Draft Discussion Paper

2015 Interior Fraser River Coho Management

March 30th, 2015

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1 INTRODUCTION

Assessments of Interior Fraser River (IFR) Coho salmon stocks in the mid-1990's revealed that alarming declines in spawning populations were occurring in many spawning sites. Low marine survival rates in combination with excessive fishery impacts were identified as key factors in this decline (Bradford 1998). Beginning in 1997, DFO implemented a range of fishery management measures to reduce the harvest impacts on these stocks, with more severe measures being implemented starting in 1998. Since that time, Canadian fisheries impacting these stocks have been curtailed to an exploitation rate ceiling of 2 to 3 percent prior to 2014 , with an additional 10 percent permitted in US fisheries (as per the Pacific Salmon Treaty management regime).

The purpose of this document is to:

- summarize what has been learned from recent science work relating to IFR coho (section 2);
- summarize generalized management approaches for IFR coho (section 3) in fisheries;
- present preliminary 2014 post-season fisheries information and analysis (section 4); and
- identify considerations for 2015 fisheries planning, including possible fishery configurations (section 5).

With respect to 2015 fisheries planning, we are seeking your feedback as follows:

Within the 10% ER limit for Canadian fisheries (occurring South of Cape Caution), what are the key fisheries management considerations that need to be taken into account? What configuration of fisheries would you support?

The views received during consultations will inform final decisions on the 2015 fishing season to be included in the Southern BC IFMP.

2 SUMMARY OF RECENT IFR COHO SCIENCE AND STOCK STATUS WORK

The *Conservation Strategy for Coho Salmon (Oncorhynchus kisutch), Interior Fraser River Populations* (2006) (Interior Fraser River Coho Recovery Team, 2006) contains the following recovery objectives:

Objective 1: *The 3-year average escapement in at least half of the sub-populations within each of the five populations is to exceed 1,000 wild-origin spawning coho salmon, excluding hatchery fish spawning in the wild. This represents a total Interior Fraser Coho spawning escapement of 20,000 to 25,000 wild-origin coho. This objective is designed to provide the abundance and diversity required to satisfy the recovery goal.*

Objective 2: *Maintain the productivity of Interior Fraser Coho so that recovery can be sustained. This objective is designed to ensure that the threats to recovery are addressed.*

A significant amount of recent work related to IFR coho populations has been completed through the Canadian Science Advisory Secretariat (CSAS) process. CSAS is the DFO process through which formal scientific advice is provided for fisheries management purposes. Science advice in the form of working papers are prepared by DFO staff, in conjunction with external authors in some cases, and reviewed through a committee process involving a cross-section of DFO technical experts as well as experts from First Nations and stakeholder groups. The following papers have been completed or are in preparation:

- Decker and Irvine. 2013. Pre-COSEWIC Assessment of IFR Coho Salmon **CSAS Res. Doc. 2013/121**
- Decker et al. 2014. Assessment of IFR Management Units relative to 2006 conservation strategy recovery objectives. **CSAS Sci. Advis. Rep 2014/032**
- Parken et al. *2015*. WSP Biological Status Assessment for Conservation Units of IFR Coho Salmon. **CSAS Sci. Advis. Rep. In press.**
- Evaluation of Marine Recreational Coho Mark Selective Fisheries in British Columbia, including an evaluation of the Canadian marine fishery exploitation model for Interior Fraser Coho (***under development***)

Some general themes have emerged (or are emerging) as a result of this work.

- The future is uncertain for IFR coho since there is no evidence that we have departed from the 'low' productivity period that has persisted since the 1994 return year. Current productivity as measured in recruits per spawner or smolt to adult marine survival is still well below that observed in a prior period of higher productivity during 1978-1993 (Figure 2).
- Overall returns of IFR coho are still well below levels seen prior to 1994; spawner abundance has improved in the last decade compared with the 1990's but remains variable (Figure 1). Parken et al. (2015, in press) concluded that three conservation units within the IFR coho Management Unit had an integrated Wild Salmon Policy (WSP) biological status of AMBER (Middle Fraser, Fraser Canyon, South Thompson) and two conservation units were determined to have an integrated status of AMBER/GREEN (Lower Thompson, North Thompson) (Table 2).
- The Parken et al. (2015, in press) analysis also found no evidence that smolt-adult survival has improved or returned to the higher productivity regime. Because the productivity is low, the sustainable harvest that can be expected from the management unit is also low relative to historic levels.

- The Decker et al. 2014 analysis showed that (based on the results of forward simulations of various fisheries exploitation scenarios), exploitation rates exceeding 30% would result in a lower than 50% probability of achieving the short term conservation objective of 20,000 spawners established by the 2006 Interior Fraser River Coho Recovery Team (Table 1). Note also that there is a 13% to 25% probability of not reaching this short term goal even at a 0% exploitation rate. The results of this analysis, combined with the imprecision in implementing a specific exploitation rate with current fishery management and assessment information requires that any planned increases in exploitation be approached with caution.
- Planning tools used for fishery planning (see Section 3.3) require refinement and validation with data to address various sources of uncertainty. Work is underway or planned in the 2015 CSAS schedule to review fisheries impact models and inform further refinements required.
- Further work is required to further develop longer term harvest strategies and fisheries reference points that incorporates analyses for both high and low productivity regimes. This work will be informed by recent CSAS work but will need to continue beyond 2015. Further work will be required to consider socio-economic factors, uncertainty and risk in developing these strategies.

Figure 1. Reconstructed time series of wild Interior Fraser coho escapement, total escapement (hatchery plus wild) and total return (fishing mortality plus escapement) during the period 1975 to 2012. From Decker et al. 2014.

