Fraser Chinook Info Presentation

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Background and Context

- Significant Fraser Chinook management discussions began in spring 2008
- In 2007/08 DFO identified conservation concern for ET chinook
- In 2008 DFO identified conservation concern for 5sub2 spring/summer chinook

DFO Chinook Management Model

- 2008 and 2009: DFO initiated and implemented management measures *intending* that Rec and Commercial sectors "bear the brunt of conservation"
- Meaning: all sectors were supposed to reduce harvest effort, but Rec and Commercial were supposed to be reduced "more" than First Nations

Technical Discussions

- JTWG: Formed in spring 2009: subset of FWJTF
- Small group of technical people from Fraser First Nations organizations and DFO
- Assembled to discuss the draft 2008 ET Chinook Review document completed by DFO
- Discussed the technical information and methods applied by DFO to evaluate 2008 chinook management actions for ET chinook

JTWG

- Met in June, October, December and January 2010
- The first three meetings focused mainly on the 2008 ET Chinook Review
- Result of work: Limitations and Assumptions section to be included in the next version of report, data corrections to analysis, this method of evaluation will be discontinued

Fraser Chinook Issue

- The chinook issue is important because the DFO evaluation of **access priority** measures relative exploitation changes in First Nations, Recreational and Commercial fisheries
- Does not just evaluate presence/absence in fisheries
- Requires higher precision

Playing Catch-up

- Overall discussion highlights the intensive management that is being applied - the tools have not kept up with the demand

Chinook Stock Status

- 3 stock groups of Fraser Chinook are not replacing themselves: **prior to fishing**
- 2007 Ocean entry appears to have dramatically affected 4 year old salmon return in 2009 (Fraser sockeye, Nicola chinook)
- The 5 year old fish returning in 2010 experienced those 2007 ocean conditions

Outline

1. Background
2. Status Indicators
3. Fisheries
4. 2010 expectations
5. Planning process

1. Background: Stock Groups

- Current Pacific Salmon Treaty (PST) arrangements refer to 2 Fraser stock groups: *Fraser Early* and *Fraser Late*
  - *Fraser Early* includes all Fraser chinook stocks except Fraser Late.
  - *Fraser Late* includes Harrison, and all transplanted Harrison stock (Chilliwack, Stave, etc)
- Chinook technical committee is revising Fraser Early into 4 component stock groups to better represent Fraser chinook population dynamics and fishery distribution (Chinook model improvement).
- Escapement reporting on Fraser chinook is for 5 stock groups, currently.

Revised Stock Groups

1. *Spring 4_2 stream type*
2. *Spring 5_2 stream type*
3. *Summer 5_2 stream type*
4. *Summer 4_1 ocean type*
5. **Fraser Late Natural** (Harrison)
6. **Fraser Late Hatchery** (Chilliwack)

- These management units (MUs) based on reporting units identified by the Chinook Technical Committee for Pacific Salmon Treaty process

Background: Spring 4_2 Chinook

- **General life history traits for the MU**
  - One year-plus juvenile freshwater residence
  - Adult migration through Albion March to late July, peak in late June
  - Includes early-timed stocks: Spius, Coldwater and Louis Creek (italics below)
  - Return mostly at Age-4 (90%), although some returns at Age-5 (7%) and occasionally Age-3 (3%)

CU #	CU Name	Spawning Locations
16	STh Bessette Creek	Bessette Creek;
17	LTHOM spring age 1.2	Bonaparte River; *Coldwater River*; Deadman River; *Louis Creek*; Nicola River; *Spius Creek*;

Background: Spring 5_2 Chinook

- **General life history traits for the MU**
  - One year plus juvenile freshwater residence
  - Adult migration through Albion March to late July, peak in late June
  - Includes Birkenhead, Cottonwood, Upper Chilcotin and Chilako early-timed stocks (italics below)
  - Return mostly at Age-5 (70%), although some returns at Age-4 (~20%) and occasionally Age-6 and Age-3
  - Mostly offshore resident (except Birkenhead-far north migrant) but vulnerable to south coast fisheries during return migration

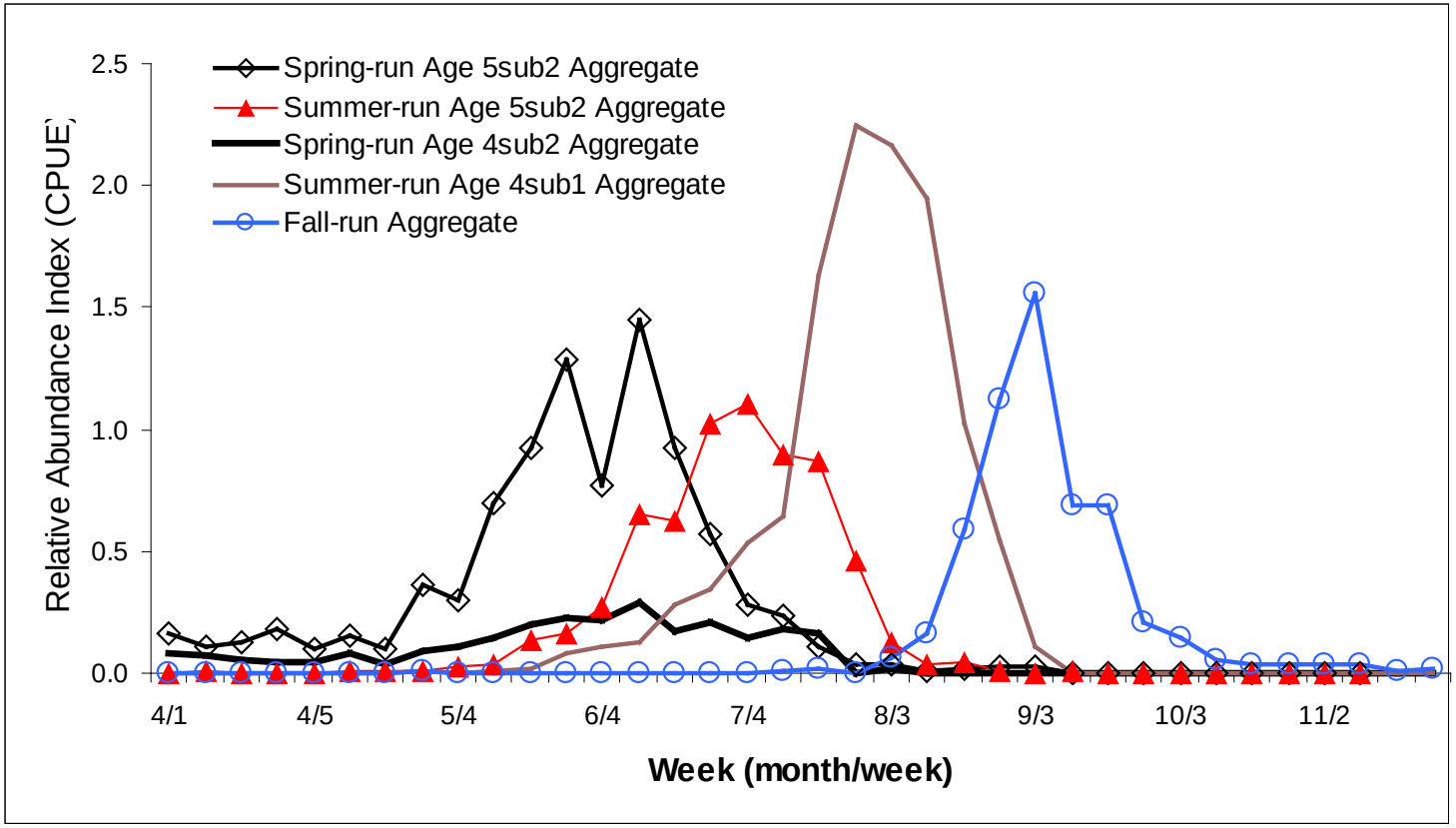
CU #	CU Name	Spawning Locations
4	LFR springs	*Birkenhead River*
5	LFR Upper Pitt	Pitt River-upper
8	FR Canyon-Nahatlatch	Nahatlatch River
10	MFR springs	Cariboo River-upper; *Chilako River*; *Chilcotin River upper*; Chilcotin River-lower; *Cottonwood River*; Horsefly River;; Narcosli Creek; Naver Creek; West Road River
12	UFR springs	Bowron River; Dome Creek; East Twin Creek; Fraser River-above Tete Jaune; Forgetmenot Creek; Goat River; Holliday Creek; Holmes River; Horsey Creek; Humbug Creek; Kenneth Creek; McGregor River; McKale River; Morkill River; Nevin Creek; Ptarmigan Creek; Slim Creek; Small Creek; Snowshoe Creek; Swift Creek; Torpy River; Walker Creek; Wansa Creek; West Twin Creek; Willow River
18	NTHOM spring age 1.3	Blue River; Finn Creek; Raft River

