

Commission of Inquiry into the Decline of
Sockeye Salmon in the Fraser River



Commission d'enquête sur le déclin des
populations de saumon rouge du fleuve Fraser

Public Hearings

Audience publique

Commissioner

L'Honorable juge /
The Honourable Justice
Bruce Cohen

Commissaire

Held at:

Room 801
Federal Courthouse
701 West Georgia Street
Vancouver, B.C.

Wednesday, February 2, 2011

Tenue à :

Salle 801
Cour fédérale
701, rue West Georgia
Vancouver (C.-B.)

le mercredi 2 février 2011

APPEARANCES / COMPARUTIONS

Wendy Baker, Q.C. Maia Tsurumi	Associate Commission Counsel Junior Commission Counsel
Hugh MacAulay Jonah Spiegelman	Government of Canada
No appearance	Province of British Columbia
No appearance	Pacific Salmon Commission
No appearance	B.C. Public Service Alliance of Canada Union of Environment Workers B.C. ("BCPSAC")
No appearance	Rio Tinto Alcan Inc. ("RTAI")
No appearance	B.C. Salmon Farmers Association ("BCSFA")
No appearance	Seafood Producers Association of B.C. ("SPABC")
No appearance	Aquaculture Coalition: Alexandra Morton; Raincoast Research Society; Pacific Coast Wild Salmon Society ("AQUA")
Tim Leadem, Q.C.	Conservation Coalition: Coastal Alliance for Aquaculture Reform Fraser Riverkeeper Society; Georgia Strait Alliance; Raincoast Conservation Foundation; Watershed Watch Salmon Society; Mr. Otto Langer; David Suzuki Foundation ("CONSERV")
Don Rosenbloom	Area D Salmon Gillnet Association; Area B Harvest Committee (Seine) ("GILLFSC")

APPEARANCES / COMPARUTIONS, cont'd.

No appearance	Southern Area E Gillnetters Assn. B.C. Fisheries Survival Coalition ("SGAHC")
No appearance	West Coast Trollers Area G Association; United Fishermen and Allied Workers' Union ("TWCTUFA")
No appearance	B.C. Wildlife Federation; B.C. Federation of Drift Fishers ("WFFDF")
No appearance	Maa-nulth Treaty Society; Tsawwassen First Nation; Musqueam First Nation ("MTM")
No appearance	Western Central Coast Salish First Nations: Cowichan Tribes and Chemainus First Nation Hwlitsum First Nation and Penelakut Tribe Te'mexw Treaty Association ("WCCSFN")
Brenda Gaertner Leah Pence	First Nations Coalition: First Nations Fisheries Council; Aboriginal Caucus of the Fraser River; Aboriginal Fisheries Secretariat; Fraser Valley Aboriginal Fisheries Society; Northern Shuswap Tribal Council; Chehalis Indian Band; Secwepemc Fisheries Commission of the Shuswap Nation Tribal Council; Upper Fraser Fisheries Conservation Alliance; Other Douglas Treaty First Nations who applied together (the Snuneymuxw, Tsartlip and Tsawout)
No appearance	Adams Lake Indian Band
No appearance	Carrier Sekani Tribal Council ("FNC")
No appearance	Council of Haida Nation

APPEARANCES / COMPARUTIONS, cont'd.

No appearance	Métis Nation British Columbia ("MNBC")
Tim Dickson	Sto:lo Tribal Council Cheam Indian Band ("STCCIB")
No appearance	Laich-kwil-tach Treaty Society Chief Harold Sewid Aboriginal Aquaculture Association ("LJHAH")
No appearance	Musgamagw Tsawataineuk Tribal Council ("MTTC")
No appearance	Heiltsuk Tribal Council ("HTC") Articled Student

TABLE OF CONTENTS / TABLE DES MATIERES

	PAGE
PANEL NO. 16:	
TIMBER WHITEHOUSE	
In chief by Ms. Baker	2/10/11/13/15/20/22/24/26/30/31 34/39/40/41/42/43/45/49-54/59-63/66 68-71
Cross-exam by Mr. MacAulay	77/79/81-82/85/88/90
Cross-exam by Mr. Leadem	91
BRIAN RIDDELL	
In chief by Ms. Baker	1/9/11/12/13/14/18/21/22/25/29 31/34/38/39/40/41/43/44/45/49-53/59-62/66 68-70/74
Cross-exam by Mr. MacAulay	78/80-82/84/86/89
Cross-exam by Mr. Leadem	91

EXHIBITS / PIECES

<u>No.</u>	<u>Description</u>	<u>Page</u>
379	<i>Curriculum Vitae</i> of Timber Whitehouse	3
380	Email dated February 3, 2010, from Timber Whitehouse to Alan Cass	36
381	Salmon Stock Assessment Plan 2004/05	41
382	Draft Decision Note from Brian Riddell to Regional Director General, July 9, 2007	48
383	E-mail from Chuck Parken to Brian Riddell, July 7, 2005, with attached Summary of Historical Funding for Stock Assessment Budgets, BCIA, FY 98/99 - FY 05/06	54
384	Impact Statement STAD Budget Challenge 2002-2003 BCIA - FRS enumeration 2003	57
385	Letter from Pacific Salmon Commission, Concern re Escapement Assessment Programs, August 26, 2002	58
386	Memorandum from Pacific Salmon Commission with attachments, Fraser River Sockeye and Pink Spawning Enumeration Programs, May 1, 2003	59
387	E-mail from Gord Sterritt to Timber Whitehouse and others, NSTC - DFO STAD Activities in the NStQ Territories for 2009, May 5, 2009	64
388	Fraser Stock Assessment: Operational Project Budgets 2000/01 - 2009/10 (\$K's)	80

1
PANEL NO. 16
In chief by Ms. Baker

1 Vancouver, B.C. /Vancouver
2 (C.-B.)
3 February 2, 2011/le 2 fevrier
4 2011
5

6 THE REGISTRAR: The hearing is now resumed.

7 MS. BAKER: Mr. Commissioner, today we are going to be
8 addressing the topic of stock assessment, and we
9 have two witnesses, one of whom you've met before,
10 one who is new to you. We have Timber Whitehouse
11 and Brian Riddell. So maybe you could go ahead
12 and swear these witnesses.
13

14 TIMBER WHITEHOUSE, affirmed.

15 BRIAN RIDDELL, recalled.
16
17

18 THE REGISTRAR: Could you state your full name, please?

19 MR. WHITEHOUSE: My name is Timber Reginald Whitehouse.

20 THE REGISTRAR: Thank you. Counsel?

21 MS. BAKER: Thank you.
22

23 EXAMINATION IN CHIEF BY MS. BAKER:
24

25 Q Dr. Riddell, you've already testified in these
26 proceedings and we've reviewed your qualifications
27 on other days. I just want to highlight a couple
28 of things to do with stock assessment in
29 particular.

30 From 1979 to 2001, you were a research
31 scientist at the Department of Fisheries and
32 Oceans, and you were the program manager for
33 various programs and sections related to Pacific
34 salmon stock assessment; is that right?

35 DR. RIDDELL: Yes, it is.

36 Q Including population genetics research and
37 international fisheries issues relating to Pacific
38 salmon stock assessment?

39 DR. RIDDELL: Yes.

40 Q And then sometime in 2001 and through to part of
41 2004, you were the science advisor for the Pacific
42 Fisheries Resource Conservation Council? It was a
43 secondment from the Department of Fisheries and
44 Oceans?

45 DR. RIDDELL: That's correct. Specifically, I was away
46 from the Department from September 2001 through
47 March 2004.

February 2, 2011

2
PANEL NO. 16
In chief by Ms. Baker

1 Q And then you returned to the Department in March
2 '04 and became the advisor on Pacific salmonids at
3 the office of the Director, Science Branch?
4 DR. RIDDELL: Yes.
5 Q And from 2005 to 2009, you were the division head,
6 Salmon and Freshwater Ecosystems, Science Branch,
7 DFO?
8 DR. RIDDELL: That's correct.
9 Q And as the division head, the acronym -- we have a
10 lot of acronyms in this world it seems -- so the
11 acronym for Salmon and Freshwater Ecosystems is
12 SAFE, and as a division head of SAFE, you were in
13 charge of salmon stock assessment, including
14 Fraser River salmon stock assessment?
15 DR. RIDDELL: Yes.
16 Q And currently, as I think we've identified
17 previously, you're the CEO and president of the
18 Pacific Salmon Foundation?
19 DR. RIDDELL: That's correct.
20 Q Okay. Thank you.
21 And, Mr. Whitehouse, you're c.v. is attached
22 in the binder before you in Tab 11, and it's CAN
23 285162 and it's on the screen in front of you.
24 You have a Bachelor of Zoology from UBC?
25 MR. WHITEHOUSE: That's correct.
26 Q You were a fisheries technician at the
27 International Pacific Salmon Commission from '82
28 to '83?
29 MR. WHITEHOUSE: Correct.
30 Q And you've been with the Department since 1984?
31 MR. WHITEHOUSE: That is correct.
32 Q You've been a research technician in various
33 capacities and have been within the Stock
34 Assessment Division up to the present?
35 MR. WHITEHOUSE: Correct.
36 Q And from 2005 to the present, you have been the
37 Area Chief of Fraser River Salmon Stock Assessment
38 Program?
39 MR. WHITEHOUSE: Correct.
40 Q And as Area Chief for the Fraser River Salmon
41 Stock Assessment Program, you're responsible for
42 enumeration of sockeye spawning escapements in the
43 Fraser River?
44 MR. WHITEHOUSE: That's correct.
45 Q And the Fraser River Salmon Stock Assessment
46 Program provides science support for stock
47 assessment including determining production and

February 2, 2011

1 processes affecting production of salmon in the
2 Fraser River watershed?

3 MR. WHITEHOUSE: That is correct.

4 Q And I take it that the Stock Assessment Division
5 deals with other salmon stocks in the Fraser River
6 watershed, not just sockeye.

7 MR. WHITEHOUSE: That's correct. We're responsible for
8 assessment of all five species that are under
9 federal jurisdiction.

10 Q And your work is exclusively in the freshwater
11 environment?

12 MR. WHITEHOUSE: Yes, we work exclusively within the
13 freshwater environment.

14 Q Thank you. I haven't spent a lot of time looking
15 at your c.v., but I would like it marked to go
16 into the record as an outline of your history with
17 the stock assessment portfolio.

18 MS. BAKER: Could that be marked as the next exhibit?

19 THE REGISTRAR: Exhibit number 379.

20

21 EXHIBIT 379: *Curriculum vitae* of Timber
22 Whitehouse

23

24 MS. BAKER:

25 Q I'm going to begin my questions by going through
26 some of the current programs for Fraser River
27 sockeye stock assessment, and the questions are
28 primarily directed to Mr. Whitehouse, to begin
29 with. So I would like -- if you could please just
30 go through with me, in an overview, what are the
31 Fraser River stock assessment programs that are
32 currently being used by the Department?

33 MR. WHITEHOUSE: Yes, certainly. I highlight that we
34 are a science-based program working on all species
35 as we mentioned earlier. We work on Fraser River
36 sockeye assessment. That includes the terminal
37 area escapement estimation, estimation of juvenile
38 life history stage, abundances within the
39 watershed, number of locations. We also work on
40 the evaluation and assessment of the data
41 collected within those programs, and in the
42 capacity of forecasting the program abundances
43 associated with annual sockeye forecasting for
44 production purposes.

45 We also work on chinook and coho stocks, so
46 we have a program organized on the chinook and
47 coho. It contributes to exactly the same

1 elements, the assessment of adult escapement
2 within the watershed. We also evaluate juvenile
3 abundance and life history characteristics and
4 have a component that is involved in the
5 production, forecasting and technical evaluation
6 of data collected in association with the
7 management programs that we operate there.

8 We also have a program that focuses on chum
9 and pink salmon within the watershed, collecting
10 the same types of information on a limited basis
11 with those two species.

12 That, in a nutshell, wraps up the major focus
13 with respect to the work that we do.

14 Q Okay. I'm going to go, then, to a little bit more
15 detail on some of those. We'll just identify - I
16 think we'll come back to this in more detail - but
17 just to identify now, there are -- and I think
18 you've confirmed that you do escapement
19 enumeration on spawning grounds?

20 MR. WHITEHOUSE: That's correct. Escapement
21 enumeration involving the assessment of adult
22 spawning stocks of salmon as they return to their
23 spawning grounds including the detailed assessment
24 and calculation of abundance. They also work on
25 programs that help characterize biological
26 attributes or traits of the populations that we've
27 assessed on the spawning grounds.

28 Q Okay. And then just to kind of go through some of
29 these other programs, because we'll spend a bit
30 more time on the adult programs, do you do fry
31 assessments?

32 MR. WHITEHOUSE: We do do fry assessments. There are a
33 number of fry assessments that occur within the
34 watershed: assessments of fry production out of
35 incubation habitat, that is, newly-emergent fry,
36 spring programs. Those are directly operated
37 within the mandate of my program.

38 We also undertake, in conjunction with the
39 habitat assessment science component at Cultus
40 Lake's labs, assessments of summer/fall fry
41 abundances in sockeye nursery lakes throughout the
42 watershed, and in conjunction with that, there are
43 frequently follow-up assessments of fall fry
44 abundances within nursery lakes in the watershed.

45 Q And are those assessments done on all systems
46 within the Fraser watershed?

47 MR. WHITEHOUSE: No, they're not done on all systems.

1 They're done on a select few throughout the
2 watershed, largely strategically focused based on
3 information requirement needs.

4 Q Where are they done?

5 MR. WHITEHOUSE: When we talk about spring projects,
6 those have been done recently out of artificial
7 spawning channels throughout the watershed, so
8 that would at Nadina, at Gates Creek, and from the
9 Horsefly spawning channel as well as Weaver
10 spawning channel. Fall -- or summer fry
11 assessments for sockeye abundance in nursery lakes
12 have been largely restricted to, in recent years,
13 the Shuswap system and the Quesnel system. As
14 well, we've done -- there has been some recent
15 work done at Chilko Lake.

16 Q And are those assessments done on a yearly basis
17 in the sites you identified?

18 MR. WHITEHOUSE: They're done as required, and largely
19 associated with information needs. There's not
20 necessarily a need to do assessments every year
21 annually. If you think about the information
22 need, it largely relates to fry recruiting from
23 large spawning abundances, so it occurs in the
24 year following large escapements to systems.

25 Q And just to make sure we all know what you're
26 talking about, when you talk about a fry
27 assessment year, what are you counting on a fry
28 assessment? You're counting how many fish in a
29 system, and how do you do that?

30 MR. WHITEHOUSE: Different techniques depending upon
31 the life history stages that we're attempting to
32 evaluate in the context of fall fry -- or spring
33 fry programs. We're looking at marker capture
34 programs, using capture techniques as fry migrate
35 from their spawning gravel downstream into the
36 nursery lakes. So we use largely marker captures
37 there, or out of the spawning channels they use
38 what are called proportional fraction samplers.

39 If we're talking about the assessment of
40 summer or fall fry in nursery lakes, we're dealing
41 with a different technique altogether there. We
42 use in-lake hydroacoustic techniques to evaluate
43 total populations. In both cases, back to your
44 original question to frame (sic), we are
45 attempting to estimate total sockeye fry abundance
46 at the particular life history stage.

47 So spring programs, that would be in relation

1 to fry migrating from the gravel into the nursery
2 lake. In the case of a summer fry estimate, we're
3 talking about estimating fry abundance in the June
4 timeline within the nursery lake using
5 hydroacoustics. Then in the fall, again,
6 hydroacoustics-based estimate, total abundance of
7 fry based on distribution of the surveys
8 throughout the lake.

9 Q And were those types of fry surveys done under the
10 old International Pacific Salmon Commission?

11 MR. WHITEHOUSE: Yes, there's been -- an estimation of
12 fry abundance has been a component of the data,
13 information collected on a regular basis for
14 Fraser River sockeye assessment back to the IPSFC
15 days.

16 Q Once that information has been collected by your
17 group, how is that information used in Fraser
18 River sockeye management?

19 MR. WHITEHOUSE: It informs a number of pieces of
20 process. First of all, I think most importantly,
21 you have to look at what the information may
22 provide in terms of understanding potential
23 production bottlenecks. With respect to fry data,
24 we're looking to understand whether or not there
25 are limitations associated with incubation habitat
26 quality. Are the number of spawners present on
27 the spawning grounds sufficient to demonstrate a
28 reduced fry production in relation to the numbers
29 of fry present -- or spawners present, excuse me.

30 In the case of the in-lake nursery
31 assessments, the summer and fall assessments,
32 we're looking to get an understanding of the
33 impact of various levels of fry entering the lake
34 on that lake's ability to produce sockeye - a
35 concept called carrying capacity - from a
36 biological perspective, and an understanding of
37 whether or not the fry entering the lake may have
38 their survival affected by the numbers that
39 recruit into the lake.

40 These have the potential to feed into
41 production forecasting if the data are collected
42 in a consistent manner. They also have the
43 benefit, in terms of strategic program
44 implementation, that they may tell you that there
45 are issues in terms of potential fry output for a
46 given year in a given stock.

47 Q So can you explain what that means?

1 MR. WHITEHOUSE: I think the key concept would be if
2 we're seeing situations where we've got high
3 abundance recruiting into a sockeye nursery lake,
4 if in undertaking summer or fry fall estimates,
5 for example, would tell us whether or not the
6 expected abundance produced the subsequent spring
7 would be average, greater than average or less
8 than average.

9 Q Okay. And the next area I wanted to cover is
10 nursery lake productivity assessments, and I think
11 this is something different from what you've just
12 been talking about; is that right?

13 MR. WHITEHOUSE: That is correct. They are linked.
14 We're are talking about habitat assessments of
15 nursery lakes. We're dealing with a discipline
16 called limnology. The purpose of the assessment
17 in these cases is to determine ecosystem-type
18 impact that -- or the linkages between Fraser
19 River sockeye and the lake that they're rearing
20 in.

21 Nursery lake productivity assessments involve
22 detailed assessment of algae communities,
23 zooplankton communities, which are the food basis
24 which sockeye feed on, as well as the chemical and
25 physical properties of the lake nutrients present
26 in the system that support the sockeye food webs.

27 I mentioned earlier the concept of carrying
28 capacity, the ability of a lake to support
29 sockeye, juvenile sockeye. Nursery lake
30 productivity assessments are used to give us a
31 handle on what the capacity, based on the linkage
32 between the juvenile assessment and the
33 limnological parameters are.

34 Q And where does this -- what's the breadth of this
35 limnology program? How many lakes are examined in
36 your program?

37 MR. WHITEHOUSE: Well, over the years, most of the
38 major nursery lakes within the Fraser drainage
39 have been assessed. The key focus in recent years
40 has been on the Shuswap Lake system, Quesnel Lake
41 and Chilko Lake.

42 Q And so how often is work done to review or assess
43 the limnology, if that's the way to phrase it, in
44 these lakes?

45 MR. WHITEHOUSE: The strategic approach that is taken,
46 in terms of assessing, is a follow-up normally
47 associated with years of large abundance, spawning

1 abundance, so that it would occur in the year
2 following a large spawning abundance. Very
3 predictable in the context of the Shuswap system,
4 and that's a system which is dominant and sub-
5 dominant on the 2002, 2006, 2010 cycle for
6 dominant, and 2003, '07 and '11 on the sub-
7 dominant. So important to be conducting the
8 limnology assessments on those years. Similarly,
9 at Quesnel, it follows on the year that juveniles
10 are rearing from large spawning escapements.

11 Q So it's done simply on certain cycle lines for
12 those lakes that you've described?

13 MR. WHITEHOUSE: Those are the important or critical
14 pieces of information that need to be collected,
15 yes.

16 Q And so would it be just one year out of four, or
17 would it be two years out of four, or how would it
18 be done?

19 MR. WHITEHOUSE: It could be one or two years out of
20 four depending upon escapement abundances.

21 Q Okay. I'm sure I'm not using this terminology
22 properly, but have those limnological assessments
23 been done to a greater degree in the past or
24 what's the status if you were to compare to the
25 past type of work done and today? Is it more or
26 less today or the same?

27 MR. WHITEHOUSE: There has been a period associated
28 with the old IPSFC, the International Pacific
29 Salmon Commission period, prior to 1985, when
30 there was a structured program that evaluated
31 nursery lake capacity on a regular basis. It
32 would have been structured very much in the way
33 I'm identifying here, although they would have
34 wanted to collect baseline information to
35 understand what a lake looks like under a low
36 abundance versus a high abundance situation in
37 terms of fry recruiting into the system.

38 Once you get that baseline information out of
39 the limnological surveys, then it becomes more
40 important to do follow-up in terms of these
41 dominant abundance years to look at the impact of
42 sockeye fry as they graze on the food source in
43 the lake, to see the impacts that they're having
44 upon the nursery and its capacity.

45 One of the outputs in the linkage back to the
46 fry programs we talk about is a lake that is not
47 being heavily grazed produces big fry. A lake

1 that is being grazed heavily, such that there may
2 be competition for the food resources, produces
3 smaller fry 'cause the densities of fry get higher
4 in the lake due to large spawning escapements.
5 You'll see a signal from the fish population that
6 their fry size decreases in either the summer or
7 fall surveys.

8 Q Dr. Riddell, you had something to add?

9 DR. RIDDELL: Maybe just to emphasize a couple of
10 points that Timber is talking about here. But
11 when we do the fry assessments, you should really
12 think of that as probably the sort of first level
13 assessment of the management objectives. These
14 objectives tend to be set on a spawner to fish
15 recruiting to fishery, and then the subsequent
16 spawner, so adult to adult.

17 But one of the ways that we track whether or
18 not these are in the appropriate range, are they
19 too high or are they too low, well, then we do the
20 ecological assessments on whether you're getting
21 good production and survival of the fry.

22 So Timber talked about the early assessment
23 of fry in the gravel and we use that to look at
24 habitat capacity of spawning areas. You can
25 estimate management objectives simply based on
26 available spawning space. There are estimates of
27 those.

28 When you start talking about the nursery lake
29 productivities, I simply wanted to bring out that
30 there's actually been two major thrusts. There
31 has been the work done by the old IPSFC and
32 evolved into the current program. There was a
33 serious effort through the mid-'70s and through
34 the '80s in Science Branch. At that time, it was
35 the Fisheries Research Board. Dr. John Stockner
36 did extensive work on the limnology, productivity
37 and fish communities of the Fraser Lake systems so
38 you could look at what are the appropriate
39 carrying capacities of those lakes and what are
40 production potentials. Where would you choose to
41 invest money in spawning channels or lake
42 enrichment as an enhancement program, for example?

43 So Science Branch was looking, at that time,
44 at opportunities for development. And where there
45 have been dams built, for example, we have
46 spawning channels. What is the effect of the fry
47 production out of those? So those problems come

1 in.

2 I also wanted to bring up in the limnological
3 work, there is extensive work done on trawling.
4 The reason for that is that the fish community of
5 the lake also determines what the sockeye
6 productivity can be. There are of course sockeye-
7 like fish called kokanee which are resident in the
8 lake. They are also counted on the
9 hydroacoustics. So the Department developed this
10 trawl system so they do the hydroacoustics, but it
11 has to be matched with an extensive program of
12 trawling so you can get the species
13 identification.

14 Mr. Commissioner, it's very, very similar to
15 the idea of the hydroacoustics discussion last
16 week and you have to associate that with a test
17 fishery in some way to identify the targets. It's
18 the exact same idea.