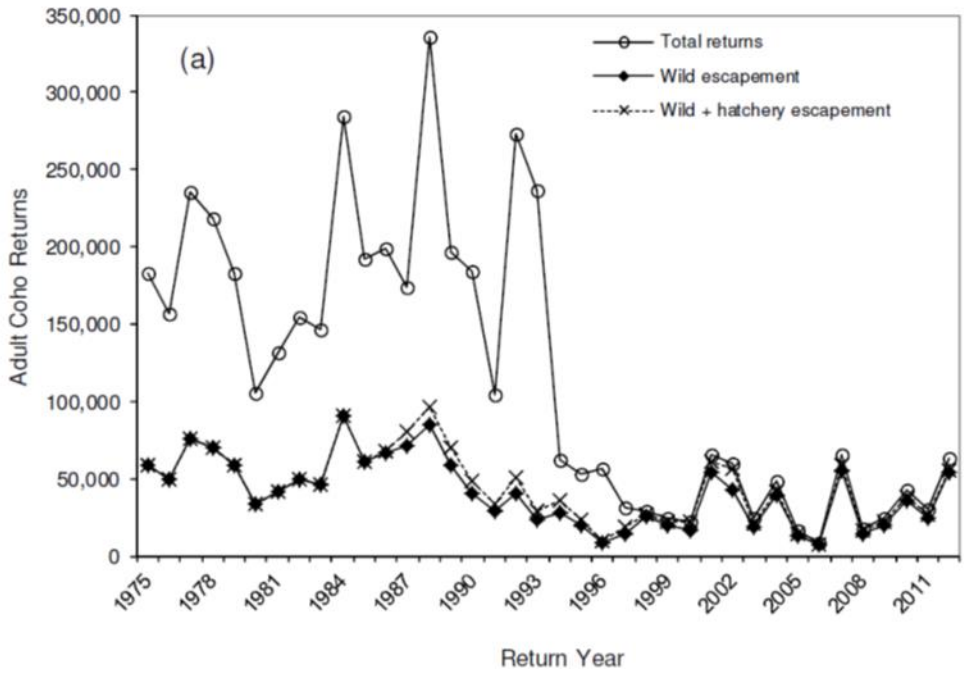

Figure 2. Plots of productivity (ln[recruits/spawner]) versus aggregate brood escapement for 1978-1992 and 1993-2012. Note: 2013 data point was preliminary when figure was originally published (Decker et al. 2014)

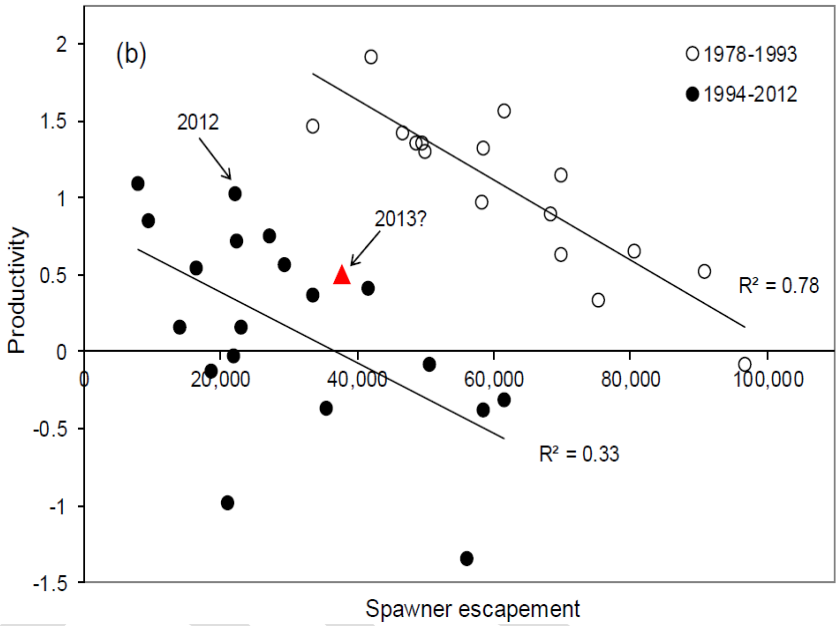

Table 1. Results of the harvest scenario analysis to determine the probability of meeting or exceeding short term and longer term 2006 Interior Fraser Coho Recovery Team conservation objectives under a range of total exploitation rates and for three rebuilding periods, assuming a continuation of the 1994 to 2012 low productivity regime. Conservation objectives are expressed as the generational geometric mean numbers of spawners. (Decker et al. 2014)

Total Expl. Rate	Short Term Objective (20,000 spawners)			Longer Term Objective (40,000 spawners)		
	One Generation	Two Generations	Three Generations	One Generation	Two Generations	Three Generations
0%	0.75	0.84	0.87	0.00	0.23	0.31
5%	0.72	0.80	0.84	0.00	0.19	0.26
10%	0.69	0.76	0.79	0.00	0.16	0.22
15%	0.65	0.71	0.73	0.00	0.12	0.17
20%	0.60	0.66	0.67	0.00	0.09	0.13
25%	0.56	0.59	0.59	0.00	0.07	0.09
30%	0.51	0.52	0.50	0.00	0.05	0.06
40%	0.39	0.36	0.31	0.00	0.02	0.02
60%	0.15	0.07	0.03	0.00	0.00	0.00

Table 2. Three CUs were determined to have an integrated status of AMBER (Middle Fraser, Fraser Canyon, South Thompson) and two were determined to have an integrated status of AMBER/GREEN (Lower Thompson, North Thompson). WSP benchmarks and WSP biological status assessments at the conservation unit level are not fisheries reference points. (Parken et al. 2015, in press)

Conservation Unit (CU)	**Subpopulation**	**Status Assessment**
South Thompson	Adams River	Amber
	Middle/Lower Shuswap	
	Shuswap Lake	
North Thompson	Lower North Thompson	Amber / Green
	Middle North Thompson	
	Upper North Thompson	
Lower Thompson	Lower Thompson	Amber / Green
	Nicola	
Middle/Upper Fraser	Middle Fraser	Amber
	Upper Fraser	
Fraser Canyon	Fraser Canyon	Amber

3 IFR COHO IN FISHERIES

3.1 DOMESTIC MANAGEMENT APPROACH

In response to large declines in total returns and escapements of IFR coho in the mid-nineties, exploitation rates in Canadian fisheries were significantly reduced, and for many years, with the exception of 2014, the maximum Canadian exploitation rate (ER) has been set at 3%. This value accounts for the impacts of Canadian fisheries occurring in waters south of Cape Caution, and excludes some terminal FSC harvests. Since 1998, this level of exploitation has led to significant fisheries management restrictions for fisheries in times and areas where IFR coho may be encountered. These management actions have generally ranged from non-retention of wild coho to time and area closures, with implications for the following areas and fisheries:

- West Coast Vancouver Island (WCVI) troll (commercial and First Nations) and recreational fisheries in offshore areas from late May until early September;
- Commercial net and recreational fisheries in the Straits of Juan de Fuca from June until early October;
- Commercial, recreational and First Nations fisheries in Johnstone and Queen Charlotte Straits from early June until late August;
- Commercial, recreational and First Nations fisheries in the Strait of Georgia from June until early October,
- Commercial, recreational and First Nations fisheries both off the mouth of, and in, the Fraser River from early June until mid-October, and
- Commercial, recreational and First Nations fisheries in the Fraser River upstream of Sawmill Creek from mid- to late September until late October.

3.2 PACIFIC SALMON TREATY IMPLICATIONS

Annex IV, Chapter 5 of the Pacific Salmon Treaty establishes the international management regime for southern BC and southern US origin coho based on the status of defined Management Units (MU) in each country. Each MU is to be managed to constrain exploitation rates based on the status of the MU, or groups of MUs in the case of the US. Until such time as the Parties provide specific maximum exploitation rate targets for each MU which originates within its jurisdiction consistent with attainment of maximum sustained harvest levels, Canada and the US will manage their fisheries consistent with the maximum exploitation rate ranges for three status levels – *low, moderate and high* (Table 3).

