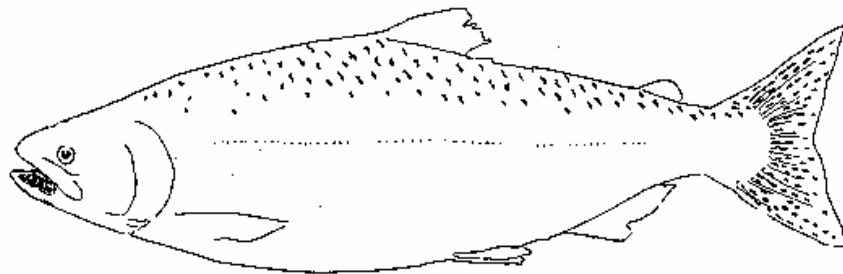


2006

**Information Document to Assist
Development of a**

Fraser Chinook Management Plan



Fisheries and Oceans
Canada

Pêches et Océans
Canada

Canada

RECORD OF REVISIONS

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1. Introduction

Fraser River chinook salmon are an important part of the ecology of the Fraser River watershed. They are the largest of the seven species of Pacific salmon (including steelhead and anadromous cutthroat) returning to the Fraser and have the widest distribution, with some stocks migrating distances over 900 km from the mouth to systems near the headwaters of the Fraser. They have sustained First Nations for thousands of years, provide important recreational harvesting opportunities, and were an important part of the colonization of British Columbia and commercialization of the British Columbia fishing industry.

Chinook salmon spawn in numerous tributary systems throughout the Fraser watershed. Once chinook fry emerge from the gravel in the spring following spawning, they spend up to one year in their natal system, although some stocks spend only a few weeks, before beginning their migration to the coast. The smolts adapt to salt water in the Fraser River estuary then migrate into marine waters. While the majority of Lower Fraser stocks rear off the south-west coast of Vancouver Island, coded wire tag (CWT) information has shown that Fraser River chinook salmon are found over a wide geographic area with many spring and summer run populations utilizing marine waters at least as far north as Southeast Alaska.

Some of the returning chinook begin to enter the Fraser River as early as February. The maturing adults return to the Fraser River from February to November, primarily as three, four and five year old fish. Spawning activity commences in early August for some systems and can last until mid-November or later for others. Some watersheds have more than one population of chinook with different life history characteristics (e.g., run timing, time spent in freshwater, etc.).

Chinook salmon may undertake long ocean migrations and remain at sea feeding for a few years before maturing and returning to reproduce in their natal stream. During these years, chinook salmon are subject to numerous fisheries, the cumulative effect of which has been the over-harvesting of many Pacific coast chinook stocks both in the United States and Canada. In 1985, the Pacific Salmon Treaty (PST) was negotiated and ratified partly to address the

issue of declining chinook stocks. Under the Treaty, Canada and the United States agreed on a chinook conservation program (based on fixed catch ceilings in certain major mixed-stock ocean fisheries) to rebuild stocks from both countries by 1998. This strategy was met with mixed success; some populations were slowly rebuilding, while others remained depressed.

A combination of reductions in directed fisheries and in incidental mortality resulting from reductions to fisheries targeting other co-migrating species has had a positive impact on most Fraser chinook stocks. Recent average escapements have increased for most stock groups compared to the period prior to the signing of the Treaty. However, some stocks in the spring-run age aggregate with early timing, including Birkenhead River, Coldwater River, Spius Creek, Westroad River and tributaries, and the Upper Chilcotin River remain at depressed levels.

2. Stock Assessment

1. Test Fishing

Since 1981, Fisheries and Oceans Canada (DFO) has conducted a chinook test fishery at Albion, British Columbia (near Fort Langley) from early April to late-October. The test fishery is conducted each year with a drifted gillnet at a specific site by the Albion ferry crossing in the Fraser River.

For each sampling event, two 30-minute sets are made daily just prior to and after daylight high tide. The original net was 8-inch mesh, but beginning in 1997 a multi-panel net was used on alternate days. The multi-panel net consisted of panels of five, six, seven, eight, and nine inch mesh, and was fished identically to the standard net. The purpose of the multi-panel net was to provide a more accurate sample of the chinook stock assemblages passing the test fishing area by including both smaller and larger mesh panels. Intuitively, we expected the catch in the multi-panel net to more fully represent the wide range of body sizes of Fraser River watershed chinook stocks.

Analysis of the 1997 to 2001 data was initiated in 2001. The primary objective was to identify the new information the multi-panel net provided, particularly as it pertained to in-season management and stock assessment, and assess which net best indexed in-river chinook abundance. The secondary objective of the analysis was to establish a relationship between the catch of the standard chinook and the multi-panel nets that provide uniform relative abundance estimates. The study estimated population specific migration timing and aggregated population abundance indices by using DNA and CWT information to estimate the population origin of individual fish. The analysis indicated that the test fishery adequately measured in-river abundance (Parken et al. 2004).

Due to concerns for the potential for excessive by-catch of some sockeye populations, a decision was made to utilize only the standard 8" net in 2003. Utilizing the multi-panel net for only a portion of the year would have resulted in gaps in data collection that would have compromised subsequent analysis.

The operation of the test fishery in 2005 was the same as in 2004; alternate days fishing with the standard 8 inch mesh net and the multi-panel net that was reconfigured in 2004. The total 2005 catch from both nets between April 1 and August 2 of 480 chinook (cumulative CPUE for 8" net Apr 1-Aug 2 = 56.28, adjusted for days the multi-panel net was fished) is the lowest in the 25 year history of the test fishery, including those years when only the 8" net was used. The average chinook catch and CPUE in the test fishery for the period 1990-2005 is 1429 and 162.29, respectively. The 2005 Albion test fishery results were an early indication of the very low escapements subsequently recorded for those chinook which migrate through the lower Fraser during the spring and early summer. Catch information from the Albion Test Fishery can be found in Appendix A or at:

<http://www.pac.dfo-mpo.gc.ca/fraserriver/commercial.htm>.

2. Overview of Fraser River chinook stocks

Chinook salmon in the Fraser River are comprised of a large and complex group of spawning populations. For management purposes, they have historically been divided into four major geographical stock complexes and three timing groups based on their adult return entry timing into the lower Fraser River.

The geographical stock complexes are:

- upper Fraser,
- middle Fraser,
- Thompson River and its tributaries, and
- lower Fraser.

The timing groups are:

- spring-run (peak migration through the lower Fraser prior to July 15)
- summer-run (peak migration through the lower Fraser between July 15 and September 1), and
- late-run (migrate into the lower Fraser after September 1).

Recently, Fraser River chinook salmon stock composition was reviewed¹ (Candy et al. 2002: CSAS 2002/085) and DFO has moved toward five interim management units for Fraser River chinook based on genetic interrelationships, life history, productivity, and run-timing. Life history is indicated by a number such as: 4₂. The large number represents the total age of the fish from its deposition in the gravel as an egg, to its return to spawn. The subscript number represents the number of winters the fish spent in freshwater during the juvenile stages of their life history. Interim management units are outlined in Table 1.

¹ CSAS Discussion Document 2002/085 A discussion paper on possible new stock groupings (conservation units) for Fraser River chinook salmon.

Table 1: Interim Management Units for Fraser River Chinook salmon

Management Unit	Sample Streams	Indicator Stock
Fraser spring-run age 4 ₂	Bonaparte River, Bessette Creek, Coldwater River, Deadman River , Nicola River, and Spius Creek	Nicola River
Fraser spring-run age 5 ₂	Birkenhead River, Chilcotin River, upper Chilcotin River, Westroad River, Cottonwood River, Elkin Creek, Horsefly River, upper Cariboo River, upper Pitt River, Fraser River mainstem tributaries above Prince George (Bowron, Willow, Slim, McGregor etc.), spring runs of North Thompson and Salmon River in South Thompson	Dome Creek
Fraser summer-run age 5 ₂	Chilko River, Quesnel River, Stuart River, Taseko, Lower Cariboo River, and the Clearwater River	Chilko River (proposed)
Fraser summer-run age 4 ₁	Lower Shuswap River, Mid Shuswap River, Lower Adams River, Little River, South Thompson River, Lower Thompson River (below Kamloops Lake), and Maria Slough	Lower Shuswap River
Fraser late-run age 4 ₁	predominantly fish of Harrison River origin (those natural spawners returning to the Harrison River, and transplanted populations to the Chilliwack, Chehalis, and Stave Rivers)	Chilliwack River

Long term escapement trends for each management unit are illustrated in Appendix D.

3. Lower Fraser River

A. Stocks

Lower Fraser River chinook stocks are numerically dominated by the fall returning, white-flesh Harrison River stock group, also known as the Fraser late-run. The Fraser late-run stock group includes the original natural population of fall returning chinook to the Harrison River, and transplanted Harrison origin populations returning to the Chilliwack, Chehalis, and Stave Rivers. The Fraser late-run stock group is unusual in that upon fry emergence from the gravel they migrate immediately to the estuary where they rear for three to six weeks before moving offshore instead of staying one year in freshwater (ocean-type life history).

In addition to the late-run chinook populations there are also relatively small, unique populations of spring and summer-run chinook salmon returning to the lower Fraser River. These can be either red or white-fleshed stocks that typically exhibit a stream-type life history (i.e., chinook fry that over-winter in fresh water and migrate to the ocean in their second spring). Birkenhead, upper Pitt and spring and summer-run Chilliwack River populations are examples of this life history. Chinook returning to Maria Slough are distinct in the lower Fraser River in that they exhibit a summer-run ocean-type life history pattern. The Chilliwack River watershed has two or possibly three distinct stock groups: 1. a spring-run population that spawns above Chilliwack Lake in Dolly Varden Creek, 2. a summer-run population that spawns in the upper reaches of the lower Chilliwack River above Slesse Creek, and 3. the transplanted Harrison-origin late-run population that predominately spawns downstream of the Slesse Creek confluence.

B. Enhancement

Harrison chinook were transplanted to the Chilliwack River in the early 1980's, and this population is now sustained by returns to the Chilliwack River and the enhancement work of the Chilliwack hatchery. Records indicate escapement of the spring and summer-run populations to be significantly smaller than the late-run population. Both the spring and summer-run populations in the Chilliwack River may have mixed populations with transplanted mid-Fraser stocks. From 1985 to 1988, mid/upper Fraser summer-run red-fleshed chinook were transplanted from Bowron, Slim, Finn, Chilko & Quesnel stocks. Some upper Pitt summer-run white-fleshed chinook were transplanted between 1981 and 1985. These were reportedly transplanted to bolster a weak natural summer-run to re-establish a recreational fishery during the June to early August period.

Mid-Fraser stocks have also been transplanted to the Chehalis River to replace an early timed, red-fleshed population that returned to the upper Chehalis until the early 1980's. The Chehalis River historically had a spring/summer-run red-fleshed chinook population that was enhanced in the late eighties with summer-run red-fleshed populations from Slim Creek and Chilliwack River. This population arrives on the spawning grounds in late June to July and peak of spawn usually occurs from late August to early September.

The Birkenhead Hatchery on the Birkenhead River was established in 1977. The hatchery suffered devastating damage in the flood of the fall of 2003 and is now closed. This volunteer-run hatchery was operated by the Pemberton Wildlife Association (PWA) and enhanced both chinook and coho. Coho eggs were used for the '*Salmon in the Classroom*' program for schools in D'Arcy, Pemberton and Whistler. The impact of the hatchery closure is unknown. However, historical CWT tag returns indicated 15 - 25% contribution of enhanced chinook to the run. This is very significant during the very low return years, when even a small percentage, made a positive difference.

C. *Stock Assessment*

Assessment of the lower Fraser River chinook spawning stocks rely on visual surveys, a mark-recapture project, and the coded-wire tagging of hatchery production.

The Harrison River is the only lower Fraser River system where a chinook mark-recapture study is employed to estimate spawner abundance. This mark-recapture project has been conducted annually since 1984. Since 1985, the Fraser-late run component returning to the Chilliwack River population has been estimated with an extensive deadpitch program. Additionally, in certain years, visual surveys of a suite of smaller stocks including Birkenhead and upper Pitt Rivers, as well as Maria Slough provide some information on escapements to these systems.

D. *Forecasts*

Forecasts of the next year's expected escapement of Fraser late-run (Harrison and Chilliwack Rivers) chinook are developed for use in the Chinook Technical Committee's coastwide modeling work. This is the only stock group in the lower Fraser River, and only one of two Canadian chinook stocks, for which a forecast is calculated.

A forecast for 2006 is not available at this time, but will be by mid to late March. Forecasts are not adjusted in-season since very little information is available upon which to make such changes.

4. Interior Fraser River

A. Stocks

Chinook salmon in the interior Fraser River (above Hope) comprise a large and complex group of spawning populations. Interior Fraser chinook have historically been divided into three major geographical regions:

- the upper Fraser (those returning upstream of Prince George and including Nechako),
- middle Fraser (downstream of Prince George but excluding the Thompson), and the
- Thompson (which are divided into lower Thompson/Nicola, North Thompson, and South Thompson/Shuswap).

Within these regions, two migration times are recognized: early or spring-run, and summer-run.

B. Enhancement

Since the early 1980's, the main hatcheries enhancing upper Fraser River chinook have been the Eagle, Shuswap, Clearwater, and Spius (all Thompson); the Quesnel (mid-Fraser); and Stuart (upper Fraser). Since the early 1990's, the Clearwater, Eagle, Quesnel, and Stuart facilities have been closed. Some enhancement still occurs throughout the watershed, mostly linked to stock assessment and the production of coded-wire tag mark groups. Overall, enhancement is thought to have a relatively small effect on the total number of chinook returning to the interior Fraser although the effects on certain watersheds may be significant (e.g., Nicola watershed enhanced by Spius hatchery and Shuswap stocks from the Shuswap hatchery). Interior Fraser chinook escapement data are in Appendix C.