Background: 5_2 Summer Chinook

- **General life history traits for the MU**
  - One year plus juvenile freshwater residence
  - Adult migration through Albion late June to late August, peak in late July
  - Return at Age-5 (71%), at Age-4 (22%) and occasionally Age-6 (7%) and Age-3 (10%)
  - Mostly offshore resident but some catches occur in northern and southern fisheries in early summer

CU #	CU Name	Spawning Locations
6	LFR summers	Big Silver Creek; Chilliwack/Vedder River; Cogburn Creek; Douglas Creek; Green River; Lillooet River; Lillooet River-lower; Lillooet River-upper; Sloquet Creek; Weaver Creek
9	MFR Portage	Portage Creek
11	MFR summers	Bridge River; Cariboo River lower; Chilko River; Endako River; Kazchek Creek; Kuzkwa River; Nechako River; Quesnel River; Seton River; Stellako River; Stuart River;
14	STh summer age 1.3	Eagle River; Salmon River;
19	NTHOM summer age 1.3	Barriere River; Clearwater River; Mahood River; North Thompson River

Migration Timing – Lower Fraser 2000 & 2001

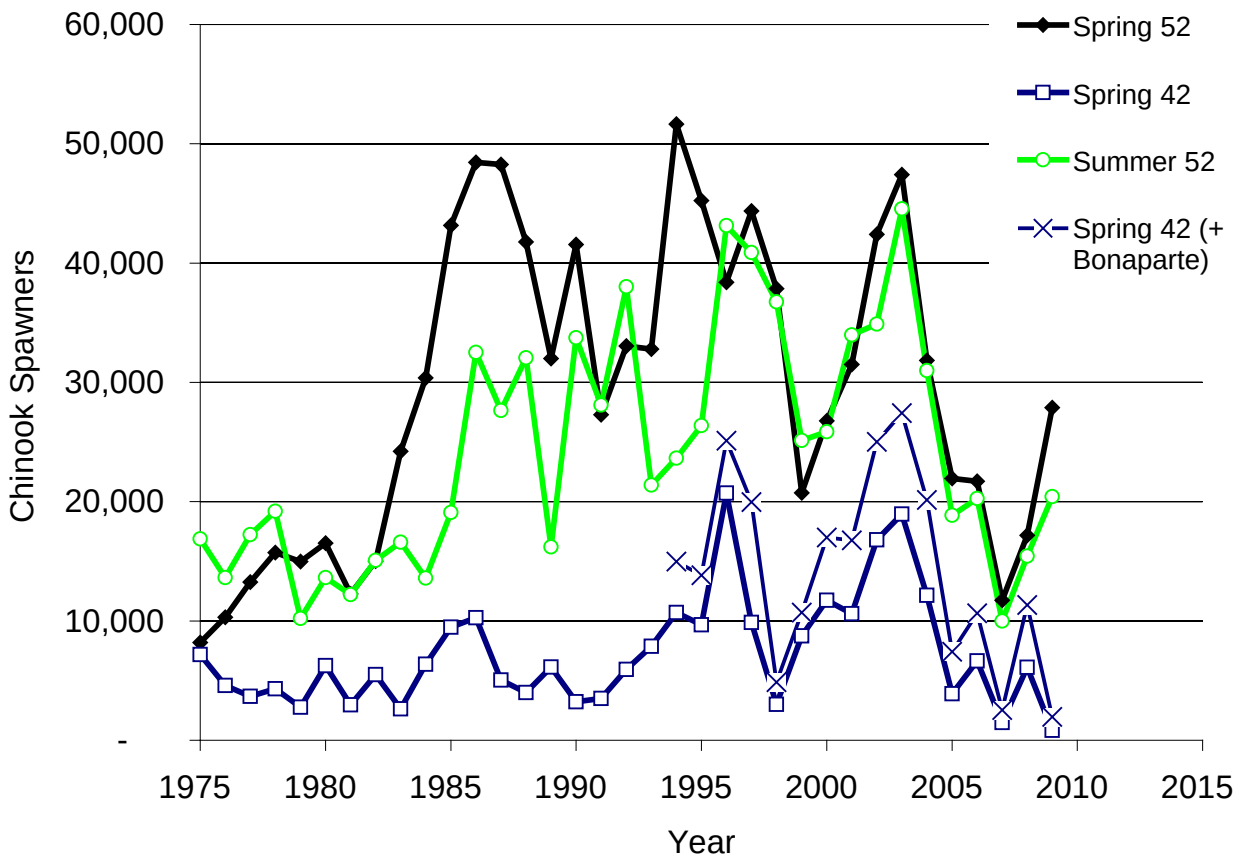


Data based on DNA samples from the Albion test fishery

2. Status Indicators

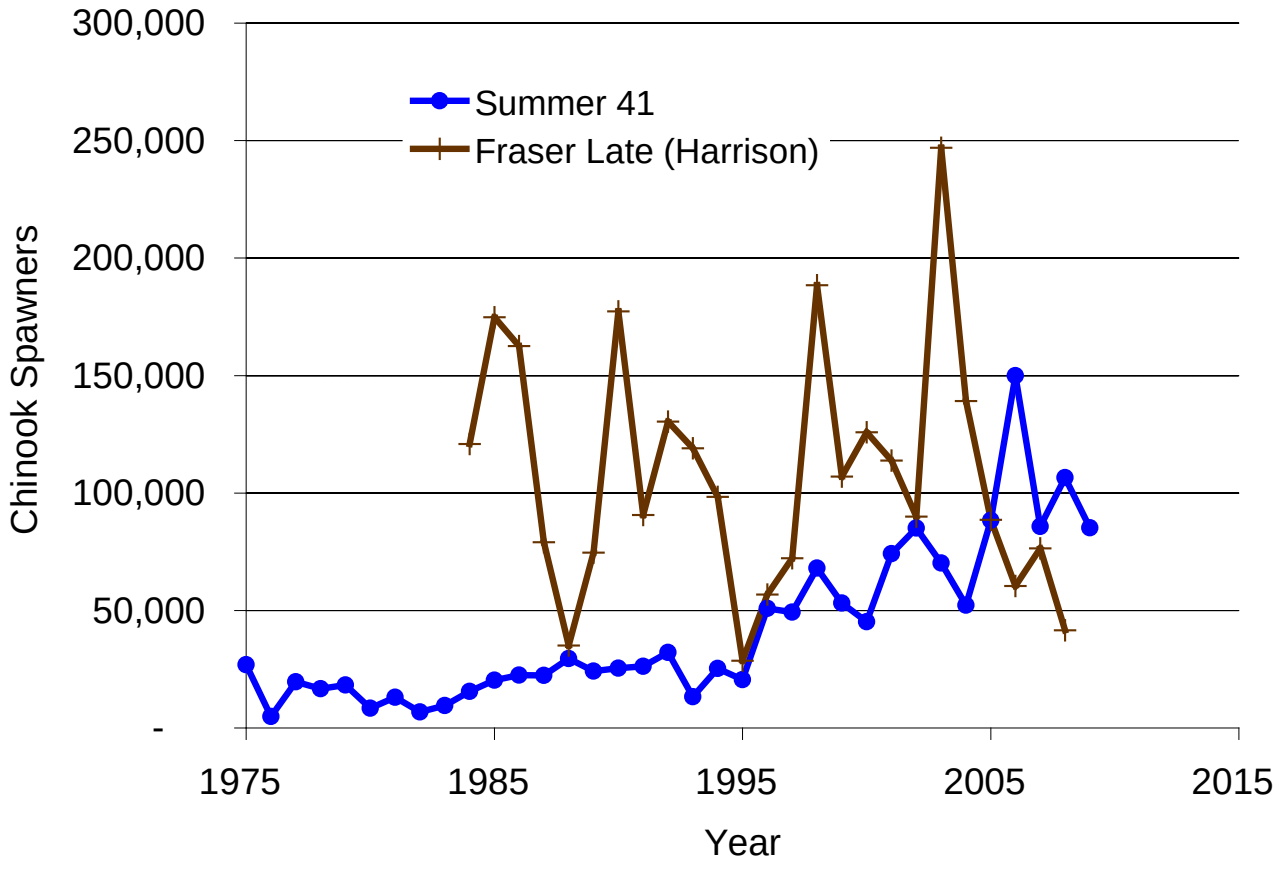
- Spawner abundance
- Habitat based model estimates of spawning capacity and sustainable exploitation rates
- Productivity trends

2. Spawner abundance: *stream types*



- Stream type life history aggregates plotted.
- Bonaparte data available beginning in 1994
- Declines continued for 4_2's in 2009.
- increased spawners for 5_2's in last 2 years, but declined relative to parental generation.