Table 3: Pacific Salmon Treaty abundance-based exploitation rate limits on coho salmon stocks in fisheries harvesting southern BC coho.

MU Status	US ER caps	Total ER
Low	10%	Up to 20%
Moderate	12%	>21 to 40%
Abundant	15%	>41 to 65%

In addition, within the *low status* zone, each country is expected to implement additional fishery management measures as may be necessary to address conservation needs for MU's within its jurisdiction. For most years since 1998 (except 2014) Canada has done this by reducing its share of the total exploitation rate on IFR coho to 2-3%.

For 2015, Canada has informed the US that Canada plans to manage our domestic fisheries consistent with *low status*. This will require Canada and the US to plan for fisheries within a total ER of up to 20% combined.

3.3 IFR COHO FISHERY PLANNING TOOLS

For fishery planning purposes, IFR coho fishing mortality is estimated pre-season using a variety of domestic models. Exploitation rates in the marine fisheries are estimated using a harvest rate spreadsheet model, which is based on the historical relationship between fishing effort and associated exploitation rates in the period 1986 to 1997 as determined from coded wire tag recoveries of IFR coho and release mortality rates as identified in the South Coast Integrated Fisheries Management Plan (IFMP).

In-river food, social and ceremonial, commercial and recreational impacts are estimated using results from a decay model which is based on the number of coho encounters in fisheries directed on other species; the average timing of IFR coho, the proportion IFR coho makes up of the total Fraser coho return at the time of the particular fishery; and, release mortality rates as identified in the IFMP. Coho encountered in tributary and main-stem Fraser River fisheries upstream of Sawmill Creek are assumed to be 100% IFR coho.

A post-season estimate of exploitation rate is developed from the same model but using reported catch and release and/or fishing effort data collected during the fishing season. For 2014, standard post-season model outputs were compared with alternative methods including DNA-based analysis for marine fisheries (see section 4).

For the purpose of implementing the PST arrangements in the Annex 4 Coho Chapter, Canada works with the United States to estimate fishery impacts on southern BC coho using a bilaterally agreed Fisheries Regulation Assessment Model (FRAM).

The FRAM model is used pre-season by Canada and the United States to plan fisheries within stock-specific constraints associated with MU status as identified in the Agreement. FRAM estimated impacts on IFR coho may not match the estimates projected by Canadian domestic models as it is based on a shorter base period of CWT data (1986-92, instead of 1986-97 used in CDN domestic models), does not include impacts in Fraser River in-river fisheries, and includes other impacts associated with natural mortalities and dropouts.

Post season, FRAM reconstructs cohort abundance(s) to estimate fishery-stock-specific ERs. The post season application of the FRAM model has recently been updated to incorporate Fraser River freshwater fisheries impacts. The post-season FRAM analysis for 2015 fisheries will not be completed until February 2017.

4 2014 POST-SEASON ANALYSIS

4.1 2014 IFMP OBJECTIVE

In 2014, the Southern BC Salmon Integrated Fisheries Management Plan (IFMP) objective for IFR coho (including Thompson River coho) was to limit the Canadian exploitation rate to 16% or less for the 2014 season only.

This objective was an increase in allowable exploitation from previous years where total Canadian exploitation rate was limited to 3% or less.

For clarity, the management objective for IFR coho in the Southern B.C. IFMP is used to constrain impacts in Southern B.C. fisheries. Possible fisheries impacts North of Cape Caution are thought to be low and are not included. Also, prior to 2014, FSC fisheries impacts upstream of Hells Gate were not subject to the objective but were considered in 2014 planning within the 16 % exploitation rate objective.

The IFMP objective change in 2014 was based on the following considerations:

- Fishery planning for 2014 was informed by a Canadian Science Advisory Secretariat (CSAS) scientific review of available stock and fishery information and forecast abundance. The 2014 forecast returns for the IFR coho aggregate ranges from 31,000 to 78,000 with a mid-point of 50,000. Based on the management objective, 2014 forecast and abundance of wild spawners in recent years, the projected 3-year geometric mean (2012-2014) escapement was expected to meet or exceed the longer term recovery objective (i.e. 40,000 coho) even for returns at low end of the 2014 forecast range.
- The Department's general approach to managing fisheries was to include efforts to achieve the lowest exploitation rate possible while providing additional flexibility for managers to plan for First Nations, recreational and commercial fisheries for more abundant stocks and species, such as Fraser River sockeye.
- Fishing plans were designed to be consistent with existing policies and to control overall IFR coho exploitation rates by limiting impacts to incidental, bycatch or release mortalities in most areas.

4.2 2014 FISHERIES

A number of changes in fisheries management measures occurred in 2014 pursuant to the change in allowable exploitation rate relative to prior recent years. These included:

- Retention of wild and marked coho by-catch encountered in FSC fisheries targeting other species;
- Provision of potential opportunities for directed fisheries targeting IFR coho in some terminal locations (subject to sufficient terminal abundance);
- Shortened of IFR window closure in the Fraser River (commercial / recreational / FSC);
- Retention of one wild coho/day during some times and areas for a number of marine recreational fisheries areas in Southern BC;
- In commercial net fisheries, continuation of requirement to release all coho, but some increase in allowable mortalities to enable access to more abundant species (e.g. Fraser sockeye) through increase effort or fishing time compared with past years. Troll retention of coho permitted in areas and times where IFR coho not prevalent (September WCVI).

IFR coho impacts were tracked in-season based on observed effort and /or harvest levels compared with model estimates. The final in-season estimate for the IFR coho exploitation rate in Southern B.C. fisheries was 10.9% based on planning models.

In-season estimates of in-river impacts were somewhat higher than projected pre-season. Delayed entry of late-run sockeye into the Fraser River resulted in additional commercial gillnet fishery openings in the Fraser targeting late run Sockeye in September (during times typically closed during the IFR window closure) than anticipated. BC Interior in-season estimates of impacts were lower than projected pre-season.

For 2015, the United States planned their fisheries consistent with a "low" abundance status (i.e. ER < 10%) based on information available to them for their annual fisheries planning process. Post-season model estimates of 2014 exploitation rates, based on actual U.S. fishing patterns, will be available in the winter of 2015 based on post-season FRAM model results.

4.1 2014 SPAWNING ESCAPEMENT

Spawning escapement enumeration programs are complete, and have yielded a total estimate of 18,500 IFR coho to the spawning grounds in 2014.

This number is significantly less than what was anticipated based on planning considerations, including:

- Pre-season forecast range was 31,000 to 78,000 with a mid-point of 50,000

- Final in-season modelled estimate of fisheries impacts was 10.9%.

The 2014 spawner abundance was used to update the 3-year average and geometric mean spawner abundances to permit comparison with recovery objectives. The calculations for recent 3 year intervals are shown in Table 4.

