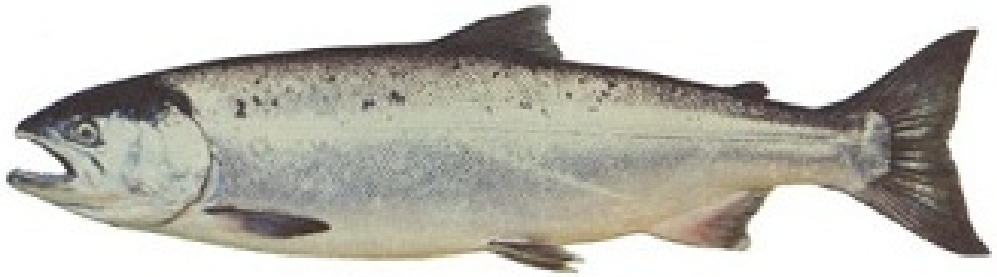
2015 Interior Fraser River Coho Management



2014 Post-season update and 2015 Fisheries Planning
FN FORUM Meeting
April 13, 2015

2014 Fishery Post-season Review Update

2014 Fisheries Management Plan

- Changes from previous years' plans included:
  - Retention of wild and marked coho encountered in FSC fisheries targeting other species
  - Expansion of fisheries targeting IFR coho in some terminal locations (subject to sufficient terminal abundance)
  - Shortened of IFR window closure in Fraser River (commercial / recreational / FSC)
  - Retention of one wild coho / day in 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). Troll retention of coho permitted in areas and times where IFR coho not prevalent (September WCVI).

2014 post-season assessment

- 2014 IFR coho spawner abundance: 18,500
- Spawner abundance was lower than expected based on:
  - 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 %
- Low escapement suggests that either total returns were well below the lower end of the forecast range and / or fisheries impact models underestimated fisheries impacts.
- 2 memos developed that outline review of fisheries impacts in marine areas and Fraser River to better understand factors contributing to low escapement.

2014 post-season assessment cont'd

- DNA analysis project (marine fisheries)
  - DNA samples from 2014 fisheries analyzed
  - Majority from marine areas (GST, JDF, JS, WCVI in shore / offshore); limited number of samples from Fraser in-river
  - Results support an improved understanding of stock composition and IFR coho distribution
  - Comparison of model projections to DNA based estimates of IFR coho mortalities
- Lower Fraser gill net fisheries and Interior Fraser fisheries project: review focussed on using alternative data sources compared to evaluate fisher reported and fisher independent data used to estimate IFR coho mortalities.

Summary: 2014 Post-season analysis

	Pre-Season Estimate	In-season Estimate		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	Model based (includes some in-season catch updates in the BCI). *Estimated mortalities in pieces based on mid-point of forecast range.*	Model based (includes some in-season catch updates in the BCI). *Estimated mortalities in pieces based on low end of forecast range.*	**Marine Fisheries** Model based (using post-season effort) **Fraser Fisheries** *All* - base estimation programs. *LFR* catch estimates based on fisher reported data	**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 programs
Spawners	78.4%	79.7%	79.7%	79.5%	79.9%	70.6%
	39,220	**39,830[a]**	**24,694[b]**	**18,500[c]**	**18,500[c]**	**18,500[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.

Observations of 2014 Post-season analysis

- pre-fishery abundance of IFR coho estimated to be between 23,141 and 26,215 coho; well below expectations based on 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 project CDN ERs from 10.34% to 10.55%; below the management objective of 16% or less, and less than pre-season projections (11.56%)
- Post-season estimates of CDN ERs using alternative methods indicate ERs may have been higher than 16%; uncertain ranges from 10.06% to 19.39%.
  - Large source of uncertainty from Lower Fraser River gill net fisheries where ER was estimated between 3.35% to 12.84%.
  - marine fisheries using DNA based estimates were 4.87% to 5.51%; slightly lower than the model based estimate of 6.04%.
- General conclusion: IFR coho pre-fishery abundance was lower than expected and although uncertain, ERs were likely higher in some fishery areas.

