Troll Fisheries: The troll fishery harvest of 287,400 chinook included 33,100 harvested in the winter fishery (October 1, 1989 to April 14, 1990), 7,200 in experimental and terminal hatchery fisheries (June 5-June 29), 34,800 in June special hatchery access fisheries (June 5-7 and June 21-23), and 212,300 during

the general summer season (July 1-July 22 and August 23 and 24). The 1990 winter troll catch was similar to the 1985 to 1989 average of 33,700. The 1990 general summer troll season opened July 1 and remained open for 22 days through July 22. Approximately 200,900 chinook were harvested during this period for an average catch rate of 9,100 chinook per fleet day. This was lower than the 1988 and 1989 summer season rates of 13,500 and 12,900 chinook per fleet day. The summer troll season opened for an additional 2 days on August 23 and 24. A total of 11,900 were harvested (6,000 per fleet day). About 6.6% of the chinook harvested during the summer troll season were produced by Alaska hatcheries, compared to 14.3% and 38.6% harvested during the winter troll season and the June openings, respectively.

Chinook non-retention regulations were implemented during the remainder of the summer troll season from July 23-August 12 and August 25-September 20. The troll fishery was closed to all fishing August 13-22 and September 21-30. As in past years, several outer coastal areas with high chinook abundance were closed to all trolling to reduce chinook salmon hook and release mortality. Troll harvest of other species during the summer season included 1.8 million coho, 0.8 million pink, 63,100 chum, and 9,200 sockeye salmon.

**Net Fisheries:** The 1990 commercial catch included 27,700 chinook harvested incidentally in net fisheries. Chinook represent less than 0.1% of the total net harvest of 35 million salmon. Net fisheries are managed for a guideline harvest level of 20,000 chinook (excluding Alaska hatchery harvest) established by the Alaska Board of Fisheries. The 1990 incidental net harvest was 14% above the 1989 harvest of 24,200, 29% above the 1988 catch of 21,500 and 74% above the 1987 catch of 15,900. Net harvest of chinook is limited for the purse seine fishery by a 28-inch minimum size limit and non-retention regulations. Net harvest for the gillnet fisheries is limited by early season closures and some night closures.

**Recreational Fisheries:** Recreational fisheries are managed under a two-chinook-per-day bag limit and a 28-inch minimum size limit. No recreational harvest guideline has been established by the Alaska Board of Fisheries. The projected 1990 harvest of 38,200 chinook is about 13,000 fish above the 1985 to 1989 average.

### 3.2 Canadian Fisheries

The minimum size limit for troll fisheries in all areas except the Strait of Georgia remained at 67 cm fork length. Catch statistics for commercial fisheries are based on sales slips accumulated through the week ending February 2, 1991. These data are clearly preliminary at this time.

### 3.2.1 North/Central B.C.

The preliminary total catch in North/Central troll, net, and sport fisheries is 256,200, which is 45,800 (15.2%) under the 302,000 1990 catch ceiling. The accumulated overage for this fishery was 38,000; therefore, the Canadian objective was to manage for a total NBC chinook harvest of 264,000 chinook. The cumulative overage through 1990 for NBC is 1,100 chinook. Canada is proposing that terminal exclusion catches of 6,958 be deducted from the 1990 total catch. With this catch excluded, the 1990 catch of 249,200 represents an underage of 52,800 (17.5%).

**Troll Fisheries:** The preliminary troll chinook catch is 179,000. The 1990 troll fishery opened for all species on June 28. A portion of northern Hecate Strait adjacent to the Skeena River (Area 4) was closed to trolling from August 5 to August 14 as a coho conservation measure. The majority of the west coast of the Queen Charlotte Islands closed to trolling August 14. All North/Central Coast areas closed to chinook trolling August 18. The western portion of northern Hecate Strait closed to trolling August 25 to reduce chinook shakers. The North/Central Coast areas closed to trolling September 30 after 43 days of chinook non-retention.

**Net Fisheries:** The preliminary net catch of chinook in North/Central areas was 46,000. This was comprised of a Queen Charlotte Island catch of 8,000, a Skeena/Nass catch of 20,000 and a Central Coast catch of 18,000.

**Recreational Fisheries:** Estimates of the North/Central sport catch in tidal water totaled 31,000. The Queen Charlotte Islands sport catch was 16,800, the Skeena/Nass catch was 3,300, and the Central Coast catch was 10,800.

Catches in terminal areas of Skeena, Kitimat and Bella Coola proposed for exclusion from the North/Central ceilings are as follows:

<u>AREA</u>	<u>Base Catch*</u>	<u>Catch</u>		<u>Exclusion*</u>		
		<u>1989</u>	<u>1990</u>	<u>1989</u>	<u>1990</u>	<u>Total</u>
Skeena	2,400	6,902	6,844	4,502	4,444	8,946
Kitimat	1,602	2,168	3,011	566	1,409	1,975
Bella Coola	2,800	3,117	3,905	317	1,105	1,422

\* These figures are currently under review.