Table 4: Calculations of the Spawner Abundance in 3-year intervals:

	Pre-season Forecast Total Abundance (pre-fishery)			**Actual Annual Spawner Abundance**	**3-year Average Spawner Abundance**	**3-year Geometric mean Spawner Abundance**
	low	mean	high			
2014	31,477	49,472	77,754	18,500	43,742	38,863
2013				58,361	45,839	42,846
2012				54,365	38,240	36,325
2011				24,791	26,946	26,236
2010				35,563		
2009				20,483		

The 3-year geometric mean is provided for comparison to recovery objectives. The geometric mean value for 2012 through 2014 is close to the IFRCRT long term recovery objective of 40,000, however, the 2014 escapement was well below the anticipated level.

The causes of the low escapement in 2014 are uncertain, but are likely to be a result of:

- continued poor productivity resulting in total returns below the lower end of the forecast range; and / or,
- higher fisheries impacts than expected based on planning models.

In addition, it is possible there are other sources of uncertainty that could be contributing to the lower-than anticipated 2014 spawner abundance, such as en-route losses in the Fraser River or tributaries, but methods to evaluate these factors are not currently available.

DFO has been able to carry out some evaluation of fisheries impacts models in the 2014 post-season (see section 4.2). However, a more systematic evaluation of both the marine and in-river estimation models is being carried out through on-going or planned CSAS processes with additional results expected late in 2015.

4.2 POST-SEASON EXPLOITATION RATE ANALYSIS

4.2.1 Marine exploitation rate estimation methods

Two methods were compared for estimating marine exploitation rates (Southern BC) post-season:

1) Post-season estimates for spreadsheet models updated with post-season information (e.g. observed effort levels) used in previous years (see description in section 3.3)
2) An independent approach that applied DNA stock composition of IFR coho determined from 2014 fishery sampling to estimates of retained and release coho in southern BC marine fisheries. The project design and results of this DNA-based program are described in a separate memo that will be shared with First Nations and stakeholders (Candy, J., Andres, A., Kearey, L., and Luedke, W. 2015. Genetic stock identification of Interior Fraser River coho salmon in southern B.C. marine fisheries in 2014. Report to the PSC Southern Fund Committee. Project SF-2013-I-11).

4.2.2 Fraser exploitation rate estimation methods

Three methods were compared for estimating 2014 in-river exploitation rates:

1) In-river decay model (see description in section 3.3)
2) In-river decay model with adjustments for encounter rates in Lower Fraser gill net fisheries based on combined observer and test fishery information.

DNA sampling did occur in the Fraser River in 2014, but the sample size was small and was taken mainly from test fisheries. The program was not considered representative enough of actual Fraser fisheries to support a DNA-based approach for estimating in-river fisheries exploitation rates.

The key driver for exploring alternative methods for estimating 2014 IFR coho impacts, in the Lower Fraser gill net fisheries, was the anticipated high impact of these fisheries, particularly during September when the IFR window closure would normally have been in effect to protect expected high proportions of IFR coho. Further description of the methodology and results for this analysis are contained in a separate memo that will be shared with First Nations and stakeholders (Estimation of Coho Encounters and Interior Fraser Coho Impacts in Lower Fraser Gill Net and Interior Fraser Fisheries in 2014).

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4.2.3 Summary of total Southern B.C. Canadian exploitation rates using alternative methodologies.

- Table 5 contains a summary of the results of the 2014 post-season exploitation rate analysis.

- Table 6 contains a summary of the 2014 Fraser in-river exploitation rate analysis broken down by major fishery component.
- Further information on DNA-based exploitation rate methodologies and marine exploitation rates by major fishery components are contained in Candy et al., 2015.
- Methodologies for estimating in-river gillnet and BCI impacts are discussed in the memo referenced in section 4.2.2 above (Estimation of Coho Encounters and Interior Fraser Coho Impacts in Lower Fraser Gill Net and Interior Fraser Fisheries in 2014).
- For the pre-season and in-season analysis (Table 5), we used the pre-season forecast of IFR coho pre-fishery abundance to back-calculate estimates of mortalities (in pieces) and spawners (pieces) based on exploitation rates (%) in each area. Calculations for the in-season estimates were done using two scenarios, the mid-point of the pre-fishery abundance forecast (50,000) and the low-end of the pre-season forecast of (31,000).
- For post-season estimates, we used actual post-season spawner abundance (18,500) and estimated IFR coho mortalities (in pieces) to estimate exploitation rates (%) in each area and to estimate the potential pre-fishery abundance.
- Final estimates of United States fishery exploitation rates on IFR coho are not yet available; all results assumed a United States fishery exploitation rate of 10%. This number will be updated upon completion of the Canada – US 2014 post-season analysis in 2016.
- Preliminary observations on the results of this analysis include:
    - Based on post-season analysis methods, the pre-fishery abundance of IFR coho was estimated to be between 23,141 and 26,215 coho, well below expectations based on the pre-season forecast (mid-point 50,000; range 31,000 to 78,000).
    - In-season and post-season estimates of IFR coho exploitation rates using model based methods (method 2 and 3a in Table 5) project Canadian exploitation rates from 10.34% to 10.55%; these were below the management objective of 16% or less, and less than pre-season projections (11.56%)
    - However, post-season estimates of Canadian exploitation rates using alternative methods indicate IFR coho exploitation rates may have been higher than 16% but there is uncertainty with ER's based on these methods ranging from 10.06% to 19.39% in Canadian fisheries.
    - The greatest source of uncertainty in overall exploitation rates in Table 5 is from Lower Fraser River fisheries where ER was estimated between 3.35% to 12.84% using alternative post-season methods. This variation in estimates is due mainly to the alternative methods used to estimate in-river gillnet impacts (Table 6).
    - Post-season estimates of exploitation rates in Canadian marine fisheries using DNA based estimates were 4.87% to 5.51%; slightly lower than the model based estimate of 6.04%.
- Further analysis of uncertainties in catch/release estimates, DNA results or other sources of uncertainty is not yet complete; further work is planned as part of CSAS reviews of methods used to estimate IFR coho exploitation rates planned for fall/winter 2015.