C. Stock Assessment

Assessment of these large stock aggregates is largely formed by annual estimates of escapement by aerial surveys, mark-recapture (Nicola River, Louis Creek, and lower Shuswap River), and electronic counter (Deadman River). Trends in these spawning escapements are used to assess stock status.

D. Stock Forecast

Quantitative forecasts are not prepared for this large group of chinook salmon populations.

Additional technical information on the Pacific Salmon Treaty, Harrison chinook, stock assessment, and forecasting can be found in Appendix L.

3. Goals, Priorities and Constraints

The establishment of Fraser River escapement goals, management priorities and fishing constraints follow the general process outlined below:

1. Set escapement objectives

The escapement goals currently being used were set following negotiation of the original Pacific Salmon Treaty in 1986. While there were a variety of methodologies that could have been used to determine escapement goals, it was agreed to establish the goals at twice the average escapement observed during the period 1979 to 1982. This strategy was to be used until 1998 at which time the goals were to be reviewed. Scientists are now evaluating current information and discussions have commenced regarding alternative approaches to establishing escapement goals. While the current goals will not be modified for 2006, the review of the goals and discussion of alternate methods will continue.

More information on setting future escapement goals for Fraser River chinook populations can be found in Appendix L

2. Identify management priorities

Fisheries are managed to the following set of ordered priorities:

A. Conservation of the resource

Since 1985, Canada has based its fisheries management on a rebuilding strategy. Total exploitation rates on a brood year were reduced from past high levels in the range of 75% - 85%. The minimum requirement of the Pacific Salmon Treaty (1985) was a 15% reduction in total exploitation of the four indicator stocks identified at that time. This was in addition to domestic measures already in place, such as the closure of the terminal Fraser River commercial gillnet fishery, and measures required in pass-through fisheries to protect

specific stocks. Amendments to the PST negotiated in 1999 resulted in further initiatives to rebuild coastal Chinook stocks (including Fraser Chinook) through implementation of an Aggregate Abundance Based Management (AABM) system. Allowable harvest levels for chinook salmon are now determined through an assessment of overall chinook abundance on a coast wide basis versus management based on a fixed quota approach.

Fisheries openings and closures are designed to fulfil conservation requirements first. Fishing times are adjusted to achieve this requirement, as information regarding run size, harvest rates, and escapement becomes available.

B. Aboriginal fisheries for food, social and ceremonial purposes

Consultations are on going between Resource Management staff and First Nations, both within the Fraser River Watershed and outside the Watershed. Fishery plans are based upon stock conservation requirements and needs indicated by all Fraser River First Nations.

C. International allocations

Pre-season fishing plans are formally discussed in bilateral meetings with the United States within the framework of the Pacific Salmon Commission.

D. Canadian domestic allocations for commercial and recreational fisheries

Commercial Fisheries: Only very limited directed commercial net fisheries (i.e., 2004 Area E gillnet exploratory fishery) have occurred within the Fraser River since 1980. Because of the wide distribution of chinook in the marine areas, Fraser stocks are taken in commercial troll fisheries in Alaska and British Columbia and to a lesser extent as by-catch in some commercial net fisheries (i.e. Fraser River sockeye and chum fisheries). During the last seven years, a mandatory non-retention requirement in all South Coast seine fisheries has significantly reduced chinook mortalities. Over the past few years the majority of the Fraser River commercial chinook catch has been taken in the Area F commercial troll fishery in northern B.C. waters. Late run chinook stocks are also harvested in the Area G commercial troll fishery off the west coast of Vancouver Island.

Recreational Fisheries (Tidal and Non-Tidal): The marine waters off the Pacific coast of British Columbia are generally open for harvest of chinook salmon year round. Recreational harvest is constrained using daily and annual limits. In tidal waters the annual limit is 30 chinook of which only 15 chinook may be taken from Areas 28 and 29. In non-tidal waters there is an annual limit of 10 chinook. Daily limits are two per day in most tidal waters and range from one to two adults per day in most non-tidal waters. Recreational harvest is further constrained using minimum size limits (minimum size limit 45 cm coast wide with the exception of a 62 cm size limit in Johnstone Strait, the Strait of Georgia and the Fraser River mouth), slot limits, reduced daily quotas and closed areas. Closed areas may be closed year-round or closed seasonally depending on local stocks. The majority of Fraser River chinook caught in recreational fisheries are late returning Harrison origin fish.

Details on recreational chinook opportunities may be found online at:

http://www.pac.dfo-mpo.gc.ca/recfish/default_e.htm

3. Identify constraints

Since 1985, the impact of all Canadian and U.S. fisheries on Pacific chinook stocks has been substantially reduced in accordance with the rebuilding program specified in the Pacific Salmon Treaty. Relative to the pre-Treaty situation (1984 and earlier) Alaskan and Canadian ocean catches in highly mixed stock harvesting areas are lower as they are now controlled by a ceiling or maximum catch level based on an estimate of aggregate abundance. In response to declining returns, now partially attributed to declining ocean survival, Canada implemented a major reduction in this ceiling in 1995. Alaska has not yet implemented an equivalent ceiling reduction. Information on Alaska commercial salmon harvests can be found at: <http://www.cf.adfg.state.ak.us/geninfo/finfish/salmon/salmhome.php>.

In 1995, Canada reduced its harvest rate by approximately 50% on West Coast Vancouver Island stocks and implemented substantially larger closures on recreational and commercial fisheries. With the signing of the renewed Treaty in 1999, management ceilings in several marine fisheries were replaced by an abundance based management regime. This had the result of further reducing chinook harvest in the mixed-stock ocean fisheries.

Many, but not all Fraser River chinook stocks seem to have responded positively to management actions implemented as a result of the treaty and additional management actions taken in Canada.

4. Wild Salmon Policy

On June 24th, 2005, Geoff Regan, Minister of Fisheries and Oceans, announced adoption of the Wild Salmon Policy and committed \$1.1 million to its implementation and related salmon science.

The policy, released as a living document, defines a new approach to salmon conservation in the Pacific Region. It advances the Government of Canada's agenda for reform of Pacific fisheries. The policy responds to feedback received from significant consultation. After the December 2004 draft was made available, DFO listened to feedback received at information sessions with First Nations and other interested parties as well as at a multi-interest dialogue forum March 2-3, 2005. The Department also received 246 written submissions. After considering this input, DFO presented a revised policy to a First Nations forum on April 29 and a multi-interest forum on April 30, 2005. The policy was then finalized.

The policy and consultation details can be found on the DFO website, at:

http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/wsp/default_e.htm.

4. 2005 Fishery Summaries

Fraser River chinook migrating along northern (Johnstone Strait) and southern (Juan de Fuca Strait) approach routes to the Fraser River are harvested in a number of fisheries. These fish are taken as by-catch in sockeye net fisheries (seine and gillnet) in Johnstone Strait, Juan de Fuca Strait, Fraser River and Alaska. In addition, there are directed fisheries for chinook by WCVI, North Coast and Alaska troll fisheries.

The principal U.S. fisheries harvesting Fraser River chinook are the net fisheries in Juan de Fuca Strait, the San Juan Islands area, and off Point Roberts. The Fraser chinook catch taken in Southeast Alaska is unknown but thought to be smaller.

Chinook are also harvested in Aboriginal food fisheries and recreational fisheries throughout the Fraser watershed.

1. Aboriginal fisheries for food, social and ceremonial purposes

First Nations both in and outside the Fraser River are provided with an opportunity to harvest Fraser chinook. The number of fishing days is dependent upon the conservation needs of chinook stocks and other species, such as sockeye, steelhead and coho. Reductions or alterations to the agreed upon fishing pattern are subject to ensuring escapement requirements are met.

Once sockeye enter the Fraser River, management actions are driven by considerations for those stocks and chinook are taken as by-catch. Conservation concerns for steelhead and coho salmon have resulted in net fisheries being curtailed from early September to mid October in recent years.

Stock ID information indicates that those fish entering the river from February to July 15 are bound for tributary systems in the lower Thompson basin, the middle and upper Fraser basins, as well as the Birkenhead River in the Harrison River system. These stocks are understood to have a low productivity and individual stocks range in size from 100 to > 10,000 spawners.

Pre-season consultations with Lower Fraser First Nations resulted in an agreed to fishing regime that was designed to reduce the impacts on the earliest timed chinook stocks. This was accomplished by reductions in fishing times from those set the previous year for Lower Fraser First Nations.

Table 2: 2005 Fraser River First Nations Fishing Times:

Area and Gear	Dates	Hours per Week
Mouth to Pt Mann Bridge-drift net (Musqueam and Tsawwassen)	13-Mar	14 hours
	March 20-April 10	24 hours per week
	April 17 - 24	36 hours per week
	May 1 - June 26	48 hours per week
	April 30 – May 15	24 hours per week
	May 21 to June 27	48 hours per week
Pt Mann Bridge to Mission Bridge- drift net	March 13-April 10	10 hours per week
	April 17-June 26	12 hours per week
Pt Mann Bridge to Sawmill Creek- set net (Lower Fraser Groups-Friday to Sunday)	March 13-April 10	24 hours per week
	April 16-June 27	48 hours per week
Sawmill Creek to Texas Creek and the Thompson River – set net	March 30-May 29	4 days per week
	May 29-July 3	7 days week
	July 3-July 31	7 days per week (Selective)
	July 31-Sept. 20	7 days per week
Texas Creek to Deadman Creek – set net	March 30-April 3	4 days per week
	April 3-July 3	7 days per week
	July 3-July 31	7 days per week (Selective)
	July 31-Sept. 27	7 days per week
Deadman Creek upstream – set net	April 01- June 20	Closed **
	June 20 - July 3	7 days per week
	July 3-July 31	7 days per week (Selective)
	July 31-Sept. 27	7 days per week

A table of catches for 2005 can be found in Appendix E.

** Little interest by FN's to fish as few Chinook in this area until after June 20

2. Commercial fisheries

With the exception of a very limited exploratory gillnet fishery directed on chinook salmon within the lower Fraser River in 2004, directed gillnet fisheries for chinook within the Fraser River have been closed since 1980 in order to rebuild stocks. By-catches of chinook are permitted during the in-river commercial gillnet sockeye fishery (July and August) and chum fishery (October and November).

In 2004, the Area E gillnet fleet conducted an exploratory chinook fishery to target anticipated good returns of summer run chinook stocks (ref: Section 3 for fishery details). Plans to continue this project in 2005 were cancelled due to lack of available by-catch of sockeye

salmon. For the 2006 season a similar initiative to that employed in 2004 is being considered and details will be finalized pending further consultations.

A table of all Canadian commercial catches of chinook can be found in Appendix F.

3. Recreational fisheries

Historically, the recreational fishery in the Fraser River was open year-round with a daily limit of 4 chinook with no annual limit. In 1980, the fishery was closed to assist in rebuilding chinook stocks. When the fishery re-opened in the lower Fraser River area, it started June 1st with a daily limit of 1 adult chinook and an annual limit of 10 adult chinook. An adult chinook is defined as a chinook over 50 cm in length. In 1998, the recreational Chinook fishery was opened on May 1 based on an assessment that the additional fishing time and associated catch and effort would not compromise long term sustainability of Fraser Chinook stocks.

In 2005, the recreational fishery opened May 1st. For 2005 catches, see Appendix H.

4. Selective Fishing

The objective of the selective fishing policy is to ensure that selective fishing technology and practices are adopted where appropriate in all fisheries in the Pacific Region, and that there are continuing improvements in harvesting gear and related practices.

Selective fishing is a required element of conservation-based fisheries. In meeting conservation objectives, fishing opportunities and resource allocations will be shaped by the ability of all harvesters – First Nations, commercial and recreational anglers – to fish selectively. Two selective fishery projects were implemented in 2004: Area E Chinook Exploratory Fishery, and Area H Chinook Sampling Program.

5. Area H Chinook Sampling Program

The Area H chinook sampling program was designed to determine stock composition in a variety of areas during different time periods. This project has been reduced to focus on the

more abundant stocks in the Fraser River (i.e. South Thompson and Harrison origin) to gather chinook stock composition through DNA sampling, to confirm the impacts on by-catch while determining the viability of troll harvest in the terminal area of the Fraser River. All sampling and analysis is funded by Area H. The data generated can then be used in future discussions and consultations regarding the possibility for a limited catch controlled fishery when and if stocks and access policy warrant. A summary of the activity and results to date follows:

Time and Area: February 2004, Upper and Lower Strait of Georgia

Areas 14 and 15

- 18 vessel days in Area 14 for 64 kept and 73 released for total 137 samples

Areas 17, 18 and 29-5

- 25 vessel days (17,18 & 29-5) for 18 kept and 23 released total 41 samples

Note: Samples also obtained from a DFO science project (sea lice) that saw a collection of about 70 samples from Area 14, 1-2 weeks prior to this project.

Results:

154 samples analysed and paid for by Area H

Upper SoG result 113 samples: 82% East Coast V.I.; 17% Puget Snd; 1% Other

Lower SoG result: 41 samples: 60% East Coast V.I.; 35.5% Puget Snd; 2.5% Upper Fraser; 2% Other

Time and Area: April/May 2004, Lower Knight Inlet (Area 12)

- 11 vessel days for no chinook catch therefore no samples

Note: 2 very experienced harvesters, with good conditions and lots of feed showing raises some concern for the low stock abundance in this area

Time and Area: September 2004 past the peak of the Harrison/Chilliwack run, Area 29

- 3 vessels for 13 vessel days between September 17-28 for 17 chinook kept; 6 released; 1 chum and 1 coho released

Note: Some loss due to seals and all Chinook appeared to have white flesh

Results:

98-99% Lower Fraser Chinook (Harrison, Chilliwack, Stave)

20 of 21 sampled had at least a 99% chance of being Harrison, Chilliwack or Stave stocks.

In 2005 a project was proposed and ready to implement if the in-season stock indicators showed a significant improvement from the weak early season stock test results at Albion. When the project was reduced in size and co-management funding was not obtained during the sockeye season this project was cancelled for 2005. Area H are planning to propose this project again in 2006.

