

# 2004 Southern Salmon Fishery Post - Season Review



## **PART ONE** **FRASER RIVER SOCKEYE REPORT**

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**March 2005**



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# 2004 SOUTHERN SALMON FISHERY POST-SEASON REVIEW

## PREFACE

In the spring of 2004, as in previous years, Fisheries and Oceans Canada (DFO) prepared a plan to regulate and control the salmon fishery. The main purpose of this plan is first to provide for an escapement of salmon to the spawning grounds, and second, under law to provide enough salmon to allow members of the aboriginal communities in their respective areas to obtain sufficient fish for food, social and ceremonial purposes. The balance is allocated between commercial and recreational or sports fishers, which groups would also include some aboriginal fishers.

The salmon fishery includes the regulation of all species, chinook, coho, sockeye, chum, pink, as well as steelhead, all of great importance to British Columbia. Commercially, sockeye is the most notable, with the Fraser River sockeye runs by far the most important in the province. Salmon, of course, in the summer and fall return to the river for spawning. The Fraser River sockeye runs have been divided by DFO into four run-timing groups: the Early-Stuart, Early-Summer, Summer, and Late runs.

The Fraser River sockeye runs in 2004 have been publicly described as a disaster. An estimated 1.3 million fish are unaccounted for. The escapement objectives were not met, and as a result some First Nations fishers maintain that they did not receive their anticipated food, social and ceremonial fish. This will arguably have important consequences in the cycle years yet to come.

No conclusive answer was found by DFO for this regrettable phenomenon. Consequently, the Minister appointed an independent committee which I was asked to chair. The Committee's mandate was to evaluate the performance of each fishery and to provide conclusions and recommendations to the Minister by March 31, 2005. The Committee met on several occasions and conducted public hearings in six British Columbia centers. We heard from a number of fisheries officers and managers, aboriginal chiefs and band members, commercial and recreational fishers, and citizens with an interest in, or serious concern for, what happened last year.

The Committee received written submissions through a website developed for the review. We also called upon a number of experts on fish management, measurement, enforcement and environmental conditions within DFO, and from the academic and consulting communities outside that department.

The public hearings and written submissions revealed a great deal of concern, indeed anger and dismay, along with many accusations of mismanagement on the part of DFO, as well as allegations of widespread illegal fishing, particularly along the Fraser River. I must say that almost all

presenters who gave their evidence under oath were candid and focused, and that except for the refusal to provide us with one enforcement report that we requested, we received the full cooperation of the Minister and DFO staff in conducting this review.

Unfortunately, due to the volume of documents and evidence as well as time needed for the Committee to reach a consensus, it will not be possible for us to complete a review of the entire South Coast by the end of March 2005. Accordingly, this report is Part One of the review, and includes only the Fraser River sockeye run. The other species of British Columbia South Coast salmon will be included in Part Two, which will be delivered later in 2005.

The Honourable Bryan Williams, Q.C.  
Chair

# HISTORY AND ORGANIZATION OF REVIEW AND COMMITTEE

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In mid-November 2004, the Honourable Geoff Regan, Minister of Fisheries and Oceans, appointed the 2004 Southern Salmon Fishery Post-Season Review Committee, chaired by the Honourable Bryan Williams, Q.C. and consisting of the 15 members of the southern section of the Integrated Harvest Planning Committee (IHPC). The Committee was established by the Minister independent of DFO, with a mandate set forth in the Terms of Reference dated November 18, 2004, and annexed to this report as Appendix 1.

The IHPC was established as a result of the 2002 Southern Salmon Fishery Post-Season Review and has a Northern and Southern Section. The Chair is associate counsel at the law firm of Miller Thomson LLP and former Chief Justice of the Supreme Court of British Columbia. Members of the Southern Section were appointed by the Minister to serve on this Committee and they are as follows:

#### **Commercial Fishers**

Ken Connolly  
Rob Morley  
Rick Nordstrom  
Bob Rezansoff  
Les Rombough  
Peter Sakich

#### **First Nations Fisheries Representatives\***

Don Hall  
Flavian Harry  
Robert Hope  
Mike Staley (Observer)

#### **Recreational Fishers**

Gerry Kristianson  
Jeremy Maynard  
Bill Otway

#### **Marine Conservation Caucus**

Craig Orr  
Ken Wilson\*\*

#### **Province of British Columbia**

Sandy Argue (ex-officio)

\* One First Nations position was left unfilled

\*\* Mr. Wilson resigned from the Committee February 9, 2005

The Committee was expected to meet and carefully plan its approach to the conduct and procedure of the review and, under the Terms of Reference, to hold public hearings in Nanaimo, Kamloops and Prince George. The Committee was then expected to analyze all of the evidence and submissions received, to deal with the substantive issues raised in the Terms of Reference, and to submit a report to the Minister of Fisheries and Oceans by March 31, 2005.

#### **First Meeting and Focus**

The Committee met for the first time on December 7, 2004 in Vancouver, at which time the Chair introduced Anne Murnaghan, Project Manager, who would be responsible for the process and administration of the Committee's work. Paul Ryall, head of the salmon team for DFO and Andrea Petersen, Salmon Officer, DFO, were invited as guests. The Committee would meet again on December 21, 2004.



A number of preliminary decisions were reached in these first two meetings:

1. A Steering Committee was established;
2. Evidence was to be given under oath;
3. The Minister would be asked to confirm that he will advise all members of DFO to cooperate with and appear before the Committee if requested;
4. Additional meetings would be required in Richmond, Surrey and Chilliwack;
5. The Chair would explain to the Minister that it was unlikely the Committee would complete a review of the entire South Coast by March 31, 2005, and recommend that a review of the Fraser River, and in particular Fraser River sockeye, be conducted as the first and most important concern;
6. The Committee would seek the professional assistance of a communications firm, if necessary, legal counsel, and a number of scientists outside DFO, to assist in explaining some of the complicated issues that exist.

The Chair was instructed to discuss these changes with the Minister and obtain his consent. That was done and a letter dated January 4, 2005 confirming these arrangements is attached as Appendix 2.

### **Public Hearings**

Further, as a result of the preliminary meetings, tentative public hearing dates and Committee meeting dates were established (Surrey, Chilliwack and a final Richmond date were added later) as follows:

January 19, 2005 .....	Richmond
January 24, 2005 .....	Prince George
February 1, 2005 .....	Kamloops
February 7 and 8, 2005 .....	Surrey
February 21, 2005 .....	Chilliwack
February 22, 23, 24, and 25, 2005.....	Richmond

A press release was issued prior to the commencement of the hearings, along with advertisements in the Vancouver Sun and the Province as well as other local newspapers.

The Committee heard from a number of witnesses at the public hearings, including commercial fishers, recreational fishers, First Nations fishers, conservationists, Pacific Salmon Commission (PSC) staff and members of the Commission's Fraser River Panel (FRP), a representative of the Pacific Salmon Foundation, fisheries enforcement officers and managers, DFO catch assessment biologists, supervisors in various departments, district and area managers and Assistant Deputy Ministers. A list of those who provided testimony in-person is attached as Appendix 3.

The Committee also received letters by fax, mail and e-mail from interested parties, and a list of those written submissions is attached as Appendix 4. All of the witnesses appearing before the Committee at the public hearings agreed to, and did in fact, provide testimony under oath (either by swearing on the bible or by affirmation) except one, Phil Eidsvik who refused.

## **The Issues**

Early in the process it became clear that this year's review would have to involve a careful analysis of the following issues:

1. High temperature of the Fraser River (peak of 21.5°C);
2. Accuracy of the count either at Mission (PSC) or in the spawning grounds (DFO);
3. Illegal fishing and unreported catch from legal fisheries;
4. Adequacy of management of the fishery by DFO.

## **The Regulatory Process**

A simplified description of the manner in which the current system operates is:

1. The PSC and DFO jointly estimate the expected run of the various species of salmon in that particular year. This assessment is normally published by DFO in the spring. After the assessment and during the course of the runs, test fisheries and fish counts at the Mission counting station are conducted for the purpose of confirming the accuracy of the estimate. Then in-season adjustments are made on the basis of the information gathered. If necessary, as the season progresses an environmental management adjustment (EMA) is conducted by DFO and the PSC in order to determine whether a higher proportion of fish are required to meet escapement goals to compensate for unusual in-season circumstances.
2. The Mission estimate takes place as the runs go up the Fraser River approximately at the Mission Bridge through a process known as hydro-acoustics conducted by the PSC.
3. The EMA model estimates the amount of additional loss that will occur en route as a result of such factors as elevated water temperature or undocumented catch and suggests the additional numbers of fish that must be passed through the fisheries to ensure escapement goals are met.
4. The balance of the fish in each run is then available for harvest, (subject to DFO regulations) and an allocation is made such that the aboriginal food, social and ceremonial catch receives priority, and following that the commercial and recreational catches. Of course, both commercial and recreational fisheries may and do include aboriginal fishers.

## **History of Fisheries and Reports 1992, 1994, 2002**

There have been a number of post-season reviews over the years. An in-depth enquiry was conducted by Professors Peter Pearse and Peter Larkin in 1992. In 1994, the Honourable John Fraser, former Minister of Fisheries and Speaker of the House of Commons chaired a committee to investigate 1.3 million "missing sockeye", as he described it.

The results of annual post-season reviews through the years, except in 1992 and 1994, appear to be more or less in line with the estimates until 2002, when a surplus of sockeye reached the spawning grounds. This caused serious concerns by harvesters since more fish than necessary proceeded to the spawning grounds, and consequently harvesters were deprived of a higher allocation of fish.

In 2002, a review was conducted by a committee chaired by Assistant Deputy Minister, Fisheries Management, Pat Chamut.

In these post-season reviews, a number of recommendations were made to DFO. Those recommendations will be dealt with in a subsequent section of this report. While this year's review committee is not the first, it is a totally independent committee and unlike the others, it has had the announced cooperation of the Minister for attendance by, or witnesses from, DFO employees, and has taken its evidence under oath.

## The Law

The regulation and control of the Pacific salmon fishery is governed by the *Fisheries Act*<sup>1</sup> of Canada, the federal government having the constitutional authority with respect to fisheries.

The Minister of Fisheries and Oceans has the right under the legislation and regulations to stipulate when and to what extent a fishery with respect to any species of salmon may take place. DFO is also responsible for conservation of the fishery and allocation among the user groups.

In 1984, in the case known as *Guerin*<sup>2</sup>, the Supreme Court of Canada recognized that the Crown's relationship to aboriginal people was characterized by the existence of a fiduciary duty between the Crown and Canada's aboriginal peoples. The scope of the *Guerin* concept of fiduciary duty (with respect to land) was later expanded in the case known as *Sparrow*<sup>3</sup>, where the court drew on the fiduciary duty of the relationship to give content to the recognition and affirmation of aboriginal fishing rights and title in section 35 of the *Constitution Act* of 1982.

Since that time, the courts have struggled to determine when and what special obligations arise toward aboriginal people and the content of the obligations in specific circumstances. The *Sparrow* case determined that, subject only to justification under the Charter (including most significantly, conservation), those who can establish an aboriginal right to fish must be given a priority over all other fishers.

In *Sparrow*, however, the priority and aboriginal right was expressed in terms of fishing for food, social and ceremonial purposes (FSC). It did not deal with the sale of fish by aboriginal fishers or their Nations. The aboriginal right to fish commercially was considered by the Supreme Court of Canada in a trilogy of cases, *Van der Peet*<sup>4</sup>, *Gladstone*<sup>5</sup>, and *N.T.C. Smokehouse*<sup>6</sup>.

In *Van der Peet*, a member of the Sto:lo Nation advanced her aboriginal right to sell salmon. In *Gladstone*, a member of the Heiltsuk First Nation advanced his aboriginal right to sell herring spawn on kelp, and in *N.T.C. Smokehouse*, a member of each of the Tseshah and Opetchesah First Nations advanced his aboriginal right to sell salmon.

In *Van der Peet*, the court established the test which says that generally speaking, an aboriginal claimant must establish that the sale of fish at issue is linked to the practices, traditions and customs integral to the aboriginal community's distinctive culture prior to contact with Europeans. The court applied that test on the evidence in *Van der Peet* and *N.T.C. Smokehouse* and decided that the exchange of fish for money or other goods by them was not an integral part of the distinctive culture of those First Nations people prior to contact, accordingly they failed to meet the test.

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<sup>1</sup> *Fisheries Act*, (R.S.C. 1985, c.F-14)

<sup>2</sup> *Guerin v. The Queen*, [1984] 2 S.C.R. 335

<sup>3</sup> *R. v. Sparrow*, [1990] 1 S.C.R. 1075

<sup>4</sup> *R. v. Van der Peet*, [1996] 2 S.C.R. 507

<sup>5</sup> *R. v. Gladstone*, [1996] 2 S.C.R. 723

<sup>6</sup> *R. v. N.T.C. Smokehouse*, [1996] 2 S.C.R. 672

In *Gladstone*, however, the court found that the aboriginal right to sell herring spawn on kelp had been a part of trading kelp spawn for other goods and was a central, significant and defining feature of the pre-contact culture of the Heiltsuk people. Further, it was determined to be on a scale best characterized as commercial.

Although the Supreme Court of Canada did not find an aboriginal right to sell salmon in the first two cases, it is still possible that other First Nations may or may not be able to meet the test set forth in *Van der Peet*, assuming that the evidence adduced is established, as it was in *Gladstone*, that the activity was a central, significant and defining feature of the pre-contact culture.

In 1992, DFO established the Aboriginal Fisheries Strategy (AFS), Aboriginal Communal Fishing Licenses and Regulations (1993), whereby agreements were entered into between the government and several First Nations and tribal councils. The program included buybacks of commercial licenses on a voluntary basis.

Within the Aboriginal Fisheries Strategy, the Pilot Sales Program (now known as Economic Opportunity Fisheries) allows DFO to issue communal licenses to certain aboriginal groups involved in the sale of fish caught by aboriginal fishers. The right of the government to enter into such an agreement was challenged in the courts in the case known as *Huovinen*<sup>7</sup>, wherein the British Columbia Court of Appeal dismissed the appeal from the trial judge and held that the regulatory scheme properly authorized the Minister to issue a communal licence to aboriginal organizations for fishing and related activities. It was simply a reflection of the licensing regime established by the *Fisheries Act* and *Regulations*. This issue of the Pilot Sales Program was also challenged in 2004 in *R. v. Kapp*<sup>8</sup> in the Supreme Court as heard by Chief Justice Brenner of the Supreme Court of British Columbia. In this case, a group of fishers led by defendant John Michael Kapp were charged and convicted of fishing illegally in a closed season. A different argument was put forth in *Kapp* and rejected on the grounds that the government had every right to enter into an agreement with native people and to permit the Pilot Sales Program. That case has been appealed to the British Columbia Court of Appeal but has not yet been heard.

The law in the Province of British Columbia as governed by the *Fisheries Act* and those decisions referred to above clearly come down to the proposition that aboriginal individuals and groups have the right, after conservation but ahead of all other fisheries, to fish for and retain fish for FSC. However, fish caught under FSC cannot be sold by any native or agent of a native unless it is done through the Economic Opportunities Program as provided for by the Aboriginal Fisheries Strategy.

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<sup>7</sup> *R. v. Huovinen*, [2000] BCCA 427

<sup>8</sup> *R. v. Kapp*, [2004] BCSC 958



# **PRE-SEASON, IN-SEASON, MISSION AND POST-SEASON ESTIMATES**

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## **Background**

Fraser River sockeye have been managed cooperatively with the USA since 1930 following the signing of the “Convention between Canada and the United States of America for the Protection, Preservation, and Extension of the Sockeye Salmon Fishery in the Fraser River System”, followed in 1937 by the creation of the International Pacific Salmon Fisheries Commission (IPSFC). In 1985 Canada and the USA signed the Pacific Salmon Treaty (PST) and the IPSFC was replaced by the PSC. Within the geographic remit of treaty waters the terms of the treaty are managed by the PSC in conjunction with the domestic management agencies of the two countries, which in Canada is DFO.

The management responsibilities under the PST are divided into four areas known as panels (Trans-Boundary, Northern, Southern and Fraser) and the bi-lateral makeup of each panel is a combination of government and stakeholder representatives chosen by their respective national governments. The Fraser Panel (FRP) has the responsibility to manage Fraser River origin sockeye at sea in an area approximately described as between 48 and 49 degrees north latitude and within the Fraser River watershed itself (refer to PST, Annex II for an exact geographic description), although in practice only DFO exercises an active management role in the Fraser River above the Mission Bridge.

The Fraser River encompasses the largest watershed of any river system in British Columbia and is fed by numerous tributary rivers, many of which are large river systems in their own right. Sockeye salmon return throughout the Fraser River watershed, starting with fish that leave the main river below the head of tidewater at Mission and return to the Pitt River. At the other extreme, some stocks migrate far inland to the Bowron, Stuart and Nadina river systems, all well upstream of Prince George. In between there are many more stocks, including those from the well-known Adams, Chilko and Quesnel River populations.

With more than 30 separate Fraser sockeye populations, many with a number of terminal area stream-specific sub-populations of their own, management of Fraser sockeye is a complex business. Fraser sockeye return to their river of origin from late June into October and are managed in four separate run-timing groups: Early Stuart, Early Summer, Summer and Late runs.

## **2004 Pre-Season Forecast**

Pre-season forecasts for each run-timing group are developed by DFO and PSC staff using several criteria including the size of return in the brood (parent) year, estimates of spawning success and subsequent fry-to-smolt survival, the jack (precocious male) return in the previous (to forecast) year and historic spawner-recruit relationships. Despite the extensive experience of developing these forecasts, because they are estimates subject to many variables beyond human control (such as ocean conditions) they are structured according to a “probability-level” of achieving the forecast number, expressed as a percentage. The higher the probability percentage (i.e. certainty of achieving the forecast) the lower the number of forecast return and vice versa. These forecasts are examined and approved by the Canadian Pacific Scientific Advice Review Committee (PSARC), a peer review, science-based process before adoption by the FRP.

The 2004 pre-season forecast for Fraser River sockeye was reviewed by PSARC and adopted by the FRP. For pre-season planning purposes the panel used the 50% probability level of abundance, meaning there was a 50% probability that the run would achieve this number.

**2004 Fraser River Sockeye Pre-season Run-Size Forecasts**

<b>Stock Timing Group</b>	<b>50% Probability Forecast</b>	<b>75% Probability Forecast</b>	<b>Pre-season Escapement Target</b>
Early Stuart	216,000	137,000	90,000
Early Summer	885,000	486,000	310,000
Summer	3,501,000	2,078,000	1,424,000
Birkenhead-type Lates	218,000	120,000	89,000
True-late	100,000	51,000	85,000
<b>Total</b>	<b>4,920,000</b>	<b>2,872,000</b>	<b>1,998,000</b>

The eventual accuracy of the pre-season forecast is subject to many variables. The FRP met for four days in May 2004 (05/17-20) to conduct an extensive review of a draft fishing plan incorporating known conservation objectives for all salmon species and stocks likely to be affected by fishing for Fraser sockeye (e.g. exploitation rate ceilings for Cultus and Sakinaw Lake sockeye and Interior Fraser coho) and the pre-season forecast in context of predicted environmental factors. For example, the diversion rate of in-bound sockeye through Johnstone Strait into the Strait of Georgia on the east side of Vancouver Island (forecast by salinity/temperature variables relative to past known migration routes) and the size and temperature of the Fraser River discharge and probable effect on the in-river migration of salmon.

**In-Season Run-size Estimates and Adjustments**

In-season abundance of Fraser sockeye in near-shore marine waters and in the lower Fraser River itself is estimated through a combination of test fishing and by a hydro-acoustic program located at Mission near the head of tidewater. This program has evolved over many decades and embodies a considerable body of knowledge and experience by a core group who undertake this important task.

**Test Fishing**

Test fishing programs operated in marine waters are; the PSC conducts gillnet and seine fisheries in Juan de Fuca Strait (Area 20), DFO conducts a gillnet fishery at Round Island (Area 12) and seine fisheries operated in both the upper and lower sections of Johnstone Strait (Areas 12+13). The PSC also conducts gillnet test fisheries in the tidal section of the lower Fraser River (Area 29) at Cottonwood and Whonnock. These have become more important because reductions in the scale of commercial fishing have reduced the quality of data that used to flow from this source.

It is common that the same boats and crews are contracted to do the test fishing each year; in many cases the experience at this task extends over decades. All these test fishing programs are operated at a frequency and location at the direction of PSC staff and results are collated daily. In addition to catch numbers, DNA and scale bio-sampling is done to provide individual stock identification.

A recent initiative is to coordinate the marine harvest of the Fraser sockeye FSC allocation (250,000 fish approximately) by First Nations in Johnstone Strait as part of a larger scale test fishing program. First conducted in 2004 (catch: 108,800 sockeye) by the First Nations Marine Society based in Nanaimo, this initiative offers considerable promise, however the status of the program for 2005 and beyond is presently in doubt.

## Mission Hydro-Acoustics Program

Near the head of tidewater in the lower Fraser River the PSC operates a hydro-acoustic station located at Mission. This facility is a critically important part of the in-season run-size estimation process and provides confirmation on the abundance estimates made from test fisheries downstream and in the ocean waters. In 2004, for the first time a split-beam sampling system was used as the primary assessment tool, although the single-beam was also used. Problems with the implementation of the new split-beam system were identified mid-season (first reported week of July 18-24<sup>th</sup>). The table presented below was presented as evidence by PSC staff. It shows the changes in Mission escapement estimates by run-timing group resulting from a post-season review of the Mission split-beam estimates for 2004.

### Changes in Estimates by Timing Group

Mission Escapement		
	In-season	Post-season
Early Stuart	187,000	129,000
Early Summer	974,000	701,000
Summer	1,288,000	1,211,000
Late	208,000	293,000
<b>Totals</b>	<b>2,657,000</b>	<b>2,334,000</b>

Statistics courtesy of Pacific Salmon Commission

At present there are no other run-size assessment programs for sockeye within the Fraser River. From 1993 to 1998 a secondary hydro-acoustic program was operated in the mainstream Fraser at Qualark, located approximately 95 km. upstream from Mission close to the confluence of Qualark Creek and the Fraser River near the town of Yale. However, operation of the Qualark counter was suspended following the 1998 season after only six years of operation due to DFO budget constraints as well as operational difficulties in low and changing water levels. The Committee was advised by a number of DFO and PSC staff that the management of Fraser River sockeye would benefit by re-establishment of an additional system or even two additional systems upriver from Mission to allow for a more accurate estimate of natural loss and fishing mortality above Mission.

### History

Mission Hydro-Acoustics was formed in 1972 from a suggestion by Dr. J. Woodey. In 1973 a vessel-based type acoustic program was put into place at two sites, one at Deas Island Tunnel and one above Mission Bridge. In 1977 the Mission Acoustic site became the sole site due to high water problems and sockeye milling up and down at the Deas Island site.

Since 1985 the purpose of the Mission site has been to provide in-season monitoring of the progress towards gross escapement targets. Gross escapement equals spawning ground escapement plus in-river First Nations and recreational catch. This site is used as a primary tool for in-season assessments of timing, abundance and sharing arrangements between Canada and the US. It assists in scheduling in-river fisheries for First Nations, recreational and commercial. In some years this site also generates best estimates of total runs migrating past Mission Bridge.