19 Q So the trawling allows you to do the species
20 composition to go with the hydroacoustic count?

21 DR. RIDDELL: That's right, and it's not just salmon in
22 the lakes. One of the biggest competitors are
23 things like sticklebacks that can be in very, very
24 large abundances. They can be very productive and
25 actually become a food sink 'cause the food that
26 you're trying to enhance through, like in
27 Richmond, under the Salmon Enhancement Program, if
28 you don't have the right zooplankton community or
29 fish community, you can't get the food to the
30 sockeye. We've definitely found many examples
31 where we've tried fertilization in stock because
32 you're not able to get it to sockeye.

33 Q You're just feeding the other --

34 DR. RIDDELL: You're feeding the other animals in the
35 system, yeah.

36 Q The baseline analysis that was done by the old
37 Commission, has that been reassessed in recent
38 years, or is that work still -- do you still rely
39 on the baseline work that was done 20 years ago,
40 20-plus years ago.

41 MR. WHITEHOUSE: There was an add-on associated with
42 the fertilization program that Brian talked about.
43 That did a fairly extensive broad survey of
44 nursery lakes within the Fraser in the '80s and
45 '90s. But since that time, there has been little
46 -- we call that synoptic work, looking at the
47 production capacities across a broad range of

1 lakes to determine whether there'd been changes
2 relative to earlier assessments. That work has
3 not really had much follow-up since the mid-1990s
4 in the Fraser system.

5 Q And is that work that needs to be done?

6 MR. WHITEHOUSE: I think periodically, there's a
7 considerable value.

8 DR. RIDDELL: Well, I think periodically is the right
9 term because the determining factors in
10 productivity can be the lake morphology, which is
11 not going to change very quickly except if you
12 have differences of the river inputs and so the
13 nutrients; the rate of turnover of the water mass
14 itself, and that's actually highly predictable if
15 you know the flows from the rivers and the
16 morphology; and the clarity of the water. Those
17 sort of three key parameters determine how
18 frequently you really need to go back.

19 Now, if the development around the lake
20 substantially changes, then, yes, you would have a
21 different nutrient input. Even that doesn't
22 change very quickly, and so you really don't need
23 to be there always, but you do need to be vigilant
24 and sort of tracking what's the status of
25 development around the lake and what's the flows
26 to the lake and so on.

27 Q And is there a program within Science, then, to do
28 that kind of qualitative assessment as to whether
29 or not you need to go back and do more detailed
30 baseline analysis?

31 DR. RIDDELL: I'll probably have to leave that to
32 Timber locally. I think that there's no question
33 that we were trying to maintain a regular
34 monitoring, like periodical, as Timber referred
35 to. Whether we're doing the shoreline monitoring,
36 I'm less certain of that.

37 MR. WHITEHOUSE: I'll actually add one more condition
38 that does warrant a follow-up, an addition to the
39 development issues that Brian spoke about. That
40 is any particular major shifts associated with
41 sockeye abundance, sockeye carcasses themselves
42 represent a potential source of nutrients coming
43 into a system. Where there's a likelihood that
44 large numbers of sockeye could actually boost
45 nutrients in the system, I think there is a pretty
46 strong rationale to include those types of events
47 as ones that would warrant a follow-up. Sockeye

1 can have an effect on subsequent sockeye
2 production by delivering nutrients from the marine
3 environment into nursery lakes.

4 So clarification, just a bit of additional
5 information to what Brian said regarding an
6 ongoing program to assess these aspects, there is
7 a program. We have been successful to this point
8 in continuing to keep it running. It operates out
9 of the Cultus Lake lab as I mentioned earlier.
10 The opportunity to assess the key systems that I
11 mentioned earlier, Shuswap, Quesnel and the
12 Chilko, has been maintained but we haven't been
13 able to look at many systems in the Fraser beyond
14 those in recent times.

15 Q And when it was under the old Salmon Commission,
16 was that assessment done on a greater number of
17 lakes than the three you identified that are
18 currently being done?

19 MR. WHITEHOUSE: Not only the IPFSC. DFO in the '80s
20 and '90s as I mentioned earlier had a more
21 structured approach to delivering these
22 assessments, such that we visited most of the
23 major nursery lakes as a follow-up to work done by
24 the IPSFC in the '70s, so in the '80s and '90s,
25 there were periodic follow-ups to look at baseline
26 levels of production within lakes as well as
27 investigating these events associated with large
28 escapement.

29 Q All right. And I'm still not sure, is there right
30 now a program within DFO where you are able to go
31 and do that qualitative assessment on the
32 different lakes beyond the three you identified to
33 see if it's time to update that baseline
34 information? For example, if there's large
35 carcass inloads into the lakes.

36 MR. WHITEHOUSE: Yeah, it's quantitative, not
37 qualitative work, just to clarify there.

38 Q Sorry, I thought that the point was that you only
39 need to do it when there's certain changes done
40 and I was assuming that was sort of a qualitative
41 assessment, but maybe I was wrong on that.

42 DR. RIDDELL: Well, I think Timber's point is that the
43 work, by its very nature, is quantitative, so you
44 have a comparison with the past.

45 Q Yeah, no, I understood. As to when it's time to
46 redo that baseline, perhaps that's also a
47 quantitative assessment. I had understood it

1 otherwise.

2 MR. WHITEHOUSE: The capacity exists. We have a group
3 within the Department that focus on limnology and
4 lake acoustics and trawl surveys. So, yes, we
5 still have an existing program.

6 DR. RIDDELL: Maybe as an example the one system that
7 we have not been able to maintain as regular a
8 system on was monitoring of the Stuart/Takla
9 system. That was done under IPSFC. It's actually
10 a challenging system because the abundances are
11 relatively low and there was always one that was
12 really difficult to actually address. I think
13 that there's some work going on with First Nations
14 up there, but I do not believe it's presently
15 funded under the core programs.

16 MR. WHITEHOUSE: No, you're correct, Brian. And a
17 number, Francois Lake, Fraser Lake.

18 DR. RIDDELL: Francois Lake.

19 MR. WHITEHOUSE: The big group of Early Stuart system
20 lakes. There's also systems like Harrison Lake
21 and the Pitt Lakes which, in the context of
22 overall nursery capacity within the system,
23 warrant a review on a periodic basis.

24 Q And those lakes you've just identified haven't
25 been reviewed since the '90s?

26 MR. WHITEHOUSE: That's correct.

27 Q Another area I wanted to go over with you were
28 smolt assessments, so that's different from what
29 we've talked about with respect to fry
30 assessments. Could you just review what those are
31 and how often they're done, et cetera?

32 MR. WHITEHOUSE: Yeah, I'll just step back 'cause I
33 think Brian made a good point when he was talking
34 about the life history stages.

35 Smolts are, just to clarify what we're
36 talking about, smolts are sockeye just as they
37 leave the nursery lake on the journey towards the
38 ocean to spend another two-and-a-half years in the
39 ocean before they return as adults. So they've
40 reared in the lake for a full year, and they're
41 leaving the nursery to make an oceanward
42 migration.

43 We have two systems within the Fraser where
44 we have been able to regularly monitor smolt
45 output. These are direct counts of smolts, so
46 we're talking about making estimates of total
47 smolt output on a year-by-year basis.

1 The most important system that we monitor is
2 Chilko Lake. In that system, we generate an
3 annual estimate of total smolt abundance out of
4 the system based upon a sub-sampling technique
5 where we put a fence in the river, direct all
6 smolts within the -- that are leaving the system
7 through that fence and generate photograph
8 estimates of their total abundance on the way out.

9 This gives us a couple of pieces of
10 information that are quite important to
11 understanding life history of Fraser sockeye.
12 First is the relative production of smolts from a
13 given brood year that leave a lake. That tells us
14 the production between egg deposition, which is
15 the number of eggs that females lay in the gravel
16 in their spawning year, to the subsequent survival
17 to the smolt stage. We can then break the life
18 history, at least survival of sockeye, into two
19 discrete components because we'll have information
20 from eggs to smolts, and because we enumerate
21 adults as well, we'll have information from smolts
22 to returning adults. So there's two survival
23 stanzas that you can get out of that.

24 We also do smolt enumeration at Cultus Lake.
25 Cultus is a smaller system in the Lower Fraser,
26 also has a fence. In the case of Cultus, we do
27 complete -- because it's a much smaller system, we
28 can count every smolt out of the system, so they
29 move through a fence into a trap box and are
30 counted out on a daily basis.

31 DR. RIDDELL: Can I just add?

32 Q Yes.

33 DR. RIDDELL: Cultus has not been consistent to the
34 degree that Chilko was. Cultus has a very long
35 history where we actually did some of the original
36 studies of sockeye biology in the '20s and the
37 '30s in Cultus Lake, and one of the earliest
38 hatchery programs, but Chilko is, without
39 question, the best set of sockeye data in British
40 Columbia, because we have a sockeye-counting fence
41 at Chilko since 1948, and that's been done every
42 single year. I believe that's true.

43 MR. WHITEHOUSE: That's correct.

44 DR. RIDDELL: So we get smolt size and number, length
45 and weight, scale samples. So it's by far -- it's
46 quite different than really talking -- shouldn't
47 make a direct comparison, I guess what we're

1 saying, in terms of consistency to Cultus Lake.

2 Q Right.

3 DR. RIDDELL: It's been done when the stock was
4 subsequently quite depressed and we're looking at
5 recovery now.

6 Q And I know that you weren't working on this in
7 1948, I don't think, but do you know why Chilko
8 was chosen as a smolt-counting environment?

9 DR. RIDDELL: You know, I've looked for that myself, to
10 be honest, and I think Mr. Roos's book is the only
11 place I've ever really seen a discussion of that.
12 I think it really comes down to sort of a unique
13 environmental situation. It's a very, very wide
14 laminar flow. You can put a fence in there.
15 There's a lot of flow of water going by, but
16 there's a very wide area, so the pressure front
17 can be -- you know, you can hold a fence in there.

18 If you went to the outlet of Quesnel Lake,
19 well, you're going through a canyon, and so you
20 have a very difficult time working that
21 environment. I think something was asked of me
22 like this previously. You might do something like
23 this at the outlet of Shuswap Lake, because you
24 have a very wide system there. But you have a
25 much higher flow going through there and it's much
26 more difficult. I think it really is a rather
27 unique environment.

28 People talk about doing it at the outlet of
29 Stuart Lake, for example, but it's very wide and
30 it would be a much, much bigger fence. So it's
31 probably just a choice of a number of trade-offs
32 they had to make at the time.

33 Q And just - it's probably obvious - but just to
34 confirm, this is a continuation of a program that
35 was in place under the IPSFC.

36 DR. RIDDELL: Yeah, definitely.

37 MR. WHITEHOUSE: That's correct.

38 Q And I take it, it's been upgraded as new equipment
39 has become available, but it's essentially the
40 same program with newer and better ways to count;
41 is that right?

42 MR. WHITEHOUSE: The methodology has been very
43 consistent through time. You're right, there have
44 been modifications, updates to the fence, to the
45 trap boxes, et cetera, that make it more efficient
46 to operate. But the principle behind the
47 enumeration program has been consistent and

1 maintained in that manner through time.

2 Q Okay.

3 MR. WHITEHOUSE: I'll add one more thing. I think
4 there's a very -- Brian is correct in his
5 characterization of why Chilko was selected. In
6 addition to the very wide nature, it's shallow.
7 This is one of the key issues. It is actually
8 workable through the range of water levels that
9 you get during smolt out-migration, so the water
10 levels -- it's a high alpine lake and, as such, it
11 experiences a very late spring in terms of water
12 run-off, so the flows and water levels are low and
13 stable through the period of smolt emigration,
14 making it actually doable.

15 Many of the other systems, the water comes up
16 so much during the period of smolt out-migration
17 that it's just not tractable to put a fence in for
18 the purposes of enumerating.

19 Q And just to close off on Cultus, the Cultus system
20 is somewhat different from other systems in B.C.
21 in that it is a hatchery system to a large extent,
22 that what you're counting in the smolt fence are
23 hatchery fish to a large extent; is that right?

24 MR. WHITEHOUSE: It's not specifically a hatchery
25 system until very recently. So there's been a
26 great deal of enhancement work that has gone on at
27 Cultus associated with its endangered status.
28 Cultus sockeye are listed as endangered. The
29 Department has a recovery strategy and plan to
30 support the recovery of that stock. One of those
31 components relates to enhancement.

32 Recently, one of the important facets of the
33 work at the fence at Cultus, in Sweltzer Creek, is
34 evaluating the survival of the various hatchery
35 strategies. There are a number of different
36 strategies to release juveniles from the hatchery
37 back into the wild, and we're looking at the fence
38 to determine which strategies are effective.
39 There are marks that are applied to the fish to be
40 able to follow them as juveniles in the lake,
41 smolts through the fence, and then actually marks
42 that you can see on the adults as they return to
43 get a feel for the efficacy of the various
44 enhancement strategies. So that's where
45 enhancement comes into play in hatchery fish at
46 Cultus.

47 Q Okay. But because of that, the fish that you're

1 counting in Cultus are somewhat different in that
2 they do have a mix of hatchery and wild fish that
3 you don't have, for example, in Chilko or in some
4 of the other systems.

5 MR. WHITEHOUSE: That's correct. In no other systems
6 within the Fraser that we're enumerating juveniles
7 are we dealing with hatchery-enhanced components.

8 Q Okay. The Chilko stock, you had said that the
9 enumeration of smolt gives you two components of
10 information. One, egg to smolt, and then one,
11 smolt to returning adult. So kind of the
12 freshwater lifetime and then the marine, if I can
13 call it that, lifetime coming back.

14 Is the Chilko stock a valid indicator for
15 other stock in the system for both of those
16 timeframes, the freshwater environment and then
17 the marine environment? Can you say that what you
18 see with the Chilko stock can be extrapolated to
19 the other systems for both of those life phases?

20 MR. WHITEHOUSE: First of all, I should identify what
21 indicator means. It has a specific meaning in
22 terms of the terminology we use. "Indicator"
23 meaning representative of other stocks, groups or
24 life history stages in -- throughout a broader
25 range. You would, in developing an indicator
26 stock, pick one group to be representative of a
27 much -- one stock to be representative of a much
28 larger group of stocks.

29 So your question was is it a valid indicator
30 to represent life history, freshwater life
31 history, egg to smolt production within the Fraser
32 for all groups? That would be a significant
33 stretch and I would say, no, it would not be.
34 Chilko is quite a unique system. So as an
35 indicator for freshwater productivity in the
36 watershed, Chilko is unlikely to be an indicator.

37 Is it an indicator of the marine life history
38 survival stage? I would say there's a qualified
39 "yes" to that. The reason I say it's qualified is
40 we don't fully understand what's going on from the
41 time smolts leave their nursery lake till the time
42 they hit the ocean, and there's a very broad range
43 of migration distances within the Fraser such that
44 some fish are moving 1500, 1200-1500 kilometres
45 out of their nursery lakes on the very top end of
46 the Fraser, whereas others are only migrating tens
47 of kilometres out of the Lower Fraser before they

1 hit the marine environment. Potentially, subject
2 to different survival effects along that migration
3 corridor.

4 However, in terms of marine survival
5 patterns, there is quite a synchrony associated
6 with sockeye movement into the marine environment.
7 Sockeye migration, smolt migration begins about
8 April in the Lower Fraser. You'll start to see
9 sockeye smolts occur. By the end of June, the
10 main body of the total run has gone by. Those
11 fish are then migrating within the marine
12 environment largely en masse. So is it reasonable
13 to assume it's a marine survival indicator? A
14 qualified "yes".

15 Q Did you --

16 DR. RIDDELL: Well, if I could add, empirically, for
17 marine survival, over time it actually has been a
18 very good indicator actually. Mr. Al Cass, that
19 you'll be interviewing next week, has, for a
20 number of years, tracked what we call the co-
21 variation. So what he looks at is adult-to-adult
22 returns, and from that, you can imply marine
23 productivity rates. You get productivity rates
24 for over the whole life span.

25 Then he can plot with that the actual
26 estimate of smolt-to-adult survival which is a
27 true measure of what we can get from marine
28 survival. The correlation is very high.

29 The lakes actually have a co-variance of
30 about .7, so about half of the annual variation is
31 accountable from lake to lake. So, as an
32 indicator of marine survival, it's actually been
33 quite good until recent years. In the most recent
34 period where we're talking about the rate of rapid
35 decline in productivities, Chilko survival seems
36 to be tracking down a little worse than some of
37 the other lakes. So it seems to have separated.

38 But up until certainly within the past
39 decade, it's been a very good indicator of marine
40 survival. And I would agree with Timber
41 completely on the adult spawning to smolt. It's a
42 very unique environment and it's not
43 representative of the other productivities.

44 Q Okay. And for the period of decline that you just
45 indicated, do we have any indicator stock that
46 allows us to assess marine survival?

47 DR. RIDDELL: Well, I mean, you're still getting an

1 estimate of -- you're getting the only direct
2 measure of marine survival in the Fraser is the
3 Chilko Lake smolts. The fish coming out of
4 Cultus, you can get another measure, but many of
5 the tagged fish they've got the estimates for are
6 hatchery-based juveniles. There's actually a wide
7 variety of recovery plans being attempted in
8 Cultus Lake so there's a few different life
9 histories.

10 So there's no really direct measure of the
11 marine survival change outside of Chilko Lake.

12 Q So you'd indicated, though, up until the past
13 decade, there was very good -- it worked very well
14 as an indicator of the other systems. What's been
15 done in the past decade to account for changes in
16 that system that it may not be such a good
17 indicator anymore?

18 DR. RIDDELL: There has been no adjustment of the
19 indicator 'cause there's no other opportunity.
20 What we're comparing that against is the other
21 systems that were -- is the sort of backdrop for
22 comparing Chilko are the adult-to-adult return
23 rates. If you plot those through time, you see
24 this trend that really the Commission has really
25 been asked to explain, the rate of decline of
26 Fraser sockeye. That's really looking at adult
27 returns to adult spawners.

28 So if you look at Chilko smolt-to-adult
29 returns or the marine survival estimates, it's
30 tracking a little below that as if there's a
31 little bit poorer marine survival from that system
32 than the others in the Fraser.

33 Now, keep in mind when you do a total for the
34 Fraser, in total, in two out of four years, that
35 will be heavily affected by the fall return, and
36 particularly Shuswap Lake complex which has not
37 shown the rate of decline that the other sockeye
38 lakes have. So what you're getting is an
39 averaging effect where the big returns in the fall
40 runs are keeping that average up in two out of
41 four years.

42 THE COMMISSIONER: Ms. Baker, can I just ask a couple
43 of quick questions on this point that Mr.
44 Whitehouse referred to.

45 If I understood it, you mentioned migration
46 corridors within the Fraser for the out-migration.
47 Is that -- are the corridors fairly well tracked

1 in terms of research or -- what did you mean by
2 migration? I think I know what you mean, but I
3 just want to make sure I'm not misunderstanding
4 your point.

5 MR. WHITEHOUSE: Yeah, to clarify, all smolts within
6 the Fraser obviously leave through the Fraser.

7 THE COMMISSIONER: Right.

8 MR. WHITEHOUSE: They share common areas. So up-river
9 stocks, the stocks originating above the Nechako,
10 for example, are in a common migration corridor
11 from the Nechako/Fraser confluence through the
12 remainder of their migration down to Steveston.
13 Stocks that enter below that are obviously going
14 to only share a portion of the total migration.

15 Your question is very much germane to the
16 understanding of survival patterns within the
17 watershed, because if there are different factors
18 affecting survival during that period, between
19 which they leave their lake and which they reach
20 the marine environment, could be related to how
21 far they're moving through the system.

22 THE COMMISSIONER: I see.

23 MR. WHITEHOUSE: So where they share common -- and my
24 point with Chilko was is that until the Chilko
25 smolts hit the main stem of the Fraser, they're in
26 a unique migratory corridor on their own. It's
27 quite a dynamic environment above there.

28 If there are survival effects that occur
29 between the lake outlet and the confluence, that
30 may not represent what's going on throughout the
31 rest of the watershed.

32 Brian's work in conjunction with our program
33 on the Chilko smolts is, last year, an acoustic
34 tagging program to look at the in-river survival
35 estimates of smolts is the first attempt that
36 we've made, as this is brand-new technology, to
37 actually understand what survival patterns for
38 sockeye are during their migration between their
39 nursery lake and entry into the marine
40 environment. So we don't understand those
41 dynamics well at all.

42 THE COMMISSIONER: Thank you.

43 MS. BAKER: Thank you.

44 Q And that actually is perfect lead-in because the
45 last program I wanted to talk about here was the
46 Chilko tagging program, and we touched on it just
47 in a few words when you were here before, Dr.

1 Riddell, but perhaps now you could explain in more
2 detail what that program is.

3 DR. RIDDELL: Well, the Chilko smolt tagging was really
4 -- last year was our very first year. It was
5 definitely a pilot study and it was applying sonic
6 tags to naturally produced sockeye salmon smolts
7 leaving Chilko Lake, and using the post-detection
8 system that we brought up last week under
9 hydroacoustics, so these are tags that are
10 actively transmitting a unique signal. Every fish
11 is therefore identifiable. We put receivers down
12 the river and then there are an array of receivers
13 in the Lower Fraser, and then there's lines of
14 receivers in the Strait of Georgia up into Queen
15 Charlotte Sound. Those lines are what people
16 refer to as the POST arrays.

17 It was exactly as the Commissioner asked.
18 When I was investigating the whole issue of what
19 was contributing to the decline, and what we knew
20 and we didn't know, I contacted what I call the
21 "God of sockeye", Jim Woodey, and he said, "No,
22 we've never actually been able to monitor that."
23 The first real study effort was in the mid-'60s,
24 and there's actually been no effort to study the
25 survivorship of downstream within Fraser mortality
26 of smolts.

27 So the tagging technologies that have been
28 developed now for small salmon provides us the
29 first opportunity to do it. I call it a pilot,
30 because the tags are only so small. We were not
31 able to put tags in any fish -- I don't think we
32 put any tags in fish less than 12 centimetres.

33 So when people talk about one-year-old smolts
34 for Fraser sockeye, it's not strictly true. You
35 can have one and two-year-old smolts. Two-year-
36 old smolts are about 50 percent bigger than one-
37 year-old. So what we were tagging is natural
38 fish, but we were tagging the upper maybe five to
39 ten percent of the size distribution.

