

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.

Tuesday, February 8, 2011

Tenue à :

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

le mardi 8 février 2011

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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")
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Don Rosenbloom	Area D Salmon Gillnet Association; Area B Harvest Committee (Seine) ("GILLFSC")

APPEARANCES / COMPARUTIONS, cont'd.

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Chris Watson	West Coast Trollers Area G Association; United Fishermen and Allied Workers' Union ("TWCTUFA")
Keith Lowes	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")
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APPEARANCES / COMPARUTIONS, cont'd.

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No appearance	Heiltsuk Tribal Council ("HTC")

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In chief by Ms. Baker (cont'd)

1 Vancouver, B.C. /Vancouver
2 (C.-B.)
3 February 8, 2011/le 8 février
4 2011
5

6 THE REGISTRAR: The hearing is now resumed.

7 MS. BAKER: Mr. Commissioner, just to outline what our
8 plan is for this morning, we have David Patterson
9 back to complete his evidence on management
10 adjustments, and then we'll be following that with
11 the panel that we had yesterday. I'm wondering if
12 I could propose that we take one break in the
13 morning at about 10:45. We'll just go ahead
14 through to that. Thank you.

15 So I will continue with Mr. Patterson. Mr.
16 Patterson, you were previously sworn and you
17 remain under oath.

18 MR. PATTERSON: Yes.
19

20 DAVID PATTERSON, recalled.
21

22 EXAMINATION IN CHIEF BY MS. BAKER, continuing:
23

24 Q The first document I'd like to take you to this
25 morning is at Tab 1 of the binder in front of you,
26 and it's CAN 002886. It's titled "Improvements to
27 Environmental Management Adjustment Models", SEF
28 Final Report.

29 Now, I understand that this report came out
30 of some recommendations from the Williams review
31 of the 2004 fishery and the standing committee
32 review of the 2004 fishery; is that right?

33 A Yes. Some of the recommendations came from there.

34 Q And the recommendations are referred to at
35 paragraph 2 of the Executive Summary which is at
36 page 2 under the ringtail numbers. It just makes
37 reference to the earlier reviews and the
38 recommendation to review management adjustment
39 models. What were the areas for improvement that
40 were identified and which were the subject of this
41 report?

42 A The main areas were we wanted to look at the
43 actual model inputs, the variables that went into
44 the MA models. We wanted to look at the model
45 structure itself, and also model selection were
46 the three broad areas. We broke that down into
47 five other areas which were basically, sensitivity

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1 of the management adjustment models to
2 temperature, flow, the uncertainty in the
3 environmental forecasts that go with it. I mean
4 they're actually all outlined in the report, but
5 those are the main things, input structure and
6 selection.
7 Q And this was funded by the Salmon Commission's
8 Southern Boundary Fund; is that right?
9 A Primarily funded by them and then subsidized by
10 DFO, and then also by NSERC for a graduate
11 student.
12 Q And was the work contemplated -- let me just back
13 up. This is a final report that was produced once
14 the different studies had been done; is that
15 right?
16 A That's correct.
17 Q And what we put into evidence here is an Executive
18 Summary of the different report. The actual SEF
19 report is quite lengthy; is that right?
20 A Yes.
21 Q Okay. But the excerpts that we have included here
22 outline the -- summarize the conclusions of the
23 different reports that were done?
24 A Yes.
25 Q Okay. And was all the work that was contemplated
26 under this proposal finished, or was there work
27 outstanding?
28 A We completed all the objectives and delivered on
29 what we said we would do. However, the very last
30 objective is a bit open-ended in terms of the
31 actual development of ecosystem management
32 protocols, so that's ongoing work. And there's
33 continuing ongoing work associated with the other
34 four objectives too. But, for the most part, it
35 was done.
36 Q The objectives that you're referring to, are those
37 the objectives that are on page 3?
38 A Yes, the 1 to 5.
39 MS. BAKER: So if you could turn the page, Mr. Lunn.
40 Q All right, so these five adjustments. So the
41 final one, number 5, you say is not complete?
42 A Well, we looked into it, but it's an assimilation
43 of all the information that has been collected and
44 is continuing to be collected, so it's not really
45 something that could be completed, per se. It's
46 never -- this is an iterative process would be a
47 better way of thinking about it.

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1 Q Okay. Are you able to summarize the conclusions
2 of the different studies that were done?

3 A Yes. If you want to look at the -- basically the
4 main conclusions that are associated with each one
5 of those on the bottom of the page there, from 1
6 to 7, are the seven main chapters that refer to
7 the first four objectives.

8 The first paper there dealt with looking at
9 how we could improve getting a heads up at the
10 beginning of the season, before the fishing season
11 started, based on snow pack, air temperature
12 anomalies, and we looked into the efficacy of
13 doing that. It turned out we can within a
14 reasonable amount of uncertainty.

15 The next one really dealt with how we can
16 improve our temperature forecasting and our
17 monitoring within the system, in the Fraser.
18 That's outlined there. There are some
19 improvements that could be made.

20 The next one really looked at -- one of the
21 suggestions in the Williams report was to look at
22 different models for accumulated thermal units.
23 We realized that if there's a really good
24 agreement between temperature sites within the
25 Fraser River, then that really wouldn't be
26 necessary and you could use a single surrogate for
27 the entire system, and that turned out okay.

28 The next one has to do with looking at the
29 uncertainty in the actual model, what other
30 uncertainty goes into the MA models. Not just the
31 inputs, but also how the fish are coming in, the
32 timing of the fish, the shape and profile of the
33 run itself. We realized that it tends to be very
34 sensitive to the actual distribution of the fish
35 coming to the river, the actual MA outputs
36 themselves.

37 The final -- so is that feedback I'm hearing,
38 you're hearing? Okay.

39 The evaluation -- the next one has to do with
40 looking at different HE (phonetic) models as well.
41 We accomplished -- we looked at that and to see
42 whether or not it could be feasible. We
43 determined that it wasn't actually a feasible
44 method for the in-season; however, it could be
45 used post-season.

46 The last two, they're both two primary
47 publications. The one has to do with looking at

1 model rationale for what we're actually doing in
2 the first place, and whether or not the model
3 structure was sound. It was based on sound
4 biological rationale. The last one has to do with
5 looking at model selection and ways of improving
6 how we choose, how models could be chosen in-
7 season for doing it.

8 Q All right. Each of these studies discussed
9 improvements that could be made to the models that
10 were being used prior; is that right?

11 A They looked at improvements to be made and also
12 other ways of looking at the problem. The last
13 thing is a whole list of publications that are in
14 here and subsequent that have to do with the last,
15 which is the assimilation of the ecosystem
16 approach to the management side, which is the
17 actual looking at mortality directly.

18 Q Were the improvements that were identified in
19 these studies implemented? Have they been
20 implemented since the work was done?

21 A Certain aspects have been, but not all, no.

22 MS. BAKER: I'll have this marked, please, as the next
23 exhibit.

24 THE REGISTRAR: What's the face page of this document?

25 MS. BAKER: It says "Improvements to Environmental
26 Management Adjustment Models, SEF Final Report."
27 It should be in Tab 1.

28 THE REGISTRAR: Exhibit 404.

29
30 EXHIBIT 404: Document titled "Improvements
31 to Environmental Management Adjustment
32 Models, SEF Final Report"
33

34 MS. BAKER:

35 Q I don't want to spend too much time on this
36 report, but can I just ask you to identify -- if
37 we move through this document, there'll be an
38 Executive Summary for each chapter beginning at
39 page 8. So each of these reports that you just
40 reviewed has been summarized in these different
41 Executive Summaries; is that fair?

42 A Yes.

43 Q Okay. Now, I'd like to move to another document
44 which is, I think, referenced in the exhibit that
45 we just reviewed which is a study done by John
46 Cummings from SFU. That is found at Tab 3 of the
47 materials in front of you.

5
David Patterson
In chief by Ms. Baker

1 First of all, I'll just ask if you can tell
2 me whether this document, which is a study titled,
3 "The Impact of Different Performance Measures on
4 Model Selection for Fraser River Sockeye Salmon,"
5 is that actually one of the reports contemplated
6 by the SEF project?

7 A Yes. This is the primary publication from number
8 7 on the previous document.

9 Q Okay. And you're one of the authors of this
10 report as well?

11 A Yes.

12 MS. BAKER: Can I have this marked, please, as the next
13 exhibit?

14 THE REGISTRAR: Exhibit 405.

15
16 EXHIBIT 405: Document titled, "The Impact of
17 Different Performance Measures on Model
18 Selection for FRSS".

19
20 MS. BAKER:

21 Q At page 4 of this document, lines 89 to 96 at the
22 bottom it states that:

23
24 During the fishing season, these --

25
26 We're talking about discrepancies. Just a minute,
27 I'll make sure I've got my -- all right. This is
28 just -- I want to pull just some lines out of this
29 summary, so it's a bit -- I don't want to go to
30 the first part of the paragraph, but if we can
31 just pick it up at 89.

32
33 During the fishing season, these
34 discrepancies are incorporated by fisheries
35 managers into estimates of total allowable
36 catch, thus potentially reducing available
37 harvest for regulated fisheries in years when
38 the forecast of loss is high.

39
40 And the discrepancies that we're talking about are
41 what are tried to be captured with the management
42 adjustments, I take it.

43
44 Underestimates of in-river loss can lead to
45 conservation concerns with too few fish
46 reaching spawning grounds due to excess
47 catch, whereas overestimates of in-river loss

1 can result in foregone catch. Therefore,
2 management of the Fraser River sockeye salmon
3 fishery would benefit from identifying MA
4 models that produce the most precise and
5 unbiased prediction of in-river loss.
6

7 So that describes one of the objectives that you
8 were looking to solve, how to find the most
9 precise and unbiased prediction of loss through
10 management adjustment models; is that correct?

11 A Yes.

12 Q Okay. And then on page 6 at lines 136 to 138,
13 you'd specified the research objective as being:

14
15 Our research objective was to develop a
16 standardized framework to quantitatively
17 evaluate new and existing MA models and, more
18 generally, to explore how different model
19 performance measures can influence the rank-
20 order of model selection.
21

22 So that in fact was the objective that you were
23 dealing with in this project?

24 A That's the specific one in this paper, yes.

25 Q And in this research project, you looked at the
26 models for determining management adjustments, and
27 some of those are the ones you talked about last
28 day when you were here, and they included
29 temperature-only models, right?

30 A Yes.

31 Q Discharge-only models?

32 A Yes.

33 Q Temperature and discharge models?

34 A Yup.

35 Q Migration timing models?

36 A Yes.

37 Q And average historical escapement discrepancy
38 models; is that right?

39 A Yeah.

40 Q And that you assess those models against each
41 other and also against the outcome from applying
42 no management adjustment at all.

43 A That's right.

44 Q Okay. And what was the conclusion of your
45 research with respect to using management
46 adjustment models versus not using management
47 adjustment models at all?

7
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1 A The conclusion was that in three of the four run-
2 timing groups, the worst choice to make would be
3 not to apply one. In the case of the remaining
4 run-timing group, it's the second worst choice of
5 not applying one. So in terms of actual
6 performance, you're better off having an MA model
7 regardless of how precise or biased it may be.

8 Q So in your view, are management adjustment models
9 then a useful tool for managers to use in managing
10 the fishery?

11 A Yes.

12 Q Then moving into some of the choices that must be
13 made in determining what the appropriate
14 management adjustment model is, if you could move
15 to page 17 and line 365. I just wouldn't mind
16 getting a non-technical version of these
17 statements. Three-sixty-five, partway through the
18 line says:

19
20 Model performance measures should not be
21 chosen simply on the basis of statistical
22 tradition, but instead should be consistent
23 with the stated management objectives. For
24 example, use of model rankings based only on
25 AIC_c or R^2 fit to the entire dataset (as is
26 often the case) for management of the Early
27 Summer run would result in the selection of
28 a --

29
30 I don't know what this means.

31
32 -- D model (i.e., the historical average
33 discrepancy model). However, for managers
34 who place high priority on objectives that
35 specifically aim to avoid extreme errors in
36 achieving escapement targets, a model that
37 minimizes MAE or RMSE, i.e. the T+Q
38 (temperature and flow) model would be
39 preferred.

40
41 So in layman's terms, what are you getting at in
42 those lines? Like what is the dynamic that you're
43 trying to describe?

44 A I guess when you think about model fit, what
45 happens with these things, like R^2 which is a more
46 traditional way of looking at it, you're looking
47 at a model and you'll see how well they did. He

1 currently had how well it fits -- if you have a
2 relationship between temperature and in-river
3 loss, you can see how well it does. The problem
4 is if you then -- that's only explaining one
5 aspect of the model itself.

6 Now, one way, what we did here is we went
7 back and we said, okay, let's start running this
8 model from 1995 and if we had this information in
9 '95 when we apply the model, do we get -- and we
10 keep doing that iteratively, year after year after
11 year. Basically you're looking ahead to see how
12 well it performs in the future. Do you get a --
13 do these models -- some of these model produce a
14 bias. In other words, they tend to overestimate
15 the number of fish coming back. Even though they
16 may fit the model in terms of after the fact, we
17 may be seeing a bias through time. That's what
18 we're really getting at here.

19 So if managers, depending on what they want
20 to do, if they want to avoid -- just because of
21 how the models are structured, you have different
22 outcomes will come from them. If you want to
23 avoid extreme errors or if you want to avoid a
24 bias in one direction or the other, you may want
25 to choose to have one model over another.

26 So I guess it's not an easy thing to actually
27 explain, but there are differences between models
28 and the selection of them, and it's important that
29 we -- it's potentially important, I should say, if
30 managers wanted to do that. It's an area, I
31 guess, that we're looking at exploring and trying
32 to get across.

33 Q All right. I think that that picks up at page 21
34 of your report at lines 448 through to 454 where
35 you say:

36
37 Clearly, multiple performance measures need
38 to be considered in fisheries
39 analyses...because of the competing
40 management objectives typically faced by
41 fisheries managers...When clear objectives
42 are combined with appropriate affiliated
43 performance measures, model selection through
44 retrospective analysis can be used to provide
45 scientific advice to managers to help
46 increase the probability of achieving
47 fisheries management objectives.

- 1 And that's kind of what you were just saying,
2 isn't it?
- 3 A Yes.
- 4 Q So the point I think you're trying to make, and
5 correct me if I'm wrong, is that fisheries
6 managers will have certain objectives whether to
7 avoid not meeting their -- if they want to meet
8 their escapement target. If it's important to
9 ensure that they overestimate to make sure that
10 the escapement targets are met, that could be a
11 management objective, and that objective may help
12 you select a model that will best meet that goal.
13 If the objective is to maximize catch while at the
14 same time attempting to meet the escapement goal,
15 that objective may cause you to use a different
16 model as well. So the model selection could be
17 influenced by the management objective; is that
18 right?
- 19 A Yes.
- 20 Q Currently have managers been able to communicate
21 their objectives to Science in a way that allows
22 for you to provide advice on the most appropriate
23 model to reflect the management objectives?
- 24 A On the one level, yes. I mean, the overarching
25 objective of achieving the spawning escapement
26 target while still providing opportunities to
27 harvest is articulated. The more subtle
28 objectives which are associated with these
29 performance measures have not been. I mean, there
30 are many reasons why. You'd have to ask them I
31 guess. But this process hasn't really had time
32 to, I guess, develop with them, to be honest with
33 you. So it's a yes and no answer.
- 34 Q Is that a goal right now, to work with managers to
35 articulate objectives that will assist in
36 providing a proper or a useful model selection for
37 management adjustments?
- 38 A Yes. We have presented this work to them and
39 we'll continue to present it, the idea of building
40 a framework for looking at model selection,
41 basically coming up with an agreed-upon set of
42 conditions and taking in mind what the management
43 objectives are so to come up with the best suite
44 of models they can use.
- 45 Q Right now, different models can be selected in
46 season for calculating management adjustments; is
47 that correct?

1 A Different models are presented in season. I'm not
2 sure how they're selected.

3 Q And, as far as you know, the model selection is
4 not done using this quantitative method that
5 you're trying to develop here. In other words,
6 right now there's not a clear set of objectives
7 that are linked to the models, the model choices
8 that allow them to make a decision on what
9 management adjustment to use.

10 A I'm not sure what the objectives -- those
11 objectives I've been talking about, as far as I
12 understand, it's the mainly R^2 that's being used as
13 the actual performance measure that's assessed,
14 and without the appropriate p values, I don't know
15 how you can assess what the actual confidence you
16 have in those results are, to be honest.

17 Q Okay. If the objectives and the performance
18 measures were clearly stated, would that allow for
19 more predictable and transparent assessment of the
20 appropriate management adjustment model to use in-
21 season?

22 A I think based on the work we've done here, we've
23 demonstrated that by actually having clear
24 performance measures, then you can, in theory,
25 improve the performance management of the system.

26 Q Thank you. I would like to move to another topic
27 now. At Tab 2 of the binder before you, there's a
28 document titled, "Environmental Watch Program
29 Overview with Specific Reference to Fraser River
30 Sockeye Salmon." That is CAN 05407.

31 I just wanted to identify this is a summary
32 of the Environmental Watch Program and it outlines
33 the different objectives of that program; is that
34 fair?

35 A Yes.

36 MS. BAKER: Okay. I'd like this marked, please, for
37 the record.

38 THE REGISTRAR: Exhibit 406.

39
40 EXHIBIT 406: Document titled "Environmental
41 Watch Program Overview with Specific
42 Reference to FRSS"
43

44 MS. BAKER:

45 Q Getting back to the Environmental Watch Program
46 that you're a part of, does your group do any work
47 on the impacts of temperature and kinds of in-

1 river fishing? We've heard a little bit in this
2 commission of inquiry about how different kinds of
3 in-river fishing can have certain impacts if
4 temperature of the water is higher than a certain
5 point.

6 A Yes, we've been indirectly involved, because we've
7 been fishing for the last ten years in different
8 environmental conditions using every gear type
9 imaginable. So we have a baseline record for
10 stress responses from fish caught in different
11 gear types.

12 But more recently, we've been involved in two
13 NSERC projects that are related directly to the
14 impact of fishing interaction with temperature
15 using different gear types in fresh water.

16 Q So that work is going to continue being performed;
17 is that --

18 A There is another two years left on the one
19 project. These are funded out of Carleton
20 University and the University of British Columbia.
21 It's Steve Cooke and Scott Hinch. I believe
22 there's one year left in the UBC one and two years
23 left in the Carleton one.

24 Q All right. And what will that -- what will the
25 results of that research be used for?

26 A The idea is to actually basically provide managers
27 with science advice and information on the
28 potential impacts of different gear types, so it's
29 not selecting one over the other. Also, what the
30 impact of those different gear types would be in
31 terms of actual -- at different temperatures as
32 well.

33 I mean, that particular project, though, is
34 sort of looking straight at the actual catch and
35 typically release as opposed to the other
36 interactions which are getting captured without
37 being brought on board and then incidental capture
38 or even just net avoidance or capture. So there
39 are different levels of interaction, but this is
40 the most primary one where the fish are caught,
41 assessed and then released, looking at post-
42 release survival for the most part.

43 Q Is your group doing any work that looks at the
44 impacts of future climate change scenarios?

45 A Yes, we are. We're doing both forecast involved
46 with climate model. There's looking at future
47 conditions in the Fraser River, and also looking

- 1 at individual stock specific responses to climate
2 change, either physiologically or behaviourally.
- 3 Q What about habitat loss? Has that influence been
4 studied by your group?
- 5 A Not habitat loss necessarily. We're more in
6 habitat change, I guess, in regards to temperature
7 itself.
- 8 Q So that work is still tied to temperature; is that
9 right?
- 10 A Yes, that's correct. We have a pretty broad
11 network of water temperature monitoring stations
12 throughout the Fraser. So we're trying to look
13 now at disentangling climate from habitat
14 alteration.
- 15 Q All right. Thank you. Moving to another topic,
16 under the old IPFFC, was temperature data
17 collected by that agency?
- 18 A Yes.
- 19 Q And did that go back to the 1940s?
- 20 A Yes.
- 21 Q When certain aspects of the Fraser River sockeye
22 fishery moved to DFO in 1985, did temperature data
23 continue to be collected in the same way as it was
24 done previously by the IPFFC?
- 25 A No, there was some changes during the changeover.
26 Some stations were dropped. Methods also changed,
27 switching from older equipment to modern
28 electronic equipment.
- 29 Q What temperature data is being collected now?
- 30 A Right now, there's two main types. There's real-
31 time water temperature data which is collected on
32 the main tributaries. There's ten real-time sites
33 in the Fraser River. Plus there's a network of
34 just logger stations that you're in there but have
35 to retrieve once a year.
- 36 Q If you turn to the exhibit that's on the screen
37 right now, Exhibit 406, if you turn to page CAN
38 number 9. It has a map. Are these sites that are
39 currently being monitored for temperature?
- 40 A Those are the sites that are being monitored for
41 water temperature in real time. Actually, it's
42 kind of hard to tell, isn't it?
- 43 Q Yeah. That's (indiscernible - overlapping
44 voices).
- 45 A Actually, no, these are both. These are real-time
46 and the permanent, the non real-time stations. So
47 we're monitoring in the major migration corridors.

1 We have some experimental research work in lakes
2 as well, looking at thermal properties and
3 changes.

4 Q The work that's being done currently by your
5 program and by Water Survey Canada, is that the
6 same level of monitoring that took place from the
7 time DFO took over this in 1985, or was there a
8 period of time where the temperature records are
9 not as good?

10 A Yeah, the 1980s and the early '90s are
11 particularly poor compared to the '50s and '60s.
12 I think now we're back up to a level that's
13 probably commensurate with what was taking place
14 in the '60s. So, I think, really, I guess in the
15 -- that was really in response to the previous
16 reviews that the temperature monitoring expanded
17 back up after '94.

18 Q Is the temperature data that's being collected
19 currently representative of the entire river?

20 A No. The current temperature monitoring, the way
21 it's set up, is designed primarily to provide
22 advice for migratory conditions for adult Fraser
23 sockeye. That's the way it's set up, and that's
24 the main objective for doing it.

25 Q So the question was whether it's representative of
26 the entire river. How does the answer that you
27 just gave relate to that question, just to be
28 basic with us.

29 A I guess the first part, when I said "no", I mean
30 insofar as Fraser sockeye are distributed
31 throughout most of the Fraser, it's not set up --
32 it's not a temperature-monitoring program for the
33 entire Fraser River. It's a temperature-
34 monitoring program for Fraser sockeye migration,
35 and it's earmarked for the 19 major production
36 units. It's not geared to the individual CUs or
37 anything like that.

38 I mean if you were to look at the future down
39 the road, if you want to look at climate change
40 impacts, then you'd probably remodel, tweak some
41 of the stations around. If you wanted to look at
42 CUs for the WSB as a habitat indicator, then you'd
43 have to modify the existing program.

44 Q Is the data that you are able to obtain through
45 these sites adequate for the management adjustment
46 models that are used in managing?

47 A They're adequate for the current management

1 adjustment models, yes. I think that one multi-
2 site correlation paper that was referred to
3 earlier, and one of the SCF project reports,
4 summarizes how confident we are, I guess, in the
5 current coverage.

6 Now, that's just for the current system. If
7 the management changes or the fisheries are
8 redistributed or any sort of change, then we'd
9 have to adjust accordingly. I mean, that's not to
10 say improvements couldn't be made, but in the big
11 scheme of things where we have other uncertainties
12 that go into the management adjustments, we're
13 comfortable with water temperature is not playing
14 -- is not a limiting problem in this case.

15 Q In your view, is it important to maintain that
16 full dataset of environmental conditions in the
17 river?

18 A Yeah, absolutely. I mean, although most of the
19 scrutiny is associated with the in-season
20 management and Fraser sockeye for temperature
21 monitoring, the real benefit of this temperature
22 monitoring has actually probably come from a lot
23 of the other research and spin-off work that we've
24 done, such as assessing climate change. You don't
25 have that information unless you have long-term
26 records of water temperature monitoring. We can
27 now look at individual -- we can reconstruct
28 thermal exposures for different populations.
29 We're doing it now for downstream smolts.

30 Q Do you think that the Department of Fisheries and
31 Oceans is the right department to be responsible
32 for monitoring temperature in the river?