### 3.2.2 West Coast Vancouver Island Troll

The 1990 catch ceiling was 360,000 chinook with a cumulative deviation of 27,000 (7.5%). The preseason forecast and fishery modelling projected a season catch of less than the ceiling and in the range of 260,000 to 275,000. The main objective in 1990 was not to increase the harvest rate in this fishery over the 1985-1987 average harvest rate. This objective was implemented due to conservation concern for the Harrison River chinook stock. This harvest rate average translates into a season of about 77 days open for chinook retention. The fishery opened on June 28 with all areas open, except Areas S and G (Fig. 1). There were four major area/time closures on the west coast of Vancouver Island in 1990:

- (1) Areas 127 and 130-1 were closed from August 3 until August 23. This action was taken to prevent shaker and enforcement problems with sockeye and pink salmon.
- (2) Complete closure to all trolling from August 17 to August 22 followed attainment of the sockeye allocation.
- (3) Conservation Areas F1, F2, G and B were closed September 1 (Fig. 1). This action was taken to reduce the coho catch rate.
- (4) The same areas as in (3) above, plus chinook conservation area A and waters shoreward of chinook conservation area B closed on September 7 (Fig. 1). This action was taken to reduce coho and juvenile chinook shaker catches.

Chinook fishing closed for the balance of the season on September 13, for a total of 72 days open to chinook fishing. There was no chinook non-retention period in 1990. The preliminary reported chinook catch in 1990 for the WCVI troll was 295,600.

### 3.2.3 Strait of Georgia

Troll: As in 1988 and 1989, the catch ceiling for the troll fishery was 31,000 chinook. The reduced ceiling was maintained to reduce exploitation on the lower Strait of Georgia chinook stock by reducing the harvest rate by 20% in a suite of fisheries. The troll fishery opened for chinook on June 28 and continued through September 30. Chinook non-retention fisheries did not occur in 1990. The preliminary catch by trollers was 32,400.

Recreational: The Strait of Georgia recreational fishery was also managed to reduce harvest rate by 20% for the lower Strait of Georgia chinook stock. Consequently, the management plan

implemented in 1989 was continued in 1990. This plan consists of the following management actions:

- (1) An annual bag limit of 15 chinook and a size limit of 62 cm was implemented for the area north of Cadboro Point (north of Victoria in Statistical area 19B), including Johnstone Strait. These measures represent an increase in the bag limit (from 8 to 15) for the Strait of Georgia recreational fishery compared to 1988.
- (2) In the Victoria area, the annual bag limit was increased from 8 to 20 chinook, and the size limit was decreased from 62 to 45 cm.
- (3) For Johnstone Strait, the daily bag limit was reduced from 4 to 2 chinook, the season limit was reduced from 30 to 15, and the size limit was increased from 45 cm to 62 cm.

The estimated 1990 catch in the creel survey area (including the Victoria area but excluding Johnstone Strait) was 111,900. Effort in 1990 totalled 543,400 boat trips. Recreational effort in the Strait was similar to 1986 and 1987, but reduced from 1988 and 1989.

An evaluation of the lower Strait of Georgia chinook conservation program is currently in progress.

#### 4.0 REVIEW OF OTHER FISHERIES

##### 4.1 Canadian Fisheries

###### 4.1.1 Transboundary Rivers

Commercial gill net catch of chinook in the Canadian portions of the transboundary rivers are: Taku River - 1,258 chinook adults and 128 jacks and Stikine River 1,617 chinook adults and 700 jacks.

###### 4.1.2 Southern B.C. Commercial Net

<u>Area (Stat. Area)</u>	<u>Preliminary Catch (chinook &gt; 5 lb.)</u>
Johnstone Strait (11-13)	18,000
Strait of Georgia (14-19)	1,200
Fraser River (28,29)	13,500
Juan de Fuca Strait (20)	7,200
Barkley Sound (23)	29,000
Other WCVI (21,22,24-27)	400

The fishery in Barkley Sound is a terminal gillnet fishery that operates in Alberni Inlet.



#### 4.1.3 Area 12 Troll

Preliminary catch is reported as 1,520 chinook.

#### 4.1.4 Tidal Recreational

Preliminary catch estimate for the Barkley Sound recreational fishery in 1990 is 61,000. The catch is split between a terminal fishery operating inside Alberni Canal and that operating in Barkley Sound. The catch in Alberni Canal was 19,500 and in Barkley Sound was 41,800. The survey period covered from July 15 to September 30. Catch estimates for sport fisheries off WCVI are not available.