5. Catch monitoring

For the responsible management of all fisheries, the Department needs to have effective catch monitoring programs in place in areas where the level of fishing activity has the potential to significantly impact management objectives. Although in-season run size estimates are not provided, a defensible catch estimate along with spawning ground escapements are necessary for management of these stocks.

Following is a listing of catch monitoring activities in the Fraser River area in 2005.

1. Aboriginal Fisheries

All First Nation's fisheries are authorized by communal licence. The majority of areas have catch monitoring systems in place. In areas where there is not a specific catch monitoring program, the fisher is required by licence to report his/her catch to the band and the band to report to DFO.

Areas where specific catch reporting programs have been implemented include:

a) Below the Port Mann Bridge

During fisheries for food, societal and ceremonial purposes, catch monitoring is undertaken by Aboriginal Fishery Officers who collect hail information from the fishers.

b) Port Mann Bridge to Sawmill Creek

i) Set net and drift net fishery between Port Mann Bridge and Mission:

Charter Patrolmen patrol the Katzie, Kwantlen and Matsqui drift net fisheries.

Monitors collect hails as well, at Katzie Reserve Dock, Barnston Island and the Kwantlen Reserve Dock at Fort Langley. Set net fishers hail in their data by phone to band fisheries offices.

ii) Set net and drift net fishery between Mission and Sawmill Creek:

Monitors are stationed at main access points on the river during daylight hours, every day that the fishery is open to collect catch per unit effort (CPUE) and 24-hour effort surveys. Sites include: Lakahahmen, Island 22/Kilby, Skway, Scowlitz, Seabird, Agassiz Bridge, Hunter Creek, Chawathil Reserve, Coquihalla, and Yale Beach. A supervisor co-ordinates and stations the monitors at their sites, and ensures that they have the necessary data collection equipment.

Helicopter over flights are used to conduct instantaneous gear counts between the Port Mann Bridge and Sawmill Creek. These over flights are conducted once during the fishery and require one flight technician on each flight.

Data collection sheets are gathered from each of the monitors at the various monitoring sites and provided to DFO. Once all the CPUE and effort data is gathered the information is entered into a computerized statistical analysis program that generates weekly catch estimates.

- c) *Sawmill Creek to Kelly Creek and the Thompson River downstream of the Bonaparte River, Kelly Creek upstream to Deadman Creek and Deadman Creek to Naver Creek*
- A sample survey program during FN directed chinook fisheries is conducted by FNs /DFO staff along the Fraser River between Sawmill Creek and Kelly Creek and in the Thompson River downstream of the Bonaparte River confluence. Fishery Technicians interview all fishers encountered during random roving vehicle patrols to obtain catch and effort information (CPUE). Total fishing effort is obtained by averaging the count of active nets or hook & line gear observed during a given week.

No catch monitoring program was undertaken in the main stem Fraser River from Kelly Creek upstream to Deadman Creek during directed First Nation chinook fisheries in this area. Catch and effort in directed chinook fisheries in this area is extremely small. Catch monitoring is undertaken by members of the High Bar Indian Band when sockeye fisheries occur in this area. Chinook caught incidentally in fisheries directed on sockeye salmon are enumerated.

Very limited First Nation fisheries directed on chinook salmon occur in the main stem Fraser River from Deadman Creek to Naver Creek. Accordingly, no monitoring program is in place to monitor catch in directed chinook fisheries. Monitoring occurs during directed sockeye fisheries in this area and chinook harvested incidentally to directed sockeye fisheries are enumerated.

- d) *Naver Creek upstream and the Nechako River to Isle Pierre*
- Lheidli T'enneh Nation monitor each of the fisheries via collecting hail information from the fishers.
- e) *Nechako River upstream of Isle Pierre and the Stuart System*
- Lheidli T'enneh Nation monitor each of the fisheries via collecting hail information from the fishers.

f) Thompson River upstream of the Bonaparte River

The Secwepemc (Shuswap) Nation Fisheries Commission monitor each of the fisheries on a census basis utilizing staff from their individual member bands.

g) Shuswap River (Shuswap Falls to Mabel Lake)

The Okanagan Nation Alliance monitor their fisheries on a census basis utilizing staff from their individual member bands.

2. Commercial Fisheries

Commercial catch data for the salmon fishery is primarily from fish slips and on board observers. Fish slips are required when fish are sold, offloaded or taken home for personal consumption. The number and weight of each salmon species landed and/or sold are required on the slip. A new survey designed to estimate catch and effort by in-river fisheries by area and time of day was implemented in 1998. The survey includes the following: on the ground observations; hails; over flights; mandatory phone catch reporting requirements; log book submissions; and point of offloading sampling.

DFO obtains further information about salmon average weight data through a Mark Recovery Program (MRP). This program involves collecting salmon heads from adipose fin clipped fish from commercial and recreational landings. While the samplers are at a plant, they also collect individual salmon weights to contribute to the average weight estimate. An average weight estimate is obtained by species, and gear, MRP catch region and fishing period (week). The average weight is used to calculate pieces from the total weight reported on the fish slips. The 2004-2005 WCVI chinook troll fishery catch and releases are given in Appendix J.

3. Recreational Fisheries

DFO obtains most of its catch information through the Creel Survey Program which is carried out in recreational fisheries that have displayed significant catch and effort characteristics in past years. This program incorporates surveys by land (access point and roving surveys) and air of active fishermen. In 2005, the lower Fraser was surveyed between Sumas and Hope from May 1st to September 7th, and the Chilliwack River was surveyed from September 15th to

November 15th. While Nicomen Slough and Norrish Creek were surveyed from October 8st to November 30th, anglers were not allowed to retain chinook in these systems. Chinook salmon recreational openings in specific sections of the Fraser River upstream of Sawmill Creek, the Bridge River, the lower Shuswap River, Mabel Lake and the Thompson River at Spences Bridge were also surveyed during their open times. Preliminary catch numbers are available in Appendixes G, H, and I.

6. Draft Fishing Plans

Special concerns for 2006

Survival rates for many stocks of chinook salmon in the Pacific Northwest are substantially lower than they were in the 1980's. Continuing to be of particular concern are some of the earliest returning populations of the spring-run age 5₂ and spring-run age 4₂ chinook aggregates referred to as early-timed chinook populations (e.g. Birkenhead River, Coldwater River, Spius Creek and Upper Chilcotin River). Many summer-run age 5₂ and summer-run age 4₁ populations have increased in recent years while escapement estimates of the four early-timed populations tend to display an erratic trend. While the status of the spring-run age 4₂ and spring-run age 5₂ aggregates are uncertain, the escapements to the four selected early timed populations within this aggregate were very low in 2005 and there is an increasing likelihood that conservation concerns may develop if these populations continue to display very low escapements in upcoming years.²

A review of the status of 4 early timed stocks within the Fraser River spring run chinook aggregate (i.e., Upper Chilcotin, Coldwater, Spius, Birkenhead) was undertaken by the Pacific Scientific Advice Review Committee (PSARC) in 2001. Recommendations resulting from this review were to manage Canadian domestic chinook fisheries up to the end of April each year in a manner that would not exceed an exploitation rate of 33% on these four stocks.

² PSARC Research Document 2001/134 Summary of stock assessment information for selected early returning chinook salmon populations of the Fraser River watershed.

Migration characteristics of these stocks do not coincide with periods of heavy fishing activity throughout most of their migratory route. These stocks are usually not affected by adverse weather conditions (high water, high water temperature) but have been found to display low productivity. Review of recent data suggests that the First Nation fishery in the lower Fraser River exerts the highest harvest rate on these early timed chinook stocks (Bailey et al. CSAS 2001/134).

The Department has been managing the spring timed chinook stocks (which includes the early timed component of this stock aggregate) using a fishing plan that has been reasonably consistent for years 2001 to 2005. Catches and associated harvest rates have varied during this time period but there is potential for significant increases in harvest rate on an annual basis if in-river fishing conditions result in improved catching efficiency of fishing gear.

Some lower Fraser First Nations expressed the desire to change their method of fishing from set gill nets to drift gill nets. The Department considered these requests and authorized drift net fishing in the waters located between the Mission Bridge and Sawmill Creek in the spring of 2005. A study was undertaken to compare the cumulative effects of set nets versus drift nets in the area. The results of the study will be made public soon. It must be recognized that mobile and larger nets have potential to increase normal rates of catch and harvest rates may increase accordingly. Fishing plans for the entire area need to be coordinated to ensure that increased impacts do not result in an increased harvest rate on early timed chinook stocks. In addition the harvest rate impact of providing separate fishing times for First Nation groups in the lower Fraser canyon area will be reviewed to determine if this management approach is consistent with recommendations provided by the Pacific Scientific Advice Review Committee (PSARC) regarding management of early timed Fraser chinook stocks. These recommendations state that the fishery exploitation rate in chinook fisheries conducted to the end of April on early timed stocks should not exceed 33%.

The Department of Fisheries and Oceans (DFO) will also be discussing with Fraser First Nations and the South Coast SFAB, a Fraser River early chinook management concept referred to as the 'traffic light' management system. This proposed system is intended to

develop a more transparent and consistent approach to managing Fraser River early timed chinook stocks in a manner that will ensure long term sustainability of these stocks of concern. Decisions with respect to implementation of the 'traffic light' management system will be made prior to the 2007 fishing season. The 'traffic light' management approach will not be implemented in its entirety during the 2006 fishing season.

As of March 01, 2006, lower, middle Fraser and Thompson River watershed snow pack levels were tracking at near normal levels as determined by monitoring stations in these areas. The upper Fraser snow pack conditions are tracking below normal at this time. Further updates on this topic can be found at the following web address: <http://www.env.gov.bc.ca/rfc/>

1. Aboriginal

The primary objective in developing 2006 fishing plans will be to ensure protection for the early timed chinook stock components of the Fraser chinook spring stock aggregate, wild steelhead stocks, and Interior Fraser and Thompson coho stocks. The objective of the 2006 harvest strategy for early season First Nations fisheries is to provide access to First Nations for food, social & ceremonial needs while addressing fishery exploitation rate concerns on early timed Fraser chinook stocks.

The following management approaches are presented for consideration:

- 2006 chinook allocations are agreed to with all and /or some Fraser First Nations and commensurate catch monitoring programs are put in place to ensure harvests do not exceed agreed to allocations.
- Develop a fishing plan that is consistent with advice provided by the Pacific Scientific Advice Review Committee (PSARC) regarding exploitation rate guidelines for the early timed component of the Fraser River spring Chinook stock aggregate.

The Department also encourages discussion among Fraser River First Nation groups in the watershed in the development of fishing plans. Improved coordination in the development of a Fraser River watershed chinook fishing plan for First Nations will assist with addressing conservation concerns for early timed Fraser chinook.

2. Recreational

For 2006, the Department will be consulting on the following:

- Fraser River downstream of the Alexandria Bridge: chinook retention from May 1 to December 31.
- The daily limit is 4 chinook, only one of which may be over 50 cm. The possession limit is two times the daily limit . The gear permitted is one line per angler, with a single, barbless hook restriction in place. A bar rig is also permitted but only in those waters downstream of the Mission Bridge.

The following tables outline proposed tidal and non tidal recreational chinook opportunities in the Strait of Georgia and Fraser River watershed for the 2006 fishing season:

Table 3: Freshwater Salmon Sport Fishing Regulations: Region 2: Lower Mainland

1. Unless otherwise stated in the table, the daily limit in all waters of Region 2 is zero (0).
2. The aggregate daily limit for all species of Pacific salmon (other than kokanee) from tidal and non-tidal waters combined is four (4).
3. All retained coho must measure 25 cm or more from tip of nose to tail fork, and all retained chinook, chum, pink, and sockeye must measure 30 cm or more from tip of nose to tail fork.
4. A single barbless hook is in effect year round for all streams in Region 2.
5. There is an annual limit of 10 adult chinook. All retained adult chinook must be recorded on the back of your freshwater angling licence. An "adult chinook" in Region 2 is defined as being over 50 cm except in the following areas where an "adult chinook" is defined as being over 62 cm:
 - a) the Fraser River between the CPR bridge at Mission to the powerline crossing approximately 1 km above the Aggasiz/Rosedale bridge from Sep 01 - Dec 31,
 - b) the Chilliwack/Vedder River below Slesse Creek and the Sumas River below the Barrow Town Pump station from Jul 01 - Dec 31,
 - c) the Capilano River.

WATERS	SPECIFIC AREA	SPECIES	DATES	LIMITS / GEAR
Chehalis River	From the logging bridge 2.4 km below Chehalis Lake to the confluence of the Harrison/Chehalis Rivers, including tributaries to that part	All	Sep 01-Dec 31	Daylight hours only.
		Chinook	Jan 01-May 31	<i>No fishing for chinook.</i>
			Jun 01-Aug 10	4 per day, only 1 over 50 cm.
			Aug 11-Sep 15	<i>No fishing for chinook.</i>
			Sep 16-Dec 31	4 per day, only 1 over 62 cm.
Chilliwack/Vedder River (including Sumas River)	Downstream from Slesse Creek including that portion of the Sumas River from the Barrow Town Pump Station downstream to boundary signs near the confluence with the Fraser River	All	Sep 01-Dec 31	Daylight hours only.
		Chinook	Jul 01-Mar 31	4 per day, only 1 over 62 cm.
Dewdney Slough - See Nicomen Slough				
Fraser River	Salmon closures are being considered from early September to mid-October to protect co-migrating Upper Fraser and Thompson River coho. Please contact your local DFO office for details.			
	From the downstream side of the CPR Bridge at Mission upstream to the Alexandria bridge, except Landstrom Bar (described below) which is closed to all angling from May 1 to Oct. 31.	All	Jul 01-Dec 31	Daylight hours only.
		Chinook	May 1-Dec 31	4 per day, only 1 over 50 cm.
		Landstrom Bar is those waters of the Fraser River inside a line beginning at a fishing boundary sign on the eastern end of Landstrom Bar, then to a fishing boundary sign on the opposite bank, then to a fishing boundary sign at the southern end of Croft Island, then westerly to a fishing boundary sign on the nearest bank of the river, then following the river bank to the beginning point.		
Harrison River	From the Highway 7 bridge to the confluence with the Fraser River	All	Jul 01-Dec 31	Daylight hours only.
		Chinook	Sep 01-Dec 31	4 per day, 1 over 50 cm
Pitt River	Upper and Lower, including tributaries	Chinook	Jan 01-Dec 31	<i>No fishing for chinook.</i>
Stave River	Downstream of B.C. Hydro Dam to the CPR Railway Bridge	Chinook	Jan 01-Dec 31	1 per day.
Sumas River - See Chilliwack River				
Vedder River - See Chilliwack River				

Table 4: Freshwater Salmon Sport Fishing Opportunities: Region 3: Thompson-Nicola

1. Unless otherwise stated in the table, the daily limit in all waters of Region 3 is zero (0).
2. The aggregate daily limit for all species of Pacific salmon (other than kokanee) from tidal and non-tidal waters combined is four (4).
3. A single barbless hook is in effect year round for all streams in Region 3.
4. There is an annual limit of 10 adult chinook. All retained chinook must be recorded on the back of your freshwater angling licence. An "adult chinook" in Region 3 is defined as being over 50 cm.