## **Methodology**

Presently, there are two systems in place in Mission. The single-beam and the split-beam system.

### *Single-Beam System*

The single-beam system has a 30-year track record in which a vessel travels back and forth across the river approximately 150 times per a day. This system operates 7 days per week and 24 hours per day from June through September. In 2004 they began testing the single-beam around the 24<sup>th</sup> of June in time for the early Stuart migration.

Data are recorded on a paper chart recorder and the targets are read manually off the paper.

The single-beam, however, cannot tell in what direction the fish is traveling and if on the surface cannot be picked up by the transducer. Also at certain times of the season, if debris is present in the river, the single-beam cannot distinguish it from fish.

### *Split-beam System*

The split-beam system has been in development for the last 10 years from the shore and the vessel. This system has advantages over the single-beam in that it can measure speed and direction of the fish upstream versus downstream. It can also detect targets near the surface and determine the swimming speed.

In 2005 there may be a new system coinciding with the single and split-beam. It is called Didson which is a type of ultrasound technology. This system will enable staff to properly identify and distinguish between migrating fish and other underwater objects. There are also discussions on putting in a fixed-beam system on the opposite shore to the present site.

The Didson system although valuable in distinguishing objects, is limited in range and PSC is working on increasing same.

## **Problems**

There were problems at the Mission site in 2004 due to lack of proper training and familiarity with the equipment by staff. In 2003 there was interference by a set net positioned in front of the fixed single-beam which was discovered and then rectified following discussions with First Nations. In 2004 there was a situation with a drift net that interfered with the operation of the vessel traversing the river. This matter was also resolved. There is also the constant threat of break and enters.

The role of the Mission system is to count the daily passage of fish in order to identify the gross escapement past Mission, which consists of the spawning ground requirement plus the anticipated catch above Mission. There are some potential discrepancies in estimating the size of the four run-timing groups. For example, the Early Stuarts are the first to migrate up the river but there are problems distinguishing between Early Stuarts and Chinook that are migrating at the same time. In the past few years the Chilliwack Lake sockeye run has been larger than forecast. It coincides with the Early Stuarts' timing so in fact there could have been overestimation of Early Stuarts versus Chilliwack Lake. Early Summers are more difficult to estimate because the generally smaller run-size overlaps the larger Summer run. One unique situation with Early Summers is Pitt Lake sockeye which do not migrate past Mission Bridge but are accounted for when estimating Early Summers. In 2004, Pitt was more than 35% of the Early Summer run. Also in odd numbered years Pinks are migrating at the same time as Late run sockeye.

## **Environmental Management Adjustments**

Beyond changes (date/duration/size of harvest) made to fisheries in-season as a result of the test fishing information, adjustments to the management of Fraser sockeye are also made to take into account the in-river environmental conditions and some level of undocumented harvest. The EMA are developed from a combination of estimated river-entry date and spawning escapement targets for each sockeye run-timing group, measured Fraser River water temperature and discharge volume, and a weather forecast for the next 10 days. In the past this was called a “buffer” and was used even when environmental conditions were expected to be benign. EMAs are designed to provide a guide to managers on the expected differences between Mission and upstream estimates due to a combination of environmental conditions and stock assessment factors, and result in increases to lower river escapement targets to increase the likelihood that upper river spawning targets are achieved.

Pre-season EMAs are developed on known snow pack information and the historic relationship between this and in-river temperature/discharge levels. In 2004, a pre-season EMA of 10,000 fish was made for the Early Stuart run-timing group and 147,000 fish for the Early Summer group. No pre-season EMA was developed for the Summer and Late Run run-timing groups.

In-season, the EMAs change to reflect known environmental conditions and any changes to spawning escapement targets resulting from changes in run-size estimates. However since more exact EMA determinations cannot be made until a significant portion of each run-timing group has entered the Fraser River, it is not unusual for many of the fisheries directed at Fraser sockeye to have already been planned or to have taken place by the time the first in-season EMA has been developed. This situation has been exacerbated in recent years because fisheries have become more concentrated earlier in the season to conserve Late Run sockeye.

In response to low discharge and high water temperatures, in 2004 the EMAs for the Early Stuarts, Early Summer and Summer run-timing groups were revised from 10,000, 147,000 and 0 fish (pre-season) to 29,000, 330,000 and 570,000 (in-season). Based on post-season escapements and actual rather than forecast environmental conditions, EMA models predicted differences between Mission (minus acknowledged catch upstream of Mission) and spawning escapements of 56,000, 208,000 and 262,000 for Early Stuart, Early Summer and Summer run-timing groups respectively. No EMA was developed in-season for the Late run in 2004, however a predicted difference of 157,000 fish for this run-timing group was made post-season as part of a Fraser sockeye return retrospective analysis.

## **In-Season Adjustments to Run-Size Estimates**

Run-size estimates change as the season progresses and information from both the test fisheries and the Mission estimate are recorded. In 2004 the principle cause of differences between in-season and post-season estimates of run-size was the revision to the Mission escapement estimates with most adjustments to the final run-size estimate taking place as a result of the post-season review referenced above. However there was considerable in-season change to the run-size estimate of the large Summer return in 2004. The pre-season forecast for this run-timing group was 3.5 million fish but by the first week of August the FRP accepted a “provisional total return” of 4.0 million Summers recommended by PSC staff after a review by the bilateral US/Canada FRP Technical Committee.

As further information became available the estimate declined and at the August 27<sup>th</sup> meeting of the FRP a final in-season estimate of 2.5 million Summer sockeye was adopted. The downward revision of the Summer run estimate was caused by an unexpected collapse of a later-timed component of the Summer run, the Chilko River stock, which seems to have experienced the second lowest marine survival in 50 years. The increase in the Summer run EMA and considerable reduction in run-size estimates for the Summer run timing-group that occurred after the conclusion of fisheries resulted in

catches exceeding target exploitation rates. As a consequence, Mission estimates were only 50% of the target for the Summer run-timing group.

**Post-Season Estimate**

A final post-season estimate of the Fraser sockeye run-size is not available until all the spawning escapement information has been collected and analyzed, a process that often continues into the following year.

The following “near to final” estimates were presented to the Committee in late-February 2005:

<b>Stock</b>	<b>Mission Estimate</b>	<b>Catch Upstream of Mission</b>	<b>Final Spawning escapement</b>	<b>Difference (Mission – catch – spn. escapement)</b>	<b>Predicted difference from EMA model</b>
Early Stuart	129,000	31,000	9,286	88,714	56,000
Early Summer	701,000	140,000	150,354	410,646	208,000
Summer	1,211,000	306,000	272,061	632,939	262,000
Late (including Birkenhead)	293,000	9,000	92,096	191,904	157,000
<b>Total</b>	<b>2,334,000</b>	<b>486,000*</b>	<b>523,797</b>	<b>1,324,203</b>	<b>683,000</b>

\* Catch upstream of Mission – these are not final counts

Based on these numbers, which assume that the revised Mission count and the Near Final upstream escapement assessments are in the ballpark, the number of unaccounted for or “missing” fish is 1,324,203, of which 683,000 were predicted by the EMA model. However, it needs to be kept in mind that the EMA model assumes the accuracy of the reported catch upstream of Mission and the historic average of uncounted harvest or poaching.

Against this background, there are two possible explanations for the difference between the actual escapement and the number predicted by the EMA.

- The environmental conditions were more severe than found in the historical data used by the EMA models, consequently the models underestimated the difference. In other words, more fish succumbed to warm water and the associated impacts.
- The catch upstream of Mission was larger than shown.

The Committee believes that environmental conditions and/or an insufficiently robust EMA model and a larger than reported catch upstream of Mission were important factors during the 2004 season.

The Committee is satisfied that the Mission count which on the best evidence we have would be no more than 10.5% out, was not a major problem with respect to the so-called missing sockeye. PSC staff have indicated that they expect the accuracy to be plus or minus 4%.

## RECOMMENDATIONS

1. It is recommended that a cost benefit analysis be done to determine the utility and feasibility of an additional counting station at either Boston Bar or Qualark.
2. A further site at the confluence of the Harrison might also be beneficial if it could be installed in order to establish run-size, catches, escapements and timing on late run-timed sockeye (i.e., Birkenhead, Harrison, Weaver, etc.)
3. That sufficient funding needs to be ensured to keep and expand on existing assessment programs. A continuation of “realtime monitoring” (12-hour turnaround) is needed to give PSC and DFO faster and accurate data of the migrating stocks. The continuation of funding from both Canada and the U.S. is needed to pay for the above.
4. That a further split-beam be installed on the north shore of the Fraser at the Mission Site.
5. The use of the First Nations FSC harvest in marine waters should be incorporated as part of the test fishing program on a long-term basis. This requires secure long-term funding for the catch monitoring carried out during the First Nations Marine Society FSC fishery.



# CATCH MONITORING

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## Background

Accurate monitoring of catches is one of the core responsibilities for any credible fisheries management agency. Simply put, if harvest levels, including all mortalities, cannot be accurately estimated, fisheries cannot be carried out without significant risk to the stocks.

Large scale unauthorized harvests (and to a lesser degree, inaccurate estimates of authorized harvests) are one of four likely causes contributing to the failure of Fraser River sockeye to reach the spawning grounds in expected numbers in 2004. In all probability, whatever befell sockeye also occurred to some degree to other co-migrating salmon. It is for this reason that understanding the catch monitoring regime practiced within the Pacific Region in recent years is so important.

Like many other activities undertaken by DFO in the past decade, catch monitoring within the Pacific Region continues to evolve along with a variety of demands and expectations placed upon DFO. The increased focus on this activity is common to all finfish and shellfish harvest sectors, be they commercial, First Nations or recreational fisheries.

Since the Atlantic cod collapse, and with the finite nature of fish resources now all too apparent, the Canadian public has raised its expectations for successful management, while at the same time, persistent budgetary constraints are making it increasingly difficult for DFO to maintain even the catch monitoring standards of yesteryear. These pressures are obliging DFO to structure its catch monitoring initiatives on a “cost neutral” basis, with mixed success.

In many commercial fisheries, boat specific on-board or dockside monitoring programs are underway, ensuring a high degree of verification. In all others, catch monitoring is largely a function of a new mandatory daily phone-in and logbook program. Catch numbers generated by this program can be verified through a sales slip paper trail through processing facilities. Not all commercially harvested fish are sold through processing facilities. A relatively small portion of the overall commercial harvest is sold through dockside sales by individual fishers. This is an increasing trend with scope for diminished accountability.

Like any other fishery, the accuracy of recreational fishery catch monitoring largely depends on the resources applied to the task; however, that’s where the similarities end. As a generalization, the recreational fishery is always open unless otherwise closed, the reverse of commercial fishery management. Because there is a large number of participants, and because there is no legal sale component permitted, recreational fishery catch monitoring presents some fishery specific requirements and challenges and is usually conducted by what are called “creel surveys.”

Creel survey data are usually a combination of an estimate of effort in a given area (boat trips or anglers counted on a river or lake) along with landing site specific monitoring of the actual harvest through an interview process. Because it would be impossible to monitor every landing site or access point used by the recreational fishery on a consistent basis, the overall estimate is derived from the known catch of a minority of participants and expanded to account for the total estimate of effort. A logbook program involving guides is currently in the pilot stage.

First Nations’ fisheries are managed in two different categories: 1) FSC fisheries, which enjoy the highest priority within the management hierarchy, second only to the needs of conservation, and 2) the Economic Opportunity fisheries (previously known as Pilot Sales), which are accorded the same ranking as the usual all-citizens commercial fisheries. Prior to FSC fisheries, DFO is supposed to negotiate with individual bands or band groupings to determine the needs of the First Nations

community, and the fisheries are usually conducted by individual bands under a communal licence. There are exceptions to this; for example, the implementation of large scale communal harvesting of sockeye by the First Nations Marine Society as part of a broader marine waters test fishing initiative, referenced elsewhere in this report.

In common with other fisheries, First Nations fishery catch monitoring varies substantially in accuracy and completeness, depending on area and time of year. FSC fisheries catch monitoring standards are less stringent while the harvest within an Economic Opportunity fishery is required to be documented by observers present at designated landing sites.

### **Review Testimony**

The Committee heard substantial testimony about catch monitoring, portraying a wide range of views. Although there were positive reports about the level of catch monitoring in specific fisheries, in general there was repeated testimony by departmental staff about the steady erosion of confidence in the data accumulated over the past decade (or increased data bias).

In Prince George, the Interior Fraser Area Chief of Resource Management advised the Committee that there were inconsistencies among years and fisheries on the level of catch monitoring in the interior of the province. The Committee was told that funding in this region for catch monitoring had declined from \$800,000 in 1994 to \$200,000 in 2004 (not accounting for inflation). In 2000 the Interior Fraser area staff were sufficiently concerned to have hired an independent consultant to assess the area catch monitoring capabilities at that time. The consultant concluded that the catch monitoring was not “scientifically defensible” and with the steady erosion of budgets since 2000 it is widely assumed by area DFO staff that the situation has not improved.

In response to questions from the Committee, in both Prince George and Kamloops the same DFO staff member clearly stated that the present wholly inadequate situation regarding catch monitoring in the Interior Fraser area is directly attributable to continually declining and uncertain levels of funding. In addition the Committee was advised that the quality of catch monitoring and stock assessment programs also depended on the size of the return of a given stock or species of salmon. The Interior Fraser area senior stock assessment biologist for sockeye indicated that his budget in 2004 was adequate only in terms of the diminished size of return, but cautioned it would not have been if the returns had met expectations.

In Prince George, the resource manager based in Quesnel indicated that as the catch monitoring programs were being curtailed, some fishers simply chose to go fishing when they knew the monitors would not be active on the river, meaning the credibility of the catch data goes down as the unauthorized harvest goes up. The senior Interior Fraser resource management biologist noted that because of budget concerns the catch monitoring in 2004 did not start as usual in April; consequently, there was no ability to assess harvest of early run-timing chinook salmon (identified by DFO as a stock group of concern) before the sockeye catch monitoring started in late June.

The situation in the lower Fraser best exemplifies the complexities and inadequacies of the catch monitoring program in the Pacific Region. Between Steveston and Hell’s Gate there is a mix of commercial, First Nations’ FSC, First Nations’ Economic Opportunity and recreational fisheries for sockeye.

The growth in the recreational fishery for sockeye in this area over the past decade has been significant, bringing conflict with First Nations and doubt over the credibility of the recreational harvest data. As outlined earlier, recreational fishery harvest is estimated via creel surveys rather than by trying to count each fish. The Committee heard a variety of testimony from both DFO staff and several individuals about the veracity of the creel survey efforts in the lower Fraser. Some felt it was

adequate, others clearly did not; once again, DFO staff are caught in the middle trying to make the best of an unacceptable situation. Given the participation by thousands of anglers throughout the season, the accountability level for this fishery is not perfect. There is strong agreement within the recreational fishery that a more comprehensive creel survey would be a good thing, not only to more accurately assess the recreational harvest but also to validate the degree of compliance within the fishery.

The all-citizens commercial fisheries for sockeye in the lower Fraser River are relatively small in comparison, considerably limited by time (duration and small number of individual openings) and geography. Unless the fish harvested are sold from the individual boats at dockside, which in many cases they are, most are offloaded at processing facilities providing significant accountability.

Similarly, Economic Opportunity fisheries by First Nations are thought to have an acceptable degree of accountability because of the requirement to land fish at designated landing sites manned by trained catch monitors. It should be noted however that during these fisheries up to 700 set nets may be operating between the Mission Bridge and Hell's Gate, plus drift nets in the Cheam Band traditional fishing area near the Agassiz Road Bridge. With the curtailment of enforcement resources and especially the loss of helicopter patrols in the river, the scope for non-compliance is significant.

For both of these fisheries, the close proximity to a large market makes for the ability to sell a fairly significant portion of the catch outside the normal channels. DFO's catch monitoring system needs to take this factor into account.

The Committee heard a wide range of testimony regarding the catch monitoring of First Nations' FSC fisheries throughout the south coast and the interior of the province. In Nanaimo, the A'Tlegay Fisheries Society reported on the development of real time reporting from their patrol vessel in the lower Johnstone Strait area, transmitting catch estimates from alongside the harvest boats (seine and gillnet) directly to both the society office and to DFO. Elsewhere (Langley and Lillooet for example) DFO supervisors spoke of the positive relationships they and their staff have with local First Nations bands and the high degree of compliance demonstrated by them to the local fisheries management regime, catch monitoring being a part thereof.

The Committee heard testimony from Ken Malloway (Sto:lo Fisheries Manager) on January 22 on the operation of the Sto:lo's catch monitoring program. Funded through AFS agreements, the program began in 1989 by monitoring FSC fisheries, and by 1992 also monitored "pilot sales" fisheries. Malloway testified that the main duty of staff—which included a fisheries manager, catch monitor contractor, 4 supervisors, and 49-60 catch monitors—is to ensure accurate data collections from all fisheries.

In non-sales (FSC) fisheries, landing sites are not mandatory, and monitors collect catch per unit effort data, and count nets from aircraft, sampling 30% of all landings. Monitors maintain logs and collect biological samples from approximately 240 sockeye near Chilliwack and Yale.

In sales fisheries, monitors distribute landing slips (with copies to DFO and Sto:lo Fisheries). Data are recorded at the Katzie dock, Barnston Island, Kwantlen dock, Leq'a:mel, Suma, Bowman's Mill, Skway, Skwah, Island 22, Scowlitz and Chehalis (Port Mann to Harrison) and Peters Reserve, Shxw'ow'hamel Reserve, Chawathil, Coquihalla and Yale Beach (Harrison to Sawmill Creek). All fisheries are planned with DFO, and the totals exclude Yale and Cheam catches.

Sto:lo employed 23 catch monitors for 16 chinook fisheries in 2004. Fishers caught 4,632 chinook between Port Mann and Mission, and 19,868 between Mission and Sawmill Creek. During 6 sockeye fisheries, 50 catch monitors (full 24 hours), stationed at each landing site, counted 82,418 sockeye



below Mission and 254,292 above. There were also 9 chum openings with a total of 46,041 fish landed. Fishers are asked to release all live sturgeon, steelhead and coho.

However, in a number of areas the Committee was advised that the catch monitoring regime for local First Nations was undermined by largely uncontrolled and/or unauthorized fishing. This situation is especially prevalent in the area between the Mission Bridge and Hell's Gate but in the Nanaimo hearing several individuals characterized the situation in 2004 in Barclay Sound and the Stamp/Somass watershed near Port Alberni as being similar, albeit on a smaller scale.

The Committee heard significant testimony on the history of the First Nations' fishery between Mission and Hell's Gate since the introduction of the AFS in 1994. By 2003 portions of the river were a "no go" zone for DFO staff and the fishing, never mind the catch, was no longer monitored in a meaningful way. This deficiency has been covered in the *Enforcement* section of this report, however it is raised here because it points to the impossibility of conducting catch monitoring in such an environment. Several Cheam Band individuals were candid in their comments regarding what they view as their inherent right to fish when and where they want, as well as selling the fish if the chance arises.

### **RECOMMENDATIONS**

6. That DFO convene a meeting with First Nations, fisheries stakeholders, and Conservation and Protection staff to assess the province-wide state of catch monitoring. The participants should examine budgets, personnel needs, transparency, accuracy (bias), problem areas, and ways to improve monitoring programs in all sectors.
7. That DFO, First Nations and stakeholders establish a semi-regular (perhaps annual) review of the status and adequacy of the province-wide catch monitoring program.
8. That an estimate of total mortality be included in the catch monitoring of all fisheries.
9. That DFO develop, on an annual basis, a strategy pre-season to develop some estimate of unauthorized fishing and fish harvest.
10. That resources for catch monitoring be restored to an adequate level in commercial, recreational, and First Nations fisheries as determined through the process in recommendation 6.
11. That DFO retain the ultimate authority and responsibility for auditing catch monitoring reports and performance.

## EFFECTS OF HIGH WATER TEMPERATURE ON FRASER RIVER SOCKEYE IN 2004

Salmon migrate optimally at the average temperatures they have evolved and adapted to; extremely high temperatures will be lethal to a portion of the population through a variety of means. In 2004 migrating Fraser River sockeye experienced extreme high water temperatures. High water temperatures are one of the four most probable causes of the estimated 1.34 million missing sockeye in 2004, along with unreported catch and associated errors in estimating catch above Mission, errors in the Mission and spawning ground escapement estimates and fisheries management. The Committee heard considerable observational and scientific evidence confirming the harmful impact of high water temperature to the dismal failure of the 2004 Fraser River return to spawning grounds.

Each of the four Fraser River sockeye salmon run-timing components experienced unusually high temperatures at some point during their Fraser River migration. For example, based on the 60-year average temperatures measured at Hell's Gate (Figure 1), the Summer-run component experienced the major impact of the highest ever-recorded temperatures in the third week of August. Record high temperatures reaching 21.5°C were measured between August 15<sup>th</sup> and August 23<sup>rd</sup> at Hell's Gate.

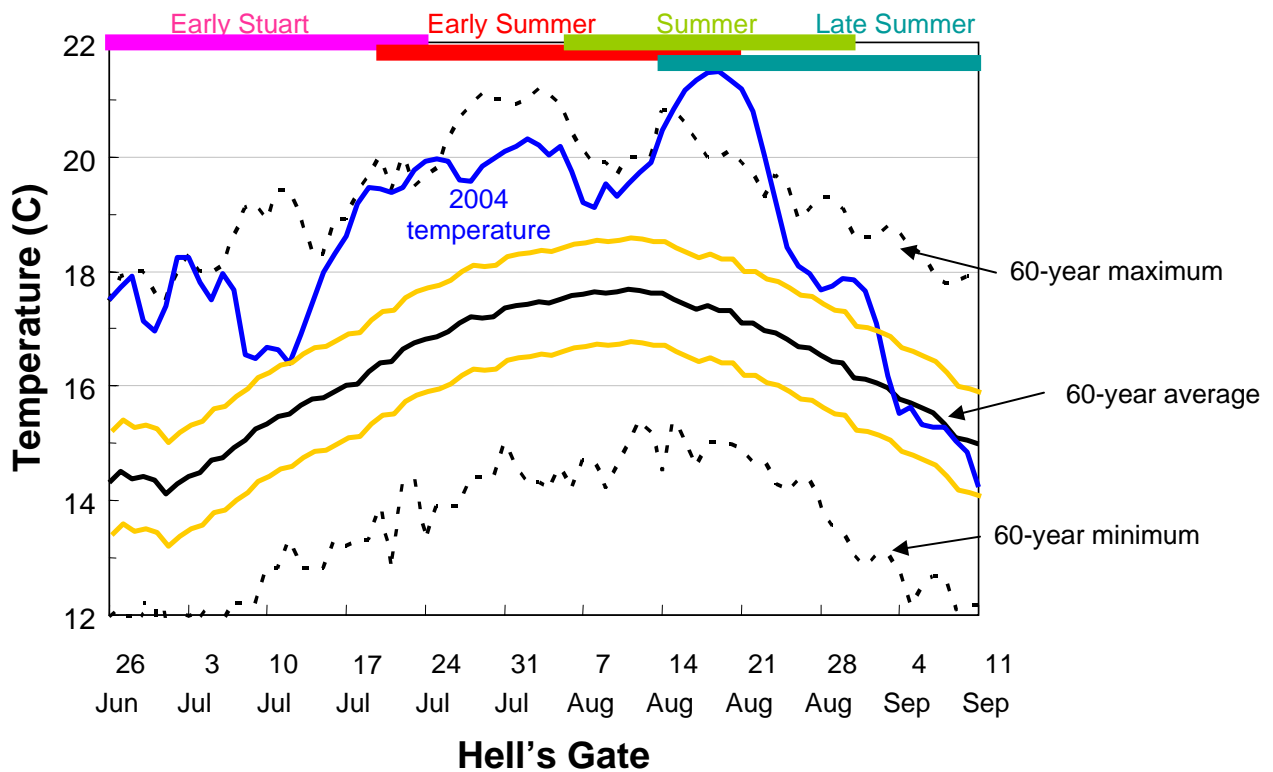


Figure 1. Temperature profile at Hell's Gate in 2004 (blue line), also showing 60-year mean (black solid line),  $\pm 1$  standard deviation (yellow lines), and 60-year minimum and maximums (dashed black line). For several days in mid-August Fraser River water temperatures as measured at Hell's Gate were the highest ever recorded.

