

**2005 LICENCE AREA F
ITQ DEMONSTRATION FISHERY**

A REVIEW

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Prepared for:

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1. INTRODUCTION

The northern troll fleet experimented with a different management approach in the 2005 fishing season. A demonstration fishery based on individual transferable quota (ITQ) management was conducted during part of the northern troll commercial salmon fishery. For the directed chinook fishery, each licence holder was given the option of either fishing in the traditional manner (known as the competitive fishery) or under an ITQ management regime.

In a competitive fishery licenced vessels compete for the available harvest, or total allowable catch (TAC), and the fishery is closed when the TAC is attained. Under an ITQ management regime licenced vessels do not compete for the available harvest. Rather, each licenced vessel is allocated a pre-determined share of the TAC prior to the start of the fishing season and this share (or individual quota) can be transferred between licenced vessels.

In an effort to document the project and its outcomes and assist the industry, Fisheries and Oceans Canada (DFO) and other interested stakeholders in their evaluations, DFO requested a review of the 2005 northern troll ITQ demonstration fishery.

1.1 Purpose

The purpose of this report is to provide an overview of the 2005 northern troll ITQ demonstration fishery as well as discuss some of the key outcomes. This report is not a discussion of policy issues associated with individual quota management nor is it a debate about the pros and cons of ITQ management. Rather, the intent of this report is to summarize what happened in 2005, discuss some of the outcomes and consider any lessons learned.

The outline of the review is based largely on a framework provided by DFO (see Appendix A). The report is divided into separate sections that:

- provide some background on the commercial salmon fishery and the Pacific Fisheries Reform;
- discuss the northern troll fishery and how it is managed, with an emphasis on chinook;
- outline the events leading up to the implementation of the Area F ITQ demonstration fishery, the key elements of the program and the key objectives identified;
- summarize the results of the 2005 northern troll chinook fishery; and,
- comment on the ITQ demonstration fishery and some of the results as well as offer recommendations for consideration.

1.2 Information Sources

The review is based on two primary types of information; interviews, and biological, economic and other related data. Interviews were conducted with the elected vessel owner advisors on the northern troll Area Harvest Committee (AHC), a fish buyer/processor who purchases the majority of the northern troll-caught salmon, DFO staff, representatives from the recreational fishing sector and the two service providers that were involved with the demonstration fishery.¹ The interviewees are summarized in the following table and are listed in Appendix B.

Interviewees	Number Interviewed
AHC advisors (9 fished in ITQ demonstration fishery, 1 in competitive fishery)	10
Fish Buyers/Processors	1
Recreational Fishing Lodge Operator ²	1
Sport Fishing Advisory Board (SFAB) members	3
DFO Resource Management	3
DFO Stock Assessment	1
DFO Conservation & Protection	3
Service provider – dockside monitoring program	2
Service provider – data management	1

Time and budgetary constraints limited the extent of the interview process. DFO supplied the list of stakeholders to be interviewed as part of the review. During the course of the work, additional stakeholders were identified to be interviewed. Recognizing Canada's legal duty to consult with First Nations, DFO advised they would seek the views of First Nations on the northern troll ITQ demonstration fishery as part of their ongoing bilateral consultations.

Data and other information were taken from:

- DFO Pacific Region's Commercial Catch Sales Slips database;
- DFO FOS database
- Chinook ITQ database (created to track vessel ITQs, ITQ transfers and validated landings);
- post-season summaries and fishery-related information provided by DFO; and
- minutes and other records from the pre-season AHC meetings.

¹ In keeping with the scope of this review interviewees were asked to focus their comments and responses to the 2005 northern troll ITQ demonstration fishery and its outcomes. It is acknowledged that specific policy issues were raised by some interviewees, particularly by AHC members and recreational fishing sector representatives. However, such policy issues are beyond the scope of this report.

² The recreational fishing lodge operator was interviewed on the understanding that any views put forward were his own opinions.

2. BACKGROUND

2.1 The Commercial Salmon Fishery

The past decade has been a difficult one for the wild commercial salmon industry. As noted in Gislason & Associates Ltd. (2004), the revenue base of the wild salmon fishery is only about 20% of what it was in the early 1990s. This decline can be attributed to a combination of significantly lower total catch levels and depressed world salmon prices.

A regime shift in the ocean environment in the mid-1990s led to lower ocean productivity, lower rates of ocean survival, and fewer salmon returns (Gislason & Associates Ltd., 2004). This resulted in substantial declines in salmon fishing opportunities as fisheries management since the late 1990s focussed increasingly on conservation and selective fishing. At the same time, salmon prices have collapsed. According to Gislason & Associates Ltd. (2004) the very low salmon prices can be attributed to the growing supply of farmed salmon (which offers consistent availability, quality and price), the persistent weak economy in Japan (an important export market for Canadian sockeye) and the large supply of canned salmon from Alaska.

Some segments of the B.C. salmon fleet have been undertaking demonstration fisheries to test different management regimes/techniques in an effort to try to find ways to increase fishing opportunities and improve the financial viability of the fishery. For example, since the late 1990s selective fishing experiments have been conducted in various areas of the coast, in 2002 and 2003 salmon troll vessels licenced to fish the waters inside Vancouver Island (Licence Area H) conducted individual quota demonstration fisheries, in 2003 and 2004 the southern seine fleet (Licence Area B) experimented with new fishing approaches for Somass River sockeye and in 2005 the Area B seine fleet conducted a demonstration fishery for chum. In addition, then Minister of Fisheries and Oceans, the Honourable Geoff Regan, indicated his support for demonstration fisheries as part of the Pacific Fisheries Reform.

2.2 Pacific Fisheries Reform

As previously noted, for several years the commercial salmon fishery has been subject to changes that have adversely affected the financial viability of the industry. Ongoing First Nations treaty negotiations and where they were leading were also adding uncertainty to the industry (McRae and Pearse, 2004).

To address these issues, the federal and British Columbia governments commissioned the Joint Federal Provincial Task Group on Post-Treaty Fisheries to define a vision of fisheries in a post-Treaty-era that would ensure conservation of the resource, provide for sustainable use and effective management and improve economic performance. At the same time, leaders from the B.C. Aboriginal Fisheries Commission and the First Nations Summit commissioned the First Nations Panel on Fisheries to present a vision for future

fisheries management and allocation as well as identify principles that would help achieve that vision (DFO, 2005).

Both the Joint Task Group and First Nations Panel submitted their reports in the spring of 2004. The reports made a number of recommendations with respect to resource access, co-management, conservation and sustainability, and the economic performance of the fishery. In addition, both reports called for a process based on voluntary licence retirement to re-allocate fish stocks to First Nations. The reports also highlighted the need for changes to the management of the salmon fishery (DFO, 2005). For example, the First Nations Panel report notes the commercial salmon fisheries face “numerous challenges, including dwindling catches, poor prices and reduced fishing time causing many vessels to lie idle for most of the year” (Jones *et. al* 2004).

Following the release of these reports, DFO initiated consultations with First Nations and stakeholders to seek their views on the reports and on introducing reforms to the commercial salmon fishery to improve economic viability, reduce controversy and achieve a balance in fishing opportunities (DFO, 2004). On April 14, 2005 the Minister of Fisheries and Oceans announced a blueprint to reform the Pacific fisheries, particularly the salmon fishery. In his announcement the Minister made it clear the status quo was unsatisfactory and that the lack of consensus on specific reforms shown during the previous round of consultations could not be used as an excuse for lack of action (DFO, 2005b).

The blueprint contains four main themes:

- Sustaining strong salmon populations by setting clear conservation objectives for each fishery based on the principles of the Wild Salmon Policy.
- Strengthening DFO programs that are critical to salmon conservation, such as habitat protection, enforcement and the scientific assessment of stocks.
- Making progress over time on increasing First Nations’ access to economic fisheries in collaboration with First Nations and Indian and Northern Affairs Canada.
- Improving the economic performance of fisheries so that they reach their full potential, provide certainty to participants and optimize harvest opportunities.

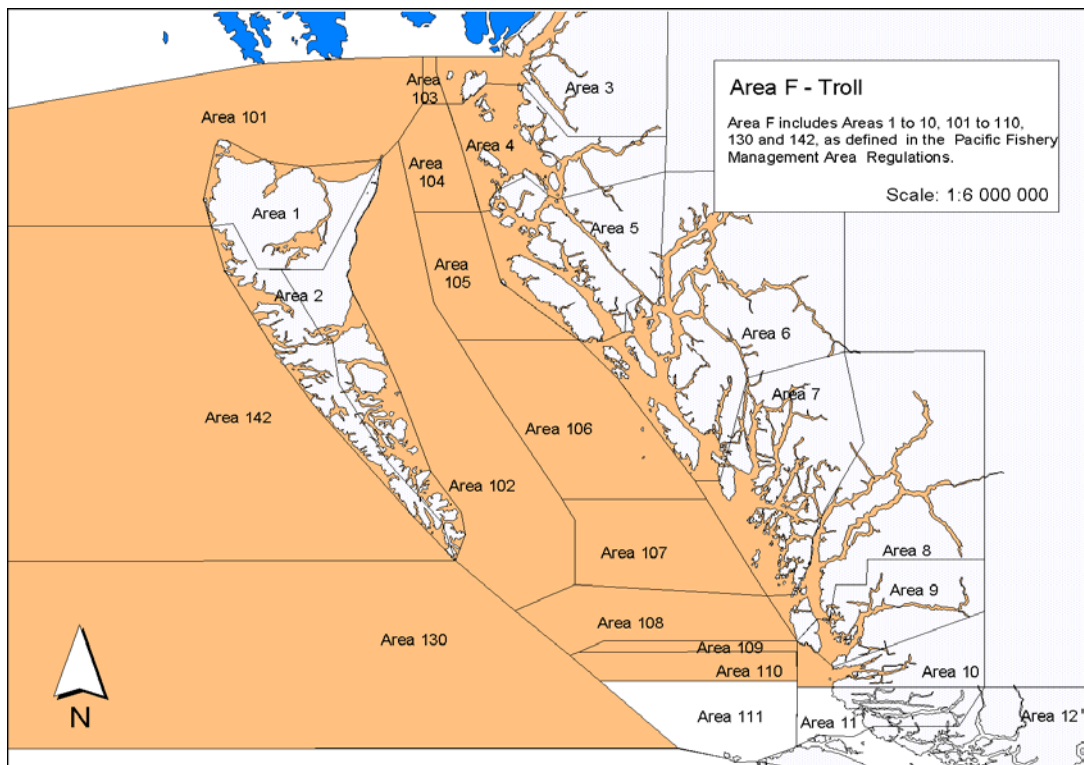
The Minister advised that 2005 would be a transition year for salmon fishery reforms and also announced his support for demonstration fisheries as a way to test different management options and innovative solutions. The announcement notes that more permanent reforms will be adopted in 2006 following an evaluation of the results of the 2005 demonstration fisheries and a final consultation phase (DFO, 2005b).

3. THE NORTHERN TROLL (AREA F) COMMERCIAL SALMON FISHERY

3.1 Background Information

Prior to 1996, the commercial salmon troll fleet was managed using an area licensing regime that divided the coast into two licence areas; Inside (the waters inside Vancouver Island) and Outside (the west coast of Vancouver Island and the North coast waters). In 1996, area licensing was implemented for all commercial salmon fleets (seine, gillnet and troll) and the existing troll vessel area licensing regime was changed. Three new areas for vessels licenced to fish salmon with troll gear were introduced (Salmon Licence Areas F, G and H).

The northern troll fishery takes place in Salmon Licence Area F; only vessels with an Area F licence may participate in commercial salmon troll fisheries in this region of the coast. The number of commercial salmon troll vessels licenced to fish in Area F increased from 147 in 2000 to 168 in 2005; although, not all licenced vessels actively participated in the fishery during this time.³ The fishery is controlled in-season by regulating fishing time and area – these fishing opportunities are referred to as “openings”.



Source: Fisheries and Oceans Canada – Pacific Region

³ The number of licences has changed because commercial salmon vessel owners that acquire an additional licence are permitted to re-designate the area of the new licence when stacking it onto their vessel.

Similar to other commercial fisheries, the northern troll fishing plan is developed through a structured DFO advisory process. Fishing plan development is undertaken through the Area F Area Harvest Committee and the Commercial Salmon Advisory Board and finally through the Integrated Harvest Planning Committee. Once all advice has been received and the plan has passed through these advisory processes it is then submitted to the Minister of Fisheries and Oceans for final approval.