Table 5: Summary of total Southern B.C. Canadian exploitation rates using alternative methodologies**.**

	1. Pre-Season Estimate	2. In-season Estimate		3. Post-season Estimates		
Results shown are either: Exploitation Rate (%) or Total Mortalities in pieces (Fisheries) or Abundance in pieces (Spawners, Return to Fraser & Pre-fishery Abundance rows)	Model-Based	2a. Model-based (includes some in-season catch updates in the BCI). *Estimated mortalities in pieces based on mid-point of forecast range.*	2b. Model based (includes some in-season catch updates in the BCI). *Estimated mortalities in pieces based on low end of forecast range.*	**3a. Marine Fisheries** Model based (using post-season effort) **Fraser Fisheries** *All* - base estimation programs. *LFR* catch estimates based on fisher reported data	**3b. Marine Fisheries** DNA-based estimate **Fraser Fisheries** *All* - base estimation programs. *LFR* catch estimates based on fisher reported data	**Marine Fisheries** DNA-based estimate **Fraser Fisheries** *LF gillnet fisheries* - combined approach tf plus observer data. *BCI fisheries* - observer information. *Other LF fisheries* - base
Spawners	78.4%	79.7%	79.7%	79.5%	79.9%	70.6%
	39,220	**39830**[a]	**24694.6**[b]	**18500**[c]	**18500**[c]	**18500**[c]
BCI Fisheries	5.4%	2.5%	2.5%	1.2%	1.2%	1.7%
	2,680	1,255	778	271	271	441
LFA Fisheries	0.88%	2.51%	2.51%	3.35%	3.37%	12.84%
	440	1255	778	781	781	3,365
Return to Fraser	42,340	42,340	26,251	19,552	19,552	22,306
CDN Marine Fisheries	5.32%	5.32%	5.32%	6.04%	5.51%	4.87%
	2,660	2,660	1,649	1,404	1,276	1,276
Total CDN Fisheries	11.56%	10.34%	10.34%	10.55%	10.06%	19.39%
	5,780	5,170	3,205	2,456	2,328	5,082
Total US Fisheries[d]	10%	10%	10%	10.0%	10.0%	10.0%
	5,000	5,000	3,100	2,323	2,313	2,633
Total CDN + US Fisheries	21.56%	20.34%	20.34%	20.53%	20.06%	29.43%
	10,780	10,170	6,305	4,779	4,641	7,715
Pre-fishery Abundance	**50,000**	**50,000**	**31,000**	**23,279**	**23,141**	**26,215**

Notes:

a – Projected # of spawners based on in-season ER estimate and mid-point of pre-season forecast (Pre-fishery forecast range 31,000 to 78,000)

b– Projected # of spawners based on in-season ER estimate and low end of pre-season forecast (Pre-fishery forecast range 31,000 to 78,000)

c - Actual spawner estimate from 2014 enumeration programs

d – US fishery exploitation rate assumed to be 10%. Will be updated subsequent to Canada - U.S. post-season process.

Table 6: Summary of Fraser in-river ER estimates using alternative methodologies by major fishery component**.**

			Decay Model	Decay + Comb **
LF	First Nations	FSC (Gill Net)	129	44
		EO (Gill Net)	28	680
		EO (Selective)	26	26
	Area E		562	2,579
	TF (non-Qualark)		34	34
	Recreational		2	2
	LF Total :		***781***	***3,365***
BCI	FSC *		268	268
	EO / Demo		160	160
	TF (Qualark)		11	11
	Recreational		1	1
	BCI Total :		***440***	***440***

* BCI FSC impacts includes 145 fish harvested from the EO/Demo fisheries

** Comb = combined approach (TF & observer), identified by blue highlighting

5 2015 FISHERY PLANNING

5.1 2015 PRE-SEASON FORECAST:

The preliminary 50% probability forecast for 2015 IFR coho pre-fishery abundance is 46,036. The probability distribution is provided below. This is a naïve forecast of the straight 3-year mean of the 2012 through 2014 abundance. There are sources of uncertainty that are not taken into account in this forecast including impacts of variable marine conditions (e.g. indications of anomalously warm ocean conditions in the North Pacific since 2014) and uncertainty in estimates of total abundance year-to-year including components of the total abundance that relate to fisheries impacts.

Table 6: Probability Distribution of the 2015 IFR Coho Forecast

Probability Level	Forecast Abundance
0.90	109,625
0.75	72,296
0.50	46,036
0.25	29,314
0.10	19,332

5.2 IFR COHO MANAGEMENT OBJECTIVE:

For 2015, the objective for Interior Fraser River coho (including Thompson River coho) is to manage Canadian fisheries to an exploitation rate of 10% or less.

This objective is lower than in 2014, but higher than in prior years, based on a consideration of:

- Information on stock status, abundance and productivity;
- Anticipated configuration of fisheries (i.e. low forecast returns on Late Run sockeye, but expected harvest opportunities for Fraser pink salmon);
- Low spawner abundance in 2014 and uncertainty about causes, evidence of ongoing uncertainty in key population parameters for IFR coho;
- International considerations under the Pacific Salmon Treaty.

The focus for 2015 planning will be to develop specific fisheries management measures consistent with the management objective. These measures will be developed based on input from consultations with First Nations and stakeholders and informed by the following considerations:

- Relevant science advice and analysis on conservation objectives, stock productivity, fisheries impacts and associated uncertainties;
- Potential configuration of fisheries targeting more abundant co-migrating stocks or species;

- Stock and fishery monitoring capacity (resources required to monitor fisheries) within DFO, and among external partners;
- The timing of the coho window closure in the Fraser River and potential changes to the dates;
- The use of selective fishing techniques during times when IFR coho are prevalent; and,
- Potential mitigation measures to address uncertainties in stock and fishery assessment.

Other high-level considerations in the design of fisheries for 2015 will be:

- Consistency with the DFO policy framework for salmon fisheries management; Policy for the Allocation of Pacific Salmon,
- Policy for the Management of Aboriginal Fishing
- Policy for Selective Fishing
- Fishery Monitoring and Catch Reporting Framework

5.3 2015 FISHERIES

5.3.1 Considerations from the 2014 pre-season options analysis:

In 2014, three exploitation rate options were presented to First Nations and stakeholders as part of the IFMP consultation process. In 2014, the general fisheries management approach associated with an ER of 10% or less (e.g. 2014 "Option 2" of 4% to 9% ER) in Canadian fisheries included the following considerations:

- FSC: retention of wild and hatchery coho by-catch in FSC fisheries targeting other species; potential for increased tributary harvests where abundances were sufficient.
- Economic Opportunity / In-river Demo Fisheries: Non-retention of wild coho; additional fishing effort / time relative to years with a 3% ER objective.
- Commercial – non-retention of wild coho; additional fishing effort / time relative to years with a 3 % ER objective.
- Recreational – some increased impacts (relative to years with a 3 % ER objective) in areas and times when IFR coho are present in low levels.