With the exception of a one week period during the middle of the Early Stuart-run and a one week period during the early portion of the Early Summer-run and the later half of the Late-run stocks, the temperatures measured at Hell's Gate remained at or within 1.0°C of the 60-year high temperature. These temperatures are an indication of those experienced in general by lower Fraser River stocks, as

well as upper river stocks as they migrated through the main stem of the Fraser River. Fish entering the Thompson system experienced even higher temperatures, whereas fish entering the Chilko system benefited from lower water temperatures.

The following table summarizes the sockeye catch and escapement information used by the Committee.

1	2	3	4	5	6	7
Run Time Group	Mission Escapement Estimate	Catch Estimate Upstream of Mission	Spawning Escapement Estimate	Unaccounted Difference (Missing Fish)	Post-season EMA Estimate	Sockeye Unaccounted for by EMA
Early Stuart	129,000	37,000	9,286	82,714	56,000	26,714
Early Summer	701,000	151,000	150,354	399,646	208,000	191,646
Summer	1,211,000	284,000	272,061	654,939	262,000	392,939
Late (including Brkhd)	293,000	2,000	92,096	198,904	157,000	41,904
<b>Total</b>	<b>2,334,000</b>	<b>474,000</b>	<b>523,797</b>	<b>1,336,203</b>	<b>683,000</b>	<b>653,203</b>

Notes:

- Column 5: The Committee used the estimate of total “missing fish” as 1.336 million.
- Column 6: The EMA estimates shown in column 6 are but one method of estimating the number of fish that may have perished due to adverse environmental conditions in 2004.
- Column 7: Column 5 (unaccounted for difference) minus Column 6 (post-season EMA estimate) estimates the number of sockeye that remain unaccounted for by the EMA estimates.

### Scientific Evidence for Temperature-Induced Mortality in the Fraser River During the 2004 Sockeye Migration

There has been considerable scientific research done over the past few years related to the effects of high temperatures on migrating Fraser River sockeye. The Committee was presented evidence from researchers Scott Hinch, Steve Cooke, Karl English, and David Patterson (Tony Farrell co-authored the Hinch and Cooke presentation but was not present to give evidence). The research has dealt primarily with the en route and pre-spawn mortality that has been occurring as a result of earlier than normal entrance into the river by the late stock grouping. Although directed at the late run-timing problem, the Committee heard evidence that the temperature related research is applicable to the other Fraser sockeye run-timing groups in 2004.

The study results presented to the Committee are based on the experiments conducted in 2002, 2003 and 2004 using the following methods:

- Destructive sampling of approximately 4,000 fish captured along ocean and fresh water migratory routes;

- Swimming performance and simulated migration experiments;
- Biotelemetry of individual fish to follow their migration, along with non-destructive assessments of their physiological state (about 2000 fish tracked and assessed).

Temperature related conclusions from the studies presented included:

- Standard metabolic costs increase exponentially with temperature depleting energy stores faster and placing greater demands on the decreased amount of oxygen contained in warm water. Fish that died while migrating had lower energy, higher plasma lactate levels (i.e., were more stressed), and were more reproductively advanced.
- High temperatures promote fungal and bacterial infections and disease developments. Secondary infection of wounds, and skin and gill damage (e.g., caused by gillnets and predators) by opportunistic fungi and bacteria, accelerate mortality. In addition, the kidney parasite *Parvicapsula minibicornis*, which has been linked to recent high levels of pre-spawn mortalities in Late run sockeye, develops more rapidly at high temperature.
- Swimming performance increases with temperature to a maximum optimum, then decreases with further increases in temperature.
  - Above 16°C, exercise capabilities are reduced (reductions occur for maximum cardiac performance, maximum swimming speed and active metabolic rate).
- Stocks have optimal migration temperatures which apparently match their long-term average river conditions.
- En route mortalities can be caused by fish running out of energy, and energy depletion is likely to be a contributing factor only when normal progress up river is delayed or impeded. Traveling more slowly increases their exposure time to temperature which can eventually lead to mortality from disease agents.

The temperature research that has been used as a standard since 1977 (Servizi and Jensen 1977) indicated the following mortalities related to water temperature:

15-21° C	no mortalities after 15 days
22° C	50% mortality after 5.1 days
23° C	50% mortality after 2.4 days

The Committee heard evidence that the results from this previous study are inapplicable to the wild Fraser sockeye. The fish were pre-treated for disease prevention prior to the experiment. Also, the duration of the normal sockeye migration may be longer than the 15 day duration of the experiment.

Based on these historical data and data from other older studies, DFO Environmental Watch program uses the following information for describing the potential effects of river temperature on salmon migrants:

18° C	decreased swimming performance
19° C	early signs of physiological stress and slow migration
20° C	associated with high en route mortality and disease
21° C	chronic exposure can lead to severe stress and early mortality

These guidelines are more conservative than the lethal temperature data generated by Servizi and Jensen (1977) and incorporate some of the more recent temperature-related research on Fraser River sockeye salmon. Using these guidelines, the record high temperature of 21.5°C at Hell's Gate between August 15<sup>th</sup> and August 23<sup>rd</sup> would cause fish mortality.

The most recent studies conducted in 2003 and 2004 by Hinch, Farrell and Cooke, which acknowledge the importance of exposure duration as well as temperature, suggest the new mortality criteria for Fraser River adult sockeye salmon could be:

19.6° C	50% mortality after 9 days
18.0° C	50% mortality after 16 days
15.9° C	50% mortality after 29 days

These criteria are likely a worst-case scenario because fish had to be handled several times and held in aquaria to generate the data. Given that the majority of sockeye in 2004 experienced temperatures above 19.6°C for a 9-day period, the research from 2003 and 2004 would predict that overall temperature-related mortality for this group of fish would be greater than 50%.

The researchers also concluded that the accumulation of degrees of water temperature encountered per day (Accumulated Degree Days, ADD) is another measurement that could be used to assess the status of migrating sockeye and predict their ability to successfully reach the spawning grounds.

- Migrating sockeye that are exposed to high temperatures for extended periods of time and accumulate about 450 to 500 degree days are more likely to die before reaching the spawning grounds.
- Late-run sockeye entering the river earlier than normal experience much warmer temperatures than they normally would (in 2004, 18 to 21°C compared to 14°C normal). This resulted in the accumulation of more degree days and promotes a rapid proliferation of *Parvicapsula* and other infections.
- Severity of *Parvicapsula* infection increased rapidly when individual fish had accumulated about 370 degree days.

The researchers presented evidence that supported other witnesses' observations that sockeye salmon may seek cooler water to improve their chances of survival and successful migration.

- Weaver sockeye experimentally exposed to warm water took longer to reach their destination when released back into the river than fish experimentally exposed to a period of cooler temperatures.
- Biotelemetry of Weaver sockeye revealed that fish that were exposed to high water temperatures in the Harrison River and subsequently moved to cooler, deeper water in Harrison Lake increased their likelihood of survival compared with fish that remained in the warmer Harrison River.

The Committee heard evidence that the development of the EMA model includes past unexplained differences (e.g., unreported catch, Mission hydro-acoustic errors). The Committee heard evidence that the existing EMA model is the most useful tool available for assisting fisheries management in delivering extra fish to the river for anticipated adverse environmental conditions. Still, the criticism of confounding effects needs to be addressed. Information to evaluate en route discrepancy models exists and should continue to be collected to begin to tease out real environmental effects from other

causes of discrepancies between the gross escapement past Mission and the escapement estimate from the spawning grounds.

The Committee is concerned that research to date has been focused primarily on Late-run sockeye and may not be specifically applicable to the other sockeye run-timing groups. The Late-run component has displayed abnormal river entry timing behaviour in recent years, unlike the other three run-timing groups, and may not be representative for this and other reasons.

### **Conclusions Reached Based On Thermal Models**

Using two simple models to estimate total mortality related to temperature, Hinch, Farrell and Cooke estimated mortality among all stock groups could have been 45-88% based on temperature alone (45% Late, 72% Early Stuart, 88% Early Summer and Summer). The researchers concluded “that our mortality estimates are consistent with the stock-specific scale of discrepancy estimates thus temperature related mortality likely explains large amounts of the observed discrepancy”. To put it simply, the temperature researchers are quite convinced that much of the discrepancy (“missing fish”) in 2004 can be attributed to mortalities associated with the high water temperatures.

The researchers qualified this conclusion with the following caveats:

- stock-specific lethality levels may exist but are not considered.
- the experiments from which data were derived were not explicitly designed to test lethality due to temperature alone. Thus, the lethality data represent a scenario where additional stresses were imposed on the fish.
- data exist that indicate salmon encounters with and escape from gill nets results in significant delayed (up to 24 h) mortality when river temperatures are high. This stress, which would have been encountered by Fraser River salmon in 2004, could result in the worst case scenario mortality rates predicted above and/or create additional mortality to that predicted by the models.

The Committee has to weigh this important conclusion from the temperature researchers with the significant evidence received regarding unreported and unauthorized catch. The temperature research models do not include an estimate of unreported catch, leaving open the question of the causes of mortality; unreported catch or temperature. Clearly both high temperature and unreported catch were factors accounting for the majority of the missing fish in 2004. Based on the information received by the Committee, it is not possible to quantify the contribution of either factor.

### **Visual Observations, Environmental Observations and Evidence Related to Water Temperature**

The Committee received evidence on fish condition from Mr. Chris Narver, DFO Technician specializing in catch monitoring and fish sampling between Bridge River Rapids, 4 km north of Lillooet and Scuzzy Rapids, 1 km north of Hell’s Gate.

- June 30<sup>th</sup> started Monitoring: Early Stuart run did not have any sores, or lesions, in fact looked ocean fresh and very healthy. Comments from First Nations fishers were positive regarding the great quality of the Early Stuart sockeye.
- Fraser River temperatures ranged from 17°C – 21°C. The Fraser reached 20°C July 24<sup>th</sup> and 21°C August 16<sup>th</sup>. Temperatures taken randomly throughout the Fraser from

Lillooet to Boston Bar. Most of the tributaries that flow into the Fraser were much cooler, 10°C to 18°C. (For most of the summer.)

- July 28<sup>th</sup> to August 28<sup>th</sup> larger than normal numbers of dead sockeye were seen in the Fraser.
- On July 28<sup>th</sup> sockeye were first observed with raw sores, lesions, and fungus patches on head, gills, and body. Occurrences increased daily from that date.
- Heavy concentrations of sick, lethargic-looking sockeye gathered at the mouths of cooler tributaries.
- On August 22<sup>nd</sup> the number of dead and sick sockeye peaked. There were hundreds in some stream mouths and thousands in some larger streams like the Nahatlach and Stein Rivers. Our dead sightings went from 10 to 20 a trip earlier in the month, to 200 to 300 floaters for this trip.
- Throughout August First Nations fishers complained that sockeye were in very poor condition. Many sockeye were thrown back dead and alive if they had sores, fungus, or lesions on the body.
- August 28<sup>th</sup>, following heavy rains, the numbers of sockeye at stream mouths drastically declined from hundreds and/or thousands to dozens.

The testimony of Mr. Narver provides clear observational evidence that increasing water temperatures experienced by migrating sockeye had a deleterious effect on their behaviour and condition. Mean daily water temperature ranged from 16.4 to 21.4°C at Qualark during the period of Mr. Narver's observations from June 30<sup>th</sup> to August 23<sup>rd</sup> and fish condition ranged from very healthy to dead. Fish condition began deteriorating about July 28<sup>th</sup> and became progressively worse until August 22<sup>nd</sup> as temperatures ranged from 19.2 to 21.4°C. These specific observations are consistent with the Environmental Watch public guidelines and the new UBC criteria for sockeye mortality presented above, but are not consistent with the more conservative Servizi and Jensen criteria for sockeye mortality. These observations also corroborated two of the main scientific findings, namely that: a) the record high temperatures of 21.5°C at Hell's Gate between August 17<sup>th</sup> and August 23<sup>rd</sup> were predicted to have caused appreciable fish mortality, and b) sockeye sought cooler water when faced with excessive water temperature in the main stem rivers.

### **The Importance of Fish Habitat**

The Committee received testimony from several witnesses concerned about habitat degradation such as clear cut logging and pollution. DFO Conservation and Protection Officers gave evidence on the lack of resources to prosecute violations of the *Fisheries Act* related to fish habitat. All governments, businesses and individuals have legal and moral responsibilities for protecting water quality.

There is increasing experimental and observational evidence that sockeye salmon can increase their chance of survival in high water temperature years by seeking cooler water. The Committee received evidence showing that the average summer temperature in the main stem Fraser River has increased over the past 50 years.

The Committee heard limited evidence that there may be ways to reduce the temperature of the Fraser River tributaries that could contribute to reducing the temperature of the Fraser mainstem. Given the increasing frequency of high water temperature years, there should at least be some scientific thought

given to the feasibility of using existing structures and water use agreements to decrease Fraser basin water temperatures.

### **Other Contributing Factors to Mortalities Associated With High Temperatures**

- The importance of back eddies as holding and resting areas increases for sockeye during years of high water temperature. This is the subject of a separate chapter in this report.
- Net encounters increase the stress on migrating sockeye.
- High water temperatures, in combination with wounds, promote lesions and generally reduce the quality and desirability of fish for human consumption. This can result in catch that is discarded and not reported. Evidence was provided that this did occur in 2004 and likely contributed to the missing fish.

### **The specific case of the 2004 Early Stuart Run-Timing Stocks**

Over the course of the review, the panel heard conflicting evidence regarding the fish condition and mortality estimates experienced by the 2004 Early Stuart run. The temperature research indicated that the Early Stuart run should have experienced temperature related mortality during their migration, especially during the later part of the run. The beginning of the Early Stuart run experienced temperatures near the historic average (Fig. 1). Observations from Fisheries Officers and DFO biologists indicated that the Early Stuart sockeye did not experience problems and appeared in good shape during their migration. However, a post-season EMA model estimate generated by the PSC suggested a significant loss due to high temperatures (56,000 fish) may have been likely.

### **Factors and evidence received associated with the Early Stuart migration**

- The majority of Early Stuart were not exposed to temperatures over 20°C when passing through Hell's Gate. The last 25% of the run experienced mean temperatures of 19.8°C at Hell's Gate. However, large portions of the run were exposed to 20°C in the Stuart and Nechako Systems.
- During this period of elevated temperature, the difference between normal and experienced temperatures for Early Stuart was at a similar level to other run-timing groups, about 3.5°C.
- Evidence generally indicated that flow conditions for migration were favourable for the Early Stuart run.
- DFO Technician Chris Narver reported that when his harvest monitoring program started on June 30<sup>th</sup> the Early Stuart fish observed did not have any sores or lesions, and looked ocean fresh and very healthy. Comments from First Nation fishers were positive regarding the good condition of the Early Stuart sockeye.
- There was more authorized fishing on Early Stuart in 2004 than in recent years.



Comments from Dennis Girodat, DFO:

- Early Stuart fish are the ones most sought after both from the legal fishery perspective and from any illegal fishing activity, because of the quality of the fish and the fact that they are the first fish in the river.
- The Early Stuart run was exposed to higher net exposure in 2004 than in recent years.

**Carcass Issue**

The Committee heard testimony from many witnesses who did not believe that high water temperature was a major factor in explaining the number of missing sockeye in 2004. Most of these witnesses based their testimony on observations that they observed fewer dead fish in 2004 compared to 1998, the last well known and reported year of high water temperature. The Committee heard evidence explaining in general the variability and difficulty of estimating temperature related mortality based on observations of carcasses. Known and suspected differences of river discharge, abundance of the sockeye run, and distribution of temperature related mortalities may explain the observed differences between 1998 and 2004. No specific studies were conducted in either 1998 or 2004 to quantify the number of carcasses. The only quantitative measure of carcass counts was testimony by David Patterson who presented the number of carcasses counted at the PSC Mission hydro-acoustic transect; this data showed similar number of carcass counts between 1998 and 2004 relative to the abundance of the runs in those years.

**Conclusions**

1. High water temperature is an extremely serious problem for Fraser River sockeye. High water temperature may lead to:
  - a) fungal, bacterial and parasitic infections and disease developments;
  - b) delayed migration;
  - c) increased physiological stress;
  - d) decrease in energy reserves to reach spawning grounds and spawn successfully;
  - e) increased delayed mortality following non-lethal fisheries encounters;
  - f) direct mortality.
2. In 2004, a significant but unquantifiable component of the missing fish can be attributed to the high water temperatures. The ability to quantify direct and indirect mortalities due to temperature effects is possible, but is not feasible until new data are generated. There was concurrence between scientific predictions of mortality and of observed elevated mortality that occurred during the period of excessively high water temperature in the Fraser River.
3. A priority activity is accurate catch monitoring. If accurate catch monitoring is possible, then future discrepancies could be attributed with more confidence to temperature and other environmental effects, improving the understanding of real environmental effects, and provide a validation approach for the scientific studies.
4. The Early Stuart run in 2004 may have been a special case among the four run-timing groups. It did experience higher than normal migration temperatures during the later segment of the run that probably caused some additional mortality. However, the evidence would suggest that unreported catch was a significant contributor to the missing Early Stuart sockeye compared with the three other run-timing groups.

## RECOMMENDATIONS

12. The EMA model should consider the newly developed mortality criteria related to in-river water temperatures.
13. The estimate of accumulated degree days should be considered as an approximation of the environmental stress experienced by migrating Fraser River sockeye salmon to inform in-season management decisions.
14. The factors contributing to the discrepancy between gross escapement at Mission and spawning ground escapement (river temperature, river flow, unreported catch, catch estimation, errors in Mission and spawning ground escapement estimates, etc.) should be separated through improved data collection and modeling. In the interim, the EMA model should be renamed to eliminate the perception that it only accounts for environmental factors.
15. New and properly designed research is required on Early Stuart, Early Summer and Summer run adult sockeye to complement the work done on Late run sockeye to determine any stock-specific effects of high temperature on migration and spawning success.
16. That riparian habitat in tributary watersheds throughout the Fraser basin be protected and restored to reverse the warming effect that lack of cover creates through the disruption of the hydrologic cycle.
17. The feasibility should be investigated of modifying existing flow control/hydro facilities and water use agreements that might decrease Fraser mainstem and tributary temperatures during high temperature years.
18. Fisheries management action should be responsive and proportional to the direct relationship between increasing water temperature and decreasing survival to spawning. In extreme warm water years additional management actions need to be taken to ensure adequate and appropriate numbers of fish enter the river. Once in the river, management action, such as a time and area conservation corridor, is needed to create the opportunity for sockeye to migrate with a minimal amount of additional stress caused by fishing in the river.
19. Given the challenge posed to fisheries management by high water temperature and associated impacts on fish mortality, more systematic collection of data on the number of fish observed floating in the river or dead on the banks downstream of the spawning grounds, would prove useful for comparative purposes.



# FISHING GEAR IMPACTS

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## Introduction

Sockeye returning to the Fraser system encounter a series of harvest efforts involving several types of fishing gear. It is important to consider the cumulative effect of this gear not only in terms of total harvest but also with respect to the incidental mortality it may cause.

The Committee heard repeated testimony that the number of fish displaying net marks and other signs of injury was substantially higher than previously seen. As just two examples, DFO stock assessment biologist Timber Whitehouse said that 60% of Tachie sockeye had net marks compared with a 1995 to 2003 average of 19.5%. Similarly, while the longer term net mark average on Early Stuart was 1.4%, the 2004 number was 12.9% or 9 times greater. The Committee also heard evidence of significant wounding on fish arriving at the spawning grounds, as high as 40% on some stocks.

Another indication of a potentially damaging cumulative gear effect was a skewed gender ratio with respect to Early Stuart, Early Summer, and Summer run sockeye reaching the spawning grounds. Testimony to the Committee suggested that the size selectivity of gill nets, combined with the average size difference between male and female fish may have been the cause. A similar impact was not observed on the late run fish into the Birkenhead-Weaver system; these fish leave the Fraser below Chilliwack. Here there was a near one-to-one sex ratio.

## The 2004 Gauntlet

While some Fraser sockeye are caught in South East Alaska and near the Queen Charlotte Islands this impact is modest and incidental to fisheries aimed at other stocks. It is the explicit policy of DFO to try and preserve the commercial harvest of Fraser sockeye for vessels which have chosen to be licensed in the South as part of the area licensing program.

### *Approach Waters / Marine*

The fish entered seine, troll and gill net test fisheries in Johnstone and/or Juan de Fuca Straits and the lower Strait of Georgia. Following this were First Nations FSC, commercial and recreational marine fisheries.

### *Mouth of the Fraser River*

Drift gill net fisheries take place between the mouth of the Fraser River and the Mission Bridge for First Nations FSC purposes as well as commercial harvest. There also is some recreational hook-and-line fishing here.

### *Mission Bridge*

The Mission Bridge is the up-river boundary for commercial fishing. There is First Nations drift and set gill net fishing above this point, as well as a substantial recreational hook and line fishery.

### *Yale*

From Yale, at the mouth of the Fraser Canyon to Sawmill Creek, there are First Nations set gill net and dip net fisheries as well as recreational hook and line fishing.

### *Sawmill Creek*

Sawmill Creek is the boundary between DFO's Lower and Mid-Fraser areas. Above here are First Nations set gill net and dip net fisheries as well as recreational hook and line fishing.

### *Upper River*

In the Upper River area there are First Nations set gill net and dip net fisheries as well as recreational hook and line fishing.

## **Overall mortality implications of different gear types**

### *Ocean Hook and Line Gear*

In tidal waters sockeye are caught by commercial-style trollers using flashers and "hootchies" (small plastic squid-like imitation lures) with barbless hooks. Recreational sockeye gear is similar in style. Fish which escape may suffer some hook injury.

### *Seine Nets*

Under current regulations which require the brailing and sorting of catch, seine nets can be selective with respect to their impact on non-target species. Their substantial fishing power requires close monitoring with respect to total catch.

### *Ocean Gill Nets*

In their tidal water application gill nets are subject to both rules and practices aimed at reducing their impact on non-target species. Their total harvest in both commercial and First Nations FSC fisheries is subject to numerical limits. Fish which manage to escape a gill net, usually because of their size, inevitably suffer both physiological stress and net mark injuries.