WATERS	SPECIFIC AREA	SPECIES	DATES	LIMITS/GEAR
Bridge River	Downstream from Road 40 bridge to the confluence of the Fraser River (see also Fraser River opportunity).	Chinook	Jun 21- Jul 14 Sun, Mon, Tue, Wed, Thur only 06:00 to 21:00 hours daily.	4 per day, only 1 over 50cm.
Clearwater River	From Clearwater Lake downstream to the confluence of the North Thompson River (except CLOSED from Murtle River downstream to 35km post from Aug 16 - 31 to protect Mahood R. chinook).	Chinook	Aug 1-Aug 31	4 per day, only 2 over 50cm. Monthly quota is 4 over 50cm (includes adult chinook caught and retained from North Thompson River).
Fraser River	Main stem of the Fraser R. in Region 3 except for that portion of the Fraser R. described below	Chinook	Apr 1-Sep 17	4 per day, none over 50cm.
	From the confluence of the Seton River and the Fraser River, downstream to the BC Hydro turbine generator tailrace located approximately 1 km downstream of the town of Lillooet.	Chinook	Jul 1-Sep 07	4 per day, only 1 over 50cm.
	From the confluence with the Bridge River downstream to the BC Railway bridge, 2 km north of Lillooet (see also Bridge River opportunity).	Chinook	Jun 21-Jul 14 Sun, Mon, Tue, Wed, Thur only 0:600 to 21:00 hours daily.	4 per day, only 1 over 50cm.
Little Shuswap Lake - See South Thompson River				
North Thompson River	Downstream of Station Road Bridge in Clearwater to the Ferry crossing at Little Fort.	Chinook	Aug 1-Aug 31	4 per day, only 2 over 50cm. Monthly quota is 4 over 50cm (includes adult chinook caught and retained from Clearwater River)
	Main stem river.	Chinook	Sep 1-Sep 22	4 per day none over 50 cm (retention of jack chinook only).

WATERS	SPECIFIC AREA	SPECIES	DATES	LIMITS/GEAR
South Thompson River	From the green can buoy near outlet of Little River to 100m downstream of Campbell Creek.	Chinook	Aug 5-Sep 22	4 per day, only 2 over 50 cm. Monthly quotas are 6 over 50cm.
Thompson River	From Kamloops Lake downstream to the confluence with the Fraser River.	Chinook	Jun 1-Sep 21	4 per day, none over 50cm (retention of jack chinook only) See exceptions below
	From the upstream side of the mouth of the Nicola River downstream to the Hwy 8 bridge at Spences Bridge.	Chinook	July 22 to August 14. Sat, Sun, Mon only, 06:00 to 21:00 hours only.	4 per day, only 1 over 50cm. Environmental conditions in Nicola River may result in closure. Check with your local DFO office for updates.
	From confluence with Bonaparte River to boundary sign approximately 1 km downstream. North Bank of the river only.	Chinook	To be determined in-season.	Opening dependent on number of chinook returning to Bonaparte fish way by July 25. Check with your local DFO office for updates.
	From Hwy 8 bridge at Spences Bridge upstream to a fishing boundary sign located approximately 1 km downstream of Martel (west side of river only). These waters open to fishing are subject to change.	Chinook	Aug 22-Sep 03	4 per day, only 1 over 50 cm. Check with your local DFO office for updates.

**Table 5: Freshwater Salmon Sport Fishing Opportunities: Region 5a: Cariboo
(Part A, Fraser River Watershed, Management Units 5-1 to 5-5 and 5-12 to 5-16)**

1. Unless otherwise stated in the table, the daily limit in all waters of Region 5 is zero (0).
2. The aggregate daily limit for all species of Pacific salmon (other than kokanee) from tidal and non-tidal waters combined is four (4).
3. All retained chinook, must measure 30 cm or more from tip of nose to fork in tail (fork length).
4. A single barbless hook is in effect year round for all streams in Region 5.
5. There is an annual limit of 10 adult chinook. All retained chinook must be recorded on the back of your freshwater angling licence. An "adult chinook" in Region 5 is defined as being over 50 cm (fork length).

WATERS	SPECIFIC AREA	SPECIES	DATES	LIMITS / GEAR
Cariboo River	From confluence of the Quesnel River to the confluence of Seller Creek.	Chinook	Jul 27-Aug 18	4 per day, only 2 over 50cm.
Chilko River	From Chilko Lake downstream to boundary signs 1.5km upstream of Siwash bridge (12 km upstream from Chilcotin R. junction).	Chinook	Jul 25-Aug 16	4 per day, only 2 over 50cm. Monthly limit of 4 over 50 cm.
Quesnel River	downstream of Poquette Creek	Chinook	Jul 15-Sep 1	4 per day, only 2 over 50cm.

Table 6: Freshwater Salmon Sport Fishing Opportunities: Region 7: Omineca-Peace
Shaded areas are new or changed opportunities.

1. Unless otherwise stated in the table, the daily limit in all waters of Region 7 is zero (0).
2. The aggregate daily limit for all species of Pacific salmon (other than kokanee) from tidal and non-tidal waters combined is four (4).
3. All retained chinook, must measure 30 cm or more from tip of nose to fork in tail (fork length).
4. A single barbless hook is in effect year round for all streams in Region 7.
5. There is an annual limit of 10 adult chinook. All retained chinook must be recorded on the back of your freshwater angling licence. An "adult chinook" in Region 7 is defined as being over 50 cm (fork length).

WATERS	SPECIFIC AREA	SPECIES	DATES	LIMITS / GEAR
Bowron River	From Forestry Road bridge nearest to the Fraser River, upstream to the Bowron Forest Road bridge crossing near Haggen Creek.	Chinook	Jul 15-Aug 15	4 per day, only 2 over 50cm.
Fraser River	From power lines crossing the Fraser River near College Hts, upstream to the Northwoods Bridge crossing the Fraser River	Chinook	Jul 8-Jul 23	4 per day, only 1 over 50cm.
	Upstream of the Northwoods Bridge to a line between two fishing boundary signs approximately .5 kilometres downstream of the Salmon River.	Chinook	Jul 15-Aug 15	4 per day, only 1 over 50cm This is a proposed opening, consultation will occur prior to implementation. Check with your local DFO office.

Table 7: Freshwater Salmon Sport Fishing Opportunities: Region 8: Okanagan

1. Unless otherwise stated in the table, the daily limit in all waters of Region 8 is zero (0).
2. The aggregate daily limit for all species of Pacific salmon (other than kokanee) from tidal and non-tidal waters combined is four (4).
3. All retained chinook, must measure 30 cm or more from tip of nose to fork in tail (fork length).
4. A single barbless hook is in effect year round for all streams in Region 8.
5. There is an annual limit of 10 adult chinook. All retained chinook must be recorded on the back of your freshwater angling licence. An "adult chinook" in Region 8 is defined as being over 50 cm (fork length).

WATERS	SPECIFIC AREA	SPECIES	DATES	LIMITS / GEAR
Mabel Lake	South of fishing boundary signs located on opposite shores approximately 1 km from Wap Creek.	Chinook	12:00 Jul 25-12:00 Sep 12	4 per day, only 2 over 50 cm. Monthly quota is 4 over 50cm, including all Shuswap River and Mabel Lake chinook.
Shuswap River	Between Shuswap Falls and Mabel Lake.	Chinook	12:00 Jul 25 - 12:00 Aug 15	4 per day, only 2 over 50 cm. Monthly quota is 4 over 50cm, including all Shuswap River and Mabel Lake chinook.
	Upstream from signs above Mara Bridge to Mabel Lake.	Chinook	12:00 Jul 25 - 12:00 Sep 12 05:00-22:00 hours only	4 per day, only 2 over 50 cm. Monthly quota is 4 over 50cm, including all Shuswap River and Mabel Lake chinook.

Tidal Waters

Areas 28 and 29 are open year-round to the retention of chinook. The daily limit is 2 per day and both must be greater than 62 cm. There is an annual limit of 15 chinook from these waters.

3. Commercial

Area E: In 2004, Area E Gillnet Association (AEGA) submitted a multi-year proposal to conduct a limited opportunity "exploratory" chinook-targeted fishery. The planned timing of this fishery was late July to mid-August, within the peak abundance timing period of the summer run chinook aggregate. Fisheries were planned to occur during times when a commercial sockeye TAC was available for harvest.

During year one of this proposal 24 vessels were authorized to participate. This project took place within the Fraser River mainstem (Mission to Steveston) during the 2004 sockeye fishing

season. In an effort to restrict impacts of this proposal within acceptable limits, DFO identified a maximum allowable harvest of 2,500 chinook with a retention of sockeye by-catch. A total of 1,882 chinook were harvested in the 2004 season in two openings that took place on July 29 and August 12. Fish caught during this initiative were accounted for as part of the overall Area E harvest. Individual fishers participating in this project were not permitted to retain any catch, making this a "pooled" type of arrangement under AEGA.

Plans to continue with year two of this proposal in 2005 were cancelled due to by-catch constraints in sockeye salmon fisheries.

Pre-season discussions with AEGA advisors have confirmed that there is an interest in continuing with the chinook exploratory program in 2006. DFO staff will continue evaluating the status of chinook stocks and reviewing the impacts of this fishery. In reviewing the viability and direction of this proposal, the Department will be consulting with First Nations and stakeholders in order to make a decision about the future direction of this initiative.

Area G / WCVI Troll: Under the Pacific Salmon Treaty (PST), West Coast of Vancouver Island (WCVI) chinook fisheries are managed using an Aggregate Abundance Based Management model. Fisheries are directed on an aggregate comprised of different U.S. and Canadian chinook stocks. Abundance forecasts provide estimates for 2 years in advance. The fall 2004 stock information was used to forecast the aggregate abundance of all chinook stocks for Fall 2005 and Fall 2006. The 2004 forecast information provided for a domestic harvest of approximately 173,000 chinook for the 2005-2006 chinook year. (October 1, 2005 to September 30, 2006). For planning purposes, the domestic harvest levels for WCVI fisheries are estimated to be: First Nations FSC – 5,000, Recreational – 50,000 and Area G Commercial – 118,000.

It is important to note that the aggregate abundance can, and usually does change in April when stock information from the previous fall can be entered in the model. It is possible that in April 2006, the aggregate chinook abundance will increase; which in turn will increase the number of chinook available for domestic harvest requirements. Area G Fishing plans for the balance of the 2005-2006 season will be developed in consultation with the Area G Harvest Committee as the

2005-2006 Integrated Fisheries Management Plan is drafted. The first meeting in this process is scheduled for February 13, 2006.