40 To be consistent, they did move downstream
41 very, very quickly. The fish that we detected at
42 the lower river were all through from the outlet
43 of Chilko Lake to the detection arrays at the
44 mouth of the Fraser in seven to ten days. But
45 what was extremely surprising is the survivorship
46 to the mouth of the Fraser was only 25 percent of
47 the tagged smolts leaving the lake. That

1 surprised us a great deal.
2 Since it's a pilot study, though, I'd
3 emphasize we are planning -- we're putting the
4 money and the tags together right now to do it
5 again this year, and we're going to take another
6 step up and use the new generation of tags that
7 will allow us to tag down to about ten-and-a-half
8 centimetres. We still can't get down to the
9 average size of the natural smolts, which is more
10 about probably nine centimetres, nine or ten.
11 MR. WHITEHOUSE: Actually, closer to 80 -- eight
12 centimetres.
13 DR. RIDDELL: Eight, yeah, so we're still in the upper
14 third of the size distribution. There are other
15 types of tags that could be used to cover the
16 whole array, but you can't detect them as easily
17 at all. It's a very, very difficult task.
18 MS. BAKER:
19 Q So when you --
20 THE COMMISSIONER: Do I understand, Dr. Riddell, that
21 you don't use any kind of test fishery or
22 hydroacoustic --
23 DR. RIDDELL: No, that's the beauty of this. You tag
24 the fish -- you have to put the tag in surgically,
25 so we maintain the fish in controlled conditions.
26 THE COMMISSIONER: I see.
27 DR. RIDDELL: We do it very early in the morning. We
28 hold the fish in to late at night, and if they're
29 fine, then we release them sort of -- I think
30 they're releasing them like 3:00 or 4:00 in the
31 morning.
32 THE COMMISSIONER: I see.
33 DR. RIDDELL: So it's still dark. So they're tagged
34 and gone in a day, and there are detections just
35 down from the release site, and if they're
36 detected at that point, then they're counted as a
37 viable tagged fish.
38 THE COMMISSIONER: I see.
39 DR. RIDDELL: And we monitor them passively down there.
40 So we never handle them again.
41 THE COMMISSIONER: Right.
42 MS. BAKER:
43 Q And who's the "we" that you referred to? Is it a
44 DFO program?
45 DR. RIDDELL: Well, it's a joint program of a number of
46 groups. The Pacific Salmon Foundation put it
47 together only because it was something that I was

1 interested in and found some donors to support.
2 We did it with UBC when Dr. Scott Hinch -- because
3 he has teams of people working on the POST arrays,
4 Timber's people. DFO maintains the Chilko smolt
5 fence, and so they were integral in all of this.
6 Science Branch contributed some funds to buy some
7 tags, and then Dr. David Welch with Kintama, who
8 was presented to the Commission before, he
9 contributed to it by detecting the fish. He had
10 to upload the data from the arrays in the lower
11 river.

12 Then even the POST program was involved
13 because we got the detections in the Strait of
14 Georgia. So this was really a very comprehensive
15 sort of program to really conduct this thing.

16 Q And you said you are going to be doing it next
17 year, or 2011 as well?

18 DR. RIDDELL: Yes. We've just put in the order for all
19 the tags. This year, Dr. Scott Hinch has money
20 from what's called the Ocean Telemetry Network for
21 Canada. This is actually part of a worldwide
22 network. And so Dr. Hinch is actually doubling
23 our tags, so we're going to use the tags that I
24 bought last year, which -- the particular size
25 range, and the new version of the tag is being
26 bought by UBC. So we'll actually, instead of
27 having 200 tags last year, we'll have 400 this
28 year.

29 Q Do you anticipate that this program could be used
30 in the future in management of Fraser River
31 sockeye?

32 DR. RIDDELL: Well, right now, the feedback I'm getting
33 is people are concerned about how representative
34 these tags are. I'm not actually prepared to
35 really throw it out that quickly. If we're
36 getting very poor survival on large fish, I don't
37 know why anybody would assume that you get better
38 survival from a small fish, except that there is
39 obviously a reason why sockeye (indiscernible) is
40 a relatively small fish.

41 So there is a bit of a trade-off right here
42 in terms of how far we push this. The unfortunate
43 part is the next step down to tag really
44 representative-sized fish is extremely difficult
45 to do. You have to sample the fish. Again, you'd
46 have to do something like the Commissioner was
47 asking for before. Now, I tag the fish and let

1 them go and we don't have to handle them again.

2 The next step, to get to very small fish, you
3 put a passive tag in and then you have to have an
4 activation system and detection. This exists in
5 the Columbia Basin. But the thing that the
6 Columbia has that the Fraser doesn't have are
7 things called dams. All right? And so we don't
8 have sampling sites downriver. What you could do
9 is actually build -- they actually have huge trawl
10 nets that they have in the river, and the end of
11 the trawl is open. In there, there are large
12 arrays of plate detectors, and so basically the
13 water flows through this net and you can detect
14 the fish doing that, but your detection efficiency
15 is very low. So it's -- going down to a new type
16 of tag other than the sonic is actually a major
17 step down.

18 I don't know that we'll continue doing this.
19 We'll see what happens this year. If we find that
20 we get very, very good survival this year, then
21 we've missed something in the two years and we'll
22 have to do it again.

23 Q So it's still research only.

24 DR. RIDDELL: It is definitely research. This is not
25 being -- I am catching people talking about the
26 survival of smolts is only 25 percent, and I have
27 to keep correcting them that this is one year
28 only, very large fish, definitely a pilot. We
29 should not be applying this generally. But I
30 think the number of us that were involved are
31 shocked that the number was so low. That's why we
32 really want to sort out what's the cause of this.

33 Q Okay. Did you have something to add?

34 MR. WHITEHOUSE: I think I want to just provide a
35 little bit more context, because I agree with the
36 way Brian has framed the program. I think if we
37 want to look at what potential it brings to
38 management assuming it was going to be feasible,
39 assuming that the tags can get to the size that
40 they're detectable for small fish, there is a real
41 positive benefit to understanding survival
42 patterns for sockeye during that phase from which
43 they've just migrated the lake to the time at
44 which they leave the Strait of Georgia, because we
45 understand nothing about that survival right now.

46 One of the complexities about forecasting is
47 the sort of black box that the ocean represents,

1 and to be able to conceptually understand two
2 years in advance of adult returns what survival
3 impacts we are seeing for smolt stages would be a
4 substantial improvement in not only the lead time
5 on which we understand what type of factors and
6 survival patterns we might be seeing for sockeye
7 stocks, but it would add another piece into the
8 production forecasting puzzle that may, if it has
9 potential and can move beyond a research tool to a
10 long-term monitoring project, would give us
11 potentially substantially more confidence in
12 forecasting, looking forward.

13 THE COMMISSIONER: Is Dr. Riddell's program the only
14 realistic or viable program for out-migration that
15 science has so far developed, the tagging system,
16 or are you thinking as well that there might be
17 other opportunities for gaining this information
18 on survival in the out-migration process for
19 sockeye.

20 DR. RIDDELL: Yeah, well, the sockeye qualification is
21 the important one. I mean, it has been used on
22 other species in the Fraser system, but always on
23 larger smolts.

24 THE COMMISSIONER: Right.

25 DR. RIDDELL: Now, there is a company trying to build a
26 very small tag that would have a very small
27 battery and so would only function for maybe six
28 weeks.

29 THE COMMISSIONER: Right.

30 DR. RIDDELL: And if you can do that, then the trade-
31 off is it would be very good to get the downstream
32 survival, but you're going to lose it very quickly
33 in the ocean. The other is to get very small, you
34 have to go to a very high frequency of
35 transmission, and so you have to have much more
36 expensive receiving arrays 'cause the range of
37 detection goes down to about 100 metres.

38 THE COMMISSIONER: Right.

39 DR. RIDDELL: And it's very, very -- one thing that we
40 didn't anticipate how hard it was to figure out is
41 if we are going down the river at the speed of the
42 Fraser, how frequently should you transmit a
43 signal so that when you pass these one and two
44 detectors, that you're actually in the receiving
45 range. So we pushed it right down to once every
46 11 seconds, and it probably actually should be a
47 little faster than that. So you're really pushing

1 the range of technology right now to get down
2 there.

3 So we don't expect another big advance in the
4 technology for a few years, so right now, I think
5 we'll go down as small as we can. Even the
6 microtags I've just referred to, you'd be very
7 hard-pressed to get down to tagging the eight-
8 centimetre fish that Timber's referred to.

9 THE COMMISSIONER: Thank you.

10 MS. BAKER: Mr. Commissioner, I'm going to move to a
11 different area. Do you want to take the break
12 now?

13 THE COMMISSIONER: Yes, thank you.

14 THE REGISTRAR: The hearing will now recess for 15
15 minutes.

16

17 (PROCEEDINGS ADJOURNED FOR MORNING RECESS)

18 (PROCEEDINGS RECONVENED)

19

20 THE REGISTRAR: Order. The hearing is now resumed.

21 MS. BAKER: Thank you.

22

23 EXAMINATION IN CHIEF BY MS. BAKER, continuing:

24

25 Q So now I'd like to cover some more sort of
26 implications of stock assessment into the Fraser
27 River Management Program. And before I do that,
28 I'd like to just ask, Mr. Whitehouse, if you could
29 explain some terms that we hear in stock
30 assessment and those two terms are "precision" and
31 "accuracy". Can you explain what those mean
32 within the -- or how those terms are used in the
33 context of stock assessment?

34 MR. WHITEHOUSE: Yes, thank you. Quite important
35 concepts and they are technical in nature. I
36 think probably the easiest way to summarize would
37 be to say that when we're talking about precision,
38 it is a statistical concept generally expressed as
39 a confidence interval around an estimate. So if
40 we say we've got a hundred thousand fish plus or
41 minus 10 percent, the confidence interval
42 expresses the precision of that estimate.
43 Operationally, or from a fundamental perspective,
44 it also tells us something about the degree of
45 effort that went into the survey. Generally, high
46 precision estimates meaning smaller confidence
47 intervals. So plus or minus 5 percent, high

1 precision are surveys that have resulted in or
2 been generated with high effort surveys. When
3 you're talking about lower precision estimates,
4 those are confidence bounds that are quite large,
5 plus or minus 40 percent, for example. Generally,
6 lower effort in terms of generating the estimate.

7 So you can have both high and low precision
8 estimates. Those are expressed by confidence
9 intervals. From a functional perspective,
10 statistically they mean if you were to run the
11 same survey repeated times. You've heard this, 19
12 times out of 20 you would expect the outcome to be
13 within the 95 percent confidence intervals. It's
14 a common way of expressing these things.

15 One of the keys, though, that we're trying to
16 communicate when we're talking about precision and
17 accuracy is confidence in the estimates. And this
18 is where accuracy comes into play. Accuracy is
19 how close we think our measurements are to the
20 true measurement. And we're always at a
21 disadvantage in that we never really know the true
22 numbers or very rarely do we know the true number
23 that we're shooting a target for. So accuracy
24 really reflects what we consider to be bias in the
25 estimation process when it comes to terminal area
26 assessment data, for example.

27 Bias would mean, do we believe that there's,
28 or are we aware of, processes associated with the
29 survey types we implement that would result in
30 estimates being constantly high or constantly low.
31 Positive bias meaning the estimates tend to be
32 greater than you would expect if you actually knew
33 the result and negative bias meaning they would
34 come inconsistently below that.

35 Key to the combination of the two is
36 understanding when we talk about the precision
37 gives you a gauge across time of the type of
38 survey. So if you've got high precision
39 estimates, you're putting high effort into
40 generating the estimate. Doesn't tell you about
41 the accuracy, though, because accuracy is related
42 to the implementation of the program and whether
43 you have the necessary program elements in place
44 to identify whether you've got the potential for
45 positive or negative bias.

46 When you -- when you're talking about high
47 precision programs, high effort programs,

1 generally means that the full suite of bias
2 testing evaluations, these are elements of the
3 survey design, are in place and you're able to
4 comment on the likelihood of bias within the
5 estimate. So is it accurate, unbiased or is it
6 likely to be biased but you can detect the
7 direction? You can have estimates that have high
8 accuracy, use the analogy of a dartboard and
9 throwing darts, or if you're shooting for the
10 bull's-eye, all the darts cluster tightly around
11 the bull's-eye. That would be high accuracy
12 because you're hitting the target with a very
13 small spread around that. The analogy to a high
14 accuracy but low precision would be a cluster that
15 may have a four or five-inch group around that
16 bull's-eye. The precision is lower but the
17 central point is still the bull's-eye. If you
18 move off of that, if there's a process that
19 results in those estimates being consistently high
20 or to the right, for example, you can still have a
21 highly accurate but imprecise estimate. Pardon
22 me. A highly inaccurate, it's off the mark but
23 precise so you measure consistently again and
24 again the same values so they may be 40 percent
25 above target or, in this case, four inches above
26 the bull's-eye, using the analogy.

27 You can also have an inaccurate and imprecise
28 estimate where the spread around the central point
29 is large. And those are things that we have to
30 watch for when we're talking about comparability
31 of estimates and the quality of the estimates or
32 reliability of the estimates generated through
33 time. So this becomes very important when you're
34 comparing time series of estimates.

35 Q Okay.

36 MR. WHITEHOUSE: Understanding the precision, high
37 precision equals high effort, and, generally, the
38 ability to comment on bias. Low precision, lower
39 effort and potentially sometimes less of an
40 opportunity to comment on the bias within the
41 estimate.

42 Q Okay. Thank you. I think those terms are going
43 to come up as we go through some of these
44 questions so I think that's helpful. In terms of
45 how stock assessment data is used in Fraser River
46 Sockeye management, I wonder if I could just run
47 through some concepts and you can just let me know

1 if I'm covering the uses of stock assessment data.
2 First of all, I understand it's used to understand
3 population dynamics and the production of
4 different stocks. Is that fair?

5 MR. WHITEHOUSE: Correct.

6 Q It's also used in the run-size forecasting
7 process. That process uses enumeration in
8 juvenile and smolt data for models?

9 MR. WHITEHOUSE: Yes, linking directly back to the
10 production forecasting that you talked about
11 earlier.

12 Q Okay. And enumeration also is used in developing
13 post-season estimates of total return for looking
14 at calculations of TAC and treaty obligations
15 within the Salmon Treaty; is that right?

16 MR. WHITEHOUSE: Escapement estimates are foundational
17 to that --

18 Q Okay.

19 MR. WHITEHOUSE: -- component, yes.

20 Q Okay. And if you don't have good stock assessment
21 data, what is the impact on Fraser River Sockeye
22 management? Like if we don't -- if the stock
23 enumeration and escapement enumeration programs
24 are not adequate, what would be the impact on
25 Fraser River Sockeye management?

26 MR. WHITEHOUSE: I guess the way I would frame that is
27 there are some fundamental underlying assumptions
28 with respect to the types of information that you
29 can collect to inform Fraser River Sockeye
30 management. This includes the ability to
31 reconstruct total abundance for stock groups
32 within a year. If you can't collect critical
33 pieces, the fundamental underlying assumption that
34 you know total return is either much more
35 uncertain or you may be able to have the inability
36 to actually reconstruct that total abundance so a
37 bit of a grade in terms of a response there.

38 Q Dr. Riddell, do you have anything to add on that?

39 DR. RIDDELL: Well, yeah, I mean I think the sequencing
40 of your question is interesting because, as Timber
41 said, the escapement information is fundamental to
42 basically all of the stock assessment. But an
43 application of that is developing management
44 objectives. So on what basis do you manage your
45 fisheries to try and achieve your management
46 goals, which are normally described in some value
47 of escapement of spawning fish. So in the absence

1 of that, you can have significant impacts on
2 fisheries because you have high uncertainty about
3 what are your goals, what is the return, how many
4 fish should you put on the grounds.

5 I've always told people that you may not
6 provide enough funds but you've got to keep in
7 mind that just not spending the money here has
8 other costs. And many times these costs are borne
9 by other people. Now, they may be the fishers in
10 the ocean, they may be First Nation fishers, but
11 the absence of information does have a cost and it
12 can be substantial and frequently, much more than
13 the cost of acquiring the data. So I think it has
14 numerous effects.

15 Q Thank you. Going back to the precision methods
16 that you talked about earlier, Mr. Whitehouse, we
17 have -- or you use -- in Fraser River Sockeye you
18 use both high precision and low precision methods;
19 is that right?

20 MR. WHITEHOUSE: That's correct.

21 Q And when do you use high precision methods? What
22 would you consider a high precision method and
23 when would it be used?

24 MR. WHITEHOUSE: High precision methods are employed
25 primarily to enumerate large escapements and is
26 linked to key drivers in terms of abundance. The
27 major targets associated with fishing in a given
28 year. Large escapements use high precision
29 estimates. These are techniques like mark
30 recapture surveys, fence counts. We have recently
31 started using hydroacoustics, DIDSON, techniques
32 to enumerate spawning ground methods and also
33 calibrated, annually calibrated visual surveys,
34 cyclical visual surveys. So that would be --
35 those would be high precision methods.

36 Q Okay. And is there a cut-off or is there some
37 number that you use to determine when you're going
38 to use a high precision method and when you're
39 going to use a low precision method?

40 MR. WHITEHOUSE: Yeah, relates back to Brian's comment
41 and mine earlier about the fundamental assumptions
42 underlying management requirements. We use an
43 abundance cut-off to make a determination of the
44 type of survey to apply. It's currently set at
45 75,000 spawners. Above that, an estimated
46 abundance of 75,000 spawners, we aim to deliver
47 high precision estimates. So that would be mark

1 recaptures, fences, DIDSON counts or calibrated
2 visual surveys. Below 75,000, we use a suite of
3 low precision estimation techniques. These
4 include visual counts that are not calibrated
5 annually. Visual counts run a gamut so there's a
6 degree of confidence associated with them from
7 sequential visual surveys down to peak live
8 counts. We also use in systems where you can't
9 count fish visually effort-based surveys, which
10 include recovery of carcasses as an index of fish
11 present on the spawning grounds.

12 Q Okay. And are all Fraser River Sockeye
13 populations enumerated every year?

14 MR. WHITEHOUSE: Our goal is -- and this is again
15 consistent with the framework, the underlying
16 requirement of management. Because Fraser sockeye
17 are managed in total, as a return, we need a total
18 understanding of escapement so our objective is,
19 on an annual basis, to estimate all Fraser sockeye
20 stocks on their spawning grounds.

21 Q And has that objective been met in every year?

22 MR. WHITEHOUSE: We have had three years in the past
23 decade when we were unable to count all stocks on
24 the spawning grounds. But aside from that, yes,
25 we've been able to enumerate all expected spawning
26 stocks within the Fraser annually.

27 Q Okay.

28 DR. RIDDELL: Could I just add -- I'm just thinking of
29 the question previous to this where you were asked
30 about every year. The only qualification here is
31 keep in mind that every year is dependent on the
32 Fraser sockeye sample. And so I believe when you
33 say that there are 157 spawning sites in the
34 Fraser River and therein various levels of
35 populations, we don't survey every single
36 population every single year because some years
37 they have no fish. As long as there is fish in
38 the returning cycle then they are enumerated.

39 Q Okay. With the exception of three years where you
40 were unable to enumerate every population in those
41 years?

42 MR. WHITEHOUSE: Yeah, correct.

43 THE COMMISSIONER: I know Ms. Baker won't be surprised
44 when I ask this but you've been talking about
45 stocks and not CUs. Has there been an adjustment
46 or an alignment within this program for taking
47 into account the CUs in the kind of research and

1 work you're doing to do the counting and so on?

2 MR. WHITEHOUSE: Thanks for the opportunity to clarify.

3 I think it's an important one. CUs are a
4 construct. They're a way of thinking about fish
5 populations. So the way we enumerate fish has
6 always addressed CU requirements. The resolution
7 to which we count goes well below the CU level.
8 I'll correct Brian. There's about 340 distinct
9 spawning sites.

10 DR. RIDDELL: Spawning sites.

11 MR. WHITEHOUSE: Spawning sites within the Fraser. And
12 he's absolutely correct; all of those sites are
13 not used by sockeye every year. It relates to the
14 population cycles in abundance. The way the
15 sockeye are counted allows you to roll the
16 escapement data up to the level of CU. So
17 escapement enumeration programs can easily
18 accommodate providing information at the CU level.

19 Q Okay. Just to return to the high precision/low
20 precision methods, do you have confidence in the
21 adequacy and appropriateness of these different
22 methods for escapement enumeration for Fraser
23 River Sockeye, Mr. Whitehouse?

24 MR. WHITEHOUSE: I have a high degree of confidence in
25 terms of the adequacy. We have embarked on a
26 process, particularly since about '92 with the
27 first major review that I was involved in that
28 continually evaluates the quality of the programs
29 that we are able to deliver on Fraser sockeye and
30 that has resulted in significant refinements
31 through the past 18 to 20 years to ensure that we
32 have a very solid and defensible set of estimates
33 that we deliver on an annual basis. So they have
34 -- the estimates will pass the test of a rigorous
35 scientific evaluation in terms of issues like
36 bias, which I've mentioned earlier, particularly
37 for the high precision methods, which, on an
38 annual basis, represent anywhere from 70 to 95
39 percent of the total escapement to the watershed.
40 So we much -- very large fraction on an annual
41 basis of the total escapement to the Fraser is
42 enumerated with high precision methods. That can
43 vary from -- depending upon the distribution of
44 abundance of cross-populations from as low as 60
45 percent on some years to as high as 90, 95 percent
46 on others.

47 Q The threshold that you identified for high

1 precision versus low precision is 75,000 spawners
2 on the bed, there was a change, I take it, in
3 recent years from 25,000 spawners, which used to
4 be the cut-off for low precision and high
5 precision, up to 75,000 spawners. Why did that
6 happen?

7 MR. WHITEHOUSE: The change that was implemented was
8 largely a response to the growing number of
9 small/moderate-sized populations that were
10 building within the Fraser. And it was a
11 financial response with a larger number of
12 populations building. There was a requirement for
13 increased number of high precision estimates to
14 meet the Fraser sockeye standard -- enumeration
15 standard. And with these larger number of
16 populations, it was stretching the ability of our
17 current funding to be able to deliver high
18 precision estimates for all populations above
19 25,000. So we, in consultation with the Fraser
20 Panel, et cetera, moved the abundance threshold up
21 to 75,000 to realize financial gain with minimal
22 loss in terms of information quality to the
23 overall management structure.

24 Q And what work was done to determine what the
25 impact would be in changing that threshold from 25
26 to 75,000 spawners?

27 MR. WHITEHOUSE: There was a high-level overview
28 looking at the distribution of population sizes
29 within the Fraser to evaluate how many populations
30 would really fall within the 25 to 75,000 range.
31 Looking backwards, retrospectively, to get a feel
32 for what portion of the run fell into this
33 category, as well, forward-looking given an
34 understanding of where abundance trends were
35 heading, what sort of number of populations we
36 expected to see, to maintain within that 25 to
37 75,000 range and how much of the total abundance
38 returning on an annual basis would be impacted by
39 a move from previous high precision to low
40 precision. It's quite a small fraction. So less
41 than -- in most cases, less than 10 percent of the
42 total return and in most cases substantially less
43 than that on an annual basis.