### *River Drift Gill Net*

For obvious reasons, the driftnets employed in the Fraser River are shorter in length than their ocean counterparts but arguably more effective in that the fish are more concentrated during their river migration. Again, the fish which encounter a net but escape, suffer both physiological stress and net mark injuries. In addition, because of the size selectivity of the gill net, these escapes may have a cumulative effect on the gender ratio of fish which make it to the spawning grounds.

### *River Set Net*

These are gill nets attached to one or two fixed points. They "fish" for as long as they are in the river and have the same impacts as a drift gill net on sockeye that escape from a net encounter. In addition, the Committee has heard evidence that the location of these nets in back eddies and other places where migrating sockeye may be seeking favourable swimming conditions, may have the adverse effect of forcing fish to swim against the swifter and more turbulent water in the central part of the river or even of "breaking up the run" as a cumulative effect of having to negotiate a series of nets—in 2004 as many as 700 between Mission Bridge and Hope according to some testimony.

### *River Dip Net*

The dip net deals with one or two fish at a time and we heard no testimony as to any adverse effects with respect to its unintended effect on fish that are not harvested.

### *River Hook and Line*

The recreational hook and line fishery has become a substantial harvester as a result of anglers perfecting a technique known as “flossing”. A barbless hook, associated usually with a small patch of colored yarn material, is rigged at the end of a leader as much as 15 feet from the casting weight on the line. This is cast and retrieved across the current. While salmon have stopped feeding when they enter fresh water, some still react instinctively to the presence of a lure. More frequently, however, since fish swim with their mouths open, when they are present in concentrated numbers it does not take long before a line crosses the open mouth and the retrieving hook catches the fish in the outer side of the jaw. This is defined as a legal catch since “foul hooking” or “snagging” is defined in the sport fishing regulations as wilfully “hooking a fish in any part of its body other than the mouth.”

The technique is controversial, even within the recreational community. Some say it still amounts to jigging or snagging. Others feel that ordinary non-aboriginal Canadians should have an opportunity to harvest Fraser River sockeye since no other hook and line technique is effective once these fish have entered fresh water.

Obviously there are some injuries caused to fish that manage to escape after being hooked, and to fish which have been subject to “catch and release” by anglers who enjoy fishing but do not wish to keep their catch.

#### **RECOMMENDATIONS:**

20. When designing the annual fishing plan, DFO must take into account not only the harvest impact of each fishery and gear type, but also the cumulative effect each fishery and its associated gear has on total fishing mortality.
21. Research must be undertaken to verify whether the selective placing of set nets can have an adverse impact on upstream migration by depriving fish of resting places or forcing them to swim in the faster and more turbulent mid-stream waters. DFO policy should be to ensure the existence of a “conservation corridor” for the fish destined for the spawning grounds.
22. Research is needed into the relationship between gill net mesh size and the desired spawning ground gender ratio.
23. Approval of a change in gear type, such as the 2004 approval of the use of drift gill nets by the Cheam First Nation, should not take place in the absence of an objective determination of the comparative fishing power of the different gear.
24. DFO should set goals and objectives with respect to the number of nets allowed.
25. The regulation requiring that all nets be clearly marked as to their ownership should be vigorously enforced. Unidentified nets should be subject to immediate removal and confiscation. The penalty for leaving nets where they can continue to fish during closed periods should be substantial.



# ENFORCEMENT

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## The Conservation and Protection (C&P) Challenge

This chapter deals with enforcement of the *Fisheries Act* and *Regulations* for the 2004 year by the C&P Division of DFO in regard to Fraser River sockeye salmon. The C&P Division is DFO's separate enforcement arm and bears responsibility for dealing with all illegal activity related to fisheries and fish habitat, including:

1. Fishing illegally, that is, when fishing is closed or fishing in a prohibited manner, whether commercially, recreationally or in the aboriginal FSC fishery.
2. Concealing the over harvesting of fish.
3. Illegally selling or trading fish illegally caught or illegally selling or trading fish that have been legally caught (such as the sale of recreationally caught fish or fish caught for FSC purposes).
4. Not respecting the "no net loss" provision with respect to fish habitat.

The illegal fishing and/or sale of sockeye has always occurred to a limited extent in all sectors of the fishery, but illegal activities in the Fraser River fishery in 2004 was attested to by numerous witnesses. Their evidence suggests that such activity was at a higher level than in previous years, that the C&P Division lacked adequate resources to deal with the illegal activity, and that, as a consequence, decisions were taken to deliberately ignore some aspects of the illegal catching and selling of fish.

### Witness Testimony

Brian Richman, a recently retired DFO officer who had served as area chief of C&P in the lower Fraser River area and as Chief of Enforcement Operations gave evidence that was subsequently confirmed by a succession of witnesses in other communities. He said that the trend in the years leading up to 2004 had been a steady decline or deterioration in the C&P Division through the reduction of staff well below what was necessary, in reduced resources such as patrol boats and air flights and in having to cope with a fleet of aging vehicles.

Mr. Richman explained the importance and time saving efficiency of the aircraft flights up and down the river that had been eliminated and spoke with serious disappointment about the "paper requirements" that meant enforcement officers now spend 60% of their time in the office. He was the first to tell us that enforcement officers were told not to engage the Cheam (an aboriginal band that fishes mostly between Jones Hill and Jespersen Bar in the Chilliwack area) for any illegal activities in order to keep peace on the river. Mr. Richman's evidence, including his reference to the Cheam and his overall view of things was confirmed as relevant to the year 2004 both by current enforcement officers who later testified and by evidence from a number of sport fishers and guides on the river.

Mr. Frank Kwak of the Fraser River Salmon Society told us that he and his colleagues compiled diaries over the summer of 2004.

We decided as a Fraser River Salmon Society and the Sport Fishing Defence Alliance to put together these books because we were seeing so many violations that we wanted to keep a record of them. Several times I observed fish being loaded into pickup trucks just at light in the morning. These fish would have been caught through the night in illegal nets. In total I recorded 17 illegal drift nets and 36 set nets.



Mr. Kwak cited numerous instances of illegal fishing taking place with no visible evidence of enforcement on the river, and said this was not limited to the Cheam area. He also told of a somewhat frightening incident where he and a CBC Radio-Canada reporter and cameraman were intimidated (she said, concerned) by a panel truck of natives at the Rosedale-Agassiz Bridge. This encounter quickly ended their filming intentions.

When asked by the panel to compare 2004 with his other years on the river with respect to illegal fishing, Mr. Kwak responded that “it grew exponentially an unbelievable amount this year.”

Mr. Fred Helmer, a guide on the river in the Chilliwack area, confirmed much of what Mr. Kwak told us as did another angler, Mr. Dean Werk. He had taken the time to keep a diary and record the calls he made to the special telephone line in Vancouver established by DFO for the reporting of illegal activities (Observe Record Report, 1-800-465-4336 “Call this number and make a difference”). From July 27 to October 8 he phoned 14 times to report infractions and on each occasion got no answer other than a recorded message. Although he left his phone number for a call back, he never once got a return call and saw no action whatsoever on the part of enforcement in the Chilliwack area to the incidents he had reported.

According to witnesses who appeared before us in Richmond, Surrey, Chilliwack and Kamloops, much of the drift net fishing, at least in the Chilliwack-Rosedale area, takes place at night and although this is illegal there are usually no C&P officials on the river to apprehend the offenders. The C&P enforcement officers told us that they did not have anywhere near the staff to even do the job in daytime, let alone at night.

From the hearings in many locations we heard evidence of growing confrontation between sports anglers casting lines off the bars and native driftnet fishers going by and their fishing gear becoming entangled. The sports fishers maintain that they have a right to fish from the bars and the aboriginal fishers maintain their right to drift up to the bars. This conflict seems likely to continue and requires reconciliation in an effort to prevent future gear conflicts.

In Chilliwack and later in Richmond we heard from several aboriginal fishers and groups of fishers. June Quipp, an elder and former elected chief of the Cheam First Nation, testified along with Chief Jimmy George. They defended the Cheam Nation and its activities, explaining that in their view the sports fishers were trespassing on their property and taking the fish that they own.

June Quipp explained that in her view of the law, the Cheam have every right to catch and sell all the fish they want by any method they choose. “Sparrow says we can fish any way we are accustomed to fishing whether it be contemporary or historical, and we do...” She went on to say,

I'll speak for myself. If I get the chance to sell fish I do. And if you look at food, social and ceremonial purposes, then I think you better start defining social. Because a lot of times when...they put that out that, you know, it came out in Sparrow, that social means economic needs...so I do agree that, yes, if I have the opportunity to sell fish....

While Ms. Quipp emphasized that she spoke for herself and not for the whole band, it was clear that she was expressing her sincere view of the law.

Chief Sid Douglas and Darwin Douglas of the Cheam Band gave evidence in contrast to that of June Quipp. They openly acknowledged the many conflicts in the past with DFO and sports fishers but said they felt positive about the future. Darwin Douglas testified that an agreement satisfactory to all could be reached between the Cheam and DFO in 2005. In fact, he said, they had already commenced or were about to commence negotiations. They also acknowledged that some illegal

activities had taken place within the Cheam fishery in 2004 but that they themselves, as a band, now treat illegal activity seriously and will assist in enforcement.

We heard from many DFO C&P staff, management staff and First Nations members that having an AFS-based fishing agreement between DFO and First Nations definitely improves the level of compliance with fishing regulations and the relationship with DFO.

Like their colleagues from other parts of the region, the fisheries officers from C&P in Chilliwack gave evidence about their lack of resources and staff and said that they decided to put their effort into saving fish and not chasing “dead fish”, that is, fish that were dead in nets or part of illegal sales. One officer testified from the Chilliwack Occurrence Binder that in 2004 there were 331 First Nations occurrences, and 168 reports of illegal fishing, of which 108 were in the region of the Rosedale-Agassiz Bridge. It seems perverse that the policy decision not to enforce the laws against illegal sales undoubtedly encouraged both clandestine harvest and inflation of the legal FSC catch by those who wished to profit from the sale of some of their Section 35 fish.

Although these officers had a territory from Mission Bridge to Sawmill Creek, they told us that, to their despair, they cannot handle the dry rack fishery and have no time to get down to Mission. They have no time to do audits and have no money for air surveillance. They do a patrol only when they have enough people. They said that they often gave advice to management that was not heeded. This evidence in Chilliwack, as in the other areas we visited, clearly demonstrated how low the morale among the C&P Division has fallen. One officer pointed out to the Committee that he was not as proud of his work as used to be the case.

Murray Chatwin, an executive with the Ocean Fishing Company, testified that poaching in the Fraser is a very serious problem, especially at night. In his view, the biggest problem regarding the missing sockeye is the unaccounted for fish in the Fraser River and that the illegal sale of fish is a serious component of that problem because it created “pressure to catch more fish.”

He suggested that on the Fraser the Rule of Law was “breaking down” and that DFO managers were “hopelessly naïve” in their estimates of illegal fishing because “Illegal activity does not happen in the daytime when planes are flying over; it happens at night. And we think it’s potentially large.” He urged the Committee to “raise the stakes for non-compliance” perhaps by putting “some power into the various user groups to deal with their own issues and make them responsible to each other.” He stated:

...basically you’ve got to put more teeth in enforcement...you’ve got to give enforcement the mandate to enforce...so that everybody knows that if you get caught doing something, you’re going to get nailed. You’ve got to give them ...some better funding....raise the stakes...I worked in Alaska for a while as part of my job....I used to get calls threatening to cancel our bond because somebody had put the wrong date in the wrong slot on the fish ticket...there were some pretty strong sanctions for not reporting....tie a guy up for a week. Second time around, tie him up for a month.

While a great deal of testimony focused on illegal net fishing, the Committee also heard evidence about problems with respect to recreational fishing. Scott Laverty, a fishery officer from Mission, said in Chilliwack that:

The sport fishery is not without its warts as well. And it’s a very difficult fishery in my mind. It’s a fishery, especially during sockeye season, that’s rampant - in my opinion it’s full of illegal activities. And, again, it just speaks that we just simply cannot deal with it and First Nations.

In Prince George, the North Fraser area was described as much less of an enforcement problem than the region below the canyon. However, Elmer Fast, the acting area chief of Resource Management for the Interior Fraser said that while “some level of unauthorized harvest does occur, DFO’s ability to measure its impact was low”. Alan Charbonneau, a C&P officer based in Prince George added that while they used to cover the river seven days a week they now had budget and personnel for only five days of enforcement per week.

Dennis Girodat, C&P supervisor for the Northern B.C. interior told the Committee:

We used to do a fair number of patrols by way of aircraft—fixed wing aircraft and helicopters. Those have been gradually phased out altogether because of budget cuts. It is to the point where we no longer do any of them. The other impact that we are ...facing ...related to the budget cuts...would be, I guess, the erosion of the ability to conduct patrols because of non-replacement of primary capital equipment. In the last 7 years, I think we have had two vehicles replaced. We are currently running a fleet of ten vehicles here, only two of which are under a quarter of million kilometres, a number of which are not totally dependable to conduct late night patrols in extremely isolated areas such as Gang Ranch and Farwell Canyon country in there...it’s a downward spiral in terms of our budgets being eroded by the cost of living and trying to maintain aged fleets of equipment, at extreme costs...The irony of it is, I guess, we are one of the very few agencies in the Interior that gets Christmas cards annually from the tow truck companies.

At the Kamloops hearing, we continued to hear about the C&P Division’s lack of resources. Time after time we were told that through budget cuts they did not have the resources to properly perform their jobs. Douglas Cowan from Salmon Arm told us that budget cuts had “crippled C&P efforts in my field unit.” He added that the “fish black market is tied closely with the drug trade.” He said it is “well documented within our agency that those people are trading drugs for fish or fish for drugs.” He said that because of budget cuts his unit had not been able to do any enforcement with respect to illegal sales since 2002—despite his belief that “the majority of black market fish were sold in the B.C. interior” or passed through on the highway to Alberta.

A C&P officer from Lillooet, Tom Grantham, said his unit had lost one position to Kamloops and had one that was unfilled. He further testified that “illegal sales are not addressed due to budget constraints” and that there was a “lack of human resources to be able to conduct these investigations” into illegal fishing or sales. Kamloops C&P Investigator/Analyst Robert Melvin testified that he had prepared a report in 2003 into illegal fishing and sales by the Cheam First Nation but that his report and recommendations had not been implemented. A DFO promise to make this report available to the Committee has not been fulfilled.

Mr. Randy Nelson, the Area Chief of Conservation and Protection for the Mid and Upper Fraser region appeared before us in Richmond and provided an extensive report. He began by noting that his area was in the throes of reducing its complement of field officers from 29 to 24, as part of the Pacific Region’s attempt to reduce C&P officer numbers by 18% in order to “free up dollars for operational funding.”

This reference to an imbalance between the salary and operations and management (O&M) categories of the regional budget later was confirmed in testimony from the Regional Director General, Mr. Paul Sprout. His presentation showed that in 1997, O&M and salaries were in rough balance, at about \$63 million each. Today, O&M is at about the same level (\$65 million) while the salary component has increased to \$86 million.

Mr. Nelson told us that the money currently available for overtime was only 20% of what was available in 1997. Funds for chartering helicopter overflights had been eliminated. Of his vehicles, 80% were past the criteria for replacement. At the current rate he could replace only one vehicle

every 20 to 30 years. He had informed his superiors of an incident in June where metal fatigue caused a serious accident with a C&P vehicle.

“If we’re not looking for violators, we won’t find them”, he said. Because of a lack of resources his staff was not able to patrol areas where non-native fishers and bands who do not live on the river might be poaching Early Stuart sockeye.

We cannot verify to what extent this [poaching] happened in 2004...those that choose to sell fish illegally are more likely to fish in remote areas not checked by monitors. They are also more likely to misreport their catch to lessen attention drawn to them for catching large amounts of fish.

After reminding the Committee that an earlier DFO random survey of restaurants and fish retailers in the Okanagan area found that amongst 64 places surveyed, there had been 89 attempts to sell them illegal fish, Mr. Nelson said:

Due to budget concerns I directed officers to not work illegal sales in both 2003 and 2004...The amount of fish moving into Alberta is amazing.

He also told us that he had tried to get the statistics on fish taken in illegal seizures included in catch statistics “but the resource Manager at the time didn’t want them”.

Mr. Nelson made positive comments about the new Restorative Justice program, calling it “a very effective, efficient way to deal with violations.”

Finally, he noted that he had prepared his report “...with a lot of anxiety and concerns. I’ve already heard criticisms from a Director on two occasions for questions that officers answered to this inquiry.” He was concerned “about the direct or subtle things that can be done to make life difficult when one speaks out.”

We heard two days of evidence in Nanaimo during which the witnesses directed their comments primarily to activities in Johnstone Strait, the Strait of Georgia and Barkley Sound, including fisheries aimed at harvest of Fraser sockeye on their way to the river.

Surprising and disturbing testimony came from Shane Gallop, an experienced non-native commercial fisherman, who said he had been asked by an aboriginal person to catch FSC sockeye during a closed commercial period on the basis that they split the catch. He did this and then proceeded to sell his half. He said he had been engaging in this activity for some three years along with a number of other commercial fishers. He further testified that this was done with the full knowledge of DFO.

Mr. Gallop: I’m here to sort of give an update on native food fisheries. We started about three years ago. One of your native friends asked us to contract to get some fish for him because we weren’t getting any fish. So we did that. And in the process...we were noticing how much fish was actually out there compared to what we felt DFO was telling us. So over the last three years. We’ve been expanding and expanding and – I do not know how to put this, but we take the percentage of what we catch. And we sell it. And this is going on with not only salmon, but it started to happen with halibut and other species, prawns, and I just thought maybe the board should realize what’s going on out there.

The Chairperson: So you’re talking about fishing for food and ceremonial...

Mr. Gallop: ...yeah it was food fish – these native fellows weren’t getting from the band, and we contracted ourselves out to catch the fish for them.

The Chairperson: So you caught the fish and sold it to them – to the natives there?

Mr. Gallop: No. They took half, and we took half ...we took half for payment ...

The Chairperson: Were these fish tallied?

Mr. Gallop: Not that I am aware of. I know there's a monthly -- they have to report once a month, but DFO knows the boats that are out there doing it ...

The Chairperson: And that's done during the closed season?

Mr. Gallop: Yes.

Some aspects of this sort of activity are clearly illegal, but nothing has been done about it. Mr. John Lewis, the Area Chief for South Coast, who operates in the area where the described activity takes place, said that he had no knowledge of it.

The Chairperson: Well, are you telling me that it's contrary to law...the fisheries law, for someone to, in a closed season, go out with his boat with a native on board and catch fish under that native's...fish and ceremonial licence ...and then split the catch? Is that what you're saying?"

Mr. Lewis: I'm saying that is prohibited by law, yes.

The Chairperson: All right, and you are also saying that you didn't know this was happening.

Mr. Lewis: As I stated, there is something of an urban myth that it happens from time to time. However, having information that's provided, that is, in fact, really a follow up or brings us to a dead end, I'm not aware of cases where we have actually had that information brought, that resulted in a successful prosecution.

Another DFO manager, Mr. Randy Braniuk confirmed the illegal aspect of this activity.

The Chairperson: If someone goes out with a commercial fisherman, a non-native commercial fisherman goes out, catches that fish, brings it back in and splits it with the band or a native person, whose licence he was fishing under, is that allowed?

Mr. Braniuk: No it's not. The sales part is not. But everything else prior to that could be....

The Chairperson: For all he knows it wasn't reported at all.

Mr. Braniuk: He may not know, but it may have been reported as well.

Chairperson: Or it may not have been.

Mr. Braniuk: That's right. It's not his responsibility to....my point was it's not the commercial fisherman's responsibility in this case to report the catch.

The C&P officers in Nanaimo gave us the same evidence we had heard so often from others: that they cannot do their jobs as they know they should be done.

Mr. Kanester: ...a main issue for us is lack of overnight patrol capability. We do not have the patrol boats. This hampers our ability to conduct patrols in remote areas during cold weather... we have open 24 ft...rubber boats to do extended patrols...through the night or in remote areas or in poor weather and it just puts officers in a position where they cannot work and accomplish the tasks it takes to operate the vessel...what we used to have was, we had patrol vessels...we find ourselves most times without any overnight patrol capability....my next point that I have here is (that) continuing reductions in our operating budget reduce our ability to conduct extended patrols and random patrols and we are restricted to species and fisheries-dedicated patrol efforts.

The testimony from a succession of fisheries officers about the difficulties facing C&P personnel was confirmed when John Cummins, MP, offered as part of his testimony a document he had obtained under the Freedom of Information Act.

The memo from Christine Van Horne, Chief of Programme Planning and Analysis in DFO's Pacific Region says that by June 2004, compared to the previous year, there had been:

- an overall 23% reduction in field enforcement activities
- a 60% reduction in occurrences and violations recorded
- a 36% reduction in field enforcement action related to threatened salmon stocks
- a 23% reduction in field habitat enforcement

The memo concludes that:

For RHQ, reduced O&M [Operations and Maintenance] results in the reversal of program integrity improvements under Results for Canadians, and difficulty accounting for the specific Program Integrity funding allocated to DFO to address gaps...Where we restored critical programs through Program Integrity funding, we are now cutting back on most of these same functions.

We also heard in Nanaimo from Captain George Quocksister, a commercial fisher for 64 years. He raised many interesting issues and was followed by Mr. Brian Assu who testified with two colleagues on behalf of the A'Tlegay Fishery Society. The society has undertaken, in co-operation with DFO, the development of a very encouraging program aimed at developing an electronic catch reporting system to ensure more accurate reporting of First Nations FSC catches. In addition, it has piloted a project which uses FSC fisheries as test fisheries to provide information for use by DFO and the PSC in regulating the Fraser River sockeye fishery.

Mr. Marshall, a director of the Gulf Trollers Association but speaking for himself, urged us to support his desire to sponsor, in co-operation with DFO, a monitoring observation course at Malaspina College. Marshall also testified that he spoke to Mr. John Lewis, C&P Area Chief for the South Coast, who told him he needs another \$5000 a year in operating funds and \$5000 a year in overtime for each of his 173 officers and is therefore short \$1,730,000 in his annual budget. Marshall asked us to recommend such a change as necessary "to cover enforcement costs, to keep it at a level where it is doing anything."

We were impressed with the evidence of Murray Chatwin in reference to the changes necessary to ensure enforcement without a significant budget increase:

Enforcement itself will never do the job. The coast is just too big and you'd have to throw the whole Canadian budget at it, probably. So you have to focus on the other side of it which is the user side, empower – identify the appropriate user groups, empower them, give them some responsibilities, design fisheries that can do that. We have some good examples from the commercial side where that's happened. Raise the cost of non-compliance. As I said earlier, if you have a right, along with that goes a responsibility. And on our side we say if somebody abuses the responsibility, they put us all at risk here. Let's take their licence away; let's – whatever it takes. And I'm saying that we're in a situation where it has to be applied to all fisheries, and hopefully by their peers.

## **Conclusions**

This chapter has concerned itself with enforcement activity related to the 2004 Fraser River sockeye fishery. Our terms of reference specifically ask us to consider the effectiveness of C&P support in respect of the fishing plans of all users and the level of compliance with fishing plans achieved.