33 A I don't think I'm the right person to ask in the
34 sense it's not -- I'm not going to comment on what
35 our mandate is. We have a use for it, we have a
36 need for it, and therefore we do it.

37 Q Well, I guess the question is should this be a
38 responsibility of Environment Canada? Are they
39 already monitoring things, water temperature and
40 other temperature sites?

41 A I mean Environment Canada does do some water
42 temperature monitoring. They give (sic) mandate
43 to monitor water quality, and in my personal
44 opinion, water quality -- water temperature is
45 probably the main attribute for analyzing water
46 quality, so insofar as that, I think that they
47 could be doing more, to be honest.

1 Q My final questions relate to some recommendations
2 made by Williams. If you could go to Exhibit 14
3 which is in front of you there, and if we can have
4 Exhibit 14 come up, Mr. Lunn? Exhibit 14, page
5 263. Recommendation 19 states that:

6
7 Given the challenge posed to fisheries
8 management by high water temperature and
9 associated impacts on fish mortality, more
10 systematic collection of data on the number
11 of fish observed floating in the river or
12 dead on the banks downstream of the spawning
13 grounds would prove useful for comparative
14 purposes.

15
16 So, first of all, did the Department assess the
17 relationship between loss and salmon carcasses in
18 response to this recommendation?

19 A Well, we initiated the work prior to this actual
20 recommendation, in terms of we're looking at the
21 relationship between carcass visibility, or the
22 ability to detect carcasses within the Fraser
23 River itself.

24 Q And were you able to establish that there's a
25 relationship between salmon carcasses and best
26 estimates of loss?

27 A We never directly compared salmon carcasses and
28 best estimates of loss because I think at the
29 time, because of what's construed within the --
30 the difference between estimates on the
31 uncertainty associated with them, we decided
32 instead to look at the direct relationship between
33 the number of carcasses and high -- and water
34 temperature itself. We did find the relationship
35 between -- those years that had high water
36 temperature also had higher number of carcasses
37 relative to the abundance of fish in the river.

38 Q And have other studies been done or experiments
39 been done to try and figure out what happens to
40 all the fish that die in the river?

41 A Yeah, we conducted a study where we actually
42 looked at the relationship between water
43 temperature, anywhere from 5 to 20 degrees, and
44 the time it takes the fish to surface. From that,
45 we deduced that even at 20 degrees, it takes one
46 to two days for a fish to resurface. At 5
47 degrees, it's up to 12 days. So it's highly

1 unlikely that you're not going to see lots of fish
2 floating in the river at any point -- and fish are
3 negatively buoyant, in which case, unless -- the
4 only way they can float is with gas build-up, so
5 if their body is perforated in any way or
6 scavenged even partially, then they're not going
7 to resurface.

8 Also the water conditions, the clarity, how
9 fast the Fraser River moves, it takes a few days
10 for water to get from the Thompson to the mouth of
11 the river, so there's a whole bunch of reasons why
12 we found it highly unlikely that you actually
13 seize large numbers of fish in the river,
14 carcasses.

15 MS. BAKER: Mr. Commissioner, those are my questions
16 for Mr. Patterson. I know that Canada has some
17 questions for him, but I'm not sure how many other
18 participants do.

19 THE COMMISSIONER: Could I, Ms. Baker, just try to
20 clear a question mark in my head on the modelling
21 side if I could, and that is, is there any
22 relationship whatsoever between the models that
23 you have discussed in these reports and given
24 evidence upon, and FRSSI?

25 A There is. I believe that those guys associated
26 with FRSSI -- Michael, who's going to come talk
27 later, if you want more details on it. There is a
28 connection, and Michael talks -- he's probably the
29 best one to know exactly how it's incorporated
30 into the model itself.

31 THE COMMISSIONER: But from your perspective, what is
32 your understanding of --

33 A Oh, how it's actually --

34 THE COMMISSIONER: Right.

35 A Well, I guess the simplest one -- well, in the
36 FRSSI model, you have the TAM rules, the Total
37 Allowable Mortality. Within there, if you -- say,
38 for example, TAM rule will be 60 percent. Most of
39 that, in a high temperature year, most of that 60
40 percent allowable mortality will be taken out by
41 the predicted MA, management adjustment model.
42 So, in that sense, the MAs are directly associated
43 with the TAM rules.

44 And then the other place where Michael talked
45 about -- or Gottfried, I guess, were talking about
46 how it's being incorporated was in the long-term
47 future planning where you can provide long-term

1 estimates of discrepancy, so they can be
2 incorporated into the long-term escapement
3 planning. So, in other words, if we're thinking
4 10, 20, 30 years down the road, our environmental
5 conditions are going to get worse, therefore it's
6 expected that you're going to have higher
7 frequency of in-river mortality, therefore you
8 should adjust your spawning escapements
9 accordingly down the road.

10 That's another place I potentially see it
11 being incorporated into FRSSI. I don't know
12 exactly specifically how it has, but that's the
13 sort of advice we've provided to them in the past
14 on this. So if that makes sense.

15 THE COMMISSIONER: As I understand the evidence, your
16 adjustments are made annually in season; is that
17 correct?

18 A Yes. The ones I was talking about today, yes.

19 THE COMMISSIONER: To the extent that in-season total
20 mortality is being used to develop a total
21 allowable catch, what I need to understand is
22 whether there is already built in to the TAM an
23 adjustment for the factors that you take into
24 account in your adjustment model?

25 A The factors that are taken into account, they are
26 one of the -- it's either the catch or it's the
27 MA, from the MA model. Those are the two that go
28 into the TAM, so the answer is yes. That's how
29 it's being incorporated into the TAM rules.

30 In some cases, the predicted mortality will
31 be greater than the 60 percent, in which case
32 there will be no TAC available at all. So it can
33 easily overcome the total allowable mortality. I
34 mean, it's allowable from a management
35 perspective, but obviously nature doesn't -- you
36 can get 80, 90 percent mortality overall. So
37 that's how it's being incorporated right now.

38 MS. BAKER: Mr. Commissioner, perhaps just to assist.

39 Q If we turn to Exhibit 317, which is the IFMP for
40 2009, and we go to page 67 of that document, you
41 can see this is the fisheries plan for sockeye and
42 you'll see a column, Mr. Patterson, a second
43 column from the right. It says "Management
44 Adjustments" and those numbers are the result of
45 the running of the different models we've talked
46 about today; is that right?

47 A Yes. I mean, we do the -- most of the -- we talk

18
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In chief by Ms. Baker
Cross-exam by Mr. Spiegelman (CAN)

1 about the in-season MA models, but MA models are
2 also developed pre-season to look at what's
3 happening and then they can be simulated to see
4 what happens. This is where these ones would have
5 come from. This is the best guess before they
6 even -- environmental conditions have been
7 assessed, is find out what we're going to expect.

8 The same thing you can do is we - and we have
9 - we can look at 5, 10, 30 years down the road.
10 We can generate management adjustments as well for
11 planning purposes. So you have to ask the other
12 FRSSI people what exactly they do, how it's
13 incorporated, or if it is right now. But it can
14 be done. In some where climate change where it's
15 -- that's exactly what we're looking at. We're
16 looking at long-term patterns and mortality and
17 how you can adjust for the -- and the tricky part
18 is it's easy to make guesses on what's going to
19 happen in the future for the fish, but it's harder
20 in terms of how that impacts on the fishery
21 itself. That's a different set of questions.

22 Q And if we could also just go to Exhibit 330. So
23 what we've just looked at, Mr. Patterson, was the
24 pre-season plan, and now I'm going to ask you just
25 to quickly look at one of the in-season decision-
26 making documents. If you can go to page 130? I'm
27 not sure if that's the CAN number, but try 130 and
28 see where that gets us. Four more. Okay, stop
29 there.

30 You see this is a calculation sheet from an
31 in-season week, and it shows, underneath the in-
32 season run size estimate, it has the escapement
33 target set out and then it shows the management
34 adjustments that need to be made for the different
35 stocks. Again, that management adjustment number
36 is what's created through the use of the models
37 that we've been talking about; is that right?

38 A Yes.

39 MS. BAKER: Thank you. Mr. Commissioner, are there
40 more questions or shall I open it up for Canada?

41 MR. SPIEGELMAN: Thank you. For the record, my name is
42 Jonah Spiegelman representing the Government of
43 Canada.

44
45 CROSS-EXAMINATION BY MR. SPIEGELMAN:

46
47 Q I just have a very few questions for you today,

February 8, 2011

1 Mr. Patterson. The first area that I want to ask
2 you about is following on the selection of models,
3 questions that you were asked previously, and I
4 just wanted to clarify there are a number of
5 different models that your group has developed,
6 and Ms. Baker took you through them. One is the
7 temperature only, and one is the discharge only,
8 then there's the combined of the two. So you have
9 a whole bunch of different models that use data
10 from different environmental factors; is that
11 correct?

12 A Yes, correct.

13 Q And you have developed these models in your
14 capacity as a research scientist with DFO, and
15 you've handed them over to the Fraser Panel for
16 use in in-season management?

17 A The models were developed -- I was one of the
18 people involved in the model development along
19 with, actually, people from the Pacific Salmon
20 Commission as well. But, yes, the development
21 phase, and now the models themselves have been
22 used by the Salmon Commission.

23 Q Okay. And as part of your work, you've evaluated,
24 as we went through, and Exhibit 405 is an example
25 of your evaluation of the performance of different
26 models using historical data among various
27 performance measures; is that fair?

28 A Yes.

29 Q And so in season, when these models are going to
30 be run for the generation of an actual management
31 adjustment, does Pacific Salmon Commission or the
32 in-season managers, they come to you and ask
33 periodically for advice about model selection; is
34 that correct?

35 A More so in the past than recently, but it does
36 happen, yeah.

37 Q Okay. And if you were to be asked that advice,
38 what factors might you consider when providing
39 that advice?

40 A I guess when we're -- the ones that I use -- my
41 background is migration biology, so one of the
42 things that if you're going to be relying on the
43 MA insofar as it explains in-river mortality, I'd
44 want to make sure that any model you're choosing
45 was grounded in biological basis as much as
46 possible.

47 The other thing is in model selection. Be

1 careful of, I guess, selecting -- leaving data in
2 or taking out just because you may have a hunch or
3 an idea of why one model is better than another.
4 There's some pretty good reasons for switching
5 between models, but I am pretty -- maybe I'm more
6 conservative but I think these things should be
7 worked out ahead of time for the most part.

8 And on top of the actual model performance
9 criteria outlined clearly in these papers, there's
10 a very good statistical basis for why you want to
11 choose one model or the other, but the other part
12 that isn't outlined there is the biological
13 rationale for it.

14 Q Would the sort of real-time and in-season
15 environmental data that you're providing lead you
16 or them towards choosing one model over another?
17 For example, let's say this week's data show that
18 it's a high temperature period. Would that tend
19 to be factored in?

20 A Only if it was going into territory they'd never
21 seen before. Pre-season, we give them an idea of
22 what sort of conditions to expect, so unless
23 there's confidence in the actual temperature or
24 discharge forecast itself, if there's a serious
25 problem or this is identified, then there's a
26 legitimate reason to switching over.

27 But unless you're going into temperatures or
28 discharges haven't been experienced before, I'd be
29 highly -- I'm not sure about actually switching
30 unless those sort of decision rules were agreed
31 upon ahead of time.

32 Q And you said that, as one of the hypotheses that
33 you tested in this study, Exhibit 405, was
34 comparing the different models versus applying no
35 MA at all.

36 A Yes.

37 Q And you indicated that it was consistently the
38 worst or among the worst options.

39 A Yes, that's correct.

40 Q I just want to turn very briefly to the climate
41 change work that you've done. Can you comment on
42 how different climate change scenarios may impact
43 the survival of migrating salmon in a general way?

44 A I think in terms of, more generally, in terms of
45 Fraser sockeye, it's been identified that the
46 actual upstream out-migration is probably going to
47 be one of the more sensitive or bottlenecks to --

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Cross-exam by Mr. Spiegelman (CAN)

Cross-exam by Mr. Leadem (CONSER)

1 in the future in terms of under climate scenarios.
2 One of the things in terms of looking at it,
3 looking at it on a stock-specific level or
4 population-specific level, they do respond to
5 temperature differently. So it's not necessarily
6 that easy to predict. You can't make general
7 statements regarding the long-term persistence of
8 the population.

9 More importantly, when it comes to things
10 like behaviour or physiological adaptation, we
11 don't know which direction they'll go. Some
12 populations may decide to come in earlier, some
13 might come in later within the group. So the
14 basis and the ability to adapt is going to come
15 from their genetic diversity that exists within
16 the populations themselves. So that's the
17 modelling stuff we've done and looked at now.

18 Q So following from that, then, in an uncertain
19 future where climate change may have an impact on
20 the environment through which salmon are
21 migrating, maintaining that broad base of genetic
22 diversity would be helpful for future survival and
23 adaptation; is that fair?

24 A Based on the modelling stuff we've done and the
25 other work we've read, yes.

26 MR. SPIEGELMAN: Those are my questions, Mr.
27 Commissioner.

28 MS. BAKER: Thank you. From talking to counsel
29 yesterday, I think the only other counsel that has
30 questions for Mr. Patterson is -- oh, Mr. Leadem
31 has one or two, and then I think Ms. Gaertner. I
32 think that that's it unless somebody else wants to
33 jump up.

34 MR. LEADEM: For the record, Leadem, initial T.,
35 appearing as counsel for the Conservation
36 Coalition.

37
38 CROSS-EXAMINATION BY MR. LEADEM:

39
40 Q Mr. Patterson, you'll have to forgive my line of
41 questions because I'm not a modeller and not a
42 scientist, so some of the questions may come from
43 a period of ignorance on my part.

44 I'm concerned about the communication of what
45 you're doing to the people that are going to be
46 affected by the management adjustments. Do you
47 know, for example, whether you or any other

1 scientist conduct workshops with fishers, the
2 commercial fishing industry, with First Nations
3 groups or with conservation groups to explain what
4 you're doing in terms of all of these modelling
5 exercises?

6 A The way it works is we provide our science advice
7 to fisheries management directly, and typically
8 the resource management are involved in the
9 consultation aspect of it. I can't speak for my
10 other colleagues.

11 Q Okay. Do you occasionally make guest appearances
12 to the Fraser River panel, either their Technical
13 Committee or the decision-making committee of the
14 Fraser River Panel?

15 A Yes.

16 Q And at that time when you attend, do you explain
17 the structure of the models and what they're used
18 for and how they're applied, and which model would
19 be better under certain circumstances? Is that
20 the nature of the kind of advice you're giving to
21 them?

22 A Not in those cases. Some cases yes, but there's
23 other reasons for appearing at the Technical
24 Committee beyond the MA model world.

25 Q All right. So I take it from your answer, then,
26 that you don't, strictly speaking, attend at those
27 meetings for the purposes of advising on the
28 management adjustment models and which one would
29 be the best selection under certain circumstances.

30 A That's correct.

31 Q I want to examine, just very briefly, Exhibit 406
32 with you. This is the Environmental Watch Program
33 Overview. If we can turn to page 8 of that
34 document under the heading "Climate Change and
35 Migratory Success", I find these words:

36
37 Warming temperature conditions have already
38 been documented in the Fraser River...and
39 have been associated with increased frequency
40 of high in-river losses of sockeye salmon.

41
42 There's a reference then to a paper that's *in*
43 *press* apparently at the time of this publication.
44 Then it goes on to say:

45
46 Increasing temperature trends, in combination
47 with shifting hydrological regimes, are

1 expected to continue under climate change
2 scenarios for the Fraser Basin.

3

4 Are you in agreement with those two sentences I
5 just read to you?

6 A Yes.

7 Q And then if we can flip back to page 6 of that
8 document under the heading "Temperature Impacts on
9 Salmon During Spawning Migration", I find this
10 sentence:

11

12 It has been well-recognized that sockeye
13 salmon in the Fraser River are vulnerable to
14 high river temperatures during their once-in-
15 a-lifetime upstream adult migration.

16

17 Once again, there's a reference to a paper by
18 Macdonald. Are you in agreement with that
19 sentence as well?

20 A Yes.

21 Q Later on in that same heading, there's a
22 reference, you drop down a sentence. It says:

23

24 Extreme high temperatures for short periods
25 can lead to thermal shock and mortality --

26

27 There's a reference to a 1977 journal article, and
28 it goes on to say:

29

30 -- while continued exposure to high
31 temperatures over extended periods can elicit
32 a variety of stress responses leading to
33 chronic sub-lethal impacts such as disease
34 progression, changes in migration behaviour,
35 decreased swim performance and altered
36 reproductive success.

37

38 There's a reference then to that paper by
39 Macdonald that's apparently *in press*. Is that --
40 well, firstly, let me ask you are you in agreement
41 with that sentence?

42 A Yes.

43 Q The paper by Macdonald, has it now been published
44 to your knowledge?

45 A Yes.

46 Q And I'm not familiar with -- is Macdonald a DFO
47 scientist or do you know where he researches or

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Cross-exam by Mr. Leadem (CONSER)

Cross-exam by Ms. Gaertner (FNC)

1 where she researches?

2 A Yeah, he's a DFO scientist.

3 Q At Pacific Biological Station in Nanaimo?

4 A No, at the West Van lab.

5 Q Now, earlier, we heard some testimony earlier, I

6 think a few weeks ago, from Mr. Lapointe, who

7 talked about temperature. Then when Sue Grant

8 from DFO attended to give her evidence with

9 respect to forecasting, I asked her a question

10 about being able to forecast water temperature in

11 the Fraser as a forecasting measure on a pre-

12 season type basis. She said that I would better

13 ask that question of you.

14 So now I'm going to pose it to you. So is it

15 possible that, as a pre-season predictive tool,

16 that you could actually make a forecast of what

17 the water temperature is likely to be in the

18 Fraser River?

19 A Yes, and we do, but we also provide the

20 uncertainty associated with those forecasts.

21 Q Right. And I understand that management

22 adjustments are then used in season. To a certain

23 extent, is that predictive effect of water

24 temperature pre-season, is that used to factor

25 into some management decisions to your knowledge

26 in terms of selection probabilities for the

27 harvesting?

28 A My understanding is that the temperature forecast

29 that we provide pre-season in June are then used

30 to generate the management adjustments that are

31 what I consider place-holders. In other words,

32 you can go into the season with no MA and then

33 wait for the first forecasts, and then have to

34 make big adjustments or you can come into the

35 season with an MA that we think is going to be

36 reflective of the conditions you're going to

37 experience and therefore have less probability of

38 having to make a major change one way or the

39 other.

40 MR. LEADEM: All right. Thank you, Mr. Patterson.

41 MS. GAERTNER: Thank you, Mr. Commissioner. Brenda

42 Gaertner, and with me, Leah Pence, for the First

43 Nations Coalition.

44

45 CROSS-EXAMINATION BY MS. GAERTNER:

46

47 Q Good morning, Mr. Patterson. I'm wondering if we

1 could go to Exhibit 317 we've already looked at
2 earlier today with you, and I want to go again
3 back to the Table B, page 66 of 150. Mr.
4 Patterson, you just previously spoke about where
5 the management adjustment is shown in this chart.
6 I wonder if we could go one step further.

7 When looking at that management adjustment in
8 preparation for my opportunity to speak with you
9 today, I was not surprised but at least curious
10 about the difference between a management
11 adjustment in one season of zero for the
12 Birkenhead and Birkenhead-type Lates, and then we
13 go to 59 percent for the Early Stuart, and all the
14 way up to 604 percent for the true Lates. I see
15 that's a fairly large difference in numbers of the
16 management adjustment, and I'm assuming that's
17 different models.

18 But I'm wondering if you could bring that
19 home for Mr. Commissioner and myself as to what do
20 we take from such differences in numbers when it's
21 -- if the management adjustments are primarily
22 addressing temperature and sort of known
23 quantities. I'm very curious about those
24 differences and I wonder if you could help us
25 understand that.

26 A On this particular case, I'm not really the best
27 person to ask. I mean, I can talk about why
28 there's run time specific differences in the
29 management adjustments or, more specifically, the
30 difference between the estimates. However, seeing
31 604 percent for the Lates, that's an artifact of
32 the management and what they're being -- their
33 spawning escapement targets, and what you'd
34 actually have to achieve mathematically in terms
35 of management adjustment to still allow for --
36 it's not a -- I'm not really the best one to ask
37 about this, 'cause this really is the use of
38 management adjustments in the management context
39 itself after we've passed along the development
40 aspect.

41 Q Mr. Patterson, I'm going to ask you to work a
42 little harder on that, because if I was thinking
43 of my clients who are looking at this chart, and I
44 was thinking about the expert that's here to talk
45 about management adjustments, and they just asked
46 this question, Mr. Patterson, why are you making
47 an adjustment of 604 percent on the Birkenhead

1 Lates, and only an adjustment of seven on the
2 Summer and 59 on the Early Stuart, when what we're
3 trying to do is make adjustments for environmental
4 conditions. I agree that the salmon, the Early
5 Stuarts come up earlier and so if that's what the
6 adjustment is, please just tell us that. Just
7 explain it to us.

8 A I'm not sure I understand where -- I'm not the one
9 who's generating the 604 percent here, I guess is
10 probably the better way of saying it. If you want
11 to know why Early Stuarts have a higher management
12 adjustment, or why we have historically seen a
13 higher discrepancy between them -- is that the
14 question you want to get at?

15 Q Sure. And just is it the Early Stuarts are more
16 sensitive to temperature and therefore they're 59
17 percent, or -- just it's really important that we
18 be able to understand these charts, and so I'm
19 just asking you to explain it.

20 A With regards to the Early Stuarts, they do come in
21 at the highest flow conditions and moderate to
22 warm temperatures, especially in the upper part.
23 So historically they've experienced some pretty
24 adverse conditions and they tend to be -- and
25 through the past, they've lost -- had high loss
26 estimates. The 40 percent for Early Summers, same
27 thing. They're coming through at the high
28 temperatures. Sometimes they get hit by high
29 flows. The Summers, historically, they're coming
30 in high temperatures with a declining (sic) -- and
31 the flow conditions are moderate.

32 But there are obviously -- these are average.
33 The actual values themselves -- this is a pre-
34 season forecast, right? So you just go on
35 historical values, what's going on.

36 With regards to the Late run, the reason why
37 it's 604 is a function of the rules. The TAM
38 rules are set, but we have seen high losses in
39 terms of Late runs since 1995.

40 Q So it's an example of -- given the --

41 A I can't comment on the Birkenhead 'cause it's
42 nothing --

43 Q There's nothing there.

44 A They don't go through the Hell's Gate, so
45 therefore I think that's the reason for exempting
46 them from the management adjustments insofar as
47 they're related to environmental conditions.

- 1 Q Okay. Thank you for that. I don't need the
2 exhibit any further.
- 3 I've just got a few questions around -- I
4 wasn't sure I quite understood your information
5 earlier. I take it from the chart, the
6 temperature and flow data that we're using is
7 primarily in-river and is primarily being used in
8 relation to returning adults. Do we need more
9 temperature and water conditions for juveniles
10 going into the marine environment, and have we
11 begun to identify where we might be able to
12 identify the environmental conditions that are
13 affecting out-migration?
- 14 A I guess in the last ten years, we've run the
15 stations -- you're trying to run them year-round
16 now for that very reason, so we can document the
17 out-migration conditions for smolts, but also for
18 conditions for other Pacific salmon migrating
19 upstream or downstream. So more the habitat
20 monitoring research as opposed to just sockeye-
21 centric.
- 22 Q And that data is getting into your models at this
23 point in time, or...?
- 24 A Well, there's no end-use for those models right
25 now.
- 26 Q Yeah, gotcha, okay. You don't use those models to
27 adjust in-season forecasts, and so you're not --
28 they wouldn't be relevant to the in-season
29 forecasting. Have I understood you correctly?
- 30 A Well, in terms of relating to juveniles?
- 31 Q Yeah.
- 32 A Yeah, as far as I understand, there's no
33 application of data for looking at juvenile
34 survival or subsequent returns, no.
- 35 Q Not yet. Okay. One more question around that,
36 which is, is there data that's presently being
37 gathered regarding the state of the Strait of
38 Georgia and what's happening there regarding
39 climate change? Have we begun to look at
40 temperature changes in the mouth? What, to your
41 knowledge, is happening there, and what might be
42 helpful?
- 43 A There is work being done in the Strait of Georgia.
44 I'm not the person to ask. I feel like I'm
45 playing the Billy Goat Gruff game here, but I --
46 freshwater biologist, habitat biologist, so --
- 47 Q Who would be doing that work?