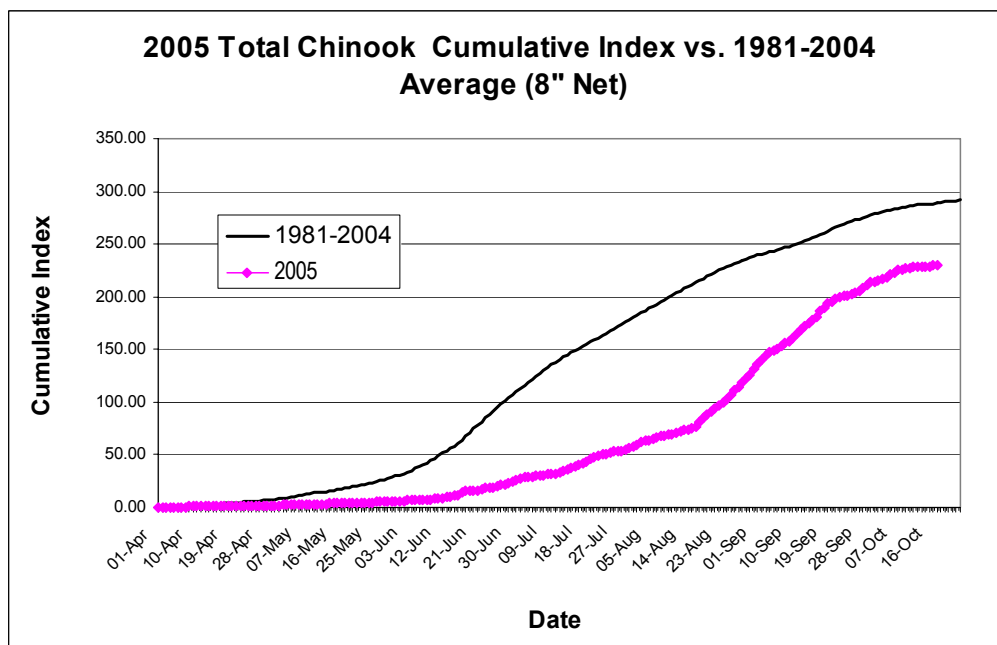
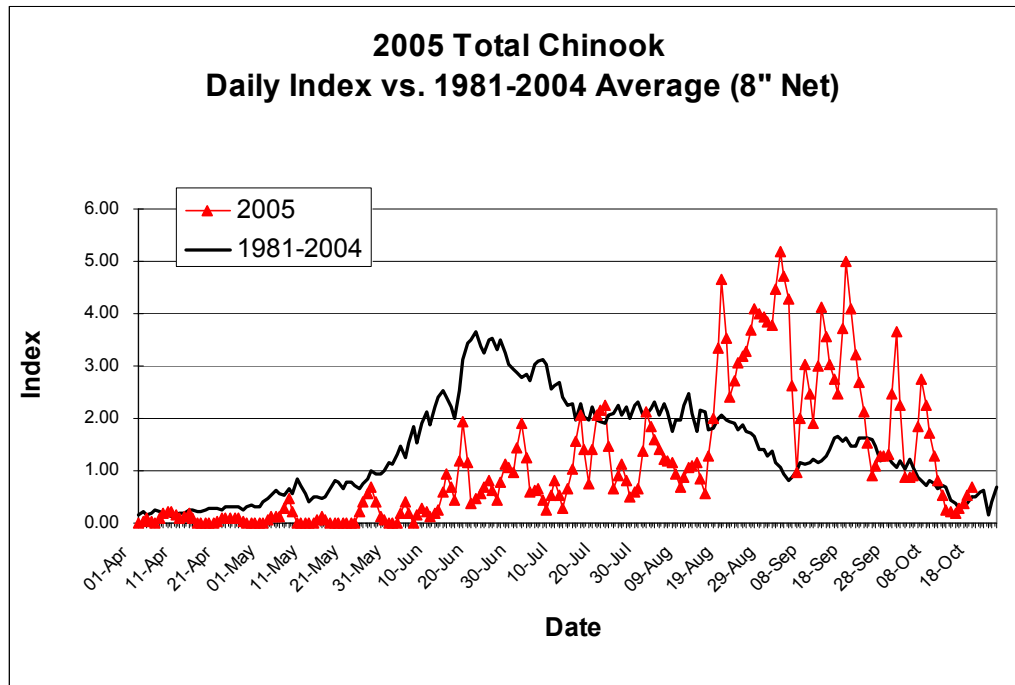
Area H Troll: Area H trollers have submitted a chinook sampling program to the department for consideration. The objectives of the Area H proposal are to:

- Determine areas and times where stocks of concern can be avoided while targeting abundant stocks by gathering stock composition information;
- Gather catch and biological information on chinook stocks focusing on months where significant data gaps are thought to exist; and
- Use the information to investigate the feasibility of a future small troll fishery for Area H.

The focus for 2006 will be on Area 29 and the terminal (near Fraser River mouth) assessment of the South Thompson and Harrison chinook by sampling in August and September.. The Area H Association will be paying for all costs of analyzing the DNA samples and providing a written report to the Department.

Appendix A: Albion Test Fishery

The following figures summarize catches in the Albion chinook test fishery for 2005 and compares these catches with data averaged from previous years. Figure 1 gives the daily catch per unit effort (CPUE) and compares it to the average of the historical data from 1981-2004. Figure 2 give cumulative CPUE and compares it to average cumulative CPUE from 1981 - 2004. The advantage of viewing CPUE cumulatively is a better understanding of the total success of the year's fishery as compared to the historical average.



Appendix B: Chinook escapement estimates to tributaries in the lower Fraser River

Early timed stocks are highlighted and indicator stocks are presented in bold italics.

Year	Chilliwack	Maria	Upper Pitt	Stave	<i>Harrison River</i>		Birkenhead	Lillooet
	River	Slough	River	River	<i>Visual</i>	<i>M.R.</i>	River	River
1971	25	75	7,500	n/o	15,000	<i>n/r</i>	250	n/r
1972	200	200	750	n/o	15,000	<i>n/r</i>	400	n/r
1973	100	200	750	n/o	35,000	<i>n/r</i>	200	n/r
1974	100	75	500	n/o	35,000	<i>n/r</i>	400	n/r
1975	100	75	300	n/o	15,000	<i>n/r</i>	200	400
1976	25	25	750	n/o	7,500	<i>n/r</i>	200	400
1977	25	200	700	n/o	25,000	<i>n/r</i>	600	400
1978	100	150	150	25	15,000	<i>n/r</i>	400	400
1979	50	75	250	n/r	15,000	<i>n/r</i>	200	750
1980	50	100	200	n/r	10,000	<i>n/r</i>	300	300
1981	25	20	325	n/o	20,000	<i>n/r</i>	100	300
1982	25	50	300	n/r	22,000	<i>n/r</i>	400	1,000
1983	8	50	300	n/r	6,000	<i>n/r</i>	550	650
1984	50	30	n/o	n/r	15,000	120,837	300	500
1985	1,492	200	n/o	n/r	50,000	174,778	200	200
1986	4,291	110	300	n/r	35,000	162,596	150	n/r
1987	16,790	4	350	n/r	<i>n/r</i>	79,038	80	n/r
1988	14,467	67	850	n/r	<i>n/r</i>	35,116	412	n/r
1989	2,933	50	375	n/r	<i>n/r</i>	74,685	415	200
1990	1,570	25	450	n/r	<i>n/r</i>	177,375	275	n/r
1991	8,392	n/r	150	n/r	<i>n/r</i>	90,638	242	n/r
1992	35,856	n/r	300	n/r	<i>n/r</i>	130,411	713	50
1993	17,834	n/r	175	n/r	<i>n/r</i>	118,998	241	n/r
1994	6,826	n/r	n/r	n/r	<i>n/r</i>	98,334	343	n/r
1995	29,820	n/r	n/r	n/r	<i>n/r</i>	28,616	162	n/r
1996	21,928	100	n/r	n/r	<i>n/r</i>	56,809	293	n/r
1997	79,717	100	n/r	n/r	<i>n/r</i>	72,277	573	n/r
1998	78,780	150	n/r	n/r	<i>n/r</i>	188,420	565	n/r
1999	74,945	198	n/r	n/r	<i>n/r</i>	106,995	147	n/r
2000	70,983	266	n/r	n/r	<i>n/r</i>	125,854	404	n/r
2001	68,247	400	n/r	n/r	<i>n/r</i>	113,777	624	n/r
2002	58,852	1,200	276	n/r	<i>n/r</i>	89,968	463	n/r
2003		823	171	n/r	<i>n/r</i>	247,121	427	n/r
2004	67,952	n/r	n/r	n/r	<i>n/r</i>	128,944	180	n/r
2005	39,429*	444**	341**	n/r	<i>n/r</i>	86,730	1,425**	n/r

n/r – none recorded (escapement program did not proceed)

n/o – none observed

* Near Final

** Preliminary

Birkenhead escapement 1991-2004 is based on a single stream walk each year on Sep 12

Appendix C: Chinook escapement estimates to tributaries in the BC Interior

C.T.C. Indicator Stream	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>
Spring - Run Age 1.3 (5 sub 2)															
Upper Pit River	150	300	175	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	276	171	N/R	341
Birkenhead River	242	713	241	343	162	293	573	565	147	404	624	463	427	180	1425
Bridge River	150	800	950	615	851	1900	1968	626	898	769	198	969	N/I	1115	183
Chilcotin River	3140	2486	3100	6354	3480	2285	4000	1636	2896	2971	1574	2092	3396	1064	1509
Cottonwood River	1000	2700	4470	4690	2100	1750	3329	2592	641	1208	781	1352	1555	1241	646
Horsefly River	500	400	200	4154	185	400	115	43	137	174	281	380	246	375	509
Westroad River	2500	2500	3200	6150	6050	4615	7206	3827	984	1600	1924	1620	2966	1366	846
Bowron River	4200	4670	6140	9104	8316	4577	7334	7618	3455	3220	5491	8719	10059	8160	4074
Fraser R. (Tete Juane)	4027	3224	3300	4240	6000	4100	2935	2586	2081	2262	4976	3913	3048	2062	2535
Goat River	107	100	55	293	400	440	354	302	89	212	411	820	569	174	151
Holmes River	1500	2150	2100	1877	2600	2775	3203	2362	523	1795	1018	3740	4110	1376	821
Horsey River	50	90	130	unk	120	20	75	57	14	128	78	308	288	62	34
McKale River	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20	present	32	9	81	49	68	78
McGregor Tributaries	1300	4150	unk	1851	2412	3461	2505	4471	1870	2449	2420	3751	4103	3253	1310
Chilako Creek	150	150	25	119	200	624	186	39	115	20	7	229	N/I	106	202
Endako River	200	10	20	200	125	167	43	191	171	160	275	292	N/I	N/I	252
Ormond Creek	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/I	N/I	N/I
Nevin Creek	N/A	N/A	N/A	N/A	N/A	N/A	N/A	161	46	62	57	132	385	238	77
Slim Creek	2500	1725	1300	2473	4634	2268	3130	2664	1235	2112	2876	3021	3676	2284	2161
Swift Creek	600	980	1000	886	1700	1500	1200	1098	375	486	982	1535	835	520	335
Walker Creek	100	500	150	240	101	426	122	392	206	252	177	381	543	277	103
Torpy River	2000	2600	1000	1921	1590	1055	1042	2293	1819	1468	1755	2565	4457	2730	1027
Willow River	500	700	600	1170	817	1612	1961	2041	717	1314	893	1033	1980	1887	1012
Barriere River	50	N.I.	50	44	21	unk	unk	N.I.	present	77	362	377	131	306	220
Finn Creek	460	630	1300	1837	810	1569	725	632	524	1511	1115	650	45	538	185
Eagle River	835	1271	1100	1200	700	780	915	N.I.	624	1085	1397	1458	1583	867	427
Salmon River (Prince George)	300	300	25	729	901	1054	1200	1362	823	634	478	429	2395	1681	668
Salmon River (Salmon Arm)	616	300	1850	800	700	727	252	284	350	357	1362	1003	89	395	307

Stock Aggregate Totals	27177	33449	32481	51290	44975	38398	44373	37862	20740	26761	31521	41589	47106	32325	21438
C.T.C. Indicator Stream	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Spring Run Age 1.2 (4 sub 2)															
Deadman River	232	241	1200	1591	540	1506	934	665	350	787	780	1940		1159	417
Spilus Creek	248	250	900	150	500	500	450	300	52	668	603	1012	1170	1866	291
Coldwater River	325	1332	1500	275	1050	1500	400	300	267	497	781	1394	1195	1018	183
Nicola River	2500	4028	4000	7970	6500	16400	7614	1211	7263	8808	7771	11643	14574	7850	2926
Louis Creek	10	6	20	510	800	420	480	377	183	611	349	481	198	105	63
Bessette Creek	180	80	270	100	280	400	N.I.	150	404	360	323	350	N/O	182	18
Stock Aggregate Totals	3495	5937	7890	10596	9670	20726	9878	3003	8519	11731	10607	16820	17137	12180	3898
Summer Run Age 1.3 (5 sub 2)															
Portage Creek	N/R	50	330	36	N/R	300	N/R	18	200	46	248	445	158	103	86
Seton River	35	N/R	150	69	N/R	N/I	N/R	N/I	N/I	N/I	N/O	6	5	N/I	Present
Chilko River	7400	11168	6343	5665	10461	17000	16272	14549	8920	9171	10891	11027	21625	16287	7668
Quesnel River	4400	3375	5028	1549	3073	3100	3185	4906	1620	1718	2418	5520	5265	3356	3230
Cariboo River	1551	1000	2480	2000	817	1850	1800	936	573	744	503	1097	2198	351	526
Stuart River	7500	15000	1000	2420	3730	7415	6221	4642	3875	1875	1954	Present	Present	Present	Present
Nechako River	2360	2498	664	1144	1689	2040	1954	1868	1917	N/A	9331	5546	4077	5189	3217
Stellako River	N/R	N/R	N/R	10	N/R	N/R	N/R	15	18	N/R	N/R	N/R	N/O	N/I	231
Clearwater River	2219	2370	2700	5450	5100	7780	7830	7007	3837	4563	5051	5689	6234	4622	3519
Raft River	355	280	190	935	1371	870	1230	309	712	936	237	443	311	741	109
North Thompson River	2183	2020	2400	4164	N.I.	2375	2130	2156	3375	2732	3175	2200	1989	N/I	N/I
Stock Aggregate Totals	28003	37761	21285	23337	26241	42430	40622	36388	24847	21739.4	33560	31522	41699	30546	18586

**C.T.C. Indicator
Stream**

	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>
Summer Run Age 0.3 (4 sub 1)															
Maria Slough	N/R	N/R	N/R	N/R	N/R	100	100	150	198	266	400	1200	823	N/R	439
Adams River	3000	1300	800	1800	1900	2200	3400	4182	2029	2266	5890	3674	2496	2216	3837
Little River	250	600	unk	400	150	3000	1850	1246	1163	2043	9885	3680	2488	6000	7504
Lower Shuswap River	10000	13300	6000	10150	10000	19000	13100	16704	24691	20409	18349	19327	21380	13329	12927
Middle Shuswap River	5000	5000	2500	4000	3000	5000	3800	4474	2449	2617	3022	5442	4799	1415	1883
South Thompson River	8000	12000	4000	3000	5500	21600	27000	41277	22675	17560	36740	51298	38178	38592	61837

**Stock Aggregate
Totals**

26250	32200	13300	19350	20550	50900	49250	68033	53205	45161	74286	84621	70164	61552	88427
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**Spring - Run Age
1.3 (5 sub 2)**