From the evidence set forth above, it can be clearly seen that illegal activities along the South Coast, particularly in the lower Fraser River, were rampant in 2004 and that enforcement against these activities was lacking. DFO's lack of tidal water patrol vessels capable of overnight deployment

places an obvious limitation on its enforcement ability, as does the scarcity of money and personnel to undertake adequate numbers of night time river patrols. The elimination of enforcement overflights is unfortunate and the increasing age and disrepair of patrol vehicles both limiting and dangerous.

The most important question we have to answer is what happened to the 1.3 million sockeye which cannot be accounted for between the Mission Bridge and the spawning grounds. It is obvious from the evidence in a previous chapter that the extraordinarily high water temperatures, especially during the summer run, killed a large number of these fish during their migration. But it is equally clear that the illegal catch and sale of fish, in the face of inadequate enforcement, was a significant contributing factor.

How much is attributable to each of these factors is impossible for us to determine on the evidence we have. We cannot rely on the catch assessment to help answer this question, nor was any serious attempt made to count the number of fish that actually succumbed as a result of environmental factors. There was no in-season attempt to estimate illegal extractions or even to count the fish that remained in seized illegal nets. Since there was little or no attempt to enforce the law against illegal sales, DFO could give us no firm data on the number of sockeye that might have passed through the illicit marketplace.

We wish to make clear that we do not in any way blame the hard working but demoralized C&P officers for the inadequate job of enforcement. The blame goes to a much higher level, and must be charged to those in the Vancouver headquarters and Ottawa responsible for overall management and budget decisions. In summary, this Committee is of the clear opinion that inadequate enforcement of the rules against illegal catch and sale of sockeye was a very significant factor with respect to the 1.3 million “missing” fish.

We are disappointed to report that while DFO has commissioned a statistical analysis of the size of the illegal sockeye harvest in 2004, this report is not available for us but likely will be delivered to DFO at about the same time as our report is to be sent to the Minister.

We also are disappointed that although requested and promised on numerous occasions, an important report by Mr. Robert Melvin on illegal activities in the 2003 year has not been supplied to us. Mr. Melvin testified before the Committee in Kamloops and gave some very important evidence about the magnitude of First Nations FSC salmon, and illegally harvested fish entering the commercial marketplace. He told us of a report to DFO which included a description of the methods being used to hide and launder substantial numbers of fish.

At the request of the Committee, the Chair asked DFO on several occasions to provide a copy. Although originally promised, it was not provided. While this final report was being drafted, the Chair again asked for the report. DFO then said that it contained private and confidential information and, notwithstanding agreement by the Chair that information of a private nature could be deleted, continued to withhold the document. The Committee finds this very troubling because the information in the report would seem to go to the core of enforcement policy and practices with respect to one aspect of Fraser sockeye fisheries. The fact that DFO wishes to withhold this evidence from the Committee seems representative of the enforcement policies which have in part contributed to the disappearance of a substantial number of Fraser sockeye.

## RECOMMENDATIONS

26. At the present time, DFO through its C&P Division is not maintaining a credible enforcement presence and not properly enforcing the *Fisheries Act* and *Regulations* including those that relate to habitat protection. Accordingly, DFO must ensure that

adequate resources are available and that the budget and staffing available for enforcement be increased.

27. DFO should focus on empowering user groups with the responsibility of providing enforcement within their own sectors. Of course, ultimately such activity must be overseen by DFO.
28. C&P Division urgently needs a clear policy mandate and the resources with which to implement it. Morale will remain low among enforcement officers until this issue is addressed
29. Illegal fishing in the Fraser River has been described as rampant and out of control. This is unacceptable. DFO must properly enforce the *Fisheries Act* and *Regulations* and initiate measures to provide a reasonable estimate of the scope of this illegal activity and the number of fish actually taken.
30. Enforcement must also include adequate presence to deter the concealing of over harvesting of fish by participants from all sectors.
31. Throughout the South Coast there is an ongoing problem with the illegal sale of fish, both fish that have been caught as part of an FSC entitlement and fish that have been illegally harvested. We heard little evidence of any serious effort to prevent this activity. This situation is intolerable and must be addressed by DFO.
32. DFO should develop and have in place as early as possible in 2005 a system to more accurately record illegal nets and fishing in the Fraser River and the approach waters. This system should include overflights at varying times during closed periods of all waters in order to provide for accurate assessment of the number of illegal activities.
33. DFO should maintain a complete record, by species, of all fish found in confiscated nets.
34. Night patrols should be undertaken on a regular but variable basis, particularly in those areas where illegal fishing is being reported.
35. DFO should increase and enhance the Restorative Justice program and apply it to all sectors.
36. Pacific Region enforcement should be organized as a separate branch ultimately reporting to a senior person with enforcement experience and line authority throughout B.C. This person must be a member of the Regional Management Committee.
37. The Committee heard testimony from a number of C&P officers who felt their enforcement powers had been undermined by their inability to conduct vehicle checks at roadblocks. This issue as well as their law-enforcement status should be reviewed by the department.
38. In view of the threat to the resource posed by illegal activity DFO should review the level of penalties it can impose and consider requesting increases commensurate with the infraction and administrative sanctions, including licence suspensions, which can act as an effective deterrent.



39. A higher level of traceability needs to be in place. DFO should work with stakeholders to identify their harvest.

# MANAGEMENT AND BUDGET

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## The Management Dimension

This chapter deals with DFO's organizational management and budget programs in effect for Fraser River sockeye salmon in 2004. In particular it will review the organizational structure and resources provided to manage the Fraser River sockeye salmon fisheries and resource.

As an introduction, perhaps it is useful to look at what "management" is. A description from the literature is as follows:

**Management** is the process of setting and achieving the goals of the organization through the functions of management: planning, organizing, directing (or leading), and controlling.

Planning involves devising a systematic process for attaining the goals of the organization. It prepares the organization for the future. Organizing involves arranging the necessary resources to carry out the plan. It is the process of creating structure, establishing relationships, and allocating resources to accomplish the goals of the organization. Directing involves the guiding, leading, and overseeing of employees to achieve organizational goals. Controlling involves verifying that actual performance matches the plan. If performance results do not match the plan, corrective action is taken.

Gemmy Allen, 1998

All modern organizations are facing challenges in the new millennium including factors such as growth in complexity of the operating environment; intensification of competition; and cost squeeze amongst others. DFO is no different. We heard considerable evidence of the management challenges of meeting ever increasing demands with limited and declining resources. This chapter will review how the management of DFO has organized and resourced itself to meet these challenges.

## Witness Testimony

When the hearings began in Richmond the Committee was provided with an extensive review of the 2004 season by DFO staff. The presentations by Mr. Paul Ryall, Mr. Jeff Grout and Mr. Bert Ionson outlined the conservation and management goals and objectives for the 2004 South Coast salmon fisheries; described what happened during the course of the season; and detailed the results in catches and escapements; with particular emphasis on Fraser River sockeye. They identified potential causes for the unsatisfactory results and the "missing sockeye" as being: mortalities due to extremely warm water along the migration route; biased estimates of sockeye abundance at Mission hydro-acoustic site, on spawning grounds, or reported catches; and unauthorized and unreported catches. From the outset, the Committee began to hear that there were serious issues with respect to management of DFO and the resources for the required tasks. As the hearings progressed management and budgets became two of the biggest issues of concern.

Beginning in Richmond and continuing in Chilliwack (as detailed in the Enforcement chapter) numerous sports fishers reported almost no evidence of enforcement officers on the river throughout the year, as well as virtually no response when they contacted the Observe Record Report phone number. This lack of enforcement presence on the water was echoed in Nanaimo by sport and commercial fishers in reference to Georgia Strait and Johnstone Straits commercial, sport and First Nations fisheries.

Testimony provided by DFO fisheries officers and their supervisors, without exception, from Richmond, Prince George, Kamloops, Surrey, Nanaimo, and Chilliwack, was that their staffing levels, and capital, operating and overtime budgets had been declining over the course of the last decade and were expected to continue to decline. Graphs provided by Mr. Randy Nelson, Chief of Conservation and Protection for Interior Fraser, that illustrate this trend are attached to this chapter. Mr. Nelson also indicated that his area of responsibility had doubled when the Peace River and Kootenay regions were added in 2001, with no additional resources. The Committee heard from fishery officers throughout the Fraser watershed that the results of these budget cutbacks were serious impacts on the effectiveness of the enforcement program. Many of these are detailed in the enforcement chapter and we will not repeat them here.

Evidence on budget problems was not limited to enforcement. Stock assessment and catch monitoring programs have been impacted as well. Mr. Timber Whitehouse provided evidence in Prince George, Kamloops and Richmond that his budget for spawning ground enumeration programs has been declining and that this has reduced the precision of estimates and resulted in poorer biological information for the stock assessment program. Mr. Les Janz, Mr. Paul Ryall, Mr. Don Radford, and Mr. Jim Thomas all noted that catch monitoring systems had come under severe financial pressures and that this had resulted in less reliable estimates of catch in all authorized fisheries. The extent of the potential problems or biases in catch estimates was not agreed to by all witnesses however. Mr. Janz did note significant concern with interior catch estimates in recent years, including 2004 as a result of these budget cutbacks. Mr. Ryall did not seem to share these concerns regarding fisheries from Sawmill Creek downstream. Mr. Thomas, an independent consultant felt that there were significant deficiencies in the monitoring programs for in-river AFS fisheries that impacted on management of Fraser salmon and that funding cutbacks had hurt all catch monitoring programs. Mr. Paul Sprout suggested that DFO understood that there were some problems in catch monitoring and that it was conducting an internal review to assess what should be done.

One approach that was consistently put forward to deal in part with budget issues was “collaboration” with stakeholder groups, and “partnering” to undertake important DFO programs, particularly in the catch monitoring, stock assessment and habitat management areas. This was particularly emphasized by DFO and First Nations witnesses regarding the AFS program. The Committee heard evidence from a variety of DFO officials including Bert Ionson, Greg Savard, Don Radford, Paul Sprout and others that these programs were intended to achieve better relations with First Nations communities, undertake important fisheries management activities, and provide economic development benefits to First Nations people. DFO senior officials testified that these collaborative arrangements were also intended to result in more acceptance and compliance with fishery management and conservation requirements.

Evidence provided by Mr. Ionson was that the budget for AFS programs has remained relatively constant since its inception in 1992 (in actual dollar terms). Despite this, many First Nations representatives provided evidence that their programs for catch monitoring, spawning ground assessments and habitat activities had declined over the years due to the reduced purchasing power of the dollars provided. Testimony was given by both DFO and First Nations representatives that relations and compliance with fisheries plans was better when AFS agreements were in effect, although evidence in the enforcement chapter shows that there remain issues both within some communities (see Ms. Quipp and Mr. Sid Douglas) as well as with non-community members in those areas.

Testimony by several junior staff was provided that these budget issues had been raised with their superiors and that no response had been provided, either in additional resources or direction on priorities. Area Chiefs of C&P were left to set their own priorities with little regional direction.

The regional and national budgeting process was described in testimony by Mr. Don Radford, Mr. George DaPont, Mr. David Bevan and Mr. Paul Sprout at the meetings in Richmond on February 24 and 25. The process for allocating national, regional and program budgets, and priorities was described as one where managers brought their issues before their colleagues and superiors and discussed how to allocate scarce resources. The only evidence that the issues identified by staff in this review had been considered was that Mr. Radford indicated he had received an additional \$700,000 during fiscal 2004/05, an amount he described as “meagre” and “insufficient” to address deficiencies in catch monitoring and enforcement. Senior officials did indicate that DFO could approach Cabinet to seek funds additional to their base from time to time, but noted that these were usually for new issues, new responsibilities and new programs.

The Committee heard many comments regarding the organizational structure of DFO Pacific Region over the course of the hearings. Several DFO people identified communication and decision making gaps as a result of the number of separate management areas in the region, and the divisions between functional and line control for research, stock assessment and enforcement, for example. Testimony was provided that fishery officers did not always communicate and share data with catch monitors and vice versa, with catch monitors not reporting suspected violations to enforcement. Mr. Savard, the Head of C&P indicated he had no line authority over field officers. Mr. Wayne Saito, former Chair of the Canadian section of the FRP testified to a complex system of overlapping jurisdiction and authority regarding management of fisheries impacting on Fraser River sockeye that resulted in extensive consultations with dozens of people and difficulty in making timely management decisions.

The Regional Director General, Mr. Paul Sprout testified that there are management issues. Mr. Sprout testified that the organization had added layers over the years. He also testified that DFO’s job had gotten vastly more complex and that it was his job to “deal with recreational fishery, deal with environmentalists, deal with Coast Guard, deal with enforcement” and so on. He implied that there were many more demands from user groups than in the past. Mr. Sprout agreed that the organizational structure should be reviewed and that there were leadership and vision issues to address in the Pacific Region. He also agreed that staff turnover in important positions in the Fraser River area had not helped management of Fraser sockeye.

## **Conclusions**

This chapter has focused on the management system and budget resources DFO has established to manage Fraser River sockeye salmon in 2004.

From the evidence set out above there are clear deficiencies in management structure and budgeting process that have contributed to the “missing sockeye” in 2004 and the difficulty in determining the exact cause or causes of this situation.

DFO senior managers have provided considerable evidence that their jobs have broadened as they have added new responsibilities for the Coast Guard, Oceans Management and Aquaculture Management over the past several years. In addition, the task of managing salmon, and in particular Fraser River sockeye has become more complex with the advent of the *Species at Risk Act*, recognition of aboriginal rights in the Constitution and by the Courts, climate change, growth in recreational demand and increasing habitat pressures.

Evidence presented demonstrated that DFO management approach to this has been to add staff and increase expenditures. Over the last seven years DFO’s Pacific region operational budget has increased from \$125 million to \$150 million. The additional resources have been in the form of additional salaried employees. All of the additions appear to have been in office staff and additional layers of bureaucracy, with fewer and fewer field personnel, particularly in the C&P, stock assessment and habitat areas. Over the last eight years there has been no increase in funds available

for operating and/or capital expenditures (even on a nominal basis). There is a clear erosion of the ability of field staff to perform their functions. Field staff have been forced to use aging vehicles prone to breaking down, insufficient funds to operate them and reduced overtime funds.

It is not clear if the consequences of the resource situation are being evaluated and communicated through the governmental budgeting system that ultimately results in DFO's national, regional and sectoral resource approvals. Indeed, the evidence provided to the Committee varied widely on this subject. At the base level of local staff responsible for developing and implementing the Fraser River sockeye fishery stock assessment, management, catch monitoring and enforcement plans the Committee heard considerable testimony that the resource crunch was having a material impact on the quality of their programs and a negative impact on the likely health of the resource. The further up DFO management hierarchy that we heard testimony from, however, the less the existence of these issues and the severity of their impacts seemed to be known or regarded as significant.

We could not ascertain if senior managers were unaware of the problems; simply chose to ignore them; or had tried to make a case and lost out in the overall governmental or departmental priority setting exercise. Perhaps part of the difficulty relates to the process of establishing departmental goals and objectives.

It appears that the goals have shifted from managing fisheries and the resource to ensure sustainability and best use to attempting to satisfy demands of a host of stakeholders by developing policies and processes for public input. Setting measurable goals, analyzing options and evaluating outcomes are prime functions of management that seem to be missing. This conclusion is the same as that of the Federal Auditor General when assessing fisheries management in recent reports.

Beyond the planning and budgeting process, the organizational structure seems seriously amiss. There is a broad array of divisions with separate responsibilities and a variety of reporting relationships. There appears to be a "matrix" approach, with "sectors" (e.g. science, fisheries management, etc.) and both functional and line reporting relationships through the system. Lines of responsibility and authority for the critical elements of developing conservation objectives; planning fisheries, stock assessment, catch monitoring and enforcement are diffused and appear somewhat uncoordinated under the management structure, and there is a lack of communication and direction, and a complicated decision making process, particularly for Fraser River sockeye fisheries. DFO speaks of developing "integrated fishery management plans" for south coast salmon fisheries, but their own internal process appears far from "integrated".

Senior officials indicated that they are facing a dilemma: growing public demands and expectations at a time when budgets are static. In response they indicated that they are changing how they conduct their business to provide more public involvement in the decision making process and developing collaborative arrangements to deliver programs. This approach has been based on the belief that working together with others will result in more public support for fisheries management decisions resulting in greater compliance with the plan by fishers. In addition, the thought is that co-operation and partnerships will enable stock assessment, monitoring and resource stewardship programs to be more cost effective for DFO.

While there is some evidence that attempts to involve stakeholders in planning and decision making does result in more cooperation from some, the approach's net effectiveness in delivering the core mandate of DFO is less clear. Since its inception the mandate and budget of the AFS program has remained fairly consistent. While we heard much evidence that AFS agreements resulted in a more positive relationship with First Nation communities we also heard from most First Nation groups that the funding for the stock assessment, catch monitoring and stewardship programs under these agreements was eroding due to inflation and was insufficient to undertake the tasks with the same

level of utility. At the same time, funding for internal DFO programs and the audit function for the AFS programs has declined substantially. We heard that the net result was a less effective and less reliable program of stock assessment and catch monitoring. Has the collaborative approach resulted in more “buy-in” and compliance with the fishery management plan and regulations? Evidence and conclusions drawn in the Enforcement chapter seem to suggest otherwise.

DFO has concluded that resource management will be easier if all stakeholders: First Nations, commercial fishers, sports fishers and environmental organizations, can be brought into a room, express their views and agree with DFO on a management plan. In theory this approach seems laudable, and if consensus is achieved would be political nirvana. Striving to achieve solutions that satisfy every interest may result in actions that satisfy none. More important though is the question of whether this approach will result in fisheries that satisfy the core mandate of DFO: resource conservation and sustainable use that maximizes society’s cultural, social and economic benefits. This test is more of an objective standard than the opinions of stakeholder groups (see Auditor General comments above). The 2004 Fraser River sockeye situation is strong evidence that DFO strategy is failing on this test.

Conservation is the base requirement for a successful fisheries management program. Every group will support that concept. Nonetheless, every group will do their part as long as they view their share of the pain and their share of the ultimate gain of conservation is fair. The current system has no such assurances. Unless and until defined shares of the resource for all users are determined and all users have some security of access, the commitment to conservation in the plan will be a battle amongst competing interests with little likelihood of agreement. The Pearse/McRae Task Group and the First Nations Panel report have reviewed this topic extensively and DFO needs to deal fully with the community on the issues raised.

Many organizations in modern society are facing similar pressures as DFO. Many organizations in business, government and the volunteer sector have faced similar crises. Many have found the route back to success as an organization is to focus on the core values, core competencies, and core purposes of the organization. Perhaps DFO can learn from those approaches.

## **RECOMMENDATIONS**

40. DFO Pacific region should reassess its core mandate with respect to management of Fraser River sockeye (and indeed all Pacific fisheries resources) and devise a management organizational structure that best supports that mandate. We recommend that an independent consultant be hired to review the situation and provide guidance to senior management.
41. Integrated management plans should be developed within a framework that sets measurable goals, analyses options and evaluates results. Where possible goals should be quantifiable. This will provide public accountability.
42. Public involvement is a good thing. Ultimately the public expect DFO to maintain responsibility for good resource management and will hold DFO accountable. Collaborative approaches and consultation are costly and should be evaluated explicitly against the goals set for fisheries management and compared with the costs and benefits of in-house or independent delivery of programs.
43. DFO’s budgeting process should be informed by explicit evaluation of the impact of various budget proposals on results. Where critical elements of DFO’s programs have budget issues they should be explained and funds sought. This information should be shared both within and outside DFO to provide stakeholders’ views on budget

priorities. In the Committee's view DFO has insufficient resources to meet its core mandate for developing, managing and controlling fisheries for Fraser River sockeye and conserving the resource. DFO should be directed to make a submission for additional funds, particularly in the areas of deficiency identified by this review.

44. The PSC FRP is the critical link in management of Fraser River sockeye. The Canadian consultative and management structures for all fisheries impacting on Fraser sockeye should be integrated with the Canadian section of the FRP. In particular, First Nations' consultative processes must be fully engaged with that process. In addition, the Canadian chair of the FRP should be the senior authority on all fisheries management decisions relating to Fraser sockeye throughout the South Coast and be empowered to make those decisions on a timely basis.
45. DFO should vigorously pursue solutions to resource sharing and aboriginal claim accommodation.
46. The Committee heard repeated complaints by both DFO staff and fisheries stakeholders about the inadequate level of financial resources available to the department. There exists a strong public perception that reductions in the Pacific region budget are not consistent with good management. Since our Committee has not had the time nor expertise to undertake an objective examination of the region's financial situation, we recommend strongly that such a task be undertaken by an appropriate outside agency.

# **RECOMMENDATIONS OF 1992, 1994 AND 2002 SOCKEYE MANAGEMENT REVIEW PANELS: THEMES, LESSONS, ACTIONS**

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*Those who cannot remember the past are condemned to repeat it.*  
- Santayana

In 1992, 480,000 sockeye “seemed to disappear” on their way to spawning grounds in the Fraser River. The Fisheries Minister of the day, John Crosbie, appointed Drs. Pearse and Larkin to investigate. In 1994, 1.3 million sockeye “went missing” on their way to the spawning grounds on the Fraser River. Fisheries Minister Brian Tobin appointed a panel to investigate and make recommendations. In 2002, conservation of Fraser River sockeye was again “challenged” by an “unprecedented” set of constraints (a three-fold increase in estimates of sockeye abundance, uncertainty over levels of pre-spawn mortality, and lack of industry consensus on allocations). Fisheries Minister Robert Thibault appointed a panel to investigate and make recommendations. In 2004, 1.3 million sockeye salmon again went missing in the Fraser River; Fisheries Minister Geoff Regan appointed this panel to investigate and provide advice.

These four reviews on the management of Fraser River sockeye, coming in the space of only 12 years, have generated hundreds of pages of findings, and numerous recommendations. The 1992 review by Pearse and Larkin made no formal recommendations, but did elaborate on “Lessons for the Future.” The 1994 review, led by the Hon. John Fraser, made 35 specific recommendations, while the 2002 review, chaired by DFO Assistant Deputy Minister Pat Chamut, made 14. The 2004 review is adding yet more recommendations to the previous 49.

The rather disturbing frequency of Fraser River sockeye management reviews prompts numerous questions. Perhaps the most obvious one, posed by the public, by the 2004 panel members, and by DFO (Paul Sprout, February 25 testimony, Richmond): Why so many Fraser sockeye reviews?

The 2004 fishery review panel deemed this to be a question important to evaluating both the ongoing management of Fraser River sockeye, and the effectiveness of the review process, itself. Specifically, the panel felt it would be useful to examine the themes, lessons, and actions generated from past reviews—particularly in light of 2004 events. To assist its evaluation, the panel requested DFO staff provide it with past panel reports, a summary of recommendations made by the various panels, and DFO’s own assessment of how it has responded to the recommendations of the previous three reports.

This chapter’s primary goal is to start the task of sorting and evaluating official DFO responses to the 49 formal recommendations of the 1994 and 2002 reviews. Clearly, such a task can only be considered preliminary, given the large number of recommendations, the subjectivity inherent in both responses and evaluations, and the short amount of time available to evaluate DFO’s responses. Yet the ever-expanding data set and the process itself suggests ongoing themes in sockeye management, and a recommendation for improved management.