44 Q There was a recommendation made in the Wappel
45 Report 2005 on this issue. And that's in Exhibit
46 14 before you, page 245, recommendation number 7.
47 This was a report on the 2004 fishery. And the

1 recommendation at that time was that the
2 Department of Fisheries and Oceans re-establish
3 the threshold of 25,000 fish for the mark
4 recapture method to be used for the estimation of
5 spawning escapement. That recommendation hasn't
6 been taken up. And can you explain why that is?
7 MR. WHITEHOUSE: My explanation would be related to the
8 relative risk associated to the quality of the
9 estimates. When looking at financial constraints
10 there is a trade-off that you have to consider in
11 terms of the overall survey design. And when we
12 look at the risk associated with having more
13 imprecise or lower precision estimates for a very
14 small number of stocks on an annual basis, it far
15 outweighs the risk associated with being unable to
16 do enumeration at all on some components. So the
17 financial constraints were quite severe such that
18 we are looking at having to drop activities or
19 maintain a lower set of precision objectives for a
20 very small component of the total return. So that
21 trade-off is the issue that was driving the
22 decision to continue with the 75,000 threshold.
23 Q Dr. Riddell, do you have anything to add on that?
24 DR. RIDDELL: I just was going to emphasize that when
25 we make these trade-offs, I think Timber referred
26 to that there's a loss of precision. But what
27 typically happens in mark recapture programs when
28 you start to compromise the effort is that you put
29 yourself at greater risk of the error or the bias.
30 MR. WHITEHOUSE: The bias.
31 DR. RIDDELL: Right. And we, at all costs, want to
32 avoid the bias error. And so it was actually not
33 much of a debate, to be perfectly honest, that the
34 trade-off between very expensive studies for
35 things that would be maybe in the 50,000 range,
36 which actually in many other species the fishery
37 officers and people trained in observation can get
38 fairly good estimates versus risking the accuracy
39 of the major assessment programs, it was far
40 better to put the limited resources to get the
41 best estimates for the most fish.
42 Q Are you concerned that there has been a negative
43 impact to Fraser River Sockeye management as a
44 result of this change in threshold from 25 to
45 75,000 spawners?
46 MR. WHITEHOUSE: I am not. I'd like to add one
47 comment, too, because I think it's important from

1 a context perspective. When you look at the
2 distribution of Fraser River Sockeye stocks in
3 populations that might fall into the 25,000 to
4 75,000 bound, we do not run into many instances
5 where the likelihood is that spawner abundance,
6 looking forward in time, is going to stay within
7 that range. The capacities within the system are
8 generally that if a population breaks out of some
9 low abundance threshold and begins to grow beyond
10 the 25 -- into the range between 25 and 75, it is
11 largely going to make a significant leap and be
12 well above the 75,000 bound within a cycle or two.
13 So we're talking about very small impacts to time
14 series of probably one or two generations, at
15 which point it's going to move into the high
16 precision bounds anyway. It's going to get to
17 escapement levels that are going to exceed 75,000
18 very quickly. And that is, in fact, the case that
19 we've seen in a large number of stocks that were
20 in the early 2000s within this bound. They have
21 then moved on that we're in a position where we
22 don't have the flexibility. There are now
23 escapements in the 100 to 300,000 range, as
24 opposed to maintaining a static 25 to 75,000
25 range.

26 Q Have any concerns been -- or have you had any
27 concerns with the use of methodology for
28 populations in that 25 to 75,000 range so that
29 population range that used to be enumerated with
30 high precision methods and has now moved to low
31 precision methods, has there been any work done on
32 those populations?

33 MR. WHITEHOUSE: One of the key aspects in making the
34 move and in understanding how adequate the
35 assessment tools that we're using are for
36 estimating, and Brian mentioned it in terms of
37 being able to satisfy bias issues in mark
38 recapture programs, in making the move to a lower
39 precision estimate for a slightly larger program
40 -- for a slightly larger population, the issue
41 really relates to, is do we understand how the
42 survey techniques that we're going to use address
43 the potential sources of bias such that we may see
44 consistency in underestimation, et cetera, in the
45 tools that we're using. Mark recapture gives us
46 the ability to comment on that.

47 When we switch to a low precision estimate,

1 it's very important that you understand the
2 interaction of the survey, the fish and
3 environment, to understand how accurate and
4 complete your assessment process is going to be.
5 And one of the most important aspects of that is
6 what we call calibrating the estimation
7 techniques. And what this entails is running two
8 parallel estimates simultaneously, a high
9 precision, a fence count as an example, with the
10 low precision estimate to generate a factor that
11 allows you to correct for the potential of
12 systematic bias. So this is an essential
13 component that we require in order to make
14 confident jumps between methodology types.

15 Q Have you been able to do that calibration work for
16 that 25 to 75,000 population or numbers?

17 MR. WHITEHOUSE: Yeah, we are under -- that is work
18 that is underway currently. So as opportunities
19 arise and, of course, we're at the whim of
20 population sizes on the spawning grounds, we can
21 make our best estimates of what are going to be
22 present. We couple high precision estimates with
23 a calibration program. The simultaneous operation
24 of two projects, one of high and one of low
25 precision, to allow us to understand whether we're
26 seeing consistency in the type of patterns between
27 one survey type and another.

28 Q And I understand that we have an email, which
29 outlines where things are with the calibration
30 work and that's at Tab 10 of the binder in front
31 of you. It's CAN170247 and I wonder if you could
32 just identify that. I won't take you through it
33 because of time but if that is an accurate status
34 of where you are at -- where the department is
35 with the calibration work you just described as of
36 February 2010, which is the date of the email from
37 you --

38 MR. WHITEHOUSE: Yes, that --

39 Q -- to Al Cass?

40 MR. WHITEHOUSE: Yes, that is correct. This is the
41 status of progress on calibration work.

42 MS. BAKER: Right. And can I have that marked, please,
43 as the next exhibit?

44 THE REGISTRAR: Exhibit 380.

45
46 EXHIBIT 380: Email dated February 3, 2010,
47 from Timber Whitehouse to Alan Cass

1 MS. BAKER:

2 Q The calibration work that's been done, has that
3 been funded by the department or has that been
4 funded through some other program?

5 MR. WHITEHOUSE: Well, it's been funded by the
6 department and jointly by other programs. We
7 cannot undertake calibration without the two
8 components. And the way we've been approaching
9 calibration work is to look for support. It's an
10 add-on to existing program suites. So what we
11 would look -- the strategy involves looking for
12 sources to implement high precision estimates on
13 systems that may fall in the 25 to 75,000 range so
14 that we can deliver a consistent visual site
15 survey and then make that comparison that I talked
16 about a minute ago.

17 Q All right. So DFO, in its ordinary course of
18 business, would be funding the low precision work
19 on those sites but you would be looking for
20 additional funding to support the high precision
21 method, as the comparator on those sites; is that
22 fair?

23 MR. WHITEHOUSE: That is correct.

24 Q Okay.

25 MR. WHITEHOUSE: I'll add that in addition where
26 opportunistically we may see a proposed high
27 precision estimate delivered in-year, so a
28 population we expect to come in at a hundred
29 thousand actually comes in at 75,000, we will make
30 sure that we take the opportunity to calibrate on
31 that system so that -- these are limited-time
32 opportunities, they're fleeting, you have to take
33 advantage of them as they arise. So we would make
34 sure that we add on the necessary visual surveys
35 to pick up calibration opportunities.

36 Q Right. And again, any of that additional work is
37 funded through programs, such as the Southern
38 Endowment Fund of the Salmon Commission?

39 MR. WHITEHOUSE: The last part would be funded
40 completely in-house through DFO. The calibration
41 work specifically. We have looked to numerous
42 partners, including the Southern Boundary Fund of
43 the Pacific Salmon Treaty, the Salmon Watersheds
44 Initiative and other sources that we've partnered
45 with.

46 Q Okay. Thank you. I want to move to funding and
47 assessment frameworks and priorities. There's a

1 group called the Stock Assessment Coordination
2 Committee, or SACC, as it's referred to. This is
3 responsible for regional coordination of
4 priorities for stock assessment work in the
5 Pacific region; is that right?
6 MR. WHITEHOUSE: That's correct.
7 Q Okay. And the members of SACC include the
8 division head of SAFE, which was Dr. Riddell in
9 the past, and that's now Mark Saunders; is that
10 right?
11 MR. WHITEHOUSE: Correct.
12 Q Okay. Also includes the head of Salmon Stock
13 Assessment, who at the present, is Arlene
14 Tompkins?
15 MR. WHITEHOUSE: Yes.
16 Q Okay. Includes the area chiefs for stock
17 assessment from the area offices, which would
18 include you and your colleagues, is that right,
19 Mr. Whitehouse?
20 MR. WHITEHOUSE: That's correct.
21 Q Thank you. And it has representatives from Ocean
22 Habitat, Salmon Enhancement Program, Fisheries and
23 Management, Jeff Grout. Those people are all on
24 the SAC Committee?
25 MR. WHITEHOUSE: They participate variously, yes.
26 Q Okay. And the Salmon Treaty coordinator would be
27 a part of that committee as well?
28 MR. WHITEHOUSE: He has been in the past, yes.
29 Q And sometimes area chiefs for resource management?
30 MR. WHITEHOUSE: Correct.
31 Q Okay. And I take it that this SAC Committee that
32 is given a budget target and then a project
33 profile is developed to meet that budget target?
34 Is that how it works?
35 MR. WHITEHOUSE: Slightly out of sync. I think that
36 the overall role of SACC, budgets come into play
37 but the necessary assessment components to support
38 management objectives largely drive the profile of
39 the regional assessment program and then the
40 adequacy of funding comes into play after that in
41 terms of addressing which components are
42 affordable.
43 Q Okay. All right.
44 DR. RIDDELL: I might add, the sequencing of the
45 discussion, also, is one where the budget
46 responsibility for regional stock assessment is
47 through the science sector and so it would come to

1 the head of the salmon stock assessment division.
2 And working with their area chief stock assessment
3 and the core stock assessment program in science,
4 we would typically start meeting actually
5 typically about this time of year because there
6 are spring stock assessment programs, as we've
7 noted, and you would start then working towards
8 your expected program needs for the coming year,
9 which are going to be very similar to the past
10 program four years ago. And you would start
11 flushing out your budgets and looking at whether
12 or not you had sufficient funds to meet the
13 expected project needs before you would then go to
14 SACC because otherwise you're not really going to
15 identify what the issues are to really address
16 with the SACC members.

17 Q Okay. In terms of the budget, we've heard about
18 A-base and B-base funding in the hearings. Are
19 both those types of funding part of the budget for
20 stock assessment?

21 DR. RIDDELL: Definitely, yes.

22 Q Okay.

23 MR. WHITEHOUSE: Yes.

24 Q Mr. Whitehouse, can you explain what currently is
25 covered by B-base funding in the stock assessment
26 budget?

27 MR. WHITEHOUSE: To a large extent, when we're talking
28 B-base within the SACC arena, we're talking about
29 Pacific Salmon Treaty B-base funds, those cover
30 both salary, wages and most of the operational
31 costs for projects delivered focusing on all five
32 species within the region.

33 Q Okay.

34 DR. RIDDELL: Maybe for clarity, though, we should
35 identify A-base and B-base to beginning with,
36 because A-base is what we would, within
37 government, typically refer to as core annual
38 funding. And that has changed three times
39 significantly in my experience. When we sign the
40 -- well, actually, when we formed the regional
41 stock assessment program within science, there was
42 a regional budget review that really had to
43 separate all the existing budgets within DFO
44 Pacific. They defined the existing A-base budget
45 in about 1985.

46 In 1985, we signed the Pacific Salmon Treaty
47 for the first time and the region received

1 approximately \$32 million in salaries and
2 programs, including some capital for equipment.
3 It was a very large sum at the time because, of
4 course, we accepted responsibility for the old
5 IPSFC and brought those people in to the
6 department. That money was for a very long time
7 considered to be a special allocation by treasury
8 board and was referred to as B-base because it
9 wasn't part of the core annual budget. It was
10 dedicated to the implementation of the Treaty and
11 it was tracked that way financially from probably
12 1985 fiscal year through 1999.

13 In 1999, we signed a second-generation treaty
14 with the United States. And I actually do not
15 recall why but at that time, the original Pacific
16 salmon funding that had been referred to as B-base
17 and a dedicated fund was rolled into A-base, which
18 is the ongoing core funding. That had an
19 unfortunate effect in the long run because
20 frequently when there are reductions in government
21 spending, your core funding is the first place
22 that funds are looked for and special allocations
23 are frequently protected by treasury board
24 agreements. The 1999 agreement had a second
25 treasury board allocation of approximately \$11
26 million. And that money was tracked and is still
27 tracked as a separate, special allocation from
28 treasury board. And of course, it's dedicated
29 through DFO but it is still tracked separately.

30 The effect of the 1999 on the Fraser Sockeye
31 is probably notable because the presentation to
32 treasury board in 1999 was that we could only ask
33 for additional funds under the new agreement for
34 anything that was clearly new under the agreement
35 of the new treaty. So given that most of the
36 significant funds for 1985 was taking over the
37 IPSFC, we were not allowed to request any
38 additional funds at all for Fraser Sockeye in
39 1999. Am I emphasizing "all" too much? I don't
40 think we did in the end.

41 MR. WHITEHOUSE: No, there was a small amount.

42 DR. RIDDELL: Small amount. Very small amount for
43 Fraser Sockeye.

44 Q So in terms of cost increases for wages, cost of
45 living, incremental costs, replacement of
46 equipment, any of that kind of stuff, were you
47 allowed to ask for new money for any of that?

1 DR. RIDDELL: No, but those are frequently considered
2 to be annual operating costs and you are expected
3 to budget for in your annual process. Salaries,
4 our different salaries, are provided by treasury
5 board, as new agreements are signed and you don't
6 always get the full increment, regrettably. I'm
7 not sure how that happens but we do typically have
8 to find resources to meet the salary demands at
9 times.

10 Q All right. And improvements that you may want to
11 make to those existing programs, would they be
12 considered new programs or would they be
13 considered the old programs and you were unable to
14 ask for new money for them?

15 DR. RIDDELL: Well, I'm trying to remember why Timber
16 is saying "some" because I can't actually remember
17 the exact example. What did we get money for in
18 Fraser Sockeye?

19 MR. WHITEHOUSE: There was an increase of 330,000 O and
20 M recognizing there was substantial growth in some
21 stock so --

22 DR. RIDDELL: Oh, okay.

23 MR. WHITEHOUSE: -- there was new stocks emerging that
24 would require high precision estimation. And
25 there was one FT, one new staff member funded,
26 recognizing there would be an increased workload
27 associated with evaluating and assessing that
28 information. So there was both salary and wages
29 and O and M identified.

30 Q For the total 330,000?

31 DR. RIDDELL: Yeah. And that's out of 11 million. And
32 the majority of the money was directed to new
33 programs, which, at that time of the treaty
34 agreement, the big debates in '99 were management
35 regimes for Chinook and Coho salmon coast-wide.
36 And then when they went to an abundance-based
37 management regime in the ocean that I assure you,
38 you don't want to talk about, then they went to
39 indicator stock so you had better information to
40 manage those fisheries on. But the Fraser Sockeye
41 did not get a lot of resources other than Timber
42 identified. The consequence of that is it then
43 became part of core funding and open to subsequent
44 reductions within the department.

45 Q So is it fair to say that the Fraser River stock
46 assessment program is still mostly reliant then on
47 funds allocated in 1985 in terms of a total number

1 when DFO took over the assessment from the IPSFC?
2 And then there's also been -- not only is that
3 sort of the baseline but there's been erosion of
4 that money base because since 1999 these funds are
5 now in A-base funding and are subject to further
6 reductions?

7 DR. RIDDELL: Well, I think the simple answer is yes.
8 But my qualification would be that much of the
9 money that is directed to Fraser Sockeye now has
10 had to come from the Pacific Salmon Treaty
11 allocation. The department has always treated
12 Fraser Sockeye as our first priority need to meet
13 our Treaty obligations and we see it clearly as
14 the sort of gold standard of how the department is
15 evaluated. So the Fraser Sockeye program when you
16 look at budget histories, they have suffered fewer
17 cuts than many of the other programs only because
18 of the very specific decision to fund them as a
19 top priority.

20 Q Okay.

21 DR. RIDDELL: And so it's a little bit difficult to
22 answer your question historically because if you
23 had a 1985 dollar now and we have a dollar today,
24 they're not made up out of the same pots that they
25 used to be.

26 Q Okay. Coming back to the funding on an
27 operational level, SACC, again, it apportions
28 annual stock assessment funds; is that right?

29 MR. WHITEHOUSE: Yes.

30 Q And is there an agreed prioritization framework
31 for how monies are spent within stock assessment?

32 MR. WHITEHOUSE: We follow a structured approach, yes.

33 Q All right. And if I can ask you to turn to Tab 7
34 of the binder in front of you? Is this document a
35 document used in prioritizing stock assessment
36 funds and needs? This is the Salmon Stock
37 Assessment Plan 2004/2005.

38 MR. WHITEHOUSE: That's correct. This is a document
39 that reflects business planning exercises in
40 '04/'05. Represents I will call it an iterative
41 process associated with three to four years of
42 planning prior to that and aligns assessment
43 objectives with management objectives.

44 Q Is it still foundational for assessment
45 priorities? Is it still relevant today?

46 MR. WHITEHOUSE: I think it's important to stress that
47 at a core or base level, the funding or the

1 assessment priorities haven't changed at all
2 probably from a Fraser Sockeye perspective to
3 times that pre-date the initial 1985 treaty. So
4 the elements that require support are stable and
5 would be similar to those that are -- well,
6 equivalent to those that are described within the
7 elements of this plan.

8 Q Okay.

9 DR. RIDDELL: Could I just add something?

10 Q Yes.

11 DR. RIDDELL: The business plan was developed. There
12 was always a limited amount of money. And there
13 are changing priorities over time. And so what
14 the intention was, was to develop a business
15 planning process that was structured and the
16 people could have an accountability with and it's
17 structured around the idea that there are ongoing
18 objectives we have to meet such as conservation
19 risks of particular populations, meeting Pacific
20 Salmon Treaty obligations, First Nation
21 agreements, which are developing and some may be
22 new in some areas and so they could change their
23 priority. We put a high priority on assessing
24 stocks that are important for harvest management.
25 What are important contributors to the fisheries?
26 And then one that probably got less importance but
27 is always in the back of our minds scientifically
28 is the priority for long-term monitoring
29 information.

30 And so we set up a structure for all of the
31 salmon populations throughout B.C. and tried to
32 evaluate them on a standard set of criteria. Now,
33 the weighting of those can change over time
34 because the conservation value, for example, could
35 change with time. But this was a way to try and
36 develop a structured approach to budgeting on an
37 annual basis that was responsive to changes in the
38 stock and meeting current priorities.

39 Q Thank you. And I don't know if you answered the
40 question. Is this document still used today? Is
41 it still a foundational document and used today?

42 MR. WHITEHOUSE: It largely describes the process used
43 to allocate funds today.

44 MS. BAKER: All right. Thank you. Could I have that
45 marked, please, as the next exhibit?

46 THE REGISTRAR: Exhibit 381.

47

1 EXHIBIT 381: Salmon Stock Assessment Plan
2 2004/05
3

4 MS. BAKER:

5 Q And are the assessment priorities revised every
6 year as you look at the landscape before you?

7 MR. WHITEHOUSE: The assessment priorities, meaning
8 project profile -- well, let me step back.
9 Assessment priorities don't change unless there's
10 a major change associated with management
11 objectives. The exception would be if there was
12 emerging conservation concerns whereby we knew we
13 had to re-direct resources to address the ability
14 to provide status comment for stocks that had
15 reached very low levels, for example. But as I
16 said earlier, the key drivers that underpin the
17 management models don't change largely so
18 assessment priorities, with the exception of maybe
19 emerging conservation-related issues, are quite
20 static as well.

21 Q All right.

22 DR. RIDDELL: Could I add that the assessment
23 priorities do change annually. I mean the
24 criteria we set; we try to maintain to be
25 consistent through time. But example, a First
26 Nation agreement. If there is a new agreement
27 that comes into place with new deliverables and
28 they require an allocation of funds that would
29 have to be met. We've already identified in
30 Fraser Sockeye that you have the cyclic variation
31 in a number of populations. In some years, we
32 would have had to allocate significant amounts of
33 the budget to meet the demands in the Fraser
34 Sockeye. On the low cycle years, we could have up
35 to a million dollars that could be re-allocated to
36 other programs to try and catch information up
37 from other areas and other populations. So the
38 budgeting process is actually different every
39 year; the criteria don't change much.

40 Q Yeah, I guess that was the point. The criteria
41 don't change but every year you're going to be
42 applying the funds differently depending on --

43 DR. RIDDELL: Every year was a different argument.

44 Q All right. And when are your budgets typically
45 finalized for stock assessment in the calendar
46 year?

47 DR. RIDDELL: Which one? We have the preliminary. We

1 have our near final and our near-near final and
2 then final.

3 Q Final.

4 DR. RIDDELL: Final typically is actually about mid-
5 fall.

6 Q Okay.

7 DR. RIDDELL: Used to be. I shouldn't speak currently.
8 Do you know that?

9 MR. WHITEHOUSE: It may be slightly better than that,
10 Brian. Late August/September timeline. But
11 you're right, it's well into the enumeration
12 season.

13 Q All right. So you've actually been implementing
14 programs before the budget is finalized in any
15 given calendar year; is that right?

16 DR. RIDDELL: Every year.

17 Q Okay. Is there any impact from the late
18 finalization of these budgets within the calendar
19 year?

20 DR. RIDDELL: Well, you know, full credit to the area
21 chief stock assessments because they were the ones
22 typically -- we always knew where we could, if you
23 want, to be most risky and what we could fund and
24 not fund. And so we would always plan within plus
25 or minus 10 percent when we're looking at final
26 allocations and then really had to track them
27 continuously through the year. Formally, the
28 government has a six-month review, a nine-month
29 and then a final. And at that six-month review,
30 which six months into our year typically is
31 September and currently now apparently have full
32 budgets. We had years where you really didn't
33 even know exactly what the target was at six
34 months. But what you would start doing or what I
35 did at the time, we would start looking at what
36 the expenditures were in real dollars because most
37 of the programs are now pretty much coming to an
38 end except Fraser Sockeye assessment frequently
39 into the fall.

40 Those are so well budgeted that very, very
41 seldom did Timber ever have a problem in trying to
42 recoup money for pre-planned programs. And so
43 really we were getting away with just really good
44 people managing these budgets and understanding
45 what the budget pressures were going to be. The
46 nine-month review frequently is when I would have
47 to do a lot of looking across budgets to make sure

46
PANEL NO. 16
In chief by Ms. Baker

1 that I came out as close to a zero balance as I
2 could in the end. Surprisingly, I think, in my
3 four or five years, I think we only went over
4 budget by very small amounts once out of four or
5 five years. But it is fairly tense in the final
6 three or four months of budgeting and what it
7 leads you to.

8 Q And have there been instances where --

9 THE COMMISSIONER: Ms. Baker, I wonder if this would be
10 a good place to take our break?

11 MS. BAKER: Oh, sorry, yes.

12 THE REGISTRAR: The hearing is now adjourned until 2:00
13 p.m.

14
15 (PROCEEDINGS ADJOURNED FOR NOON RECESS)

16 (PROCEEDINGS RECONVENED)

17

18 THE REGISTRAR: The hearing is now resumed.

19 MS. BAKER: Thank you.

20

21 EXAMINATION IN CHIEF BY MS. BAKER, continuing:

22

23 Q When we left just before lunch we were talking
24 about the SAC Committee and funding and budgets.
25 Who is responsible for approving the final budget,
26 Dr. Riddell.

27 DR. RIDDELL: Well, the final approval is at the
28 Regional Executive Management Committee.

29 Q And is that based on recommendations from SACC as
30 a whole?

31 DR. RIDDELL: Yes. Annually I would prepare a budget
32 summary indicating what was covered, what the
33 unfunded priorities might be, and basically send
34 that up through the chain. That would be the
35 signoff for the budget.

36 Q Right. And you have an example of that at Tab 8,
37 which is CAN062201. This is, I take it, one of
38 the notes that would find its way up to the
39 Regional Management Committee for final decision?

40 DR. RIDDELL: Yes.

41 Q Okay. And just to identify some of the concerns
42 that would be outlined in a briefing note like
43 this, if we turn to the final page, you set out --
44 sorry, not the final page, that is a table, but
45 just before the table. Yes, that's right.