Baker Creek	400	250	300	250	250	150	292	420	47	282	268	420	423	N/I	N/I
Dome Creek	523	458	575	530	550	571	625	400	309	198	49	450	444	270	191
East Twin Creek	N/I	N/I	N/I	N/I	N/I	N/I	N/I	64	N.I.	18	35	51	52	62	12
Holliday Creek	N/I	N/I	N/I	N/I	N/I	N/I	N/I	N	N.I.	15	74	126	48	54	17
Humbug Creek	N/I	N/I	N/I	N/I	N/I	N/I	N/I	N/I	N.I.	26	22	85	35	N/A	N/I
Kazchek Creek	N/I	N/I	N/I	N/I	N/I	N/I	N/I	0	present	Present	N/O	N /O	6	8	N/I
Kenneth Creek	N/I	N/I	N/I	N/I	N/I	N/I	N/I	132	17	65	58	338	148	N/A	N/I
Kuzkwa	N/I	N/I	N/I	N/I	N/I	N/I	N/I	N/I	N/I	N/I	215	300	345	245	
Naver Creek	300	unk	250	250	150	150	777	994	57	231	240	281	489	N/I	N/I
Narcosli Creek	300	500	250	350	250	150	757	254	161	145	383	129	382	N/I	N/I
Pinchi Creek	N/I	N/I	N/I	N/I	N/I	N/I	N/I	N/I	present	45	14	Present	15	25	
Ptarmigan Creek	N/I	N/I	N/I	N/I	N/I	N/I	N/I	58	103	49	8	66	140	N/A	N/I
	1523	1208	1375	1380	1200	1021	2451	2322	694	1074	1366	2246	2104	664	29

**Spring - Run Age 1.3 (5 sub
2) Cont....**

C.T.C. Non Indicator Stream	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	
Small Creek	N/I	N/I	N/I	N/I	N/I	N/I	N/I	115	66	34	48	268	212	6	15
Snoeshoe Creek	N/I	N/I	N/I	N/I	N/I	N/I	N/I	N	N	N/I	N/I	165	66	N/I	N/I
Fraser River (Tete Juane)	4027	3224	3300	4240	6000	4100	2935	2586	2081	2262	4976	3913	3048	2062	2535
Upper Cariboo River	N/I	N/I	N/I	N/I	N/I	N/I	N/I	N/I	N/I	N/I	407	198	367	N/I	N/I
West Twin Creek	N/I	N/I	N/I	N/I	N/I	N/I	N/I	24	N.I.	34	14	22	108	40	58
	4027	3224	3300	4240	6000	4100	2935	2725	2147	2330	5445	4566	3801	2108	2608
Stock Aggregate Totals	5550	4432	4675	5620	7200	5121	5386	5047	2841	3404	6811	6812	5905	2772	2637

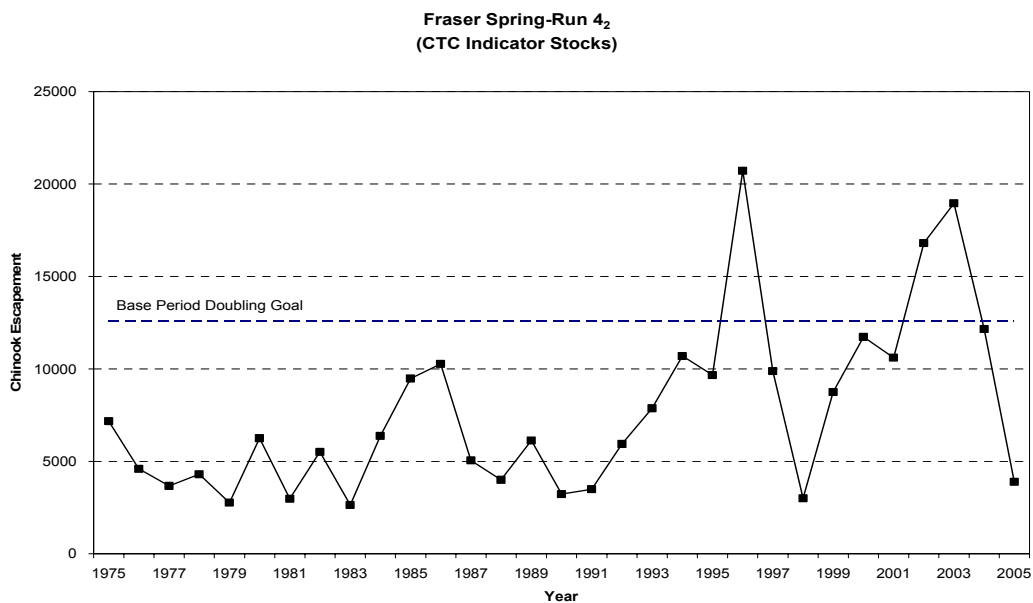
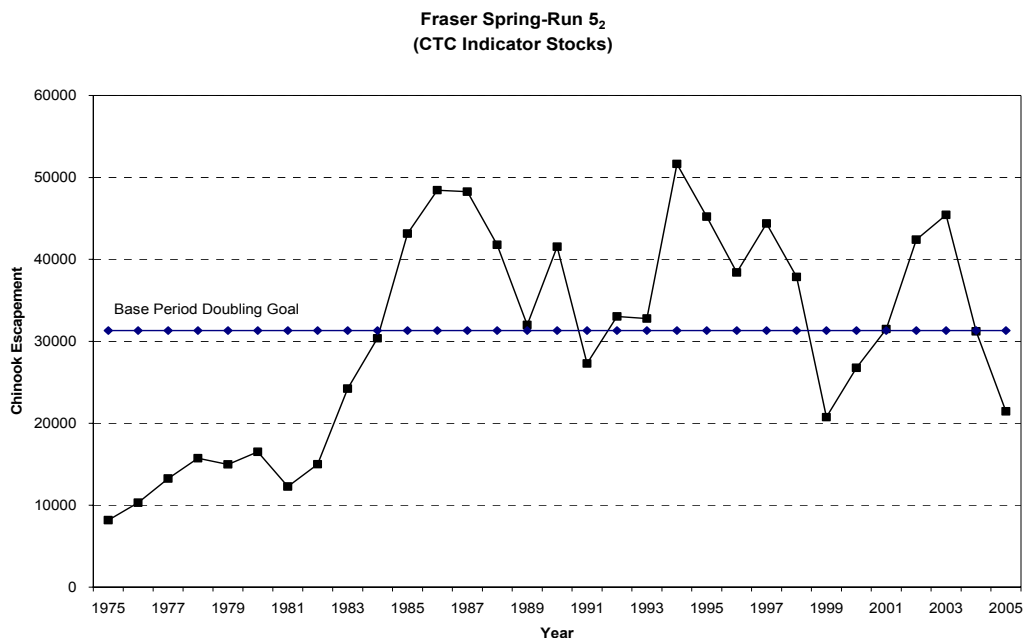
Spring Run Age 1.2 (4 sub 2)

Bonaparte River	2100	1659	1500	4283	4157	4391	10084	1864	1954	5258	6150	8216	8470	7990	3516
	2500	4028	4000	7970											
Stock Aggregate Totals	4600	5687	5500	12253	4157	4391	10084	1864	1954	5258	6150	8216	8470	7990	3516

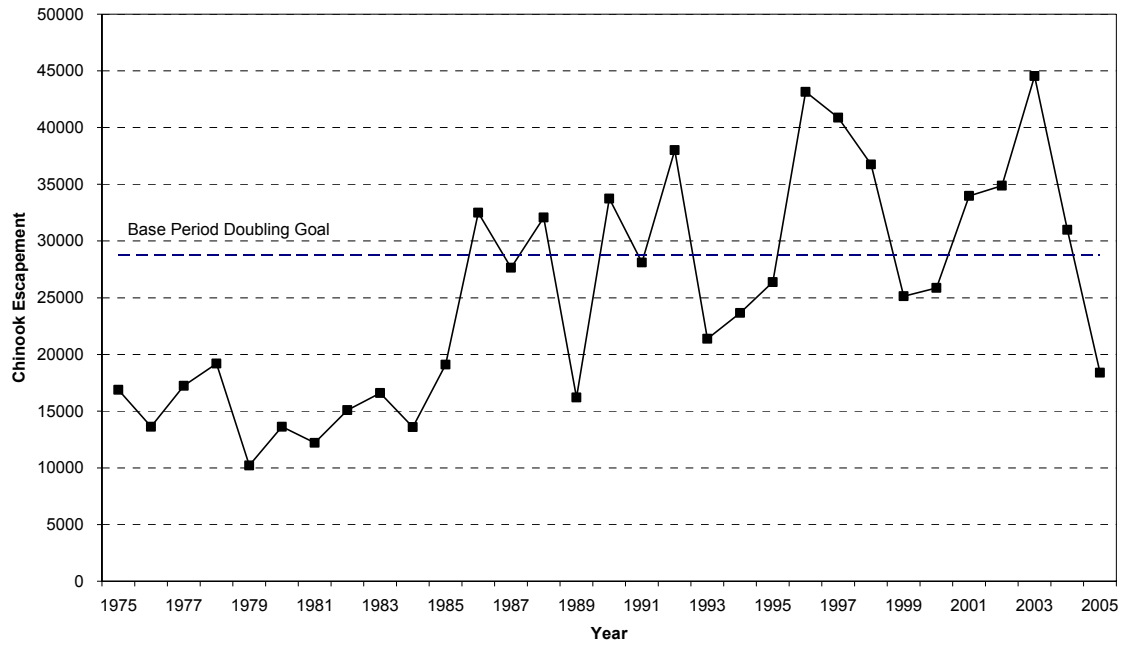
C.T.C. Non Indicator Stream	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
Summer Run Age 1.3 (5 sub 2)															
Adams River (Upper)	12	N.I.	unk	unk	128	220	275	100	107	60	109	46	150	238	N/I
Blue River	N.O.	40	8	48	35	0	0	110	11	235	88	480	329	152	N/I
Chilcotin River (Upper)	unk	unk	200	450	262	735	360	617	285	229	243	523	678	220	97
Eagle River	835	1271	1100	1200	700	780	915	N.I.	624	1085	1397	1458	1583	867	426
Elkin Creek	600	540	450	508	786	1250	806	651	417	394	458	420	1038	N/I	N/I
Lemieux Creek	N/I	N.I.	N/I	N/I	N/I	N/I	N/I	N/I	216	115	117	155	N/O	194	28
Lion Creek	12	50	12	150	65	95	N.I.	N.I.	34	0	3	N/O	N/I	N/I	N/I
Stock Aggregate Totals	1459	1901	1770	2356	1976	3080	2356	1478	1694	2119	2415	3082	3778	1671	

Appendix D: CTC Indicator Stocks

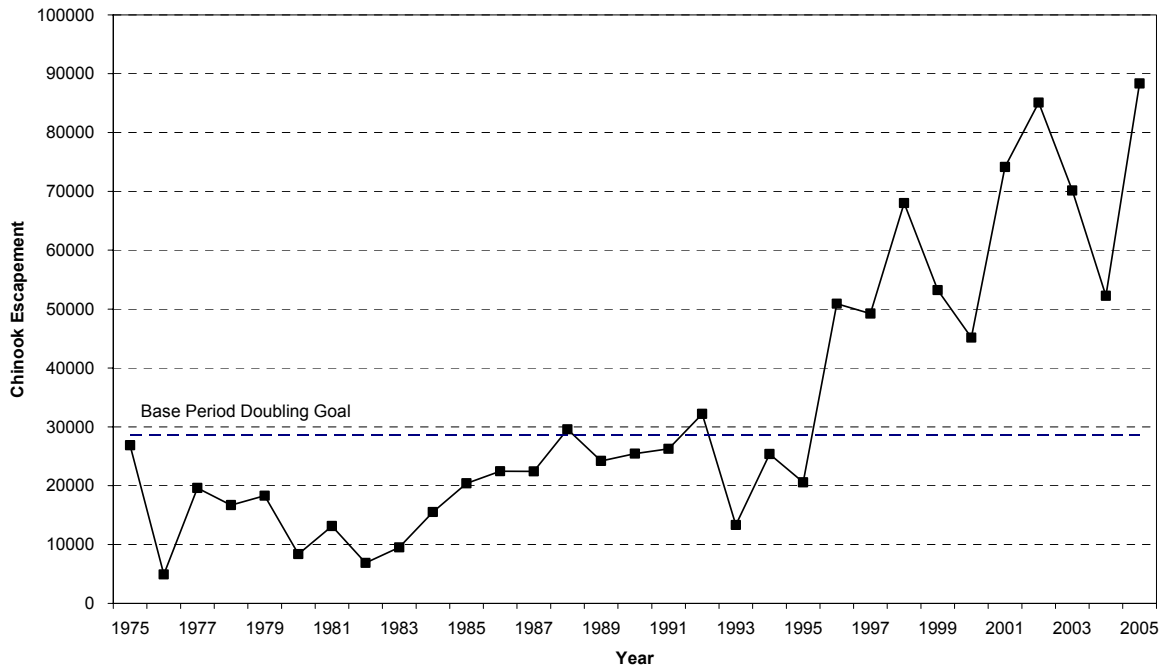
The Chinook Technical Committee established interim escapement goals for British Columbia chinook stocks in 1986. These interim goals for natural and enhanced stocks were set at double the 1979-82 base period or, for key streams, double the 1984 escapement estimate. They are referred to as, “base period doubling goals” (bdp). The fall run has amended it’s escapement goal from 241,00 to 75,000 using a stock-recruitment analysis. New escapement goals for other timing groups still using bdp, based on carrying capacity of systems, are currently under development.