## **Recurrent Themes**

Several recurrent themes are evident from the four sockeye management investigations, including this one. These themes provide context needed to understand the issues, the nature of the formal recommendations, and the responsiveness of DFO to implementing the recommendations. For instance, in most cases, managers were faced with concerns about weak stocks; uncertainty



surrounding information on run-size, estimates of in-river mortality (legal and illegal), and spawner estimates; and extreme environmental conditions (only in 2002 were temperatures below long-term averages). The Early Stuart sockeye stock grouping, the first major stock complex to enter the Fraser River, and the subject of extensive rebuilding efforts, was the most frequently mentioned subject of concern.

The 1992 review concluded that the rebuilding program for Early Stuarts “suffered a setback [which] cannot be repeated without seriously threatening salmon resources.” The 1994 and 2004 (Scott Hinch testimony) reviews noted that Early Stuarts entered the river when above average temperatures were believed to have contributed to stress and in-river mortality. In those years, enforcement and management issues were exacerbated by delayed implementation of aboriginal fisheries agreements (1994) and special enforcement arrangements with Cheam (2004). In 1994, the escapement of Early Stuarts was just 15% of pre-season targets. In 2004, only 9200 Early Stuarts survived to spawn, just 10% of the expected spawning abundance.

The 1994 review provides several quotes which help illustrate management challenges and themes also noted in the other investigations. In reviewing DFO itself, the 1994 panel suggested that:

The combination of cutbacks and restructuring in DFO created a situation in which the ability to manage an entire spectrum of DFO responsibilities was strained beyond capacity. (p. 33)...We heard little to suggest that managers took sufficient account of the significance of the combination of in-season conditions that prevailed in 1994, i.e., high water temperatures...the magnitude of the breakdown in compliance in both the marine and in-river environments; the unreliability of landing data; the uncertain control of AFS fisheries (both for pilot sales and food); the inadequate levels of surveillance, monitoring and enforcement; and the potential for a U. S. commercial fishery on the late run sockeye. (p. 49)

Similar quotes are common in each of the four reviews. For the purposes of distilling and organizing the issues, however, it is helpful to focus on four broadly recurring themes: enforcement, management and accountability, information and communications, and environmental conditions. For the purpose of brevity and ease of presentation, the 32 pages of DFO responses to the 49 recommendations of 1994 and 2002 have been condensed into four tables on the following pages. Responses have been reported in full where possible, and paraphrased in a few instances to fit the available space.

## **Enforcement**

The 1992 report noted that many of the management and enforcement challenges stemmed directly from the fact that sockeye had begun entering the river before aboriginal fisheries agreements had been completed. While it made no specific recommendations (meaning there was no written DFO response), it was unequivocal in assigning part of the blame for the missing fish on strained relationships between DFO and First Nations, a breakdown of enforcement and surveillance, and unreliable estimates of catch.

The 1994, 2002 and 2004 reviews have also clearly emphasized recurring problems with enforcement. The 1994 and 2002 reports make 10 recommendations on improving enforcement (Table 1), including that DFO reaffirm the importance of enforcement as a DFO priority (Recommendation 12: 1994).

There were also many specific recommendations, including: re-establishing a credible enforcement level for 1995 (13: 1994); reviewing fisheries regulations (14: 1994); investigating in depth the abuse of fishing laws in 1994 (15); revisiting its policy of non-criminal administrative sanctions (16); establishing an enforcement branch (17); instituting an “observe, record, report” program (18); separating food and commercial fisheries (21); working with industry to develop a peer system to

report illegal catch (32); and consulting with First Nations and stakeholders on enforcement issues (8: 2002).

DFO has responded (Table 1) that it had acted on most of the enforcement recommendations. Some of the actions are ongoing, such as consultation and reviews, and thus difficult to assess. Some were reported to have been carried out in part, such as separating commercial and FSC fisheries (Table 1), or already implemented (observe, record, report hotline). DFO also noted it had added 15 new enforcement officers and strengthened its C&P sector as a result of the 1994 review (Table 1; recommendation 13).

The subsequent panels, however, heard evidence that enforcement responses had not been adequate or sustained in many cases. Evidence heard in 2002 and 2005 (of the 2004 season) suggested there are systemic and unresolved problems with enforcement mandates and budgets, and that additional resources added in response to the 1994 review had been eroded. Testimony by several recreational anglers in 2005 indicated that there are unresolved problems with the “observe, record and report” hotline (see *Enforcement*). Evidence presented on February 24 in Richmond by Fisheries Officer Randy Nelson (Figure 2, page 60) also clearly illustrated a 10-year erosion in enforcement resources (with overtime budgets but one example).

**Table 1. Enforcement**

<b>Year</b>	<b>Recommendation Number and Details</b>	<b>DFO Response</b>
<b>1994</b>	12 That enforcement be recognized once again as an essential element of the fishery management process.	C & P sector strengthened
	13 That, for the 1995 fishing season, DFO institute a plan to ensure that an effective and credible enforcement level is re-established.	Resources increased; 15 new officers
	14 That DFO review the regulations pertaining to the various fisheries and implement changes needed to ensure they are enforceable.	Review ongoing
	15 That DFO undertake an in-depth investigation of 1994 abuse of fishing laws.	Already done by 1994 panel
	16 That DFO revisit its policy of non-criminal administrative sanctions (which include licence suspensions) with a view to making such a policy more workable and expanding its application.	Will be expanded in 1995
	17 That DFO establish an enforcement branch in DFO Pacific Region, headed by a director with extensive law enforcement experience, to report to the Regional Director-General and be responsible for developing and maintaining enforcement capability at a level of competence and coverage which would ensure that the Minister’s mandated duty to conserve and protect Canada’s Pacific fisheries resources will be fulfilled properly.	Already implemented
	18 That DFO institute an “observe, record, report” program with a communications centre that operates 24 hours per day and seven days per week.	Already exists
	21 That DFO, in consultation with First Nations, separate food and commercial fish in time and space to promote more effective enforcement.	Will comply, only in key fisheries
	32 That industry participants in the salmon fishery develop and implement, in conjunction with DFO, a peer group system for reporting to DFO, the illegal catch, sale and transportation of fish.	Will develop coast watch and reward programs

<b>Year</b>	<b>Recommendation Number and Details</b>	<b>DFO Response</b>
2002	8 That DFO consult with First Nations and stakeholders on enforcement issues: There will be pre-season meetings involving Conservation and Protection staff from Area offices to address anticipated monitoring enforcement issues, coordinated strategies, and priorities; There will be post-season meetings to review the outcome of these strategies, and progress related to partnership arrangements and protocols; and Partnership arrangements and protocols with First Nations and stakeholders should be developed or improved, wherever possible. These would formalize the shared roles and responsibilities, and could include improved monitoring and catch reporting, co-management issues, or on-ground interactions between the parties. As well, external members of the Steering Committee advocate more funding to support enforcement activities related to the conduct of Fraser River sockeye fisheries.	Pre-season meetings have taken place

### **Management and Accountability**

The 1994 and 2002 reviews generated 27 recommendations to improve management and accountability (Table 2). As is true for enforcement issues, some of the recommendations and responses are general in nature, and/or ongoing, and thus difficult to assess, especially without fully relating them to 2004 events and findings.

The 1994 panel made several general recommendations similar to the informal “lessons for the future” section of the 1992 report. Specifically, the 1994 panel recommended that DFO “retain its constitutional conservation responsibilities (1)” and take “immediate steps to initiate a process of planning for the future of the fishery (2).” It also suggested that DFO adopt a (more) “risk averse management strategy because of the great uncertainty in stock estimates, in-season catch estimates and environmental problems (3),” as well as commit to “quality management principles (11).” The 1994 and subsequent panels also noted the need for improved preseason planning and post-season reviews (Table 2).

DFO affirmed it was the ultimate conservation authority; that it had plans for fleet reductions; that it would develop risk-averse plans, adjust escapement targets for environmental factors, and reduce harvest rates; that it would expand its operations branch and organizational review team; and that it would improve the involvement of stakeholders in pre- and post-season planning and assessment (Table 2; responses to recommendations 1, 2, 3, 7, 8). DFO also agreed with several recommendations (19, 20, 22, 23, 24, 25) from the 1994 review to improve AFS fisheries accountability, implement dispute resolution mechanisms, limit the expansion of pilot sales, and improve the quality of catch estimates.

There is no ‘short answer’ on the validity or adequacy of DFO’s responses on management and accountability issues, especially without relating the recommendations and responses more fully to 2004 events, and to other existing reports. The 2004 review panel heard testimony from DFO staff of improved relationships and partnering with certain First Nations. Substantial fleet reductions have been undertaken, planning processes have been expanded and refined, and further risk-reduction strategies have been integrated into certain fisheries, including reduced harvest rates, but concerns with capacity, mixed-stock management, accountability, severe environmental issues, and AFS fisheries continue. Further refinements on integrated harvest planning were also recommended and implemented after the 2002 review; for example, the formation of the IHPC, part of which also constitutes the panel for the 2004 season review.

Some of the changes have not been in place long enough to evaluate; others, such as the establishment of an independent fisheries resource conservation council (2004: 10), appear to be

undergoing serious challenges relative to staffing and budgets; still others have not yet been enacted (the coast-wide policy committee recommended in 2002), or completed (e.g. the wild salmon policy). Indeed, a draft wild salmon policy was only made available in December 2004. Nearly six years in development, the draft policy remains in the consultation phase. Numerous written critiques of the policy have recently been submitted, and these reviews and DFO's responses have not yet been evaluated.

**Table 2. Management and Accountability**

<b>Year</b>	<b>Recommendation Number and Details</b>	<b>DFO Response</b>
<b>1994</b>	1 That DFO retain and exercise its constitutional conservation responsibilities and not in any way abrogate its stewardship of resources under federal jurisdiction. Conservation must be the primary objective of both fisheries managers and all others participating in the fishery. The conservation ethic must prevail throughout and be adhered to by all.	Conservation is top priority but shared responsibility
	2 That DFO take immediate steps to initiate a process of planning for the future of the fishery, addressing all critical problems affecting conservation and sustainability, through an ongoing consultative forum. Among the problems to be considered would be over-capitalization, user group allocation and ensuring equitable treatment under the law.	Plans for fleet reduction, new consultative mechanisms
	3 That DFO and PSC adopt a risk aversion management strategy because of the great uncertainty in stock estimates, in-season catch estimates and environmental problems. Conservation goals must be achieved before any other priorities are addressed.	Will develop risk-averse plans, adjust escapement targets for environmental factors, reduce harvest rates
	7 That DFO and PSC give First Nations greater and more meaningful access to, and involvement in, the management process.	Several things planned
	8 That DFO, PSC, First Nations and user groups institute a formalized pre-season review of each season's management plans and strategies, to be followed by a post-season performance analysis. Independent experts should be invited to assist in extending the range of expertise and in promoting transparency in the management process.	1995 post-season analysis planned, public process thereafter
	9 That the Canadian section of the Fraser River Panel be vested with responsibility for in-season management for Fraser River sockeye and pink salmon fisheries in Canadian waters beyond the current PSC Convention area. Further, to facilitate communication and understanding (between DFO and PSC) of the in-season run and stock size estimates, a member of the DFO Stock Assessment Division be assigned to work closely with PSC during planning, estimation and evolution of run estimating procedures. There is also a need for practical arrangements for in-season communications between the U.S. and Canadian sides of the Fraser River Panel, whether or not there is formal diplomatic agreement.	Will implement
	10 That an independent Pacific Fisheries Conservation Council be established to act as a public watchdog for the fishery, to report to ministers and the public annually and from time to time as is appropriate.	Not realistic for 1995
	11 That DFO make a commitment to quality management principles in the management of fish stocks by Pacific Region and, in this context, that a third-party quality auditing organization be contracted to provide ongoing services.	Will expand Operations Branch organization review team to include SEP, habitat, stock assessment

<b>Year</b>	<b>Recommendation Number and Details</b>	<b>DFO Response</b>
	19 That DFO ensure that AFS agreements clearly identify the Minister's responsibility for conservation, and that final authority to regulate and protect fish and fish habitats remains vested in DFO.	We agree, will be fully implemented in 1995
	20 That DFO expedite the implementation of an effective training program to develop fisheries management, enforcement and administrative capacity within First Nations communities.	Have/will set up training and field programs
	22 That all AFS agreements contain a dispute resolution mechanism and, when feasible, be cast within multi-year frameworks.	Starting in 1995
	23 That the pilot sales project not be expanded at present.	Agree
	24 That, in those AFS agreements having a pilot sales component: no sale of fish or payments to First Nations for AFS purposes be permitted until agreements are completed and signed; the agreements specify that DFO fishery Officers and Aboriginal Fishery Officers be responsible to and directed by a DFO official; landing sites be clearly identified; the agreements require that fish landings and the sale of fish be documented; and any sale of fish other than that recorded and documented at a designated landing station be deemed to be an illegal sale.	Agree with recommendation
	25 That, in First Nation territories where there are no AFS agreements, DFO implement plans to improve the quality of catch estimates.	Agree; plans in place
	26 That DFO pursue a policy of purchasing licences in the commercial sector and transferring these to First Nation communities, not for traditional Aboriginal fisheries, but to increase their participation in established commercial fisheries in a manner consistent with the laws and regulations pertaining thereto.	Currently being implemented
	33 That industry participants in the salmon fishery and DFO work together to investigate means of dealing with excessive fishing capacity.	To be done in 1996 through Pacific Roundtable
	34 That a user fee be assessed on fishers and processors to increase funding available to DFO, if it can be assured that all monies collected will be used only for local fisheries management.	Some cost recovery occurs; Fees normally go to consolidated revenue
	35 That, in the interest of conservation, DFO ban monofilament nets, gaffing and other fishing gear which may be wasteful of the resources harvested.	Currently banned commercially; review to be conducted
<b>2002</b>	1 That DFO conduct consultations on a wild salmon policy and associated guidelines, with First Nations, harvesters and other interest groups including conservation organizations, and the policy should be finalized by December 31, 2003. This policy will provide a framework for defining conservation objectives for naturally spawning salmon and will include direction for resource management (conservation units and reference points), habitat protection, enhancement and aquaculture.	Draft, December 2004, now out for public consultation
	2 That new advisory processes be developed by the fall of 2003 for the provision of advice on policy issues and harvest planning to facilitate improved, transparent consultation:	

<b>Year</b>	<b>Recommendation Number and Details</b>	<b>DFO Response</b>
	<p>Policy Advisory Process - A new formal, structured policy advisory process is proposed. Specifically, a policy steering committee should be established that represents the full range of interests for the conservation and management of Pacific fisheries resource including First Nations, commercial and recreational fishing sectors, conservation organizations, community groups, and the provincial government. This committee would provide a venue for broadly based dialogue with DFO on major policy matters affecting the fishery, including a wild salmon policy, risk management, and socio-economic objectives. It would also provide advice on the full range of interests that need to be consulted further and the best means of obtaining input on specific policy matters of concern;</p>	Has not yet been formed
	<p>Assignment to Policy Advisory Process - Given that the conservation concerns associated with some mixed stock fisheries are likely to result in harvesting opportunities to more terminal areas, it is recommended that the policy steering committee, once established, should be asked to provide advice to clarify the policy on access and allocation. Consultation with affected parties should occur in the fall of 2003 to discuss issues, and provide information to support a policy decision before the 2004 salmon fishery;</p>	Has not yet been established
	<p>Harvest Planning - A more streamlined and representative cross-sectoral advisory process is proposed for harvest planning and post-season review. Specifically, two new salmon harvest planning committees, one each for the north and the south. A three-phased process would be established to provide co-ordinated advice to DFO on the development of IFMPs: Advice on conservation objectives and science-based risk management would be provided by representatives from First Nations, the recreational and commercial sectors, and conservation organizations; Harvesters would develop proposals on the conduct of fisheries consistent with phase 1, for inclusion in draft IFMPs; First Nations, the recreational and commercial sectors and conservation organizations would provide advice on draft IFMPs focusing on ensuring consistency between conservation objectives and proposed fisheries, and on any cross-sector integration issues requiring resolution. As well, they would participate in post season review.</p>	Committees being established
	<p>Fraser Panel - The Fraser River Panel of the Pacific Salmon Commission will continue to serve as a focal point in the in-season management of Fraser River sockeye and pink.</p>	Agree
3	<p>That the Fraser River First Nations Watershed process be further supported by ensuring technical support is provided for continued improvements in the efficiency of annual management planning and consultation processes. Also, support should be provided to Coastal First Nations who choose to form an aggregate body representing First Nation communities.</p>	Agree, but note organizational and funding issues
4	<p>That the pre-season development of the IFMP be the focal point for consultation and debate. IFMPs should clearly define the priority of conservation and should also include a number of other key items: A description of domestic and international commitments; Decision rules that will guide in-season management. This would include a science-based risk management framework, with decision tables that illustrate probable effects of a wide range of management options. They would cover a broad range of foreseeable circumstances and would guide the appropriate fisheries management responses to changing circumstances (such as in-season estimates of pre-spawning mortality of Late run sockeye); and A description of socio-economic objectives.</p>	Meeting held; IFMP produced; insufficient time to develop risk assessment framework, socio-economic objectives not included in 2003 plan

<b>Year</b>	<b>Recommendation Number and Details</b>	<b>DFO Response</b>
5	Pending completion of a wild salmon policy and completion of long-term escapement goals for Fraser River sockeye, it is recommended that consultations be held with First Nations and stake holders (including conservation organizations) on escapement targets to guide resource management for the 2003 fishery. As well, there will be consultations on the management objectives for Cultus Lake and Sakinaw Lake sockeye in 2003, relating to both fishing and habitat protection, and other means of stock rebuilding.	Implementation complete
6	All harvesting plans will continue to be designed to ensure that, after conservation objectives have been addressed, priority access for food, social and ceremonial (FSC) purposes is provided over other uses.	Implementation complete
7	That consultations be initiated with the Sport Fishing Advisory Board to address concerns regarding the regulation of the recreational fishery, its linkage to the First Nations and commercial fisheries, and possible impediments to the provision of stable and predictable opportunities for the recreational harvest of sockeye.	Implementation complete
13	That DFO work with all sectors to adopt innovative means to conduct sustainable fisheries that are consistent with conservation objectives. Where appropriate, conservation organizations should be involved to assist in advising this work.	Implementation complete
14	That the Regional Director of Fisheries Management be assigned the authority and accountability for implementation of the IFMP including coordination between Area offices and dispute resolution, and for other circumstances that are not anticipated in the IFMP.	Implementation complete

### **Information and Communication**

All four reviews highlighted the need to improve both the quality of information, and communication. The 1994 and 2002 reviews provided 8 formal recommendations (Table 3). The 1992 review was the first to indicate that estimates of catches, especially in-river, were unreliable. Uncertainty over impacts of high water temperatures and the constraints this uncertainty places on managers has been noted in each review (this uncertainty was also a primary driver in limiting harvests of larger than expected returns of sockeye in 2002). Each subsequent review has more broadly added to our understanding and list of recommendations for improving the quality of information on catches, pre-season forecasts, in-river estimates, environmental variables, and stock assessment.

DFO has responded to many of the recommendations (Table 3). Improvements have clearly been made to the Mission in-river counts (Mike LaPointe testimony, February 23, Richmond), but the effectiveness and duration of the full suite of responses has been questioned in each post-1992 review. While DFO claimed (response to recommendation 4: 1994) that it would implement new measures to prevent laundering of fish into commercial fisheries, and improvements to counts of landed fish, these issues continue to be raised in subsequent reviews (2002 and 2004). The 2004 review panel also heard testimony from DFO staff of debilitating reductions in stock assessment (e.g., from \$1 million to \$400,000 per year for the Kamloops region) and catch monitoring budgets. These budget cuts (with others planned) have reduced the quality and increased statistical bias of information needed to manage Fraser sockeye and other salmon; budget constraints rendered DFO incapable of generating confidence limits on sockeye catches upstream of Sawmill Creek for the past two years (Timber Whitehouse, testimony, February 1, 2005, Kamloops).

Communication problems mentioned in each review—between the Pacific Region and Ottawa, between stakeholders and DFO, and between enforcement and management staff (Randy Nelson testimony, February 24, Richmond)—remain unresolved.

Improvements have clearly been made since each review in our understanding of high temperature impacts on sockeye (Scott Hinch testimony, February 23, Richmond). This understanding has been fostered mainly by creative means of circumventing DFO’s diminishing science capacity, e.g., through enhanced DFO partnering with academic researchers, and by successfully seeking funds outside a diminishing federal budget (e.g., foundations, BC Hydro, NSERC, PSEF, PSC endowment funds). But while we can now be much more predictive of sources and magnitudes of sockeye mortality, it remains less certain if and how effectively that information is communicated to or incorporated by managers.

**Table 3. Information and Communications**

<b>Year</b>	<b>Recommendation Number and Details</b>	<b>DFO Response</b>
<b>1994</b>	4 That DFO, in conjunction with provincial authorities, First Nations, commercial and recreational fishery groups, implement (both in marine and in-river areas) a revised system to ensure that catch information is timely and reliable, given that accurate counting and timely reporting of catch are fundamental to conservation. The system must also include a more stringent paper trail wherein there must be stricter control of landing and sales slips and a mandatory retention of sales slips with fish through to retail sale or export.	Will implement mandatory hauls, and new measures to prevent laundering of fish, landing slip system
	5 That DFO explore the application of new technology to collect information on stock levels in ocean areas in order to supplement catch statistics.	Will work with PSC on new technologies; implement new test fisheries
	6 That DFO develop better co-ordinated inter-party communications among its staff and between its staff and PSC, First Nations, commercial and recreational fishing groups, with a greater degree of co-operation aimed at enhanced in-season management and post-season evaluation and at fostering closer working arrangements among all parties, and facilitate clearer and more transparent management and allocation policies.	Agree; plans discussed in detailed response
	31 That industry participants in the salmon fishery develop and implement in conjunction with DFO a self-sustaining, user-pay, landing verification system, as already exists in other West Coast fisheries (for example, halibut, sablefish and groundfish).	Will be considered
<b>2002</b>	9 That monitoring and assessment studies be continued to improve understanding of the effects of high spawner density (e.g. Adam River 2002) and the migration behaviour and in-river mortality among Late run sockeye.	Studies planned



<b>Year</b>	<b>Recommendation Number and Details</b>	<b>DFO Response</b>
10	That DFO work with the staff of the Pacific Salmon Commission, First Nations and stakeholders to develop improved in-season estimates of run-size and timing; Improvements to existing test fisheries; Development of new test fisheries; Environmental monitoring programs; Use of stock assessment fisheries (conducted on a limited small fleet basis); Traditional knowledge and on-water information will be evaluated as a means of augmenting these information sources; DFO should consider a three to five year program designed to optimize use of resources directed at in-season estimates required to achieve management objectives. It is also recommended that DFO work with all harvesting groups to improve the accuracy and timeliness of catch reporting, including adoption of a catch monitoring system to provide information on landings.	Workshop planned, and proposals received. Fraser panel adopted improved EMA adjustment
11	That the trigger for a pilot sales fishery be clarified so that the occurrence of stock assessment fisheries (conducted on a limited small fleet basis) that are specifically for the determination of stock abundance and the identification of a Canadian total allowable catch (TAC), whether in approach areas or within the Fraser River, would not automatically trigger a pilot sales fishery. Such an assessment fishery would need to be approved by the Fraser Panel, as part of the Pacific Salmon Commission process.	Implementation complete
12	That Pacific Region staff consult with the Sport Fishing Advisory Board prior to the commencement of the 2003 management season to identify and implement practical, affordable options that will improve the timeliness and effectiveness of in-season communication and consultation with the recreational fishing community.	Implementation complete

## Environment

There are just four formal recommendations on the environment, including one on pollution (DFO agrees), one on predicting water temperature (under development, probes in place), and two on the Fraser in general (Table 4). The recent information on sockeye physiology and mortality seemingly reinforce broad though unresolved environmental concerns in the Fraser River. These concerns are likely to remain primary drivers in future fisheries for Fraser sockeye.