2. Spawner abundance: *ocean types*



- Ocean type life histories plotted
- Increasing trend for Summer 4_1
- Harrison spawner abundance variable but declining over last 5 years

2. Pacific Salmon Treaty (PST)

Aggregate	Spawners at MSY	CWT Indicator	Years
Spring 4_2	19,972	Nicola	1995-2008
Spring 5_2	81,296	Dome**	95-98, 00-03, 05-06
Summer 5_2	42,784	*None***	-
Summer 4_1	154,228	Lower Shuswap	1995-2008
Fraser Late (Fall 4_1)	75,100*	Chilliwack	1986-2008

*Spawners at MSY are estimates based on habitat model except Lates which is the PST escapement target for Harrison chinook from stock-recruit analysis.

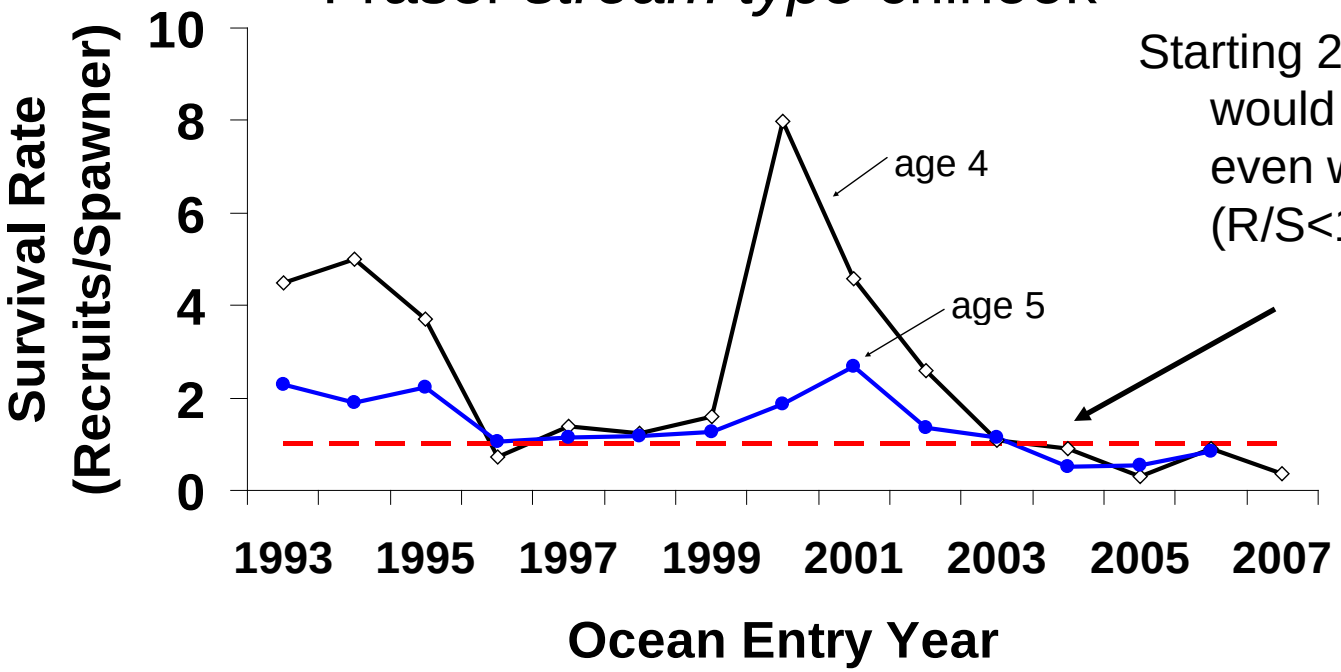
**No current CWT indicators for Spring 5_2 and Summer 5_2 groups.

2. Status Indicators: Spawners

System	Spawner Est. 2009	Brood year	% of Brood	Spawners at MSY	2009 as % of S_{MSY}
Spring age 4_2	836	3,880	**22%**	19,972	**4%**
+ Bonaparte	1,963	7,396	**27%**	26,072	**8%**
Spring age 5_2	27,881	32,654	**85%**	81,296	**34%**
Summer age 5_2	20,430	31,286	**65%**	42,784	**48%**
Summer age 4_1	85,242	87,988	**97%**	154,228	**57%**
Fraser Late	In prog			75,100	

2. Stock Productivity

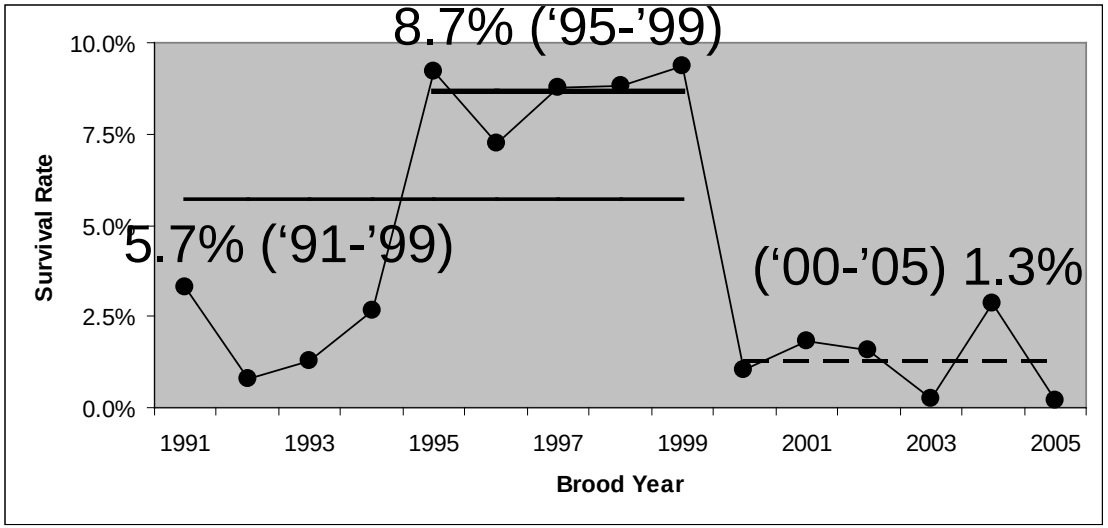
Fraser *stream type* chinook



Starting 2004 populations would have declined even with no fishing (R/S<1)

- Starting in 2004, age 4_2 and 5_2 R/S has been insufficient to replace the spawners in the absence of fishing
  - Spring 4_2 mean R/S= 0.62
  - Age 5_2 mean R/S= 0.64.
- R/S >1.67 is needed to sustain 40% exploitation rates.