- 1 A At PBS, there's a scientist at PBS -- I'll give
2 you a name, Dick Beamish, you probably know, who
3 is -- if he's not involved in it, someone else
4 will be. But there is work going on there.
5 There's work from UBC, from IOS in the Strait of
6 Georgia. I'm not up to speed on what -- there's
7 an ecosystem initiative, but you'll have to ask
8 someone else in terms of getting the straight
9 answers on who the best person to talk to is.
- 10 Q Okay. Thanks very much on that. What indicia are
11 being used in-season in the river? You spoke
12 briefly about the report you're doing on gear
13 types. What are you learning? What are the
14 indicia on health of the salmon as they migrate
15 through, and are we looking at developing models
16 that are actually looking at the health of the
17 salmon as distinct from the climate around the
18 salmon?
- 19 A I mentioned earlier we have sort of the indirect
20 assessments of gear type was based on the years of
21 catching fish at different locations in the river
22 using different types. Part of that was we do
23 physiological assessments where we're actually
24 looking at not just the acute stress associated
25 with capture, but also chronic stress to see what
26 kind of condition the fish are in, in terms of
27 energetic condition, if they have sufficient fat
28 stores.
- 29 Some of the information is then fed into use
30 for other health assessments. Information can be
31 provided. We look at autoregulatory stress, so I
32 guess the answer is yes. We don't have predictive
33 models associated for it, but it takes time
34 because you need a variety of conditions, annual
35 variability to be able to interpret what you're
36 actually seeing, if that makes sense.
- 37 Q Yeah, I think I followed you. I'm just going to
38 make sure I understand that you are looking at
39 some of the health indicators and it's something
40 you're beginning to collect data, but these are
41 not being put into the models at this point in
42 time. Did I understand that correctly?
- 43 A Yes. No, the models are based strictly on
44 environmental conditions, but biological rationale
45 is consistent with the information we are
46 collecting, biological research we're doing on
47 energy and migratory energetics and disease

1 progression.

2 Q Water temperature seems to trigger those
3 vulnerabilities; is that correct?

4 A Yes.

5 Q I'm just wondering is there a way of running the
6 models to increase the indicia, to begin to
7 address that which I'm going to generally call
8 cumulative impacts. As you know, there are a lot
9 of things that are occurring. You're comfortable
10 using water temperature. Are there any other
11 indicia that we should be looking at more closely
12 in order to begin to collect the data?

13 A Maybe I'll back up a bit. Your first part of the
14 question was to the actual model. I think I'd be
15 careful in terms of using additional information
16 in the current model structure. I'd be even more
17 comfortable saying we can start to use those
18 things you're talking about in coming up with
19 independent assessments of in-river mortality
20 based on cumulative impacts and the stress but
21 outside of, necessarily, the MA model paradigm.
22 We can still provide advice, but it would be an
23 estimate of the actual, say, mortality that's
24 associated just with the in-river mortality, not
25 associated with the other issues with DBEs.

26 Q I'd like to think of that - and bear with me -- I
27 sound a bit more -- the difference is that you can
28 provide advice to the managers and those -- you
29 can help them make informed decisions, but not
30 necessarily numbers.

31 A Well, I don't know if it's the best process for
32 getting those numbers across is using the
33 management adjustment model structure as it
34 currently exists, because of the ability to be --
35 'cause you need forecasting and predictability for
36 them to work, right? It's pretty hard to forecast
37 some of these other issues when the fish are
38 already in the river.

39 Although, thinking about it, you can use the
40 post-season to evaluate what we think happened and
41 then provide a best estimate for -- it can be a
42 number. I'm not sort of loathe to provide it, a
43 point estimate, but you can provide a range of
44 numbers saying, look, mortality can be 10 to 20
45 percent. It's the regional estimate for in-river
46 mortality. Then you could use that to evaluate
47 your post-season estimate, which is important for

- 1 the DBEs for generating run sizes, so for
2 production --
- 3 Q Don't get me wrong. I wasn't actually suggesting
4 or creating a criticism that you couldn't provide
5 the numbers. In fact, it's a compliment of the
6 work that you do is you can provide numbers on
7 some things 'cause I heard your opening remarks on
8 what you provide. You also provide advice,
9 general advice on the balancing that needs to
10 occur or the considerations that need to occur
11 given the multitude of matters that can come into
12 the conversation of environmental conditions and
13 their effect on salmon.
- 14 A Yes.
- 15 Q And that advice presently that you're providing is
16 generally through DFO Science to DFO managers?
- 17 A And to the general science community. We are in
18 the field all the time too, so we do talk to
19 stakeholders and the public all the time, right,
20 on an informal basis.
- 21 Q Okay. Just two more brief questions. One is I
22 wasn't clear, do your MAs make adjustments to
23 uncertainties that are -- increasing uncertainties
24 that are being developed around run timings and
25 run shapes and run profiles? Do you make an
26 adjustment within the MA for that?
- 27 A We looked at how sensitive the MA models are to
28 changes and run timing and run shape. In the case
29 of the pre-season, we generate -- because the run
30 timing is a critical one, we generate forecasts on
31 a daily basis so that managers can see what the
32 actual impact of the MA would be by changes in the
33 actual run timing itself. So that's how the
34 uncertainty is incorporated and produced.
- 35 In the case of the run shape, we still --
36 this is a 19-day mean average, so there is no
37 shape associated with that.
- 38 Q Okay. One final question. We've heard a couple
39 of times about - and haven't heard much detail at
40 all - about some work that Kristi Miller is doing.
41 I understand it's what's generally called
42 genomics, and I wonder if you could just briefly
43 describe to Mr. Commissioner what genomics are and
44 what value they may provide in better assessing
45 environmental impacts on salmon.
- 46 A I will be brief because I think Kristi Miller or
47 someone else would be better to actually address

1 this. But in this case, the genomics, we're
2 looking at -- we normally do, or historically have
3 done, is looked at sort of the physiology of the
4 fish. We look at its blood, we look at hormone
5 levels, we look at stress levels. But we can only
6 do limited -- maybe 20 parameters.

7 What the genomics allows us to do is look at
8 16 or 30,000 genes that are being turned on or
9 off, so it's looking at a holistic organismal
10 response, so you can actually look at the
11 condition of the fish, take a snapshot of what
12 it's actually doing, how it is, and if you take a
13 biopsy of the fish and then release it and track
14 it through radio tracking or acoustic tagging, you
15 can trace its fate in terms of survival. So you
16 can see whether or not the condition of the fish
17 at the time of capture, and how it's doing, its
18 overall health state, by looking at all these
19 different genes that are turned on or off, or
20 being expressed or not expressed, and see whether
21 or not -- probably a survival. That's the work
22 that's being referred to here.

23 Q And that work actually, as it develops, would it
24 help us assist in assessing more precisely
25 conservation units; is that correct?

26 A From a conservation unit perspective?

27 Q So if we know the gene -- through the genes work
28 already, you know what conservation unit it is, so
29 if you were assessing the conservation unit
30 through the genes, you're also then doing the kind
31 of health of the salmon approach that genomics
32 does. I'm just wondering, that might be --

33 A Yes.

34 Q -- a positive thing; is that correct?

35 A In terms of this application, you know the actual
36 conservation unit the fish belongs to. You'll
37 know its actual health condition at the time, and
38 then you can trace its fate. You can see whether
39 or not some populations may be more vulnerable
40 than others to environmental conditions or other
41 insults that are thrown at it.

42 Q So it will help us become more precise. How would
43 that work help your work in setting management
44 adjustments?

45 A How would it help? Well, right now we're in
46 discussions and trying to -- exactly how you could
47 incorporate these biomarkers or bioinformatics

1 information into the management itself.

2 Yeah, I can envision in some cases how it
3 would work. This is sort of a work in progress, I
4 guess, that needs to be filled out. This is part
5 of a three-year project that's ending this year,
6 so we are involved in the post-doc right now to
7 look at some of how this stuff could be
8 incorporated. It does have promise, but it takes
9 time to develop.

10 Q I guess one of the reasons why I, as a layperson
11 as we called ourselves, became instantly
12 interested in is that it's difficult to do
13 cumulative impact assessments because there are so
14 many different variables. It would be difficult
15 to get measurements of all those variables.

16 But from a genomics perspective, you're
17 letting go of measuring all the different external
18 variables and you're trying to more concretely
19 understand the salmon's response to those
20 variables and you can actually do that at a
21 conservation unit. So it seems like a -- I know
22 it may be cutting edge, but it seemed very useful
23 in the challenges associated with cumulative
24 impacts.

25 A Yeah, and conceptually it's a bit of a shift,
26 because we're now using the fish as an indicator
27 of the environment and that habitat, as opposed to
28 the other way around in the past. So we've done
29 this successfully in other cases, looking at
30 individual aspects of fish physiology and
31 survival, so in this case we have a much broader
32 ability to look at the whole organism response.
33 It does show promise, although it takes a long
34 time to go from that to actually being implemented
35 as a management adjustment process.

36 I've seen this many time and time again.

37 It's difficult to go down that road. I'm not
38 saying -- it will require work to get there.

39 MS. GAERTNER: Those are my questions, Mr.
40 Commissioner.

41 MS. BAKER: Thank you. Mr. Commissioner, I just have
42 one quick re-exam question.

43

44 RE-EXAMINATION BY MS. BAKER:

45

46 Q Mr. Leadem asked you, Mr. Patterson, if you used
47 the pre-season forecast of temperature in-season,

1 and you said that you used a pre-season forecast
2 to create a place-holder for management adjustment
3 in season. I just wanted to clarify that in
4 season, for management adjustments, there are
5 ongoing forecasts done of temperature. There's
6 not a reliance on pre-season where they forecast
7 in season.

8 A As soon as the in-season forecasts become
9 available, then the MA models themselves will be
10 updated.

11 MS. BAKER: Thank you. Those are all my questions, Mr.
12 Commissioner. Thank you, Mr. Patterson, you can
13 step down.

14 Our next witnesses will be the panel from
15 yesterday.

16
17 AL CASS, recalled.

18
19 ROB MORLEY, recalled.

20
21 MICHAEL STALEY, recalled.

22
23 KEN WILSON, recalled.

24
25 MR. TAYLOR: Mitchell Taylor, Mr. Commissioner. With
26 me is Hugh MacAulay. I'll continue with my
27 questioning of this panel from yesterday.

28
29 CROSS-EXAMINATION BY MR. TAYLOR, continuing:

30
31 Q First, and with some measure of risk to me, I'm
32 going to pick up on something that Mr. Patterson
33 was testifying to and have the panel clarify or
34 see if you agree that I've got things right here.

35 The Commissioner had asked Mr. Patterson
36 about the connection or link between management
37 adjustments and FRSSI in terms of the modelling
38 exercises. Now, am I right - and I'll ask any
39 panel member of this, whoever wants to answer -
40 that, as a starting point, you can use FRSSI to
41 determine the TAM and the escapement number? Am I
42 right so far? Mr. Cass, perhaps?

43 MR. CASS: Mr. Commissioner, yes, that's correct.
44 FRSSI is all about the TAM rule.

45 Q And then am I further correct that you use the
46 management adjustment to apply to and incorporate
47 that into the TAM or the MA is applied to and

1 incorporated in TAM?
2 MR. CASS: That's correct. I invite others to respond.
3 Q So, at bottom, TAM is made up of the harvest rate
4 or harvest number plus the management adjustment?
5 MR. CASS: Yes.
6 Q Then if you look at matters for the other end, so
7 to speak, the harvest number is TAM minus the
8 management adjustment.
9 MR. CASS: Correct.
10 MR. TAYLOR: Now, this is a question of Mr. Cass. I
11 wonder if you could turn, Mr. Lunn, to CAN 252068,
12 which is in Canada's binder at Tab 2.
13 Q Mr. Cass, do you recognize that document? I know
14 you can only see the cover of it at the moment.
15 We can turn up more if you need it.
16 MR. CASS: Yes, I recognize that document.
17 Q Can you say what is it and who prepared it? I
18 don't mean the person, but what organization?
19 MR. CASS: If it's possible, Mr. Commissioner, to
20 scroll down to -- I think there might be an
21 abstract or Executive Summary. That's correct,
22 okay.
23 This is a summary document that's produced
24 annually in preparation for pre-season planning
25 activities. That's my recollection. So this one
26 would be for 2010.
27 Q All right. And is that prepared by the Fisheries
28 Department?
29 MR. CASS: Yes.
30 MR. TAYLOR: Could that be marked as an exhibit,
31 please?
32 THE REGISTRAR: Exhibit number 407.
33 THE COMMISSIONER: Is this document in the binder?
34 MR. TAYLOR: It's in what's called Canada's list of
35 exhibits, and I'm not sure whether that gets to
36 you, Mr. Commissioner, or not. I'm getting an
37 indication not.
38 THE COMMISSIONER: And the exhibit number, I'm sorry,
39 Mr. Taylor, is...?
40 MR. TAYLOR: It's 409, I believe, Mr. Registrar?
41 THE REGISTRAR: It's 407.
42 MR. TAYLOR: All right, sorry, 407.
43
44 EXHIBIT 407: Document titled "Fraser River
45 Sockeye Escapement Strategy 2010, Model
46 Overview and Summary of 2010 Planning
47 Simulations

1 MR. TAYLOR: Now, if you turn to page 12 of that,
2 please, Mr. Lunn, I've got a couple of questions
3 of Mr. Cass.

4 Q This page is speaking to the "History of Model
5 Revisions" under FRSSI, and you'll see that in the
6 second bullet in the first half of the page,
7 there's a heading "Model Structure". Then it
8 reads:
9

10 The model now includes the option to specify
11 stock-specific escapement strategies (as in
12 Figure 1, previous page) --
13

14 And that is a figure that we've seen before in
15 other documents.

16 MR. TAYLOR: Maybe just for a moment, Mr. Lunn, can you
17 just go to the previous page and then back again
18 to this page?

19 Q You're familiar, panel, with those charts that
20 we've seen before in other documents. Then if we
21 go back to page 12:
22

23 The model now includes the option to specify
24 stock-specific escapement strategies --
25

26 As per what we just looked at.
27

28 -- so that the total allowable mortality for
29 stock would be based on its individual
30 abundance rather than aggregate abundance.
31

32 So from this it's evident that the option is there
33 to do what's said. Can any of the panel members
34 say to what extent that option is then applied in
35 fisheries management in any given year?

36 MR. CASS: Mr. Commissioner, I guess I'm hesitating a
37 bit because while I understand what that sentence
38 says in that bullet, yes, it's possible to derive
39 a TAM rule for each stock, and that has been done
40 as it says. There would need to be some
41 assumptions about how the in-river environmental
42 mortality is included in that, because the last I
43 had been aware, the en route mortality is based on
44 a run-timing aggregate, so if you're talking about
45 stock-specific escapement strategies and using the
46 in-river mortality that's included in the TAM, it
47 would have to reflect a particular run-timing

- 1 group in the absence of assumptions about in-river
2 mortality being attributed to at the stock level.
- 3 Q So is what you're saying that the option is there,
4 but it would be very difficult to execute in
5 practice because of the nature of beast, so to
6 speak?
- 7 MR. CASS: You could execute it. If it was confined to
8 a particular timing group, that's possible. To
9 the extent that it has actually been considered
10 and adopted in management, I don't know the answer
11 to that.
- 12 Q All right. Mr. Staley or Mr. Wilson, do you have
13 anything that you want to add to that?
- 14 MR. WILSON: No.
- 15 MR. STALEY: I do recall, actually, the model being
16 used with this option, but it wasn't in a
17 management context. It was in the context of
18 evaluating some options for discussion with the
19 United States as to how to aggregate and
20 disaggregate the stocks in the round of
21 negotiations which has now been postponed.
- 22 Q Was that being done in a theoretical sense or in a
23 real world on-the-fishing-ground sense?
- 24 MR. STALEY: In a theoretical sense for the purposes of
25 determining what the consequences of different
26 aggregations that may be agreed to with the United
27 States for management.
- 28 Q All right. Thank you. Mr. Morley, did you want
29 to add anything to that?
- 30 MR. MORLEY: No, thank you.
- 31 MR. TAYLOR: Okay. If we could, may we go to Exhibit
32 398, please? Specifically page little Roman
33 numeral (iii). Well, first we should go to the
34 cover, I think, so that people can orient
35 themselves.
- 36 Q You'll recall this document, I think, panel
37 members, from yesterday. This is the report of
38 2008 that Pestal and others prepared. If we could
39 go to (iii), this being a report on the
40 "Collaborative Development of Escapement" work,
41 now you'll see there a list of participants at one
42 or more workshops. As I understand it, both you,
43 Mr. Morley, and you, Mr. Wilson, were present at
44 these workshops; is that right?
- 45 MR. WILSON: Not all of them, no.
- 46 Q All right.
- 47 MR. MORLEY: I was present at most of them.

- 1 Q Okay. Thank you. Mr. Wilson, were you present at
2 very few or most of them or half and half, or
3 what?
- 4 MR. WILSON: I was involved at the beginning of the
5 process for several years, and the organization
6 that I work for removed itself from that process.
7 I was also involved later on, on behalf of the
8 Upper Fraser Conservation Alliance.
- 9 Q All right. This page is indicating that you were
10 present at one or more workshops in 2007, and a
11 workshop in 2008; is that correct?
- 12 MR. WILSON: I'd have to check my own records, but I'm
13 not certain that I was at the meeting in 2007.
- 14 Q All right. Well, we'll leave it at that. With
15 that, these workshops and meetings were a bringing
16 together of stakeholders and scientists to develop
17 consensus or aimed at consensus and developing
18 recommendations for then being incorporated into
19 the Harvest Management Plan; is that right, Mr.
20 Morley?
- 21 MR. MORLEY: Well, these workshops were totally
22 directed at developing the FRSSI model and coming
23 up with the options that would be considered as
24 part of the integrated fishery management process,
25 yes.
- 26 Q Yes. Thank you. And were these workshops
27 attended by representatives of First Nations,
28 commercial fishers, recreational fishers and
29 industry?
- 30 MR. MORLEY: When you say representatives, there are
31 members who are part of there who do come from
32 those sectors. As to whether they represented
33 their sector at the meeting, I wouldn't suggest
34 that was the case.
- 35 Q All right.
- 36 MR. MORLEY: Certainly from the First Nations
37 prospective, I would suggest that most of the
38 people who were there were technically-oriented
39 people and not sort of the policy or management-
40 directed First Nations representatives.
- 41 Q All right. Well, you've put it better than I,
42 thank you, that people attended who were from the
43 sectors that I've described; is that right?
- 44 MR. MORLEY: Yes.
- 45 Q And you recognize from the list in front of you a
46 number of names who are First Nation people; is
47 that right?

- 1 MR. MORLEY: There's several names that are First
2 Nation people and some that are technical non-
3 First Nations people who may be employed by First
4 Nations organizations.
- 5 Q Right. Well, you recognize Brian Assu, Pat
6 Matthew as First Nation people, Morgan Guerin; is
7 that right?
- 8 MR. MORLEY: That's correct.
- 9 Q And were these meetings part of a structured
10 decision-making process?
- 11 MR. MORLEY: There were exercises of structured
12 decision-making that were part of the meetings,
13 but that didn't run the entire process by any
14 means.
- 15 Q Okay. As a result, was the outcome of these
16 meetings that a fair level of consensus was
17 developed and recommendations made for onward
18 movement to being considered in the Harvest
19 Management Plan?
- 20 MR. MORLEY: I wouldn't characterize it as being
21 consensus from the participants whatsoever. That
22 wasn't the nature of the input of the
23 participants. We provided our view and advice,
24 and the technical people in DFO went away and
25 developed their model and put forward the options.
- 26 Q All right.
- 27 MR. MORLEY: That was certainly not consensus amongst
28 the participants that that was the appropriate
29 approach.
- 30 Q All right. The model was then developed, informed
31 by the input that had been provided at the
32 meetings, was it?
- 33 MR. MORLEY: You'd have to ask DFO as to how they used
34 the advice.
- 35 Q Okay.
- 36 MR. MORLEY: Because I wouldn't suggest that my advice,
37 in particular, informed their approach.
- 38 Q Mr. Wilson, do you have anything to add to that?
- 39 MR. WILSON: Yes. I would certainly say that the
40 advice I provided doesn't appear to have been
41 incorporated in large part.
- 42 Q All right. Mr. Staley, am I right that you were
43 not at these meetings, or have I got that wrong?
- 44 MR. STALEY: No, I believe I was at most of the
45 workshops in one form or another, yes.
- 46 Q All right. And you've heard what Mr. Morley and
47 Mr. Wilson have just said, which is that there was

- 1 input provided. You agree with that, I take it?
2 MR. STALEY: There was input provided, yes.
3 Q And did you see aspects of the input provided
4 reflected in the ultimate Harvest Management Plan?
5 MR. STALEY: I would say there were aspects of all of
6 the input, yes. Some parts of them were
7 incorporated, yes.
8 Q You'll never be able to include everyone's input,
9 recognizing the diverse nature of the stakeholders
10 in the Harvest Management Plan, will you? It will
11 always have to be an amalgam and bits will be
12 included and some won't.
13 MR. STALEY: I seldom say never.
14 Q Okay. Will you agree with me, Mr. Morley, that
15 the meetings added transparency to the developing
16 the harvest numbers and the escapement numbers?
17 MR. MORLEY: I don't like the terminology
18 "transparency". I think that there was some
19 discussion of some of the options and some of the
20 consequences with some of the stakeholders, but a
21 large number of people who are affected by this
22 certainly were not involved in those discussions,
23 and certainly weren't informed of the technical
24 nature of how the FRSSI model incorporated the
25 objectives setting that DFO put into it.
26 Q Well, at the meetings you could ask questions of
27 the DFO people, couldn't you?
28 MR. MORLEY: You could ask questions of the technical
29 people who were doing the work. Most of the
30 technical work was not done by DFO people. It was
31 done by Gottfried Pestal, who was a consultant to
32 DFO.
33 Q Will you agree with me, though, that the meetings
34 offered any number of stakeholders, including
35 yourself, an opportunity to hear what DFO had to
36 say and provide input on the FRSSI work?
37 MR. MORLEY: Yes.
38 Q You'll agree with that too, Mr. Wilson?
39 MR. WILSON: Yes.
40 Q All right. And Mr. Staley?
41 MR. STALEY: Yes.
42 Q Now, Mr. Cass, I want to take you to two documents
43 that are in what's called Canada's list of
44 exhibits at Tabs 5 and 6, and there should be a
45 binder up on the witness table, I believe, that
46 will have those in it.
47 MR. TAYLOR: Again, Mr. Commissioner, these are

1 documents which I understand have not yet been
2 provided to you. This is the document at Tab 5
3 that's up on the screen now. If, for a moment, we
4 could go to the next one at Tab 6.
5 Q Do you recognize each of those documents, Mr.
6 Cass?
7 MR. CASS: Yes, I do.
8 Q Can you recognize them as the 2007 and 2008
9 version of a document that we've already seen for
10 2009 being Exhibit 322, I think it is, that's been
11 referred to?
12 MR. CASS: Yes, that's correct.
13 MR. TAYLOR: I'd ask that these two documents be marked
14 as the next exhibit.
15 THE REGISTRAR: Do you wish them independently or
16 together?
17 MR. TAYLOR: I think independently is the best route to
18 go.
19 THE REGISTRAR: Document number 5 will be 408. Number
20 6 will be 409.
21 MR. TAYLOR: Thank you. So just to be clear, then, the
22 Escapement Strategy for 2007 is Exhibit 408, and
23 the Escapement Strategy for 2008 is Exhibit 409.
24
25 EXHIBIT 408: Escapement Strategy for 2007
26
27 EXHIBIT 409: Escapement Strategy for 2008
28
29 MR. TAYLOR:
30 Q Now, one further document I want to take you to,
31 Mr. Cass, is again in the binder of Canada's
32 exhibits at Tab 1. It's a deck that was prepared
33 apparently for a CSAP meeting in May of 2010. Do
34 you recognize that document, Mr. Cass?
35 MR. CASS: Yes, I do.
36 Q And just remind us CSAP stands for what?
37 MR. CASS: It's Canada Science Advisory Secretariat.
38 CSAP is the Centre for Science Advice Pacific.
39 Q All right. If you turn to pages 7 through 9 of
40 that document -- I'm not sure if Mr. Lunn can --
41 probably can't show all pages at once, but if we
42 take -- oh, there we go.
43 Pages 7 through 9 set out what's referred to
44 as "Guiding Principles". They're now getting
45 quite small on the screen. If you want them
46 enlarged, say so. But if you could have a look at
47 that, then my question of you is whether what's

1 set out there are the guiding principles
2 underpinning FRSSI, as you understand it.
3 MR. CASS: Mr. Commissioner, these are certainly -- you
4 could call them guiding principles, yes. I'd have
5 to look very closely to make sure I understood
6 what each one says, but we did have some certainly
7 guiding principles that were used to guide the
8 process, if you like, so I would agree that these
9 are -- these represent those.