**Table 4. Environment**

<b>Year</b>	<b>Recommendation Number and Details</b>	<b>DFO Response</b>
<b>1994</b>	27 That DFO urge the Greater Vancouver Regional District (GVRD) and the province of British Columbia to install, without further delay, at Annacis Island the secondary sewage treatment facility which has long been under construction.	Agree
	28 That DFO develop a predictive water temperature model, supported by adequate observation systems, for the Fraser River and its major sockeye tributaries. Information on water temperatures should be used for in-season risk aversion management.	Model under development; temperature probes in place
	29 That federal, provincial and local governments join forces to develop effective policies and plans in the Fraser River basin designed to: Better treat and control the discharge of effluent into the Fraser River watershed; See to the implementation of responsible forestry practices in line with the new provincial Forest Practices Code; Continue to remove in-river obstacles which impede the migration and spawning of anadromous species; and Regulate urban development in the Fraser River watershed so as to be compatible with environmental priorities.	Already addressed by Fraser Basin Management Board

<b>Year</b>	<b>Recommendation Number and Details</b>	<b>DFO Response</b>
30	That DFO conduct further research on: The effects of logging on the water temperature and flow regime in the Fraser River; Means by which to mitigate adverse water temperature and flow fluctuations; The effect of multiple, sublethal stresses on migrating salmon; Means by which to improve anadromous species survival at all stages of the life cycle in the face of natural fluctuations and predation; Environmental effects on the Johnstone Strait diversion rate; and Such matters as the potential of gene banking and altered fishing techniques as means by which to promote the enhancement of anadromous species' genetic diversity.	Research underway and/or planned

### **Summary and Recommendations**

Three reviews have now been conducted since 1992 to investigate the “disappearances” of some 3 million sockeye salmon from the Fraser River over three seasons (including the 2004 review). A fourth review in 2002 investigated concerns arising out of management constraints (limiting the harvest of certain stocks that returned in better-than-expected numbers) resulting from uncertainty over late-run sockeye mortality.

The reviews have prompted a large number of recommendations, and revealed recurrent themes around enforcement, management and accountability, information and communication, and the environment.

Though DFO has responded to most of the recommendations of earlier reviews, the complexities presented by mixed-stock management, competing stakeholder aspirations, environmental deterioration, diminishing operational budgets, information and communication challenges, and changing demographics, all contribute to the hampering of the effectiveness, completeness, and lasting nature of those responses. Moreover, the cycles of reviews—and management flexibility—seem slavishly linked to the repetitious cycle of crisis-outcry-review-recommend-repeat. No proactive plan exists to understand and meet these challenges. Constraints worsen as agencies shrink, seek efficiencies, and shift priorities, and stakeholders lose hope. As a result, the public loses trust in management agencies (and in new policies and approaches that are inadequate and/or under-resourced), morale fails, information needs are unmet, and reviews happen with increasing frequency—and with cumulative damage to the resource, stakeholders and management agencies.

### **RECOMMENDATION**

47. That DFO form a cross-sectoral committee, and produce a work plan for addressing the completeness of responses to past recommendations, and for responding to ‘new’ recommendations contained in the current review.

### References

- Managing Salmon in the Fraser River: Report to the Minister of Fisheries and Oceans on the Fraser River Salmon Investigation. 1992. Peter Pearse.
- Review of the 2002 Fraser River Sockeye Fishery: Report by the External Steering Committee. Anonymous 2003.
- Fraser River Sockeye 1994: Problems & Discrepancies. Report of the Fraser River Sockeye Public Review Board. 1995.
- Fraser River Sockeye 1994: Detailed DFO Response to the Report of the Fraser River Sockeye Public Review Board. Anonymous, undated.

Status of Implementation of 2002 Fraser River Sockeye Review Recommendations. Briefing note from D. Radford for RDG signature, to Pat Chamut, ADM Fisheries Management. December 3, 2003.

**Yearly OT Allotment - C&P BCI**

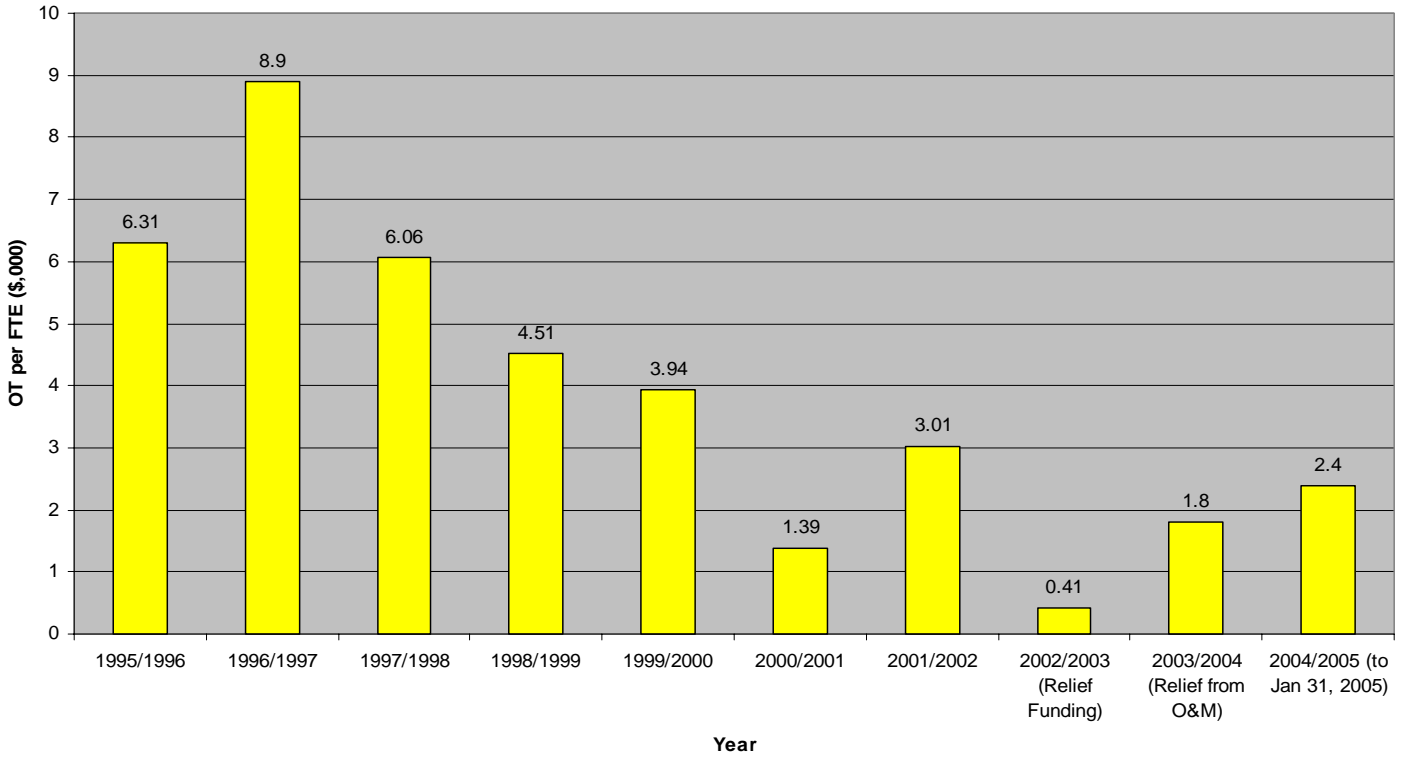


Figure 2. Annual Overtime Allotment for mid and upper Fraser fisheries enforcement staff, from testimony of Randy Nelson, February 24, Richmond.

## **GENERAL CONCLUSIONS IN SUMMARY**

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This report (Part One) is concerned only with the return of Fraser sockeye in the year 2004. In many of the past years, sockeye returns have been reasonably close to the original forecast numbers or to the adjustments made during the fishing season. Also, in many of those years, estimates of spawning abundance have not been too far off the Mission estimates, taking into account the predicted degree of natural in-migration mortality in the river and the catch upstream of Mission.

In some years, however, there have been major discrepancies. For example, a very large number of fish were unaccounted for in 1994 and an overabundance reached the spawning grounds in 2002. It will not be possible in every year for DFO and the FRP to make accurate predictions, and this is not because of bad management. In some case the fault will be with nature, attributable to natural phenomena such as low ocean survival, extremely high or low river flows, and high water temperatures.

It is obvious that during the 2004 migration season, environmental factors, and especially abnormally high water temperatures, played a role in causing greater than usual en-route mortality especially to Early Summer and Summer run fish.

From the evidence before us it would seem that in 2004 the Mission estimate was reasonably accurate, perhaps within a 10.5% range, and the count on the spawning grounds through both fence and visual observation programs was in accordance with past practice although hampered by declining stock assessment resources.

We do find, however, that much more could have been done and must be done to improve the accuracy of catch numbers. The Committee very much doubts the accuracy of both the 2004 catch monitoring numbers and DFO's estimate of the number of fish caught illegally and/or unreported. This lack of important information reflects both a lack of resources in DFO and a failure of management policies and practices.

It also accounts for a significant number of missing sockeye. The fact that this Committee is left with no idea of how many sockeye failed to make it to the spawning grounds because of high temperature and how many because of inadequate catch monitoring or enforcement, clearly demonstrates the need for better management.

The Committee heard repeated complaints from both DFO staff and fisheries stakeholders about the inadequate level of financial resources available to the Department. Since our Committee has not had the time nor expertise to undertake an objective examination of the region's financial situation, we recommend strongly that such a task be undertaken by an appropriate outside agency. It must never be overlooked that there is a strong public perception that the reductions in the Pacific region budget are not consistent with good management. The apparent fiscal crisis in the Pacific region needs urgent attention.

Finally, we wish to express our appreciation to all the members of DFO, the FRP members and staff of the PSC, and the many First Nations people, other members of the public and representatives of fisheries organizations who either gave evidence or made submissions or suggestions. The Committee worked well together and we sincerely hope that our report will be of value for the preservation and rehabilitation of Fraser River sockeye stocks. We believe that the changes we recommend must take place if the Canadian public is to continue enjoying the social and economic benefits that flow from abundant salmon stocks.



## RECOMMENDATIONS

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The primary goal of Fraser sockeye management must be to ensure adequate spawning escapement.

- a) To facilitate this, there must be an escapement goal and harvest plan that applies to all sectors. Ideally, this should be the result of consensus among all harvest sectors, but ultimately the setting of a sustainable goal is the responsibility of the Minister of Fisheries and Oceans. At present there is at least the perception of different goals for different groups.
- b) If there is no harvestable surplus beyond the sustainable conservation goal, then there can be no fisheries.
- c) If there is a harvestable surplus, First Nations FSC needs have priority. It is the responsibility of DFO to negotiate the size of each First Nations' harvest and to impose a catch number failing agreement.
- d) Since the largest part of the First Nations' harvest will be taken in the Fraser River system, these FSC numbers need to be defined clearly along with an agreed harvest process that avoids undue damage to the structure of the run. In order to achieve agreements on these harvest numbers and any economic opportunity fisheries DFO should employ a team of skilled and experienced negotiators.
- e) The remaining harvestable surplus must then be allocated among commercial and recreational fisheries including First Nations economic opportunity fisheries with each user group accountable for its share.

### **Pre-Season, In-Season, Mission and Post-Season Estimates**

1. It is recommended that a cost benefit analysis be done to determine the utility and feasibility of an additional counting station at either Boston Bar or Qualark.
2. A further site at the confluence of the Harrison might also be beneficial if it could be installed in order to establish run-size, catches, escapements and timing on late run-timed sockeye (i.e., Birkenhead, Harrison, Weaver, etc.)
3. That sufficient funding needs to be ensured to keep and expand on existing assessment programs. A continuation of "realtime monitoring" (12-hour turnaround) is needed to give PSC and DFO faster and accurate data of the migrating stocks. The continuation of funding from both Canada and the U.S. is needed to pay for the above.
4. That a further split-beam be installed on the north shore of the Fraser at the Mission Site.
5. The use of the First Nations FSC harvest in marine waters should be incorporated as part of the test fishing program on a long-term basis. This requires secure long-term funding for the catch monitoring carried out during the First Nations Marine Society FSC fishery.

## **Catch Monitoring**

6. That DFO convene a meeting with First Nations, fisheries stakeholders, and Conservation and Protection staff to assess the province-wide state of catch monitoring. The participants should examine budgets, personnel needs, transparency, accuracy (bias), problem areas, and ways to improve monitoring programs in all sectors.
7. That DFO, First Nations and stakeholders establish a semi-regular (perhaps annual) review of the status and adequacy of the province-wide catch monitoring program.
8. That an estimate of total mortality be included in the catch monitoring of all fisheries.
9. That DFO develop, on an annual basis, a strategy pre-season to develop some estimate of unauthorized fishing and fish harvest.
10. That resources for catch monitoring be restored to an adequate level in commercial, recreational, and First Nations fisheries as determined through the process in recommendation 6.
11. That DFO retain the ultimate authority and responsibility for auditing catch monitoring reports and performance.

## **Temperature**

12. The EMA model should consider the newly developed mortality criteria related to in-river water temperatures.
13. The estimate of accumulated degree days should be considered as an approximation of the environmental stress experienced by migrating Fraser River sockeye salmon to inform in-season management decisions.
14. The factors contributing to the discrepancy between gross escapement at Mission and spawning ground escapement (river temperature, river flow, unreported catch, catch estimation, errors in Mission and spawning ground escapement estimates, etc.) should be separated through improved data collection and modeling. In the interim, the EMA model should be renamed to eliminate the perception that it only accounts for environmental factors.
15. New and properly designed research is required on Early Stuart, Early Summer and Summer run adult sockeye to complement the work done on Late run sockeye to determine any stock-specific effects of high temperature on migration and spawning success.
16. That riparian habitat in tributary watersheds throughout the Fraser basin be protected and restored to reverse the warming effect that lack of cover creates through the disruption of the hydrologic cycle.
17. The feasibility should be investigated of modifying existing flow control/hydro facilities and water use agreements that might decrease Fraser mainstem and tributary temperatures during high temperature years.

18. Fisheries management action should be responsive and proportional to the direct relationship between increasing water temperature and decreasing survival to spawning. In extreme warm water years additional management actions need to be taken to ensure adequate and appropriate numbers of fish enter the river. Once in the river, management action, such as a time and area conservation corridor, is needed to create the opportunity for sockeye to migrate with a minimal amount of additional stress caused by fishing in the river.
19. Given the challenge posed to fisheries management by high water temperature and associated impacts on fish mortality, more systematic collection of data on the number of fish observed floating in the river or dead on the banks downstream of the spawning grounds would prove useful for comparative purposes.

### **Gear Impacts**

20. When designing the annual fishing plan, DFO must take into account not only the harvest impact of each fishery and gear type, but also the cumulative effect each fishery and its associated gear has on total fishing mortality.
21. Research must be undertaken to verify whether the selective placing of set nets can have an adverse impact on upstream migration by depriving fish of resting places or forcing them to swim in the faster and more turbulent mid-stream waters. DFO policy should be to ensure the existence of a “conservation corridor” for the fish destined for the spawning grounds.
22. Research is needed into the relationship between gill net mesh size and the desired spawning ground gender ratio.
23. Approval of a change in gear type, such as the 2004 approval of the use of drift gill nets by the Cheam First Nation, should not take place in the absence of an objective determination of the comparative fishing power of the different gear.
24. DFO should set goals and objectives with respect to the number of nets allowed.
25. The regulation requiring that all nets be clearly marked as to their ownership should be vigorously enforced. Unidentified nets should be subject to immediate removal and confiscation. The penalty for leaving nets where they can continue to fish during closed periods should be substantial.

### **Enforcement**

26. At the present time, DFO through its C&P Division is not maintaining a credible enforcement presence and not properly enforcing the *Fisheries Act* and *Regulations* including those that relate to habitat protection. Accordingly, DFO must ensure that adequate resources are available and that the budget and staffing available for enforcement be increased.
27. DFO should focus on empowering user groups with the responsibility of providing enforcement within their own sectors. Of course, ultimately such activity must be overseen by DFO.



28. C&P Division urgently needs a clear policy mandate and the resources with which to implement it. Morale will remain low among enforcement officers until this issue is addressed
29. Illegal fishing in the Fraser River has been described as rampant and out of control. This is unacceptable. DFO must properly enforce the *Fisheries Act* and *Regulations* and initiate measures to provide a reasonable estimate of the scope of this illegal activity and the number of fish actually taken.
30. Enforcement must also include adequate presence to deter the concealing of over harvesting of fish by participants from all sectors.
31. Throughout the South Coast there is an ongoing problem with the illegal sale of fish, both fish that have been caught as part of an FSC entitlement and fish that have been illegally harvested. We heard little evidence of any serious effort to prevent this activity. This situation is intolerable and must be addressed by DFO.
32. DFO should develop and have in place as early as possible in 2005 a system to more accurately record illegal nets and fishing in the Fraser River and the approach waters. This system should include overflights at varying times during closed periods of all waters in order to provide for accurate assessment of the number of illegal activities.
33. DFO should maintain a complete record, by species, of all fish found in confiscated nets.
34. Night patrols should be undertaken on a regular but variable basis, particularly in those areas where illegal fishing is being reported.
35. DFO should increase and enhance the Restorative Justice program and apply it to all sectors.
36. Pacific Region enforcement should be organized as a separate branch ultimately reporting to a senior person with enforcement experience and line authority throughout B.C. This person must be a member of the Regional Management Committee.
37. The Committee heard testimony from a number of C&P officers who felt their enforcement powers had been undermined by their inability to conduct vehicle checks at roadblocks. This issue as well as their law-enforcement status should be reviewed by the department.
38. In view of the threat to the resource posed by illegal activity DFO should review the level of penalties it can impose and consider requesting increases commensurate with the infraction and administrative sanctions, including licence suspensions, which can act as an effective deterrent.
39. A higher level of traceability needs to be in place. DFO should work with stakeholders to identify their harvest.

## Management and Budget

40. DFO Pacific region should reassess its core mandate with respect to management of Fraser River sockeye (and indeed all Pacific fisheries resources) and devise a management organizational structure that best supports that mandate. We recommend that an independent consultant be hired to review the situation and provide guidance to senior management.
41. Integrated management plans should be developed within a framework that sets measurable goals, analyses options and evaluates results. Where possible goals should be quantifiable. This will provide public accountability.
42. Public involvement is a good thing. Ultimately the public expect DFO to maintain responsibility for good resource management and will hold DFO accountable. Collaborative approaches and consultation are costly and should be evaluated explicitly against the goals set for fisheries management and compared with the costs and benefits of in-house or independent delivery of programs.
43. DFO's budgeting process should be informed by explicit evaluation of the impact of various budget proposals on results. Where critical elements of DFO's programs have budget issues they should be explained and funds sought. This information should be shared both within and outside DFO to provide stakeholders' views on budget priorities. In the Committee's view DFO has insufficient resources to meet its core mandate for developing, managing and controlling fisheries for Fraser River sockeye and conserving the resource. DFO should be directed to make a submission for additional funds, particularly in the areas of deficiency identified by this review.
44. The PSC FRP is the critical link in management of Fraser sockeye. The Canadian consultative and management structures for all fisheries impacting on Fraser sockeye should be integrated with the Canadian section of the FRP. In particular, First Nations' consultative processes must be fully engaged with that process. In addition, the Canadian chair of the FRP should be the senior authority on all fisheries management decisions relating to Fraser sockeye throughout the South Coast and be empowered to make those decisions on a timely basis.
45. DFO should vigorously pursue solutions to resource sharing and aboriginal claim accommodation.
46. The Committee heard repeated complaints by both DFO staff and fisheries stakeholders about the inadequate level of financial resources available to the department. There exists a strong public perception that reductions in the Pacific region budget are not consistent with good management. Since our Committee has not had the time nor expertise to undertake an objective examination of the region's financial situation, we recommend strongly that such a task be undertaken by an appropriate outside agency.

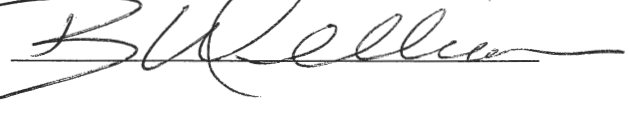
**Recommendations of 1992, 1994 and 2002 Sockeye Management Review Panels: Themes, Lessons, Actions**

47. That DFO form a cross-sectoral committee, and produce a work plan for addressing the completeness of responses to past recommendations, and for responding to 'new' recommendations contained in the current review.

# 2004 Southern Salmon Fishery

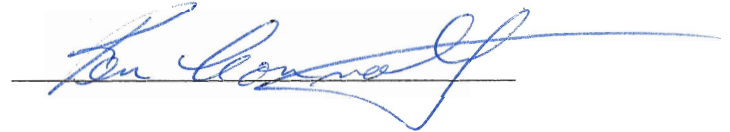
## Post - Season Review

Bryan Williams, Chair

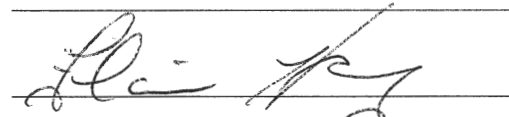


### Committee Members

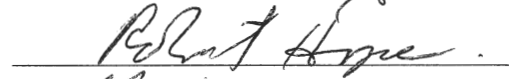
Ken Connolly



Don Hall



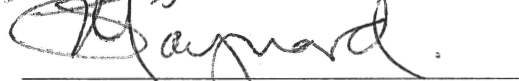
Flavian Harry



Robert Hope



Gerry Kristianson




Jeremy Maynard



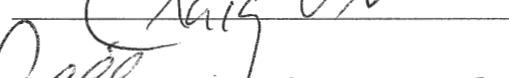
Rob Morley



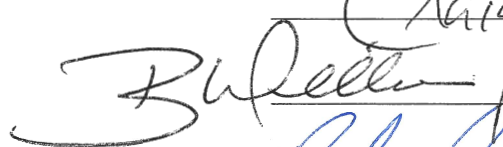
Rick Nordstrom



Craig Orr



Bill Otway

 AUTHORIZED BY BILL OTWAY

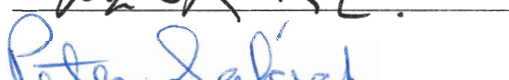
Bob Rezanoff



Les Rombough



Peter Sakich



Ken Wilson

Resigned February 9, 2005

Sandy Argue, Ex Officio

Signature not required

Michael Staley, Observer

Signature not required

***Fisheries and Oceans Canada***

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# ***Background***

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BG-PR-04-067e

November 18, 2004

## **2004 SOUTHERN SALMON FISHERY POST-SEASON REVIEW**

### **TERMS OF REFERENCE**

#### **INTRODUCTION**

- The management of the salmon fishery in 2004 was especially difficult because of special conservation challenges for stocks at risk, and limited opportunities to harvest more abundant stocks. In addition, environmental conditions created harsh migratory conditions that affected achievement of escapement objectives, and diminished spawning success. Some stocks (West Coast Vancouver Island chinook, Fraser River chinook, chum) returned in abundance and supported strong fisheries, while others were disappointing. On the Fraser River, sockeye spawning escapements appear to be low and there is strong public interest in understanding the factors which have contributed to the failure to meet plan objectives. Chinook in the Strait of Georgia appear to be returning at low levels.
- On September 21, 2004, the Minister met with several groups involved in Pacific salmon fisheries to discuss these issues and he agreed to conduct a comprehensive, independent post season review.