2. Spring 4_2 Survival



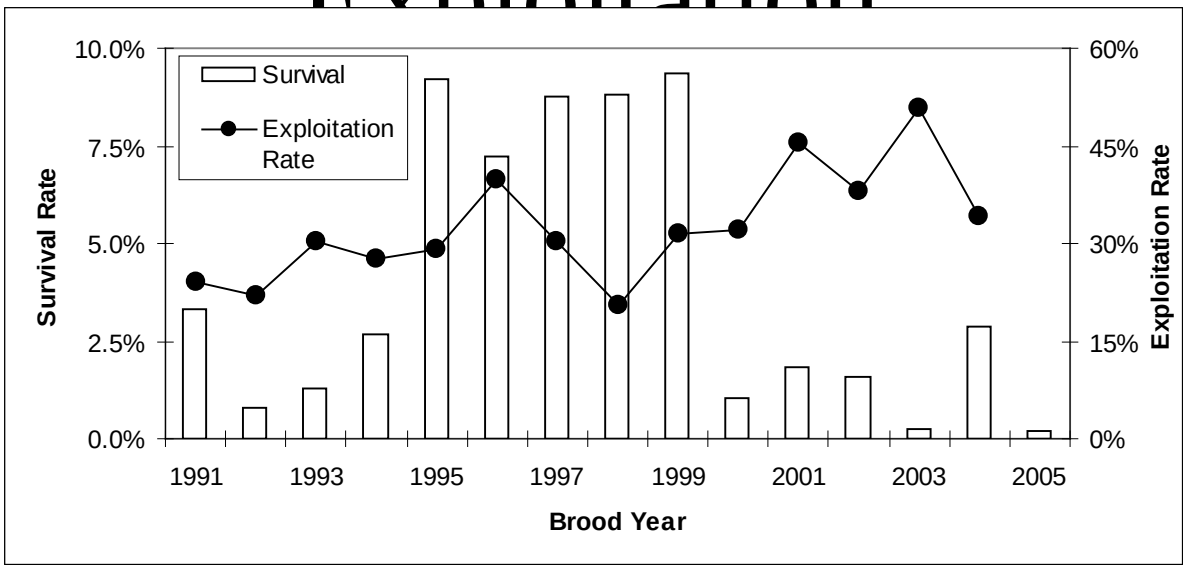
Short period of survival observations based on Nicola CWT information

- Long-term average unclear, perhaps in range of 5.7% to 8.7%
- Episodes of poor and good survival; not purely random

Average survival 1.3% since BY 2000

- ~77% reduction from 91-99 & 85% reduction from 95-99

2. Spring 4_2 Survival and Exploitation



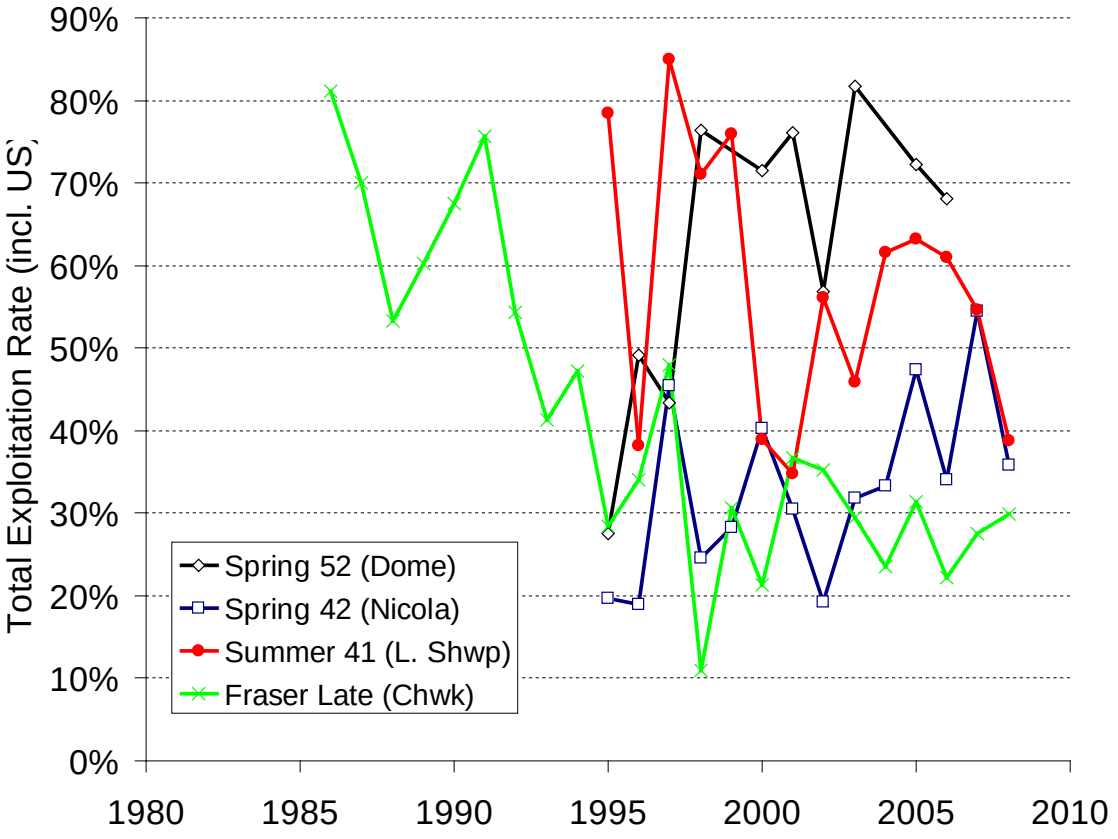
- Brood Year exploitation rates have been variable but increasing trend
  - Ranging 21% to 51%, averaging 33%; about ½ of the 63-65% SER for average productivity conditions
  - Reduction in 2004 BY associated with increased management actions in 2008
- Exploitation rates post BY 1999 not decreased in response to decline in survivals (average ER ~40%); have exceeded the 8-11% SER estimated for low survival period and populations have declined.
- This time series of survival data was not available until 2009