The northern troll fleet fishes mainly for chinook and coho salmon although there is a secondary targeted fishery on pink salmon. Area F licence holders are permitted to retain sockeye salmon caught as by-catch while directing on other salmon species; however chum and steelhead are non-retention species. Troll vessels may also retain and land lingcod while fishing salmon under Schedule II licence conditions (DFO, 2005). Fishing opportunities can vary between years and may also change in-season due to specific conservation measures and/or allocation arrangements.

In addition to completing mandatory logbooks that document fishing location and catch, as a condition of licence Area F licenced vessels are also required to communicate in-season reports through a phone-in program. Prior to leaving port, a vessel master must contact Archipelago Marine Research Ltd., a designated service provider, and make a Start-Fishing Report (also referred to as “hailing out”). Within 24 hours of the end of a fishing trip and prior to commencing a subsequent fishing trip, vessel masters must contact the designated service provider and make an End-Fishing Report (also referred to as “hailing-in”).

Vessel masters are also required to make an In-season Catch Report to the designated service provider within 24 hours of completion of a fishery or within 24 hours of entering port, providing number of fish caught (retained and released) by species in addition to other information. For all reports, the service provider then enters the information received into the DFO Fisheries Operations System (FOS) database. The costs of the logbook and phone-in program are jointly-funded by industry (60%) and DFO (40%).

Each year DFO undertakes a post-season summary of the northern troll fishery. Since the 2002 season the Department has also conducted a post-season audit of Area F catch reporting of chinook and coho.⁴ As part of this audit, fisheries managers and stock assessment biologists compare each vessel’s information from In-Season Catch reports with sales slip information. In cases where significant discrepancies cannot be resolved or the information appears suspect, vessel names are forwarded to DFO Enforcement personnel for follow-up and investigation.

Similar to the rest of the wild commercial salmon industry, the past decade has been difficult for the Area F troll fleet. There has been a marked improvement in financial viability in Area F since 2002. Not all vessels licenced to fish in Area F were active during this period, but those vessels that did participate in the fishery are reported to have been able to conduct viable fishing operations.

⁴ The coho catch reporting was not part of the 2002 audit but was included for 2003 and 2004.

Area F Total Landed Value, 2000 to 2004

Year	Total Landed Value (2005 \$)	Landed Value per licenced vessel (2005 \$)	Landed Value per active vessel (2005 \$)
2000	983,280	6,690	18,210
2001	1,264,600	8,850	15,810
2002	5,055,640	33,700	50,060
2003	6,753,460	43,600	53,600
2004	11,055,080	69,100	80,700

Source: DFO Commercial Catch Statistics Branch and Pacific Licensing Unit
2004 data is preliminary

According to the industry participants interviewed, this improvement in financial viability can be attributed to increased fishing opportunities for chinook and coho and the development of a winter fishery for chinook that has allowed fresh fish to be landed during periods when it was not traditionally available. The fish buyer interviewed also felt the Area F fishery has benefited from a price upturn for wild salmon as an “anti-farmed, pro-wild” sentiment started to permeate the market approximately three years ago. A similar point is made in Gislason & Associates Ltd. (2004) where the authors note that although farmed product from Norway and the United Kingdom has displaced BC chinook, coho and chum in European markets, BC producers reported an increased interest in BC wild salmon in Europe during 2003.

3.2 The Area F Chinook Fishery

Chinook salmon are managed pursuant to the Canada-United States Pacific Salmon Treaty (PST). Under the PST, an annual TAC for chinook is allocated to northern British Columbia and is divided between the Queen Charlotte Islands recreational fishery and the northern troll fishery.⁵ The anticipated recreational harvest is subtracted from the TAC assigned under the PST, then stock assessment test fishing catches are deducted and what remains is the commercial TAC for the Area F fishery.⁶

By regulation, Area F vessel owners are required to release all chinook below 67 centimetres in length. The intent of the regulation is to try to protect juvenile chinook. The regulation has been in place for a number of years. Catch and release mortalities from this activity are accounted for in stock assessments.

The ability of the Area F fleet to harvest its chinook allocation is greatly affected by conservation concerns for West Coast Vancouver Island (WCVI) chinook stocks. As outlined in the 2005/2006 Salmon Northern B.C. Integrated Fisheries Management Plan, the objective for WCVI chinook is to manage Pacific fisheries (not including enhanced terminal areas) to an exploitation rate of 10%. Northern trollers encounter the WCVI

⁵ Under the Pacific Salmon Treaty chinook allocations apply for the period October 1st to September 30th.

⁶ After First Nations food, social and ceremonial requirements have been addressed, the recreational sector has priority over the commercial fishery for access to chinook and coho (DFO 1999).

stocks while fishing chinook in Area F. For the Area F fishery, one of the stated objectives is to catch the amount of chinook allowed under the PST, while managing WCVI chinook to a share of the total Canadian impact (DFO 2005).

The Area F chinook fishery is managed to a numerical ceiling of WCVI mortalities that is set pre-season. The numerical ceiling is based on the exploitation rate and pre-season forecasts of anticipated WCVI chinook returns (DFO 2005). The exploitation rate and forecasts are used to calculate the number of WCVI chinook mortalities permitted in the northern troll fishery in a given year – in other words, a TAC for WCVI chinook.

For the Area F chinook fishery, the numerical ceiling, or WCVI TAC, is used to develop a percentage guideline of WCVI chinook that can be taken as part of the total chinook catch. This percentage guideline is one of the main tools used to determine when the Area F chinook fishery opens and closes.

Since 2002, DFO has used DNA analysis to monitor the Area F harvest of and impacts on WCVI chinook. DNA samples are obtained from both regular commercial landings and test fishing vessels prior to, within and after each fishery. The DNA analysis is used to identify the prevalence of WCVI chinook. If DNA analysis indicates that the abundance of WCVI chinook (as a percentage of the catch) is greater than the percentage guideline, DFO will delay the opening or close the fishery if fishing operations are already underway. In the past the prevalence of WCVI chinook has caused the northern troll chinook fishery to close before the Area F fleet has attained its chinook allocation.

DFO and the industry plan fishery openings at different times of the year in an effort to avoid WCVI chinook and extend the harvest; although, the vast majority of the harvest tends to take place during openings held between June 1st and September 30th. The Area Harvesting Committee provides advice to DFO on fishing times and catch targets, with an emphasis on trying to minimize the impacts on WCVI stocks. The intent is to try to provide the fleet with as much fishing opportunity as possible so they can achieve the overall TAC. As the year progresses the TAC (and WCVI TAC) is reduced to reflect the catches to date.

4. THE 2005 AREA F DEMONSTRATION FISHERY

4.1 Pre-season

Early in 2005 some members of the Area Harvest Committee approached senior DFO managers requesting the opportunity to conduct an individual quota demonstration fishery during the 2005 northern troll chinook fishery. DFO indicated they were willing to support a demonstration fishery and the concept was discussed at a March 7th teleconference meeting of the Area F AHC. During the meeting the basic elements for an Area F individual quota demonstration fishery were envisioned. Among other details, it was determined that there would be two fisheries -- a competitive fishery and an ITQ demonstration fishery – and Area F licence holders would have the option of participating in one, but not both, of these fisheries. The next meeting was scheduled for April 8th.

The AHC members were split evenly on the demonstration fishery; five advisors supported its implementation while five advisors were opposed to it. Recognizing that they would be discussing an important and contentious issue, DFO agreed to pay for AHC advisors travel expenses so all members could attend the upcoming meetings in person. On April 8th and 9th the Area F AHC met in Prince Rupert to review the 2005/06 North Coast Integrated Fishery Management Plan (IFMP) and address elements of both the competitive fishery and the ITQ demonstration fishery. The Area F AHC next met on April 18th and 19th in Richmond to continue their discussions and review of the 2005/06 IFMP.

Both meetings were chaired by David Barrett, Executive Director of the Commercial Salmon Advisory Board. The meetings were also attended by Area F licence holders, First Nations representatives, the UFAWU-CAW, and the general public. At both meetings opening remarks were made by advisory board members, then licence holders and finally other interested parties. For the April 8/9th meeting, after the observers put forward their views they were asked to depart but were invited back at the end of each session for a summary of the discussion. For the April 18/19th meeting, observers were permitted to remain throughout the sessions.

According to DFO staff, although the Area F AHC was evenly split on implementing the ITQ demonstration fishery, the Department decided to proceed with the project for three main reasons: 1) demonstration fisheries have been used in the past to test new management techniques or regimes of interest to industry; 2) a demonstration fishery would be consistent with the direction the Department was taking with respect to a phased approach for reforms to the management of the salmon fisheries; and, 3) licence holders were being given a choice as to what management regime they wished to fish under.

In the interviews with the AHC members, those advisors who supported the implementation of the ITQ demonstration fishery tended to think the process leading to the implementation of the ITQ demonstration fishery was fair and open. These advisors noted there was opportunity to voice concerns and provide input into the process. They commented that ultimately Area F fishermen were given a choice as to what management

regime they wanted to fish under and noted that 2005 was a demonstration fishery, not a permanent change.

Those Area F AHC members who were opposed to the ITQ demonstration fishery expressed concern with the implementation process. Many of these advisors acknowledged that the AHCs are advisory bodies and final decisions are up to DFO; however, they felt they were working in a consensus-based process or one that, at least, required a majority vote. In their view, the process for the ITQ demonstration fishery did not seem to follow these rules and some advisors felt the program was forced upon them. This group also commented that the process to implement the demonstration fishery was too rushed; more time should have been spent discussing the program and considering its implications. There was general agreement among this group of advisors that a ballot of the fleet should have occurred to determine the level of industry support prior to the ITQ demonstration fishery being implemented.

4.2 The ITQ Demonstration Fishery

In early May 2005, a mail-out package was sent to all licence holders outlining the elements of the ITQ demonstration fishery and the competitive fishery. Area F vessel owners were notified that the 2005 chinook salmon season would start in June and close on September 30, 2005 conditional on acceptable levels of WCVI chinook to be determined through DNA testing. Both the ITQ demonstration fishery and the competitive fishery would fish under the caveat that overall fishing time could be affected by the abundance of WCVI chinook.

Area F licence holders were advised of the two proposed options for harvesting chinook in 2005 -- a competitive fishery or an ITQ demonstration fishery -- and were required to return a form indicating their preferred option by May 31, 2005. The fleet was advised that vessel owners that did not return their form to DFO before midnight on May 31st would be automatically placed into the competitive fishery.

Vessels owners were also advised that chinook salmon allocations between the two fisheries would be made proportionally on a percentage basis to the number of participants in each fishery. Similarly, the numerical ceiling of WCVI mortalities would be divided between the competitive and ITQ fisheries relative to the number of licences participating in each fishery.

Each licence in Area F would be assigned 1,000 pieces of chinook. In the competitive fishery, vessels would compete for a total catch based on the number of licences that opted to fish in this manner multiplied by 1,000 pieces. In the demonstration fishery, each licenced vessel that chose this option would receive 1,000 chinook as its ITQ.

Vessel owners were notified that re-allocation of quota would be permitted between vessels choosing to participate in the ITQ fishery. Licence holders would be able to request quota reallocations by faxing a signed "Request for Temporary Reallocation of

Chinook ITQ Holdings” to DFO for processing. Reallocations would not be permitted if the vessel from which the chinook ITQ was being reallocated was hailed out and at sea. However, reallocations would be permitted if the receiving vessel was hailed out. All ITQ reallocations were completed by the DFO northern troll manager. A Chinook ITQ Database was constructed by an independent service provider to track reallocations and catch against ITQ holdings.

Experimental licences were issued to vessels participating in the ITQ demonstration fishery. However, given vessels had to be in possession of a valid Salmon Area F licence, ITQ demonstration fishery participants were required to follow both the conditions of the Experimental Licence and the conditions of the 2005/2006 Salmon Area F licence. As a condition of the Experimental Licence, vessels participating in the ITQ demonstration fishery were required to participate in a dockside monitoring program and have their catch validated by JO Thomas & Associates Ltd. (JOT), a designated service provider.