5.4 2015 SPAWNER ABUNDANCE PROJECTIONS

Projecting the 3-year geometric mean spawner abundance under the proposed ER objective for 2015 is useful in comparing the likelihood of achieving the IFCRT objectives (section 2) given the forecast range of returns for 2015. Assuming a 20% exploitation rate (including 10% CAN + 10% US), the 2015 forecast abundance and spawner abundance in recent years, the range of projected 3-year geometric mean spawner abundances is as follows:

Table 7: 2015 Spawner Abundance Projections

	Forecast Abundance			Prog./Act. Spawner Abundance			3yr Avg Spawners			3yr Geomean Spawners		
	low	mid-point	high	low	mid-point	high	low	mid-point	high	low	mid-point	high
2015	29,314	46,036	72,296	23,451	36,829	57,837	23,451	37,897	57,837	23,451	34,132	57,837
2014					18,500			43,742			38,863	
2013					58,361			45,839			42,846	
2012					54,365			38,240			36,325	
2011					24,791			26,946			26,236	
2010					35,563							
2009					20,483							

5.5 2015 FISHERY MANAGEMENT APPROACH CONSIDERATIONS

An initial set of potential fishery configurations for 2015 have been developed using pre-season planning models for consideration by First Nations and stakeholders. These fishery configurations were developed to illustrate potential options for discussion and the Department is willing to assist with development of alternative fishery configurations. For each harvest group (First Nations, commercial and recreational) two or three generalized options or scenarios have been developed for discussion to reflect potential configurations of fisheries for 2015 (see Appendix 1 for details). Detailed analysis of the estimated impacts of alternative fishery configurations by area and harvest group are provided in Appendix 1.

Prior to finalizing the 2015/2016 Southern BC Salmon Integrated Fisheries Management Plan, the Department will consider First Nation and stakeholder input on different configurations of fisheries consistent with the IFR coho management objective. These discussions will occur through the regular advisory processes to assist in the development of the final Southern BC Salmon IFMP.

With respect to 2015 fisheries planning, we are seeking your feedback as follows:

Within the 10% ER limit for Canadian fisheries (occurring South of Cape Caution), what are the key fisheries management considerations that need to be taken into account? What configuration of fisheries would you support?

The views received during consultations will inform final decisions on the 2015 fishing season to be included in the Southern BC IFMP.

Feedback is requested by **April 17, 2015.**

Feedback on these questions can be directed to any of the local Area Directors identified below.

South Coast – Andrew Thomson
(250) 756-7280
Andrew.Thomson@dfo-mpo.gc.ca>

Lower Fraser – Jennifer Nener
(604) 666-6478
Jennifer.Nener@dfo-mpo.gc.ca>

BC Interior – Stu Cartwright
(250) 851-4892
Stu.Cartwright@dfo-mpo.gc.ca

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APPENDIX 1: PRE-SEASON PLANNING SCENARIOS FOR SOUTH COAST, LOWER FRASER AND BC INTERIOR FISHERIES

1. Southern B.C. Marine Fisheries – IFR Coho ER Scenarios

Notes: Marine recreational fishing plan and T'aaq-wiihak fishing plan not included in this analysis

Descriptions

Scenario	Estimated Marine IFR ER	Description
2015A	1.64%	Updated Inside nets and troll, WCVI troll same as 2014
2015B	1.67%	Inside Diversion, Updated Inside nets and troll, WCVI troll same as 2014
2015C	1.56%	Outside Diversion, Updated Inside nets and troll , WCVI troll same as 2014
2015D	1.72%	Inside Diversion, 2011 Inside nets and troll with a 20% increase in effort during pink fisheries (some Sockeye opportunity
2015E	1.58%	Inside Diversion, 2013 Inside nets and troll (no sockeye opportunity and little pink i.e no gillnet fishereis), WCVI troll same
2015F	1.72%	Inside Diversion, 2011 Inside nets and troll with a 20% increase in effort during pink fisheries (some Sockeye opportunity

Modeled impact: Marine	2015A	2015B	2015C	2015D	2015E	2015F
RECREATIONAL - *FISHING PLAN UNDER DEVELOPMENT*						
JST						
GSN						
GSS						
JdF						
WCVI Insides Surfline						
WCVI Outside Surfline						
Total Recreational	NA	NA	NA	NA	NA	NA
COMMERCIAL						
JST-Gillnet	0.04%	0.04%	0.02%	0.05%	0.01%	0.05%
JST-Purse Seine	0.04%	0.07%	0.03%	0.08%	0.02%	0.08%
JST-Troll	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
JdF-Purse Seine	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%
Gulf-Purse Seine	0.96%	0.96%	0.90%	1.00%	0.96%	1.00%
Gulf-Troll	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%
WCVI-Troll (CN)	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
WCVI-Troll (CN w/Co Ret.)	0.23%	0.23%	0.23%	0.23%	0.23%	0.23%
WCVI-Troll (SK)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
T'aaq-wiihak Troller	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
T'aaq-wiihak Small Boat	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Area B	1.00%	1.03%	0.94%	1.07%	0.98%	1.07%
Total Area D	0.04%	0.04%	0.02%	0.05%	0.01%	0.05%
Total Area H	0.00%	0.01%	0.01%	0.00%	0.00%	0.00%
Total Area G	0.32%	0.32%	0.32%	0.32%	0.32%	0.32%
Total T'aaq-wiihak	TBD	TBD	TBD	TBD	TBD	TBD
Total Commercial	1.37%	1.40%	1.29%	1.45%	1.31%	1.45%
TEST FISHERIES						
Troll (sockeye)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Johnstone Strait	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
Area 20 Gillnet	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%
Round Island Area 12	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Total Test Fisheries	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
MARINE FSC	**0.19%**	**0.19%**	**0.19%**	**0.19%**	**0.19%**	**0.19%**
Total Marine	**1.64%**	**1.67%**	**1.56%**	**1.72%**	**1.58%**	**1.72%**
- recreational not included						

Southern B.C. Marine Fisheries – IFR Coho ER Scenarios – Effort Assumptions

Commercial Effort

2015A (Updated inside effort, WCVI troll same as 2014 and no T'aaq fisheries included)

Anticipated mean Effort (Boat Days/Month)		**Month**											
Region	Gear Group	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
JST-Gillnet	Area D	0	0	0	0	0	0	0	960		816		0
JST-Purse Seine	Area B	0	0	0	0	0	0	0	300	200	180		0
JST-Troll	Area H (Boat Days)	0	0	0	0	0	0	0	150	50	200		0
JdF-Purse Seine	Area B	0	0	0	0	0	0	0					0
Gulf-Purse Seine	Area B	0	0	0	0	0	0	0		160			0
Gulf-Troll	Area H (Boat Days)	0	0	0	0	0	0	0	20	20			0
WCVI-Troll (CN)	Area G (Boat Days)	15	20	60	408	1511	0	419	202	186	0	0	0
WCVI-Troll (SK)	Area G (Boat Days)	0	0	0	0	0	0	0	0	0	0	0	0
WCVI-Troll (CN/SK)	T'aaq-wiihak Troller	0	0	0	0	0	0	0	0	0	0	0	0
WCVI-Troll (CN/SK)	T'aaq-wiihak Small Boat	0	0	0	0	0	0	0	0	0	0	0	0
WCVI-Troll (CN) with coho retention	Area G (Boat Days)	0	0	0	0	0	0	0	0	350	39	14	0