3. Fisheries Information

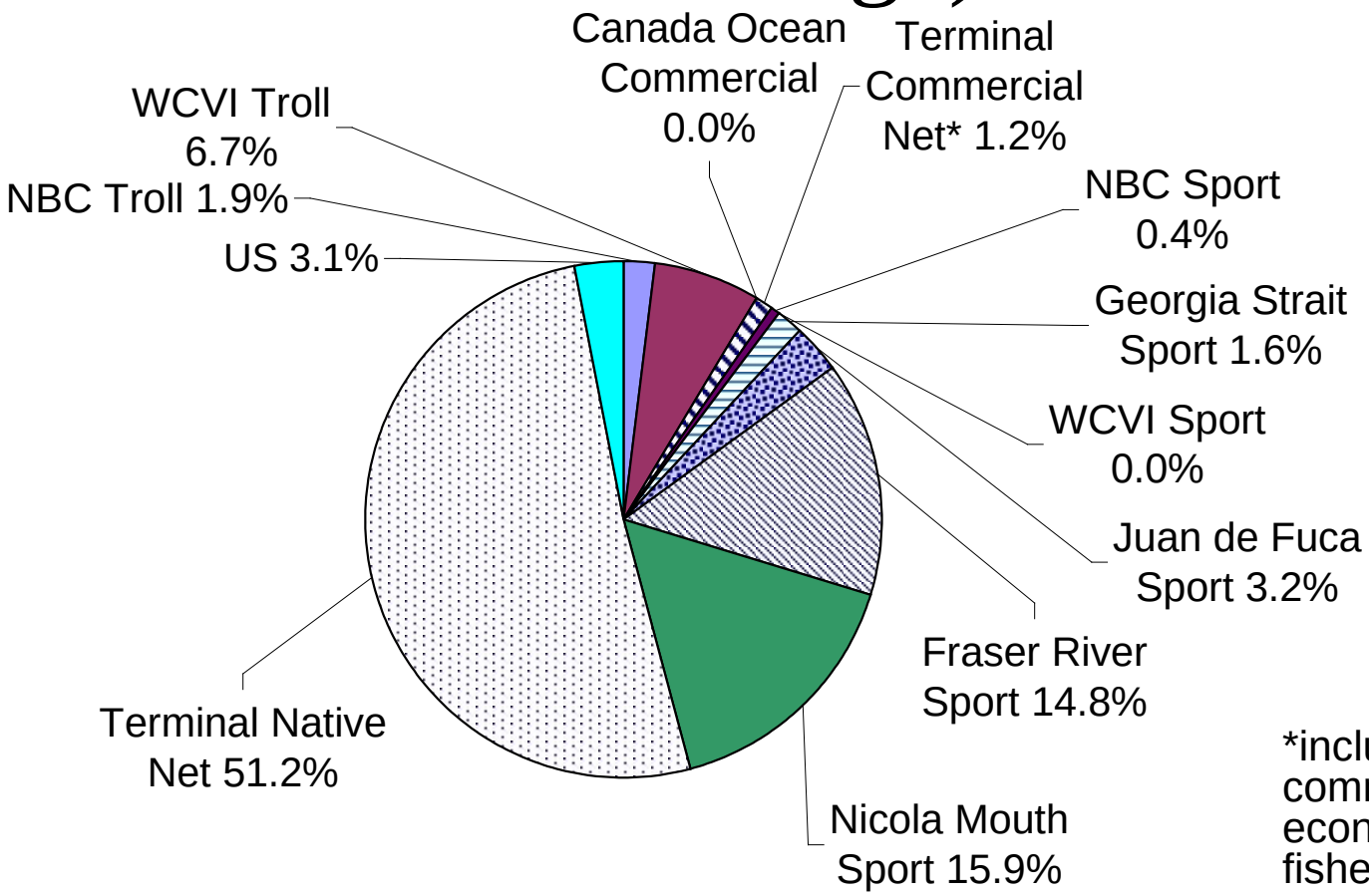
- Exploitation rate indicators- CWT data for Spring 4_2, Summer 4_1 and Fraser Fall.
- Run Reconstruction- trends of catch and harvest rates *in Fraser River fisheries only*
- DNA information available (not provided here)
  - Regular sampling in area F troll fishery
  - Limited samples for other areas and times

3. Total Exploitation Rates (ER)

- Total Canadian and US exploitation rates based on CWT data
- Additional management actions reduced ER for Spring 4_2 in 2008
- Dome CWT discontinued
- No Summer 5_2 CWT indicator