2015 Fishery Planning

2015 Fisheries Planning

- **The draft 2015 IFMP objective for Interior Fraser River coho (including Thompson River coho) is to manage Canadian fisheries to an exploitation rate of 10% or less.**
- This exploitation rate level is consistent with a "low" status under the Pacific Salmon Treaty.
- DFO will continue to advance fisheries management measures that minimize impacts on IFR coho stocks.

Pacific Salmon Treaty abundance-based exploitation rate limits on coho salmon stocks in fisheries encountering southern BC coho

Management Unit Status	US ER caps	Total Exploitation Rate
Low	10%	Up to 20%
Moderate	12%	>20 to 40%
Abundant	15%	>41 to 65%

2015 Coho Management Approach

- Specific fisheries management measures for 2015 will be developed based on input from First Nations and stakeholders, and informed by the following considerations:
  - Relevant science advice and analysis on conservation objectives, stock productivity, fisheries impacts and uncertainties (e.g. potential impact of ocean temperatures in 2014 marine entry year for coho smolts);
  - 2015 outlook and pre-season forecast (3 year average) information;
  - Pacific Salmon Treaty requirements (principally Annex IV – Chapter 5);
  - Potential configuration of fisheries targeting more abundant co-migrating stocks or species

2015 Coho Management Approach

- Other specific fisheries planning considerations:
  - Stock and fishery monitoring capacity (resources required to monitor fisheries) within DFO, and among external partners;
  - The timing of the coho window closure in a particular area;
  - 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

2015 Coho Management Approach

- General fisheries characteristics associated with an ER < 10% (based on 2014 analysis):
  - FSC: retention of wild and hatchery coho bycatch in fisheries targeting other species; increased tributary harvests where abundances identified
  - Economic Opportunity / In-river Demo Fisheries: Non-retention of wild coho; additional fishing effort / time relative to pre-2014 fishery
  - Commercial – non-retention of wild coho; retention of hatchery marked coho in times and places where IFC are present in low levels; additional fishing effort / time relative to pre-2014 fishery;
  - Recreational – some increased impacts (relative to pre-2014 fishery) in areas and times when IFR Coho are present in low levels

2015 Projections of IFR coho impacts

- 2015 discussion document (appendix 1) identifies a range of potential fishery configurations for First Nations, recreational and commercial fisheries.
- In most instances, a range of potential IFR coho impacts are identified depending on a range of fishery configurations and/or uncertainties including:
  - Anticipated fishing effort by gear, time, area
  - Timing of fisheries
  - Fishery regulations (e.g. retention of wild coho permitted?)
  - Diversion rate of Fraser sockeye / pink salmon (influences location of commercial fisheries)
  - Fishery encounter rates of IFR coho in Fraser River fisheries
  - IFR coho distribution (i.e. inside vs. outside)
  - IFR coho abundance (influences projected ER in some terminal area fisheries)

Summary Table: Range of 2015 Projections

2015 Interior Fraser Coho Exploitation Rate Projections			
Area / Fishery	**Mid-range**	**Low End**	**High End**
South Coast Area			
Test-fishery	0.08%	0.08%	0.08%
First Nations FSC	0.19%	0.19%	0.19%
Recreational	3.15%	1.01%	4.38%
Commercial	1.37%	1.29%	1.45%
First Nations EO / Demo	TBC	TBC	TBC
South Coast Sub-total	**4.79%**	**2.57%**	**6.10%**
Lower Fraser Area			
Test-fishery	0.56%	0.30%	0.87%
First Nations FSC	0.77%	0.25%	1.22%
Recreational	0.21%	0.17%	0.26%
Commercial	0.20%	0.10%	0.33%
First Nations EO / Demo	0.40%	0.28%	0.52%
Lower Fraser Sub-total	**2.14%**	**1.10%**	**3.20%**
BC Interior Area			
Test-fishery			
First Nations FSC	3.13%	0.66%	4.92%
Recreational	0.01%	0.01%	0.02%
Commercial			
First Nations EO / Demo	0.09%	0.00%	0.23%
BC Interior Sub-total	**3.23%**	**0.67%**	**5.17%**
Canada Sub-totals			
Test-fishery	0.64%	0.38%	0.95%
First Nations FSC	4.54%	1.62%	6.33%
Recreational	3.37%	1.19%	4.66%
Commercial	1.57%	1.39%	1.78%
First Nations EO / Demo	0.49%	0.28%	0.75%
Canada Total	**10.61%**	**4.86%**	**14.47%**