#### 4.1.5 Non-tidal Recreational

Non-tidal recreational fisheries exist in most major B.C. rivers, including the Skeena, Nass, Kitimat, Bella Coola, Somass and Fraser Rivers and various streams on the east coast of Vancouver Island. A small sport fishery occurs in the upper Alsek River. The reported catch in this fishery in 1990 was 555 chinook. In northern B.C. rivers (Areas 1-10), the 1990 non-tidal catch was 9,700. In the Fraser River, chinook fisheries occurred in 9 areas (Bowron, Quesnel, Bridge, Clearwater, Shuswap, South Thompson, Thompson, Vedder-Chilliwack and Lower Fraser Rivers). Chinook catch was estimated by creel surveys and interviews by fishery officers. Catch estimates are unavailable for the lower Fraser River. The catch estimate for the upper Fraser River in 1990 is 1,813.

#### 4.1.6 Indian Food Fisheries

The 1990 chinook catch by native Indians in the Stikine River was 633 adults and 259 jacks; catch in the Alsek River was 173 chinook.

<u>Fishing Area</u>	<u>Preliminary 1990 Catches</u>
North/Central B.C.	40,800
Somass River	NA
Fraser River	17,900

The 1990 Fraser River catch was well above the 1989 chinook catch of 5,762, but similar to the 1988 level of 15,589. Catches in the Cowichan and Squamish Rivers were estimated to total 1,676 chinook, up 34% from the 1,253 reported for 1989. The higher catch in 1990 is attributable to increased fishing effort in the Squamish River. The fishery operated from June 1 to September 30 with a two week closure in August, which applied to off-reserve areas.

## 4.2 U.S. Fisheries

### 4.2.1 Strait of Juan de Fuca

Preliminary estimates of 1990 net catch in the Strait of Juan de Fuca total 5,100 chinook, compared to 10,000 in 1989. The tribal troll fishery harvested a total of 45,800 chinook, 28% below the 63,400 harvested in 1989. Tribal catch in Area 4B during the May 1 - September 30 PFMC management period has been included in the North of Cape Falcon troll summary.

Recreational catch estimates for 1990 in Areas 5 and 6 are not available at this time. In 1990, about 400 chinook were caught in the Area 4B state waters fishery, after the PFMC fishery, compared to 500 in 1989. Preliminary 1989 recreational chinook catch for all three areas is estimated at 50,400, compared to 39,800 in 1988.

### 4.2.2 San Juan Islands

Preliminary 1990 estimates of chinook net catch in the San Juan Islands total 8,900, compared to 16,200 in 1989.

Recreational catch estimates for 1990 in Area 7 are not available at this time. In 1989, about 7,700 chinook were caught in this area, compared to 9,400 in 1988.

### 4.2.3 Puget Sound

Recreational and commercial fisheries in Puget Sound were regulated by time and area closures to protect depressed spring chinook stocks. Preliminary estimates of 1990 net catch in Puget Sound total 179,100, compared to 156,500 in 1989. Puget Sound recreational catch estimates for 1990 are not available at this time. Recreational chinook catch for 1989 in Areas 8-13 is estimated at 59,000, compared to 62,700 in 1988.

### 4.2.4 Washington Coast

Ocean escapements of northern Washington coastal stocks were above minimum spawning levels, allowing both commercial and recreational fisheries. Preliminary 1990 estimates of Grays Harbor and Willapa Bay net catch total 41,500 chinook, compared to 56,300 in 1989. The 1990 commercial net fisheries in north coastal rivers harvested an estimated 16,300 chinook, compared to 28,500 in 1989.

### 4.2.5 Columbia River

Although the 1990 Columbia River freshwater recreational and commercial net catch estimates are incomplete, preliminary catch

estimates suggest a substantial reduction in harvest compared to 1989. The net fishery catch is estimated at 150,900, compared to 274,900 in 1989. The freshwater recreational fishery has harvested approximately 48,100 chinook compared to 84,300 in 1989, including approximately 5,100 caught in the Buoy 10 fishery.

#### 4.2.6 Ocean Fisheries North of Cape Falcon

In 1990, ocean commercial and recreational fisheries operating in the Pacific Fisheries Management Council (PFMC) region north of Cape Falcon were constrained by domestic chinook quotas. Separate quotas were established for the tribal troll and non-tribal fisheries.

Under PFMC quota management, ocean fisheries are terminated either when coho or chinook quotas are achieved or when seasons expire. Overall, in 1990, chinook catch success was poor, consistent with 1990 pre-season expectations for low abundance of key stocks. Most chinook quotas were not fully harvested. Preliminary estimates of 1990 tribal troll chinook catch total 31,200, 100% of the quota. Preliminary estimates of non-tribal chinook catch total 66,900, about 89% of the quota. Recreational catches are estimated at 33,100 (3,300 Oregon and 29,800 Washington). Non-tribal troll catches are estimated at 33,800 (2,500 Oregon and 31,300 Washington), of which approximately 25,900 were taken during the early season chinook fishery.