46 At the top of the page it sets out some
47 options:

February 2, 2011

- 1 1. Proceed with proposed assessment plan,
2 including activities identified in
3 Appendix 2...
- 4
- 5 2. Proceed with proposed assessment plan
6 *but cancel the activities identified in*
7 *Appendix 2...*
- 8
- 9 3. Engage the Stock Assessment Management
10 Board to determine the final salmon
11 assessment plan.
- 12

13 And then a recommendation, and your recommendation
14 at that time was:

15

16 Given the apparent uncertainty in budgets for
17 2007/08, Dr. Riddell requested that each Area
18 re-evaluate their projects and develop the
19 plan in Appendix 2 that would deliver an
20 assessment plan ***within the assumed budget.***
21 While each Area and Core Assessment has
22 cooperated in this exercise, SACC notes that
23 the projects included in Appendix 2 represent
24 a significant loss of information.
25 Consequently, it is very difficult for SACC
26 to recommend Option 2 but in the absence of
27 available relief funds in Science (to our
28 knowledge at this time) and in light of Paul
29 Sprout's memo in early June, Option 2 seems
30 the only responsible action within SACC's
31 authority.

32

33 And then the recommendation is made. And this, I
34 take it, is a situation you find yourself in when
35 the budgets are being cut that you have to make
36 recommendations dealing with reducing funds and
37 with pressure to continue to reduce your operating
38 cost?

39 DR. RIDDELL: Yes, and earlier in that page there was a
40 table of the allocations in previous years and in
41 that table it's bolded, because as we've talked
42 about this morning, when we are doing this process
43 we wouldn't know the final budget but we would
44 have a notional budget. And that I would
45 typically work with the staff to come down to the
46 best solution we could. But you're always going
47 to come in with a number of projects that you

1 can't quite fund, and that's the intention of
2 providing this summary document with some options
3 for senior management.

4 Q And just looking at that table, what are -- what
5 are the abbreviated letters there, "S&W \$K",
6 O&M \$K"?

7 DR. RIDDELL: S&W is salary and wages, and O&M is
8 operating and maintenance.

9 Q Okay. And then we see "Abase", which we've talked
10 about already, and "PST", I take it that is the
11 funding under the Treaty?

12 DR. RIDDELL: Yes.

13 Q Which is B-base, or A-base?

14 DR. RIDDELL: Well, it's a special allocation.

15 Q It's a special allocation.

16 DR. RIDDELL: Right. So it's not a guaranteed ongoing
17 fund, so it's not A-base.

18 Q But this is where you identified that certain
19 funds in 1999 were moved into A-base and then
20 additional funds were available for the PST
21 allocation. That's the distinction that we see
22 there?

23 DR. RIDDELL: That's the PST, yes.

24 MS. BAKER: Okay. Thank you. Can I have that marked,
25 please, as the next exhibit.

26 THE CLERK: Exhibit 382.

27

28 EXHIBIT 382: Draft Decision Note from Brian
29 Riddell to Regional Director General, July 9,
30 2007

31

32 THE COMMISSIONER: Ms. Baker, could I just ask very
33 briefly this question. I've heard a large body of
34 evidence around pre-season, in-season and post-
35 season management and all that falls under those
36 headings. This is the first time I've gotten into
37 this funding side. What exactly is covered by
38 this area of funding? In other words, within the
39 Stock Assessment Plan, you mentioned forecasting,
40 for example, and other areas. Is it all covered
41 under this Plan? What exactly is covered in here?

42 DR. RIDDELL: What's covered here is all stock
43 assessment of salmon in the Pacific Region,
44 including the Yukon. So when you heard
45 forecasting described, and now we have Sue Grant
46 is the person responsible for Fraser sockeye
47 forecasting, Sue would be part of the salary and

1 wages and have some operating funds. The basic
2 operating funds here are the major annual projects
3 for estimating escapements. They would not
4 necessarily include in-season test fisheries,
5 because a lot of that is under resource
6 management. But it would include things, in the
7 Skeena, for example, there's a longstanding tye
8 test fishery in the river, and that is part of
9 stock assessment. Those things actually differ
10 just due to the way things developed through time
11 a little bit. But this is all of the core
12 information that would be used in actually making
13 assessments.

14 MR. WHITEHOUSE: If I can add to that. From the Fraser
15 perspective it almost exclusively through this
16 venue is the terminal area spawning escapement
17 estimates. None of the test fisheries are funded
18 through this route. In addition, none of the
19 catch monitoring, which could be considered a
20 component of stock assessment, as it represents
21 that calculation of total return, none of the
22 catch monitoring programs are included here,
23 either, so they're under a different funding
24 envelope.

25 MS. BAKER:

26 Q So all of the programs that we talked about first
27 thing this morning, with the exception of the
28 Chilko smolt POST program that is being funded
29 through a variety of sources coordinated with the
30 Salmon Foundation, all those programs are funded
31 out of this budget?

32 DR. RIDDELL: Yes, correct.

33 Q Okay. and I just wanted to go back to the treaty,
34 just to identify the areas that are covered off
35 for DFO's management in this area. And if we have
36 that at Exhibit 65, please, a copy of the Treaty,
37 page 126. Down to - it's hard to see - paragraph
38 F -- keep going, there.

39 And what's the relevance of Paragraph F in
40 terms of the Stock Assessment Program for Fraser
41 River sockeye?

42 MR. WHITEHOUSE: So this entire MOU is attached to the
43 both '85 and '99 Pacific Salmon Treaty. This MOU
44 is related to the transfer of responsibilities
45 from the IPSFC to DFO in '85. Paragraph F
46 specifically speaks to the issue of the continuity
47 of the enumeration methods, the collection of bio-

1 sample data, and population abundance information,
2 as well as the extent of coverage that needs to
3 occur to meet Canada's obligations to the
4 management assessment framework, management
5 objectives. It recognizes that estimation of
6 total annual return is a component and as such,
7 escapement monitoring of all stocks is important.
8 It also recognizes that for the perspective of
9 continuity in method types to ensure precision and
10 accuracy is consistent through time, that these
11 approaches to enumeration are consistent, as well.

12 Q And is this one of the objectives when you are
13 looking at funding for stock assessment, is this
14 one of the priorities that you have to consider?

15 MR. WHITEHOUSE: Yes, it's key.

16 Q Okay. We've talked today quite a bit about
17 funding cuts, and I know funding cuts were
18 discussed in December when Dr. Riddell was here
19 earlier. The question I want to ask you on cuts
20 right now is there have been cuts in the past.
21 What direction have you been given as to future
22 planned cuts? Are future cuts planned for stock
23 assessment, or are they -- are future plan cuts
24 planned for government, which will have an impact
25 on stock assessment?

26 MR. WHITEHOUSE: In terms of this upcoming planning
27 year, we're being advised that there are likely
28 government-wide pressures associated with funding
29 coming down. There are some notional targets that
30 have been discussed in terms of potentials, and
31 we're talking approximately five percent cuts
32 right now as targets. But as Brian mentioned,
33 through this process it's quite iterative through
34 the year. We see many potential changes to the
35 budget until it ultimately is delivered in the
36 August to October timeline. But there are talks
37 of continued fiscal pressures on the budgets.

38 Q Right.

39 DR. RIDDELL: Could I just add, it's sometimes easy to
40 forget exactly what five percent means, because
41 the five percent expression now is five percent on
42 total budgets. So it sounds a fairly small
43 percent. But you also have government guidelines
44 where you're not allowed to reduce staff, unless
45 they're term field staff working in projects on a
46 very short-term basis. So what that means to a
47 senior manager is five percent of your total

1 budget. Very broad terms, at least 70 percent of
2 your total budget is likely taken up in salary --
3 well, salary, wages, benefits, and all that. And
4 so really you're looking at five percent of a
5 total that turns into more like 15 to 20 percent
6 of operating at times. All right? And so these
7 small cuts have a very almost insidious way of
8 accumulating to significant reductions in
9 programs.

10 Q Okay. And the five percent that's being
11 discussed, Mr. Whitehouse, is that five percent
12 per year over a number of years, or is that five
13 percent total over a number of years?

14 MR. WHITEHOUSE: It's an interesting question because
15 it hasn't been treated consistently through past
16 years. In some years it compounds from year to
17 year, so it's a five percent on a five percent.
18 Sometimes it's represented five percent cut
19 against a base level. So we have not got the
20 understanding at this point in time, looking
21 forward, to know whether it's compounded or a one-
22 time assessment against a base reference level.

23 Q All right, thank you. And then just following up
24 on your comment just now, Dr. Riddell. When you
25 were here in December you indicated that there had
26 been cuts since 1999 in the range of 10 to 20
27 percent, and I take it this is on the global
28 budget. How does that number translate into cuts
29 to the operating funds for stock assessment?

30 DR. RIDDELL: Well, when I made that comment, I was
31 thinking in terms of the total budget allocation
32 for all salaries and wages, and operating and
33 maintenance. And the total budget for the Region
34 could have been in the range of about 16.5, 16.8
35 is their highest value, and at time it's been as
36 low as about 13.5. And then sometimes of course
37 you get relief because there are special
38 allocations. But when I use that percentage, I
39 was using percent of total value. And so when
40 that gets down to program costs, now I have
41 salaries that have to be paid and then it would be
42 translated into operating costs. So it would be
43 bigger than that. If you had 10 percent reduction
44 on total, it could easily be 25 percent on
45 operating.

46 Q And if the range that you were talking about
47 earlier was 10 to 20 percent, then your range

1 would be 25 percent plus for operational cuts; is
2 that fair?

3 DR. RIDDELL: Yes.

4 Q When we started this morning we talked about the
5 different programs that are operated through stock
6 assessment, and we talked about what were
7 originally in place with the old Salmon Commission
8 and what changes had been made to those programs
9 over time. And I just want to go through some of
10 those and ask you whether those reductions, for
11 the most part those were reductions, in programs
12 are a result of budget cuts.

13 So first of all, I don't know that you had
14 with respect to adult enumeration on the spawning
15 grounds, you identified that aside from a few
16 years where you were unable to complete a full
17 assessment, that program has remained intact. Is
18 that fair, Mr. Whitehouse?

19 MR. WHITEHOUSE: That's correct.

20 Q Okay.

21 MR. WHITEHOUSE: With the exceptions noted.

22 Q Okay. You've also talked about cuts made to the
23 juvenile program, so the fry programs. Were those
24 reductions made as a result of budget cut
25 pressures?

26 MR. WHITEHOUSE: Yes, the virtual elimination of fry
27 programs responded to budgetary pressures.

28 Q You also talked about changes to the smolt
29 program, or sorry, juvenile assessment programs,
30 that the years in which those were conducted have
31 been reduced somewhat. Were those changes also as
32 a result of budget cuts?

33 MR. WHITEHOUSE: Yes, I was referring specifically here
34 to the in-lake hydroacoustic and trawl surveys and
35 the limnological assessment of Fraser lakes, a
36 marked decrease in the amount of activity due to
37 budget restraints.

38 Q What is the impact on a global level, what's the
39 impact of those kinds of reductions in programs.
40 What does that do to the knowledge that the
41 Department and science has as to the life history
42 of salmon?

43 MR. WHITEHOUSE: I think there's a number of things to
44 think about in responding. I think the key is, is
45 that the purpose of the various layers, in terms
46 of assessing different life history stages are
47 explanatory power for identifying shifts in

1 production trends, for example, changes in fish
2 production patterns that could not be explained by
3 simply tracking adults. So all of these
4 components can be looked at as incremental add-ons
5 to improve understanding and certainty with which
6 we are able to provide advice, science-based
7 advice to managers. As you remove the capacity to
8 understand these life history based studies, we
9 reduce the ability to explain variation in
10 patterns that we see.

11 Q We have obtained some documents that show some
12 funding levels required for the programs over
13 different years, and I think it might be helpful
14 just to review that. If you could turn to Tab 5
15 of the binder, which is CAN058261, and CAN058262.
16 They should be kept together. I hope that is how
17 they have been presented. There should be this e-
18 mail page from Chuck Parken to Brian Riddell, and
19 a Summary of Historical funding for Stock
20 Assessment Budgets should be the second page. Is
21 that what I see down at the bottom there.

22 MR. LUNN: They are two separate pages.

23 MS. BAKER: Okay. All right, thank you.

24 Q So I understand that these two documents go
25 together, that the spreadsheet on the back was an
26 attachment to the e-mail. Do you have that
27 document?

28 DR. RIDDELL: Yes.

29 Q Okay, thank you. And this, if we turn to the
30 spreadsheet, the Summary of Historical Funding for
31 Stock Assessment Budgets, this covers a period
32 '98/'99 through to '05/'06. And you'll see some
33 fluctuations in the total allocations for the
34 operational budgets starting in '98/'99, the total
35 is in millions -- well, maybe you can tell me what
36 is the "Sockeye Total". Is that millions, or
37 what's the value that we're looking at there?

38 DR. RIDDELL: 1.73 million --

39 Q Okay.

40 DR. RIDDELL: -- in 1998/'99. That's the sockeye total

41 Q Okay. And then it drops by 400,000, stays more or
42 less, just a little bit more, goes up again, back
43 up 17, then down to 14, down to 8, down to 798.
44 Is there some explanation you can give us as to
45 those fluctuations in funding?

46 MR. WHITEHOUSE: Yeah, I think there's some important
47 patterns that need to be pointed out here. As we

1 spoke earlier, sockeye funding needs based on the
2 program profile and the number of high precision
3 estimates required, linked to the expected
4 abundance returning to the spawning grounds,
5 fluctuates with cycles in Fraser sockeye
6 abundance. So Late run populations represent an
7 increase in pressure. That's the '98/'99, 2000,
8 2003, cycle that you see here. The numbers which
9 are elevated during those years represent
10 increased costs associated with enumeration.

11 In the years between that there are reduced
12 requirements, so the budgets commensurately are
13 reduced to reflect that reduced need in terms of
14 enumeration.

15 MS. BAKER: All right. And can I have this marked,
16 please, this combined document as one exhibit.

17 THE COMMISSIONER: Exhibit 383.

18
19 EXHIBIT 383: E-mail from Chuck Parken to
20 Brian Riddell, July 7, 2005, with attached
21 Summary of Historical Funding for Stock
22 Assessment Budgets, BCIA, FY 98/99 - FY 05/06
23

24 MS. BAKER:

25 Q And what do those fluctuations year to year in
26 funding requirements, does that create any
27 difficulties in planning and difficulties in
28 budgeting for the program?

29 MR. WHITEHOUSE: It indeed does, associated with a
30 fluctuation on that dominant year represents an
31 increase in budget pressure that while it should
32 be foreseeable, given we know population abundance
33 cycle across this four-year pattern, the reality
34 is, given the pressure on budgets, it has
35 represented an additional burden to the regional
36 assessment budgets that have been very difficult
37 to accommodate.

38 Q So once people get used to funding at a lower
39 level, you find it hard to get money to go back
40 up; is that the problem?

41 MR. WHITEHOUSE: Basically in order to accommodate the
42 increase in funding requirements on a dominant
43 cycle year, there's no new money coming in, means
44 something has to fall off the table somewhere
45 else. So the 400,000 increase approximately that
46 you see, although it would be much greater in the
47 latter years in this table, that increase is

1 associated with lowering the priority on other
2 projects that would have been delivered during the
3 non-dominant year. And those aren't necessarily
4 Fraser sockeye or even Fraser salmon programs that
5 would be accommodating Fraser sockeye interests
6 ahead of a number of other species interests,
7 coast-wide.

8 Q Okay. And 2010 was a year where the numbers came
9 back bigger than expected, or at least on the very
10 high side of what was expected. What did that do,
11 how was that accommodated within your programs?

12 MR. WHITEHOUSE: Well, first off, planning process
13 provided adequate budget for expected levels of
14 abundance coming back in 2010. When we got signal
15 early on in the season that abundances were going
16 to be substantially greater than we had
17 anticipated, I flagged this to the division head,
18 and said "I'm going to likely need substantial
19 additional resources in order to be able to
20 address this", and the Department was able to
21 identify these resources. So we did not have any
22 gaps this year in terms of the program profile as
23 implemented.

24 Q Has that been the case, that where you have had
25 extraordinary needs, money has been found to
26 provide you with the resources that you need for
27 at least managing the Fraser River stocks?

28 MR. WHITEHOUSE: In most cases, yes. However, there
29 are exceptions that are flagged in this table, for
30 example, where we were unable to meet due to
31 budgetary constraints the ability to deliver all
32 necessary program elements.

33 Q And would one of those examples be the Horsefly
34 River/Quesnel, which you see there's a zero with
35 an asterisk beside it in the -- I can't see the
36 year, Mr. Lunn, can you just move it down. I
37 think it's 2002, but if you can move the other
38 direction just so we can see the top of the table.
39 I think it's the 2002/2003 year, you see the
40 Horsefly has a zero with a star beside it, an
41 asterisk, and at the bottom it says:

42
43 Project was required but was unfunded and not
44 delivered in 2002...

45
46 Is that an example?

47 MR. WHITEHOUSE: That is exactly an example thereof,

1 yes.

2 Q Okay. And I'd like to just turn to the 2002 year.
3 In 2002 you had that problem as identified with
4 that stock, and there was a memo prepared - excuse
5 me, let me just find that - Tab 3, this is
6 CAN008206. This is an Impact Statement for Budget
7 Challenges in 2002/2003. Are you familiar with
8 this document?

9 MR. WHITEHOUSE: Yes, I'm the author.

10 Q Okay. And why was this document prepared?

11 MR. WHITEHOUSE: It was a summary of the budgetary
12 challenges in terms of program planning based on
13 our first evaluation of likely budget status to
14 come to our program in the 2002/2003 fiscal year.

15 Q At the bottom of that first page, the last
16 paragraph, identifies that:

17
18 Reductions of this magnitude will have a
19 marked negative impact on management and
20 assessment of Fraser River sockeye fisheries
21 and population dynamics in the immediate and
22 long term. The current configuration fails
23 to meet Canada's obligations under the
24 [Salmon Treaty], some aspects of which have
25 already been agreed to for 2002/2003 field
26 season... Failure to adequately deliver the
27 Fraser River sockeye enumeration program
28 mandate will seriously erode client and
29 stakeholder confidence in the Department.
30

31 And that was your view at that time?

32 MR. WHITEHOUSE: Yeah, and I think it's important to
33 point out the two bullets immediately above that,
34 because that's not simply not delivering the
35 Quesnel, which was the ultimate outcome. At this
36 point, and this was a May-time meeting, we would
37 have had no ability to enumerate Summer runs in
38 2002 -- sorry, Early Summer runs and no ability to
39 assess three of the major four components of the
40 Summer run. So it would have represented a major
41 hole in the stock assessment program. So between
42 the time that this was drafted and the ultimate
43 program delivery, there were a number of pieces of
44 emergency relief funding that were delivered, such
45 that two major gaps existed in the 2002 program.
46 Quesnel, as was already highlighted, and
47 Birkenhead, which was another component that was

57
PANEL NO. 16
In chief by Ms. Baker

1 not estimated.

2 MS. BAKER: I'd like that memo marked, please, as the
3 next exhibit.

4 THE REGISTRAR: Exhibit 384.

5

6

7

8

9

EXHIBIT 384: Impact Statement STAD Budget
Challenge 2002-2003 BCIA - FRS enumeration,
2003

10 MS. BAKER:

11 Q And in 2002 the concerns were raised also by the
12 Salmon Commission itself. I want to ask you if
13 you are familiar with the document that you can
14 find at Tab 13 of the binder. It's a Salmon
15 Commission document. This was written in August
16 2002 and it's from Don Kowal. If you could turn
17 to the next page, please. Thank you. And this
18 also identifies in the second paragraph the
19 importance of catch and escapement monitoring, and
20 second line:

21

22

23

24

25

26

27

28

29

The Pacific Salmon Treaty recognized the
importance of these data and Canada was
committed to continue to carry out essential
stock assessment activities such as the
escapement enumeration programs when the
management of Fraser River sockeye and pink
salmon was repatriated to Canada.

30

The bottom paragraph on that page:

31

32

33

34

35

36

37

38

39

And it goes on.

40

41

Were you aware of the concerns raised by the
Salmon Commission at that time in 2002?

42

43

44

45

46

47

MR. WHITEHOUSE: Specific timing of delivery of this
document, I can't comment on. I would have been
aware through the chain of communication that the
Fraser Panel and the management infrastructure
would have been concerned about this. And I
ultimately at some point later in the season would

1 have seen this document.

2 MS. BAKER: Okay. Have that marked, please, as the
3 next exhibit.

4 THE REGISTRAR: Exhibit 385.

5
6
7
8
9

EXHIBIT 385: Letter from Pacific Salmon
Commission, Concern re Escapement Assessment
Programs, August 26, 2002

10 MS. BAKER:

11 Q And what was the outcome of the 2002 year and the
12 concerns which we've just identified in Exhibits
13 384 and 385?

14 MR. WHITEHOUSE: I think we've covered it, but just to
15 restate, there was substantial relief funding to
16 address gaps associated with earlier components of
17 the program to address all Early Summer runs and
18 most Summer run components. But we did fall short
19 and were unable to identify funding or a way to
20 deliver programs associated with the Quesnel
21 assessment and Birkenhead River assessment.

22 Q And did those reductions impact Fraser River
23 sockeye management for that year?

24 MR. WHITEHOUSE: They will for a number of reasons
25 stated earlier, associated with determination of
26 total return, and evaluating management
27 performance, and specifically with respect to
28 Summer run stocks have had the impact of
29 increasing the uncertainty with which we could
30 evaluate the fishery performance.

31 Q And if you turn to the next tab, Tab 14 in the
32 binder, this is a memo from the Salmon Commission
33 dated May 5, 2003. And again in this letter, the
34 Commission is reporting concerns from the Panel
35 with respect to planned reductions stock
36 escapement enumeration programs in 2003. There's
37 a memo and a presentation attached to that,
38 setting out some of the concerns raised by the
39 Salmon Commission. If you can just flip through
40 those pages.

41 Do you remember an issue in 2003 with respect
42 to planned reductions in stock escapement, or
43 excuse me, escapement enumeration?

44 MR. WHITEHOUSE: Yes, I do, and I would frame the
45 context here, again May timeline, so this would be
46 early in the process. Considerable amount of
47 uncertainty with respect to budgets, but the

1 notional budgets that would have allocated were
2 indicating significant problems in terms of our
3 ability to deliver the full suite of assessment
4 programs, and this would have been a response from
5 the Salmon Commission and Canadian and U.S.
6 Commissioners raising their concerns that
7 something akin to 2002 was happening again.

8 Q And do you remember what the outcome was in 2003?

9 MR. WHITEHOUSE: We were largely able to implement most
10 of the assessment framework.

11 DR. RIDDELL: With the exception of Fraser pinks. I
12 would point out that.

13 MR. WHITEHOUSE: That's a good point, yes.

14 DR. RIDDELL: That is the first year that assessment
15 was not done on Fraser pink salmon, other than the
16 fry downstream.

17 Q So the money for sockeye was pulled from pinks to
18 a certain extent, is that what happened, or was it
19 just pinks eliminated?

20 DR. RIDDELL: Well, I can point out I wasn't there, so
21 I can't really answer that.

22 MR. WHITEHOUSE: That is a reasonable characterization.
23 Given the funding pressures across the region, we
24 had to basically dig into the money used to fund
25 pink to fund other higher priority items within
26 the assessment framework.

27 MS. BAKER: Thank you. I'd like that document marked
28 as the next exhibit, please.

29 THE REGISTRAR: Exhibit 386.

30
31 EXHIBIT 386: Memorandum from Pacific Salmon
32 Commission with attachments, Fraser River
33 Sockeye and Pink Spawning Enumeration
34 Programs, May 1, 2003
35

36 MS. BAKER:

37 Q Have the concerns identified in 2002 and 2003
38 continued at any point up to the present? I guess
39 what I could ask is have there been other years
40 where funding proposals for and planned programs
41 for escapement enumeration have raised concerns
42 with the Salmon Commission and have potentially
43 put Canada in a position where it was unable to
44 meet its Treaty obligations?