In addition to having to make the required in-season reports to the phone-in program described in Section 3.1, vessels participating in the ITQ demonstration fishery were also required to hail-out and hail-in to JOT as a condition of the Experimental Licence. Prior to commencing fishing operations, ITQ demonstration fishery vessels were required to hail-out to JOT. Once an ITQ demonstration fishery vessel stopped fishing or reached its quota, it was required to hail in to JOT, providing information such as offload date and time, offload location, buyer, area fished, species, product type and estimated number of pieces. A certified observer from JOT would then meet the vessel and monitor the offload, recording the number and weight of all chinook landed. JOT would then enter this information into the DFO Chinook ITQ Database within 12 hours of completion of the offload.

Both the demonstration and competitive fishery participants were advised that the percentage guideline for WCVI chinook would be set at 10% for 2005 -- if WCVI abundance exceeded 10% of the total catch in a fishery, that fishery would be closed.

Given the ITQ fishery was anticipated to be slower-paced with the catch spread out over a longer period of time, DFO was unsure they would be able to get enough samples for DNA testing from the commercial fishery. As a result, DFO increased the amount of test fishing in support of the ITQ demonstration fishery. Test fishing took place twice a month for the period from May 3rd to September 15th, with the exception of the June where testing fishing was only scheduled for the first half of the month. This was due to the fact the competitive fishery was scheduled to open on June 16th and it was anticipated sufficient samples could be obtained from these vessels.

Vessels participating in the ITQ demonstration fishery were provided with a green flag so they could be clearly identified while at sea.

4.3 ITQ Demonstration Fishery Objectives

As previously noted, in his April 14, 2005 announcement, the Minister of Fisheries and Oceans identified four main themes for the Pacific Fisheries Reform. These can be thought of as longer term objectives for the salmon fisheries. Demonstration fisheries were envisioned as a way to test different management options to try to determine which reforms might aid in meeting the Pacific Fisheries Reform main themes. Objectives for the ITQ demonstration fishery were also outlined in the pre-season mailout to Area F licence holders and the ITQ demonstration fishery experimental licence.

Objectives

Objective 1: Assist in determining whether ITQ management is a feasible way to meet the four main themes of the Pacific Fisheries Reform.

Objective 2: Assess the benefits and drawbacks of ITQ fisheries management.

Objective 3: Test the feasibility of changing to an ITQ management system.

This last objective is concerned with the operational aspects of the fishery, considering factors such as ability to meet conservation requirements, enforceability, identification of new administrative requirements and incremental costs and impacts on vessel safety in the fishery.

The Area F AHC advisors also tried to identify some guidelines for evaluating the success and viability of the ITQ demonstration fishery relative to the competitive fishery during their discussion at the April 19th meeting in Richmond. Seven potential measures of success were identified; however, the advisors could only reach consensus on three of the seven. At the meeting it was acknowledged that the list of identified measures was by no means exhaustive and further discussion was required with respect to their validity. It was also recognized that more discussion was required with DFO regarding the objectives of the demonstration fishery.

Unfortunately, these further discussions do not appear to have taken place. For information purposes only, the potential measures of success discussed by the Area F AHC advisors are listed below. The first three measures are those where consensus was achieved.

- a) The relative ability of each fishery to catch their TACs.
- b) The relative ability of each fishery to meet conservation requirements [with respect to WCVI mortalities].
- c) The relative enforcement requirements of each fishery.
- d) The relative cost of validation, tracking etc. for each fishery.
- e) The relative value (ex-vessel price) of the fish in each fishery.
- f) Participation in each fishery.
- g) Fish quality in each fishery.

5. RESULTS & ANALYSIS

Of the 168 vessels licenced to fish in Area F, 161 opted for the ITQ demonstration fishery while 7 chose the competitive fishery. Not all licenced vessels actively fished in either fishery; in the demonstration fishery there were 130 active vessels while in the competitive fishery 6 vessels actively fished. The ITQ fishery opened on June 3rd and continued until September 30th while the competitive fishery started on June 16th and closed July 17th upon achieving the total allowable catch.

The following sections examine some of the results of the ITQ demonstration fishery. Given the competitive fishery was relatively small compared to the ITQ demonstration fishery, it may not be practical or appropriate to make comparisons between these two fisheries. In cases where comparisons are required to provide some context, information from chinook openings that occurred during the spring and summer of 2003 and 2004 is used.

Readers should also recognize that this is a review of a single fishing season; the ITQ demonstration fishery took place during the 2005 summer chinook fishery. Any impacts from a change in management regime may take some time to fully assert themselves. It is difficult to ascertain program impacts based on information and data from one fishing season. Therefore, caution should be exercised when interpreting some of the results.

5.1 Biological Management

The review does not comment on whether biological management targets were appropriate or not, as that is outside the terms of reference for this report. The purpose of this section is to discuss some biological management outcomes from the 2005 Area F chinook fishery.

5.1.1 Impacts on Total Commercial Chinook Catch

The average quota fished during the Area F ITQ demonstration fishery was 1,223 pieces of chinook. The maximum and minimum quotas fished were 2,548 pieces and 50 pieces, respectively.

There were no catch overage penalties or catch underage carry over provisions in effect for the Area F ITQ demonstration fishery.⁷ Twenty-one vessels exceeded their ITQ by various amounts. The overages totalled 483 pieces. Approximately 67% of the overages

⁷ In many existing quota-based fisheries on Canada's Pacific coast vessels that exceed their quota in a given year have the catch overage deducted from their following year's quota. Further, in some of the quota fisheries, vessels that fall short of their ITQ are allowed to carry some or all of the underage over to the following year. Given the ITQ demonstration fishery was a single year project, such catch overage and underage provisions could not be considered.

were within 1% of the vessel's ITQ. The largest overage was 180 pieces; it was also the largest overage in percentage terms at 18% of the vessel's ITQ.⁸

Fifty-one vessels did not achieve their ITQ. The underages totalled 3,291 pieces, with shortfalls ranging from 1 to 1,000 pieces. There were two vessels that chose the ITQ option, but did not fish or lease their quota. Excluding these two vessels, almost 57% of the underages were within 1% of the vessel's ITQ. Again excluding the two vessels that chose the ITQ option but did not fish or lease their quota, the largest underage was 204 pieces which equated to 17% of the vessel's ITQ. The largest underage in percentage terms was 35%, which equated to a 180 piece shortfall from the vessel's ITQ.

The following table compares harvests to total allowable catches:

Total Catch vs. TAC, 2003 – 2005

Year	Total Catch (pieces)	TAC (pieces)	% of TAC Attained
2005 ITQ Demonstration Fishery	160,258	161,000	99.5%
2005 Competitive Fishery	6,953	7,000	99.3%
2004 (Oct 1/03 – Sept 30/04)	166,708	169,040	98.6%
2003 (Oct 1/02 – Sept 30/03)	136,257	141,700*	96.2%

Source: DFO post-season review documents, DFO post-season audit documents

Does not include stock assessment catch.

* 2003 TAC was initially 150,900 pieces, but was downgraded inseason (July) to 141,700 chinook due to changes in domestic allocations.

It should be noted that the 2004 Area F chinook fishery originally closed on a catch of 156,525 pieces, or 92.6% of the TAC (does not include stock assessment catches). A post-season audit of the catch revealed just over 10,000 pieces of chinook that were not reported or mis-reported. When this unreported or mis-reported catch was included, DFO estimates show the fleet landed 166,708 pieces in 2004 (does not include stock assessment catches).

Based on discussions with DFO managers, had these mis-reported chinook been properly reported in-season it is likely the fishery would have closed sooner than it did. As a result, it is unlikely the fleet would have achieved the final catch of 166,708 pieces, or 98.6 % of the 2004 TAC.

⁸ One vessel was thought to have exceeded its ITQ by more than 160%; however, once DFO investigated the matter it was determined that the necessary ITQ re-allocation forms had not been filed, leading to the impression of a significant catch overage. The required forms have since been filed and the catch overage addressed.

Conclusion

The 2005 ITQ demonstration fishery achieved 99.5% of its total allowable catch. The 2005 competitive fishery caught 99.3% of its TAC. Both these percentages are greater than the levels achieved in the previous two years.

5.1.2 Impacts on Commercial Catch Estimates

Catch information in the Area F fishery is collected from two distinct sources: (1) the DFO FOS database, where information is provided by the phone-in program; and, (2) the fish sales slips from the DFO Commercial Catch Statistics database. In 2005, in addition to the above two data sources, a dockside monitoring program was also in place for the ITQ demonstration fishery.

For the FOS database/phone-in program information, Area F vessel masters must phone in in-season catch reports within 24 hours of completion of a fishery or within 24 hours of entering port. For fish sales slip information, a copy of the sales slip is required to be mailed to DFO within seven days of the offload. For the 2005 ITQ demonstration fishery, validated landings from the dockside monitoring program were required to be entered into the DFO Chinook Database within 12 hours of completion of the offload.

It was noted in interviews with DFO managers and enforcement staff that the dockside monitoring program resulted in more timely and accurate catch data.

The following table compares in-season catch estimates to final chinook catch estimates for the period 2003 to 2005 and is based on the PST year (October 1 to September 30).

Final catch estimates for 2003 and 2004 are the results of the post-season audits.⁹ For 2005, DFO compared the FOS/phone-in program data for each vessel with the validated catch from the dockside monitoring program. Adopting a risk averse approach, DFO took the larger value as the best estimate of the catch in cases where a discrepancy was noted between the FOS/phone-in program and dockside monitoring program data.¹⁰ According to DFO, sales slip information was also reviewed to corroborate what was reported from the FOS/phone-in and dockside monitoring programs to ascertain the best estimate of the final catch.

⁹ The 2003 and 2004 audits entailed a vessel by vessel comparison of reported catches. For 2003 and 2004, DFO compared FOS/phone-in program data with sales slip information to produce a best estimate of vessel catch. For these audits, in the absence of one catch estimate, the other catch estimate was used to provide the best estimate. In cases where both sources of catch information were available and were within +/- 20% of each other, the FOS/phone-in program data was adopted as the best estimate. However, if the difference between the two catch estimates exceeded 20%, DFO would review all hail and sales slip information for the vessel in question to try to determine a value to adopt as the best estimate[0] (Winther, 2003; Winther & Pechter, 2005a; Winther & Pechter, 2005b).

¹⁰ There were three cases where DFO used dockside monitoring data which was slightly lower than the FOS/phone-in program values as the estimate of final catch.

Inseason Catch Estimates vs. Final Catch Estimates, 2003 – 2005

Year	Inseason Catch Estimates		Final Catch Estimate (pieces)
	Phone-In Program (FOS) (pieces)	Dockside Monitoring Program (pieces)	
2005 Demonstration Fishery	142,896	158,176	160,258
2004 (Oct 1/03 – Sept 30/04)	151,470	n/a	166,708
2003 (Oct 1/02 – Sept 30/03)	127,329	n/a	136,257

Source: DFO post-season review documents, DFO post-season audit documents

Note: Does not include stock assessment catches

n/a = not applicable

Conclusion

The ITQ demonstration fishery dockside monitoring program resulted in catch data being provided in a more timely manner in the Area F fishery. The dockside monitoring program also resulted in more accurate in-season catch estimates.

It is important to recognize that dockside monitoring programs are not limited to individual quota-based fisheries. Such programs can be (and are) utilized in competitive fisheries (e.g., the 2005 hook and line rockfish and hook and line 2005 dogfish fisheries).

5.1.3 Impacts on WCVI Chinook

Much of the information for the following discussion is from Winther *et al.* (2006, in preparation). This information is preliminary, particularly data from the 2005 season.

As previously discussed, the northern troll chinook fishery is managed to a numerical ceiling, or TAC, of WCVI mortalities. As illustrated in the following table the WCVI numerical ceiling was exceeded in 2003 and 2004. However, in both years, it was evident that returns to the WCVI would be stronger than pre-season forecasts and the Department was able to keep the fishery below exploitation rate targets for the northern troll fishery.

	2005			2004	2003
	Demonstration	Competitive	Total		
WCVI Mortality Ceiling (pieces)	9,962	433	10,395	7,800	6,811
WCVI Mortality Ceiling as a Percentage of the Overall TAC	6.2%	6.2%	6.2%	4.6%	4.8%
Estimated WCVI Mortalities (pieces)	6,607	213	6,820	10,065	7,637

In 2005, both the ITQ demonstration fishery and the competitive fishery were below their respective numerical ceilings. The competitive fishery had a lower relative impact on WCVI chinook than the ITQ demonstration fishery; 49% of the ceiling for the competitive fishery compared to 66% of the ceiling for the demonstration fishery. According to DFO Stock Assessment staff, the timing of the competitive fishery was designed to occur during the period when lower proportions of WCVI chinook had been observed in past years.