In 1990, an experimental fishery was conducted in the ocean waters inside three miles and north of Destruction Island to Cape Alava. This was a limited participation fishery designed to collect GSI data for fall chinook off the Quillayute River and to determine if target harvesting of local chinook stocks was possible. The fishery ran from September 15 to October 31 and a total of 11 chinook were landed.

#### 4.2.7 Ocean Fisheries Cape Falcon to Humbug Mountain

Ocean fisheries in Oregon's central coast area harvest a mixture of chinook primarily from southern stocks not involved in the PSC rebuilding program. These stocks do not migrate to any great extent north into PSC jurisdiction. Some stocks that spawn in Oregon coastal streams do migrate into PSC fisheries and include the North Oregon Coastal (NOC) stock aggregate. These north migrators are harvested only incidentally (probably <10%) in Oregon fisheries in this area.

An all salmon except coho troll fishery began on May 1; the major species harvested is chinook. The all species troll fishery (chinook and coho) opened as follows: July 4 for the area Cascade Head (Lat. 45 05"N) to Humbug Mt. (Lat. 42 40"N) and July

16 Cape Falcon (Lat. 45 45"N) to Cascade Head along the central coast. Measures were taken to decrease coho incidental mortality during chinook only fishing, to reduce harvest impacts on Klamath stock chinook, and to distribute the catch equitably between ports. The troll fishery for coho was closed on July 31 south of Cascade Head and August 31 from Cape Falcon to Cascade Head, while chinook fishing continued in both areas until October 31. Troll chinook catch in this area was substantially below the last five year average as only 232,500 chinook were landed in 1990. This is considerably less than the past two years when 469,700 and 353,400 chinook were landed in 1988 and 1989.

Sport angling was conducted as follows: May 1 to May 28 in state waters, May 28 to September 16 all waters with two one week closures intended to reduce coho incidental mortality and to extend the season until mid September. The sport catch of chinook in this area was 10,400 in 1990. This compares to the sport catch of 16,100 and 9,400 in 1988 and 1989.

The only troll fishery harvesting predominately NOC stocks is the late season near-shore fishery off the mouth of Elk River (Lat. 43 N), which was not conducted in 1990 due to conservation concerns. This fishery harvested 4,500 chinook in 1989.

#### 5.0 PRELIMINARY REVIEW OF 1990 ESCAPEMENTS

Some chinook stock escapement estimates are still being calculated at this time. Consequently, only a brief preliminary escapement overview can be presented (see Table 2). We have prepared the following brief narratives to summarize the information that is currently available. This information should be considered very preliminary.

#### 5.1 S.E. Alaska and Non-Annex Transboundary Rivers

ADF&G monitors 34 chinook systems that include S.E. Alaska and both non-annex and annex transboundary rivers. The total escapement in these systems in 1990 was 53,000 chinook, down from 54,400 in 1989 and 11,000 below the ADF&G escapement goal of 64,000. Of these 34 stocks, 11 are used as CTC escapement indicator stocks.

The five S.E. Alaska indicator stocks (Table 2) had a total escapement of 3,300 chinook in 1990, down from 4,100 in 1989. Of these five stocks, the Situk and Andrew Creek escapements increased in 1990 over 1989 and the King Salmon, Blossom, and Keta escapements all decreased. The Situk and Keta escapements remained above goal in 1990.

The three non-annex transboundary indicator stocks (Table 2) all had decreases in their escapement levels from 1989, with the

Chilkat having the largest decline both in numbers (down 1,090 fish) and percent (80%). While the Chilkat and Chickamin are both over their base period escapement levels, none of the three systems are above goal in 1990.

## 5.2 Annex Transboundary Rivers

The U.S. and Canada have different escapement goals for the Alsek, Stikine, and Taku Rivers and different estimates of annual escapement for the Alsek and Taku Rivers. By both accounts, the Taku escapement greatly increased in 1990 over 1989, by about 5,750 chinook, between 30% and 38% of the 1989 level.

The Stikine escapement decreased by 1,400 chinook in 1990 over 1989 (down 8%). The 1990 Stikine escapement was over the U.S. escapement goal of 13,440 and below the Canadian goal of 25,000 fish.

In 1990, the Alsek escapement was down from 1989 by 1,000 fish according to the U.S. estimate and by 2,000 fish according to the Canadian estimate.

## 5.3 Northern B.C. (Areas 1,3, and 4)

The 1990 Queen Charlotte Island (Area 1) chinook escapement is estimated at 2,000, a decrease of 800 from 1989. Nass area escapements were similar to 1989 and were at 76% of escapement goal. Skeena chinook stocks escapement was also slightly down from 1989, but still well above the escapement goal.