2015B (Updated Commercial Inside effort based on Inside diversion March 20, 2015

	Anticipated Effort (Boat Days/Month)	**Month**											
Region	Gear Group	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
JST-Gillnet	Area D								960		816		
JST-Purse Seine	Area B								300	500	180		
JST-Troll	Area H (Boat Days)								225	85	200		
JdF-Purse Seine	Area B												
Gulf-Purse Seine	Area B									160			
Gulf-Troll	Area H (Boat Days)								20	20			
WCVI-Troll (CN)	Area G (Boat Days)	15	20	60	408	1511	0	419	202	186			
WCVI-Troll (SK)	Area G (Boat Days)												
WCVI-Troll (CN/SK)	T'aaq-wiihak Troller												
WCVI-Troll (CN/SK)	T'aaq-wiihak Small Boat - TBD												
WCVI-Troll (CN) with coho retention	Area G (Boat Days)									350	39	14	

2015C (Updated Commercial Inside effort based on Outside diversion March 20, 2015

	Anticipated Effort (Boat Days/Month)	**Month**											
Region	Gear Group	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
JST-Gillnet	Area D								385		816		
JST-Purse Seine	Area B								225	100	180		
JST-Troll	Area H (Boat Days)								70	15	200		
JdF-Purse Seine	Area B								25	15			
Gulf-Purse Seine	Area B									150			
Gulf-Troll	Area H (Boat Days)								80	80			
WCVI-Troll (CN) Coho release	Area G (Boat Days)	15	20	60	408	1511	0	419	202	186			
WCVI-Troll (SK)	Area G (Boat Days)												
WCVI-Troll (CN/SK)	T'aaq-wiihak Troller												
WCVI-Troll (CN/SK)	T'aaq-wiihak Small Boat- TBD												
WCVI-Troll (CN) with coho retention	Area G (Boat Days)									350	39	14	

2015D (Used the 2011 effort for Inside fisheries increase pink effort by 20% relative to 2011)

	Anticipated mean Effort (Boat Days/M	**Month**											
Region	Gear Group	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
JST-Gillnet	Area D								705	310	816		
JST-Purse Seine	Area B								253	595	180		
JST-Troll	Area H (Boat Days)								178	38	200		
JdF-Purse Seine	Area B												
Gulf-Purse Seine	Area B									166			
Gulf-Troll	Area H (Boat Days)								18	20			
WCVI-Troll (CN)	Area G (Boat Days)	15	20	60	408	1511	0	419	202	186			
WCVI-Troll (SK)	Area G (Boat Days)												
WCVI-Troll (CN/SK)	T'aaq-wiihak Troller												
WCVI-Troll (CN/SK)	T'aaq-wiihak Small Boat - TBD												
WCVI-Troll (CN) with coho retention	Area G (Boat Days)									350	39	14	

2015E (used 2013 effort as there were no Sockeye directed fisheries)

	Anticipated mean Effort (Boat Days/M	**Month**											
Region	Gear Group	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
JST-Gillnet	Area D										816		
JST-Purse Seine	Area B									180	180		
JST-Troll	Area H (Boat Days)									5	200	1	
JdF-Purse Seine	Area B												
Gulf-Purse Seine	Area B									160	0		
Gulf-Troll	Area H (Boat Days)												
WCVI-Troll (CN)	Area G (Boat Days)	15	20	60	408	1511	0	419	202	186			
WCVI-Troll (SK)	Area G (Boat Days)												
WCVI-Troll (CN/SK)	T'aaq-wiihak Troller												
WCVI-Troll (CN/SK)	T'aaq-wiihak Small Boat - TBD												
WCVI-Troll (CN) with coho retention	Area G (Boat Days)									350	39	14	

2. Lower Fraser River – IFR Coho ER Scenarios

Lower Fraser Interior Fraser Coho ER Table					
	IFR Coho Exploitation Rates				
Fishery	**Proposed**	**Min**	**Max**	**Method for Proposed ER**	**Potential sources of uncertainty**
First Nations					
FSC (base method)	0.25%	0.06%	0.61%	-average of 2011, 2012, 2013, 2014	- this information is based on fisher-reported released rates in non-retention fisheries (except for 2014 where wild and hatchery marked CO retention occurred)
FSC (adjusted for wild coho retention)	0.77%	0.61%	0.92%	-minimum is impact from 2014, proposed is 25% higher, and maximum is 50% higher; hatchery and wild CO retention occurred for the 1st time in 2014; 2015 impacts are expected to be similar or higher	- information is based on fisher-reported released rates in non-retention fisheries, work is required if incorporation of alternate encounter rate impacts are required, could be developed for in-season impacts tracking tool
FSC (extended fishery)	0.49%	0.11%	1.22%	- doubling of impacts from base method	-Majority of 2014 FSC was completed by mid August. If FSC SK fishery continues into late Aug or early Sept, (due to later SK timing than forecast or other factors delaying the achievement of FSC targets), then 2015 impact may be higher than 2014.
					-The ER may change depending on retention regulations for wild CO.
EO (base method)	0.28%	0.24%	0.31%	-average of last 2 PK years	-The ER may change depending on retention regulations for hatchery CO.
EO (limited gill net deployed in chum EO fisheries)	0.40%	0.28%	0.52%	- average, min and max values of the average IFR Coho ER in CM-directed EO fishery during last 2 PK years added to the base method average	-If sockeye and chum gill net fisheries occur upstream of Port Mann Bridge, this would increase 2015 ER relative to 2011 and 2013. Would be delayed until late October due to IFR steelhead constraints, therefore impacts on IFR coho fairly minor.
EO (allocation transfers)	0.48%	0.33%	0.62%	-an expansion of 20% added to estimate limited gill net deployment scenario	- Notional estimate - will depend on pre-season and in-season demonstration fisheries arrangements. Note that base method includes years where some PK allocation was transferred into the LF.
Total (base method)	**0.52%**	**0.30%**	**0.92%**		
Total (maximum values)	**1.24%**	**0.94%**	**1.54%**		