However, there are other factors to note when considering impacts on WCVI chinook. First, there are preliminary indications that 2005 WCVI returns were weaker than forecasted. As a result, WCVI chinook were not as abundant during the 2005 season and made up a smaller component of the available harvest. Second, when the 2005 fisheries were designed the area to be open to fishing was changed to try to focus effort in areas where lower WCVI components had been observed in previous years. Significant portions of DFO Statistical Area 2W and DFO Statistical Area 142 were closed to try to minimize impacts on WCVI chinook. Both these factors likely contributed to the lower estimated WCVI mortalities in 2005.

Conclusion

In 2005, both the ITQ demonstration fishery and the competitive fishery were below their respective numerical ceilings. The competitive fishery had a lower relative impact on WCVI chinook than the ITQ demonstration fishery.

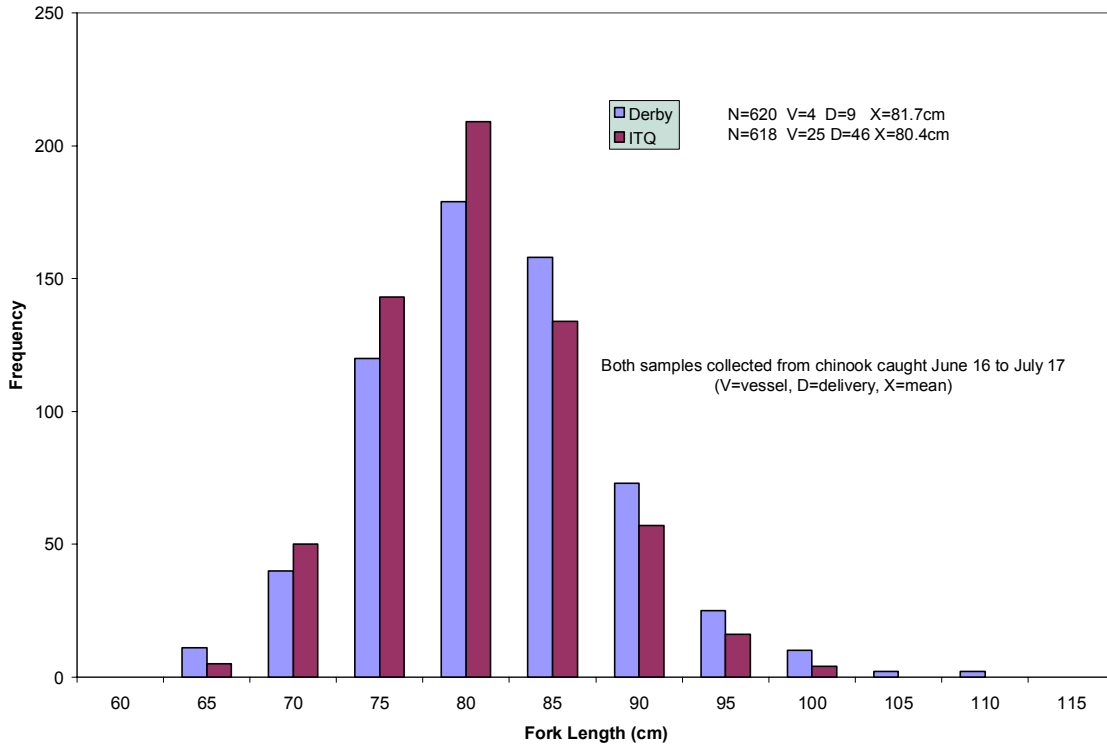
5.1.4 Impacts on the Chinook Resource - High-grading

High-grading occurs when fishers try to maximize the value of their ITQ by selecting only the largest or most valuable fish and release the rest. If the level of high-grading is substantial, the reported harvest may significantly under-estimate the impact of the fishery on the resource.

As previously noted, by regulation, Area F vessel owners are required to release all chinook below 67 centimetres in length. Therefore, high-grading in the Area F chinook fishery would entail releasing fish greater than 67 centimetres in length in an attempt to retain only the larger and more valuable chinook. The following graphs were supplied by DFO Stock Assessment staff and compare landings in the ITQ demonstration and competitive (derby) fisheries, by size of fish and grade.

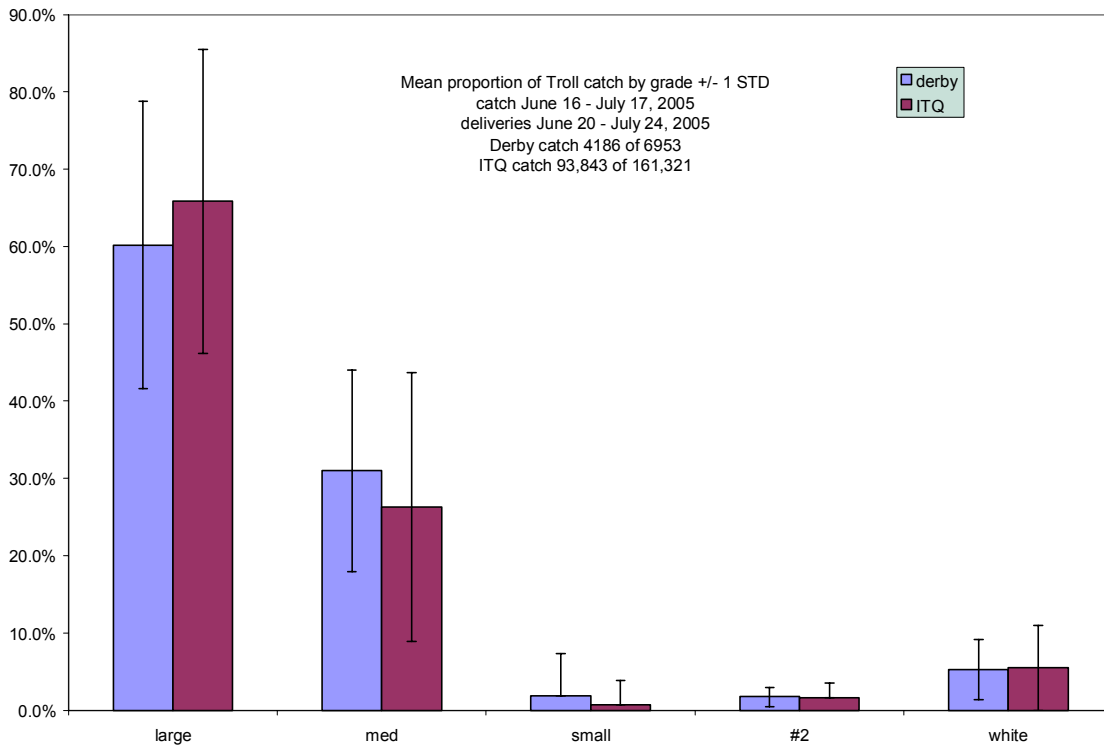
The first graph compares landings from June 16 to July 17, the dates when the competitive fishery was open. For the competitive fishery, 620 samples were taken from four vessels over nine deliveries. For the demonstration fishery 618 samples were taken from 25 vessels over 46 deliveries. The mean length of samples from the competitive fishery was 81.7 centimetres, slightly more than the mean length of the demonstration fishery samples (80.4 cm.). In addition, it would appear larger fish were landed in greater frequency in the competitive fishery than in the ITQ demonstration fishery.

Competitive (Derby) vs. ITQ Demonstration Catch, By Size of Fish



Source: Winther, 2005

Competitive (Derby) vs. ITQ Demonstration Catch, By Grade



Source: Winther, 2005

The second graph on the previous page considers the mean proportion of troll catch by grade, plus or minus one standard deviation. The catch was from the period June 16 to July 17, delivered between June 20 and July 24. Sixty percent of the total catch of the competitive fishery and 59% of the catch of the demonstration fishery was considered for this analysis. This data indicates that on average, catch by grade was almost identical between the two fisheries (within one standard deviation).

DFO Enforcement staff advised that, even though significantly more resources were devoted to the northern troll fishery than had been in the past, they did not observe anything during the 2005 season to indicate that high-grading was an issue of concern in the ITQ demonstration fishery.

In contrast, two Area F AHC advisors felt that high-grading was a significant problem during the ITQ demonstration fishery, as vessels did not keep scarred, small or white chinook. One of these individuals advised that he high-graded his chinook catch, particularly when fishing leased ITQ. He also noted that he knew of several other fishers who high-graded their chinook catch. A third advisor commented that he was concerned about the possibility that high-grading occurred and urged a review of the fish sales slip data to ascertain the facts.

The SFAB representatives and the recreational fishing lodge operator also expressed concerns over the possibility of high-grading in the ITQ demonstration fishery and the potential impacts this could have on total mortalities. Some of the SFAB members advised their constituents reported observing chinook being released by commercial troll vessels during the 2005 season. The recreational fishing lodge operator commented that he and his guides saw commercial troll vessels releasing chinook on a fairly continuous basis. The recreational sector interviewees acknowledged that this was anecdotal information, but felt an at-sea monitoring program should have been in place to collect the data necessary to determine if high-grading was occurring in the ITQ demonstration fishery.

Conclusion

The available data indicates there is no evidence of systematic high-grading of chinook in the ITQ demonstration fishery during the fishing that occurred between June 16 and July 17. Admittedly, there could have been limited high-grading during this period; nevertheless, if this was the case, it was not happening in sufficient frequency to appear in the data.

There is no data available to make a similar comparison to ascertain whether high-grading occurred before June 16 or after July 17. However, it seems unlikely that ITQ demonstration vessels systematically high-graded chinook from the start of the fishery to June 15, collectively ceased this activity for the period June 16 to July 17, then re-started high-grading chinook from July 18 until the fishery closed.

5.1.5 Impacts on Other Species

The following table provides some catch comparisons for April 1 to September 30 of 2003 to 2005.

Area F Fishery Catch Estimates, 2003 - 2005

	2005	2004	2003
Sockeye	closed	2,513	3,600
Coho	307,933	257,185	211,557
Pink	43,656	38,090	106,840
Chum	closed	closed	closed

To determine impacts on other species, it is important to consider catches (retained and released) and the relative abundance of each species in a given year. Such analysis is more suited to a full evaluation, preferably with more than one year of data available. Given this report is a review of the 2005 ITQ demonstration fishery, the section relies on a broad discussion of some key points as well as some general observations from DFO.

It is difficult to determine if the ITQ demonstration fishery had an impact on sockeye as this species was closed to harvest and could not be retained due to conservation concerns for Skeena sockeye.¹¹ Coho were more abundant in 2005 than they were in 2004; although, according to DFO managers, commercial fishing effort for coho was lower than 2004 levels. DFO managers feel this reduced effort was due to the fact vessels were still targeting on chinook when the season opened for coho. The higher than anticipated abundance led to a catch per unit effort (CPUE) for coho greater than what was observed in 2004. According to DFO, the net effect was an increased coho harvest with less fishing effort.

Due to their relatively low value, the harvest of pink salmon in Area F is driven by the opportunities available to harvest the more valuable salmon species, chinook and coho. If there are opportunities to retain chinook and/or coho when pink are being harvested, vessels will likely choose to fill their limited hold space with the more valuable species (i.e., high-grading). This could occur in a competitive or ITQ fishery; however, according to DFO, the release rate of pink salmon observed in 2005 was higher than it had been in the past. Given the 2005 coho openings were similar to 2004, but chinook harvesting occurred over a greater period of time in 2005, the ITQ demonstration fishery may have contributed to a higher release rate of pink salmon.

Changes to lingcod management in 2005 make it difficult to ascertain whether the ITQ demonstration fishery had an impact on lingcod harvests by the Area F troll fleet. Troll vessels are permitted to retain and land lingcod caught while fishing salmon. In 2005, troll vessels were required to have all lingcod landings validated as part of an industry-funded dockside monitoring program for lingcod (this was separate from the dockside monitoring

¹¹ Sockeye is normally a permitted by-catch in the directed coho and pink fisheries.

program in place for the ITQ demonstration fishery and involved a different service provider). In addition, troll vessels intending to retain lingcod were required to pay an upfront fee to fund an at-sea monitoring program to observe bycatch levels while harvesting lingcod. As a result, it is not possible to distinguish whether changes in lingcod harvest levels during 2005 Area F openings were the result of the new management requirements for lingcod or the implementation of the ITQ demonstration fishery.