## 5.4 Central B.C. (Areas 6-10)

Since 1988, index escapements for Area 6 and Area 8 have been adjusted by eliminating rivers with substantial hatchery contributions. The escapement goals for these systems have been adjusted accordingly. Chinook escapements to Kitimat area (Area 6 Index) streams are not available at this time. Escapement to the Bella Coola area (Area 8 Index) natural streams in 1990 (2,400) was similar to the 1989 escapement (2,500). Rivers Inlet was up from 1989 levels with an estimated 4,039 fish returning. Smith Inlet (Areas 10) chinook escapement improved from 1989; the 1990 estimate was double the 1989 escapement of 225.

## 5.5 Southern B.C. (outside the Fraser River)

Chinook escapement to upper Georgia Strait was down for all indicator stocks in 1990. The Nimpkish River decreased to 1,200 from the 1989 escapement level of 4,900. The other Upper Georgia Strait indicator stocks showed similar declines. The 1990 reported returns to west coast of Vancouver Island stocks decreased from 1989, but are similar to returns in 1988. The

primary reason for this decline was due to decreased returns to the Marble River. The 1990 escapement estimate to the Marble River was 2,000 compared to 4,500 in 1989. The 1990 figure may be an underestimate of actual returns though, due to the inability to conduct escapement surveys in November 1990. The estimates of returns to the Lower Georgia Strait stock were slightly larger than the 1988 and 1989 returns. The Cowichan escapement was the same as in 1989, while the Nanaimo and Squamish escapements showed slight improvements.

#### 5.6 Fraser River

The escapement of Fraser River indicator stocks showed significant improvement in 1990, with the Upper and Middle Fraser escapement estimates above their escapement goals. Escapement to the Thompson River, while showing improvements over 1989, was still at only 72% of the escapement goal. The greatest improvement was in the returns to the Harrison stock, where the escapement was at the highest level in 4 years (73% of escapement goal). However, this result is mainly due to a single age-class. Preliminary estimates indicate that the 1990 spawning escapement consisted of 95% 4 year-olds and the remaining 5% age 3 and 5 year-olds. By contrast, in 1989 64% were 3 year-olds.

#### 5.7 Puget Sound

Preliminary 1990 spawning escapement estimates are not yet available for most stocks. In 1989, escapements were down for most Puget Sound stocks and well below goal for all but the Green River fall stock. It is expected that 1990 escapements will continue to be depressed. The preliminary 1990 estimate for Skagit spring chinook is slightly above that for 1989 but still only 63% of the goal.

#### 5.8 Washington Coast

The northern Washington coastal chinook stocks from the Quillayute (except summer run), Hoh, and Queets Rivers are managed on the basis of escapement floors and terminal area fishery harvest rates. Terminal area abundance for these stocks in 1990 was sufficient to allow directed harvest. Preliminary indications are that spawning escapement levels exceeded the established floors. Final escapement estimates for most stocks are not available at this time. The preliminary 1990 estimate for Quillayute summer chinook is slightly above the goal.

#### 5.9 Columbia River

The 1990 escapement data for Columbia River chinook stocks are incomplete; however, preliminary estimates suggest a reduction from 1989 levels for many stocks. The 1990 total adult

escapement of Upriver Spring chinook at Bonneville Dam was 87,300. Separation of the Upriver Spring chinook run into the hatchery and wild components for the 1990 return has not yet been accomplished. However, applying the 1985-89 average wild proportion (37.8%) to the Bonneville Dam escapement of 87,300 results in an escapement estimate for wild stocks of 33,000 chinook. This is a substantial reduction from improved escapements for 1986-1988, but a 26% increase from the 1989 escapement of 26,100 wild spring chinook. The reduced escapements for the last two years are probably due, in part, to poor flow conditions during smolt outmigration in recent years.

The preliminary Bonneville Dam adult escapement estimate for 1990 Upriver Summer chinook is 25,000 fish, a 13% reduction from the 1989 escapement of 28,700 fish. This continues the decline from the peak in 1987.

The 1990 Upriver Bright adult escapement at McNary Dam was 57,600 fish. Although the adult escapement exceeded the 40,000 goal, there is concern that this stock may be entering into a major abundance decline, based upon significantly reduced jack counts in recent years. There is a strong relationship between jack and adult returns from the same cohort. The 1989 Upriver Bright jack count was the lowest since 1980 and the 1990 jack count improved only slightly.

The escapement of tule hatchery stocks in 1990 was mixed. The 1990 adult return to Spring Creek Hatchery, including tule fall chinook trapped at Bonneville Dam for supplemental broodstock, totaled 8,200 fish, compared to 4,300 in 1989 and the goal of 8,200. Return of Lower River Hatchery stock was very depressed in 1990. However, extensive off-site trapping and collection programs allowed Washington and Oregon hatchery facilities to meet broodstock goals.

#### 5.10 Oregon Coast

Spawning escapements into the 10 standard index streams were considerably lower than the last three years as indicated by counts of the peak number of live and dead fish seen during foot surveys of the spawning grounds. The spawner abundance index for the aggregated north migrating stocks was 125 fish per mile in 1990. This compares with 151 fish per mile in 1989 and 221 fish per mile in 1988. The abundant 1984 brood year of this stock aggregate has completed its life cycle and subsequent broods have not survived as well, resulting in decreased spawner abundance in 1990 and anticipated continued lower stock sizes.