- Projections are intended to illustrate the potential range in IFR coho exploitation rates across fisheries.
- Ranges incorporate different fishery configurations and/ or key uncertainties.
- The *mid-range* projection indicates potential impacts for the fishery configurations considered. *Low-end* and *high-end* provide consideration of uncertainties or alternative fishery plans.
- *Mid-range* projections indicate that IFR coho management objective for Canadian fisheries (<10%) could be exceeded.
- Further input is expected on preferred fishery configurations and management considerations (e.g. potential uncertainties in planning models) for the various fisheries listed consistent with the objective.

2015 Projections of Potential Spawners

	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	33,437	37,897	44,899	29,364	34,132	39,673
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							

Assumptions:

- Overall exploitation rate limit of 20% (10% CAN + 10% US)
- 2015 IFR Coho Forecast: 46,036 (50% CI: 29,314 to 72,296)
- Note, the 2015 discussion document estimates of the 3 year geometric mean spawners are incorrect for the low and high[1].

[1]*Ref. Table 7 in IFR Coho Management Discussion Document draft dated March 30th*

Discussion Questions:

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? What key uncertainties need to be considered?

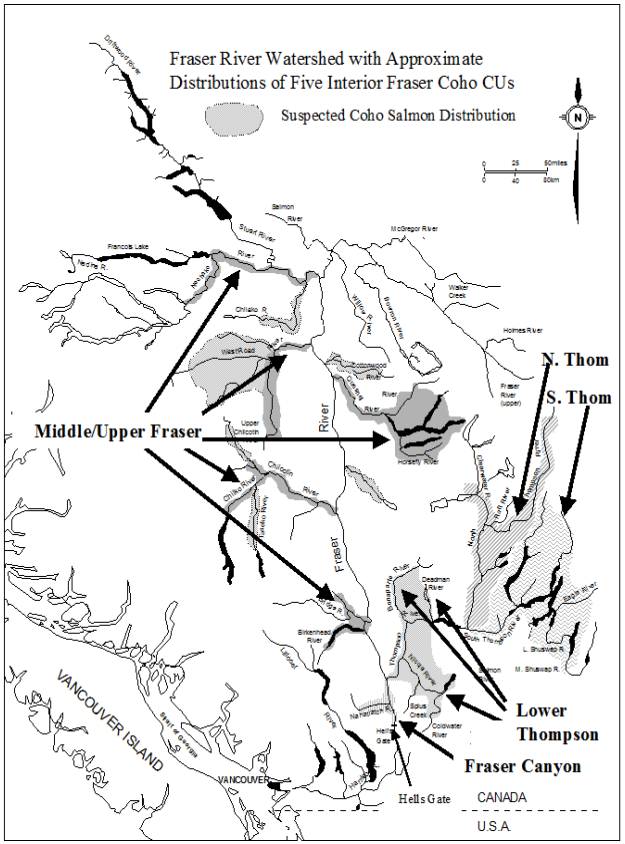
The views received during consultations will inform final decisions on the 2015 fishing season to be included in the Southern BC IFMP.