Conclusion

According to DFO fishery managers there are some indications that the ITQ demonstration fishery may have contributed to less fishing effort directed at coho and a higher release rate of pink salmon.

5.1.6 Impacts on Recreational Chinook Catches

Determining whether the ITQ demonstration fishery had an impact on the recreational fishery is beyond the scope of this review. DFO felt it was important to record the comments of the recreational sector as part of this review.

As previously noted, under DFO's allocation policy for Pacific salmon, the recreational sector has priority access over the commercial sector for chinook and coho once First Nations food, social and ceremonial requirements had been met. As a result, the anticipated recreational harvest is considered prior to determining the allowable harvest levels for the commercial troll fleet.

During the interviews with the SFAB representatives and the recreational fishing lodge operator, concern was expressed that the ITQ demonstration fishery may have had a negative impact on recreational chinook catches. The recreational sector representatives noted that the ITQ demonstration fishery resulted in the commercial fleet fishing for a longer period of time, which meant there was constant fishing pressure that could impact the recreational sector.

The recreational fishing sector representatives noted that the sports fishery is an abundance-based fishery; if there are more fish around, anglers have a higher chance of catching a fish. If a commercial fleet is fishing prior to or at the same time as the recreational fishery, this reduces abundance - which in turn reduces the chance of catching a fish. If there is to be a successful recreational fishery where anglers can catch fish, there needs to be fish in the area. The recreational fishing lodge operator acknowledged there are other factors that can affect sports catches (e.g., overall abundance, migration patterns); however, he commented that it appeared there was a reduced abundance of chinook when the commercial troll fleet started fishing in early June.

DFO provided the following estimates of recreational catch and effort in the north coast areas around the Queen Charlotte Islands (statistical areas 1 and 2W). DFO also noted

that overall chinook abundance was significantly greater in 2004 than it was in 2003 and 2005.

Estimated Recreational Chinook Catches and Fishing Effort, 2003 - 2005

	2003	2004	2005
Total Catch (pieces)	100,116	191,000	129,800
Retained (pieces)	54,300	74,000	68,800
Released (pieces)	45,816	117,000	61,000
Effort (boat days)	28,386	36,500	37,002

Source: DFO

Generally speaking, there appeared to be an acknowledgement by the recreational fishing sector representatives that commercial fisheries should be designed and managed to benefit the participants.¹² However, it was clear that the recreational sector representatives are concerned about the impacts commercial fishing may have on the recreational fishery. During the interviews, the SFAB representatives noted that if any management changes are being considered for a commercial fishery, the impact these changes may have on the recreational sector must be taken into account.

Conclusion

The recreational fishing sector representatives want to ensure, and are seeking assurances, that the recreational fishery will be saved harmless from any changes in the management of the commercial fishery.

5.2 Financial Viability of Harvesting

5.2.1 Impacts on Landing Patterns

There were a total of 494 landings in the ITQ demonstration fishery, which translates into 3.8 landings per active vessel. The largest single landing was 1,997 pieces, the smallest landing was 5 chinook and the average landing size was 320 pieces.

The following table shows the distribution of ITQ demonstration fishery landings by port, with a comparison to 2003 and 2004.

Conclusion

The distribution of landings by port appears to be similar to previous years, with the notable exception of Greater Vancouver which went from averaging 10.6% of the landings to accounting for only 6.2% of the landings. Landings in Port Hardy continued to increase from 2003 levels.

¹² The recreational sector representatives did note they have some policy concerns with individual quota management.

Distribution of Landings by Port, 2003 - 2005

	2005 ITQ Demonstration Fishery (%)	2004 (%)	2003 (%)
Masset	18.1	18.1	18.9
Queen Charlotte City	5.8	0.8	5.5
Prince Rupert/Port Edward	58.2	49.6	59.6
Port Hardy	9.3	6.8	2.8
Campbell River	0.5	0.0	0.0
Nanaimo	2.0	0.0	0.1
Greater Vancouver	6.2	10.6	10.6
Victoria	n/a	10.5	1.7
Tofino/Ucluelet	n/a	1.9	0.9
Portland	n/a	1.7	0.0

Note: Numbers may not add to 100 due to rounding

Source: DFO Chinook Database (J.O. Thomas & Associates Ltd.), DFO Catch Statistics

n/a = not applicable

5.2.2 Impacts on Season Length

The following table compares the chinook openings from 2003 to 2005 that took place between April 1 and September 30.

**Area F Chinook Openings
2003 – 2005**

Year	Opening Dates	Days Open to Fishing
2003	• Apr 1 – May 12	42
	• Jun 19 - Jul 5	17
	• Sept 4 – Sept 9	<u>6</u>
	Total:	65
2004	• Apr 1 – Apr 15	15
	• Jun 15 - Jul 1	17
	• Jul 18 – Jul 22	<u>5</u>
	Total:	37
2005	• Demonstration Fishery (Jun 3 – Sept 30)	120
	• Competitive Fishery (Jun 16 – Jul 17)	<u>32</u>
	Total:	120

In 2005 there were significantly more days open for chinook fishing than there had been in previous years. The difference becomes even more pronounced if the period June 1 to September 30 is examined. The ITQ demonstration fishery was open for 120 days and the catch appears to have been spread out over a longer period of time when compared to previous years. In the ITQ demonstration fishery approximately 38% of the catch was landed in June, 48% was landed in July, 10% was landed in August and 4% was landed in September.

During an interview with the DFO northern troll fishery manager, it was noted that in mid-August it became apparent that WCVI chinook prevalence was greater than the 10% guideline. Nevertheless, DFO decided to leave the demonstration fishery open because they were confident they would be able to keep the estimated mortalities of WCVI chinook below the numerical ceiling. The Department was aware of the maximum number of vessels that could go out fishing (only those vessels with ITQ left) and also knew the maximum number of chinook that could be harvested (the total remaining ITQ).

From this information DFO managers were able to determine the potential impacts on WCVI stocks that could arise from leaving the ITQ demonstration fishery open. With this information DFO managers were able to conclude they could leave the demonstration fishery open and still be below the numerical ceiling for WCVI chinook. According to the northern troll manager, ITQ management provided greater confidence in the in-season catch estimates and in the ability to control the impacts on WCVI stocks.

While the above points tend to indicate that ITQ management led to longer opening times, there are other factors that must be considered. As previously noted, minimizing impacts on WCVI stocks is one of the main objectives for the Area F chinook fishery. As outlined in section 5.1.3, the WCVI numerical ceiling was significantly greater in 2005, in both absolute terms and as a percentage of the TAC. This provided DFO and industry more flexibility with respect to WCVI mortalities. In addition, preliminary results indicate that 2005 WCVI returns were less abundant than forecast, so these stocks made up a smaller component of the available catch. Further, changes were made to the 2005 fishing areas to try to focus effort in areas where lower WCVI components had been observed in previous years

Finally, in the demonstration fishery the bulk of the chinook harvest (approximately 86%) occurred during June and July. DNA results from the 2005 season indicate that WCVI prevalence started to increase in August. Based on discussions with DFO fisheries managers and biologists, had less fish had been harvested in June and July (leaving a greater proportion of the TAC to be taken in August and September) it is likely that DFO would have closed the ITQ demonstration fishery in August to protect WCVI stocks. It is unclear when, or if, the fishery would have been re-opened and if there would have been enough opportunity to catch the remaining TAC.

Conclusion

The demonstration fishery resulted in a longer chinook opening times than observed in previous years and greater confidence in the in-season catch estimates and in the ability to control the impacts on WCVI stocks.

However, with only one season under ITQ management, some caution should be exercised attributing the longer fishery solely to the demonstration project as there are other factors, such as WCVI chinook abundance and changes to the 2005 fishing area, that may have had an impact.

5.2.3 Impacts on Product Quality

Area F AHC advisors had different opinions on the impact of the ITQ fishery on product quality. Those advisors who supported the demonstration fishery tended to think there was a positive impact on quality while those against it felt there was no improvement as a result of ITQ management.

The fish buyer noted that ITQ management took place over a single season and that it takes time for some benefits to manifest themselves but commented that they did not see as good an increase in quality as should be expected from a move to an individual quota regime.

According to the fish buyer the ITQ demonstration fishery did result in a noticeable increase in quality from ice vessels supplying fresh fish, but the quality of fresh product has generally been better over the past three seasons (2003 – 2005). The buyer noted that ITQ management removed the pressures of a competitive fishery and allowed for shorter trips, which led to some increase in the quality of fresh product. For the frozen-at-sea (FAS) vessels, no real change in quality was noted by the buyer. According to the buyer, the potential for better quality exists as ITQ management would remove the need to race for the fish and allow freezer vessels to address product quality issues.

Conclusion

The fish buyer noted that they did not see as good an increase in quality as should be expected from a move to an individual quota regime. According to the fish buyer, there was a noticeable increase in the quality of fresh product but no real change was noted for frozen-at-sea product.

5.2.4 Impacts on Landed Prices

As previously noted, it can take time for impacts from a change in management of a fishery to fully assert themselves (e.g., it can take time to penetrate or develop new markets). At the same time, there are a variety of factors that can influence salmon markets, and, as a result, observed impacts may not be necessarily be the result of a change in management. Given the ITQ demonstration fishery took place over a single summer fishing season, caution should be exercised when interpreting possible impacts on price.

To estimate if there were price changes due only to the ITQ demonstration fishery, factors other than the change in management (e.g., changes in market conditions) must be taken into account. South-east Alaska has experienced a relatively stable summer troll fishery for chinook for the past three years, with a season that generally runs from the beginning of June to the end of September. Given south-east Alaska did not have an individual quota fishery in 2005, it may be assumed that the price changes in Alaska were affected by

market forces, rather than a change to an ITQ system. Note that the ITQ demonstration fishery could influence Alaska prices by changing the quality, timing and product mix of a competing product.

Estimated landed prices for Area F and south-east Alaska for the summer months are presented in the following table. Prices are expressed in dressed weight and Alaskan prices have been converted to Canadian dollars.

	Area F		SE Alaska		Price Spread Area F:Alaska	
	FAS	Fresh	FAS	Fresh	FAS	Fresh
2003	1.92	2.00	0.95	0.88	0.97	1.12
2004	3.54	2.99	1.94	1.97	1.60	1.02
2005	3.39	4.36	2.21	2.30	1.18	2.06

Source: DFO, Alaska Department of Fish & Game (Commercial Fisheries Division)
2005 data should be considered preliminary

There does not appear to be a consistent trend between Area F and Alaskan prices for frozen chinook. The 2005 price spread observed between Area F and Alaska was below 2004 levels but was greater than the difference observed in 2003. Based on this information, it cannot be ascertained whether the ITQ demonstration fishery had an impact on landed prices paid for frozen product. The fish buyer also shared this sentiment and advised he did not believe the ITQ demonstration fishery resulted in any real changes in the prices paid for FAS product. The buyer noted the potential for higher prices for frozen product exists, if quality issues can be addressed.

For fresh product, it appears Area F harvesters have traditionally received a higher landed price than their Alaskan counterparts. For 2003 and 2004, this premium averaged \$1.07/lb, while in 2005 the spread jumped to \$2.06/lb, a difference of \$0.99/lb when compared to the past average. This may indicate that the ITQ demonstration fishery resulted in an increase of approximately \$1.00 per pound to the landed price paid for fresh chinook. This is consistent with the comments received from the fish buyer.

In the interview, the fish buyer stated that he believed the average price ice trollers received for supplying fresh product was about \$1.00/lb higher because of the ITQ demonstration fishery. This was mainly due to the fact that: (1) the industry was able to stretch the season out and provide fresh product for a greater period of time; and, (2) there were no supply gluts as landings were more spread out.

The buyer noted that the ITQ demonstration fishery fit well with the demand for fresh seafood from the U.S. market. According to the buyer, none of the fresh product they purchased from the 2005 chinook summer season ended up being frozen, a first for the company in its history of purchasing northern troll catch.

Interestingly, the proportion of the total Area F chinook catch landed as fresh product was below the levels observed in 2003 and 2004. Given a higher price was being paid for fresh

product in 2005 and the fact that freezer trollers can move to producing fresh rather than frozen product, a greater proportion of fresh landings would be expected. It may be the case that such a transition takes time as vessel owners and buyers adjust and new markets are developed.