Lower Fraser River – IFR Coho ER Scenarios cont'd

	IFR Coho Exploitation Rates				
Fishery	Proposed	Min	Max	Method for Proposed ER	Potential sources of uncertainty
Test Fisheries					
Albion (base method)	0.13%	0.05%	0.23%	-average of last 3 PK years; did not include non-PK years because impact is 0.06% lower on average	
Albion (CO retention for bio sampling)	0.21%	0.08%	0.38%	-average of last 3 PK years assuming 100% CO retention	- if all CO are not retained for sampling, ER would decrease
Whonnock	0.12%	0.10%	0.15%	-average of last 3 PK years	
Cottonwood	0.09%	0.01%	0.19%	-average of last 3 PK years	
Mission	0.02%	0.00%	0.02%	-only operated in 2011	-Mission test fishery may not occur in 2015.
Qualark	0.12%	0.10%	0.14%	-average of last 2 PK years	
Total (base method)	**0.47%**	**0.27%**	**0.72%**		
Total (CO retention)	**0.56%**	**0.30%**	**0.87%**		
Commercial					
Area E Gillnet (base method)	0.07%	0.03%	0.11%	-average of 2009-2013, excluding 2010	- estimates based on fisher-reported data
Area E Gillnet (sockeye-directed opportunity late in season)	NA	NA	NA	- to be evaluated in-season	-If there is a SK-direct opening in 2015 and if commercially-available SK abundances are later than expected (e.g. late entry / unexpected strength in late run) IFR coho impacts would increase significantly. No estimate of impacts available at this time. To be evaluated in-season based on available ER room.
Area E Gillnet (alternative catch estimation methodology applied)	0.20%	0.10%	0.33%	-correction factor applied to the base method approach based on difference between standard post-season method and 2014 alternative IFR Coho encounter rate estimation methodology	-Application of 2014 post-season estimation of gillnet IFR Coho encounter rates could increase proposed ER. We have attempted to approximate application of this method in the maximum value provided.
				- more refined methodology to be developed in future assessments	-Proposed retention of hatchery CO could be taken into account in estimation of impacts but potential increases to IFC ER are expected to be small given proposed timing after the window closure.
Area B Seine	1.04%	0.86%	1.22%	- average of last two PK years	- if proportion of allocation used increases relative to previous years, ER could increase
Area H Troll	0.00%	0.00%	0.00%	- average of last two PK years	- no appreciable impacts anticipated due to low participation in this fishery
Total (base method)	**1.11%**	**0.90%**	**1.33%**		
Total (maximum)	**1.24%**	**0.96%**	**1.55%**		

	IFR Coho Exploitation Rates				
Fishery	Proposed	Min	Max	Method for Proposed ER	Potential sources of uncertainty
Recreational					
Lower Fraser Recreational	0.21%	0.17%	0.26%	-average of 2007-2011, excluding 2013 due to fisheries closures in this year	-Potential effect of starting the season with a daily limit of 4 in non-tidal areas (2014 IFMP proposal).
All Lower Fraser Fisheries					
Total (base method)	**2.64%**	**2.00%**	**3.52%**		
Total (maximum)	**3.25%**	**2.37%**	**4.23%**		

Sources of uncertainty that could affect all fisheries:
-SK migration timing: if returns are later than expected, fishing patterns could extend later and potentially increase impact on IFC
-Sockeye TAC: current snowpack levels indicate low discharge for 2015, which could increase expected in river mortality, and MA, which will affect fishery planning

SK = Sockeye Salmon; IFR Coho= Interior Fraser River Coho Salmon; CO = Coho Salmon; PK = Pink Salmon; CM = Chum, Salmon; ER = Exploitation Rate; MA = Management Adjustment; TAC = Total Allowable Catch

3. BC Interior – IFR Coho ER Scenarios

BC Interior 2015 Summary of IFR Coho Impacts

Note: Calculations based on 2015 forecast mid-point of 46,000

BCI Food Social and Ceremonial Fisheries					
Plan A			**Plan B**		
Sockeye Catch		**194,900**	Sockeye Catch		**300,000**
IFR Coho Exp.		**0.66%**	IFR Coho Exp.		**3.13%**
Release mortality rate:		variable	Release mortality rate:		variable
Killed	Released	Total Mort	Killed	Released	Total Mort
304	0	304	1,441	0	1,441

Fishery Description

Plan A Directed sockeye catch similar to 2011 and recent average directed coho harvest

Plan B Directed sockeye greater than 2011 and anticipated directed Coho harvest identified in 2015 fishing plans

Directed coho harvest is terminal harvest on fences or fishways

Coho release mortality rates applied: Dipnet-0%, Gillnet-60%

BCI Demonstration Fisheries								
Plan A			**Plan B**			**Plan C**		
Catch*		**6,000**	Catch*		**17,400**	Catch*		**101,000**
IFR Coho Exp.		**0.00%**	IFR Coho Exp.		**0.09%**	IFR Coho Exp.		**0.15%**
Release mortality rate:		variable	Release mortality rate:		variable	Release mortality rate:		variable
Killed	Released	Total Mort	Killed	Released	Total Mort	Killed	Released	Total Mort
0	2	1	0	383	40	0	818	68

Fishery Description

Plan A Similar Chinook and Pink catch as 2013

Plan B Similar Chinook, Sockeye and Pink catch as 2011

Plan C Increased Chinook, Sockeye and Pink catch relative to 2011 and 2013

Catch* Catch is combined target species

Fisheries inlcuded: UFFCA Dipnet, UFFCA Fishwheels, SFC Shallow Purse Seine and SFC Chinook Gillnet, Siska Dipnet

Coho release mortality rates applied: Dipnet-0%, Shallow Purse Seine-10%, Fishwheels-10%

BCI Recreational Fisheries						
Plan A				**Plan B**		
Pink Catch			**4,500**	Pink Catch		**9,000**
IFR Coho Exp.			**0.01%**	IFR Coho Exp.		**0.01%**
Release mortality rate:			10%	Release mortality rate:		10%
Killed	Released	Total Mort		Killed	Released	Total Mort
0	29	3		0	52	5

Fishery Description

Plan A Similar to recent years (2011 and 2013)

Plan B Increase relative to recent years (Lower Thompson and Region 5 extension directed on Pinks)

Fisheries included: Lower Thompson, Fraser River at Seton and Fraser River Mainstem in Region 5

Coho release mortality rate applied: Rod and Reel-10%

BCI Test Fisheries (Qualark)			
Plan A			
Pink Catch			**NA**
IFR Coho Exp.			**0.14%**
Release mortality rate:		NA	
Killed	Released	Total Mort	
56	17	66	

20

Fishery Description

Expected Coho impacts based on 2013 observations

Coho release mortality rate applied: Gillnet-60%

2015 Interior Fraser Coho pre season exploitation rate estimate summary- Interior Fraser River and tributaries.

		Plan A	Plan B	Plan C
Food Social and Ceremonial				
	Directed (terminal)	0.47%	2.83%	2.83%
	Bycatch	0.19%	0.31%	0.31%
	Total	**0.66%**	**3.13%**	**3.13%**
First Nations Demonstration				
	Total	**0.00%**	**0.09%**	**0.15%**
Recreational				
	Total	**0.01%**	**0.01%**	**0.01%**
Test Fishery				
	Total	**0.14%**	**0.14%**	**0.14%**
Grand Total		***0.81%***	***3.37%***	***3.44%***
Grand Total (Directed FSC above Hells Gate Removed) *		***0.34%***	***0.55%***	***0.61%***
Grand Total (All FSC Above Hells Gate Removed) *		***0.15%***	***0.24%***	***0.30%***

*** Prior to 2014 estimates of First Nation FSC catch above Hells Gate was not included in the Coho exploitation rate estimates.**