10 MR. TAYLOR: All right. If that could be marked as the
11 next exhibit, please.

12 THE REGISTRAR: Exhibit 410.

13
14 EXHIBIT 410: FRSSI presentation to CSAP
15 meeting May 2010
16

17 MR. TAYLOR:

18 Q Then one more document I'd like to take you to,
19 Mr. Cass, is at Tab 4 of that same binder. This
20 is entitled "Guidelines for Applying Updated
21 Methods for Assessing Harvest Rules for Fraser
22 River Sockeye Salmon." Do you recognize that
23 document, Mr. Cass?

24 MR. CASS: Yes, I do.

25 MR. TAYLOR: If you just -- can we just get the whole
26 of that page on, Mr. Lunn?

27 Q This document appears to be January of 2011; is
28 that right?

29 MR. CASS: This document, there's been various drafts
30 of this document, so I'm not sure exactly what
31 version this is, but it does have the Science
32 Advisory Report number, so yes, you --

33 Q Maybe you could explain what is this document?
34 Who prepared it and what's its purpose?

35 MR. CASS: This document is an output from the science
36 advisory process or the peer-review process of the
37 -- in this case, the document that was the draft
38 research document, if you like, or working paper
39 that was reviewed by DFO at a peer-review meeting
40 in May 2010. This particular document is called a
41 Science Advisory Report.

42 The intent is to summarize the content of the
43 meeting in terms of what was reviewed. It also
44 contains conclusions of participants at the
45 meeting as well as recommendations based on the
46 review and provided by reviewers at the meeting.

47 So it is a DFO document, as I was saying.

1 The series is a Science Advisory Report that is
2 available at a DFO public internet site.

3 Q This is all in relation to FRSSI, is it?

4 MR. CASS: This particular document is, yes.

5 Q Yeah, it's an evaluation of the FRSSI methodology?

6 MR. CASS: That is correct.

7 Q If you turn to page 5 of this document, you'll see
8 there at the bottom, and then over onto the next
9 page, page 6, "Conclusions and Advice". It says
10 that:

11
12 The application of the FRSSI model for Fraser
13 River sockeye salmon planning is endorsed.

14 It was concluded that the alternative
15 assumptions currently available in the FRSSI
16 model establish reasonable bookends on
17 plausible scenarios and allow users to
18 explore a comprehensive suite of "what if"
19 scenarios in the collaborative planning
20 process.

21
22 So when it says this "is endorsed", who is it
23 endorsed by?

24 MR. CASS: At these peer-review meetings, one of the
25 main issues is whether the methodology is
26 considered by those who have participated, whether
27 it's considered sound and considers all the inputs
28 that's available. It's the best available
29 information at the time. So participants are
30 asked, or at least given an opportunity to reflect
31 whether they believe the methodology meets the
32 standards from a scientific point of view.

33 So, in this particular case, this document
34 was approved -- or, sorry, the content of the
35 working paper, the methodology, was approved by
36 the committee subject to revisions that would be
37 laid out at that meeting, and so approval has a
38 condition that the revisions to the document, in
39 the case of the research document, which the
40 working paper eventually becomes, that those
41 revisions are approved and signed off by the chair
42 of the meeting to indicate that the revisions meet
43 the standards that were agreed to at the meeting.

44 Q And are the peer reviewers, both inside DFO and
45 outside scientists?

46 MR. CASS: That is correct.

47 Q Do you know who or what organizations or where the

1 peer reviewers came from for this one?

2 MR. CASS: Well, I think Mike Staley was a reviewer,
3 but --

4 MR. STALEY: Not a formal one.

5 MR. CASS: Oh, okay.

6 Q That's fine if you don't know.

7 MR. CASS: I believe Randall Peterman was but I'd have
8 to check.

9 MR. TAYLOR: That's fine. May this document be marked
10 as an exhibit, please?

11 THE REGISTRAR: Exhibit 411.

12

13 EXHIBIT 411: Guidelines for Applying Updated
14 Methods for Assessing Harvest Rules for FRSS,
15 January 18, 2011
16

17 MR. TAYLOR: Now, I have a few questions of Mr. Cass to
18 do with Policy and Practice Report number 5, which
19 is the Policy and Practice Report on harvest
20 management. These, Mr. Commissioner, as you may
21 recall, are papers that the Commission staff have
22 put together, and then they file them as exhibits
23 for use in the hearings.

24 They're no-name authors as I understand it,
25 and I've got some questions of Mr. Cass on a
26 couple of points.

27 Q If you turn, please, to paragraph 96 on page 40
28 and 41, this paragraph is speaking to the
29 productive capacity of Fraser sockeye may possibly
30 be limited in freshwater spawning or rearing
31 areas.

32 Mr. Cass, can you say anything about whether
33 there are real or possible issues for Fraser
34 sockeye productivity relative to their time in the
35 marine environment?

36 MR. CASS: There are estimates of marine survival, or
37 at least survival of Chilko smolts, mainly going
38 back to the early '50s, late '40s, 1940s. When I
39 say Chilko smolts, I mean from the time that these
40 fish leave the lake, there is a facility there
41 that estimates the numbers of Chilko smolts that
42 leave the lake and are bound, then, for the ocean.
43 So there are estimates of marine survival, or at
44 least the survival from the time they leave the
45 lake and the time that they return based on the
46 return of adults. So there are estimates of
47 survival for Chilko Lake.

1 There are also some estimates based on Cultus
2 Lake sockeye, but they are -- there's not a
3 continuous series. So there are estimates of
4 survival, if you like, which are different from
5 freshwater survival based on the smolt survival,
6 if you like. So there are estimates of ocean
7 productivity if you make some assumptions about
8 what mortality may have occurred in the river
9 outbound towards the ocean.

10 Q And, from that, can you say whether there are
11 limitations that may be placed on the productivity
12 due to the marine environment?

13 MR. CASS: There are certainly marine factors that
14 affect the survival, inter-annual survival if you
15 like, over time. So that affects the productivity
16 of the population, yes.

17 Q Okay.

18 MR. CASS: It's a little different than if you think
19 about the capacity of the ocean, but in terms of
20 productivity, there are measurements based on
21 survival.

22 MR. TAYLOR: I note the time. Ms. Baker wanted to
23 break at a certain point.

24 THE COMMISSIONER: All right. Thank you.

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

27

28 (PROCEEDINGS ADJOURNED FOR MORNING RECESS)

29 (PROCEEDINGS RECONVENED)

30

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

32

33 CROSS-EXAMINATION BY MR. TAYLOR, continuing:

34

35 Q Continuing with PPR-5, Mr. Cass, if you could turn
36 to page 45 and paragraphs 109 and 110, I'll give
37 you a moment to have a read through those and, in
38 particular, I'm looking at 109(c) and paragraph
39 110. My question of you is whether you have a
40 comment on the accuracy of what's said there, and
41 with that question I'll let you read and absorb it
42 and then answer.

43 MR. CASS: Yes, in reference to 109(c), that has been
44 done. That is a recent add-on, if you like.

45 Q And more specifically, what is the recent add-on,
46 and what correction are you making?

47 MR. CASS: Others can help me on this, but the idea was

1 to, because we are constrained, if you like, by
2 the timing groups that are the aggregates of
3 individual stocks, and so the point here was to, I
4 believe, although it's not exactly stated there,
5 to get at this issue of overlapping run timing
6 groups and to account, attempt to account, for
7 different TAM rules for the different run timing
8 groups and whether there's an overlap, in order to
9 adjust the exploitation so that you can separate
10 the exploitation for the timing groups in the area
11 that they overlap.
12 Q So are you saying that the FRSSI model can and
13 does simulate the effect of TAM rules on the four
14 running groups at once?
15 MR. CASS: Yes, I believe that is now built into the
16 model.
17 Q All right.
18 MR. CASS: You might ask my colleague, Mr. Staley,
19 whether it is --
20 Q Mr. Staley or Mr. Wilson, do you want -- Mr.
21 Staley has something?
22 MR. STALEY: Yeah, I believe the new version of the
23 model -- I'm not sure which document we're -- this
24 is the --
25 Q This is a report that the commission staff have
26 prepared, that's in front of us on the screen
27 right now.
28 MR. STALEY: Oh, commission staff, okay. Earlier
29 versions of the computer model did not allow --
30 they were correct, did not allow -- FRSSI did not
31 simulate them all at once; it did them
32 individually. But the current version that was
33 the subject of the May CSAP review, that version
34 of the model will be able to run the four -- or
35 any type of aggregation/disaggregation of the 19
36 units together --
37 Q All right.
38 MR. STALEY: -- to look at the interaction or overlaps,
39 as it's represented and extracted in that model.
40 Q All right. Thank you. Mr. Wilson, do you agree
41 with that?
42 MR. WILSON: As far as I know, yes.
43 Q Thank you. Now, we heard some evidence from panel
44 members yesterday about the fact that the
45 modelling uses the past to look to the future.
46 With that, can the model, is the model capable of
47 taking account of variables to the extent that

1 they're foreseeable that may arise in the future
2 and bring that into the modelling work? Mr.
3 Staley?

4 MR. STALEY: Yes, it's capable to represent many of the
5 things that we expect are possible to happen.

6 Q Do you agree with that, Mr. Wilson?

7 MR. WILSON: Yes. The model looks at a range of future
8 possibilities.

9 Q All right. And the model has the flexibility to
10 take account of differing variables that might be
11 foreseeable, and that can be incorporated into the
12 modelling, can it?

13 MR. WILSON: Is that a question for me?

14 Q Yes.

15 MR. WILSON: It does what it does. There are some
16 things the model can deal with, and some things
17 the model can't deal with.

18 Q Okay. Do you have anything to add, Mr. Cass?

19 MR. CASS: Only that I think, as the way you've phrased
20 that point, Mr. Commissioner, that it's a model to
21 look at long-term strategies, so as Mr. Staley
22 pointed out, any view or scenario can be
23 constructed that would be an attempt to bookend or
24 represent possible future scenarios.

25 Q All right. Yesterday, Mr. Morley gave some
26 evidence in relation to Exhibit 322, that's the
27 document that's been up on the screen several
28 times with the curves that are now well familiar
29 to many of us and very familiar to you as
30 panellists, and maybe if I could just bring up
31 322, page 15, I think it is? Yeah. Now, looking
32 at that bottomgraph and the curves there, Mr.
33 Morley gave some evidence that in a given year
34 there's no difference, conservation-wise, between
35 options 2, 3, and 4, and yet the impact on the
36 harvest rate of taking a different option, one
37 from the other, was quite substantial, as he
38 pointed out.

39 Now, with that, and I'll ask Mr. Staley
40 first, while you might not see a conservation
41 difference in one year or in a one-year sample,
42 could you, using different options, see
43 differences or an improved probability of survival
44 of a weak stock in the long-term? In other words,
45 long-term, does the use of different options make
46 a difference?

47 MR. STALEY: It's my understanding that this graph

1 represents, or at least the top panel represents
2 the probabilities of occurrences, I guess, in the
3 simulations of catches and escapements being above
4 or below various benchmarks, but in the long-term.
5 And so the graph at the bottom is more of a long-
6 term. However, these are sort of updated and
7 reviewed on an annual basis. But I look at this
8 one particularly, and this may or may not be a
9 good example, that the conservation, what might be
10 considered a conservation performance measures,
11 such as the spawning escapement numbers, they're
12 relatively insensitive, I think very insensitive,
13 to where you set the one lever or knob we have on
14 these policies, which is the setback.

15 So this example here, I'd have to say, you
16 know, is the long-term estimation that's in the
17 models, is that this particular model population
18 is not sensitive. The two measures we have shown
19 here of escapement, which are representative of
20 some of the conservation issues, are relatively
21 insensitive to which of the TAM rules is chosen.
22 That would be my reading of this graph.

23 Q Okay. I'm just going to ask if you could bring
24 that down to plain language and picking up on my
25 question, are you saying that you would expect to
26 see improved probability of survival of a weak
27 stock in the long term, using different options,
28 or no difference?

29 MR. STALEY: I would expect that, depending on what the
30 weak stock was, but this graph doesn't show us --
31 isn't dealing with what we can -- well, Early
32 Stuart is currently weaker, but it's managed as a
33 separate entity. But if there were a weak stock
34 mixed in with this stock, it may behave different.
35 The performance measure that is not modelled in
36 FRSSI, if there is such a thing, and if it were,
37 if we were able to construct those same
38 performance measures for that, they may show some
39 different sensitivity to which TAM rule you
40 choose.

41 Q All right.

42 MR. STALEY: So I guess there's no yes or no answer.
43 You'd need to tell me what the - not exactly, but
44 approximately - what the productivity and so on
45 and the parameters were of that weak stock to be
46 able to understand whether the difference in these
47 TAM rules would have a consequence on a

1 conservation measure such as the escapements.

2 Q Okay. Mr. Wilson, do you want to take a run at
3 this? Have you got something to say in answer to
4 my question?

5 MR. WILSON: Not at this time.

6 Q Okay. Mr. Cass?

7 MR. CASS: No, I think that's a good summary of what's
8 in these graphs.

9 Q Okay. Now, Mr. Morley, you opened this up, to
10 some extent, with your evidence. You were
11 speaking, as I understood you yesterday, no
12 difference conservation-wise in the given year
13 that this was being done for, but would you agree
14 with me that while you might not see a
15 conservation difference, option to option, in the
16 year in question, would you expect to see improved
17 probability of survival of a weak stock long-term
18 using different options?

19 MR. MORLEY: Mr. Commissioner, I believe the learned
20 gentleman has misunderstood my comments yesterday.
21 I said exactly the opposite, that what this
22 analysis shows, as Mr. Staley just said, is that
23 there is virtually no difference, conservation-
24 wise, long-term between option 2, 3, and 4. There
25 is a considerable difference on what might happen
26 within a given season, depending on the size of
27 run coming back, and that was the point I was
28 making about one of the weaknesses of how the
29 FRSSI model is being used to evaluate escapement
30 options, because it is not demonstrating some of
31 these significant differences that will impact on
32 all users in the short-term from applying some of
33 these long-term models.

34 And, in fact, you know, your question about a
35 particular weak stock can't be answered by looking
36 at this particular graph, and so you have to know
37 the characteristics of the weak stock and what
38 levels of exploitation it can withstand in order
39 to answer your question.

40 Q All right. So the answer, then, is whether
41 there's going to be a difference long-term will
42 depend on the particular characteristics, the
43 particular parameters that apply to the weak stock
44 in question, then?

45 MR. MORLEY: Yeah, assuming, I mean, as I say, we keep
46 using these terms of "weak stock", "small stock",
47 and what have you, and unless you get more clear

1 as to what you're talking about and what the
2 productivity levels are, it's very difficult to
3 answer the questions.

4 Q All right. Mr. Wilson, yesterday you expressed
5 some concern about using the historical data to
6 then look into the future, and as I understood
7 your evidence, you were questioning whether you
8 would get an accurate picture by doing that and
9 you, at one point, said that one should look at
10 the present, but will you agree with me that it is
11 useful to look at historical data as an
12 information source and to inform what could be
13 happening in the future?

14 MR. WILSON: Yes, I'd agree with you.

15 Q Now, a couple more questions, then I think I'm
16 done. Mr. Morley, it seems to me that a
17 consequence of your approach, and I'm taking 2010
18 as an example, and you referred to 2010 yesterday,
19 is that you would say where there's a lot of fish,
20 fish hard have a high harvest rate even though
21 it's not known what the impact of that would be on
22 small or weak stocks, however you want to call
23 them, that are mixed in, and you could thereby do
24 damage unknowingly to those small or weak stocks;
25 isn't that the case?

26 MR. MORLEY: Mr. Commissioner, again, I think my
27 comments are being misconstrued and, in fact, what
28 I suggested was that there needs to be a much more
29 dynamic analysis of the risks and the consequences
30 on an in-season basis, depending on the relative
31 strength of the runs we see coming back, whether
32 they be an amalgam of the whole Early Summer
33 population that might place a constraint on your
34 ability to catch the larger Summer run population
35 or whether, as in the case of 2010, it was the
36 Cultus Lake sockeye that were placing a constraint
37 on our ability to optimize or maximize a harvest
38 of the Late run composite.

39 In 2010, I think the analysis that was done
40 was based on a feeling -- or a forecast that in
41 fact the population that we were concerned about,
42 i.e. Cultus, was, in fact, coming back at a level
43 that was much higher than what had been identified
44 as being an objective to meet in the Cultus
45 Rebuilding Strategy, a group -- I was on that
46 Cultus rebuilding team that developed the
47 objectives, and the analysis that was undertaking

1 in-season was one that said, instead of putting an
2 extra one or two thousand or three thousand Cultus
3 fish on the spawning grounds, when we expected to
4 see, based on the size of the runs coming back and
5 the forecast for Cultus, a run of ten to fifteen
6 thousand, that if we had held to the preseason
7 exploitation rate that was in the TAM rules that
8 were laid out in the plan, we would have given up
9 somewhere in the range of two to three million
10 sockeye in the catch for all user groups for the
11 Late runs.

12 So that was an assessment done based on what
13 we saw in-season, rather than suggesting that we
14 stick to TAM rules that are developed in the long
15 run for a 40-year simulation based on some
16 evaluation techniques that I think are suspect.

17 Q You're referring to Cultus in the answer you just
18 gave, but you know, of course, that there would,
19 in any given year, including 2010, be other weak
20 stocks that we simply wouldn't have information
21 about, mixed into the run, right?

22 MR. MORLEY: We certainly do not have any other stocks
23 that, so far, have been assessed in the same kind
24 of status as Cultus. In terms of what levels of
25 exploitation those populations may be able to
26 withstand, I don't think you have the evidence to
27 demonstrate that they couldn't withstand a harvest
28 trade in the range of 50 percent. In fact, the
29 evidence we do have is that the populations that
30 are smaller populations continue to exist at some
31 level within the river system and have been around
32 for the last 80 to 90 years when we have had
33 exploitation rates in the range of 75 to 80
34 percent. So I would disagree with you that we
35 would be concerned about those populations.

36 Q In your answer there you seem to have hit on what
37 I see as a fundamental difference of approach
38 between some of the things you've said and, for
39 example, the WSP. You seem to suggest that there
40 should be evidence of harm, and absent evidence of
41 that you go fish, as opposed to in areas or in
42 times or situations of uncertainty one should be
43 cautious. You seem to be very bullish and the WSP
44 takes the opposite approach. That's a fundamental
45 difference between your thinking and the WSP,
46 isn't it?

47 MR. MORLEY: With respect, Mr. Commissioner, I don't

1 think the WSP has been fully implemented to the
2 point of having reached those conclusions as to
3 what the appropriate mix is between yield and
4 biodiversity in the Fraser, and in order to come
5 to that assessment as to whether or not I'm being
6 bullish, or looking at trying to analyze the
7 relative impacts here, we need to learn a lot more
8 about those populations that you profess to be
9 concerned about.

10 We have not had an official assessment of
11 those populations. We have not had an analysis of
12 what is causing those populations to be in the
13 state they're in. We have not had an analysis as
14 to what impact exploitation rates may or may not
15 have on those populations. So I cannot, in a
16 sense, the evidence we do have, as those
17 populations continue to exist at some levels and
18 have withstood far higher exploitation rates than
19 we're looking at under any of these scenarios
20 we're developing today.

21 So bullish, you know, when we're harvesting
22 in the 30 to 40 percent and maybe get to 50
23 percent once in a while, that's not bullish; that
24 is very, very conservative exploitation of Fraser
25 sockeye.

26 Q Will you agree with me that where you have
27 uncertainty, it's better to be cautious in
28 fisheries management than to charge ahead?

29 MR. MORLEY: Where you have uncertainty, you need to
30 evaluate the risks and the consequences taking
31 into account the uncertainty. The question as to
32 whether you should be risk-averse, risk-neutral or
33 risk-prone, I think the evaluation needs to be
34 risk-neutral and we need to have scientific advice
35 that provides risk-neutral advice to the decision-
36 makers.

37 Caution, in the sense that you're putting
38 forward, is something that the decision-makers
39 need to take into account when they determine,
40 again, what this trade-off is between biodiversity
41 and benefits to the resource users.

42 MR. TAYLOR: All right. Thank you. Those are my
43 questions.

44 MS. BAKER: Thank you, Mr. Commissioner. The next
45 counsel is Mr. Leadem.

46 MR. LEADEM: Leadem, initial T., appearing as counsel
47 for the Conservation Coalition. I should also

1 indicate, Mr. Commissioner, for the record, that
2 Mr. Wilson is affiliated with Watershed Watch, one
3 of my clients that make up the Conservation
4 Coalition, and in that sense, I'm going to start
5 by asking him questions in direct, and then I will
6 move to my cross-examination of the entire panel.
7

8 CROSS-EXAMINATION BY MR. LEADEM:
9

10 Q Mr. Wilson, in your evidence, you said that you
11 and Mr. Young, Jeffery Young, from the Marine
12 Conservation Caucus, withdrew from the discussions
13 around FRSSI sometime in 2007 or so; is that
14 right?

15 MR. WILSON: Yes, it would have been early in 2007.

16 MR. LEADEM: I'm going to ask Mr. Lunn to pull up a
17 document. It's document number 9 from the
18 Conservation Coalition Book of Documents.

19 Q And you should have before you a letter dated
20 February 28, 2007, to Mr. Ryall from DFO. It's a
21 three-page letter - and if you can just flip to
22 the last page, Mr. Lunn - it appears that you
23 signed that document, Mr. Wilson?

24 MR. WILSON: Yes, I did.

25 Q And does that letter spell out the reasons why the
26 Marine Conservation Caucus suspended involvement
27 in the FRSSI?

28 MR. WILSON: Yes, it does.

29 MR. LEADEM: Might that be marked as the next exhibit,
30 please?

31 THE REGISTRAR: Exhibit 412.
32

33 EXHIBIT 412: Letter from Wilson, Orr and
34 Young to Paul Ryall, dated February 28, 2007,
35 re: FRSSI/WSP Pilot
36

37 MR. LEADEM: I'm not going to go into this document at
38 length, Mr. Commissioner.

39 Q But I will ask you, Mr. Wilson, to look at the
40 language at the bottom of the first page, if we
41 could go back to the first page, please, Mr. Lunn.
42 I find these words:
43

44 Specifically, the FRSSI process is asking the
45 question, "What is the best way to manage
46 sockeye aggregates and what are the
47 consequences of harvesting these aggregates

1 in mixed-stock fisheries at different rates?"
2 The MCC is interested in asking a different
3 question. We want to understand the
4 consequences of alternative harvesting
5 strategies on the individual conservation
6 units that the WSP is intended to protect.
7

8 Is that still your opinion today?

9 MR. WILSON: Yes, it is.

10 Q You also gave evidence concerning your critique of
11 FRSSI and referenced the fact that, at some stage,
12 you appeared at a FRSSI workshop on behalf of the
13 Upper Fraser Fisheries Conservation alliance; is
14 that right?

15 MR. WILSON: That's correct. I attended meetings on
16 January 21 and 22, 2009.

17 Q What kind of organization is the Upper Fraser
18 Fisheries Conservation Alliance?

19 MR. WILSON: It's a group of First Nations.

20 Q And I assume, from the name, that they're situated
21 in the upper Fraser River system?

22 MR. WILSON: Correct. Generally, from Williams Lake
23 north to the top of the watershed.

24 Q And as part of your attendance at that workshop,
25 did you produce a document for the Upper Fraser
26 Fisheries Conservation Alliance?