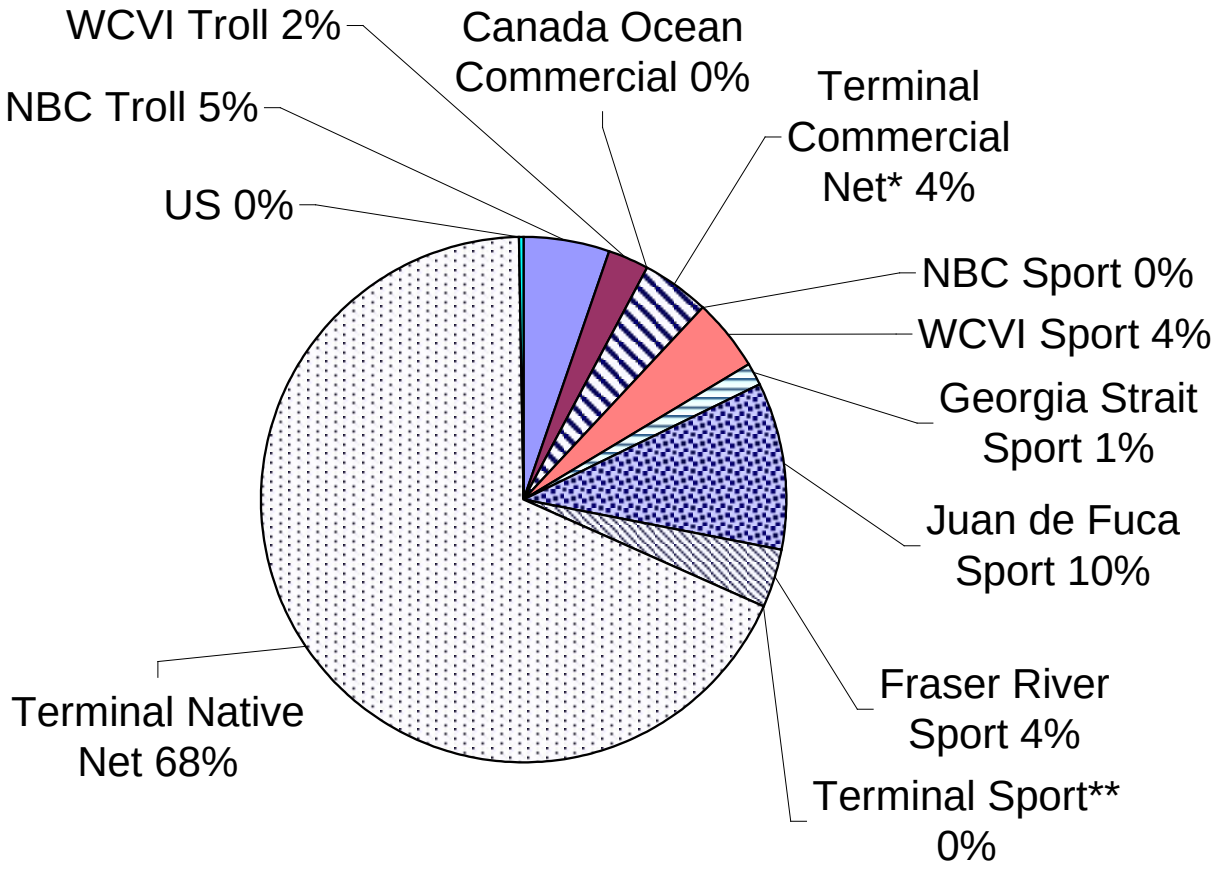


3. Distribution of Fishing Mortality –Spring 4_2 (Nicola CWT: 2006-08 average)



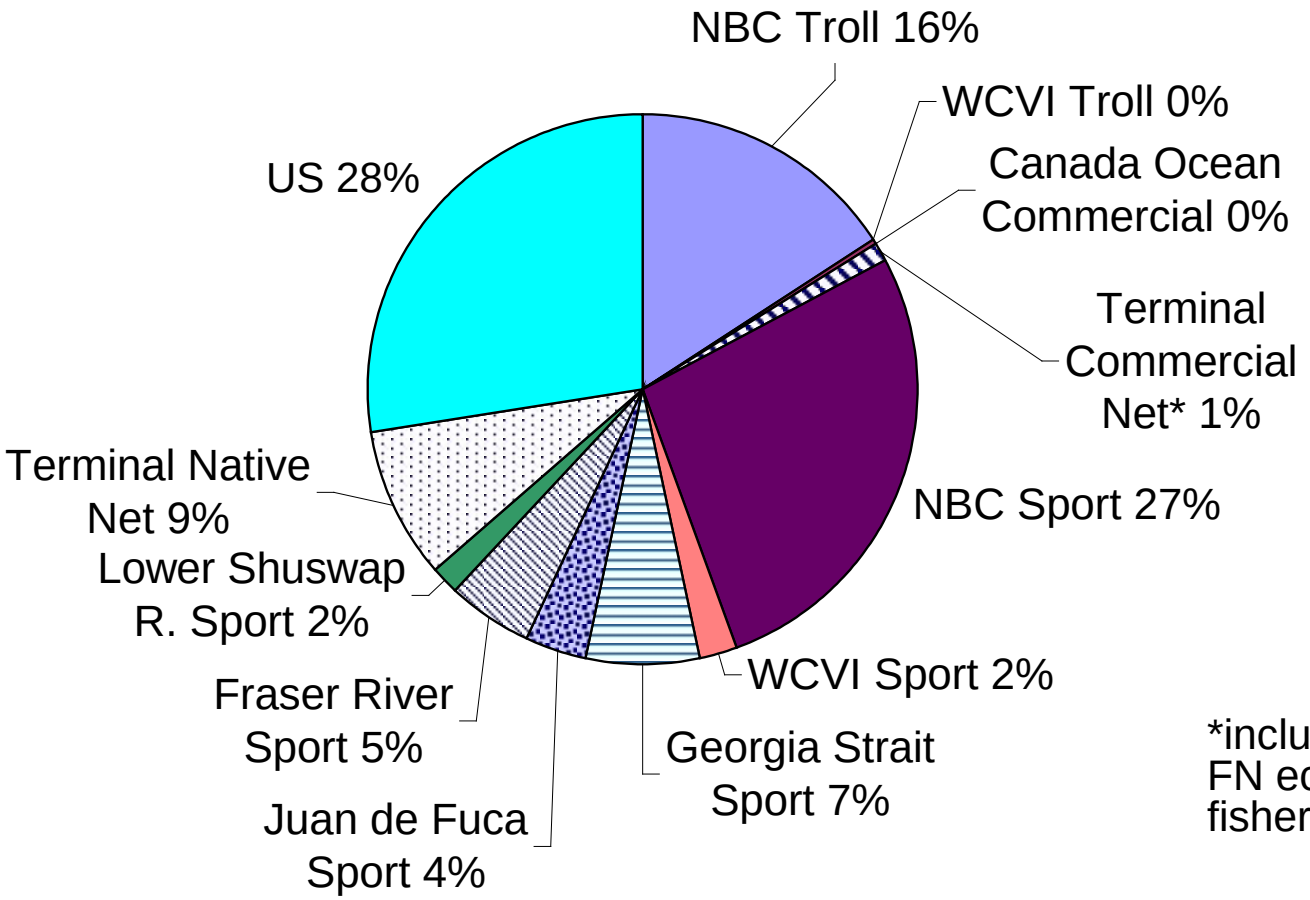
*includes commercial, FN economic and test fishery

3. Distribution of Fishing Mortality –Spring 5_2 (Dome CWT: 2003, ’05,’06 average)



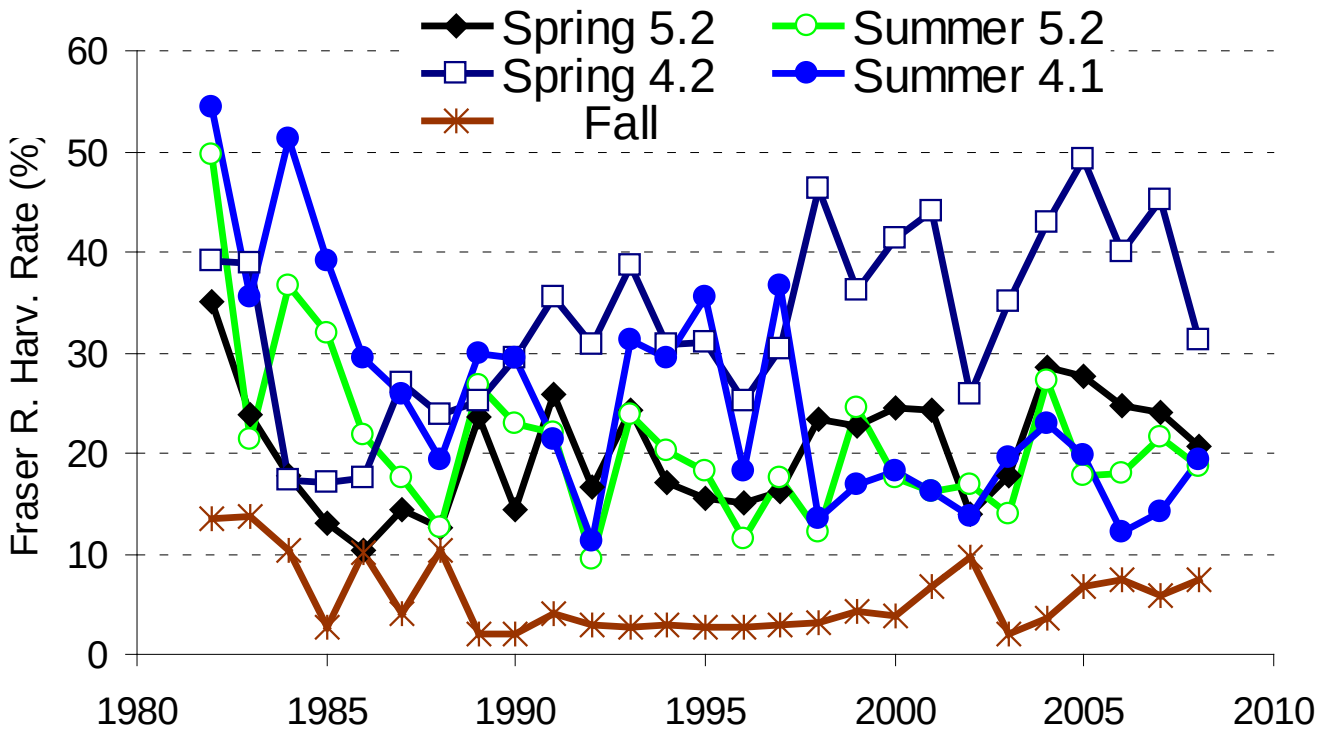
*includes commercial, FN economic and test fisheries

3. Distribution of Fishing Mortality –Summer 4_1 (L. Shuswap CWT: 2006-08 average)



*includes commercial, FN economic and test fishery

3. Fraser River Run Reconstruction



- Harvest rate trend information, but only for Fraser River fisheries.
- Marine fisheries not included in the reconstruction.