#### **SCOPE**

- The review will describe and evaluate the management of southern B.C. salmon fisheries in 2004. It will assess the extent to which objectives were met; identify key factors which constrained performance; and provide recommendations to overcome constraints and guide future management. In particular the review will focus on pre-season planning and the adequacy of consultation processes; establishment of conservation objectives; application of risk management principles; adequacy and timeliness of in-season data; in-season processes for decision making; and enforcement and compliance measures.
- For the purpose of the review, the southern fisheries include those addressed in the South Coast Salmon Integrated Fishery Management Plan (IFMP), and range from First Nations food, social and ceremonial fisheries to commercial net and troll fisheries on the West Coast of Vancouver Island (WCVI), the approach waters to the Fraser River, including

Johnstone, Georgia and Juan de Fuca Straits, as well as the Fraser River and include recreational salmon fisheries throughout the south coast of B.C.

- Recommendations must be consistent with Government of Canada and Fisheries and Oceans Canada (DFO) policy, and able to be implemented within the existing resource capability of DFO, Pacific Region.

## **PARTICIPATION AND PROCESS**

- The review will be conducted by the Integrated Salmon Harvest Planning Committee (IHPC). For the purposes of the post-season review the IHPC will be chaired by Bryan Williams. The members of the IHPC will coordinate consultations with their sectors and DFO, and review and approve the final report. The Committee will invite and receive written and web-based public input, and organize public meetings that provide for public participation.
- Membership on the IHPC includes:
  - First Nations representatives,
  - Recreational fishing representatives from the Sport Fishing Advisory Board (SFAB),
  - Environmental group representatives from the Marine Conservation Caucus, and
  - Commercial fishing and processing representatives from the Commercial Salmon Advisory Board.
- DFO officials who are knowledgeable about the science and management programs pertaining to southern salmon fisheries will support the conduct of the review.

## **MANDATE**

- The Committee will be responsible for reviewing the conduct of all fisheries included in the 2004 southern salmon integrated fisheries management plan (IFMP). In the conduct of this review, the Committee shall:
  - 1.) Evaluate the performance of each fishery (or groups of fisheries) included in the southern IFMP. In particular, the Committee will assess:
    - a) was the pre-season planning process adequate?
    - b) were plan objectives clearly defined?
    - c) was in-season data required for management timely and accurate?
    - d) were in-season decision making processes adequate?
    - e) were plan objectives met; if not, why not?
    - f) was there adequate compliance with plan provisions?
    - g) what can be done to improve pre-season planning and in-season management?

**APPENDIX 1**  
**TERMS OF REFERENCE AND**  
**NEWS RELEASE**

2.) Examine the conduct of the Fraser River sockeye fishery in 2004. In addition to evaluating the specific issues set out in section 1 (a -g), the Committee shall assess:

a) Conservation Objectives

- Was the conduct of the 2004 salmon fishery consistent with the conservation objectives stated in the fishing plan?
- Did the pre-season planning process adequately identify the appropriate conservation objectives?
- To what extent does the uncertainty around sharing and allocation arrangements impact the achievement of conservation objectives?

b) Scientific Advice and Risk Management Strategies

- Are the hydro-acoustic and test fishing data providing adequate information to support the in-season estimations of abundance necessary to meet the management and allocation expectations?
- Is the risk management approach using an Environmental Management Adjustment (EMA) model to increase escapement requirements during low flows and high temperatures an appropriate tool on which to base fisheries management decisions?
- If the EMA is not considered adequate, what other approaches should be considered and evaluated?
- Does the in-season data on abundance, timing and distribution adequately support the decision making process

c) In-Season Management Processes/Consultation Processes

- Is the decision making process for opening and closing fisheries timely?
- How could decision rules and the process related to their development and implementation be improved?
- Were the roles of DFO and the Fraser River Panel in the decision making and management of the in-season Fraser River sockeye fishery clear and properly executed?
- Did the Fraser River Panel and DFO respond to unexpected circumstances in a satisfactory manner?

d) Enforcement

- How effective was the Conservation and Protection support to the fishing plans for all users?
- What levels of compliance with fishing plans was achieved?

e) Other Issues

- Other relevant issues that may be identified by members of the Committee, or the public, during the conduct of the review.

3.) The Committee shall provide a report to the Minister of Fisheries and Oceans documenting their conclusions and recommendations by March 31, 2005.

## **WORKPLAN AND SCHEDULE**

- Appointment of the Independent Chair.
- First meeting of the IHPC, to review and approve the terms of reference for the 2004 Southern Salmon Fishery Post Season Review.
- Meetings of the independent chair with umbrella representative organizations representing sectors, and other groups such as Pacific Salmon Commission staff, and DFO officials.
- Public meetings to be held in Nanaimo, Kamloops and Prince George.
- Draft report to be prepared including conclusions and recommendations.
- Review of draft report by the IHPC.
- Final report with conclusions and recommendations, and review to be completed by March 31, 2005



***Fisheries and Oceans Canada***

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# *News Release*

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**NR-PR-04-067e**

**November 18, 2004**

## **MINISTER REGAN ANNOUNCES INDEPENDENT CHAIR OF NEW COMMITTEE**

**Vancouver** - The Honourable Geoff Regan, Minister of Fisheries and Oceans, today announced the appointment of Bryan Williams as the independent chairperson of the 2004 salmon post-season review. This review will be led by Mr. Williams and will be conducted by the newly formed Integrated salmon Harvest Planning Committee (IHPC) for southern B.C. It will also provide for public input.

"Mr. Williams is a skilled negotiator, arbitrator and jurist," said Minister Regan. "I have the utmost confidence that he will lead the IHPC discussions regarding the post-season review in a productive and efficient manner, which will in turn provide the Department with advice on the management of our salmon resource."

Mr. Williams was Chief Justice of the Supreme Court of British Columbia from 1996 to 2000. He is now associate counsel with the Vancouver law firm Miller Thomson. He has a particular expertise in all forms of alternate dispute resolution, including mediation and arbitration.

The first meeting of the IHPC is scheduled for November 18. One of the committee's first tasks will be to conduct a post-season review, under the leadership of Mr. Williams, of the 2004 salmon fishery, as announced on October 20, 2004. The review will emphasize consultation processes, conservation objectives, risk management, adequacy of data, process for decision making, and DFO fisheries management processes. The intent of the review is to focus on recommendations for the future management of southern BC salmon fisheries.

The IHPC is comprised of representatives from First Nations, and commercial, recreational and environmental interests. Participants on the committees are nominated by their respective organizations/sectors based on scientific, technical, ecological or traditional expertise/knowledge, and those nominations are forwarded to DFO.

The committee has been established by the Department to provide formal advice and make recommendations to DFO on operational decisions related to salmon harvesting in the Pacific Region. The goal of the committee is to ensure fishing plans are coordinated and integrated, to identify potential conflicts, and to recommend a means of resolving disputes.

**[Backgrounder: Terms of Reference - 2004 Southern Salmon Fishery Post-Season Review](#)**

### **For further information:**

Michelle Imbeau  
Communications Officer  
Fisheries and Oceans Canada, Pacific Region  
(604) 666-2872



**THE HON. BRYAN WILLIAMS, Q.C.  
ARBITRATOR / MEDIATOR**

Robson Court, 1000 – 840 Howe Street  
Vancouver, BC Canada V6Z 2M1  
Tel: (604) 643-1213  
Fax: (604) 643-1200  
E-mail: bwilliams@millertomson.ca

January 4, 2005

File: 050800.0048

House of Commons  
Parliament Buildings, Wellington Street  
Ottawa ON K1A 0A6

Attention: The Honourable Geoff Regan  
Minister of Fisheries and Oceans

Dear Sir:

**Re: 2004 Southern Salmon Fishery Post-Season Review**

I enclose a copy of a memo distributed to the last meeting of the 2004 Southern Salmon Fishery Post-Season Review Committee on December 21, 2004, which I believe reflects the telephone discussion I had with you when I was in New York. If there is a problem in this regard, please advise. Otherwise, we can assume that the Terms of Reference will be interpreted in accordance with this memo and that the Committee will be established as a committee of individuals who happen to be the Southern Section of the IHPC.

I wish to take this opportunity to thank you for your response to my serious concerns about how we could launch the Committee. The meeting of the Committee which took place on December 21<sup>st</sup> was a good meeting, and I think the Committee members and I have established a relationship which will accomplish your mandate.

I shall continue to keep Bilal Cheema and Paul Ryall advised, and in accordance with your request will endeavour to provide a report on our progress to you by the end of January, or at latest mid-February.

Yours truly

Bryan Williams, Q.C.  
BWW/db

Enclosure  
c. Bilal Cheema  
c. Paul Ryall  
bww/bww02620

## MEMORANDUM No. 1

**To:** Committee Members  
**From:** Bryan Williams, Q.C.  
604.643.1213  
**Date:** December 20, 2004  
**Subject:** 2004 Southern Salmon Fishery Post-Season Review

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This memorandum is prepared by me as Chairman to the 15-member Committee of the 2004 Southern Salmon Fishery Post-Season Review.

At the first meeting which took place between 9.30 am and 12.30 pm on December 7, 2004, a number of issues were raised by several members and I do not propose to deal with them verbatim in this memorandum. Arising out of that meeting, however, I undertook to contact the Minister at the request of a majority of members in order to clarify and refine the Terms of Reference which were handed to us by the Ministry.

By virtue of conflicting schedules on my part and the Minister's part, I had some difficulty contacting the Minister but finally, the Minister called me when I was in New York on December 19<sup>th</sup>. At that time I had a full opportunity to raise with him the issues which I agreed to raise and they are as follows:

1. The committee members felt that the scope of the review was too broad and that we would be unable to complete a review of both the Fraser River and the balance of the South Coast within the time allotted, that is to say, by March 31, 2005. It was suggested that we limit this review to the Fraser River only and that we find another way to deal with the balance of the South Coast.

The Minister fully understood our concerns about the scope of the review and understood the need to centre on the Fraser River fishery, particularly with respect to the sockeye. He did feel, however, that he could not simply abandon the balance of the South Coast which is reviewed every year. We agreed that this review will centre upon the Fraser River, and particularly sockeye, as a first task. That is to say, the Fraser River will be given priority and if there is time we should complete the balance of the South Coast review within the time allotted. If we cannot complete within the time allotted, then we will have find a way to deal with the balance of the South Coast either by separate review or following the Fraser River report.

The Minister asked that I send him a report by the end of January 2005 to indicate where we had arrived and at that time we may be in a better position to deal with the South Coast.

2. I indicated to the Minister that there was a serious need to ensure that sufficient resources were provided for us to complete the work that we must do and that members must be compensated. (I shall deal with the compensation issue in a separate memorandum).
3. I was asked by the Commercial Salmon Advisory Board to point out to the Minister that they did not appreciate this task being dumped on the IHPC without consultation or more specific guidance. In addition, I pointed out to him (which he already knew) that they were asking for a judicial enquiry and thought it would be a more appropriate forum for this endeavour where powers of subpoena and testimony under oath could occur. The Minister understood those concerns as I expressed them on behalf of the Commercial Salmon Advisory Board but said there would not be a judicial enquiry and accordingly, I put to him the proposition that we would simply have to have any and all persons

available to appear before the Committee even though the Committee would not have the powers of subpoena. I also indicated to him that the evidence would have to be under oath and that there be no jeopardy with respect to any Fisheries employees testifying under oath.

The Minister had no problem with either of those requests and said that he would advise employees of the Department of Fisheries through normal channels that they were to cooperate with the Committee (as the Terms of Reference point out they are to) and that while he had no problem with taking evidence under oath he stated that he simply did not have the power and could not order people to appear under oath as part of their contract of employment.

I indicated to the Minister that I understood his concern but that I wanted him to be certain that he would ask people that they ensure that they appear if we required them and that I would ask them to take evidence under oath as other witnesses will be required to do (what happens if people refuse to give evidence under oath is the issue we will have to discuss further).

The Minister agreed that there would be no jeopardy for employees appearing before the Committee and taking the oath.

4. I pointed out to him that to have a full IHPC Committee would be an impossible creature to deal with, and that even having the South Coast section constituted a huge committee and that I had recommended a committee of 4 members, one from each of the groups. I pointed out to him that the Committee was not receptive to that suggestion but would be receptive to the suggestion that there be a 4-person committee to deal with procedural and administrative issues so long as the substance of the matter was heard by the full 15 members.

I put to him the suggestion made to me (which made sense to me) that rather than have the South Coast section named as the Committee, we simply name the 15 members thereof so that we do not encounter problems of conflicting terms of reference between those given to us and those for the IHPC. The Minister had no objection to that suggestion, and I recommend we proceed on that basis.

5. The Committee suggested to me that we ask the Minister to amend the Terms of Reference. After my discussions with the Minister, neither he nor I thought this would become necessary in the sense that the Terms of Reference are not a binding code but simply a guideline. It may still be possible to amend the Terms of Reference, but in my view since I will be sending a copy of this memorandum to the Minister, there will be full knowledge within the Ministry and all of its sections, that we are simply clarifying or refining the Terms of Reference to meet the practical needs of our task. With that in mind, I believe we can proceed as set forth above.



**RICHMOND, RADISSON PRESIDENT HOTEL  
January 19, 2005**

**Department of Fisheries and Oceans**  
Mr. Paul Ryall  
Mr. Jeff Grout  
Ms. Sue Grant  
Mr. Bert Ionson

**Mr. Frank Kwok**  
**Mr. Brian Richman**  
**Mr. Fred Helmer**  
**Fraser Valley Salmon Society**  
Mr. Dean Werk

**PRINCE GEORGE, PRINCE GEORGE CIVIC CENTRE  
January 24, 2005**

**Department of Fisheries and Oceans**  
Ms. Andrea Peterson  
Mr. Elmer Fast  
Mr. Al Charbonneau  
Mr. Timber Whitehouse  
Mr. Dennis Girodat

**TI'azt'en Nation**  
Mr. Jim Webb

**KAMLOOPS, EXECUTIVE INN  
FEBRUARY 1, 2005**

**Department of Fisheries and Oceans**  
Mr. Les Jantz  
Mr. Richard Bailey  
Mr. Chris Narver  
Mr. Robert Melvin  
Mr. Douglas Cowen  
Mr. Tom Grantham  
Mr. Jim Michie  
Mr. Bert Ionson  
Mr. Elmer Fast  
Mr. Timber Whitehouse  
Mr. Randy Nelson  
Mr. Stu Cartwright

**Secwepemc Fisheries Commission**  
Mr. Fred Fortier  
Mr. Mike Galesloot  
**Mid-Fraser Sport Fishing Advisory**  
Mr. Don Trethewey  
**Nlakapamux Nation Tribal Council**  
Mr. Byron Spinks  
Mr. Nathan Sprinks  
**Ms. Lorraine Wood**  
**Mr. Tony Brumell**  
**Mr. Roger Meunier**  
**Nicola Tribal Council**  
Mr. Neil Todd  
**Mr. Walter Plumpton**  
**Mr. Richard Welsh**

**NANAIMO, COAST BASTION INN HOTEL  
FEBRUARY 7, 2005**

**Department of Fisheries and Oceans**  
Mr. John Lewis  
Mr. Barrie Kanester  
Mr. Steve Thompson  
Mr. Jim Robson  
Mr. Leroy Hop Wo  
**Leequesto Nation**  
Captain George Quocksister

**A'Tlegay Fishery Society**  
Mr. Brian Assu  
Ms. Kim Duncan  
**Laich-Kwil-Tach Nation**  
Chief Russell Kwakseestahla  
**BC Wildlife Federation**  
Mr. Wayne Harling

**NANAIMO, COAST BASTION INN HOTEL  
FEBRUARY 8 2005**

**Hupacasath Nation**

Mr. Peter Tatoosh  
Mr. Tom Tatoosh

**Namgis Nation**

Mr. Chris Cook

**Department of Fisheries and Oceans**

Mr. Randy Brahniuk  
Mr. Greg Thomas  
Ms. Diana Dobson  
Mr. Lori Gordon

**Tseshah Nation**

Chief Les Sam

**Kwakseestahla – Laich-Kwil-Tach  
Nation**

Chief Russell Quocksister

**Gulf Trollers Association (Area H)**

Mr. Doug Marshall  
Mr. Michael Griswold

**Mr. Shane Gallop**

**SURREY, DAYS HOTEL  
FEBRUARY 9, 2005**

**Department of Fisheries and Oceans**

Mr. Kirk McCrae  
Mr. Ian Mann  
Mr. Bert Ionson

**Mr. Scott Svelander**

**Mr. Bill Lightbown**

**SURREY, DAYS HOTEL  
FEBRUARY 10, 2005**

**Mr. Wayne Saito**

**Fraser River Panel**

Mr. Terry Lubzinski  
Mr. Murray Chatwin

**Mr. Gary Sonnenberg**

**Mr. Robert Kreutziger**

**Mr. Lorne Korbutt**

**Mr. Terry Endersby**

**CHILLIWACK, RHOMBUS HOTEL  
FEBRUARY 21, 2005**

**Cheam First Nation**

Ms. June Quipp

**Aitchelitz Nation**

Chief Jim George

**Sto:lo Nation**

Mr. Ken Malloway (Wileleq)

**Mr. Anthony Pare**

**Mr. Al Hanson**

**Elk Creek Conservation Coalition**

Ms. Verna Pigou

**Chilliwack Fish & Game Protective  
Association**

Mr. Bill Winpney

**Department of Fisheries and Oceans**

Mr. Doug Clift

Mr. Derek Ray

Mr. Perry Powers

Mr. Brian Levitt

Mr. Scott Laverty

Mr. Ken Peters

Mr. Jeff Grout

Ms. Devona Adams

**Mr. Nick Basok**

**Mr. Gwyn Joiner**

**Mr. Frank Kwak**

**Mr. Tony Nootebus**

**Mr. Shawn Krug**

**Mr. Bob Doddridge**



**RICHMOND, RADISSON PRESIDENT HOTEL  
FEBRUARY 22, 2005**

**Department of Fisheries and Oceans**

Mr. Bert Ionson

**Pacific Salmon Foundation**

Mr. Paul Kariya

**Ocean Fisheries Limited**

Mr. Larry Wick

Mr. Murray Chatwin

**BC Aboriginal Fisheries Commission**

Ken Malloway

Mr. Mike Staley

**Haida Nation**

Ms. Lavina White

**Cheam Nation**

Chief Sidney Douglas

Mr. Darwin Douglas

**David Suzuki Foundation**

Mr. Otto Langer

Mr. Jeffrey Young

**RICHMOND, RICHMOND HOTEL  
FEBRUARY 23, 2005**

**University of British Columbia**

Dr. Steve Cooke

Dr. Scott Hinch

**Department of Fisheries and Oceans**

Dr. Dave Patterson

**W.J. Gazey Research**

Mr. Bill Gazey

**LGL Limited**

Dr. Karl English

**United Fishermen and Allied Workers**

**Union-CAW**

Mr. Garth Mirau

**Pacific Salmon Commission**

Mr. Mike LaPointe

Dr. Yunbo Xie

**Department of Fisheries and Oceans**

Mr. Timber Whitehouse

Mr. Rob Houtman

Mr. Paul Ryall

**J.O. Thomas & Associate**

Mr. J. Thomas

**RICHMOND, RICHMOND HOTEL  
FEBRUARY 24, 2005**

**Department of Fisheries and Oceans**

Mr. Randy Nelson

Ms. Kirsty Walde

Mr. Stu Cartwright

Mr. Herb Redekopp

Mr. Glenn Kostiuk

Mr. Greg Savard

Mr. Don Radford

Mr. Reg Reeves

Mr. Les Jantz

**David Suzuki Foundation**

Mr. Otto Langer

**Mr. Terry Slack**

**Ms. Gilda Bechler**

**Mrs. Donna Sonnenberg**

**Dr. Jim Woodey**

**Mr. Wayne Saito**

**RICHMOND, RICHMOND INN  
FEBRUARY 25, 2005**

**MP, Delta/Richmond East**

Mr. John Cummins

**B.C. Fisheries Survival Coalition**

Mr. Phillip Eidsvik

**Area E Gillnetters Association**

Mr. Mike Forrest

**Department of Fisheries and Oceans**

Mr. George Da Pont

Mr. David Bevin

Mr. Paul Sprout



**APPENDIX 4  
WRITTEN SUBMISSIONS**

Mr. Michael D. Akerly	Mr. Terry Mooney
A-Tlegay Fisheries Society (Mr. Brian Assu)	Ocean Fisheries Ltd. (Mr. Edward A. Safarik)
B.C. Sportfishing Guides Association (Mr. Wayne Michie)	Mr. Ken Pearce
Mr. Craig Beggs	Mr. John Pederson
G.B. Boulton	Ms. Petrie
Mr. David Boyes	Ms. Verna Pigou
Canadian National Railways (Mr. Alvin Whitfield)	Mr. Walt Puetz
Mr. Bob Cavill	Radio-Canada TV (Ms. Thérèse Champagne)
Cheam Nation (Ms. June Quipp)	Mr. John Rampanen
Mr. David Christian	Residents of Elgin Saving Creeks (Mr. Larry Ramsell)
Mr. James G. Duffy	Ms. Sandy Ritchie
D. Dunham	Mr. Terry Slack
First Nations Marine Society (Ms. Natalie Nelson)	Ms. Heidi Smith
Fraser River Ecological Society of Hope (Mr. Tony Dal Bello)	Steelhead Society of British Columbia (Mr. Poul Bech)
Tom and Elaine Godwin	SWB Fisheries Ltd. (Mr. Stephen W. Beans)
High Country Stainless (Mr. Glen Monaghan)	The Kingfishers Rod and Gun Club (Mr. Rick Bridarolli)
Ms. Lisa Ingvallsen	Mr. Brian M. Toth
Mr. Gary Jennings	Mr. Rob Twiddy
Mr. Ed Juliussen	United Fishermen and Allied Workers Union-CAW (Mr. Garth Mirau)
Mr. Robert O. Kreutziger	WSC Wild Salmon Canada Ltd. (Mr. George Gould)
Mr. Frank Kwak	Ms. Darlene Wulff
Mr. Jim Lion	Yale First Nation
Mr. James McGinnis	