27 MR. WILSON: Yes. My contract was to provide a
28 critique of the FRSSI process and provide that at
29 a meeting between the Upper Fraser Fisheries
30 Conservation Alliance and DFO.

31 MR. LEADEM: Mr. Lunn, could you please pull up
32 document number 3 from the Conservation Coalition
33 Book of Documents, please?

34 Q Is this the document that you prepared for the
35 Upper Fraser Fisheries Conservation Alliance that
36 you just alluded to?

37 MR. WILSON: Yes, it is.

38 MR. LEADEM: Might this be marked as the next exhibit,
39 please?

40 THE REGISTRAR: Exhibit 413.

41

42 EXHIBIT 413: FRSSI Report, prepared by Ken
43 Wilson for UFCA, March 2009
44

45 MR. LEADEM:

46 Q You've had an opportunity to review this before
47 testifying here, today, have you?

1 MR. WILSON: I have, yes.

2 Q And are the conclusions and critiques contained in
3 there still your opinion today?

4 MR. WILSON: Yes, they are. Generally, I'm still
5 concerned about the same things.

6 Q And just so that I can draw this to the attention
7 of the Commissioner - if we can look at page 7 of
8 that document, please, Mr. Lunn - under the
9 heading Conclusions and Recommendations, you say:

10
11 There are multiple and significant possible
12 sources of error and uncertainty in the FRSSI
13 process and its application. I consider the
14 loss of stationary -

15
16 -- should that be "stationarity" or "stationary"?

17 MR. WILSON: Stationarity.

18 Q Okay.

19
20 - lack of data for the majority of CUs, and
21 the assumptions around the makeup of run
22 timing or management aggregates and the
23 assumptions around the impacts of fisheries
24 on these aggregates to be the most critical
25 immediate concerns.

26
27 And those are still your views today, are they?

28 MR. WILSON: They are.

29 Q I want to turn, now, to asking some questions of
30 the panel as a whole, and I want to begin by
31 asking any of the panel members, and you'll have
32 to excuse this question, because I am not a
33 modeller and I don't quite understand how the
34 model functions, but who runs the model? How is
35 it handled?

36 MR. CASS: Mr. Commissioner, the model is run within
37 DFO, there's a team associated with that, there's
38 a consultant, Gottfried Pestal, who has the pen,
39 if you like, on any technical issues or add-ons or
40 changes to the model that are agreed to in the
41 spirit of developing the capability of the model
42 fuller.

43 Q And you mentioned, I think, Mr. Cass, and some of
44 the other panel members mentioned, some of the
45 variables that are fed into the model. So I
46 gather from that, that what occurs is that various
47 simulations are conducted of the model to produce

1 certain results that emanate from that model; is
2 that how it works?

3 MR. CASS: Mr. Commissioner, there are inputs to the
4 model that, as we've discussed, are largely driven
5 by what we -- how we model the biological process
6 and the main input for that are the spawners and
7 recruitment data that we use to characterize the
8 population dynamics. So that's one part, is the
9 input from the biological perspective.

10 And then there are the harvest management
11 levers, if you like, that vary the TAM rule
12 according to the objectives, and then this is
13 simulated on an annual timestamp forward 48 years,
14 as we've described, and then the output is used,
15 then, to assess the performance of a particular --
16 of those inputs, including the TAM rule, assess
17 the performance of those inputs, in terms of the
18 objectives that is used in the model.

19 Q So I take it from your answer then, Mr. Cass, is
20 that - and if I can just break it down and make it
21 simple so that I can understand it - is that
22 numbers are put into this model and then some
23 numbers are derived from the model, and then
24 somebody takes those numbers and provides advice
25 to somebody else in terms of management decisions
26 that are made, then, on the fishery. Is that
27 generally, from a simplistic perspective, how it
28 works?

29 MR. CASS: Yes and no. I mean, the objective is to
30 look at the consequences of alternative management
31 strategies in the long-term. So the consequences
32 are in terms of the performance of the range of
33 harvest management scenarios and the biological
34 assumptions about what's driving the biology. And
35 so those consequences are really the output of
36 what the model, the tool, provides. And so that
37 then becomes the information that's used to guide
38 management decisions.

39 Q All right. So obviously, then, somebody then
40 conveys what the model says to the managers. Do
41 the managers have some appreciation, in your view,
42 to how the model functions and how it works?

43 MR. CASS: Well, certainly the key DFO managers that
44 have been part of this process would have an
45 understanding of the model. The model's been
46 developed over a course of eight years, now. But
47 I can't comment on others who may, internally

1 within DFO, who may use this at some point in time
2 about their expertise.

3 Q All right. When the model is being applied in the
4 sense of deriving certain strategies or certain
5 results for in-season use, how is that then
6 conveyed? I mean, is it conveyed to the Fraser
7 River Panel, to the Fraser River Panel Technical
8 Committee? What's the process involved in that?

9 MR. CASS: I'm not involved with the Fraser River Panel
10 process anymore, but the process that occurs is
11 this preseason management planning time, which
12 starts up, well, in a month or so, but FRSSI would
13 be used to generate the tables that you've seen in
14 the various management plans, so at various run
15 sizes that the FRSSI, the TAM rule would be used
16 to identify the target escapement --

17 Q All right.

18 MR. CASS: -- based on the runs.

19 Q All right. I think I'm getting it, now. So when
20 Ms. Grant came and gave evidence and she had lists
21 and lists of tables and 50 percent probabilities
22 of return and 75 percent probability return, those
23 numbers actually came from the FRSSI model?

24 MR. CASS: No, those numbers are from the preseason
25 abundance forecasts that currently Sue Grant is
26 responsible for.

27 MR. LEADEM: Okay. I think I'm just going to confuse
28 you, Mr. Commissioner, as well as myself. I'm
29 hopelessly confused by some of this stuff right
30 now.

31 Q I'm going to move on from that and suggest to you,
32 based upon some of my confusion and some of the
33 remarks I heard from you yesterday, that if we
34 wanted to go forward in terms of some
35 recommendations that would better assist the model
36 and how it's being applied, that I seem to hear
37 from you some consensus building that the
38 communications of what this model does, how it's
39 applied, why it's used and why it's used in
40 decision-making, that all of you seem to indicate
41 that there can be better communications around
42 that aspect of the FRSSI process; do I have that
43 right?

44 You're all looking at one another. Maybe
45 I'll start with you, Mr. Staley.

46 MR. STALEY: Yes, I'd agree that one of the most
47 challenging parts of this process has been trying

1 to communicate it to both people who have some,
2 you know, educational capacity to absorb it. They
3 even have difficulty. There's also those who have
4 not had exposure to the kinds of tools -- these
5 kinds of tools in the past. Communicating to them
6 is a challenge, and I think that's certainly
7 something that would benefit from more effort.

8 Q Would you agree with that, Mr. Morley, that better
9 communication of what the model does and how it
10 works would assist the people with whom you're
11 connected with the commercial fishing sector?

12 MR. MORLEY: Well, it would certainly assist them to
13 understand how the harvest rules and escapement
14 rules are developed. I'm not sure it would assist
15 in being any happier with what those roles end up
16 being.

17 Q And Mr. Cass?

18 MR. CASS: Yes, I would agree that a challenge is to
19 communicate at a level that people can understand
20 in order for them to be part of the process. I
21 think communication is key.

22 Q And finally, Mr. Wilson?

23 MR. WILSON: Yes, I agree very much.

24 MR. LEADEM: Thank you. Those are my questions.

25 THE COMMISSIONER: Before Mr. Leadem sits down, I'm
26 going to try - I'm going to try - if we take 2009,
27 the evidence I've heard at this commission is a
28 much lower run than was expected or forecast, and
29 2010, in the evidence I've heard, is a much larger
30 run than was forecast or expected. Take me
31 through, if you can, Mr. Cass, the preseason, in-
32 season and postseason use of the FRSSI model. And
33 I'm understanding that there's a point in time
34 before the fish arrive, when there's a lot of
35 discussion taking place around what might be
36 expected. But as Mr. Leadem alluded to, when we
37 get to the point in time when the fish are showing
38 up, what happens on the ground, and what happens
39 postseason?

40 Maybe I can just frame it by looking at Tab 6
41 in your book, which is the 2010 - I don't know
42 what exhibit it is - but the Updated Methods for
43 Assessing Harvest Rules for Fraser River Sockeye
44 Salmon, and on page 5 of that document, which may
45 be on the screen, I don't know. It's the model
46 overview under Methods. It's Tab 6, and page 5.
47 And it says this:

1 The model is simply a thinking aid, a
2 consistent way of linking and tracking some
3 of the many considerations that are debated
4 during the annual planning process.
5

6 So it would be helpful for me if you take 2009 and
7 2010, two bookends, I think, that are helpful for
8 me, at least, because one, the evidence is far
9 below expectations, and one far above
10 expectations. And pretend that I'm a group of
11 stakeholders trying to understand the use of this
12 model, both preseason, in-season and postseason.
13 Is it possible for you to do that?

14 MR. CASS: I'll give it a try --

15 THE COMMISSIONER: Thank you.

16 MR. CASS: -- and perhaps I could be helped by my
17 colleagues on the panel.

18 THE COMMISSIONER: All right.

19 MR. CASS: So, yeah, preseason there's a model that we
20 have that, as stated in this document, I'm not
21 sure I'd use the words "a thinking tool", but it's
22 certainly a guide to develop an escapement plan.
23 So the objective preseason is to look at -- take
24 2009 for an example, look at the preseason
25 forecast of abundance that is prepared by DFO and
26 the abundance forecast is cast in terms of a
27 probability distribution, so it's not a point
28 estimate. But you have before you an estimate of
29 the run size and the uncertainty around that run
30 size.

31 So moving from the work that FRSSI does is to
32 then take, in the preseason planning process, is
33 to take that forecast and look at ranges to
34 evaluate the different fishing scenarios. And
35 Mike Staley may be able to help on the details of
36 that. As I say, I've been removed a bit from that
37 process.

38 So in the preseason planning process, FRSSI
39 would then be used to develop various scenarios,
40 if you like, in terms of an escapement plan that
41 would be part of the usual preseason preparation.
42 And 2009, of course, with going into the season,
43 there was no indication that the forecast would be
44 off or that the distribution that describes the
45 abundance forecast would be off. But as we know,
46 at the end of the season the evidence is quite
47 strong that suggests, obviously, the runs were

1 very low and probably in terms of the forecasted
2 distribution for some of the key runs, the 2009
3 estimated run season postseason would be far
4 outside the normal range that we would have
5 considered, so it was probably, you know,
6 something that you might see one in a hundred
7 years, for example. I don't have the distribution
8 in front of me, but that's sort of the story.

9 So you have, going into the season, then, a
10 preseason forecast that would be much larger than
11 the run actually occurred, and so the estimates of
12 in-season then that would be starting to be
13 generated as the run entered our waters would be
14 -- via the test fisheries, there would be signals
15 starting around July, I guess, or certainly by the
16 end of July, that would indicate that the run was
17 likely to be lower than the forecast run.

18 So with the TAM rule and the escapement plan,
19 because the TAM rule is designed to identify the
20 target escapement based on the estimated in-season
21 run size, there would then be a target escapement
22 that would be the result of applying the FRSSI TAM
23 rule and that, of course, would also identify what
24 the overall harvest rate would be, depending on
25 the run.

26 So as the information started to accumulate
27 in-season that indicated the run was much lower
28 than anticipated, there would be some recognition
29 of what the impact would be of fisheries and in
30 order to achieve the target escapement. And, of
31 course, in the postseason sense, or near the end
32 of the season, it was seen that there was no
33 opportunity for fishing and, in fact, the
34 escapement targets that were identified were on
35 the very low end of the TAM rule, if you like,
36 down in the non fishing zone.

37 So that's sort of 2009, how that would have
38 played out. And I would invite, you know,
39 somebody who's closer to the actual panel process,
40 where I've gone astray, but I think that's my
41 understanding of how FRSSI would be at least used
42 in 2009, and Mike might...

43 MR. STALEY: I think, to give a little more clarity on
44 it, the FRSSI model, itself, probably isn't used
45 in-season at all; it's used preseason. It's used
46 preseason to help evaluate alternative TAM rules,
47 which are the total allowable -- which are a rule

1 that is, in theory, supposed to be applicable
2 regardless of the run size that actually occurs.
3 So it's a TAM rule that applies if there's almost
4 no fish, and it's a rule that applies if there's
5 lots of fish, like 2009 and 2010. That's the
6 theory of it. So it's set preseason.

7 And then, in-season, the rule is then used to
8 calculate what is the available harvest at any
9 point in the season based upon the current
10 estimate of run size, the current estimate of the
11 management adjustment, and some other factors,
12 test fishing and other things, the amounts of
13 those, and from that is calculated the available
14 catch. So that's what's used in-season, but the
15 FRSSI model, itself, is not used in-season; it's
16 used preseason to set up these rules which are, in
17 theory, supposed to apply regardless of the run
18 size.

19 In 2010, as Mr. Morley has pointed out, and
20 perhaps -- not so much in 2009, but certainly in
21 2010, there were events and the estimates of some
22 of the populations returning which were not
23 necessarily outside of the rules, theoretically,
24 but they were outside of the thinking of the
25 people who evaluated those rules preseason, I
26 think that would be fair to say. And so there may
27 have been some adjustments to some of the aspects
28 of those rules recommended, and in some case
29 perhaps adopted, to recognize that not all we were
30 -- the preseason was trying to appear like we were
31 accounting for all possible futures, but we hadn't
32 actually thought too much, I guess, most people
33 hadn't thought about what the potential of the run
34 that we did experience in 2010, what it meant.

35 So that's my explanation of the use -- I
36 think, of your question, Mr. Commissioner, of
37 what's used. Preseason it's used. It's not used
38 in-season. The products of all the work that's
39 done preseason is used in-season. And as I don't
40 believe it's the FRSSI model, per se, is even used
41 to any great extent postseason. There's some
42 postseason accounting. Certainly the results of
43 the season are then fed back into the dataset, the
44 stock and recruitment dataset, and new stock and
45 recruitment models are updated based upon the
46 experiences from those previous seasons.

47 So the evaluation that a FRSSI model will now

1 or soon in the future will include the experience
2 we had in 2009 and 2010, may give us different
3 results than it would have without it. So that's
4 how it might be used in the postseason, in that
5 sense, but that's for planning for future seasons,
6 that that will have some impact.

7 THE COMMISSIONER: Maybe you can just help me with one
8 more thing. Both the FRSSI model materials that
9 we have in front of us, the exhibits, and earlier
10 this morning the management adjustment materials
11 that we have, both used the term that these models
12 are developed to assist with or the objective is
13 escapement strategies. To the extent that both
14 models are attempting to deal with escapement
15 strategies, how do they interrelate and is there
16 an element of double counting?

17 In other words, I'm more familiar with taking
18 contingencies into account once, not twice or
19 three times or four times. To the extent that
20 contingencies, or if you want to call them
21 uncertainties, are factored into these numbers,
22 these models, which I take it the managers are
23 using in-season as well, in other words, they have
24 some guidance from these models, they have some
25 numbers that have popped out of the models, using
26 Mr. Leadem's example of people getting numbers and
27 using them, how many times are uncertainties
28 factored into these models?

29 MR. CASS: In the actual model, there's been various
30 fine-tuning of the models, if you like, to account
31 for things like what are plausible scenarios of
32 future productivity. So that's one thing that's
33 being treated seriously. There is also the actual
34 structures of the model. So we've talked about
35 Ricker models and Larkin models, but those are
36 models that describe the population dynamics, and
37 so that drives the population dynamics with
38 including changes in productivity, for example,
39 what we might think are plausible scenarios in
40 terms of en route mortality, if you want to
41 consider things like depensation. So there's a
42 number of inputs into the model that you can vary
43 to account for the uncertainty.

44 At the end of that, though, you have a TAM
45 rule which is, going into the season, that is the
46 -- we call it a TAM rule because it includes the
47 management adjustment based on information that

1 occurs in-season. We would then have the TAM rule
2 which is, if you like, if you're in the run size
3 range of where the TAM rule is a fixed
4 exploitation, has included a fixed exploitation,
5 then the management adjustment is then estimated
6 in-season and it's then included along with any
7 estimates of fishing in the actual understanding
8 of what the TAM rule tells you. It tells you what
9 he total mortality is. Take from that the
10 management adjustment, and you end up with what is
11 leftover for removal.

12 And so when you ask the question on terms of
13 the various uncertainties, there's uncertainty
14 around, of course the management adjustment,
15 there's uncertainties accounted for in the
16 simulations used in the model, and so those are
17 the, you know, so it's uncertainties that are part
18 of the process of every step. There's an
19 evaluation of the uncertainty that at least that
20 we can estimate.

21 But as far as double accounting goes, you
22 know, we have one TAM rule going into the season,
23 we have a management adjustment that's applied in-
24 season, and we have an escapement target that is
25 the consequence of the TAM rule, and so
26 opportunities for double accounting, I mean,
27 there's opportunities for errors in terms of what
28 you might expect to be in-river losses, so there's
29 errors there, but double accounting, I don't see
30 an opportunity where that would occur.

31 MR. STALEY: I think you explained it correctly, but I
32 think one of the problems perhaps people are
33 having is the use of the -- free exchange of the
34 use of the words "the management adjustments" with
35 what the actual mortality might be. The
36 management adjustment is exactly that, it's an
37 adjustment that management takes to try and
38 account -- or try and best offset or ameliorate or
39 - I forget the word - the effects of mortality or
40 losses in the river that may occur. So in the
41 context of FRSSI going in its analysis, it's not
42 really modelling the management adjustment; it's
43 using a historical representation of the kinds of
44 differences that have occurred in simulating
45 forward, and in simulating forward it's generating
46 total runs and partitioning that into catch and
47 mortality, and so some of the performance measures

1 that are based upon the catch side of -- catch
2 types of calculations have been effected by the
3 sort of this representation of this en route
4 mortality.

5 Once we get in the season, then the concept
6 of the management adjustment plays, and that's
7 where we try to compensate for any potential
8 losses, either mortality or other losses, in the
9 management -- in the calculation of what's
10 available to harvest. I hope that helps.

11 THE COMMISSIONER: Thank you all very much.

12 MR. ROSENBLUM: Yes, Don Rosenbloom. I appear for
13 Area B Seiner, Area D Gillnet.

14
15 CROSS-EXAMINATION BY MR. ROSENBLUM:

16
17 Q I'd like to feed on the theme of what we have just
18 been discussing most immediately, and speaking to
19 the in-season processes, you have already told us
20 that the FRSSI model is not applied for in-season
21 management decisions. Mr. Morley has testified,
22 yesterday, of the, I believe, his testimony of the
23 inflexibility of making changes in-season in light
24 of the results that are coming out of the test
25 fishery and the early fishery.

26 First question to you in respect to in-season
27 fishery is: Are you satisfied that there are
28 appropriate parameters for the managers to make
29 in-season management decisions through the course
30 of the fishing season? That is my first question.
31 In other words, FRSSI is not an applied principle
32 and you are applying other principles as
33 discussed, including adjustment issues, are you
34 satisfied that all stakeholders would have an
35 appreciation how the decisions are being made by
36 management in respect to in-season decisions? I
37 put that out to any of you and all of you.

38 MR. MORLEY: I mean, as I said, I don't know that a lot
39 of the stakeholders fully understand exactly the
40 things that everyone here is struggling with, in
41 terms of how a TAM rule works and how the
42 management adjustments play into it, and how it
43 changes in the course of the season, so I'm sure
44 there's a number of people who don't understand
45 how the managers are making those decisions in-
46 season.

47 I mean, I think, to me, the key point is Mr.

1 Staley talked before, and so did Mr. Cass, that
2 some of the scenarios that we're seeing happen on
3 a more regular basis are outside the realm of what
4 we had anticipated in the preseason planning and
5 that my analogy to how this works right now is
6 that the -- I mean, we -- the DFO is trying to
7 develop a cookbook for managing this fishery and
8 put it into the IFMP and say, "Based on our
9 analysis of all these scenarios, if 'X' happens,
10 turn to page 89 in the IFMP and we will implement
11 'Y'," and just whatever the rules are, we'll do
12 that.

13 And so in order to do that, we have to
14 anticipate a lot of things that might happen,
15 because we've seen there's a lot of variables
16 around these fish. And, in fact, you spend a long
17 time trying to develop "what if" scenarios for
18 things that -- for many, many things that actually
19 will never happen because, in fact, 99 percent of
20 the things that you're trying to plan on will
21 never happen. So you're spending a lot of time
22 developing those kind of rules. And yet, in fact,
23 what we've seen happen more lately is what does
24 happen is something you didn't anticipate.

25 So I guess, from my point of view, the strict
26 cookbook approach that's been developed is
27 insufficient for managers to be able to react to
28 what actually happens in the season and try to
29 meet some broad objectives for conservation and
30 sustainable use, and that's where I think the
31 managers need more than what's been given to them
32 in that cookbook.

33 Q And can you give us a sense of what that "more" is
34 that should be given to the managers so that there
35 is better predictability by all parties to the
36 process of in-season management?

37 MR. MORLEY: Well, as I've been saying all along here,
38 I think we're developing -- I mean, a lot of these
39 things are developed as mathematical formulae that
40 go into a model, and it's something that modellers
41 love, because they can -- and now that we have
42 computers, they can do umpteen simulations and
43 come up with all these things. But again, it
44 doesn't provide for the ability for a manager to
45 have some broad goals and objectives, some ways to
46 evaluate success in those goals and objectives,
47 and to say, "Okay, given that this scenario is

1 different than what we thought was going to
2 happen, how do I take that kind of evaluation and
3 make an informed decision as a manager in-season?"

4 And I think we could give them those tools
5 and those abilities and can, in fact, get user
6 groups to understand that system better than the
7 current one, which is a very deterministic and
8 mathematical approach to management and doesn't
9 provide any flexibility for a seasoned,
10 experienced manager who has some feel for what's
11 going on with the resource to apply some
12 evaluation techniques in-season to come up with
13 the best approach.

14 Q Do any of the other panel members have anything to
15 comment on in respect to Mr. Morley's response and
16 my question? Mr. Staley?

17 MR. STALEY: Yes, I think we have to be clear that what
18 most of what Mr. Morley spoke about was not
19 specifically relating to FRSSI. FRSSI is a
20 process for developing some guidelines. How those
21 guidelines are used and what the protocols are to
22 adjust them are part of the IFMP process, which is
23 bigger than FRSSI, it has a lot more in it than
24 just the FRSSI.

25 So I just want to make sure that that's
26 clear, that FRSSI is a process which includes a
27 very analytic tool as well as some work on how to
28 use that analytic tool to evaluate options, but
29 how those options are -- and the rules that come
30 out of that, how those are expressed in the IFMP
31 and what the policies and protocols for adjusting
32 the IFMP in-season, those are separate from the
33 issue of what FRSSI is and isn't.

34 Q I appreciate that, but in the course of the
35 parties formulating -- applying the FRSSI
36 principle and formulating the Integrated
37 Management Plan, there is expectation to try to
38 get your calculations as accurate as possible so
39 that you don't have in-season management
40 decisions; you would agree with that, wouldn't
41 you?

42 MR. STALEY: That would be the objective --

43 Q Yes.

44 MR. STALEY: -- but how often we can meet that
45 objective is...

46 Q Right. But then the question I have, and if I'm
47 ruled out of order and I'm informed by commission

1 counsel when this question is more appropriate, I
2 gladly will move on. Mr. Morley testified of the
3 inflexibility in-season in making changes to what
4 is the Integrated Harvest Management Plan, which
5 is founded upon a FRSSI principle, Mr. Morley, why
6 did you say that? Why is there that
7 inflexibility, from your perspective?

8 MR. MORLEY: Well, again, it does relate back to the
9 IFMP process and the approach, currently, is that
10 whatever rules are laid out in the IFMP process
11 are signed off, as we see, by the minister on the
12 preseason plan, and the process to get ministerial
13 change to some of those details, I think, is a
14 very involved, detailed process, going up through
15 the bureaucratic chain, and most of these
16 decisions are ones that -- and most of these
17 circumstances take place in the middle of the
18 summer, when many people are away and very
19 difficult to get a hold of, so I think it's a very
20 cumbersome process to have to go back for every
21 minute detail in that plan to get a ministerial
22 sign-off on a change.

23 Q Is that inflexibility, from your perspective, been
24 prejudicial to the resource and certainly to the
25 harvesters?