TABLE 1. Summary of the 1987-1990 Chinook Catches in Fisheries Relevant to the U.S./Canada Pacific Salmon Treaty.  
(numbers in thousands of fish).

NOTE: Catches for 1990 are very preliminary (estimates as of 2-Feb-91).

AREA	TROLL				NET				SPORT				TOTAL			
	1990	1989	1988	1987	1990	1989	1988	1987	1990	1989	1988	1987	1990	1989	1988	1987
S.E. ALASKA a/	265	236	231	242	17	24	22	15	28	28	26	24	310	288	279	281
BRITISH COLUMBIA b/c/																
North/Cent. Coast	179	225	182	240	46	46	44	29	31	36	21	14	256	307	247	283
W. Vanc. Island	296	203	409	379	29	40	15	1	61	48	33	32 d/	386	291	457	412
Georgia St/Fraser	32	29	20	38	15	24	8	13	112	133	119	121 e/	159	186	147	172 e/
Johnstone St	2	2	2	2	18	29	6	14	10	10	10	10	30	41	18	26
Juan de Fuca St	0	0	0	0	7	22	4	7				e/	7	22	4	7 e/
sub-total	509	459	613	659	115	161	77	64	214	227	183	177	838	847	873	900
WASHINGTON INSIDE																
Strait (mar) f/	46	63	50	45	5	10	10	11	NA	50	40	53 i/	NA	123	100	109
San Juans (mar) g/	1	1	0	0	9	16	32	29	NA	8	9	14 i/	NA	25	41	43
Other PS (mar+fw) h/	0	0	0	0	179	156	133	127	NA	59	63	59 i/	NA	215	196	186
Coastal (mar+fw) h/	0	0	0	0	58	85	74	51	NA	NA	7	3 i/	NA	NA	81	54
sub-total	47	64	50	45	251	267	249	218	NA	NA	119	129	NA	NA	418	392
COLUMBIA RIVER	-	-	-	-	151	275	491	483 j/	48	84	94	84 k/	199	359	585	567
WA/OR N C FALCON	65	74	108	81	0	1	3	4	33	21	19	44	98	96	130	129
OREGON																
Inside Waters m/	0	5	4	3	-	-	-	-	NA	42	49	47	NA	47	53	50
GRAND TOTAL	886	838	1006	1030	534	728	992	784	NA	NA	490	505	NA	NA	2338	2319

a/ Southeast Alaska troll chinook catches shown for Oct. 1- Sept. 30 catch counting year. Alaska catches do not include hatchery add-on.

b/ British Columbia net catches includes only fish over 5 lb. round weight. Native food fishery catches are not included.

1989 and 1990 include catch from terminal sport and gillnet fisheries (2 year total of 12,283) proposed for exclusion from the catch ceiling.

c/ Sport catches are for tidal waters only, catch updates will be provided as available.

d/ Estimates of tidal sport catches are from creel surveys in Barkley Sound only. Survey times and areas may vary from year to year.

e/ Georgia Strait sport catches include Juan de Fuca Strait sport catches.

f/ Strait troll catch includes all catch in areas 5 and 6C and catch in area 4B outside of the PFMC management period (May - September).

g/ San Juan net catch includes catch in areas 6, 6A, 7, and 7A; sport catch includes area 7.

h/ Coastal and Puget Sound sport catches include marine and freshwater catches, but only adults in freshwater.

i/ Numbers adjusted for punch card bias. See "1988 WA State Sport Catch Report" for details.

j/ Columbia River net catches include Oregon, Washington and treaty catches, but not treaty ceremonial.

k/ Columbia River sport catches include adults only, for Washington, Oregon, Idaho and Buoy 10 anglers.

m/ Troll = late season troll off Elk River mouth (Cape Blanco); sport = estuary and inland (preliminary for 1987-89).



TABLE 2. Summary of the 1986-1990 escapement of Pacific Salmon Commission Chinook Escapement Indicator Stocks.

NOTE: Escapements for 1990 are very preliminary (estimates as of 2-Feb-91).