4. 2010 Expectations

Salmon Outlook

- Spring Run 4_2: Outlook status 1, *stock of concern* (last year = 1)
- Spring Run 5_2: Outlook status 1, *stock of concern* (last year = 1)
- Summer Run 5_2: Outlook status 1, *stock of concern* (last year = 1)
- Summer Run 4_1: Outlook status 3 / 4, *near target / abundant* (last year = 3)
- Fraser Late: Outlook status 2, *low* (last year = 2)

4. Future Projections of Spring 4_2 Returns

Return Yr	Recent Average (last 4 returns: R/S = ~ 0.62)	2000-2009 Average (R/S =~ 2.16)	1988-1999 Average (R/S=~3.37)
2010	6,626	22,969	35,837
2011	1,648	5,713	8,914
2012	7,080	24,542	38,290
2013	1,510	5,234	8,166

- Projections are total chinook returns before fisheries
- Based on R/S calculated for Spring $4_2$for ocean entry years 1991 to 2007 and parental brood spawner abundance
- Spawners that produce maximum sustainable harvests (S_{msy}) for these populations is estimated at 26,072

4. Future Projections of 5_2 Returns

Return Yr	Like 4_2 in 2009 (R/S =~ 0.37)	Recent Average (last 3 returns; R/S =~ 0.64)	2000-2009 Average (R/S =~ 1.23)	1988-1999 Average (R/S=~2.0)
2010	19,286	33,307	64,269	103,206
2011	20,044	34,617	66,796	107,264
2012	10,462	18,069	34,865	55,987
2013	15,853	27,378	52,828	84,833

- Projections are total chinook returns before fisheries
- Based on R/S calculated for age 5 stream type (Spring 5_2 + Summer 5_2) for ocean entry years 1991 to 2007 and parental brood spawner abundance
- The spawners that produce maximum sustainable harvests (S_{msy}) for these populations is estimated at 124,080.
- Very low returns projected if R/S experienced by Spring 4_2 in 2007 ocean entry year also affects 5_2 aggregates
- 2009 IFMP identified a management reference point at a return of 40,000 adults at Albion test fishery (after marine fisheries)

5. Post-season Reviews

- Plans to finalize 2008 Early-timed chinook post-season review
  - Incorporation of CWT data for 2007 and 2008
  - Documentation of model assumptions and limitations
  - Post-season review of Early-timed chinook to be discontinued.
- Future post-season reviews
  - PST aggregates to be used for post-season reviews in subsequent years.
  - Annual post-season reports completed by the PST Chinook Technical Committee (CTC).
    - Catch and escapement data through 2009 (January 2010)
    - Total fishing mortalities and CWT analysis through 2009. (April 2010)
- Post-season review schedule means there is a 2 year lag for assessing any new management actions to allow exploitation rates to be assessed based on CWT data (e.g. analysis of CWT data for 2009 fisheries will be available in April 2010, plans adjusted for 2011 fisheries)
- Effects of new Pacific Salmon Treaty harvest reductions implemented in 2009 season will not be assessed until April 2010.

5. 2010 Planning Priorities

Item	Date
1. Interim Benchmarks and Status Assessment	January 2010
2. Fishery Management Objectives for 2010/11 IFMP •Spring 4_2, Spring 5_2 and Summer 5_2 priority	Jan-Feb 2010 (Spring 4_2) March 2010 (others)
3. Development of Alternative Fishery Management Options	Jan-Feb 2010 (Spring 4_2) March 2010 (others)
4. Release of Fraser River Chinook Information Document	February 2010
5. Implement Spring 4_2 Management Approach	March 2010

5. 2010 Salmon IFMPs Content + Process

- South and North Coast IFMP's: Identify current policies and objectives relating to salmon management
- Identifies stocks of concern and constraints for fishery planning
- Identifies anticipated fishing opportunities for 2010
- Post-season report on 2009 management objectives
- Process: feedback on IFMP's at SFAB meetings and Integrated Harvest Planning Committee (IHPC)
- 1st Draft released: March 17th, 2010
- Comments until: April 26, 2010
- 2nd Draft released: April 30, 2010
- Final review by IHPC: May 6-7, 2010

5. Future Work Plan and Timelines

Item	Date
1. Finalize Lower Benchmarks	2010/11
2. Report on CU Status (PSARC review?)	2010/11
3. Chinook production model development	
4. Fishery Decision Rules and Reference Points by MU	
5. Development of in season abundance indicators by MU	
6. PST Escapement Goal Development	
7. Development of Exploitation Rate Indicators for Spring 5_2 and Summer 5_2 MU's?	

Additional Slides

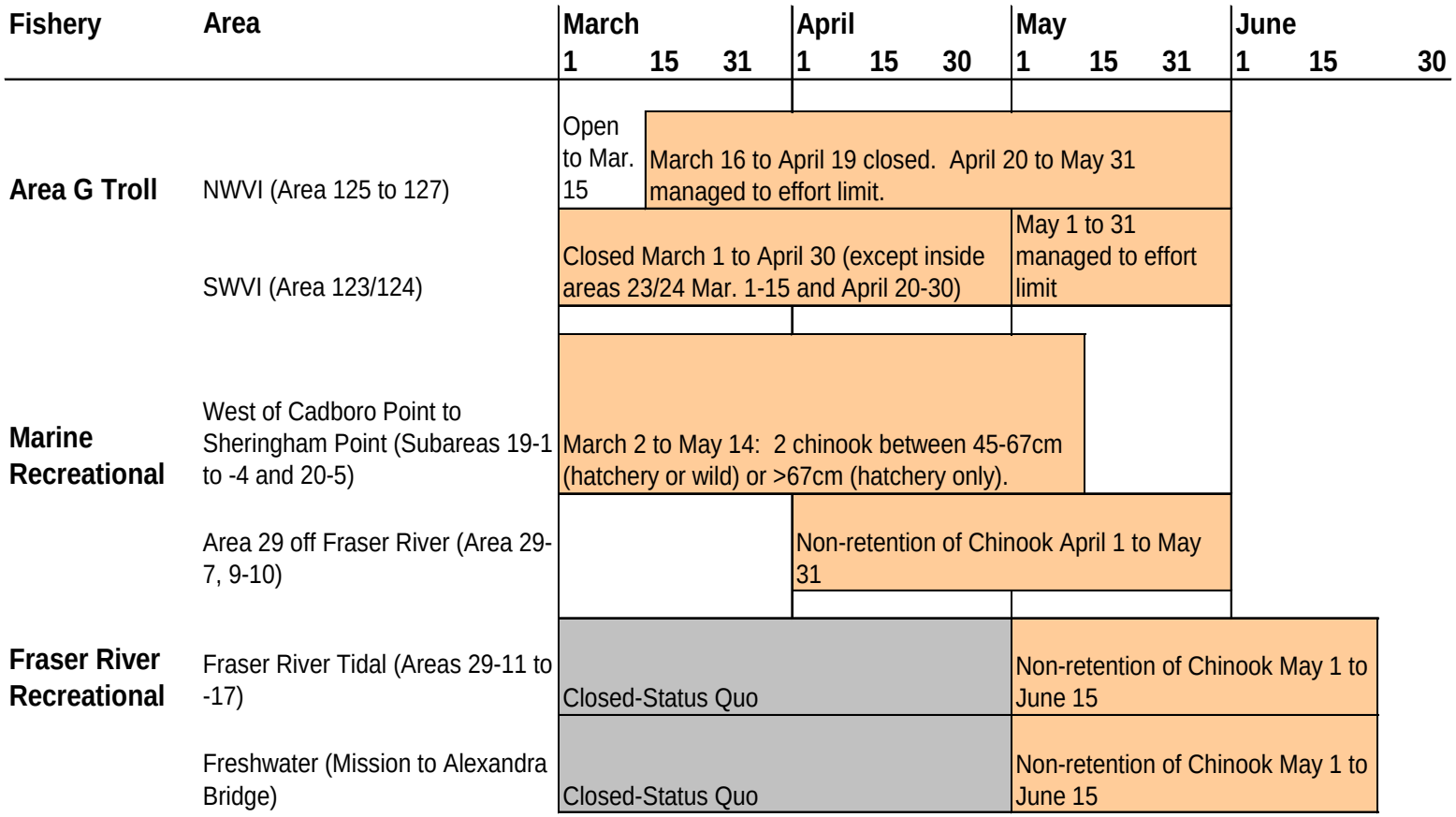
2009 Early Timed Chinook Management

2009/10 IFMP Objective:

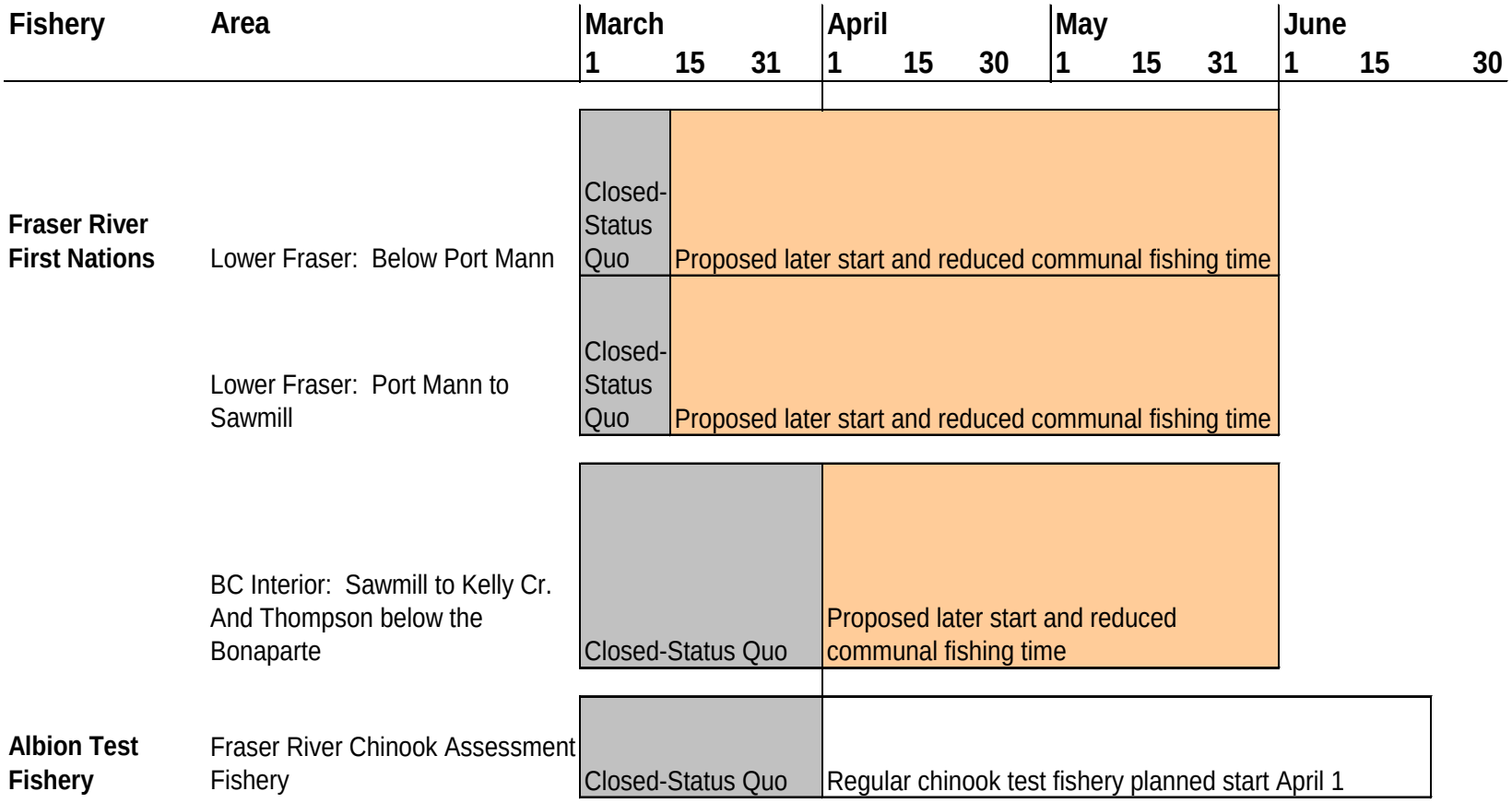
The objective is to implement management actions that will reduce the exploitation rate approximately 50% relative to the 2006 and 2007 period.

- Revisions to the management approach to be considered for 2010.

Early Timed Chinook 2009 Management Actions



Early Timed Chinook 2009 Management Actions



2009 Spring and Summer 5_2 Chinook Management Approach

- In-season estimate of predicted return of SS chinook to the Fraser based on the Albion test fishery used to guide management actions
- PST process recognized rebuilding of population spawner abundance from 30,050 average in 1979 to 1982 base period.
- 2009 IFMP identified 2 management zones based on whether the in-season estimate of the predicted return is above or below 40,000. A return of 40K with a 25% harvest rate would result in 30K spawners.

Zone	Predicted Return to the Fraser River	Rationale
2	Above 40,000	Rebuilding required; continue to use management actions implemented in previous years prior to 2008. (e.g. remove recreational and commercial restrictions implemented in 2008, allow additional FSC fishing time)
1	Below or equal to 40,000	First Nations opportunities similar as in 2006-2008. Management actions to reduce harvest in recreational and commercial fisheries similar to 2008.

2009 Zone 1 Management Approach

- Department proposes to use management actions similar to those implemented in 2008 as a starting point for discussion of the 2009 management approach.
- **First Nations –** Directed fishing opportunities. Similar Chinook directed harvest opportunities as in 2006-2007 from June 1 until August 8.
- **Recreational –**Similar regulations in marine waters. Fraser River (including areas 29-6 to 29-10 and appropriate tributaries) management actions:
  - Closed to end of June then 1 chinook per day greater than 30 cm but less than 77cm from July 1 to July 30th to protect larger SS chinook)
- **Commercial –**Full fleet Area G harvest opportunities in June constrained to maintain effort levels similar to recent years. Limited large plug fishery in offshore areas delayed to August.

2009 Zone 2 Management Approach

- In **zone 2** (higher abundance than zone 1), the Department proposes to relax management measures and provided the possibility of increased Chinook directed harvest opportunities for First Nations in the Fraser River.
- Note: Although a very low return (e.g. below 20 to 25K) is not expected in 2009, the Department is reviewing additional fishery measures that would be considered. Feedback would be sought on these .
- In 2009, fisheries were managed based on zone 2 based on an estimated return to the Fraser >40K based on the Albion test fishery

2009 Preliminary Fraser Chinook Catch [a]

FN FSC	
Lower Fraser	25,834
BC Interior	2,707
FN Ec./Demo. Fisheries	
Lower Fraser	3,626 [b]
BC Interior	534
FN ESSR	
Lower Fraser	5,000 [c]
BC Interior	0
Commercial	
Lower Fraser	3,713 [d]
BC Interior	0
Recreational	
Lower Fraser	18,099 [e]
BC Interior	3,480
All Catch	
Lower Fraser	56,272
BC Interior	6,721
Total	**62,993**

[a] Catch includes jacks

[b] Target species was chum and pink

[c] Catch is in terminal areas and 4,902 were jacks

[d] Catch is test fishery catch

[e] 9,218 Chinook were retained in the Fraser River mainstem