45 MR. WHITEHOUSE: We have experienced budget challenges
46 of variable magnitudes annually since that point
47 in time. I don't recall off the top of my head

1 whether we've had formal correspondence from the
2 Fraser Panel in relation to their concerns, but
3 there have been years where we did not deliver the
4 entire Fraser assessment program. 2006 jumps to
5 mind, again pressures in Quesnel where we had a
6 few projects that were not able to be fully
7 implemented.

8 Q I just wanted to touch on the point that you
9 raised, Dr. Riddell, impacts on non-Fraser River
10 sockeye stocks. When we talk about the priorities
11 for funding and for stock assessment, I take it
12 Fraser River sockeye is the top priority stock; is
13 that fair?

14 DR. RIDDELL: Yes.

15 Q Okay. And the focus on maintaining programs for
16 sockeye means that there are impacts on other
17 species and that there's not enough money to
18 perform full enumeration or assessment programs
19 for those other species; is that correct?

20 DR. RIDDELL: Yes, and it goes back to my earlier
21 description about how the money is managed under
22 the core funding and the Pacific Salmon Treaty
23 funding after '99. When the original funding for
24 the Fraser sockeye to a very large extent was
25 included in the '85 Treaty, that money
26 subsequently became A-based or core funding, and
27 that then opened it up to Departmental reductions
28 for a number of, well, national and more local
29 pressures. And so when those pressures caused our
30 budget to go down, then we would have to dip into
31 the Pacific Salmon Treaty funding to ensure that
32 we were meeting most of the requirements for
33 Fraser sockeye salmon. And as Timber has
34 described, to a very large extent we have met
35 those through the time, but there have been where
36 we've tried to cut down, so we minimize the loss
37 on other populations.

38 Q So some of the impacts would be the elimination,
39 as you said, of pink enumeration, adult pink
40 enumeration?

41 DR. RIDDELL: Pink has been an ongoing loss since our
42 most numerous single population of salmon in
43 Canada and it's currently not assessed.

44 Q And then have there been reductions in chum, Coho
45 and Chinook assessments, as well?

46 MR. WHITEHOUSE: Yes, there have. Yes.

47 Q Okay. And we're here to talk about Fraser River

1 sockeye, so let me ask you whether there's any
2 impact on Fraser River sockeye from the diminished
3 funding available to enumerate and assess those
4 other stocks I just mentioned. And if I could
5 start maybe with Mr. Whitehouse.

6 MR. WHITEHOUSE: I think there's a number of things
7 that you have to think about, because considering
8 Fraser management, sockeye management, recognizing
9 it's not only a mixed stock in terms of numbers of
10 sockeye populations impacted, but it's also a
11 multispecies fishery, where Chinook and Coho are
12 captured as a by-catch in sockeye directed
13 fisheries. If we lose the resolution to be able
14 to identify either emerging conservation concerns
15 due to cuts associated with reductions in Chinook
16 or Coho assessment, and Coho is a very good
17 example in the Fraser. If we lose the capacity to
18 be able to inform management as to status of Coho
19 or Chinook stocks, we may be in a place where we
20 have to unnecessarily constrain sockeye fisheries
21 to deal with the uncertainty around status on co-
22 migrating species. So there are implications that
23 can be quite far-reaching in seeing a degradation
24 in the information that is collected on other
25 species, as well.

26 Q Did you have anything to add that, Dr. Riddell?

27 DR. RIDDELL: Just to reinforce that there could be
28 ecological issues of extremely large pink salmon
29 returns and we have no assessments on that. I
30 don't think that you could really time any Chinook
31 issues to it. Most of the fisheries are non-
32 retention Chinook now in the large seine fisheries
33 for sockeye. The conservation concern for Chinook
34 in the Fraser is really on the Early time
35 component mostly, and that's not in conflict with
36 fisheries on Fraser sockeye, including the Early
37 Stuart run. With the exception, I guess, of in-
38 river management would be --

39 MR. WHITEHOUSE: Yes.

40 DR. RIDDELL: -- under consideration there. And the
41 other one that we should note is, I mean, there is
42 minimal assessment of Southern B.C. chum and have
43 been for a number of years. And again because
44 there hasn't been the sort of value placed on
45 them, and they simply have not been closely
46 monitored through time.

47 MR. WHITEHOUSE: Can I just reinforce.

1 Q Yes.

2 MR. WHITEHOUSE: I would like to clarify that there
3 would potentially be significant impacts to in-
4 river fisheries management on a Chinook
5 perspective.

6 DR. RIDDELL: Chinook, yes.

7 MR. WHITEHOUSE: Particularly for the up-river five-
8 year-old stocks, which are substantially impacted
9 by a number of in-river fisheries.

10 Q Thank you. I'd like to move to a new area, the
11 Wild Salmon Policy and Fraser River stock
12 assessment. We have, of course, heard about the
13 Wild Salmon Policy in these hearings and we have
14 heard discussions about CUs under that policy, and
15 we touched a little bit on that this morning. Can
16 the current levels of funding available for Fraser
17 River stock assessment provide the information
18 needed to evaluate and manage at a CU level? I'm
19 going to start with you, Mr. Whitehouse.

20 MR. WHITEHOUSE: Fraser sockeye I think is unique, and
21 I think we have to step back to the discussion
22 that we just had. We have the most robust and
23 complete data series on Fraser sockeye, it's
24 probably the strongest dataset that exists on the
25 Eastern Coast of North America -- Eastern Coast of
26 the Pacific, I should say. And ability to address
27 WSP implementation is probably most robust there,
28 that is with respect to any species on the Coast.

29 However, I don't think when you talk about
30 WSP implementation, you can simply take a single
31 species focus. The WSP is an integrated planning
32 and evaluation process that considers ecosystem
33 and multispecies impacts. So we really have to be
34 careful when we say fully implementing sockeye
35 management under a WSP provision is adequately
36 addressing salmon management coast-wide from a CU
37 perspective, because it's quite a different
38 perspective when we look at the quality of
39 information outside of the Fraser, or even within
40 the Fraser for non-sockeye CUs.

41 Q Okay, thank you. Dr. Riddell.

42 DR. RIDDELL: I would agree with Timber that for
43 sockeye I think you're probably in pretty good
44 shape for doing the assessments, and he spoke to
45 that earlier this morning. My only, I guess,
46 caveat on that would really be when we do define
47 the lower benchmarks, do we have adequate in-

1 season assessments to ensure that certain
2 conservation units are managed to try and meet the
3 lower benchmarks so that we don't have to
4 implement major recovery efforts. There may be an
5 assessment issue at that point. But I think that
6 the broader point that Timber has just made about
7 the other species and how they would affect
8 fishing opportunities is the more important one.

9 Q I'd like to move to another new topic, looking at
10 First Nations and involvement of First Nations in
11 in-river stock assessment. And again these
12 questions are primarily directed to Timber
13 Whitehouse. First of all, I understand that some
14 Fraser River First Nations have been involved in
15 working with DFO to do stock assessment in the
16 Fraser River watershed for sockeye and other
17 salmon species.

18 MR. WHITEHOUSE: That's correct, there's quite
19 extensive involvement.

20 Q Could you describe what that involvement is?

21 MR. WHITEHOUSE: Through a number of processes, but
22 primarily supported through the Aboriginal
23 Fisheries Strategy, DFO has undertaken capacity
24 development as a major mandate with First Nations
25 to participate in management and stock assessment.
26 Numerous agreements throughout the watershed with
27 First Nations support, delivery of capacity
28 development, to allow First Nations to begin to
29 work in a meaningful way on in-stock assessment
30 projects.

31 Q Okay. And are you aware that some First Nations
32 have asked for further involvement in Fraser River
33 stock assessment projects in their traditional
34 territories?

35 MR. WHITEHOUSE: It's quite a common theme. We hear
36 from First Nations on a regular basis that they
37 would like to, their aspirations are a greater
38 involvement with stock assessment.

39 Q Okay. And I'm just going to ask you to turn to
40 Tab 15 of the binder before you. It's an e-mail
41 which doesn't have a CAN number, but it's an e-
42 mail from Gord Sterritt to you and others about
43 stock assessment opportunities they'd like to
44 pursue. Do you remember receiving this e-mail?
45 It's dated May 5, 2009.

46 MR. WHITEHOUSE: Yes, I do.

47 MS. BAKER: Okay. Can I have that marked, please.

1 THE REGISTRAR: Exhibit 387.

2
3 EXHIBIT 387: E-mail from Gord Sterritt to
4 Timber Whitehouse and others, NSTC - DFO STAD
5 Activities in the NSTQ Territories for 2009,
6 May 5, 2009
7

8 MS. BAKER:

9 Q In this e-mail Mr. Sterritt says that it has been
10 difficult to get stock assessment involved in
11 discussions with his tribal council regarding
12 greater involvement in stock assessment programs.
13 Do you agree that that's an issue?

14 MR. WHITEHOUSE: I think my perspective is slightly
15 different. I think we have quite a productive
16 working relationship. We've worked with the NSTQ
17 for a large number of years in delivery of not
18 only sockeye but other species assessments in
19 their traditional area. I fully acknowledge that
20 this note expresses a desire for increased
21 participation.

22 Q He says in the second paragraph, second line:

23
24 On the part of [Stock Assessment] this
25 engagement has been minimal to say the least.
26

27 You don't agree with that?

28 MR. WHITEHOUSE: No, I cannot. I think there's a
29 number of examples that I can point to that
30 indicate that we've been working fairly
31 productively, although perhaps not as rapidly as
32 Mr. Sterritt would hope to see, towards developing
33 capacity within First Nations in their area.
34 There are specific funds set aside in their AFS
35 agreement to specifically participate in sockeye
36 assessment. We've worked with them in conjunction
37 with other partners in terms of developing
38 alternate assessment methodologies within the
39 Quesnel. That relates to the use and application
40 of high-tech DIDSON counters in the main stem of
41 the Quesnel. We have in addition directly hired
42 members of the NSTQ as direct DFO staff to try and
43 assist in developing their capacity further. So
44 while it may not be enough progress, I think we
45 have been working quite productively together to
46 attempt to move forward on that capacity
47 development.

1 Q My understanding that the NSTC is involved in
2 Chinook and Coho stock assessment, is that right?

3 MR. WHITEHOUSE: That's correct.

4 Q Okay. And has the partnership with DFO with
5 respect to Fraser River sockeye been at the same
6 level as their involvement in Chinook and Coho
7 stock assessment?

8 MR. WHITEHOUSE: You have to separate and understand
9 the complexities of the programs to understand
10 whether the engagement would likely be at the same
11 level. The Coho program is a very simple one that
12 involves the operation of a fence. The complexity
13 of the assessment elements associated with sockeye
14 on most years require a fair bit more technical
15 integration and understanding. The components are
16 quite closely linked to both mark-recapture and
17 visual surveys. And as such you're not comparing
18 the same skill set, suite of skill sets, in
19 implementing the similar or the dissimilar project
20 types.

21 Q Are you familiar with the in-season abundance and
22 health indicator program that the NSTC, the
23 northern Shuswap Tribal Council has?

24 MR. WHITEHOUSE: Yes, I am.

25 Q And what do you think of that program, has it got
26 any usefulness to your programs?

27 MR. WHITEHOUSE: It's largely structured not as a stock
28 assessment tool per se, but its purpose is of
29 supporting in-season process for evaluation of in-
30 season run strengths, as opposed to terminal area
31 assessments. It is structured to try and attempt
32 to provide information on the condition of fish
33 through capturing them on their migratory route up
34 to terminal spawning areas but before reaching
35 them, and also to attempt to try and provide some
36 sort of an indication of relative abundance. I
37 think the concept is generally well-meaning.
38 However, when talk with resource managers in
39 terms of the utility of the information, right now
40 it's not particularly well-positioned to be
41 providing advice that would assist managers in-
42 season.

43 Q And this is the fish wheel program that they are
44 operating.

45 MR. WHITEHOUSE: Yes.

46 Q Okay. Dr. Riddell, have you got any comments on
47 in-river assessment being done by First Nations?

1 DR. RIDDELL: No. No.

2 MS. BAKER: Thank you.

3 THE COMMISSIONER: I wonder if I could ask, Ms. Baker,
4 either Dr. Riddell or Mr. Whitehouse, you used
5 that term "the complexity of assessment components
6 associated with sockeye". I wonder if one of you
7 could just tell me the main characteristics that
8 differentiate sockeye from the other species in
9 terms of stock assessment. I realize sockeye
10 spend longer in freshwater than some of the other
11 species, but apart from that.

12 MR. WHITEHOUSE: Yes, certainly. Key is the relative
13 complexity of population structure when we're
14 talking about the enumeration of spawning
15 populations. There are in excess of 80 distinct
16 spawning sites spread throughout the Quesnel
17 system, and there are two very major stocks that
18 on two or three out of the four cycle years
19 require the use of the high precision mark-
20 recapture techniques, or alternately DIDSON
21 techniques, which we've been evaluating there.

22 When we're dealing with mark-recapture
23 program implementation, there is a large number of
24 factors associated with bias evaluation that make
25 it very critical that not only in the main
26 population, the main, let's use Horsefly as the
27 example, a body of fish that may be a million plus
28 centred amongst 60 or 70 other spawning streams
29 that may be from a couple of hundred to several
30 tens of thousands. While the general perception
31 is that sockeye have high fidelity to their
32 spawning streams, there is a lot of straying and
33 mixing of those populations en route.

34 Tagging programs are specifically prone to
35 sources of bias. If very careful care isn't made
36 in structuring the programs that evaluate
37 populations to the spawning sites outside of the
38 main rivers, so outside of Horsefly River in this
39 case, so that you get information on
40 tagged/untagged fish, these are all relating to
41 the bias and the reliability of the estimate.
42 These programs have to be very carefully
43 intertwined and linked, and there cannot be
44 significant breakdowns between the delivery of the
45 mark-recapture and the delivery of the visual
46 surveys which are the low-precision surveys on the
47 streams outside the mark-recapture area, or you

1 will be subject to significant negative bias.

2 A great deal of coordination is required in
3 order to deliver those programs, and as such, it
4 doesn't make for a piece that is readily cleave-
5 offable. You can't cut off a piece to say here is
6 a piece of work that could be discrete and
7 delivered through another mechanism without having
8 a potential negative bias to the mark-recapture.
9 So they're very closely intertwined, and this is
10 the complexity.

11 Coho enumeration, there are one or two
12 populations. The Coho head to a single stream.
13 The stream that they use in the Horsefly system
14 can be fenced using a very small temporary fence.
15 A fence operation is very simplistic. It really
16 simply needs someone sitting on the fence, manning
17 it and counting fish through a passage in the
18 fence. So you can stop fish migrating overnight,
19 open the fence during the day and count the fish
20 through visually, one at a time. And there would
21 be on the order of a couple of hundred to a couple
22 of thousand fish at most.

23 When you're dealing with sockeye populations,
24 in the Horsefly system, Horsefly/Quesnel, you're
25 dealing with up to two-and-a-half million fish.
26 So it's the order of magnitude reflects the
27 complexity in terms of evaluating it.

28 MS. BAKER:

29 Q And just a couple of recommendations from prior
30 studies, reports. The Chamut Report, 2003, so
31 that's in Exhibit 14 again, at page 217. Thank
32 you. It's recommendation number 9.

33
34 It is recommended that monitoring and
35 assessment studies be continued to improve
36 understanding of the effects of high spawner
37 density (e.g. Adams River, 2002) and the
38 migration behaviour and in-river mortality
39 among Late run sockeye. As well, external
40 members of the Steering Committee advocate
41 undertaking more extensive stock assessment
42 studies on all Fraser River sockeye stocks.

43
44 I don't see in the response from the Department a
45 specific response. Do you know if anything was
46 done in response to these recommendations,
47 particularly the more extensive stock assessment

1 studies, which were recommended for all Fraser
2 River sockeye stocks?

3 MR. WHITEHOUSE: I'll actually tackle the first one,
4 because it's quite clear that the Department,
5 through number of partnerships with universities
6 and consulting agencies made a major effort to
7 address the issues surrounding Late run mortality.
8 There have been extensive studies implemented
9 since 2001. Very large budget, you know, \$1
10 million to \$1.2 million specific projects
11 implemented to address these in 2002, 2003,
12 subsequently in 2006. So very easy to demonstrate
13 that there's been significant movement in
14 addressing the issue of in-river mortality.

15 Q What about the recommendation that more extensive
16 stock assessment studies on all Fraser River
17 sockeye stocks be done?

18 MR. WHITEHOUSE: It's difficult for me to understand
19 what the writers of the recommendation might have
20 been pointing at. But I think there are a couple
21 of things that clearly overlap with the Late run
22 mortality evaluation that has extended much
23 broader to Fraser sockeye run timing groups in
24 general. So a lot of the work on the telemetry
25 extended on to Summer run stocks, and Early Summer
26 run stocks. So there has been work there through
27 the academic institutes, in particular
28 collaborating with UBC, Dr. Hinch and his group
29 working on energetics. There's been a substantial
30 amount of work looking at issues affecting
31 migration in the Fraser. We also have added a
32 fair bit of environmental assessment associated
33 with water temperatures and predicting potential
34 migratory success. That was brought on sort of in
35 the 2000 timeline. So that has been developed and
36 is going forward and playing a significant role in
37 management at present.

38 When I take that recommendation down to the
39 more narrowly focused stock level, and reflect
40 back on some of the comments that we've been
41 discussing earlier today, like evaluation of
42 nursery lake trophic status, the research into
43 incubation habitat, fry programs, we haven't made
44 as much progress there. In fact probably less
45 work being done there than say in the '95 to 2000
46 timeline.

47 DR. RIDDELL: I think you also have to consider in 2002

1 you've touched on the number of the sensitivities
2 a few times today. That was the Quesnel year.
3 That was the period of the Fraser pinks, that was
4 the year that - I'm just thinking of another
5 discussion we had earlier - reductions in budget
6 that year was a major drop. I think it was about
7 \$2.5 million because of the drop in the -- what
8 was that program called --

9 MR. WHITEHOUSE: CFAR.

10 DR. RIDDELL: -- CFAR, yeah, Canadian...

11 MR. WHITEHOUSE: Canadian Fisheries Adjustment and
12 Realignment.

13 DR. RIDDELL: It was another special allocation for
14 about five years and it terminated. So there were
15 a number of sensitivities at that time. But I
16 think that Timber's response is appropriate. And
17 when you look at the coverage that one of your
18 exhibits on the budget addressed just recently,
19 and we've acknowledged a few times, I mean, Fraser
20 sockeye as much as we can put into it, we put that
21 as a first priority. And so there wasn't a great
22 deal more you could do without having significant
23 impacts in other stock assessments in the region.

24 Q Thank you. And then staying in Exhibit 14 at page
25 246, the Wappel 2005 report, recommendation number
26 8. They recommended that knowledge gaps regarding
27 quantitative estimates of spawning fish should be
28 investigation, and in response the Department has
29 said that it:

30
31 ...restructured its Pacific science program
32 to have a dedicated focus on salmon stock
33 assessment and scientific research.
34

35 Dr. Riddell, what was involved in that?

36 DR. RIDDELL: So we're talking 2005?

37 Q Right.

38 DR. RIDDELL: Well, there was a small reorganization,
39 but I wouldn't call that significant. That was
40 the year that we did form the SAFE Division.
41 There was extensive collaboration going on with
42 other Departmental groups. There was extensive
43 work on the Late run Fraser sockeye, including
44 much of the research that we've seen recently in a
45 Science publication by Dr. Kristi Milli-Saunders.
46 So there was a lot of work going on as described
47 in the paragraph here, but we didn't change the

1 stock assessment program substantially. That was
2 the year that I took over. There were some
3 reorganizations within the Fraser, so we went to a
4 single stock assessment group within the Fraser
5 River, but we didn't change any real people there,
6 in that some little bit of reporting. Nothing
7 that I would qualify as major at all.

8 Q Okay. I think I've just got one or two final
9 questions, and I'd like to just complete them. In
10 terms of long-term monitoring programs, we've
11 talked a lot so far in these hearings about
12 different programs that have been in place since
13 the 1940s or earlier. And I take it there's
14 significant value in long-term monitoring for
15 Science and for Management; is that fair?

16 MR. WHITEHOUSE: Absolutely.

17 Q Okay. Should it be the Department of Fisheries
18 and Oceans who is responsible for long-term
19 monitoring programs and maintaining long-term
20 programs in relation to Fraser River sockeye?

21 DR. RIDDELL: Well, I would say it's even more general
22 than Fraser River sockeye. To be honest, I've
23 made this point several times in my career that
24 universities are not a centre that wants to do
25 long-term collection of data. They want to do
26 specific tasks, do an investigation, and publish
27 and move on.

28 The legacy of the Department of Fisheries as
29 a government agency really is one of having good
30 quality data for long-term monitoring. So if we
31 do want to monitor the effects of climate change
32 through time, then we have the baseline. If we
33 can look at the effects on various populations of
34 salmon, I think it's a core responsibility of the
35 Department to maintain legacies of long-term data.

36 Q Do you have anything to add to that, Mr.
37 Whitehouse?

38 MR. WHITEHOUSE: Other than I agree completely, nothing
39 additional.

40 Q Okay. This is my final question for each of you.
41 Is there anything that you think the Department of
42 Fisheries and Oceans could be doing better with
43 respect to stock assessment needed for Fraser
44 River sockeye management. So basically I'm asking
45 you are there recommendations that you would like
46 to leave with the Commissioner before we complete.

47 DR. RIDDELL: Well, I hope it's not ten words or less,

1 because I probably have a number of thoughts.

2 Well, number one, I think you've heard that
3 in stock assessment on the Pacific Region, Fraser
4 sockeye salmon is number one. And a number of the
5 other resources have obviously over time suffered
6 to some extent because we have tried to direct
7 money to Fraser sockeye. Have we done enough?

8 Well, you've also heard that we could probably do
9 more in ecological studies of the large lakes and
10 looking at the effects on productivity over time.

11 In terms of explanation for what's happened
12 over the past decade, I think we need to recognize
13 that the Department needs to put more into early
14 marine survival and likely now downstream survival
15 of smolts leaving the lakes. I'm not sure that we
16 can do a lot more in smolt enumeration. We could
17 probably do some more in fry evaluations in the
18 fall. I don't think you need to do a lot more in
19 the DNA studies, because we've done extensive work
20 there, but we definitely are lacking in
21 understanding of what's limiting marine survival
22 in the first few months at sea, and how the animal
23 actually utilizes the Strait of Georgia. If a lot
24 of the mortality is occurring then, what are the
25 mortality mechanisms? How quickly do they leave
26 the Strait? There's quite a bit of debate on that
27 at this moment, and that we do have some tools we
28 can try and apply to improve our understanding
29 there.

30 So I think that in terms of freshwater
31 assessment of escapement work, we can probably
32 improve our understanding about the utilization of
33 freshwater habitats and spawning grounds. We're
34 going to hear discussion about the over-spawning,
35 so we can do more to understand the ecological
36 impact of large numbers of spawners. Those are
37 things we can do right now. But we need to have
38 new programs, I believe, in the Strait of Georgia
39 so we can really address these concerns about
40 early marine survival.

41 Q Thank you. Mr. Whitehouse.

42 MR. WHITEHOUSE: I agree with Brian. I would also like
43 to make a couple of additional comments because
44 it's easy to lose track of the potential risks
45 that you're exposed to in looking at accommodating
46 needs for new information emerging from specific
47 management issues, climate change, et cetera.