26 MR. MORLEY: You know, I think that the rules that we
27 have adopted in the IFMP are robust enough to
28 situations that where we end up with fewer fish
29 coming back that I don't think that, in any case,
30 that we have ever been prevented from taking
31 action when there was serious conservation
32 problems. I don't think it's at all been
33 prejudicial to conservation, but it certainly has
34 limited the ability for sustainable harvest to be
35 taken by many of the users, yes.

36 Q Thank you. In your testimony yesterday, you, as a
37 panel, you spoke about the need for reliability of
38 the data to obviously inject into the FRSSI
39 formula, and if I understood most of your
40 evidence, and I'm just generalizing, there was, I
41 thought, a general sense of comfort by you with
42 the reliability of that data, assuming that I have
43 accurately spoken of your testimony, and
44 particularly you, Mr. Morley.

45 I ask you this: There is testimony before
46 this inquiry, and I appreciate you don't sit here
47 day in and day out, fortunately, and there is

1 testimony, for example, and I am happy to start
2 bringing documents up to the screen, but I don't
3 think it's necessary, of correspondence from the
4 Fraser River Panel directed to the commissioners
5 of the Pacific Salmon Commission, expressing
6 concern about stock enumeration, deficiencies of
7 stock enumeration, and not meeting treaty
8 obligations between the two countries.

9 And in testimony given last Thursday, again,
10 where you would not have been present, I was
11 cross-examining Mr. Whitehouse and he acknowledged
12 in testimony, and again, I can refer you right to
13 the transcript on the screen there, if you wish
14 it, that indeed there has been ongoing
15 communication between the commission and DFO
16 regarding the insufficiency of data, in terms of
17 stock enumeration, that has forced DFO to take
18 remedial steps to try to upgrade the deficiencies,
19 the shortcomings.

20 My question is this: Are you familiar with
21 the fact that there appears to be tension between
22 the Pacific Salmon Commission and DFO as to
23 whether they're meeting their stock enumeration
24 responsibilities so that there's compliance with
25 the treaty?

26 MR. MORLEY: Yes, I'm certainly aware of that, and I
27 did look at some of the testimony at last week's
28 hearings. I think that the issues that perhaps
29 were not fully canvassed in that testimony and
30 that bears onto this FRSSI process here, is that
31 when we talk about the 19 modelled stocks here,
32 that most of them are of a sufficient size that we
33 are getting reasonably good estimates of spawning
34 escapements.

35 The issues are perhaps more acute and more
36 difficult than -- you talked a little bit about
37 the stocks between the 25,000 and 75,000 threshold
38 and the deficiencies that were identified and
39 problems that have been there and tensions between
40 the Salmon Commission and DFO over undertaking
41 those analyses. What wasn't spoken about was the
42 populations that are of a smaller size and that,
43 which are some of the ones that clearly are
44 potentially deterministic if we are to listen to
45 some people's interpretation of how the Wild
46 Salmon Policy might be applied, and could have
47 significant impact, and I think that in those

- 1 smaller populations undoubtedly I don't think that
2 anyone on the panel here would disagree that we
3 could have a lot more effort put into it to get a
4 lot more accurate understanding of what's actually
5 happening in those populations.
- 6 Q Mr. Morley, with the smaller stocks that may have
7 a deficient or inaccurate data, does that not have
8 a huge consequence to the FRSSI model and to the
9 outcome of the harvest plans for any given year?
- 10 MR. MORLEY: Well, in fact, it doesn't have a huge
11 consequence to the FRSSI model because the
12 assumption is that they are acting the same as the
13 stocks that are modelled, and so that --
- 14 Q That they are what, sorry?
- 15 MR. MORLEY: That they have the same productivity,
16 essentially, as the stocks that are being
17 modelled, so it's not a -- if we're deficient in
18 data on some of the smaller populations, it won't
19 impact on what the results are in terms of the
20 FRSSI model, itself.
- 21 Q But it will impact on harvest decisions, will it
22 not?
- 23 MR. MORLEY: Only to the extent that there are specific
24 harvest decisions for something like Cultus put
25 forward separate from what would be coming out
26 from the run timing aggregates in the FRSSI model.
27 So it's...
- 28 Q With the FRSSI model it has been said, and again,
29 Mr. Morley, I focus on you, but I think others
30 have really said it, that the FRSSI model does not
31 incorporate into its analysis, for want of a
32 better term, socioeconomic issues, and you did say
33 that, Mr. Morley, did you not?
- 34 MR. MORLEY: I said it, in my opinion, doesn't
35 adequately canvass socioeconomic issues, yes.
- 36 Q Yes. And that economists, I'm going to suggest to
37 you, were not part of the team that developed the
38 FRSSI modelling; is that not fair to say?
- 39 MR. MORLEY: Not intimately, in terms of developing the
40 model, itself. I think that the compass research
41 group perhaps had people who have some economic
42 training involved in it, but the kind of
43 approaches that are undertaken, in terms of
44 performance indicators and the analysis
45 undertaken, I wouldn't consider to be a
46 socioeconomic analysis.
- 47 Q And so it's fair to say that FRSSI does not employ

1 any cost benefit analysis approach to evaluating
2 options?

3 MR. MORLEY: That's correct.

4 Q And it's also fair to say that FRSSI does not
5 incorporate any habitat issues or options when
6 addressing FRSSI, the formula?

7 MR. MORLEY: Yeah, I think we had quite a bit of
8 discussion about this yesterday --

9 Q Yes.

10 MR. MORLEY: -- and it does and it doesn't, but it
11 certainly doesn't look at using habitat as a lever
12 for addressing future production in terms of
13 making alterations to habitat to improve
14 productivity, no, it doesn't include that.

15 Q Precisely. Now, before I go to what is the thrust
16 of my questioning in this area, do any of the
17 other panel members have any contribution to make
18 on what Mr. Morley has responded to so far?

19 MR. CASS: Mr. Commissioner, on the habitat side, I
20 just wanted to clarify that Mr. Morley is correct
21 in that there has been no alterations to account
22 for case specific habitat changes that may have
23 occurred, but it does include, at the very root of
24 the stock recruitment analysis that occurs, it
25 does account for habitat capacity in that sense.
26 So habitat in the sense of how many sockeye can
27 you seed, given a piece of real estate with, it
28 does account for that, if you like.

29 Q Indirectly, in that your spawner recruit figures
30 will be partly dependent on the habitat
31 environment; is that fair to say?

32 MR. CASS: Yes.

33 Q Yes, okay. Appreciating that and assuming the
34 other panel members -- I'm sorry, yes, Mr. Staley?

35 MR. STALEY: On that point of habitat, the FRSSI is
36 used as a harvest management tool; it's not used
37 as a habitat management tool.

38 Q Yes.

39 MR. STALEY: So as Mr. Morley said, it doesn't have a
40 lever - or maybe it was Mr. Cass - it doesn't have
41 a -- the only control rule we have is on
42 mortality, and the only part of that we have is
43 the harvest part of it. So that's the model,
44 itself.

45 In terms of the socioeconomic piece, while it
46 wouldn't fit probably some professional standard
47 criteria, there are performance measures that are

1 being produced which could be used by someone
2 skilled to compute cost benefit-type things. It
3 does calculate average long-term catches, average
4 variability in those catches, and so on and so
5 forth. But the process to date has not, other
6 than to, as we saw with those graphs earlier,
7 looking at sort of sensitivity of some measures of
8 catch, has not -- and measures of a conservation
9 has not, you know, gone into the detail of cost
10 benefit.

11 On the socioeconomic piece, there has -- the
12 people I work with, First Nations, have been
13 concerned about the representation of the so-
14 called food, social and ceremonial part of the
15 puzzle and that's not explicitly accounted for in
16 there. And that would require some retooling of
17 the model in order to -- because it would have to
18 be identified, I suppose, at a separate fishery,
19 and I believe right now the model only deals with
20 one fishery. But at some of the workshops those
21 issues have been raised and, to date, they haven't
22 really been incorporated directly and explicitly
23 in the FRSSI process.

24 Q Thank you. Let me focus on the thrust of this
25 line of questioning, and forgive me if I
26 inarticulately make my point to you and ask for
27 your response. FRSSI is a model established for
28 the purposes of determining harvest rate, in part,
29 to determine harvest rate for a given year and to
30 incorporate it into the Integrated Harvest
31 Management Plan, I assume that's obviously trite,
32 and assuming that to be the case, do you not see a
33 danger to where so many eggs are put into one
34 basket where FRSSI becomes the model or
35 determinant for that harvest rate which leads, I'm
36 going to suggest to you, to a complacency by DFO
37 to respond to other factors that should be playing
38 into harvest rates, such as habitat issues,
39 restoration of habitat, things of that sort, does
40 it not lead us all to a complacency where the DFO
41 chooses to look at the FRSSI model, make its
42 application to an adoption to the Integrated
43 Harvest Management Plan, and then to govern the
44 issues of conservation by way of fishing or no
45 fishing, TAM, harvest rate, TAC, without really
46 being forced to deal with the habitat issues which
47 are also critical to the life and conservation of

1 the fish? Your response? Any of you and all of
2 you.

3 MR. CASS: Mr. Commissioner, certainly where there are,
4 if you want to use the word "levers" that are
5 deemed now or into the future important to
6 consider for management, for fisheries management,
7 then there would be a motivation, I suppose, to
8 start thinking about different approaches either
9 within FRSSI or as a separate way. So on the
10 complacency side, I would hope that complacency
11 doesn't become the -- overwhelms the process, but
12 I have some optimism that where there's habitat
13 issues that need to be treated in a modelling
14 sense that would guide decisions about whether you
15 want to, you know, where you want to put your
16 emphasis in terms of habitat restoration, in cases
17 where that might be required.

18 So in the big picture I think DFO should be
19 open to challenges of changes that might move
20 FRSSI in a different direction, or some other
21 management tool, but it's a model that, you know,
22 I mean, models are models, of course, and they
23 need to be, in some way reflective of the reality
24 of the world, and so if habitat were deemed to be
25 a lever that you might want to use in some -- in
26 the future, let's say, or as a recommendation,
27 then I think it should be listened to. But the
28 current FRSSI model is, as has been said, the only
29 tool we have, the only management lever is harvest
30 rate, at this time.

31 Q But it doesn't have to be the only lever if,
32 indeed, DFO and your department paid more
33 attention to habitat issues, restoration issues,
34 and saw that as another lever, a critical lever to
35 the sustenance in conservation of the resource;
36 you agree with that?

37 MR. CASS: I can't disagree with that, yes.

38 Q And as an employee of DFO, I believe you're the
39 only one that is currently an employee of the DFO
40 on the panel, you would agree that your department
41 has not been putting proper emphasis on habitat
42 restoration issues in the last, let's say, decade?

43 MR. CASS: Yeah, I can't comment on that. I mean --

44 Q Why can't you comment on that?

45 MR. CASS: Because I'm not an expert in habitat
46 management, and so I think it's an important
47 question, but I have no expertise in that area.

1 Q Thank you very much. I open my questioning to the
2 rest of you. Yes, sir?

3 MR. WILSON: Yes, I wanted to make an observation. As
4 you know, Cultus has been listed as an endangered
5 stock, yet we still harvest about 30 percent of
6 it. Part of that justification is based on
7 habitat remedial work that's being undertaken.
8 So, for example, while the harvest rate that might
9 be allowed on Cultus would normally be quite low,
10 we have included programs to remove pike minnow
11 from the watershed in large numbers, to harvest
12 milfoil weed, which we feel interfered with
13 spawning, and those programs contribute to our
14 willingness to allow greater harvest on Cultus in
15 addition to enhancement activities.

16 So I don't think it would be fair to say that
17 the department is entirely unresponsive to habitat
18 concerns.

19 Q It wasn't necessarily totally unresponsive; I was
20 saying there were shortcomings, significant
21 shortcomings. Evidence was given, and I'll put it
22 to you, sir, a few days ago by Mr. Whitehouse that
23 only three lakes in British Columbia have what I
24 believe he referred to as nursery habitat
25 assessment programs, where it used to be almost
26 all the lakes of the province, under the old
27 International Pacific Salmon Commission. He
28 agreed that that was obviously a shortcoming over
29 what it had been previously. I am simply asking
30 you: Is it not in the interest of everybody, and
31 particularly the harvesters and, for that matter,
32 the environmentalists, that there be a full-
33 fledged comprehensive habitat restoration --
34 sorry, habitat assessment and restoration program
35 by DFO? You can't disagree with that, can you?

36 MR. WILSON: But I cannot comment. I guess my concern
37 here is that on the habitat side, DFO does what
38 DFO does. I'm not a habitat expert, either. But
39 I'm simply pointing out that in the application of
40 harvest rules we do take into consideration
41 remedial work on habitat where we have evidence
42 that that work is going to increase productivity
43 and allow harvest. I'm just making the
44 observation that that's been done in the past.

45 Q Yes. But there's a great deal of work that
46 doesn't come to your attention because it's not
47 been done by DFO; is that not fair to say?

1 MR. WILSON: That's fair to say.

2 Q Yes. And is it also fair to say that where we've
3 heard about the decisions by DFO back in 1994, to
4 change the threshold for stock enumeration for
5 high precision enumeration from 25,000 to 75,000,
6 there, again, is a significant gap of information
7 which, with high precision, one would be more
8 comfortable relying on in respect to the FRSSI
9 model?

10 MR. WILSON: I agree that we can always use more
11 information to make our models better.

12 Q Any other comment for other panellists in respect
13 to this exchange?

14 MR. CASS: Just a point that you made in terms of the
15 25,000/75,000 change. You said, "May have
16 significant consequences," something like that,
17 and there is work, now, to look at how -- what are
18 the consequences of that change. So there is some
19 work to look at that.

20 Q Yes.

21 MR. CASS: And so I guess the jury's still out on that
22 particular move. But, yeah, there's reducing
23 programs on monitoring, for example, escapement
24 enumerations could have an effect on the precision
25 of estimates.

26 Q On the what?

27 MR. CASS: On the precision and accuracy of estimates
28 of escapement that would be used as a measure of
29 how well you're doing in terms of performance.

30 Q Yes. And that, sir, in turn, has a significant
31 effect, among others, to the fishers of the
32 province with a determination to what extent they
33 will be able to harvest? You're nodding in the
34 affirmative?

35 MR. CASS: Yes, uncertainty in escapements could have
36 an impact on decisions that affect harvest.

37 Q In fact, a dramatic impact?

38 MR. CASS: I haven't seen any analysis that indicates
39 what the --

40 Q All right.

41 MR. CASS: -- impact would be, but...

42 Q Thank you. The other two of you, any comments?

43 MR. STALEY: I guess my only comment is back to your
44 original question, which was, "What does FRSSI
45 have to do" -- the focus on FRSSI somehow has led
46 to a complacency in DFO, and I guess I don't have
47 -- I'm not an expert on DFO's complacencies.

1 Q Thank you. The last question I have, which I'm
2 sure I'm the only one that doesn't understand
3 this, you have the FRSSI formula for purposes of
4 sockeye of the Fraser River. Is this formula and
5 this approach only being applied by DFO for
6 sockeye of the Fraser River, or is this level of
7 sophisticated statistical analysis being done for
8 other systems within British Columbia?

9 MR. CASS: I could take a crack at that, Mr.
10 Commissioner. In terms of salmon, these TAM rules
11 are not applied in the formal sense that they are
12 in the Fraser, but there are other examples in
13 B.C. marine fisheries where the population models
14 for providing advice are as or more complicated
15 than what's here, so this is not, if you like,
16 it's a -- in the salmon world it's probably more
17 developed than in other areas, other regions,
18 other species, but certainly on the marine side
19 there are very mature, very complex models that
20 are used in the management of marine species.

21 Q Thank you. Mr. Morley?

22 MR. MORLEY: I just had one comment on your last
23 question that I didn't get a question --

24 Q Yes?

25 MR. MORLEY: -- to put in, Mr. Commissioner, and that
26 is your view of the FRSSI and approach to harvest
27 management having DFO being complacent. I
28 wouldn't call it complacent. I think that, and
29 again going back to the example that Mr. Wilson
30 presented in terms of Cultus, I think it is --
31 when DFO is presented with a problem as to whether
32 there's a conservation issue or whether there's --
33 with a particular stock or a run, it is dealing
34 with harvest management is their easiest approach
35 and something over which they have a great deal of
36 control in terms of trying to manage a population
37 and can see immediate impacts. And the costs are
38 not borne by the Government of Canada. There's no
39 out-of-pocket money from DFO's budget in order to
40 protect a stock.

41 When you're dealing with something like
42 Cultus Lake, and I sat on the Cultus Recovery Team
43 and was intimately involved in looking at all the
44 strategies, and the modelling work that was done
45 in conjunction with that is sort of expanding on
46 what Mr. Wilson said, in fact, demonstrated that
47 harvest management was not really deterministic of

1 the future of Cultus Lake sockeye that, in fact,
2 unless some of the critical issues to do with
3 freshwater survival and potentially some of the
4 issues to do with the ocean survival, unless
5 something was done to improve freshwater survival
6 or unless ocean survival picked up, it didn't
7 really matter whether you harvested Cultus at 50
8 percent, 70 percent, 30 percent, or zero, okay?
9 The future of Cultus, as an independent wild
10 population, was more than likely in serious
11 question, and that without doing something else we
12 could very well not see Cultus survive. And that,
13 in fact, trying to address those other issues does
14 cost real money. The real money, so far, for the
15 major program that's been undertaken, a predator
16 control, and even the milfoil work, has come from
17 the commercial fishing sector, okay; it has not
18 come from the Government of Canada.

19 Q As we've heard.

20 MR. MORLEY: And so the Government of Canada, again, in
21 terms of your question about complacency, is
22 certainly the first place they turn when dealing
23 with an issue is harvest management, because
24 there's no direct cost, but there potentially are
25 considerable costs to society and to commercial,
26 recreational and First Nations fishers, but some
27 of the other case, and in Cultus, for example,
28 unless we do some of these other things, that
29 harvest management is not going to be effective.

30 MR. ROSENBLOOM: All right, thank you very much. I
31 have no further questions, thank you.

32 MS. BAKER: Thank you, Mr. Commissioner. So we will
33 have to continue with this panel after lunch. I
34 would ask my friends to tell me what their
35 estimates are. Some of the questioners have gone
36 over their estimates, so we're behind schedule, so
37 we need to get in line with that. Thank you.

38 THE REGISTRAR: The hearing is now adjourned until 2:00
39 p.m.

40
41 (PROCEEDINGS ADJOURNED FOR NOON RECESS)

42 (PROCEEDINGS RECONVENED)

43
44 MS. BAKER: Mr. Commissioner, just a little bit of
45 housekeeping. We're back with our panel, of
46 course. Mr. Wilson may have to leave at 3:00 so
47 I've talked to the other participants to find out

1 how we can make sure the people are able to ask
2 him questions who want to do so, and so we'll
3 start with Mr. Eidsvik representing the Southern
4 Area E Gillnetters and B.C. Fisheries Survival
5 Coalition. And then we'll follow with Ms.
6 Gaertner and hopefully all the questions for Mr.
7 Wilson will be completed by 3:00 and then we'll
8 carry on with the West Coast Trollers Area G which
9 is Mr. Watson and then the B.C. Wildlife
10 Federation, Mr. Lowes.

11 MR. EIDSVIK: Good afternoon, Commissioner. My name is
12 Philip Eidsvik, E-i-d-s-v-i-k - it's not an easy
13 name to spell - and I'm here on behalf of the Area
14 E Gillnetters and B.C. Fisheries Survival
15 Coalition.

16
17 CROSS-EXAMINATION BY MR. EIDSVIK:

18
19 Q And I have a number of questions to ask the full
20 panel members and I'm not as interested in the
21 workings of FRSSI as I am interested in why FRSSI
22 - and perhaps, Mr. Staley, you can help me a
23 little bit and give us a very short history of
24 Fraser River sockeye. Am I correct in saying we
25 had pretty good abundance until the Hell's Gate
26 slides?

27 MR. STALEY: It's believed so, yes. The data, though,
28 is on the catch, not on the escapement. There's
29 no escapement data from that period.

30 Q That's true. And then we had a long period of
31 rebuilding following the installation of fish
32 ladders and then in about the '60s we hit another
33 low in the early '60s?

34 MR. STALEY: Yes, sir.

35 Q And then a fairly successful rebuilding program
36 until about 1990?

37 MR. STALEY: The abundance increased into early '90s,
38 yes.

39 Q At that time, is it fair to say that I think you
40 were involved in management then and a number of
41 people that we've heard so far were that fishery
42 managers, Fraser River sockeye managers, had kind
43 of a worldwide reputation through the '60s, '70s
44 and '80s as doing impressive work?

45 MR. STALEY: Certainly many of the -- some of the
46 managers who were also scientists also ended up in
47 the academic field and I think of people like Dr.

1 Larkin, for example, and Dr. Ricker, work for DFO.
2 They sort of were world leaders in the population
3 dynamics of salmon and recognized as such.

4 Q Well, perhaps at this point I'll open it up to the
5 panel members. What I'm curious about is why
6 FRSSI? We had a really good fisheries management
7 model from the '60s to the early '90s that
8 successfully rebuilt runs and we could go back to
9 the '40s and go to the '90s. Why the need for
10 FRSSI? We didn't have FRSSI during this
11 tremendous rebuilding period. Why the need for
12 FRSSI? Anybody want to take a crack at that? Mr.
13 Cass?

14 MR. CASS: Mr. Commissioner, I think one of the -- I
15 mean, the history is important to understand, yes.
16 We had come off of a good series of years in
17 rebuilding and -- but I think times have changed
18 recently, too, because we now have the Wild Salmon
19 Policy, although FRSSI by a couple of years pre-
20 dates that. But certainly the thinking about how
21 you deal with the trade-offs in a consistent way
22 within a framework that takes advantage of the
23 fisheries science that exists. So it -- and I
24 think as Rob Morley had pointed out, the modelling
25 capability is -- with fancy new desktop computers
26 and laptops, is enhanced. But really, I think
27 it's a way to look at how you trade off escapement
28 on the conservation side, but also with a need to
29 ensure that you have escapement for future
30 sustainability, but -- and to trade off the --
31 with the socioeconomic side of things. So -- but
32 I think the main point is that it allowed for
33 consistent assessment and evaluation of trade-
34 offs. I'll leave it at that.

35 Q Well, I guess my point is we obviously had a lot
36 of trade-offs through the '60s, '70s and '80s and
37 some years we probably took less fish than we
38 wanted to for that rebuilding effort. At the end
39 of the 1980s we could be pretty proud that most
40 runs were in much better shape than 30 years
41 earlier, so we had a really effective fishery
42 management model. And what I'm trying to figure
43 out is why we abandoned that model and now we've
44 stepped into FRSSI? Are we trying to solve
45 problems that happened between 1990 and eight
46 years ago when we developed FRSSI?

47 MR. CASS: I guess -- I guess -- specifically, sorry,

- 1 Mr. Commissioner, the existing rebuilding plan,
2 the so-called 1987 rebuilding plan, was rules-
3 based, as is FRSSI, but it was designed to at a
4 minimum maintain escapements but also to increase
5 escapements on the brood year, so not -- to not go
6 backwards. And so that works okay in a situation
7 where abundance is stable or increasing, but in
8 the -- as in the '90s when things declined, the
9 plan that was in place then would have been
10 difficult to continue implementing because of
11 declines and the inability to maintain broods as
12 in the rebuilding phase.
- 13 Q So what were the reasons for the declines in the
14 '90s?
- 15 MR. CASS: I mean, there's a list of hypotheses, if you
16 like. Not sure you want me to go into that,
17 but...
- 18 Q Well, I think it's useful, because you said that
19 FRSSI is a response to problems and declines in
20 the '90s, so I think it's helpful if we understand
21 what the reasons for the decline were and how
22 FRSSI responded to those particular problems.
- 23 MR. CASS: Yeah, I'm not sure, Mr. Commissioner, the
24 reasons for the decline were an issue with FRSSI,
25 although certainly within the model there needs to
26 be some understanding or some way to develop
27 future scenarios, if you like, or scenarios for
28 the future but, you know, the fact is we don't
29 know what the reasons are for the decline.
30 There's hypotheses that are described to explain
31 them, but the fact is it was in response to a
32 decline and the causes of it were unexplained.
33 And FRSSI was -- I mean, the 1987 rebuilding plan
34 was targeted for 12 to 16 years, which takes us up
35 to whatever that is, 2002, in that range, 2005, so
36 it had -- that rebuilding phase had reached its
37 limit, if you like, in terms of what initially was
38 planned.
- 39 Q So I think that helps a little bit, but it doesn't
40 answer my question. I'm just trying to get why
41 FRSSI now, what problem does FRSSI solve? And
42 does anybody else want to take a crack at that?
- 43 MR. MORLEY: Mr. Commissioner, I guess just to sort of
44 expand a little bit on the sort of the history as
45 to how we got here, I think the -- when the IPSFC
46 was managing Fraser sockeye and setting escapement
47 goals for that period of time of long rebuilding

1 from the time they took over management after
2 building the fishways up through the '50s and the
3 '60s, into the '70s and the '80s, that the general
4 approach was one of trying to have fairly
5 significant fisheries virtually every year, but
6 certainly to have escapement goals that looked at
7 building the populations in a measured way instead
8 of looking at sort of doubling escapement in any
9 one population from one cycle to the next, look at
10 a gradual increase in the escapement goal and see
11 what the response was. And as was indicated,
12 there was a gradual increase in the runs over that
13 time period.