Production Unit	Stock Type	Ave Esc. Base a/	Esc. Goal	1986 Esc.	1987 Esc.	1988 Esc.	1989 Esc.	1990 Esc.	1990 % Base	1990 % Goal
-----										
Southeast Alaska										
Situk	Spring	1,391	2,100	2,067	1,884	885	652	700	50%	33%
King Salmon	Spring	92	250	245	193	206	238	206	224%	82%
Andrew Creek	Spring	379	750	1,131	1,042	752	848	1,062	280%	142%
Blossom	Spring	163	1,280	2,045	2,158	614	550	411	252%	32%
Keta	Spring	407	800	1,104	1,229	920	1,848	970	238%	121%
Transboundary Rivers Not Addressed in Treaty Annexes										
Chilkat (U.S.)	Spring	213	2,009	129	1,286	781	1,362	272	128%	14%
Unuk (U.S.)	Spring	1,469	2,880	3,402	3,157	2,794	1,838	946	64%	33%
Chickamin (U.S.)	Spring	338	1,440	2,683	1,560	1,258	1,494	902	267%	63%
Transboundary Rivers Addressed in Treaty Annexes										
Alesek (U.S.)	Spring	4,214	5,000	4,073	3,892	3,105	3,838	2,992	41%	60%
Alesek (Canada)	Spring	5,255	12,500	5,418	5,232	4,060	4,912	3,102	59%	25%
Taku (U.S.)	Spring	7,978	25,600	12,178	8,951	13,411	15,462	21,278	267%	83%
Taku (Canada)	Spring	9,700	30,000	15,040	11,486	17,252	18,784	24,498	253%	82%
Stikine (U.S.)	Spring	6,224	13,440	11,572	19,108	29,168	18,860	17,416	280%	130%
Stikine (Canada)	Spring	8,004	25,000	11,572	19,108	29,168	18,860	17,416	218%	70%
B.C. North Coast										
Yakoun River	Summer	788	1,576	500	2,000	2,000	2,800	2,000	253%	127%
Nass area	Spr/Sum	7,944	15,888	17,390	11,400	10,000	12,500	12,000	151%	76%
Skeena area	Spr/Sum	20,883	41,766	59,968	59,120	68,700	57,200	55,980	268%	134%
B.C. Central Coast										
Area 6 Index	Summer	2,760	5,521	2,615	1,566	3,165	1,000	NA	NA	NA
Area 8 Index	Spring	2,725	5,450	3,362	1,456	1,650	2,500	2,385	88%	44%
Rivers Inlet	Spr/Sum	2,475	4,950	7,623	5,239	4,430	3,330	4,039	163%	82%
Smith Inlet	Summer	1,055	2,110	532	1,050	1,050	225	510	48%	24%
West Coast Vancouver Island										
Indicator Stocks	Fall	5,745	11,500	4,810	3,570	5,525	8,480	5,756	100%	50%
Fraser River										
Upper River	Spring	12,229	24,458	41,207	34,520	34,250	25,300	35,500	290%	145%
Middle River	Spr/Sum	9,216	21,133	27,349	27,330	24,160	15,100	25,170	273%	119%
Thompson River	Summer	22,059	55,714	45,130	36,730	47,100	38,000	41,006	186%	74%
Harrison River	Fall	116,791	233,582	162,393	78,693	35,700	75,000	170,676	146%	73%
Georgia Strait										
Upper b/	Sum/Fall	2,546	5,100	1,630	5,700	3,300	6,600	1,670	66%	33%
Lower	Fall	11,139	22,278	2,830	2,530	6,914	6,830	7,400	66%	33%

TABLE 2. (Continued)

Production Unit	Stock Type	Ave Esc. Base 1/	Esc. Goal	1986 Esc.	1987 Esc.	1988 Esc.	1989 Esc.	1990 Esc.	1990 % Base	1990 % Goal
Puget Sound										
Skagit	Spring	1,217	3,000	1,995	2,108	1,988	1,853	1,902	156%	63%
Skagit	Sum/Fall	13,265	14,900	18,127	9,647	11,954	6,776	NA		
Stillaguamish	Sum/Fall	817	2,000	1,277	1,321	717	811	NA		
Snohomish	Sum/Fall	5,028	5,250	4,534	4,689	4,513	2,947	NA		
Green	Fall	5,723	5,800	4,792	10,338	7,994	11,512	NA		
Washington Coast										
Koh	Spr/Sum	1,325	NA c/	1,500	1,700	2,600	4,800	NA		
Queets	Spr/Sum	925	NA c/	900	600	1,800	2,600	1,800	190%	
Grays Harbor	Spring	425	1,400	1,800	900	3,000	1,900	NA		
Grays Harbor	Fall	8,575	14,600	10,500	18,800	28,200	26,500	NA		
Quillayute	Summer	1,275	1,200	700	600	1,300	2,200	1,400	110%	117%
Quillayute	Fall	5,850	NA c/	10,000	12,400	15,200	10,000	13,900	238%	
Koh	Fall	2,875	NA c/	5,000	4,000	2,700	5,100	NA		
Queets	Fall	3,875	NA c/	7,700	6,000	7,800	8,900	NA		
Columbia River										
Upper River	Spring	27,800	84,000	36,500	41,400	35,100	26,100	33,000 d/	119%	39%
Upper River	Summer	23,100	85,000	25,700	31,800	30,100	28,700	25,000	108%	29%
Lewis River	Fall	13,021	NA	12,000	12,900	12,100	21,200	NA		
Upriver Bright	Fall	28,325	40,000	113,300	154,100	114,700	96,500	57,600	203%	144%
Oregon Coast										
Aggregate Index e/	Fall	91	NA	121	129	221	151	125	137%	

a/ Base period for Alaskan and Transboundary stocks 1975-80; base for all other stocks 1979-82.