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

Background Information

Interior Fraser Coho Conservation Unit Description

Conservation Unit (CU)	Subpopulation
South Thompson	Adams River
	Middle/Lower Shuswap
	Shuswap Lake
	Total
North Thompson	Lower North Thompson
	Middle North Thompson
	Upper North Thompson
	Total
Lower Thompson	Lower Thompson
	Nicola
	Total
Middle/Upper Fraser	Middle Fraser
	Upper Fraser
	Total
Fraser Canyon	Fraser Canyon



Interior Fraser River Coho Recovery Objectives

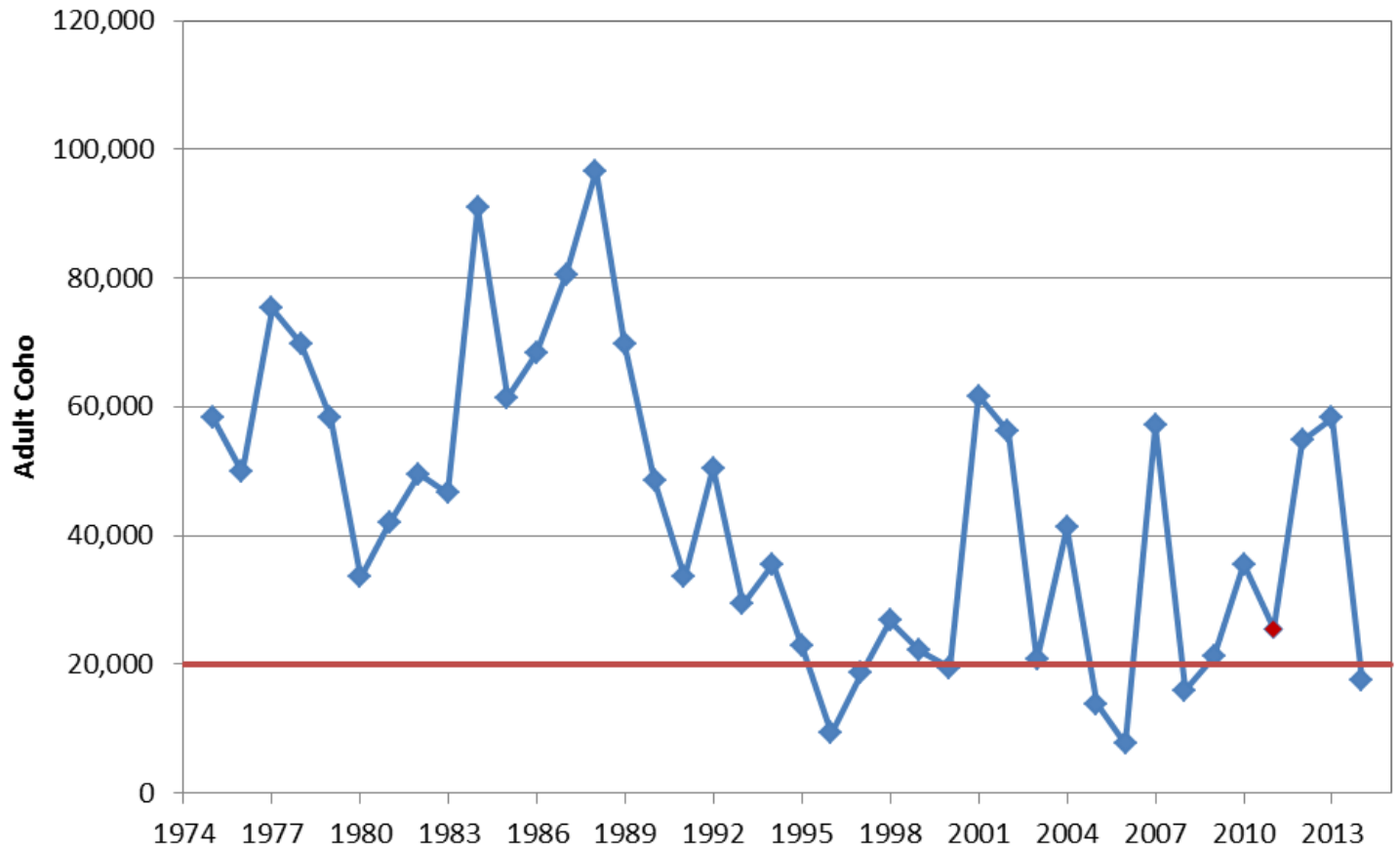
- Short Term Objective: 3 year geometric mean escapement in at least half of the subpopulations within each of the 5 CUs to exceed 1000 natural spawners, excluding hatchery fish spawning in the wild; approximately 20,000 wild spawners; and
- Longer Term Objective: 3 year geometric mean escapement in all of the subpopulations within each of the 5 CUs to exceed 1000 natural spawners, excluding hatchery fish spawning in the wild; approximately 40,000 wild spawners