**Frozen & Fresh Landings As a Proportion
of the Total Area F Chinook Catch**

	Frozen	Fresh
2005	68.8%	31.2%
2004	65.6%	34.4%
2003	60.9%	39.1%

Source: DFO Commercial Catch Statistics Unit

Conclusion

Recognizing that information is only available from one season of ITQ management, the ITQ demonstration fishery may have resulted in a \$1.00/lb increase in the landed price for fresh chinook in Area F.

5.2.5 Impacts on Landed Value

If the assumptions with regard to fresh prices are correct, based on the total catch and the proportion landed as fresh product, this translates into an increase in the gross value of the Area F chinook fishery of approximately \$700,000 as a result of the ITQ demonstration fishery.

It is important to note that although the ITQ demonstration fishery may have had a positive impact on the landed value of chinook, this increased value was divided amongst a greater number of participants. For example, 132 vessels actively participated in the Area F chinook fishery in 2004; 132 vessel owners derived revenue from the fishery. In 2005, although 136 vessels were active in the Area F fishery (130 demonstration, 6 competitive), 165 vessel owners derived revenue from the fishery as 29 vessel owners that chose the ITQ option reallocated their entire ITQ to another vessel(s).¹³

Conclusion

If the assumptions with regard to fresh prices are correct, the ITQ demonstration fishery resulted in an increase in the gross landed value of the Area F chinook fishery of approximately \$700,000. However, this increased value was divided amongst more participants.

¹³ As previously noted, one vessel that chose the competitive fishery did not participate while two vessels that chose the ITQ option did not fish or re-allocate any of their ITQ.

5.2.6 *Impacts on the Costs of Harvesting*

There is no quantitative information readily available on the total harvesting costs (operating and fixed) of the Area F troll fleet.

In the past DFO has conducted a survey of Fishing Costs and Earnings in an attempt to acquire such cost data; however, the last year for which such data is available is 1994. A survey of the 2004 season was conducted in 2005 but the response rate to the survey is apparently too low to produce any meaningful results. As a result, there is little data available to use to determine the impacts of the ITQ demonstration fishery on vessel operating and fixed costs. This section relies on interviews with the Area F AHC advisors, discusses the costs associated with the dockside monitoring program and utilizes available data to make some general observations about potential impacts on harvesting costs.

The Area F AHC members were asked how the ITQ demonstration fishery affected their operating costs, or if they changed their operation to try to reduce their costs. Nine of the ten Area F AHC advisors participated in the ITQ demonstration fishery. Of these nine advisors, three indicated they did not see any change in their operating costs as a result of the ITQ demonstration fishery.

Four advisors felt there was a reduction in their operating costs because of their participation in the ITQ demonstration fishery. Of these four Area F AHC advisors:

- three advisors indicated their fuel consumption was lower because they did not have to run their vessels as hard or move around as often;
- one advisor said he fished with one less deckhand because the extra person was not needed in a slower-paced fishery and this was a way to try to minimize his fishing costs;¹⁴
- one advisor indicated he saved on gear costs as he did not have to purchase new gear to try to maximize his daily catch; and,
- one advisor commented that as he self-markets his product he was able to reduce his custom offloading and trucking costs because of the ITQ demonstration fishery, as he knew his total catch and was better able to plan for his requirements.

Two advisors felt their operating costs increased as a result of the ITQ demonstration fishery. One of these advisors said his fuel consumption was greater because more time went into catching the fish. The other advisor noted that his costs increased because of the ITQ demonstration fishery as he had to lease additional quota to achieve the same volume of chinook he had normally caught in previous years.

¹⁴ Another advisor noted that, should an ITQ management regime be adopted for the future, he would not need as many deckhands because of the slower-paced fishery and would likely reduce the size of his crew to save costs.

The dockside monitoring program represents an increase in vessel operating costs that can be attributed to the ITQ demonstration fishery. Area F vessel owners were required to pay \$81.68/hour (GST excluded) to have their chinook validated by the designated service provider.¹⁵ This was a flat rate charged; there was no premium for weekend landings or overtime hours. This fee covered the hail-in hail out services, catch validation, data entry and management, reporting to DFO and program administration. The total cost to industry for the dockside monitoring program was approximately \$67,600 (excluding GST).

Given the size of the Area F chinook fishery, the length of the season and the number and patterns of landings, the hourly rate of \$81.68 seems low; and in our discussions with the service provider, it appears the hourly rate was indeed low. As a comparison, similar dockside monitoring programs appear to have higher hourly rates. For example, in the 2005 Outside ZN rockfish fishery, vessels were charged an upfront fee of \$582.00 and the hourly rate was \$93.46 (GST excluded) for dockside monitoring services. In the 2005 Schedule II dogfish and lingcod fisheries participants had to pay an upfront fee of \$351.00 and the hourly rate was \$93.46 (GST excluded) to have their catch validated.

Admittedly, there may be ways to design a dockside monitoring program to minimize the overall cost. For example, for the Area F demonstration fishery, the service provider noted the fact they had to bill each vessel individually meant that there was a large administration component to the program. The service provider commented that if there was a way to send out fewer invoices (e.g., to buyers or to a representative industry association), this may reduce the administration requirements and possibly the costs of the program itself.

Area F Active Vessels

	Chinook Fishery Only	As a % of Area F Licenced Vessels
2000	45	30.6%
2001	72	50.3%
2002	93	62.0%
2003	116	74.8%
2004	132	82.5%
2005 Total	136	81.0%
2005 Demonstration	130	80.7%
2005 Competitive	6	85.7%

Source: DFO Catch Statistics Unit, DFO Area F 2005 Post-Season Review

Total harvesting costs can also be greatly impacted by the number of active vessels in a fishery. As illustrated in the above table, the number of active Area F vessels has been

¹⁵ Any lingcod retained and landed during the Area F salmon fishery had to be validated by a different service provider.

increasing steadily over the past few years. This is likely the result of the improvement in the financial viability of the fishery over the same period.

In 2005, the number of active Area F vessels increased again, albeit slightly. However, it is not clear whether this increase in the number of active vessels is attributable to the ITQ demonstration fishery. Given the fact the number of active vessels in Area F has been increasingly steadily over the past few years as the financial viability of the fishery improved, it is likely 2005 would have seen a further increase in participation regardless of the management regime in place.

What is not clear is whether the implementation of the ITQ demonstration fishery resulted in an increase in the number of active vessels greater than what would have been expected given the trend observed in the past; or whether the re-allocation of quota permitted in the ITQ demonstration fishery ultimately resulted in there being fewer active vessels than expected given the past trend. In other fisheries that have adopted individual quota management and re-allocation provisions, the number of active vessels has tended to decrease over time.

Conclusion

Without quantitative data, it is not possible to determine the overall impact of the ITQ demonstration fishery on total harvesting costs

There does not appear to be a consensus among the Area F advisors over the impacts of the ITQ demonstration fishery on vessel operating costs.

The dockside monitoring program represented an increase in total operating costs of approximately \$67,600 (excluding GST).

5.3 Employment and Safety

5.3.1 Impacts on Employment

Active Vessels & Boat Days, All Salmon Species

	Active Vessels	Total Boat Days	Boat Days per Active Vessel
2003	126	4,740	38
2004	137	5,196	38
2005	140	6,106	44

Source: DFO Area F post-Season Reviews, DFO Catch Statistics

Without being able to determine the impact of the ITQ demonstration fishery on the number of active vessels, it is difficult to ascertain impacts on employment levels. The number of active vessels in 2005 were slightly greater than that observed in 2003 and

2004, which would tend to indicate an increase in the number of crew jobs. It would also appear vessels and their crews fished more days in 2005 than they had in the past.¹⁶

Crew size can also affect employment levels. Based on comments from two of the nine Area F AHC advisors who participated in the demonstration fishery, there are indications that the slower fishery afforded by an ITQ management regime led, or may lead to, some Area F vessel owners reducing the size of their crew to try to minimize costs. If this occurred in sufficient numbers it could result in a decline in overall employment, despite the increase in the number of active vessels. However, a significantly greater sample of Area F vessel owners is required before estimates of such possible impacts on employment can be generated with any precision.

The dockside monitoring program generated new employment. According to JO Thomas and Associates Ltd., approximately 2,600 hours, or 346 days (7.5 hours per day), of new employment were generated as a result of the dockside monitoring program from validation, management and administration activities.

Conclusion

With the information available it is difficult to ascertain the impacts the ITQ demonstration fishery may have had on employment levels in the fishery.

The dockside monitoring program generated 2,600 hours or 346 days of new employment.

5.3.2 Impacts on Safety

ITQ management is generally cited as having a positive impact on safety in a fishery. Benefits cited include less fatigue, less stress, more flexibility to choose fishing or travel time and avoid poor weather conditions without concern about foregone catch (Jones 2003).

When asked for their views on the impact of the demonstration fishery on safety in the fishery, seven of the ten Area F AHC advisors indicated they felt ITQ management provided some benefit as fishermen did not have to fish in inclement weather. Of these seven advisors, four also cited reduced fatigue and less stress as positive health and safety benefits from ITQ management. One of these advisors also noted that, in the ITQ demonstration fishery, fishermen were not always having to push the envelope; they didn't have to push their vessels, machinery, crew and themselves to the limit. Interestingly, the recreational fishing lodge operator commented that on bad weather days the troll fleet stayed in the harbour. He noted the move to ITQ management appeared to result in a fishery where vessels were not pressured to fish in bad weather.

Three advisors did not feel that the ITQ demonstration fishery had any impact on safety in the fishery. One advisor noted that even under ITQ management fishermen may still have

¹⁶ It is not possible to break out boat days by salmon species.

to race to catch the fish and/or risk poor weather conditions if the season is closing and they still have uncaught quota.

A troll vessel sank in poor weather conditions during the 2005 ITQ demonstration fishery. In recent years, vessels have sunk and lives have been lost in the commercial halibut and groundfish trawl fisheries, both managed under individual quota regimes. Critics argue that individual quota management did not prevent these accidents while proponents feel it is important to consider what would have happened in the absence of ITQs -- would more vessels have been out fishing and sunk as a result.

Conclusion

There are no data with which to quantify the impact of the ITQ demonstration fishery on safety (injuries, sickness, stress and accidental death). What is apparent is that the ITQ demonstration fishery gave vessel owners more flexibility in choosing their fishing and travelling times.

5.4 Monitoring, Compliance and Enforcement

5.4.1 Impacts on Monitoring

The dockside monitoring program introduced a new layer of monitoring to the Area F troll fishery. Certified observers validated chinook landings, by piece, but would stay to the end of the offload to ensure all fish had been removed from the vessel. Observers were also required to check vessel holds following an offload to ensure no fish were left onboard.

Both DFO and the service provider noted that there were instances where the timing of the quota re-allocation lagged behind the offload process. Chinook were landed before the ITQ reallocation was entered into the Chinook ITQ database. As a result, some vessels appeared to be offloading catches significantly greater than the ITQ thought to be associated with the vessel, which would lead to an incident report being forwarded from the service provider to DFO Enforcement.

These occurrences apparently resulted from either confusion between the two parties involved in the re-allocation over who would file the proper forms with DFO or simply the timing of when records were processed by DFO, when the vessel hailed in and when the service provider dispatched an observer to monitor the offload.¹⁷

¹⁷ The fact such timing issues occurred is not surprising as similar problems have arisen in other existing individual quota fisheries. In these fisheries, protocols have been developed over time to address such matters and try to achieve a balance between the need to provide accurate and timely data and the need to ensure industry has the flexibility to operate in as an efficient manner as possible.

Conclusion

The presence of the dockside monitoring program increased the level of monitoring in the Area F troll fishery. It is important to recognize that dockside monitoring programs are not limited to individual quota-based fisheries. Such programs can be (and are) utilized in competitive fisheries (e.g., the 2005 hook and line rockfish and hook and line 2005 dogfish fisheries).

5.4.2 Impacts on Compliance

It is difficult to compare compliance levels between years given there were new monitoring and reporting requirements in 2005. This is further complicated by the fact that a post-season audit similar to the level undertaken for 2003 and 2004 has yet to be conducted for the 2005 season. As outlined in Section 5.1.2, a post-season vessel-by-vessel comparison has been completed for the 2005 ITQ demonstration fishery, but it employs a different methodology than that utilized in 2003 and 2004. Readers should be careful drawing year-to-year comparisons from the following data.