14 Sort of the radical departure to that kind of
15 policy came about, I think, as it has been
16 described in the rebuilding strategy of 1987 where
17 Canada decided that that approach was too slow and
18 that there were greater gains to be made by having
19 massive increased of escapement that we would
20 hopefully see a significant response and have
21 increased yields to the fisheries in Canada, given
22 that the Americans were now capped under the
23 Salmon Treaty at a fixed total number and not
24 getting 50 percent of whatever was caught in the
25 convention waters.

26 And I think clearly what -- so that was one
27 significant change that happened and how the
28 stocks responded to that is you're going to hear a
29 lot more about, I think, in the next panel on
30 over-escapement and theories as to what the
31 response to those massive escapements that we've
32 been putting on the ground since then are. But
33 certainly that is one of the potential reasons why
34 we have seen some of the stocks decline, in
35 particular some of the more populous stocks like
36 Quesnel. But then you can look at those stocks as
37 being the ones that actually now have the lowest
38 productivity. So it's not the small stocks that
39 are the weak ones. It's actually the biggest ones
40 that are currently facing the worst productivity
41 as a result of massive over-escapement.

42 The -- but the other confounding factor that
43 comes into this in terms of -- so the -- clearly
44 the rebuilding strategy had some drawbacks, as Dr.
45 Cass has mentioned, and it resulted in having to
46 look to a new approach here that would be a made-
47 in-Canada approach. So the question -- I don't

1 think at this point, given that the escapement
2 goals have been increased so dramatically that
3 people were prepared to go back and look at
4 reducing them to what they had been prior to
5 Canada taking over management responsibilities.
6 So we needed to have some way to analyze it.
7 FRSSI is a tool, but as I think we have talked
8 about here, it is only a tool to analyze the
9 potential impacts of different harvest rules and
10 spawning escapements.

11 Two other confounding factors sort of
12 happened here in the sort of 1990s, as we started
13 the -- well, three other factors. We started to
14 see high water temperatures and en route losses,
15 we started to see early entry of the late runs,
16 and again, associated high mortalities with that.
17 And we had the **Sparrow** decision and a change in
18 the allocation and a change in the amount of
19 fishing that was taking place within the river
20 sort of all the way from the mouth up to -- up
21 through the canyon. And all of those things had
22 an impact on what was happening to Fraser sockeye
23 as they were going up towards the spawning grounds
24 and clearly we needed to try to figure out how to
25 develop an escapement and harvest rule in response
26 to all that.

27 How they all play out and what -- where the
28 sort of cause and effect in these things are is
29 very difficult to sort out, but certainly -- I
30 mean, so FRSSI's response to that, in terms of how
31 good it is as a response to that is a question
32 that I -- you know, I have certainly.

33 Q Yes. So maybe to sum up then, we had successful
34 fisheries management from about 1940 to 1990, had
35 a cautious plan for escapement and FRSSI is
36 responding to problems from 1990 onwards that Mr.
37 Morley has given some sense of what they might be,
38 Mr. Cass is reluctant to. Mr. Staley or Mr.
39 Wilson, do you have anything to add to that?

40 Maybe I can go to fisheries management, and I
41 know FRSSI is an attempt to control fishing
42 effort. Mr. Morley, I think you would agree that
43 the lowest point in the recent history of Fraser
44 sockeye was about the '60s. We've gone over that.
45 What was the traditional harvest rate in the
46 commercial sector prior to the early 1990s? I
47 think you've said it's about 75 to 80 percent; is

1 that about right?
2 MR. MORLEY: That was the traditional total harvest
3 rate of all commercial recreational and First
4 Nations fisheries.
5 Q And how many years would that harvest rate have
6 been in place?
7 MR. MORLEY: I mean, I think probably that harvest rate
8 would go back to the turn of the century.
9 Certainly in some years when there was very low
10 abundance and low fisheries that you wouldn't have
11 had that harvest rate every year, but the -- and
12 for most of the years on an average it would be in
13 that range.
14 Q And from the perspective of a fishery manager in
15 2010, we had a much bigger commercial fleet.
16 Roughly how many seiners would have fished on
17 Fraser River sockeye prior to fleet reduction?
18 MR. MORLEY: I think at the maximum number of seiners,
19 there was about -- there was over 500 seine boats.
20 Q And how many now?
21 MR. MORLEY: There are --
22 Q If the full southern fleet --
23 MR. MORLEY: The southern fleet is -- I think there's
24 169 licences but in terms of active vessels, I
25 would suggest there's -- on a given year, there
26 wouldn't be more than 130 or so.
27 Q Now, any change in fishing techniques? Has it
28 lowered the productivity rate or the seine fleet
29 in the last, say, ten years, 15 years?
30 MR. MORLEY: The seine fleet is now required to braille
31 all their catches, so they can't use their drums
32 to drum in the net, and so each -- when they make
33 a set, they have to slowly dip out a couple
34 hundred fish at a time and sort the fish to put
35 back live all of the non-retention species like
36 Chinook.
37 Q Any sense -- do you remember how big the troll
38 fleet was on Fraser sockeye prior to fleet
39 reduction?
40 MR. MORLEY: I don't have it -- I mean, it's --
41 Q Okay.
42 MR. MORLEY: -- was --
43 Q Substantially bigger?
44 MR. MORLEY: Substantially -- you know, the fleet --
45 Q What about -- what about gillnet --
46 MR. MORLEY: The fleet is probably, you know --
47 MS. BAKER: Mr. Commissioner, we are having a whole

1 section on commercial fisheries coming up as soon
2 as we finish harvest management, and I wonder if
3 the questions might be more appropriately saved
4 for that period of time.

5 MR. EIDSVIK: Mr. Commissioner, there is a reason why
6 I'm -- and I'll be there shortly, why I'm asking
7 these questions. If you'd just go with me for
8 another minute or two.

9 Q And on an average opening in the Fraser River, how
10 many gillnetters?

11 MR. MORLEY: Currently?

12 Q Yeah, roughly.

13 MR. MORLEY: About 300, 400.

14 Q Compared to prior?

15 MR. MORLEY: Eight hundred, 900.

16 Q So my point is fishery managers have a much easier
17 job managing the commercial fleet today as
18 compared to in the days when they had no
19 computers, we didn't have a FRSSI model; is that
20 fair to say?

21 MR. MORLEY: I think the amount of effort in the
22 commercial sector, the sort of fishing power, is
23 certainly reduced from what it was and that would
24 provide them with -- it would slow the rate of
25 harvest down and they certainly have better
26 technology in terms of communications and
27 monitoring catches available to them.

28 Q In the development of the FRSSI model, other than
29 avoiding low catches, was there another model that
30 should have been considered maybe in that?
31 Because we had the low catch model, but I'm
32 curious, we used to try and fish and catch a fair
33 amount of fish. Was that considered in FRSSI?

34 MR. MORLEY: As I think Mr. Staley pointed out, the
35 model does certainly provide the potential harvest
36 as an output in terms of the numbers of fish that
37 can be taken in -- from any particular run timing
38 group in any particular year. So that, as one of
39 the outputs, is available. It is -- currently
40 there's nothing done with that in terms of
41 analyzing the options per se and if you were going
42 to look at a sort of cost benefit kind of
43 analysis, first of all you'd want to really look
44 at what that meant in terms of jobs and income to
45 people and so you have to translate that, numbers
46 of fish, into where it might be caught, what it
47 might be worth in terms of commercial value and

- 1 what the costs of accessing it might be. So it's
2 a fairly detailed analysis that has not been
3 attempted with -- through this model.
- 4 Q Yes. And that brings me to the role of fish
5 scientists in development of FRSSI models and
6 issues like that. And, Mr. Cass, maybe you can
7 help me. Is it traditional for a DFO scientist to
8 take an advocacy position, say, for weak stock
9 management or high escapement or low escapement or
10 is their job to say here's what'll happen if you
11 do high escapement, here's what'll happen if you
12 do low? Can you fill us in a little bit on that?
- 13 MR. CASS: Yes. Mr. Commissioner, the point of the
14 science is to be objective and to assess data and
15 build models or platforms for analyzing data.
16 It's -- doesn't have the role in advocacy as you
17 questioned.
- 18 Q Thank you. Now, for Mr. Staley and Mr. Wilson,
19 both of you represent interest groups that have
20 interest in the fishery. When you're a fish
21 scientist, these groups must have retained you for
22 a reason. Can you give me some assistance on
23 that? Why would a fish group want a scientist
24 working for them?
- 25 MR. STALEY: First of all, the organization I work for
26 in the main right now is actually a joint First
27 Nation/DFO organization, so it's not strictly
28 working for First Nations in that capacity. But
29 in other cases I have done work for individual
30 First Nations and First Nations groups. They --
31 the reason they're interested is that they see
32 that they have a role in management and they'd
33 like, and they ask me for -- to help them
34 understand some of the analysis that DFO is doing
35 in -- that supports the management and that
36 provides them explanation to them about that.
- 37 Q So would you -- you're on the Fraser Technical
38 Committee, I gather, the Fraser Panel Technical
39 Committee?
- 40 MR. STALEY: I'm on the Fraser Panel Technical
41 Committee, yes.
- 42 Q Any other user group on that technical committee?
- 43 MR. STALEY: Not to my knowledge, no.
- 44 Q In your role on the technical committee or as
45 scientist for aboriginal groups, have you ever
46 argued that a public fishery, commercial or
47 recreational, should be closed to accommodate

1 aboriginal fisheries in the river? And I'm not
2 being critical of you, Mr. Staley. I'm just
3 trying to understand what the role of science is
4 in the management of the fishery and whether
5 sometimes scientists can become advocates.

6 MR. STALEY: I think I would, in some cases, point out
7 when and if plans were being made for harvest that
8 would not be consistent with the distribution
9 that's set out in pre-season plans and some of
10 that distribution of catch is directed towards
11 First Nations, as is -- do the -- you know, the
12 priority right that they -- that many people and
13 they believe they have.

14 Q Not disputing those at all. In the drafting of
15 the FRSSI model or an escapement model or a weak
16 stock management plan or a setting escapement
17 levels, would there be, depending on how those
18 models are set, would there be a benefit for your
19 clients if those models were developed one way or
20 another?

21 MR. STALEY: There would be benefits, I suppose, for
22 different groups if they were done one way or the
23 other. Currently I work for an organization which
24 encompasses -- on issues about where the harvest
25 might take place, that encompasses everywhere from
26 the marine area right up to the top of the
27 watershed, so I think -- I don't -- I'm not there
28 to -- which I think would probably encompass most
29 harvesting interests or perspectives, I guess, and
30 interests. So my role is to be as neutral as I
31 can, at least with the FRAFS organization about
32 where -- about those issues.

33 Q Thank you. Mr. Wilson, you said that you were
34 unhappy with the FRSSI model because you thought
35 -- you didn't like the 60 percent number and there
36 were some other questions about it. I'm curious.
37 What -- is there a general acceptable level of
38 harvest that you would say as a rule was okay
39 if --

40 MR. WILSON: No.

41 Q And why not?

42 MR. WILSON: Well, for example, in recent years we've
43 seen average productivity in the Fraser decline to
44 approximately one which is to say that there is no
45 harvestable surplus because each spawner only
46 reproduces itself. Under low productivity
47 scenarios, there may be no harvest.

1 Q Now, so you -- do you have an ideal escapement
2 level then for each stock?
3 MR. WILSON: Do I?
4 Q Yes.
5 MR. WILSON: No.
6 Q How would you set an escapement level then? Like
7 I'm saying Early Stuart sockeye, do you have a
8 number or --
9 MR. WILSON: No. It's not my job to set escapement
10 levels.
11 Q All on escapement levels. And do you accept that
12 even in off-cycle years versus peak years, you're
13 always trying to get to what we would say is a
14 maximum escapement level then?
15 MR. WILSON: We would have to have a conversation about
16 the role of cyclic dominance and the values we
17 were trying to promote through the management of
18 the resource at that time.
19 Q That wasn't what I asked. I asked do you believe
20 that every cycle in every year in every stock in
21 every year should have maximum escapement? Or do
22 you recognize that there is ups and downs?
23 MR. WILSON: I recognize that there's ups and downs.
24 Q And those are natural.
25 MR. WILSON: To some degree, yes.
26 Q Okay. Now, do you ever believe there's any point
27 when there's too many fish in the spawning
28 grounds?
29 MR. WILSON: That depends on your frame of reference.
30 I think from the standpoint of the harvester's
31 perspective, there are certainly going to be times
32 when there's too many fish in the spawning
33 grounds.
34 Q Almost done. I'm sorry. I was distracted. What
35 was the final bit of your sentence there, your
36 answer?
37 MR. WILSON: There are times when large spawning
38 populations are unlikely to produce large
39 harvestable surpluses in the future. So from the
40 standpoint of maximizing harvest, it is possible
41 to put too many fish on the spawning grounds.
42 Q How many Fraser sockeye stocks have gone extinct
43 in the last hundred years, do you know?
44 MR. WILSON: I don't know.
45 Q What kind of condition is the Early Stuart run in,
46 as a general rule?
47 MR. WILSON: Well, it's recognized as a stock of

1 concern.
2 Q And how much public commercial mixed stock fishing
3 has occurred in that run in the last 20 years?
4 MR. WILSON: You're probably asking the wrong person.
5 Q Mr. Morley, do you know the answer to that?
6 MR. MORLEY: Almost none.
7 Q So despite no public commercial fishing, we have a
8 run that's in trouble. So in other words mixed
9 stock fisheries aren't the only determinant on
10 whether a stock can be in trouble or not? For
11 example, issues like habitat, water temperature?
12 MR. MORLEY: Well, there's a very large range of
13 factors that affect the stock's productivity and
14 it's matching your harvest to the available
15 surplus, if you want to call it that, or to the
16 productivity of the stock. It's really the art of
17 management. I'm not suggesting that, nor have I
18 ever suggested, that commercial fisheries were
19 solely responsible for all the ills of Fraser
20 sockeye.
21 Q How long has the Early Stuart run been -- do you
22 call it a stock of concern or interest or...?
23 MR. MORLEY: Well, it went into decline -- gee, I guess
24 it's been -- in my experience, perhaps the last 15
25 years or so we've been worried about it.
26 Q So the last 15 years, despite no public commercial
27 fishing, but I guess my point is you saw it as a
28 stock of concern and virtually no public
29 commercial fishing on it, there was no FRSSIs,
30 there was no TAMs, but it was recognized that the
31 stock was in -- an issue of concern and the
32 commercial fleet didn't fish it; is that fair to
33 say?
34 MR. MORLEY: I guess it's fair to say.
35 Q Thank you. Mr. Staley, I know one of your
36 complaints about FRSSI was not enough aboriginal
37 consideration in the model. What did the model
38 people need to include an aboriginal portion to
39 consider it in the model?
40 MR. STALEY: One of the things that would have been
41 needed would be a separation of -- or an
42 accounting for two different fisheries, at least,
43 a minimum of more than one and currently the model
44 only in its structure assumes that there is only
45 one fishery.
46 Q What do you mean, one fishery?
47 MR. STALEY: Means there's only one harvest rate. The

1 harvest rate isn't separated by user group or...

2 Q I see. Did the aboriginal groups give the model
3 makers a number to say this is how many fish you
4 need to build into the model for us?

5 MR. STALEY: Not in aggregate, no.

6 Q Can you tell me why?

7 MR. STALEY: No, I can't tell you why.

8 Q But you're their representative in this processes,
9 aren't you?

10 MR. STALEY: No, I'm not representing them in the
11 process. I'm assisting with technical aspects and
12 trying to explain those technical aspects to them.

13 MR. EIDSVIK: Those are my questions, Commissioner.

14 Thank you.

15 MS. GAERTNER: Mr. Commissioner, Brenda Gaertner and
16 with me Leah Pence for the First Nations
17 Coalition.

18

19 CROSS-EXAMINATION BY MS. GAERTNER:

20

21 Q I just want to clear this up. Mr. Wilson, you
22 gave evidence earlier today that at one point in
23 the FRSSI you were actually there for the UFFCA.
24 As you know, UFFCA is one of my client -- in the
25 coalition I represent.

26 MR. WILSON: Yes, that's correct.

27 Q And you're not here representing the UFFCA today
28 in any kind of way; is that correct?

29 MR. WILSON: That's correct.

30 Q And Mr. Staley, you're also not representing any
31 client base in your evidence today; is that
32 correct?

33 MR. STALEY: That's correct.

34 Q Thank you.

35 MR. STALEY: Correct, yes.

36 Q All right. Thank you, Panel, for being here and
37 working through these issues with us. I just have
38 a couple of initial questions. As I see the FRSSI
39 model and process, I'm going to say that they're
40 somewhat a combination of them both, there's two
41 components that I'm using to understand it. One
42 is the technical considerations that inform the
43 modelling, Mr. Commissioner, and the other is the
44 management objectives or trade-off discussions
45 that also inform the modelling and the outcomes.
46 And I'm going to ask some questions first about
47 the modelling and the technical components and

1 then I'll turn more to some of the more management
2 objectives and trade-offs discussions. And I want
3 to first ask what can be done to correct the
4 possible errors associated with the assumptions.
5 Mr. Wilson, perhaps I'll start with you on this
6 and could I have Exhibit 413 at page 4 and 5?

7 Mr. Wilson, you say at -- in your report to
8 the UFFCA at page 4 and 5 that all the stocks
9 within each timing aggregate have the same time
10 running and are equally vulnerable to each fishery
11 is an assumption and it's an assumption in that
12 part of the report and I'll take you to your
13 report and if we begin at page 4 of the report at
14 the bottom, it's in a section called Inappropriate
15 Assignment of Stocks to Timing Groups.

16 MR. WILSON: Yes.

17 Q Are you with me, Mr. Wilson?

18 MR. WILSON: Yes.

19 Q And you see the sentence that it is at the end,
20 second-last sentence -- third-last sentence of the
21 paragraph:

22
23 It is assumed that all the stocks...

24
25 MR. WILSON: Yes.

26 Q Are you with me? So:

27
28 It is assumed that all the stocks within each
29 timing aggregate have the same run timing and
30 are equally vulnerable to each fishery. In
31 reality, we know that Fraser sockeye stocks
32 within the same run timing group can and
33 often do have very different run timing.
34 Depending on the number and timing of
35 fisheries, individual Cu's within a timing
36 group can be harvested at very different
37 rates.

38
39 And then I want to take you one step further in
40 your report in the next paragraph at the -- you go
41 on to talk about overlaps between these managed
42 stock aggregates, and you'd agree with me that
43 these two concerns are somewhat related?

44 MR. WILSON: Yes.

45 Q And with me -- in the paragraph you begin at
46 second-last sentence again of that paragraph:

1 Obvious problems with the assignment of
2 stocks into aggregates were discussed by Dr.
3 Jim Woodey in 1996 --

4
5 And as you know, Dr. Woodey is going to come here.

6
7 -- during his tenure as Senior Biologist for
8 the PSC. Dr. Woodey recommended
9 modifications to the stocks included in each
10 group to better reflect their run timing and
11 to improve management control. In the 13
12 years since Dr. Woodey's memo, little has
13 changed.

14
15 I'm wondering if you could help us understand the
16 nature of that concern as it relates to within the
17 FRSSI model, and then perhaps go one step further
18 and give us some suggestions on how we might
19 improve that.

20 MR. WILSON: Well, my concern is not so much with the
21 FRSSI model as the difference between reality and
22 the FRSSI model when you attempt to apply the
23 advice that FRSSI suggests. For example, within
24 the Early Summer group, we have a range of stocks.
25 The earliest stock to come in from the Early
26 Summers actually migrates with the Early Stuarts.
27 That's the Chilliwack.

28 At the other end of the spectrum, we have
29 Scotch and Seymour, which essentially behave as
30 Summer run stocks. Now, when you're managing an
31 aggregate that includes stocks that are
32 overlapping with both Early Stuarts and Summers,
33 and you have a model that suggests that a fishery
34 will harvest at any particular time during the
35 migration of the Early Summers will harvest in
36 equal proportion of each of the stocks within the
37 Early Summer aggregate, it seems to me a likely
38 source of error in your analysis, because there
39 will be some stocks that will be dominating the
40 Early Summer run at particular times and if they
41 happen to be there when your fishery takes place,
42 you'll harvest a much larger proportion of them.

43 Q Okay. Thank you. Mr. Staley, I'm wondering if
44 you could help a little bit on this topic also.
45 That notion of the overlaps, if I might call it
46 that, amongst the various run timing groups, if I
47 may call it that for a moment, what implications

1 to the modelling that FRSSI uses does this have
2 and how can we better improve that in the model
3 itself?

4 MR. STALEY: The -- well, it depends on whether you're
5 talking about the model that has been used for the
6 four years that we've just come through or you're
7 talking about the model that has just been
8 retooled and put through -- presented to PSARC
9 last year. The new version of the model on this
10 point are quite different than the one, the
11 version of the model that was used four years ago
12 or three or four years ago, in the sense that the
13 new model, the computer model, can actually
14 operate on individual groups so the timing and
15 overlap, if you were to manage them separately,
16 would be not relevant, I suppose.

17 Where the problem is is trying to make the --
18 bring that modelled world into some sense of
19 reality, where they are overlapped in many of
20 these -- in most fisheries, and probably all --
21 most fisheries and try and make some sense of the
22 real world, as Mr. Wilson said, and the modelled
23 world. But I think that in terms of improvements
24 to the model, at least one step has been made and
25 that is to be able to operate the model using on
26 an individual stock basis of the 19 stocks.

27 Q All right. So the model is improving and the task
28 of applying that model is most challenging in-
29 season then?

30 MR. STALEY: That's correct, yes.

31 Q Okay. Thank you very much. I want to go now to
32 the second arm of FRSSI, if I may call it that,
33 which as I understand it is the identification and
34 consideration of escapement and harvest options
35 which can be managed after choosing certain
36 options. And I'm just going to summarize a couple
37 of things I've heard from the evidence and move
38 from it and make sure that my summary is correct
39 to start with.