(*adapted from 2006 IFC Recovery Team Objectives 1 and 2)*

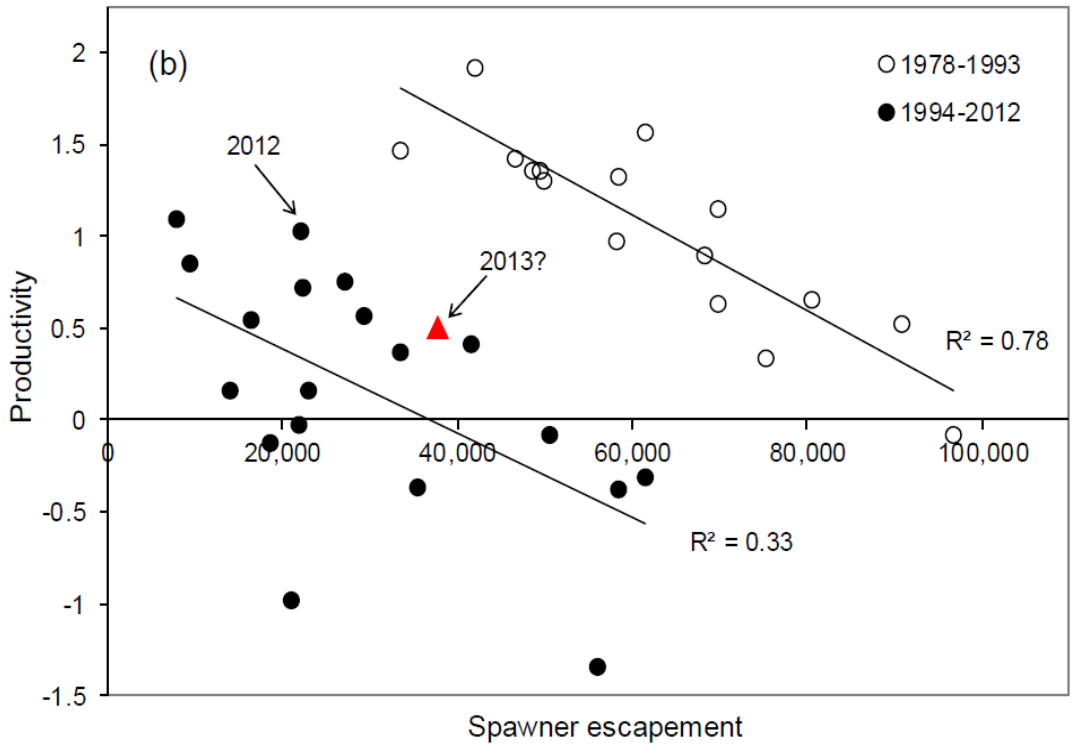
Updated Geometric Mean Calculations

	Forecast Abundance			Actual Spawner Abundance	3yr Avg Spawners	3yr Geomean Spawners
	low	mean	high	mean	mean	mean
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		

Escapement - Interior Fraser River Coho



Trends in productivity



Parken et al. 2015 (in press)
WSP Biological Status Assessment (IFR Coho CUs)

Low productivity regime

- No evidence that these CUs have moved above the current low productivity regime (persistent since 1991)
- Similar to finding of Decker et al. 2014

WSP status assessment

WSP status	Conservation Unit
Amber / Green	• Lower Thompson • North Thompson
Amber	• Middle Fraser • Fraser Canyon • South Thompson

- CU status was Amber or Amber/Green under conditions of low ER (<13%) over the last 13 years.