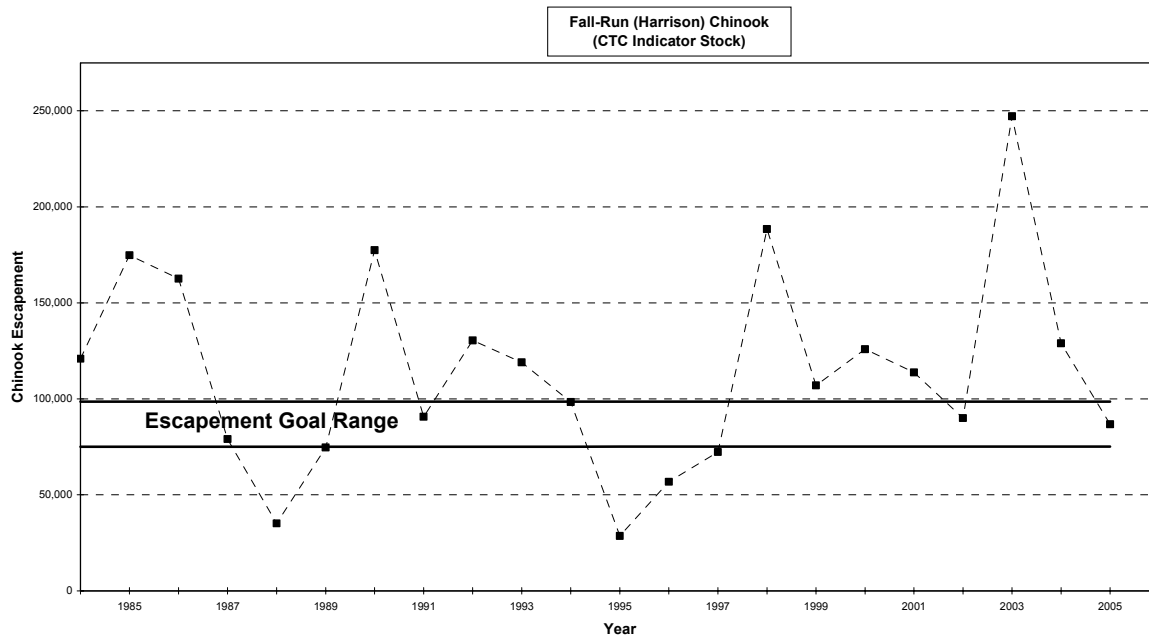


Fraser Summer-Run 5₂
(CTC Indicator Stocks)



Fraser Summer-Run 4₁
(CTC Indicator Stocks)





Appendix E: 2005 Annual Summary of First Nations Fisheries Chinook catch by area in the Fraser River mainstem and tributaries

AREA	CHINOOK
Mainstem Fraser	
Below Port Mann Bridge	1381*
Port Mann Bridge to Mission	944*
Mission to Hope	2260*
Hope to Sawmill Creek	5499*
Sawmill Creek to Texas Creek	2482
Texas Creek to Kelly Creek	747
Kelly Creek to Deadman Creek	0
Deadman Creek to Marguerite Ferry	68
Naver Creek to Shelly & Nechako R to Isle Pierre	64
Mainstem Subtotal	13,445
Tributaries	
Harrison River	0
Lillooet River System	unknown
Thompson River downstream of Bonaparte River confluence	38
Thompson River upstream of Bonaparte River confluence	827
Chilcotin River System	155
Nechako River System upstream of Isle Pierre	0
Stuart River System	3
Tributary Subtotal	1,023
TOTAL	14,468
<p>* catches to June 30, 2005 only (ie: FN directed Chinook fishery) Total 2005 Chinook harvest downstream of Sawmill Creek = 22,851</p> <p>Please note, the Fraser River is permanently closed from Williams Creek to Petch Creek, Kelly Creek to Deadman Creek and the Lillooet River System were not monitored. The Harrison River was also closed.</p>	

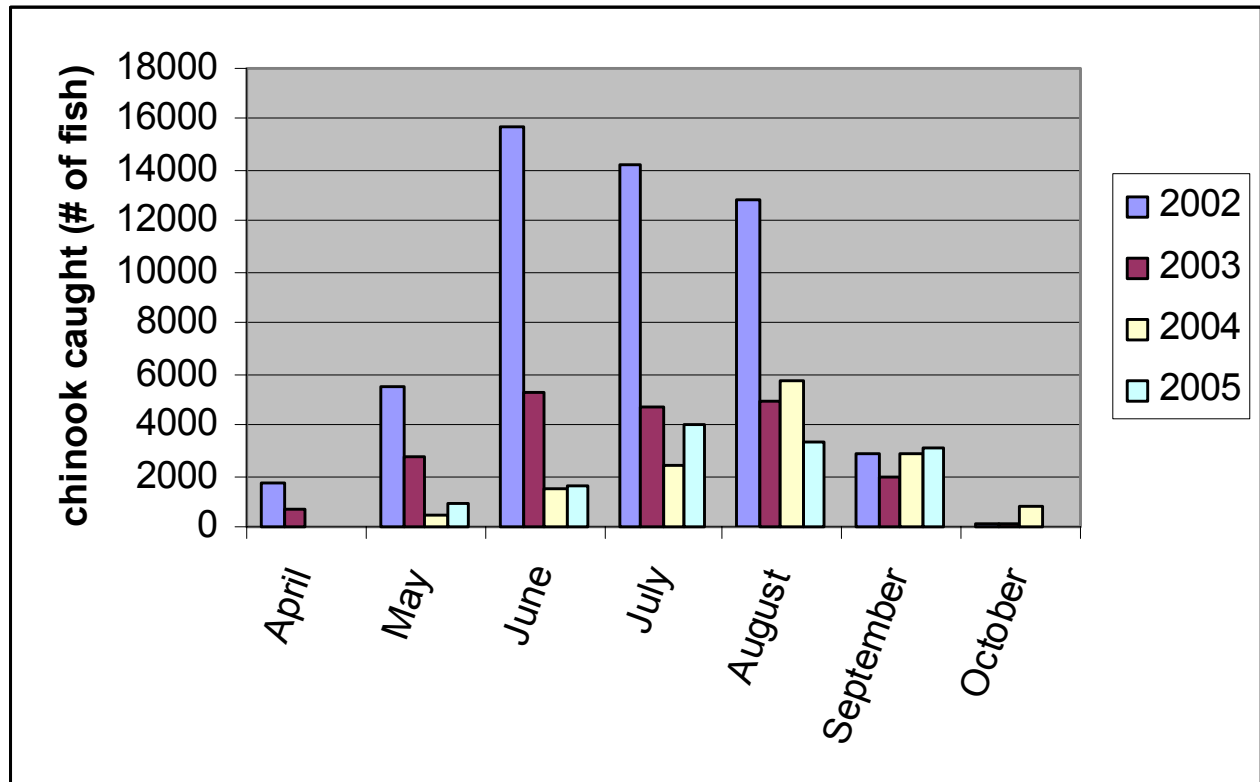
Appendix F: Preliminary estimates of Canadian commercial catches of chinook salmon by gear type and area during the 2005 fishing season.

Areas	Troll	Purse Seine	Gillnet	TOTAL
Area A		0		0
Area B		4,755		4,755
Area C			11,412	11,412
Area D			18,636	18,636
Area E			140	140
Area F	155,269			155,269
Area G	140,394			140,394
Area H	0			0
TOTAL	295,663	4,755	30,188	330,606

Appendix G: Recreational Catch Data - Georgia Strait Creel Survey

The study area is that part of the Strait of Georgia between Sheringham Point off Sooke to Stuart Island north of Campbell River. The study area includes Areas 13 to 19, 28 and 29. Area 19 is subdivided into 19A (Subareas 19-7 to 19-12) and 19B (Subareas 19-1 to 19-6).

Figure 1 - Georgia Strait Creel Survey Estimates for Chinook by Month



Appendix H: Preliminary 2005 Chinook Recreational Catches - Lower Fraser River Area

In 2005, recreational anglers were permitted to retain chinook on the Fraser River mainstem from the CPR Bridge at Mission upstream to the Alexandra Bridge from May 1 to December 31. Fishing was permitted during daylight hours only (from one hour after sunset to one hour before sunrise). The daily limit was four chinook per day of which only one could exceed 50 cm in length. The Fraser River mainstem creel survey took place from May 1st to September 7th, 2005 and covered the area from Sumas to Hope.

Table 1. Fraser River Mainstem (Summer) Creel Survey Final Results

2005 Fraser River Recreational Fishery Summary Table

	May 1-31	June 1-30	July 1-31	August 1-31	September 1-7	Total
Number of Interviews	206	627	1,884	2,123	1,983	6,823
Interview Hours	926	3,108	9,813	11,472	8,945	34,264
Number of Overflights	9	9	9	9	3	39
Average Overflight Count	51	106	280	509	1,601	509
ANGLER EFFORT						
Estimated Effort (hours)	12,496	28,119	98,893	167,985	132,383	439,876
ESTIMATED HARVEST						
Chinook Adult	102	406	3,039	7,477	2,522	13,546
Chinook Jack	0	6	0	48	124	178
Coho Adult	0	0	0	0	0	0
Coho Jack	0	0	0	0	0	0
Sockeye	0	0	11	6	42,612	42,629
Pink	0	0	0	2,067	15,323	17,390
Chum	0	0	0	0	39	39
ESTIMATED RELEASE						
Chinook Adult	0	11	159	175	56	401
Chinook Jack	0	0	6	19	100	125
Coho Adult	0	0	0	0	19	19
Coho Jack	0	0	0	0	0	0
Sockeye	0	0	3,601	48,083	18,130	69,814
Pink	0	0	0	6,626	31,896	38,522
Chum	0	0	0	47	125	172

In 2005, recreational anglers were permitted to retain chinook on the Chilliwack River from Slesse Creek downstream to boundary signs near the confluence with the Fraser River from July 1 to December 31. Fishing was permitted during daylight hours only (from one hour after sunset to one hour before sunrise). The daily limit was four chinook per day of which only one could exceed 62 cm in length. A creel program was run from September 15th to November 15th, 2005 on the Chilliwack River. Preliminary results from this creel are presented in the tables below.

Table 3: Chilliwack River Recreational Fishery Assessment from September 15 to November 31, 2005. Total catch and release (weekend and weekday catch and release data combined).

2005 Fall Chilliwack Recreational Fishery Summary Table

	September 15-30	October 1-31	November 1-15	Total
Number of Interviews	1,193	3,799	602	5,594
Interview Hours	4,394	13,530	1,980	19,904
Number of Overflights	5	9	5	19
Average Overflight Count	258	606	106	323
ANGLER EFFORT				
Estimated Effort (hours)	40,335	159,549	12,097	211,981
ESTIMATED HARVEST				
Chinook Adult	1,184	4,096	22	5,302
Chinook Jack	407	1,002	9	1,418
Coho Adult	771	2,832	415	4,018
Coho Jack	6	33	0	39
Sockeye	0	0	0	0
Pink	1,634	237	0	1,871
Chum	172	1,220	232	1,624
ESTIMATED RELEASE				
Chinook Adult	1,403	8,545	239	10,187
Chinook Jack	454	2,124	31	2,609
Coho Adult	386	2,595	367	3,348
Coho Jack	47	31	0	78
Sockeye	0	0	0	0
Pink	13,919	12,770	0	26,689
Chum	488	10,801	3,991	15,280

Appendix I: Preliminary 2005 Chinook Recreational Catches – Upper Fraser River (1)

System	Time/Duration	Hours Fished	Total Annual Catch
Bowron River	July 15 – Aug 15: 7days/week	N/A	No creel survey
Chilko River	July 25 - Aug 16: 7days/week	N/A	No creel survey
Fraser River at Prince George	Jul 9 – Aug 15: 7days/week	N/A	No creel survey
Fraser River (confluence of Seton / Fraser River downstream to Seton powerhouse)	July 01 - Sept.07	N/A	No creel survey
Fraser River (confluence of Seton / Fraser River to fishing boundary signs approx. 4 kms downstream of town of Lillooet)	August 14 – September 07 (0500 to 2100 hrs daily)	2322	16 (incidental catch in directed sockeye fishery)
Cariboo River	Jul 27 – Aug 18 7days/week	N/A	No creel survey
Quesnel River	Jul 15 - Sept 1: 7days/week	N/A	No creel survey
Bridge River	June 21 – Jul 14: 5 days/week (0600 - 2100 hrs)	3165	243
Mabel Lake	noon July 25 to noon Sept 12: 7days/week	3865	106
North Thompson River (Clearwater River)	Aug 1 – Aug 31: 7 days/week	N/A	No Creel
Shuswap River (lower)	noon July 25 - noon Sept 12: 7days/week (0500 to 2200 hrs. daily)	14564	620
Shuswap River (middle)	noon July 25 - noon Aug 15: 7days/week	N/A	No Creel
South Thompson River	Aug 05 - Sept 22: 7days/week	N/A	No Creel
Thompson River near Bonaparte River	July 31 - Aug 09 Sat / Sun / Mon only (0600-2100)	N/A	No Creel
Thompson River (near Spences' Bridge)	Jul 23 - Aug 16 Sat/Sun/Mon only 0600 - 2100 hrs.	1605	174
Thompson River (near Martel)	Aug 22 - Sept 3 7 days/week	N/A	No Creel

(1) Note: Due to budget constraints in 2005 creel surveys were not undertaken in some recreational fisheries. Creel surveys were not undertaken in recreational fisheries where past years information suggested that catch and effort, and associated harvest rates, were very low.