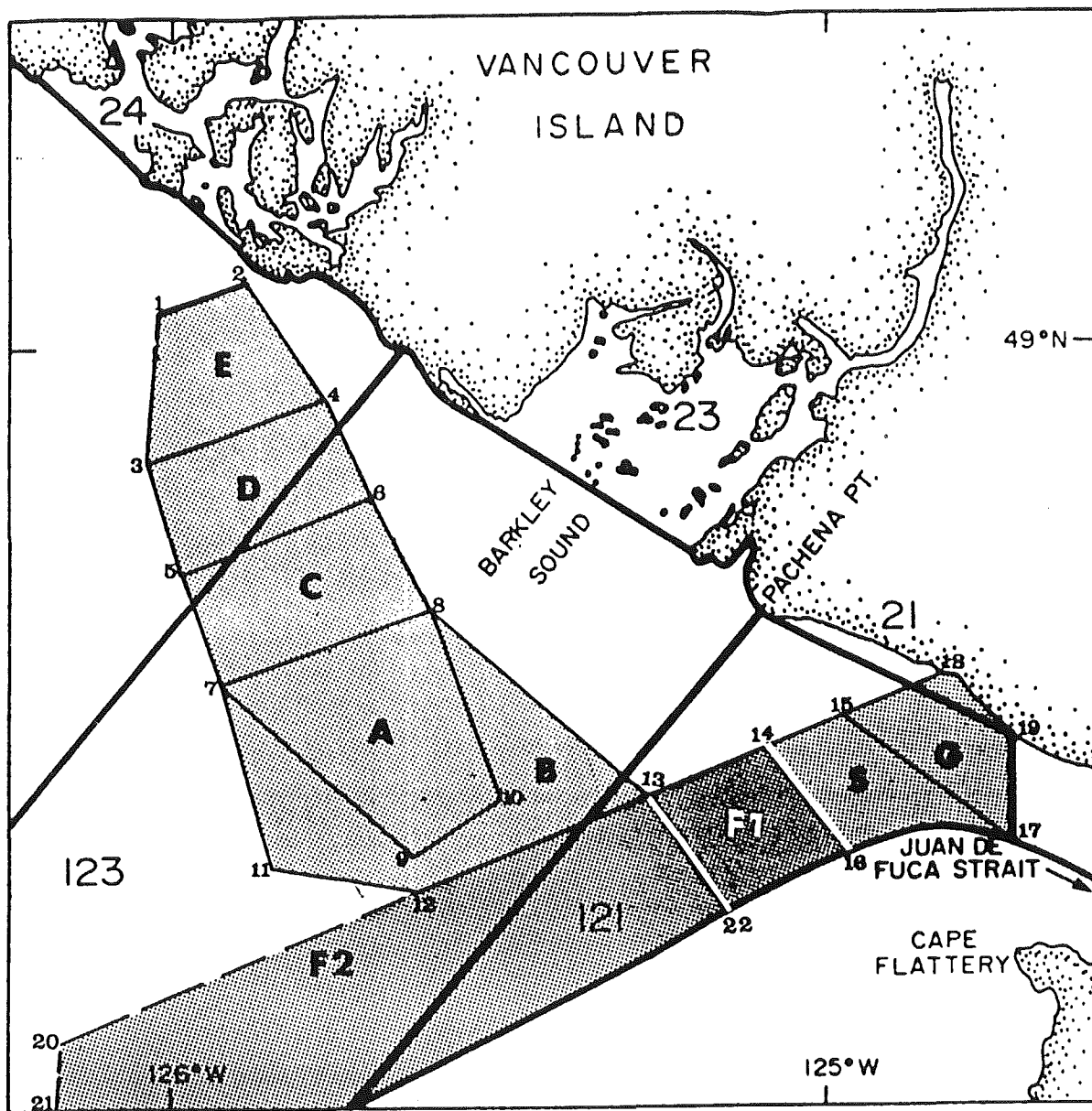
b/ 1986 escapement estimate for Upper Georgia Strait reflects unusual survey conditions.

c/ Stocks managed on the basis of floor minimum and fixed harvest rates.

d/ Based on average wild proportion of total adult escapement.

e/ Oregon coastal north-migrating chinook stocks are assessed in terms of spawners per mile survey units.

FIGURE 1. 1990 CONSERVATION AREAS



- Conservation Area A
- Conservation Area B
- Conservation Area C
- Conservation Area D
- Conservation Area E
- Conservation Area F1
- Conservation Area F2
- Conservation Area G
- Swiftsure Bank S