In the post-season review of the 2005 ITQ demonstration fishery it was determined that there were 18 vessels with catch irregularities. These 18 vessels have been referred to DFO Enforcement for follow-up and investigation. Of the 18 vessels identified, 17 did not participate in FOS/phone-in program but had their catch validated as part of the dockside monitoring program, totalling 15,280 chinook not reported in the FOS/phone-in program catch data. The remaining vessel is believed to have tried to avoid having its catch validated, as the catch was hailed into the FOS/phone-in program but there is no validation report. In addition, 12 vessels did not submit fish slips (of which 8 are part of the 18 vessels identified above). Finally, four vessels started offloading their catch before the dockside monitoring program observer was present, resulting in sales slip information being used as the validated catch.

The 2004 post-season audit revealed that 8 vessels did not participate in FOS/phone-in program, but submitted fish slips totalling 6,810 chinook not reported in the FOS/phone-in program catch data. Eight vessels did not submit fish slips all season, but their FOS/phone-in program hails totalled 5,705 chinook not reported in the slip estimate.

For 2003, the post season audit results indicate that 5 vessels did not participate in the FOS/phone-in program, but submitted fish slips totalling 2,145 chinook not reported in the FOS/phone-in program catch data. Four vessels did not submit fish slips all season, but their FOS/phone-in program hails totalled 4,267 chinook not reported in the slip catch data.

The decline in compliance with the FOS/phone in program requirements in 2005 may be attributable to confusion over the fact that the ITQ demonstration fishery was a new program and vessels were required to make hail-in and hail out reports to two separate service providers (see Section 5.4.3). For example, the dockside monitoring program

service provider observed hail-outs for only 75%-80% of the trips. Some vessels masters may have only contacted the FOS/phone-in program service provider as they left for the fishing grounds.

At the same time, the dockside monitoring program service provider noted there was almost 100% compliance with hail in requirements -- only two vessels did not hail-in as required. The greater compliance on hail-in requirements is likely a function of the fact this was necessary in order to arrange for an observer to monitor the offload, but it may have inadvertently led to less reporting to the FOS/phone-in program.

DFO enforcement staff noted that compliance issues in the north coast troll fishery may have more to do with what fishermen perceive as too much “red tape” rather than a deliberate attempt to mis-report. For the ITQ demonstration fishery, it may be the case that some vessel masters saw little reason to contact both service providers on their way into port, particularly given their catch was going to be validated and submitted to DFO as part of the dockside monitoring program.

Conclusion

Preliminary data suggests more vessels did not meet their conditions of licence in 2005 regarding FOS/phone-in program requirements than in previous years.

5.4.3 Impacts on Enforcement

According to DFO enforcement staff, the northern troll fishery has not been a high priority in the last few years as resources have been focussed on other areas. As the fishery is not a top priority, DFO enforcement staff acknowledged this could mean there are ongoing problems in the fishery of which they are not aware. However, this is not considered to be the case as the fishery usually takes place over a very short period of time and the general feeling is that there are no serious enforcement concerns in the Area F fishery.

Given the ITQ demonstration fishery was a new program, DFO enforcement devoted extra time and effort to the northern troll fishery in the summer months of 2005. According to DFO, fishery officers spent additional time in offices and harbours addressing licensing and information issues. In addition, the Canadian Coast Guard vessel Arrow Post was dedicated to the fishery and a fishery officer was placed on board to monitor the fishery and check compliance. There were also more overflights of the northern troll fishery than in the past. With the exception of the extra overflights, these additional resources were funded out of existing DFO enforcement budgets.

DFO enforcement staff advised the intent of the extra enforcement was to try to detect and prevent deliberate attempts to “end-run” the ITQ program, e.g., high-grading, un-validated catch, deliberately fishing past the vessel’s ITQ (commonly referred to as “quota busting”).

Most of the additional enforcement resources ended up being focussed on the first half of the ITQ demonstration fishery. Halfway through the season the level of enforcement was reduced because of a lack of staff in the Queen Charlotte Islands office, the necessity to re-direct enforcement resources to other priorities and a lack of need; enforcement staff were not observing any serious enforcement concerns in the ITQ demonstration fishery. DFO enforcement also advised the ITQ demonstration fishery resulted in a greater industry presence on the fishing grounds which they believe can work to create a deterrent for illegal activity due to self-enforcement by the fishermen themselves.

As previously noted, DFO Enforcement is currently following up and investigating 18 vessels with catch irregularities during the 2005 ITQ demonstration fishery. In addition to these 18 vessels, investigations are also under way in three cases where the vessel's total catch was determined to be greater than the validated landings.

DFO enforcement staff noted the problems they did encounter in-season were mainly due to the fact the ITQ demonstration fishery was a new program with new requirements for both DFO and industry. As a result, some participants were unaware or unclear of the new requirements and there were also cases of conflicting information being communicated to the industry. For example, DFO enforcement staff noted that, under the conditions of both the regular and experimental licences, ITQ demonstration fishery vessels were required to "hail out" and "hail in" to two separate service providers, which may have caused some confusion. DFO enforcement staff also noted that at the beginning of the season there was some confusion over designated landing stations; some vessels intended to deliver to a packer at-sea. Based on information received from one DFO official, the fish buyer went to the expense of sending a packing vessel to the fishing grounds only to be told that offloading at-sea was not permitted.

DFO enforcement staff noted the problems encountered with the ITQ demonstration fishery were not unexpected, citing the fact it was a new program and a major change to the management of the fishery. For the most part, DFO Enforcement believes the ITQ demonstration fishery was well thought out and seems to have helped advance the concept of orderly fisheries management. However, looking back on the season, they acknowledged some things should have been done differently.

For example, prior to the start of the fishery, DFO enforcement and fisheries management personnel should have spent more time looking at how the program was being implemented. This would help ensure the new program was implemented in the best manner possible with respect to the compliance and regulatory frameworks. Instead of using experimental licences, it may have been better, from an enforcement perspective, to use regular commercial licences with different conditions of licence.

In addition, more effort should have been devoted to ensure licence conditions, reporting requirements and notices to industry were consistent, and consistent with the regulations. DFO enforcement staff noted it is difficult to enforce issues that are not clearly laid out for participants or are not clearly understood. It was also noted there may have been some

benefit to looking more closely at existing individual quota fisheries that have similar mandatory practices (e.g., dockside monitoring programs) and requirements during the development of the Area F ITQ demonstration fishery.

DFO enforcement also acknowledged there should have been faster response times to incident reports from the dockside monitoring program. It was noted a coordinated in-season enforcement plan, with personnel assigned to specific tasks, would have helped address this issue. This would allow potential problems to be addressed in-season rather than being followed up after the end of the fishery. According to DFO enforcement staff it is easier to gather evidence, seize fish and address the problem during the fishery. This allows issues to be dealt with in a more effective and efficient manner. At the same time, DFO enforcement staff noted that it is not always possible to address all potential issues given the level of resources available; priorities have to be set and an issue that is largely administrative in nature is not going to be given the same priority as a serious enforcement violation.

Conclusion

DFO enforcement devoted extra time and effort to the northern troll fishery in the summer months of 2005 as the ITQ demonstration fishery was a new program. According to DFO enforcement staff there did not appear to be any serious enforcement issues observed during the ITQ demonstration fishery and there appeared to be fewer flagrant violations than in past years.

5.5 DFO Administration

5.5.1 Impacts on DFO Administration

In discussions with DFO staff, seven areas associated with the 2005 Area F fishery were identified as requiring new or additional resources.

- a. DNA Testing (\$50,000): DFO undertook more DNA testing in 2005 than in previous years in support of the ITQ demonstration fishery.
- b. Chinook ITQ Database (\$17,500): A database was built to track quota transfers and verify landings against ITQ holdings. This represents a one time cost associated with the implementation of ITQ management.
- c. Pre-Season Meetings (\$20,000): Due to the level of controversy surrounding the management changes being considered, instead of holding teleconferences DFO held Area F AHC meetings in Prince Rupert and Richmond in April 2005 and also funded the travel and accommodation expenses of the AHC advisors.

These expenditures are not incremental costs that result solely from the implementation of ITQ management. These costs were incurred as a result of

consultations on a significant change to the management of the fishery. Such costs would likely be incurred in the discussion and consideration of other significant fisheries management changes.

- d. Mark Recovery Program (\$11,200): In 2005, the ITQ demonstration fishery resulted in an extended fishing season. Therefore, the program to recover fish marked with a coded wire had to be extended, with an associated cost.
- e. PAL Aircraft Overflights (\$5,000): Increased overflights were conducted in 2005 as a result of the ITQ demonstration fishery.
- f. ITQ Reallocations: For the ITQ demonstration fishery there were a total of 189 temporary re-allocations of ITQ involving approximately 60,500 pieces of chinook. All ITQ reallocations were processed by the northern troll manager, and although this new activity was accomplished within existing budgets, additional DFO effort was required that can be attributed solely to the ITQ demonstration fishery.
- g. Enforcement: According to DFO Conservation & Protection staff, significantly more enforcement resources were devoted to the northern troll fishery in 2005, a result of the ITQ demonstration fishery. Although these additional resources came out of existing budgets, the increased activity occurred because of the ITQ demonstration fishery.

Conclusion

The incremental DFO costs from the 2005 ITQ demonstration fishery were just under \$104,000 plus the additional resources required to process the quota re-allocations and the extra enforcement effort that was devoted to the fishery.

Activity	Cost
a. DNA Testing	\$50,000
b. Chinook ITQ Database	\$17,500
c. Pre-Season Meetings	\$20,000
d. Mark Recovery Program	\$11,200
e. PAL Aircraft Overflights	\$5,000
Subtotal	\$103,700
g. Quota Reallocations	Existing Resources
f. Enforcement	Existing Resources

Some of these incremental costs are not solely the result of ITQ management and may be incurred with any significant change in the way the fishery is managed and/or extension of the fishing season. In addition, some of the new expenditures are one time costs associated with the implementation of ITQ management.

6. CONCLUSION & RECOMMENDATIONS

Three main objectives were identified for the Area F ITQ demonstration fishery. Based on the information reviewed and interviews conducted, it would appear the demonstration fishery was able to meet the third objective, allowing the industry and DFO to test the feasibility of changing to an ITQ management system. Admittedly a lack of data and limited information make it difficult to consider all the operational aspects of the fishery and impacts of the change in the management of the fishery.

With respect to the two remaining objectives for the Area F demonstration fishery, with only one season of information it is not possible to ascertain whether ITQ management is a feasible way to meet the four main themes of the Pacific Fisheries Reform. Similarly, with only limited data and one season of information it is not possible to use the 2005 demonstration fishery to assess the benefits and drawbacks of ITQ management in Area F.

Despite the fact the ITQ demonstration fishery was implemented within a relatively short period of time, the season appears to have gone fairly smoothly. DFO Enforcement has already made a number of useful suggestions where improvements could be made and these should be taken into consideration in the design of any future projects. For the Enforcement recommendation that more effort should be devoted pre-season to ensuring consistency between licence conditions, reporting requirements and notices to industry, this should be taken one step further to include consistency when specifying the requirements of and directions to service providers.

Given the ITQ demonstration fishery was a new program, both DFO and industry had to adapt to different requirements and develop new operating procedures. In retrospect it may have been beneficial to designate a DFO contact(s) for the program for all queries about the operational aspects of the ITQ demonstration fishery. This would help ensure consistent information is distributed to DFO staff and industry participants.

This review of the Area F ITQ demonstration fishery was hampered by a lack of data. Demonstration fisheries are a way for DFO and the industry to test new management techniques or regimes. Such projects must be properly reviewed and evaluated if DFO and the industry are to be able to make informed decisions about the future direction of a fishery. For the Area F demonstration fishery, there was some discussion pre-season on how the project could be evaluated and objectives were identified. This was a laudable effort, but further consideration was needed as the specific measurables and data requirements were never finalized.

For any future demonstration fisheries or pilot projects, DFO and interested stakeholders should ensure that a complete discussion of the components of the review or evaluation plan is undertaken before the program is implemented. A budget for the review or evaluation should also be determined.