Appendix J: 2004-2005 WCVI Chinook Troll Fishery Preliminary Catch and Releases Estimates – Generated from the Department Fishery Operations System (FOS)

YEAR	MONTH	AREA	CHINOOK KEPT	CHINOOK RELEASED	CHINOOK TOTAL	COHO RELEASED
2004	Oct	SWTR	1,627	476	2,103	542
		NWTR	9,629	502	10,131	1,418
2004	Nov	SWTR	7,927	1,354	9,281	393
		NWTR	130	9	139	4
2004	Dec	SWTR	134	21	155	0
		NWTR	0	0	0	0
2005	Jan	SWTR	1,379	418	1,797	2
		NWTR	483	19	502	1
2005	Feb	SWTR	831	327	1,158	0
		NWTR	4,819	186	5,005	0
2005	Mar	SWTR	393	55	448	0
		NWTR	15,854	1,511	17,365	1
2005	Apr	SWTR	6,274	679	6,953	59
		NWTR	50,789	2,140	52,929	288
2005	May	SWTR	12,791	2,100	14,891	1,213
		NWTR	13,864	561	14,425	572
2005	Sept	SWTR	4,789	328	5,117	*1,194
		NWTR	11,901	1,072	12,973	1,640
Total for Chinook Year			143,614	11,758	155,372	7,327

* Retention of marked coho was permitted during the September 2005 harvest period based on sampling data which indicates Interior coho have migrated off the West Coast by mid September. Fishery openings in September were from September 17 to 21, and September 24 to 30 in areas 26 to 27, and 124 to 127. The preliminary catch estimate for coho in the September fishery was 549 for NWTR and 856 for SWTR

Appendix K: Salmon Endowment Fund

As part of the 1999 Pacific Salmon Treaty, the US and Canada established an endowment fund, the interest from which would be used for the benefit of Pacific salmon. More information on approved projects and application process can be found at:

http://www.psc.org/news_restoration.htm

Chinook related projects approved in 2005:

- Microsatellite variation in southern BC chinook salmon
- Installation, operation and feasibility study of an Electronic Counter in the Coldwater River to support Habitat-Based Chinook Escapement Goal Calibration
- DNA-based stock composition of catch and released chinook salmon in the West Coast of Vancouver Island (WCVI) troll fishery.
- Nimpkish River chinook salmon enhancement evaluation
- DIDSON sonar at the Cowichan River fence to count chinook during the operation of the fence and after the fence is inoperable,
- Habitat-based chinook escapement goal calibration: small WCVI rivers, BC.
- Campbell River mainstem chinook enhancement.
- Little Qualicum River Storage Weir Upgrade
- Hope Slough Habitat Restoration Project
- Bonaparte River Restoration Program
- Cowichan Chinook Incubation and Sediment Study 2005
- Lower Deschutes River Riparian Restoration Plan

Appendix L: Additional Technical Information

1. Pacific Salmon Treaty:

The Pacific Salmon Treaty (PST) was revised in 1999. Chinook management changed so that fishing levels would vary in response to the annual production of chinook salmon (aggregate abundance-based management AABM). If the ocean abundance of chinook was poor, then the allowable harvest rates and catches would be reduced so that spawning escapements were protected. However, if the ocean abundance of chinook was very good, then harvest rates and catches could increase, but only to a level that still protected spawning escapements.

The 1999 PST specifies allowable landed catches under the AABM management regime for three ocean fishing areas (1. SE Alaskan troll, net, and sport fisheries; 2. northern BC troll and the Queen Charlotte Island sport fishery; and 3. the west coast of Vancouver Island troll and outside sport fisheries) at various levels of chinook abundance. All other fisheries are referred to as Individual Stock Based Management (ISBM) and will be managed to an overall bilaterally-agreed harvest rate (catch will vary with the abundance of chinook). Harvest rates are assessed for individual Canadian and US stocks. For Canadian and US fisheries, the harvest rate is 63.5% and 60.0%, respectively. If returns were less than the goal for a stock with an established spawning escapement goal, then the 'ISBM fisheries' would be required to reduce their harvest rates to improve escapements. If returns were greater than the goal, then the harvest rates (and catch) in 'ISBM fisheries' could be increased so long as the goal was still achieved.

The major difference between the 1999 agreement and the 1985 PST is the necessity for a pre-season estimation of chinook abundance in the ocean, and the need for agreed escapement goals for each chinook indicator stock. Chinook forecasts are usually available in March. The abundance prediction will be undertaken annually by the Chinook Technical Committee (CTC) of the Pacific Salmon Commission. The establishment of escapement goals is the responsibility of each management agency but the technical basis for establishing a goal will be reviewed by US and Canadian members of the CTC.

Harrison Chinook:

The run size of Harrison fall returning chinook is calculated using the results of the Harrison River escapement program. An exploitation rate is calculated using the run size estimate. However, the tag rate from chinook produced at the Chehalis River hatchery is very low compared to the total Harrison return. This makes finding enough tags to develop an exploitation rate during the Harrison escapement program difficult. To get a better estimate, the Chilliwack River exploitation rate has been used in place of Harrison run size calculations. Unfortunately, the Chilliwack escapement program has suffered from recent budget cuts and is becoming inadequate for developing an exploitation rate. Discussions are underway to decide whether to improve the Harrison (Chehalis Hatchery) marking program, or to improve the Chilliwack escapement program.

The Chehalis hatchery enhances Harrison River fall returning chinook through the collection of broodstock from the Harrison River and a small number of "swim-ins" to the hatchery. Production from both facilities is monitored through application and recovery of coded-wire tags (CWT's). The contribution from the Chehalis hatchery to the in-river escapement in the Harrison River is less well known than the Chilliwack hatchery's contribution to the in-river escapement of late-run fish returning to the Chilliwack River system. This is due in part to the relatively small Chehalis hatchery contribution within the large natural spawning Harrison population, making the recovery of CWT's during annual assessment programs difficult, and the absence of CWT recovery sampling and escapement estimation for the Chehalis River. The estimate of late-run chinook hatchery contribution to the escapement in the Chilliwack River is better known due to a smaller natural spawning population and a greater proportion of CWT's present.

2. Stock Assessment:

Stock assessment of chinook salmon coast wide relies upon estimating the exploitation rate on "indicator stocks" and annual monitoring of escapements to a sample of these naturally spawning chinook populations. Exploitation rate is the portion of the production from one spawning year that is killed by fishing; this includes catch and incidental mortality. It is determined by dividing

the total fishing mortality (i.e., the sum of catches and incidental mortality over all ages and fisheries is adjusted for natural mortality rates of juvenile fish) by the total population estimate (i.e., the total fishing mortality plus total spawning escapement).

Currently, exploitation rate can only be estimated through the CWT program because the true fishing mortality of any given stock is unknown in the vast majority of fisheries. Use of CWT data from the fall returning, white-flesh stock to the Chilliwack River as a surrogate for estimating exploitation of the Harrison River natural stock is a fairly new technique. Harrison stock from the Chehalis hatchery has historically been used to determine Harrison exploitation but this technique has been limited by the CWT data due to a small CWT sample size in the Harrison River spawning escapement and a lack of assessment information on the number of CWT chinook returning to the Chehalis River. This results in a sub-optimal estimation of Harrison stock contribution to fisheries. However, the annual mark-recapture program in the Harrison River does provide a quantitative estimate of this population's spawning escapement (natural production plus the Chehalis hatchery enhancement) by age and sex. Total production from one spawning year in the Harrison natural population is estimated by:

- estimating the exploitation rate by age from the CWT program;
- estimating the spawning escapement by age based on the mark-recapture program;
- estimating the return of Chehalis chinook and subtracting them from the total escapement by age;
- expanding the terminal run (terminal catch plus spawners) by the ocean exploitation rate by age;
- summing over ages (ages 3 to 5).

Accurate CWT and escapement data are essential to the detection of changes in survival due to the effects of fishing. Appendix B contains lower Fraser River chinook enumeration data.

Exploitation rate indicator stocks were identified for the upper Fraser, but due to an inability to recover coded-wire tags in the in-river terminal fisheries and to quantify recoveries in the spawning escapements, much of the tagging was discontinued in the late 1980's. Tagging of hatchery production has been continued (largely for exploitation rate indicator stocks) and the information has been used to indicate wild stock run timing and ocean distribution. The

spawning escapement data used in annual assessments are from a subset of streams selected for annual consistency in enumeration methods (referred to as the CTC indicator stocks).

3. Forecasting:

The forecast is actually the total of two separate forecasts, one for the natural Harrison River spawning population and one for the river spawning and hatchery broodstock components of Chilliwack river chinook. Each forecast is based on sibling regressions of either the age-specific estimated terminal run to each river versus estimated total ocean production or estimated total production versus total production based on data collected since the 1984 return year. Sibling regressions use past observations of the number of spawners at one age to predict the subsequent return at a later age. These relationships explain high amounts of variance ($r^2 \geq 0.8$) and have provided useful forecasts of ocean abundance, terminal runs and spawning escapements. For the relationship between spawners to be accurate, it is assumed that the ocean exploitation rates do not change over time. Marine exploitations have varied significantly in recent years; however, the accuracy of the forecasts is a concern but they have remained reasonable.

To provide forecasts (other than just recent average values, etc.) annual sampling for age structure in the catch and escapement, and a quantitative estimate of spawning escapements is needed. As noted above, upper Fraser escapements are visual estimates of trends, whose bias is largely unassessed except for a few locations. Further, it would be desirable to have in-river catch by stock and age. The real deficiency in our inability to develop predictive models for upper Fraser chinook is the fact we cannot do run reconstruction / cohort modelling. Currently, there are three stocks with CWT and reliable escapement estimation programs (Nicola River, Dome Creek, and Lower Shuswap River); however, the utility of these programs to produce forecasts is limited by the lack of a reliable estimate of CWT removals from in-river fisheries where the bulk of upper Fraser spring chinook are caught.

To accurately estimate the number of CWT's removed during in-river fisheries, required information includes:

- accurate catch estimates in most of the time/area strata (all strata would be preferable)
- reliable and representative recovery of CWT's from those strata (reasonable rates of recovery, preferably all CWT's encountered by surveyors)
- high quality information on the number of CWT's encountered in the catches sampled (most important and currently lacking to our knowledge). A desirable catch sample ratio would exceed 20% of the landed catch. This requires sampling for CWT's with accurate reporting.

DFO assessment capabilities are acknowledged as a serious limitation, but the resources necessary to improve the situation are not available. To summarize, we do not have any empirical basis for forecasting upper Fraser River chinook returns.

4. Other Stock Assessment Information:

a.) Coded Wire Tag Information

The majority of exploitation information available on Fraser River chinook is derived from CWT's recovered from commercial, recreational and aboriginal fisheries. These are summed over all brood years tagged (1983 to 1989) and all recoveries so as to maximize the number of tags included. With the exception of Candy et al. (2003) who summarized ocean CWT distributions for Fraser stocks from 1975-2001, but did not separate this information by resource use sectors, this information has not been updated since 1989. Diagrams can be found in the 2002 Chinook Information Document.

b.) DNA Analysis

Over successive generations, distinct fish populations have adapted to fit and prosper in particular niches in their ecosystems. These specialized characteristics are frequently expressed as unique patterns in their genetic code. The Molecular Genetics Lab at the Pacific Biological Station utilizes microsatellite DNA and major histocompatibility complex (MHC) genetic variation to examine differences in fish populations for ecological and conservation reasons as well as to assist in fisheries management.

To date, hundreds of distinct fish stocks (primarily Pacific salmon) have been examined, resulting in the most comprehensive set of microsatellite DNA baseline data for fisheries in the

world. DNA baseline samples and fishery samples have been collected from selected Pacific fisheries for the past five years. DNA analysis of fishery samples and additional baseline sampling has been reduced since 2000 due to other funding priorities.

5. Setting Escapement Objectives:

DFO is looking at new methodologies for setting escapement goals including a stock-recruitment based assessment and a habitat based escapement assessment. The information needs for the stock recruitment method include; number of spawners, fishing mortalities by stock and age, definitions of spawning stocks, and assumptions must be made about natural mortality rates and patterns, time sequence of environmental patterns, and consistency of data series.

The information needs for a habitat based assessment are more readily available in large spatial databases such as the Provincial Watershed Atlas and Terrain Resource Information Maps. Two biologically-based methods appear useful to establish escapement goals and both focus on estimating carrying capacity. Escapement goals will be based on each aggregate's management objectives. One method estimates spawner capacity from spawner density-habitat relationships developed from Fraser River populations (Parken et al. 2003-114). Presently, the method is being ground-truthed with fish production and stock-recruitment data for the Nicola River. The second method relies on relationships between carrying capacity, estimated from stock-recruitment analyses, and habitat parameters such as watershed area. The habitat and stock-recruitment data are from populations ranging from Northwestern Alaska to coastal Oregon. Implementation of this approach requires further calibration of the current visual escapement estimates used to assess stock status. Calibration is complete for some stream types, and additional work will be undertaken at Lower and Mid Shuswap rivers in 2006.

Appendix M: DFO Contacts

Fisheries Management, Lower Fraser Area	A/Area Chief	Vacant	(604) 666-6512
	Resource Manager – Aboriginal Fisheries	Debra Sneddon	(604) 666-8426
	Resource Manager – Aboriginal Fisheries	Brian Matts	(604) 666-2096
	A/Resource Manager - Recreational Fisheries	Linda Stevens	(604) 666-6509
	Resource Manager - Commercial Fisheries	Barbara Mueller	(604) 666-2370
	Management Biologist (Chinook, coho, chum)	Melanie Sullivan	(604) 666-2417
	Biologist	vacant	(604) 666-6608
Fisheries Management, B.C. Interior	A/Area Chief	Elmer Fast	(250) 851-4948
	A/Resource Manager - Fraser River watershed from Sawmill Creek to Deadman Creek & Thompson River upstream to Bonaparte River confluence	Merv Mochizuki	(250) 851-4952
	A/Resource Manager - Fraser River watershed upstream of Deadman Creek	Al Charbonneau	(250) 992-2434
	A/Resource Manager - Thompson River watershed upstream of confluence with Bonaparte River	Merv Mochizuki	(250) 851-4952
	Resource Manager – B.C. Interior Area – Columbia / Okanagan	Dean Allan	(250) 851-4821
	Sr. Management Biologist	Les Jantz	(250) 851- 4948
	Management Biologist	Cindy Yockey	(250) 851- 4961
Stock Assessment Division	Head – Lower Fraser River Salmon	Timber Whitehouse	(250) 851-4833
	A/Biologist, Lower Fraser	Joe Tadey	(604) 666-7273
	Biologist, Upper Fraser	Richard Bailey	(250) 851-4814
Conservation & Protection	Area Chief - Lower Fraser River Area	Herb Redekopp	(604) 607-4156
	Area Chief – B.C. Interior Area	Randy Nelson	(250) 851-4956