1 Very fundamental to the ability to assess
2 what's going on in Fraser sockeye management, is
3 the escapement time series. It's a critical
4 baseline against which everything else that we
5 collect is evaluated. We have to be careful not
6 to think that we can trade off moving to the
7 marine environment at the cost of dropping
8 escapement monitoring, for example. It's quite
9 critical that in order to have much meaning and
10 explanatory power, by moving to enhanced lake
11 assessment or enhanced assessment of survival in
12 the marine areas, that we have that key
13 fundamental, the escapement. That's the ultimate
14 signal that the fish send us as a result of their
15 experience of environment or exposure to harvest.
16 That escapement forms the platform. Recognizing
17 what has gone on in the past 50 years without the
18 escapement information that we have, would be much
19 more difficult and it's questionable whether it
20 would be doable at all. So escapement monitoring
21 forms a backbone upon which the rest of management
22 is really built.

23 And then I agree with Brian, strategically
24 there are a number of other areas that have the
25 potential to add significant explanatory power to
26 the data that we collect, to improve our
27 understanding of factors that limit production.
28 Early marine life history is clearly in current
29 science thinking leaping out as one area that has
30 a significant potential explanatory power.

31 But I think there are a number of examples
32 within the Fraser River watershed in freshwater
33 itself that need to be seriously considered, and
34 elements like freshwater assessment of nursery
35 lakes, elements associated with evaluating
36 incubation habitat quality and its ability to
37 accept very large escapements like we just saw
38 last fall, are also important to consider in the
39 mix.

40 I don't think going to the marine environment
41 exclusively is a single fix, and I don't think
42 looking in freshwater is going to be a fix in
43 terms of explanatory fact. We really need to look
44 at where the risks lay, where the information gaps
45 lay, and where we're likely going to be able to
46 actually generate meaningful add-on value in terms
47 of the data we collect. Things like the acoustic

1 tagging program on smolts have a significant
2 potential and from information perspective,
3 significant value in a leading forecast in terms
4 of survival, but they have to be doable.

5 So I think it's critical that we take a very
6 holistic and ecosystem-based approach to
7 evaluating where pressures are. You need to be
8 extremely forward looking around the type of
9 processes that may represent change to Fraser
10 sockeye.

11 A very good example is the recent
12 clarification of en route losses due to the marine
13 area telemetry program. If you look at the
14 management system, it's based on catch plus
15 escapement, and the significant gap and one of the
16 major problems between 2002 and the present is the
17 fact that at least for a significant period of
18 that stanza there was losses of fish en route that
19 represented bias.

20 I come back to my comment earlier with
21 respect to accuracy. We did not have a good
22 handle on what was going on. The research pieces
23 were needed. They answered those questions.

24 And we have to be forward-looking in order to
25 understand where those pressures may come from.
26 What are the likely drivers from climate change
27 perspective? Shifts in lake productivity, shifts
28 in marine productivity in the Strait of Georgia,
29 and how we incorporate those I think are critical
30 to any source of recommendations that go forward
31 in supporting the development and support of the
32 information collecting system to support
33 management.

34 MS. BAKER: Thank you.

35 THE COMMISSIONER: I wonder if I could just ask either
36 you, or Dr. Riddell, or both of you. This
37 Commission of Inquiry was established because of
38 the significant decline of '09, followed by a
39 larger than expected abundance in 2010. In terms
40 of your comments, given the bookends of a
41 significant decline and a larger than expected
42 abundance, do the programs that you and Dr.
43 Riddell have been describing here today, are they
44 satisfactory in dealing with what appears to be
45 two extremes happening a year apart? In other
46 words, this last piece that you've just described,
47 is that ultimately going to help address these

1 kinds of situations? But what will it take to do
2 that? I don't quite understand what more could be
3 done in the context of the programs you've
4 described and the recordkeeping you've described,
5 to address these kinds of extremes.

6 DR. RIDDELL: Well, I'll lead off. I think that if we
7 had a rigorous early marine survival study, that
8 you would have seen the explanation for both years
9 in one place. Now, I mean, that's a limited
10 number of scientists that believe this at this
11 point, but I think that the inferences being drawn
12 from just the marine surveys in the Strait of
13 Georgia and the consistency of the change in the
14 abundance of the juvenile sockeye we've seen, and
15 other salmon species, as well, with these marine
16 conditions and with better understanding of how
17 the sockeye use the Strait of Georgia in terms of
18 a period of residence, and with monitoring the
19 biological productivity of the Strait of Georgia,
20 that we could have possibly explained both of
21 these events. I may be a little overly naïve on
22 this, but I just see that the information that's
23 been accumulating really leads me to think that
24 we're missing a major signal in the early marine
25 survival.

26 In terms of explaining the difference that
27 you've pointed out, Mr. Commissioner, I agree with
28 Timber in long-term assessments, and of course
29 last week we talked about the Count on Salmon
30 Program and the use of radio tags, you know that I
31 recommended building that program. I see that as
32 a way of explaining the impacts within the river,
33 but it doesn't explain your question in terms of
34 what caused the difference in marine production.
35 Whereas I think the early marine survival is the
36 first place we should look.

37 Some people disagree with me that it's that
38 narrowly focused. I'm open to being wrong in this
39 case, but I don't see any merit of starting a
40 study in the ocean where it's extremely costly to
41 be out there and it's extremely difficult to
42 recognize Fraser sockeye, whereas in the Strait of
43 Georgia, you can recognize Fraser sockeye. We can
44 do the work, it's confined, we can use small
45 vessels from communities to do much of the work.
46 I think we could make major progress in
47 understanding with a focused program in the

1 Strait. But only because of exactly your sort of
2 question: What is it that could possibly explain
3 such events in two years.

4 THE COMMISSIONER: Thank you. Mr. Whitehouse, do you
5 have anything you want to add to that?

6 DR. RIDDELL: I think he's thinking.

7 THE COMMISSIONER: It's hard to tell when a scientist
8 is thinking. They're always thinking.

9 DR. RIDDELL: We're always thinking, thank you.

10 MR. WHITEHOUSE: It's difficult not to agree with Brian
11 in terms of --

12 DR. RIDDELL: But...

13 MR. WHITEHOUSE: -- in terms of the gap. You've framed
14 it, the \$64 million question here is what
15 additional information could we have collected or
16 could we have been collecting in a systematic way
17 that might, and it's I consider it to be a leading
18 indicator. We need to understand more early in
19 the life history the factors that are influencing
20 production.

21 I think there's a very good reason to focus
22 on the Strait of Georgia. It represents a very
23 critical time in the life history, that transition
24 from freshwater to marine residency. There's a
25 lot of interaction in terms of competitors,
26 predators, that are new to sockeye. That the
27 Strait is also highly dynamic in undergoing a
28 number of different changes associated with
29 drivers from outside and inside its basin. It is
30 the logical first place to look.

31 There are also, and just to confuse the
32 situation, I can point to situations,
33 circumstances where on a stock-specific basis, and
34 I think the key to the approach that Brian is
35 suggesting is there's synchrony amongst all Fraser
36 stocks on different time steps in terms of their
37 decline in production. There's synchrony that
38 began in the late '60s for some stocks, in the
39 mid-'80s and early '90s for others, and suggesting
40 that there's got to be something common in their
41 life history that is resulting in this depressed
42 production and then, boom, a spike, a turnaround
43 of 180 degrees in one year. Something substantial
44 is occurring.

45 But I can also point to examples where
46 there's been flip-flops of those magnitudes within
47 the freshwater environment as well. Chilko

1 represents a system for which in this decade we
2 have seen absolute peak levels of smolt production
3 for no apparent reason. No significant habitat
4 change, or at least nothing that you would
5 identify as being clear, as having a positive
6 impact on sockeye production, yet it's pushed
7 sockeye production through the roof with respect
8 to a couple of brood years.

9 In the same decade, and for stock, not really
10 much more than a couple of hundred kilometres
11 away, in the Quesnel system, we've seen back-to-
12 back very high recruitments of adults, high
13 escapement levels and what is akin to recruitment
14 collapses off of back-to-back large escapements.
15 So there are processes operating at both levels of
16 scale, at individual lakes, and on all stocks in
17 common.

18 The likely explanation is that for the big
19 downturn in production and then this big
20 turnaround, there has to be something that's
21 happening common to all of them, and the marine
22 environment is the place to look. So we cannot
23 forget that there are processes that are changing
24 within the watershed that are going to have an
25 impact on production on the local stock or, to use
26 the terminology that's more appropriate now under
27 WSP, at the CU level.

28 DR. RIDDELL: Mr. Commissioner, I should really quickly
29 add to that. I think given the recent Science
30 papers coming out, we really can't forget about
31 extensive study of the fish health concern,
32 because this could really have a major long-term
33 effect if there's something going on here and we
34 clearly don't understand that yet.

35 THE COMMISSIONER: Thank you both very much.

36 MS. BAKER: Thank you. Now, I think we were planning
37 to sit late tonight. You had --

38 THE COMMISSIONER: Until 4:15.

39 MS. BAKER: To 4:15, okay. So can we take a 10-minute
40 break, then?

41 THE COMMISSIONER: Yes, that's fine. Thank you.

42 THE REGISTRAR: The hearing will now recess for ten
43 minutes.

44
45 (PROCEEDINGS ADJOURNED FOR AFTERNOON RECESS)
46 (PROCEEDINGS RECONVENED)
47

1 MS. BAKER: First counsel up, today, will be counsel
2 for Canada.

3 MR. MacAULAY: Thank you. Mr. Commissioner, for the
4 record, Hugh MacAulay, for the Government of
5 Canada. With me is Jonah Spiegelman.
6

7 CROSS-EXAMINATION BY MR. MacAULAY:
8

9 Q Mr. Whitehouse and Dr. Riddell, I have not too
10 many questions, a few clarification questions, and
11 then a number of questions arising from your
12 responses to some of the questions that Ms. Baker
13 asked you earlier today. I've got a couple of
14 questions about resources for stock assessment
15 work, a couple of questions about linkages between
16 stock assessment work and other initiatives, a few
17 questions about collaborations around stock
18 assessment, and then a question or two about the
19 future of stock assessment.

20 So I'll start with just a couple of hopefully
21 fairly straightforward questions in terms of
22 clarifications, and I'd ask that Mr. Lunn bring up
23 the Harvest Management Policy and Practice Report,
24 which is PPR-5, I understand. And Mr. Lunn, if
25 you could go to paragraph 26, which is on page 16?

26 Mr. Whitehouse or Dr. Riddell, there is a
27 reference in both paragraphs 26 and 27 to the
28 Stock Assessment Coordination Committee, which
29 you've spoken to being a subcommittee of the
30 Salmon Working Group, or SWG; is that accurate?

31 MR. WHITEHOUSE: No, the Salmon Working Group is not a
32 subcommittee. It certainly shares a number of
33 members in common, but it's not a subcommittee.

34 Q Is it fair to say that there's a working
35 relationship, but it's not a subcommittee?

36 MR. WHITEHOUSE: Correct, there is a working
37 relationship.

38 Q Good. Thank you. Mr. Lunn, could you go, then,
39 to page 80, paragraph 205(b)(i)? And the last two
40 sentences of that subparagraph I'll just read:

41
42 Visual surveys are done on foot, by boat or
43 by air (helicopter or plane) and are
44 calibrated annually. Visual surveys tend to
45 underestimate populations.
46

47 Mr. Whitehouse or Dr. Riddell, is there anything

1 you'd like to say in terms of clarifying or
2 correcting anything in those two sentences?
3 Q Yeah, a couple of things. First of all, their
4 visual surveys do represent the class of
5 estimation techniques that are identified here.
6 They also extend, for example, a fence count is
7 based on visual observation, so visual surveys
8 also include a number of activities that aren't
9 specifically captured in the foot, boat or air
10 surveys.

11 The other thing I think that's important to
12 clarify is with respect to calibration. So there
13 are places where calibration is conducted annually
14 in association with cyclical visual surveys. We
15 didn't have the chance, earlier today, to get into
16 the specific details, but there are two
17 applications within the Fraser Watershed of the
18 visual survey techniques broadly categorized. In
19 the Early Stuart system we use annually calibrated
20 visual escapement estimates, so we implement
21 fences, and in those same streams a paired visual
22 survey to generate an annual calibration
23 comparison between a visual survey and a total
24 count into the system, and generate a calibration
25 estimate on an annual basis for the remainder of
26 the 38 streams within that group.

27 The rest of the watershed is estimated using
28 the visual techniques - this is the low precision
29 estimates - but we don't calibrate that annually;
30 we apply a standard expansion. So the standard
31 expansion factor is based on historic work that
32 was done by the International Pacific Salmon
33 Fisheries Commission, and has been validated
34 recently, in the '90s, by DFO.

35 Q Okay, Mr. Whitehouse. Dr. Riddell?

36 DR. RIDDELL: I think we should -- I'm not sure what
37 this document is - I didn't catch the initial page
38 - but this last statement, "visual surveys tend to
39 underestimate populations," that's not strictly
40 true, because of the use of calibration. So if
41 you're calibrating, you're trying to go from what
42 we typically would call an index to a fixed
43 number. That number and its accuracy to the true
44 value is very much dependent on how many you count
45 and whether you count them at the right portion of
46 the run, and so on, and so it's not true to say
47 that it's always an underestimate. If you have an

1 uncalibrated count, there's no question it's an
2 underestimate, because you count during just a few
3 days when the run's protracted over maybe a month.
4 But if you're calibrating, that statement is not
5 always true.

6 Q Thank you, that's helpful. And Dr Riddell, for
7 your benefit, this comes from the policy and
8 practice Report with respect to harvest
9 management, just for your reference.

10 Thank you very much, that was helpful. A
11 question about allocation of resources for stock
12 assessment. I'd ask Mr. Lunn to pull up document
13 1 from Canada's list of documents for stock
14 assessment.

15 Question to you, Mr. Whitehouse, this
16 spreadsheet, as I understand it, serves to
17 essentially bring forward information that Ms.
18 Baker referred you to in a spreadsheet that's been
19 marked as Exhibit 383. That information, as I
20 understand it and as I recall, went up until
21 2005/2006. This document serves to bring that
22 forward to 2008/2009, and also, as I read it, is a
23 more comprehensive listing of stock assessment
24 budgets. I think that pink salmon, for example,
25 are referred to.

26 I guess my question is: What other
27 information should we draw from this document in
28 terms of context and trends and that kind of
29 thing?

30 MR. WHITEHOUSE: I think a couple of pieces of
31 clarification are required, first of all. This
32 sheet does compare to the sheet that was presented
33 earlier. It represents all species assessment
34 budgets within the Fraser. It represents
35 additional information to that, which was
36 presented earlier as the earlier spreadsheet
37 focused on a slightly different administrative
38 structure at the time, so it was only programs
39 that were implemented out of the B.C. Interior
40 area. As Brian mentioned, we reorganized right
41 around the time that that earlier sheet was
42 prepared, so this is a much more comprehensive
43 accounting of budgets for stock assessment
44 activities.

45 It shows the same type of information, well,
46 exactly the same information, with a couple of
47 updates. In the 2005/6 year, there is new

1 information that wasn't available at the time the
2 earlier spreadsheet was prepared, which was May,
3 so those extraordinary injections of dollars to
4 address gaps in the assessment program are
5 reflected in this sheet; they were not in the
6 earlier sheet.

7 MR. MacAULAY: Thank you. I'd ask that that be marked
8 as the next exhibit.

9 THE REGISTRAR: Exhibit Number 388.

10
11 EXHIBIT 388: Fraser Stock Assessment:
12 Operational Project Budgets 2000/01 - 2009/10
13 (\$K's)
14

15 MR. MacAULAY:

16 Q Turning, then, to just a couple of questions about
17 some linkages between DFO's stock assessment work
18 and some other initiatives that Mr. Commissioner
19 has heard some testimony about, and I know that
20 Mr. Commissioner and Ms. Baker have asked you
21 about the Wild Salmon Policy and you've spoken
22 about alignment, in terms of CUs, and DFO's stock
23 assessment work. Are there other examples of
24 stock assessment work being aligned with
25 implementation of the Wild Salmon Policy?

26 DR. RIDDELL: Sorry, I don't know that I follow the
27 question. Do you mean outside of the Fraser?

28 Q No, just beyond simple alignment with CUs. Are
29 there other examples, other parts of the Wild
30 Salmon Policy implementation that stock assessment
31 is being aligned with? Sorry.

32 DR. RIDDELL: Yes, absolutely. Well, after the
33 conservation units, then, in the fall, there was
34 the presentation of the estimation of benchmarks
35 for Fraser sockeye for the first time. That's a
36 major step forward, and that was Sue Grant and
37 Carrie Holt and a number of people in science
38 branch as the primary authors. There's been
39 extensive work in the region on definition of
40 habitat indicators under Strategy 2. Some of
41 those have not been implemented in any sense yet,
42 but there has been agreement reached on the
43 indicators to measure. Less work on the ecosystem
44 indicators yet, but as you've heard in our
45 discussions today for Fraser sockeye, certainly
46 part of their ecosystem indicators is going to be
47 dealing with the freshwater lakes' system, so that

1 would be underway. And there has been very
2 limited progress in trying to implement a couple
3 of pilots for integrated regional planning, under
4 Strategy 4. Neither of those examples that I'm
5 aware of, though, are in the Fraser system.

6 MR. WHITEHOUSE: Well, no, I think FRSSI --

7 DR. RIDDELL: Oh, FRSSI, yes.

8 MR. WHITEHOUSE: The FRSSI process would be
9 specifically directed at implementing the
10 integrated planning.

11 DR. RIDDELL: Yeah. So there's actually three sort of
12 pilots: in Barclay Sound; Skeena River; and FRSSI.

13 Q Thank you. And I think you've touched on this,
14 and I know that you spoke of this, this morning,
15 in reference to the nursery lake productivity
16 assessments being an example of an ecosystem focus
17 for stock assessment work. Are there other
18 examples of the concept of ecosystem-based
19 management being employed in DFO's stock
20 assessment work?

21 MR. WHITEHOUSE: I think there's a number of examples,
22 particularly arising from some of the challenges
23 associated with explaining patterns that we're
24 seeing. The Strait of Georgia Ecosystem
25 Initiative, under the direction of Dr. Beamish,
26 would represent a specific and directed attempt at
27 incorporating ecosystem values and assessment into
28 management.

29 When I step back and think about the Wild
30 Salmon Policy implementation, I have a slightly
31 different perspective as to what the pieces, in
32 terms of are we moving forward, are. The reality,
33 to me, a number of the activities that we do have
34 always been well aligned with that, and the stock
35 assessment, in fact, supports the delivery of the
36 Wild Salmon Policy. It's just the frame through
37 which you're looking at it, really, that brings a
38 number of the context pieces together under that
39 particular construct.

40 So taking an approach that looks at life
41 history-based assessment really does align with
42 the concept of ecosystem-based approach and
43 integrated planning in understanding stock
44 dynamics. So I think there's a number of examples
45 within Fraser sockeye and outside Fraser sockeye
46 with respect to management approaches used in
47 Chinook and Coho, where we use coded wire tagging

1 to understand life history and fishery-specific
2 impacts, really plug into that same sort of
3 framework, in a general sense.

4 Q Thank you. Dr. Riddell?

5 DR. RIDDELL: Well, I mean, this is all true, but I
6 think the new element, where we talk about the
7 benchmarks, certainly a major change in
8 implementation of the policy will be the
9 definition of the lower benchmark, not just the
10 upper benchmark, which is more typically described
11 as the management target. So the lower benchmark
12 is very new and will be a significant addition.

13 The ecosystem-based really depends on where
14 you're looking. Of course, we look at marine
15 indicators, now, as far as affecting marine
16 survival of sockeye.

17 I think, as we look more in the Strait of
18 Georgia, for example, when I was listening to Sue
19 Grant's presentation on forecasting and she put up
20 plots of the marine indicators that are currently
21 discussed in forecasting, you may have noticed
22 that there was not a single indicator there for
23 the Strait of Georgia. So would it have improved
24 if we had had indicators of the Strait of Georgia
25 and not the open ocean, all right? So there are
26 steps that we need to take to really improve that.

27 Q Thank you. Turning to just a few questions about
28 collaborations between DFO and other organizations
29 with respect to stock assessment work, you've
30 spoken about collaboration between DFO and First
31 Nations and, in particular, projects with the
32 NStQ. Perhaps a question to Mr. Whitehouse: Are
33 there other examples in the Fraser Watershed of
34 collaborations between DFO and First Nations or
35 Aboriginal organizations that you'd like to
36 describe for us?

37 MR. WHITEHOUSE: Numerous examples that I can
38 highlight. We work extensively throughout the
39 watershed with First Nations groups through the
40 AFS agreement in the northern part of the
41 watershed. We undertake joint, both adult and
42 juvenile assessments, with the Carrier Sekani
43 Tribal Council. I spoke about the arrangements
44 that we've had with the NStQ, in the Quesnel
45 system, partnering with external funding sources,
46 Fraser Salmon and Watersheds Initiative, and an
47 umbrella group that represents a collective of

1 First Nations in the upper portion of the
2 watershed, the Upper Fraser Fisheries Conservation
3 Alliance. I've been partnered in that project.

4 We've worked extensively with the Chilcotin
5 national government in the Chilko system on both
6 sockeye stock assessment at the adult and at the
7 juvenile stages. We're working extensively with
8 them on a Chinook program as well.

9 I can highlight numerous examples of
10 additional collaborative efforts with First
11 Nations throughout most of the rest of the
12 watershed. We have a variety of different
13 business models, depending upon the various
14 capacities that First Nations groups have to
15 engage in stock assessment work, and we're working
16 to assist through participation both directly and
17 indirectly in DFO-delivered projects.

18 We also had a substantial degree of
19 interaction and work with groups other than First
20 Nations, funding sources through the Pacific
21 Salmon Treaty Southern Boundary Fund, have
22 contributed in a substantial way in supporting
23 stock assessment work within the Fraser, telemetry
24 work, evaluating migratory success for Late runs,
25 Summer runs, and Early Summer runs throughout the
26 watershed. We've worked with Brian's group, the
27 Salmon Foundation in evaluating new technology
28 associated with assessing smolts, as we talked
29 about earlier, the telemetry work.

30 There are additional linkages to groups like
31 the Fraser Salmon Watersheds Initiative, which is
32 another externally-funded -- well, DFO funds it,
33 but it's managed by an external board in terms of
34 priority identification, and we worked on
35 calibration programs to assist DFO with a better
36 understanding of the relationship associated with
37 change in methodologies. I talked about a number
38 of these things earlier.

39 And, finally, a substantial amount of work in
40 association with academic institutes. In
41 particular, Dr. Scott Hinch's lab at UBC, and his
42 association with Dr. Cooke, out of Carlton
43 University, who specializes in bioenergetics and
44 fish migration. Our program has served as an
45 essential springboard to facilitate a great deal
46 of that research that has gone on, both in the
47 main stem of the Fraser and the lower river, and

1 in the terminal areas where they've been
2 investigating fish health and fish bioenergetics
3 issues. So there's a great deal of integration in
4 terms of the stock assessment components delivery,
5 tapping into sources of expertise external to the
6 department, and in attempts to develop capacity
7 with other groups to contribute in a meaningful
8 way to stock assessment.

9 It's a big job. There's a lot of work in
10 managing these collaborations, but I think we get
11 significant benefit out of them.