Project objectives should be identified as should the measurables to be used to determine if an objective has been met. Perhaps a better way to think about this is to determine the questions DFO and interested stakeholders want answered, identify what data can be used to answer each question and then establish whether the information is available and, if not, how to obtain it. This helps ensure that all parties have the same expectations about what the review or evaluation will take into account.

It is important to recognize that it may not be possible to answer all questions, particularly within the confines of the budget. In some cases it may not be possible to get the data in a timely manner or without incurring significant costs. Priorities will need to be determined and trade-offs made as part of the planning process. It may be useful to include the individual(s) responsible for conducting the review or evaluation as part of the planning process to assist in such deliberations as well as ensure the reviewer clearly understands all required tasks.

It is also recommended that interested stakeholders and DFO consider multi-year demonstration fisheries. As noted in this review, it can take time for any positive or negative aspects associated with a change in the management of a fishery to fully assert themselves. Even if a full evaluation of the demonstration fishery is undertaken, one season may not provide all the information necessary to make an informed decisions about a future direction for the fishery.

DFO and interested stakeholders may want to consider three-year demonstration fisheries, with a full evaluation undertaken at the end of the second season. Prior to start of the third season, a decision would be made whether or not to continue with the management regime/measure tested in the demonstration fishery beyond year three. If it is decided to discontinue the demonstration fishery beyond year three, this timeline would allow any multi-year provisions of the project to be addressed in the third year (e.g., catch overage/underage provisions in a quota fishery). It would also allow the time necessary to plan for and make an orderly transition back to the status quo or consider a new demonstration fishery project.

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APPENDIX A

EVALUATION PLAN

LICENCE AREA "F" INDIVIDUAL TRANSFERABLE QUOTA (ITQ) DEMONSTRATION FISHERY AND TRADITIONAL (DERBY) STYLE FISHERY

Background:

At the present time, the Licence Area F (Northern Troll) salmon fishery is managed under a limited entry licensing system with the total harvest indirectly controlled largely through fishing openings and closures. The fishery itself is operated in a competitive "derby" style where all licensed fishers are entitled to fish in order to maximise their harvest during the open periods.

In early 2005, members of the Salmon Area F Harvest Committee approached Fisheries and Oceans Canada (DFO) seeking permission to proceed with a demonstration project to test the feasibility and the benefits of changing the management of their fishery to an individual transferable quota system. The quota system would directly control the total harvest by setting limits on the harvest by individual fishers.

Meetings were held in between DFO staff and the Area F Harvest Committee. Goals and objectives of the parties in pursuing a demonstration fishery and details of the potential demonstration fishery were discussed. Subsequent to these discussions, DFO formally indicated its willingness to consider a demonstration fishery subject to a number of conditions. One key condition was the development of an approved framework for evaluating the results of the demonstration fishery that is acceptable to both the Area F Harvest Committee and DFO.

Purpose:

The purpose of this document is to outline a framework and a plan for evaluating an Area F individual transferable quota demonstration fishery. The document identifies four general areas for evaluation and identifies specific hypotheses in each area. Further, the document identifies specific information that will be required to test the hypotheses. Finally, strategies are proposed for gathering the information necessary to test and answer the questions raised.

Evaluation Framework and Evaluation Plan:

This evaluation framework is designed to compare and contrast the two (competitive "derby" and individual quota) management systems in four general areas:

- Biological Management;
- Financial Viability of Harvesting;
- Employment and Safety, and;
- Administration and Enforcement.

It is recognised that any differences between the two management systems in each of these areas may take some time to fully assert themselves. However, the information system needs to be in place to identify base line performance and to adequately track relative performance in each of these areas over time.

BIOLOGICAL MANAGEMENT:

Total catch in a competitive derby style fishery is indirectly controlled largely through fisheries openings and closures while a quota system relies on direct control of individual catches by fishers. Harvest can exceed planned allowable harvests under both systems but a quota system should be more effective because of its focus on directly controlling output. There may also be potential for improved selective fishing practices under a quota system. Quota skippers may have more ability to avoid areas of higher unintended by-catch incidence because of less concern over the potential impact on their total harvest. In addition, quota fishers may take greater time in handling, reviving and releasing by-catch where this is required by the fishing regulations because of a slower pace of fishing.

On the other hand, literature reviews raise consistent concerns about problems of dumping/high-grading in quota fisheries. This is caused by a natural tendency for harvesters to attempt to maximise the value of their limited catch under a quota system by selecting only the largest or most valuable fish and dumping or otherwise releasing the rest. This incentive structure does not arise in a competitive fishery. If dumping/high-grading is a substantial problem, the calculated harvest may significantly under-estimate the impact of the fishery on the resource. This is a key potential draw back with quota fisheries.

Hypothesis 1: Landings in the quota fishery will be effectively controlled in relation to allowable harvests and selective fishing practices will improve.

Proposed Measures: Landings in the demonstration fishery relative to the total allowable catch in the demonstration fishery.

Evaluation Strategy: Final harvest from dockside monitoring records for the demonstration fishery will be compared to the total quotas assigned in the demonstration fishery. Estimated landings from logbooks and/or sales slips in the competitive fishery in relation to allowable harvests will be used for qualitative comparison. There is no effective way to compare selective fishing practices at this time and this issue is deferred for future consideration.

Hypothesis 2: Dumping/high-grading is a problem in the quota fishery.

Proposed Measures: Average Chinook weight or length distribution, proportion of number 2 grade Chinook delivered by vessels in the demonstration fishery subject to on-board observers or video monitoring compared to equivalent information for 1) fish delivered by vessels in the demonstration fishery not subject to on-board observers or video monitoring and 2) fish delivered in the competitive fishery.

Evaluation Strategy: Average Chinook weights or length distribution, proportion of number 2 grade Chinook from each type of delivery will be randomly sampled. Mean values from the sample sets will then be tested for statistically significant differences. This analysis will be supplemented through a questionnaire of fishers to ascertain their subjective views on the likelihood and extent of dumping/high-grading in the fishery.

Hypothesis 3: The Quota fishery will reduce/eliminate the competitiveness of the Traditional fishery

FINANCIAL VIABILITY OF HARVESTING

Financial viability in harvesting is reflected in the relative profits from fishing. Improved financial viability can result from either increased revenue from fishing or decreased costs of fishing.

In quota fisheries, fishers generally have greater flexibility to choose their time of fishing. This can permit them to smooth production from the fishery, optimise the quality of the harvest, take advantage of market shortfalls and avoid market gluts. All of this can have a positive impact on prices and overall revenues in the fishery. However, given the compressed nature of the salmon fishery, due to the biology of the species, the potential extent of these benefits may be fairly limited.

On the cost side, most analysts emphasise that fishery quota systems create more normal business incentives than in competitive fisheries to minimise costs. Given a fixed output (i.e. the individual quota) fishers can be expected to produce the output using the minimum necessary combination of inputs in terms of time, labour and capital without concern over pre-emption by other fishers with larger vessels or fishing power.

Hypothesis 3: A quota system will lead to higher quality product, improved product marketing and reduced costs of fishing.

Proposed Measures: Prices received by participants in the demonstration fishery compared to prices received by participants in the competitive fishery. Total costs per unit of harvest in the demonstration fishery compared to total costs per unit of harvest in the competitive fishery.

Evaluation Strategy: A revenue and cost tracking and reporting form will be designed pre-season in collaboration with fishers. Participants in the demonstration fishery will be required to track the revenue received and harvesting costs by category (e.g. gear, running, labour and capital costs) throughout the fishing season and provide a final post-season report on their total revenues and harvesting costs. Volunteers from the competitive fishery who are willing to provide equivalent information will be solicited and identified pre-season. Some supplementary interviews with both groups will be required post-season to clarify the information provided and to ascertain views on differences in quality and longer term marketing potential between the two fishery systems.

EMPLOYMENT AND SAFETY

Literature reviews indicate that quota systems often reduce employment in the fishery. However, this largely results from transferability of quotas. When quotas are transferable, fishers may choose to amalgamate or "pyramid" two or more quotas on one vessel in order to reduce both capital and operating costs in their fishing operations.

Literature reviews also indicate that quota systems often positively impact on safety in the fishery. This partly results from the increased flexibility to choose fishing times which permits avoidance of poor or dangerous weather conditions without concern over foregone harvest. In addition, there is less incentive to over-load fishing vessels during open times or to make long or dangerous runs in order to take advantage of fishery openings.

A questionnaire will be sent to fishers in both fisheries respecting overall safety at-sea issues and specifically to address the impacts of transferability on employment.

Hypothesis 4: Safety will improve in the quota fishery.

Proposed Measures: None.

Evaluation Strategy: Participants in the demonstration fishery and the identified volunteers from the competitive fishery will be asked to describe and report any "Safety Incidents" they observe. The information provided will be analysed and assessed in narrative form. More concrete information from other fisheries operating under quota systems (e.g. halibut or black cod) may be used to illustrate potential safety benefits. Other information sources (including WCB reports) will be assessed for relevance.

ADMINISTRATION AND ENFORCEMENT

Quota systems generally require more precise and timely monitoring and reporting of the harvest on an individual vessel basis and individual incentives to misreport the harvest are greatly enhanced. There is a potential increase in monitoring costs under a quota system particularly if high grading and dumping of the resource are significant problems.

However, the potential increase in monitoring costs will be difficult to assess at this time. The Department of Fisheries and Oceans is undertaking a fishery monitoring and catch reporting review in all Pacific fisheries. This will potentially increase the future costs of monitoring and reporting in the competitive fishery. At the same time, monitoring costs in the demonstration fishery may not reflect the long-term costs of monitoring under a quota system. Economies of scale are likely if the monitoring system were expanded to the full fishing fleet and the extent of observer coverage will depend upon the potential for dumping and high grading in a quota fishery. More information is needed to address this issue than is available at this time.

Under a quota system and its associated monitoring systems, the information provided by fishers should be more accurate, reliable and timely. Also, fishers collectively have improved incentives to ensure that the reporting system is effective. Self-policing and peer pressure under a quota system can dramatically improve the effectiveness of enforcement efforts. Any additional costs associated with quota fishery monitoring need to be carefully compared to any improvements in the quality of the enforcement and the information provided.

Hypothesis 5: Fishery monitoring costs will increase in a quota fishery.

Proposed Measures: Fishery monitoring costs in a quota style fishery compared to monitoring costs in a competitive fishery.

Evaluation Strategy: Deferred at this time until further information is available on potential monitoring costs in both styles of fishery.

Hypothesis 6: The quality of the information provided and the effectiveness of enforcement will improve in a quota fishery.

Proposed Measures: Timeliness and reliability of harvest data in the demonstration fishery compared to timeliness and reliability of harvest data in the competitive fishery.

Evaluation Strategy: The relative frequency of harvest updates in both fisheries will be documented. Final updates at the end of fishing will be compared to post-season final tallies/estimates of harvest in the two fisheries. This will be supplemented through interviews of fishery managers to ascertain their subjective judgement on the reliability and utility of the information provided throughout the season and their subjective views on enforceability of the two fisheries regimes.

APPENDIX B

LIST OF INTERVIEWEES

Northern Troll (Area F) Area Harvest Committee

Bill De Greef	Lindsay Doerksen
Daryl Egan	Ron Fowler
Tom Gray	Terry Gustafson
Sverre Hauknes	Ted Paul
Lawrence Paulson	Mike Sanderson

Fish Buyers/Processors

Brad Mirau, Aero Trading Company Ltd.

Recreational Fishing Sector

John Brockley (Chair, Sport Fishing Advisory Board - North Coast Regional Committee)
Gerry Kristinason (Executive Member, Sport Fishing Advisory Board - Main Board)
Urs Thomas (Chair, Sport Fishing Advisory Board – QCI Local Committee)
John McCulloch (Recreational Fishing Lodge Operator)

Fisheries and Oceans Canada

David Einarson, (Area Director – North Coast)
Stephen Groves (Resource Management)
David Rekdal (Resource Management)
Ivan Winther (Science Branch - Stock Assessment Division)

Scott Coultish (Enforcement)
Ray Sjolund (Enforcement)
Tom Hlavac (Enforcement)

Service Provider – Dockside Monitoring Program

Jim Thomas (J.O. Thomas & Associates Ltd.)
Mark Fetterley (J.O. Thomas & Associates Ltd.)

Service Provider – Data Management

Scott Garad (Beyond Basics Ltd.)