12 Q In terms of the collaborations with First Nations,
13 you've referred to funding for those projects that
14 DFO does with First Nations, being funded from the
15 Aboriginal Fisheries Strategy. Just to link this
16 back to my question and the questions you had from
17 Ms. Baker about budgets and whatnot: Does that
18 money supplement the stock assessment budgets that
19 we've been looking at, or is that part of?

20 MR. WHITEHOUSE: It is a supplement. It has a specific
21 purpose. Within the Aboriginal Fisheries
22 Strategy, capacity-building is one of the specific
23 objectives, and as we've heard, stock assessment
24 is a specific aspiration, participation,
25 meaningfully, is a specific objective for First
26 Nations, and a number of groups have chosen,
27 within their AFS agreements, to particularly
28 target stock assessment as a capacity-building
29 area. So that funding brings the capacity to
30 allow people to participate in the projects where
31 we would not have the money to treat our budgets
32 as a training budget. So there has been
33 substantial benefit to that approach in capacity
34 development.

35 Q Thank you. Just segueing to - and you've already
36 done it - but broadening the scope to
37 collaboration with other partners, you referred to
38 the Fraser Salmon and Watersheds Program, which,
39 as I understand it, is a program that's got a
40 number of partners, and I'll ask you about that,
41 but I think it's run, and you can correct me, by
42 the Pacific Salmon Foundation and the Fraser Basin
43 Council. One or both of you, and perhaps Dr.
44 Riddell would be well placed to respond to this:
45 Could you just describe what that program is and
46 what its objectives are?

47 DR. RIDDELL: Well, the Fraser Salmon Watershed Program

1 was a five-year program implemented in 2006. It
2 builds on an initial grant from B.C. Living Rivers
3 Funds for the province, and our share is about
4 12.5 million dollars. That money was then used to
5 go to the Federal Government and seek matching
6 funds, which they got five million in cash and
7 five million dollars of in kind labour from staff
8 within the Fraser Basin. The objectives of the
9 program are to develop a more sustainable set of
10 communities within the Fraser Basin -- sorry,
11 sustainability of salmon in the Fraser Basin, so
12 we work in agriculture, habitat restoration, water
13 management, new assessment tools, and fisheries
14 planning and governance. So it's fairly widely
15 diversified. It is jointly managed by the Fraser
16 Basin Council and the Pacific Salmon Foundation,
17 and it's a major problem right now, because it
18 terminates March 2011. And so we are in the last
19 year of these funds. The program will be reduced,
20 because we actually saved money to extend it one
21 year, but there is no continuation of those funds
22 agreed to at this time.

23 Q Thank you.

24 MR. WHITEHOUSE: Could I pick up on a point here?

25 Q Yes.

26 MR. WHITEHOUSE: I think it's important to
27 understanding the ability of programs with limited
28 time funding to actually meaningfully contribute
29 to stock assessment objectives.

30 We talked about, earlier today, it's very
31 important that we have consistency and long-term
32 commitment to ongoing assessment when it comes to
33 Fraser sockeye and all species. It's crucial.

34 One of the business models that has been
35 forwarded as a way to continue with the delivery
36 of a number of program aspects associated with
37 stock assessment is tapping into sources like the
38 Salmon Watersheds Initiative, like the Southern
39 Boundary Fund. One of the real risks that creates
40 is the short-term nature of those fundings. What
41 happens, and we have to be quite careful in
42 managing this, is the expectations created along
43 the lines of what is doable with the resourcing
44 available and what are priorities, because there
45 is a potential cross-messaging that occurs when a
46 short-term funding strategy comes in, injects some
47 money into something that may be a short-term

1 priority, but then potentially is viewed as
2 something that elevates in priority when that
3 money goes away and potentially cuts into core
4 funding. That's the importance of my stressing,
5 earlier on, that there needs to be, for example, a
6 commitment to making certain that that escapement
7 monitoring is the core base and that we don't see
8 that if the Salmon Watersheds Initiative goes away
9 and has funded a program that is linked to
10 hydroacoustics at Mission, that we then have to go
11 and find a source within the internal funds to
12 find that.

13 There are clearly strategic places where
14 significant value added to short-term funding
15 sources, but when you look at the short-term
16 nature of them, by design there's a disconnect
17 with what we need to support as the underlying
18 foundation for stock assessment and salmon
19 management assessment.

20 Q Dr. Riddell?

21 DR. RIDDELL: Well, Timber makes me think of probably
22 an important point. I mean, the Salmon Foundation
23 has one of the originators of the Fraser Salmon
24 Watershed Program. We are talking to government
25 about new types of funding, but we're not asking
26 directly for more funding. And the reason for
27 this - and obviously I'm sensitive to this from my
28 background - but if there's a continuous reduction
29 of funds, asking them for more money for fisheries
30 work will very likely impact DFO. I'm telling
31 people that I talk to in Ottawa that I would
32 rather you put your money into stabilizing stock
33 assessment so you have this core ongoing task, and
34 just open up how we can raise money and we can do
35 it ourselves.

36 Right now, there are a number of regulations
37 that limit how I can raise funds to put into
38 various salmon activities. If those were more
39 flexible on how we could raise funds, I'd rather
40 see government stabilizing the resources in a
41 place like the Fraser sockeye, for example, or
42 doing the early marine survival work in the Strait
43 of Georgia, but right now it's, who do you take
44 the money or give the money to? Within
45 government, or do you give it to a non-profit?

46 Q Thank you. A question to both of you: Do you see
47 more opportunities in the future for collaboration

1 between DFO and partner organizations, thinking of
2 First Nations and Interior universities and other
3 outside organizations, for freshwater ecology
4 research generally, and stock assessment work, in
5 particular? Dr. Riddell?

6 DR. RIDDELL: Absolutely. I won't make a joke, but, I
7 mean, I've been talking to people for months about
8 exactly that. Things have changed in the
9 Interior. We have two universities, previously
10 colleges, now fully-rated universities, that are
11 required to do science, they're required to
12 research to keep their status, and that's the
13 Thompson River University, it's small but growing.
14 Substantial money from advanced education program
15 in the province.

16 For the first time this year, I spent a
17 couple of days up in Prince George at UNBC.
18 Excellent people there with wanting to work in
19 freshwater ecology. And so we're talking about
20 setting up - I'm saying "we" again, to confuse the
21 Commissioner - but this time, sir, I'm talking
22 about myself finding money through the Pacific
23 Salmon Foundation working with the universities
24 through NSERC, because they can apply for their
25 science programs and with students, and the
26 intention would be to establish a freshwater
27 ecology centre at the old Quesnel hatchery.

28 And in Timber's area, in Kamloops, there is
29 significant interest in working with students
30 there on understanding the dynamics of Shuswap
31 Lake. UNBC could be ideally suited to study the
32 Stuart Lake system and what's limiting production
33 of juvenile sockeye in that lake.

34 So I think we have great new opportunities
35 for developing what I'm calling a network of
36 common interests, and First Nations, clearly, are
37 interested. I've even talked to the universities
38 about a U.S. model. For years they called it the
39 Fisheries Co-Op Program, and what they were is
40 applied science through the universities directed
41 to conservation and restoration of salmon and
42 their particular interests on the west coast.

43 The aspect of that is you could have a
44 fisheries or a salmon cooperative that is targeted
45 at building capacity in First Nations right in
46 their particular areas. You could do it through a
47 networked university. You don't have to go to

1 Vancouver. And so I think we have opportunities,
2 now, to build networks that we've never done
3 before, and to draw in more money through multiple
4 sources.

5 Q Thank you. Mr. Whitehouse, did you have anything
6 to add to that?

7 MR. WHITEHOUSE: I agree with Brian's characterization.
8 I think that the First Nations aspect of this is
9 an important one. I think that we clearly, as we
10 see the ability of these organizations to support
11 science-based organizations, and this is one of
12 the keys in making the connection, but stock
13 assessment work is a science-based activity. When
14 we see the move, and we're seeing it on numerous
15 fronts and various degrees throughout the
16 watershed, First Nations organizations able to
17 support science-based programming, and it will
18 only improve the ability to collaborate on project
19 delivery and potentially extension through
20 accession additional resources that can extend the
21 ability of the programs overall to meet resource
22 assessment objectives.

23 So I see that as very critical. I think the
24 work that we're doing with the academic institutes
25 has already demonstrated the potential value for
26 strategic input, and I think the model that Brian
27 has identified has real potential as well.

28 Q Thank you. My last question is about the future
29 of stock assessment and specifically about the use
30 of technology. You've spoken about DIDSON
31 technology and the use of it, about sonic tagging
32 and other things. Does the use of more technology
33 provide opportunities for doing better and perhaps
34 more cost-effective stock assessment work in the
35 future?

36 MR. WHITEHOUSE: I'll tackle that initially from the
37 perspective of spawning grounds. I think we've
38 already got demonstration that new technology -
39 and this is the DIDSON that I'm referring to - has
40 a potential to allow us to estimate stocks to high
41 level of precision more cost-effectively. It's
42 important to understand, though, that DIDSON has a
43 specific application. It isn't going to work
44 everywhere. There are a number of places in the
45 watershed you're simply not going to be able to
46 overcome the issues of fish migration patterns,
47 the configuration types of water, the mixed stock

1 nature for providing resolution down to individual
2 spawning levels, that the technology will not be
3 the panacea. It's not going to come in and solve
4 all issues. We're not going to be able to avoid
5 having large mark recapture high intensity, high
6 cost programs throughout the watershed, but we
7 will be able to make smaller incremental gains
8 through the use of technology.

9 There is other technology, it's not
10 particularly new, but it is being applied more and
11 more; resistivity counters, different types of
12 electronic counting gear that have the potential
13 to aid in assessing more cost-effectively smaller
14 populations to a higher degree of precision. It's
15 mapping the information need with tools and the
16 range of tools that you have.

17 When you start to extend to things like the
18 tagging programs, they've already demonstrated
19 radio telemetry is not new, acoustic telemetry is
20 newer; both of them have already been able to
21 assist in clarifying issues of migratory success
22 of returning adults as they move through marine
23 approach areas into the river.

24 When you couple telemetry with some of the
25 projects that we've worked collaboratively with
26 Brian and others on at Qualark, there may be
27 alternate ways of understanding potential system
28 bias associated with some of the tools that we use
29 currently. So they have an opportunity to impact.
30 There's nothing that looks like the sort of silver
31 bullet that's going to answer all the questions,
32 and we have to rigorously evaluate what kind of
33 contributions these tools can make to our overall
34 assessment objectives such that we are staying
35 true to the management objectives within the
36 system.

37 Q Thank you. Dr. Riddell?

38 DR. RIDDELL: Well, I agree with what Timber is saying.
39 There will be a difficult transition, particularly
40 under the MOU that was pointed out. There's
41 always great hesitation to change how we're doing
42 Fraser sockeye assessment. So, I mean, I think
43 the reality is that you probably would have to
44 have a targeted sort of five-year program to look
45 at implementation and verification that it's just
46 as good, and build some confidence in that
47 program.

1 I think people have simply not spent a great
2 deal of time looking at the scale of what that
3 full implementation would be, because there simply
4 is not reality of getting money to do that in the
5 immediate term. If we thought we could really
6 implement that and we had access to a few new
7 DIDSONs and we could apply some of these
8 technologies, including the lower cost resistivity
9 counters. These are mats, basically, that you put
10 on the floor of the stream and they do very well
11 counting fish going across them. They have to be
12 put in the right place, just like a DIDSON.

13 So there are clearly opportunities for us to
14 apply technology. I think it would be cheaper
15 overall, in the long run, but I do think you have
16 an upfront cost that is going to be fairly
17 substantial in initial capital and then testing.

18 MR. WHITEHOUSE: Could I flag one more thing, because
19 Brian raised it earlier --

20 Q Please do.

21 MR. WHITEHOUSE: -- and I think it would be an omission
22 not to flag it here, and that is biotechnology and
23 its ability to help understand fish health issues.
24 I think the work that Kristi Miller-Saunders is
25 doing with genetic arrays, looking at the ability
26 to understand fish health well away from the
27 freshwater approach areas has significant ability
28 to improve understanding of potential disease
29 pathogens and their impact on production pattern,
30 so we should also acknowledge that as a high tech
31 issue, I think, technology.

32 MR. MacAULAY: Thank you, that's helpful. Thank you,
33 Mr. Commissioner. Those are my questions.

34 MS. BAKER: Thank you. The next counsel is Tim Leadem.

35 MR. ROSENBLOOM: Mr. Commissioner, I understand that
36 you want to adjourn at 4:15. I wondered if you'd
37 be kind enough to reserve a few minutes before the
38 4:15 cut-off to discuss scheduling. I do have
39 something I wish to raise with the commission
40 regarding the future scheduling. Thank you.

41 MR. LEADEM: Thank you. For the record, Leadem,
42 initial T., appearing as counsel for the
43 Conservation Coalition.

44
45 CROSS-EXAMINATION BY MR. LEADEM:

46
47 Q I find that most of the questions that I was going

1 to put to you gentlemen have already been asked
2 and answered. They dealt primarily with the Wild
3 Salmon Policy. It's gratifying that other
4 participants are asking those kinds of questions.

5 The one area that I wanted to focus on the
6 Wild Salmon Policy was on Strategy 2, the habitat
7 that you alluded to, Dr. Riddell. And I'm
8 wondering if there's some linkages, Mr.
9 Whitehouse, to some of the evidence that you gave
10 earlier with respect to the juvenile fry
11 assessment, where you were actually looking at
12 habitat as well, and I'm wondering if that
13 information can somehow be fed into developing
14 habitat indicators for the Wild Salmon Policy so
15 that we can actually have some cost-saving
16 measures here?

17 MR. WHITEHOUSE: I'm not sure I fully understand the
18 question, but I'll take a stab at it. I think
19 there are, in association with a number of the
20 assessment pieces, clear linkages to habitat. For
21 example, incubation habitat and fry assessment
22 programs understanding the coupling between
23 capacity of spawning grounds to support productive
24 incubation and understanding the relationship
25 between spawner density and declines in
26 production. There could be links that could
27 establish whether or not we're seeing, if we were
28 to assess in a systematic way fry production out
29 of incubation habitat, there may be ways to link
30 processes operating on river-type scales that
31 would assist in understanding whether or not we're
32 seeing processes that have eroded habitat capacity
33 as opposed to representing density-dependant
34 impacts.

35 But as I extend that into understanding the
36 impact and the relationship between lake
37 environment, for example, it gets more difficult
38 because there's a much more broad suite of
39 impacting factors development in addition to fish-
40 related impacts. Broad indicators, nothing is
41 leaping to mind to me right now with that respect.

42 Q Okay. I'll leave that.

43 DR. RIDDELL: Well, could I add just quickly? I think
44 maybe you're touching on something that we've
45 actually been talking about within the Fraser
46 Salmon Watershed Program that we just referred to
47 in the sense that the critical thing in the future

1 for Fraser sockeye, of course, is to sustain high
2 quality water in the lakes, and so I think that a
3 habitat indicator could well be shoreline
4 development, road access, and simple things like
5 this that measure the distribution of developments
6 and cottages and what is the current effluent
7 policies around the lakes.

8 Certainly, this year up at the Adams brought
9 home to me very clearly that there was this
10 significant debate in that area in the past two
11 years about the development of a huge marina that
12 would have butted up very close to the Adams
13 River. I think that developments like that are
14 not going to be good for the sustainability of
15 some of these important stocks, and maybe we
16 really need to look at targeting property
17 acquisition. And it doesn't have to be
18 government, because we have things like nature
19 trusts that exist to do that sort of thing, where
20 we could buy reserves and put in conservation
21 easements. But we should be looking at critical
22 habitats for these very important sockeye salmon,
23 in particular, we're talking about. I think it
24 could be more general to other salmon, but I think
25 there are very close ties between Strategies 1
26 and 2.

27 In implementation of these, we see the
28 Strategies 1, 2, and 3 as all being integrated in
29 a sort of water, while really it's a conservation
30 unit plan to look at the importance of habitat and
31 how you have to manage it in the future.

32 MR. LEADEM: Mr. Commissioner, I'm mindful of the time,
33 and I know we want to get going at 4:15. Perhaps
34 I'll just cede the floor to Mr. Rosenbloom at this
35 time.

36 THE COMMISSIONER: Thank you.

37 MR. ROSENBLOOM: Mr. Commissioner, I don't wish my
38 remarks to be in the slightest interpreted as a
39 criticism of the Commission counsel and their
40 conduct in this section of the hearing; quite the
41 contrary. I think the evidence has gone in in,
42 obviously, a very professional way.

43 However, what is developing here is a
44 situation where panels are being called, where
45 cross-examination is sometimes embarked upon but
46 not completed. We're ending up in a situation
47 where this is, I believe, the fourth occasion

1 where a panel has been put over to another date
2 for cross-examination. In the case of the Wild
3 Salmon Policy, I was in the middle of a cross-
4 examination that's been put off, and who knows
5 when that might be carried on.

6 It becomes, obviously, a danger to this
7 process where too many panels are sitting out
8 there in orbit, waiting for instructions to land
9 and to come back before this inquiry, and it puts
10 a tremendous challenge on counsel, in terms of
11 resuscitating their own interest, their own area
12 of review of the file and the areas that they want
13 to cover in cross-examination when there is this
14 disjointed process where a panel tenders part of
15 its evidence but the cross-examination takes place
16 another time.

17 There may not be an easy answer to this. I
18 totally respect the problems that commission
19 counsel is facing in terms of panels that are
20 upcoming that are committed to those dates that
21 are being brought before this inquiry, some of
22 them having to fly into town from other regions of
23 the province, but I would ask the commission to
24 really reflect upon how this habit, if I can put
25 it this way, has developed, so that as of today,
26 this is the fourth panel that I believe has been
27 put into abeyance, where there will be cross-
28 examination on some occasion other than with
29 complete continuity, day-to-day, in succession,
30 and it concerns me, and it will even more concern
31 me if this continues where, instead of four panels
32 we have five, six and seven panels. It puts a lot
33 of pressure on, I believe, you, Mr. Commissioner,
34 in terms of your continuity of understanding, and
35 it certainly does of counsel in the cross-
36 examination.

37 I simply wanted to put that to you. Thank
38 you.

39 THE COMMISSIONER: Thank you, Mr. Rosenbloom. I can
40 say that I am mindful of the concern you raise. I
41 can assure you that no one is more mindful of that
42 than is commission counsel, because they, too,
43 have these pressures of trying to juggle the
44 attendance of these witnesses. So thank you for
45 your remarks. We certainly will keep it in mind
46 and reflect upon it as we move forward into the
47 balance of the hearings and the scheduling

1 challenges that we will face, no doubt, in
2 ensuring that we can try to do as you're
3 suggesting, which is keep the flow in a way that
4 doesn't have witnesses under cross-examination
5 out, as it were, from the witness box for days or
6 weeks at a time. So I am grateful for your
7 comments, thank you.

8 MR. ROSENBLOOM: Thank you. Could commission counsel
9 inform us, as I'm sure you would have, in any
10 event, when we might anticipate this panel to
11 return for the completion of the cross-
12 examination?

13 MS. BAKER: Yes, Mr. Commissioner, our plan for
14 tomorrow is to start with Gord Sterritt, who has
15 been brought down from the Interior and has been
16 waiting to go on for a few days now, so I want to
17 have him go up first thing in the morning. And I
18 don't think his evidence will be very long, so I'm
19 hoping that we can complete his evidence before
20 the morning break, if possible. Hopefully that's
21 possible. And then bring back the panel that we
22 started yesterday, to complete that cross-
23 examination.

24 Now, if my friends think that the cross-
25 examination of that panel can complete before the
26 end of the day tomorrow, we might be able to --
27 I've asked both these witnesses, they're able to
28 be here tomorrow, but it really depends on the
29 time that my friends will be taking with
30 yesterday's panel to complete that cross-
31 examination. So there the ball's in the air. If
32 people can complete their cross-examination of the
33 decision-making panel by three o'clock, depending
34 on how much time they think they're going to need,
35 or 2:30? I don't know. It's difficult to say,
36 because I don't know exactly where people are
37 going to land on that time, but these witnesses
38 are able to come back tomorrow, and if that works
39 with my friends' timing, we might be able to
40 complete both the decision-making panel and these
41 witnesses both tomorrow. But as I said, it's up
42 to my friends as to their timing.

43 THE COMMISSIONER: All right. Well, Mr. Rosenbloom, as
44 you can see, counsel will reflect on that
45 overnight and look at the balance of the schedule
46 going forward for the next couple of weeks and see
47 just exactly where we can accommodate your

1 concern, which is to finish this panel as quickly
2 as we can.

3 MS. BAKER: And I can also advise that our plan is to
4 start on Monday with the different witnesses that
5 will be addressing FRSSI, followed by over-
6 escapement, and then bring back, on the 11th, the
7 panel that was originally slated for tomorrow, so
8 that would be the second decision-making panel.

9 We also have to find a bit of time for David
10 Patterson's evidence, to complete that.

11 Now, we have 9:00 a.m. Tuesday, I believe, is
12 a possibility that we had talked about, to add
13 another hour.

14 THE COMMISSIONER: Yes, I have to check back with you
15 on that.

16 MS. BAKER: Okay. So I guess we will advise counsel if
17 we can --

18 THE COMMISSIONER: Right.

19 MS. BAKER: -- add some hours next week, but we'd be
20 looking at possibly nine o'clock or possibly at
21 the end of the day, but we'll have to just let you
22 know, but those are our challenges for next week.

23 So I guess if people could talk to me at the
24 end of the day about their expectations for the
25 decision-making panel tomorrow, and timing
26 estimates for these witnesses, we might be able to
27 complete everything tomorrow. I'm probably
28 overoptimistic, but hope springs eternal.

29 THE COMMISSIONER: Thank you very much. Mr. Rosenbloom
30 didn't say it, but I know, Dr. Riddell, you've
31 heard me say this before, but where we have a
32 break and you're not back on the stand
33 immediately, I have asked, respectfully asked,
34 witnesses not to discuss their evidence until
35 they've concluded cross-examination. It's a
36 standard rule that I've used in the courtroom and
37 I've decided to use it here as well. I know
38 you'll accommodate me in that regard, and I'm very
39 grateful for that.

40 Thank you very much.

41 THE REGISTRAR: The hearing is now adjourned for the
42 day and will resume at ten o'clock tomorrow
43 morning.

44
45 (PROCEEDINGS ADJOURNED AT 4:16 P.M. TO
46 THURSDAY, FEBRUARY 3, 2011, AT 10:00 A.M.)
47

1 I HEREBY CERTIFY the foregoing to be a
2 true and accurate transcript of the
3 evidence recorded on a sound recording
4 apparatus, transcribed to the best of my
5 skill and ability, and in accordance
6 with applicable standards.
7
8
9

10 _____
11 Diane Rochfort

12 I HEREBY CERTIFY the foregoing to be a
13 true and accurate transcript of the
14 evidence recorded on a sound recording
15 apparatus, transcribed to the best of my
16 skill and ability, and in accordance
17 with applicable standards.
18
19
20

21 _____
22 Karen Acaster

23 I HEREBY CERTIFY the foregoing to be a
24 true and accurate transcript of the
25 evidence recorded on a sound recording
26 apparatus, transcribed to the best of my
27 skill and ability, and in accordance
28 with applicable standards.
29
30
31

32 _____
33 Pat Neumann

34 I HEREBY CERTIFY the foregoing to be a
35 true and accurate transcript of the
36 evidence recorded on a sound recording
37 apparatus, transcribed to the best of my
38 skill and ability, and in accordance
39 with applicable standards.
40
41
42

43 _____
44 Karen Hefferland
45
46
47