40 As I understand it, there are three primary
41 objectives that Mr. Cass, you reviewed for us of
42 the FRSSI model and Mr. Staley, at page 17 of your
43 report, I also see the performance measures that
44 are related to those. We don't have to take you
45 to that unless it becomes helpful to you and we
46 can if you want. So we've got the objective of
47 keeping the spawner abundance above the minimum

1 level each year, and I'm assuming the performance
2 model -- or measurement of that is conservation;
3 is that a fair summary?
4 MR. STALEY: That performance measure is trying to
5 represent conservation.
6 Q Okay.
7 MR. STALEY: Reflect conservation.
8 Q All right. And then we have the total catch above
9 the minimum level each year and the performance
10 measure on that would be a stability of supply?
11 MR. STALEY: Correct.
12 Q And I know this seems -- sounds obvious, but I
13 think it's important to put it together for where
14 I'm going, and then the maximum average catch over
15 50 years, that's another objective of the model
16 and that again is the stability of supply. It's
17 just over a longer period of time. That's the
18 performance measure.
19 MR. STALEY: May be more than stability. It may be
20 actual quantity, the size of it. It's not an
21 objective, it's a performance measure and then
22 there would be a -- there might be objectives
23 associated with catching the most fish over 50
24 years, as opposed to the stability of catch from
25 year to year.
26 Q Okay. So I'd like to go one step further now and
27 ask you if it's possible that another objective -
28 and I'm wondering if you could comment on this,
29 Mr. Staley or Mr. Wilson or the panel - that
30 another objective could be ensuring geographic
31 distribution of the stocks throughout the
32 watershed. That's something that actually could
33 be an objective when looking at this type of
34 model. Mr. Wilson?
35 MR. WILSON: Yes. We could have as an objective the
36 delivery of some quantum of fish by geographic
37 region, for example, if your interest was in
38 ensuring that First Nations fisheries were able to
39 access the fish they needed.
40 Q And Mr. Staley or -- if you wanted to add to any
41 of that, is there anything you need to add to that
42 at this point?
43 MR. STALEY: I -- well, just in terms of the version of
44 the model which has been -- was reviewed last
45 year, the only way currently to represent that,
46 calculate that in that calculation framework would
47 be on a -- by recognizing the stocks, where each

1 of the 19 stocks originates and assume that some
2 portion of the harvest is taking place close to
3 where they originate and that that would generate
4 a distribution of geography.

5 Q So that's both the objective and how you'd measure
6 the objective, if that's correct.

7 MR. STALEY: There would have to be an objective about
8 the -- yeah, the geography. If there was an
9 objective about the geography, about the
10 distribution in geography, then the current
11 version of the model would have -- could partially
12 represent that.

13 Q Okay. So the model has that capability. Now, if
14 you added another objective which would be
15 ensuring fish in order to reach FSC priority
16 fisheries throughout the watershed, could the
17 model be tweaked or adjusted to provide for that?

18 MR. STALEY: It might be a challenge in its current
19 form, because the -- well, I said, distributional.
20 In order to distribute the fish to the various
21 groups, the First Nations groups within the river
22 and outside the river, may require a
23 representation of more than one fishery and there
24 is a sort of a key technical point in this, that
25 one fishery -- modelling one fishery makes it a
26 lot simpler. Model two, might as well model a
27 hundred. It's -- the computational and set of
28 assumptions expand sort of exponentially when you
29 add more fisheries. But in order to represent
30 properly the distribution, for example, of catch
31 in the lower river versus catch in the upper
32 river, you'd have to have more than one fishery.

33 Q Mr. Wilson, at page 5 of Exhibit 413, which is
34 your report, you touch on this particular issue
35 which is you suggest that performance of First
36 Nations fisheries be part of -- one of the
37 concerns you raise with respect to the model and
38 at the end of that paragraph you suggest:

39
40 In addition to setting minimum benchmarks to
41 protect Fraser sockeye populations from
42 extinction, it may be appropriate to set
43 minimum abundance levels by geographic area
44 to protect First Nations food fisheries.

45
46 Do you believe that the model should be adjusted
47 to provide for that and it could be adjusted to

1 provide that in a meaningful way?

2 MR. WILSON: Well, it was my understanding that a model
3 was in preparation at SFU that would try to
4 address that side of the question, so it would
5 follow fish into the river, sequentially harvest
6 them and look at the patterns of escapement and
7 abundance by geographic region. That's a separate
8 model entirely. I don't know how he would combine
9 the two, but certainly it's been recognized as a
10 shortcoming of the FRSSI model, if you want to
11 call it that, for some time.

12 Q All right. I'm going to get to that SFU model in
13 a few minutes in another part of my question, so
14 I'll pick that up in a second if I may, Mr.
15 Wilson. Were these objectives, Mr. Cass, to your
16 recollection the objective of ensuring geographic
17 distribution and the objective of providing FSC
18 priority fisheries raised at any of these earlier
19 workshops and if so, were they considered by DFO?
20 And even if they weren't raised, given DFO's
21 obligations to First Nations, did you consider
22 those when looking at these models?

23 MR. CASS: That was not considered. There was no
24 consideration for how you might allocate or
25 arrange stocks geographically. The model, as Mr.
26 Staley pointed out, has one harvest rate that is
27 -- and any sort of allocation scheme or -- beyond
28 what FRSSI was originally designed for.

29 Q All right. Maybe I'll just pick this up. I know
30 that my clients are concerned with this and so I
31 need to understand it. Mr. Staley, you raised it
32 briefly, but this model, FRSSI model, is
33 relatively recent. There have been some case law
34 that's been developed around priority of FSC
35 fisheries and how that might happen. Why was the
36 status quo of one mixed stock fishery used as an
37 assumption within this model, given the
38 complexities of DFO's management obligations? And
39 perhaps I'll start with Mr. Cass and then go to
40 Mr. Staley.

41 MR. CASS: Sorry, could you repeat that?

42 Q Why was -- why did -- when you began FRSSI, you
43 were aware of the complexities associated with
44 meeting FSC priority requirements within the
45 Fraser River and so I'm curious why, when you
46 began this modelling work, did you assume one
47 mixed stock fishery and have maintained that

1 assumption through the development of the model?
2 MR. CASS: Well, it didn't assume one mixed stock
3 fishery. I mean, it assumed a fishery that -- or,
4 you know, there could be several fisheries that
5 would be, if you like, you would need to parse out
6 the harvest rate, the harvest rate that FRSSI
7 would produce, so again, it's related to, you
8 know, the intent of FRSSI originally was to
9 balance or assess the trade-offs and consequences
10 of a range of harvest options. It was not to go
11 further than that in terms of allocation or
12 specify particular stocks that would be given
13 different weight in the model, although as I think
14 Mr. Staley pointed out that that could be done,
15 depending on the specific objective.

16 Q Sorry. Just want to make sure I understand this
17 correct, and Mr. Staley, please correct me if I'm
18 wrong. I've heard the evidence quite a number of
19 times come down to it's assumed that there's one
20 mixed stock fishery in order to run these models.

21 MR. STALEY: Well, it's -- there -- as Mr. Cass says,
22 it is one harvest rate and in the computer model,
23 it's just one multiplication of one factor against
24 the population size at the time as you simulate
25 forward. So that one is not divided in any way.
26 And as Mr. Wilson pointed out in his report, it
27 was applied is that one harvest for any of the
28 aggregates that was operating, it was operating on
29 all of those aggregates at the same time, the time
30 being a time period of one year. So in that
31 sense, they were mixed together, so it was a mixed
32 stock fishery and there was only one.

33 In part, that was -- as Mr. Cass says, it was
34 -- the intent was to look at the, you know, sort
35 of biologically at the trade-offs on productivity
36 on long-term production of harvest versus
37 escapements and versus spawning of making those
38 choices, to assist in making those choices. Also
39 at the time it was developed, I guess since the
40 time it's developed, or at the time it was
41 developed, the -- in order to expand the number of
42 fisheries, in addition to the number of
43 assumptions and data that would -- which are not
44 insurmountable but would be substantial. There
45 was some constraints on the amount of time that
46 someone was willing to dedicate their computer to
47 it. Some of the original computer runs of this

1 model took several days on some people's laptops.
2 Laptops today, only eight years later, would be
3 just a matter of probably minutes rather than
4 hours. So that has changed. So perhaps, you
5 know, the technology has changed, so in principle,
6 this sort of refinements and additions that might
7 more better reflect some of those realities could
8 be done. Which one -- but perhaps not all that
9 should be done, so there's some choices and
10 planning has to be made as to if you're going to
11 use -- continue to develop the model. But that
12 was basically the point. It was there to --
13 currently is there's one harvest rate which is not
14 divided in the model. There's -- and it's applied
15 to all stocks that are in the model at the time
16 it's being run, so whatever mixture it's placed
17 on, and it's -- basically that's the way it works.

18 Q All right. So if I understand, Mr. Wilson, your
19 evidence earlier and if I've understood this well
20 enough, that that other model, so to speak, as to
21 -- that would bring in these other objectives,
22 often people -- we've heard through stock
23 assessment, they referred us back to the SFU
24 model, Mr. Commissioner, and we're now being
25 referred back to the SFU model again today. In
26 terms of this other model that could help to
27 better understand some of the changes that we may
28 need to see in management, where would that
29 marriage of these two models best occur? Is it
30 during a FRSSI analysis or is it during an IFMP
31 analysis? Where does it make the most sense? Or
32 both?

33 MR. STALEY: I'm not sure about the IFMP. Certainly
34 many of the people that I work with, First
35 Nations, are not engaged in IFMP, so it wouldn't
36 engage the appropriate mix of them if you had to
37 do that. Perhaps an expanded version of FRSSI or
38 perhaps another process. But there are some
39 technical challenges to, as Mr. Wilson pointed
40 out, some technical challenges to putting the more
41 detailed in-season migration, both with a lot of
42 detail and time and space with in-season, together
43 with this longer-term view. There are some
44 technical challenges. As I say, probably not
45 insurmountable, but will take some time.

46 Q Okay. Just before I leave this line of
47 questioning, I just wanted to give Mr.

1 Commissioner an example of something that I expect
2 he'll hear about during the aboriginal fisheries,
3 which is totally related to what we're talking
4 about. Often aboriginal people raise a concern
5 around science, around -- it depends on what
6 question is being asked. And so would you agree
7 with me that even in the creation of the initial
8 models that are being reviewed, that's much
9 informed by the objectives that have been set and
10 the questions that are first asked of the
11 biologist that perform the initial modelling? Is
12 this a good example of that problem? There might
13 be different initial models that are created,
14 depending on who's asking the question and
15 depending on the objectives that are being run?
16 MR. STALEY: I'm not sure it matters who asks the
17 question, but more what the question is.
18 Q What the question is.
19 MR. STALEY: And --
20 Q Fair enough.
21 MR. STALEY: -- yeah, I'd have to agree with that. I
22 mean, we saw earlier a document that laid out what
23 were called guiding principles and they had in
24 them that there would be only four aggregates. I
25 must admit, that was -- I don't recall reading
26 that in quite -- that stark language, but if
27 that's a principle that was guiding the
28 development of it, then the model has met that
29 guideline, I guess.
30 Q All right. Thank you. I'm going to next turn my
31 questions to the area around the collaboration on
32 the structured decision making that is part of the
33 FRSSI model and in particular, I noted that you,
34 Mr. Cass, you, that Department of Fisheries and
35 Oceans' efforts around the implementation of FRSSI
36 was largely informed by these workshops that you
37 held in 2007 and 2008. Is it a fair observation
38 to say that in 2007 we did have some technical
39 representatives directly from the groups? I see
40 Pat Matthew is there, Mr. Commissioner has met Pat
41 Matthew and Gord Sterritt is there, Neil Todd is
42 there, Byron Spinks is there. None of these
43 people seem to have attended in the following
44 year. I'm quite sure it's not because they're not
45 interested in salmon. Mr. Staley, could you
46 perhaps comment on why it may be difficult to get
47 these First Nations people to continue to

1 participate in a FRSSI discussion?

2 MR. STALEY: Well, it would be a combination of
3 factors. I recall that the -- I believe it was
4 the 2007 workshops, the workshops that engaged the
5 structured decision-making, whether they were
6 2007, 2006, I can't recall, but many of the people
7 there, including the ones you listed who are First
8 Nations origin are really technical people.
9 They're not representing the sort of the
10 positional or, you know, interests of their
11 groups. In some cases they may represent the
12 interests of their group, but that's not broadly
13 representative of the -- in that context, much
14 like the question that Mr. Morley responded to
15 earlier that they were there as participants.

16 They felt very uncomfortable, being asked the
17 questions of interest and objectives that was
18 being put to them, so I know that some of them
19 decided not to return. The other is that also
20 it's very challenging technical exercise and some
21 of them thought that their time would be better
22 spent doing something else than -- because they
23 were struggling with understanding some of the
24 concepts -- not the concepts, but some of the
25 output and the approaches that were being used.

26 Q Mr. Cass, in Exhibit 398 which is the report that
27 was done on this process by Mr. Pestal, Mr. Ryall
28 and yourself, we've seen a number of times, at
29 page 22 of that report you're summarizing the
30 challenges associated with the -- what worked well
31 and what needs to be improved and at the end of
32 the page, page 22 at the bullet that begins:

33 The spawning initiative...

34 The spawning initiative...

35 The spawning initiative...

36 The spawning initiative...

37 The spawning initiative...

38 The spawning initiative...

39 The spawning initiative...

40 The spawning initiative...

41 The spawning initiative...

42 The spawning initiative...

43 The spawning initiative...

44 The spawning initiative...

45 The spawning initiative...

46 MR. CASS: Yes, Mr. Commissioner, I'm not sure I can
47 give you an answer to that because of my -- my

1 involvement was largely focused on the model and
2 the technical side of it and so I'm not sure what
3 steps might have been taken to help with that
4 particular statement in this.

5 Q All right. Mr. Ryall's coming later to talk about
6 these things, so I'll pose the question then.

7 Mr. Wilson, do you have anything you'd like
8 to add, any observations that you have with
9 respect to the challenges of First Nations
10 participating in these processes?

11 MR. WILSON: I guess my primary concern is that we go
12 the extra mile to make sure that people really
13 understand the tools that are being used to manage
14 their fishery. I recognize how complex the FRSSI
15 model is, but I'm still not prepared to accept the
16 argument that it can't be explained sufficiently
17 so that people can use it. If people don't
18 understand it, then they really shouldn't be using
19 it, because they're really just taking the output
20 from the model as -- on faith, if you like. And I
21 have a serious concern with that. I think people
22 that are making management decisions about their
23 own fisheries should have the tools in their own
24 hands to evaluate the outcomes of the actions they
25 plan to take. So I think it's critically
26 important that if we're going to go down this road
27 of developing complex computer models to guide our
28 fisheries management decisions, that we at the
29 same time invest a lot of effort in learning how
30 to explain these models to the people that are
31 being affected in language that they can
32 understand.

33 Q Thank you, Mr. Wilson. Mr. Staley, I'm just going
34 to pick up this point right here right now. In
35 your report you actually go as far as suggesting
36 that research be done with respect to this, and so
37 there's two things I want to clear up, one of
38 which is Ms. Baker yesterday asked if First
39 Nations are able to understand and you responded
40 yes. And from there, you were talking about the
41 sheer ability, the brain ability, of course, of
42 First Nations; am I right on that?

43 MR. STALEY: Yes.

44 Q Yes. But in your report, you do suggest that it's
45 important to do research, in fact, in how to
46 communicate; that's correct?

47 MR. STALEY: Yes.

1 Q Now, Mr. Staley, I'm going to make a fair
2 observation about your work. As you know, I've
3 watched your work for many years. You're a non-
4 aboriginal expert who likes to work with numbers
5 and actually understands numbers and you've stood
6 the test of time in First Nations communities.
7 Those three things are something to note when
8 asking this question.

9 Why is it, given that you have been able to
10 do your best at communicating and you have stood
11 the test of time, that you are recommending
12 research be done on how properly to communicate
13 this? This is not from lack of ability. This is
14 a lack of concern -- or this is an actual concern;
15 am I correct in that?

16 MR. STALEY: Yes.

17 Q And what do you suggest, what do you think we
18 should be doing, to try to better understand how
19 to communicate the implications of these types of
20 modellings on people's ability to fish?

21 MR. STALEY: Well, I guess the reason I put research in
22 there is because I don't know and I'd have to
23 research it. I have some ideas that others than
24 people like myself should be engaged in first of
25 all understanding the model and trying to
26 understand how to communicate that to, you know,
27 people in -- certainly in First Nation communities
28 who are going to be affected by it and need to
29 understand, as Mr. Wilson said, need to understand
30 how it affects them. So that's what I recall I
31 was meaning by the comment of research, is that we
32 need to spend some time to try and -- with the --
33 one, people who know how to speak to these people
34 -- that's not the right word, but speak -- but
35 also get them to understand as well as they can.
36 I -- you know, I've tried to explain FRSSI in
37 several settings in several workshops over the
38 last two or three years and I don't think I've
39 been successful yet, so...

40 Q So is it fair to say that we need to take care to
41 assume that biologists, people that are trained in
42 science, have these skills?

43 MR. STALEY: Well, they have some of the skills and
44 have support from people who have the full set of
45 those skills.

46 Q I wonder if another one of the challenges
47 associated with the communication is access to the

1 right First Nations people in a timely manner. So
2 I'm going to switch it now. We've talked about
3 the challenges of the communicator. Now I'm going
4 to talk about the challenges associated with who's
5 being communicated to.
6 So would you agree that some of it also
7 includes challenges associated with getting
8 consistent representatives at the meetings on
9 behalf of First Nations who have mandates?
10 MR. STALEY: Yes, that is true, yes.
11 Q And would you also agree that the challenge is
12 having leadership attend alongside technical
13 support when trade-off discussions are occurring?
14 MR. STALEY: Yes.
15 Q And, Mr. Wilson, would you also agree that the
16 implications of these options may be very
17 different, depending on the First Nations
18 interests that are being considered?
19 MR. WILSON: Yes, I would.
20 Q And Mr. Staley, would you also agree with me on
21 that?
22 MR. STALEY: Yes.
23 Q Mr. Wilson, I know that you're under extreme time
24 pressures and you need to leave. Why don't I --
25 would you like to stay or would you like to leave
26 and if I can do my best to ask the rest of the
27 questions of the panel and anything else --
28 MR. WILSON: That's fine.
29 Q -- I pick up with you tomorrow is -- would you
30 prefer that?
31 MR. WILSON: Yeah, tomorrow I'll be here.
32 MS. GAERTNER: All right. I'll do that, finish with --
33 if there's any further questions I have of Mr.
34 Wilson on these topics, then I'll pick it up with
35 him tomorrow, Mr. Commissioner, if that's
36 agreeable.
37 THE COMMISSIONER: Mr. Wilson, do you have a couple
38 more minutes?
39 MR. WILSON: Yes.
40 THE COMMISSIONER: I just wanted to ask one query while
41 he's here --
42 MS. GAERTNER: Please.
43 THE COMMISSIONER: -- and with these panel members, if
44 I might --
45 MS. GAERTNER: Yes.
46 THE COMMISSIONER: -- and I apologize for
47 interrupting --

1 MS. GAERTNER: No.

2 THE COMMISSIONER: -- Ms. Gaertner. I do.

3 MS. GAERTNER: Please.

4 THE COMMISSIONER: I just wanted to pick up on
5 something that Mr. Eidsvik asked the panel and see
6 if I can get an understanding of your answer to
7 him. He asked why FRSSI? And I don't mean to be
8 overly simplistic and I don't mean any insult to
9 him. He was -- he gave more than that, but
10 essentially that was the topic. And then he went
11 back and you heard his historical references and I
12 think, Mr. Morley, you picked up on the historical
13 references.

14 In Tab 6 of your binder, which is the CSAP
15 working paper at page -- it's under two methods.
16 I'm not sure -- the page number is 5, I think.
17 After talking about what FRSSI does, it then says
18 what it doesn't. And you talked about, Mr.
19 Wilson, and any of the members of the panel talked
20 about this earlier today, but it says:

21
22 However, the current model is not set up to
23 address the following:

24
25 In-season management strategies.

26
27 And I may be misunderstanding the dialogue between
28 yourselves and Mr. Eidsvik, but if it's not
29 dealing with in-season management strategies, how
30 is it different than pre-FRSSI in terms of
31 managing the in-season fishery? If this model is
32 not designed - and it says it here - to address --
33 not deal with, but address in-season management
34 strategies, alternative fishing plans, catch
35 sharing, annual adjustments, how is it different
36 than pre-FRSSI for in-season management? Because
37 that's where I'm a bit lost in the exchange you
38 had with Mr. Eidsvik. You're saying it's needed,
39 and you said why it's needed, what the changes
40 were, what it was addressing in terms of the
41 changes, and yet here it says it's not dealing
42 with in-season management. So it either is or it
43 isn't.

44 MS. GAERTNER:

45 Q Mr. Commissioner, I wonder if I could ask one
46 question in addition to that, that may be helpful
47 to that question and the panel, which is, as I

1 understand it, and correct me if I'm wrong, there
2 is a guiding rule as to the total annual mortality
3 that comes out of FRSSI that is actually applied
4 in-season. How it's applied and the variations
5 that are determined in-season is still the
6 challenge of managers, but that as a rule that
7 through the FRSSI we take into in-season, Mr.
8 Staley, since you're on the Fraser River Panel,
9 you might be the best to answer that question.
10 MR. STALEY: I'm on the technical committee.
11 Q The technical committee, sorry.
12 MR. STALEY: Mr. Morley's on the panel.
13 Q Oh, Mr. Morley is on the panel, so that could be
14 helpful.
15 MR. STALEY: So, yes, that's the case. I mean, the
16 FRSSI is, as I said before, FRSSI is used before
17 the season. In-season it's the results of FRSSI
18 that are used as guidelines to guide but not --
19 but the model itself is not used in-season to do
20 any other calculations. The calculations that are
21 used in-season are using the agreed-to or the pre-
22 season TAM rule which is informed by the FRSSI
23 process and established by the minister now to --
24 as guidelines for doing the calculations for what
25 is the allowable catch at any point during the
26 season.
27 Q So we don't -- sorry. We don't make adjustments
28 to the TAM rule in-season any longer; is that
29 correct?
30 MR. STALEY: That's correct.
31 Q Is that helpful, Mr. Commissioner?
32 THE COMMISSIONER: Well, it does, because does that
33 mean that there should be an amendment to the
34 statement or still a clear statement?
35 MR. MORLEY: No, that's -- that's -- from my point of
36 view as a panel member that -- it is definitely a
37 clear statement and I think the distinction that
38 was being drawn in -- before is that we're --
39 through this process, through the FRSSI process,
40 we're developing these TAM rules for each of the
41 four run timing groups, which are then fixed and
42 it's based on this long-term 48-year projection as
43 to what, given all the uncertainty and the
44 variables and the potential changes, what the
45 strategy over the long term might -- what the
46 implications might be for these populations and
47 given their population dynamics. That, as Mr.

1 Staley indicates, informs the decision that's made
2 on the rule. Once the rule is put in for each of
3 the four run timing groups, regardless of what we
4 actually see come back in that given year, if you
5 -- if based on the actual experience in-season you
6 might want to make a different decision, FRSSI
7 isn't used for that, isn't set up to analyze that.
8 It only analyzes this long-term kind of approach
9 to things.

10 And previously we might change our management
11 based on the relative strengths of the particular
12 run timing groups that were coming back in that
13 particular year. With this current approach
14 that's inspired by FRSSI, we have these fixed
15 rules that don't change.

16 THE COMMISSIONER: So based upon historical data,
17 you're able to project and do I take it there's a
18 consensus on the panel - that's why I wanted Mr.
19 Wilson be here, that this model which uses
20 historical data to project the future, that then
21 fixes the TAM for the annual assessment is a
22 better management model than was there pre-FRSSI?
23 Is that what you're saying? It's a model. I
24 think Mr. Cass has said many, many times it's just
25 a model, but it's being used and it's being used,
26 as you are telling me now, to fix the TAM for in-
27 season management. So you're saying based on
28 historical data but projecting 40 years into the
29 future, using the TAM for in-season management,
30 that's a better model than pre-FRSSI? I'm just
31 curious as to -- because that's something that
32 would help me understand your dialogue with Mr.
33 Eidsvik.

34 MR. WILSON: I would agree that it's a better model for
35 two reasons: one is that the exploitation rates
36 are generally lower. The other is that the TAM
37 rule allows us to set maximum mortalities and
38 accounts for fish that might disappear on the way
39 to the spawning grounds. So we don't harvest fish
40 and later find out that even more are missing and
41 see shortfalls on the grounds. We estimate as
42 well as possible how many fish may disappear or be
43 unaccounted for on their homeward migration and we
44 reduce fishing pressure to compensate. So I think
45 for those reasons particularly it's an
46 improvement. It's a step in the right direction.

47 THE COMMISSIONER: Thank you.

1 MR. MORLEY: I would say that the -- it's telling that
2 Mr. Wilson's first response as to why it's a
3 better model is because he's looking at results.
4 From his point of view, which is he wants to see
5 more escapement and exploitation rates are lower.
6 So I think that again, from my point of view, I
7 think it is a model that tries to capture more of
8 the changes that we've seen in the environment
9 than were there previously. And so it tries to
10 deal with things like en route mortality and
11 certainly does a better job of understanding
12 what's happening with the population dynamics.

13 In terms of making decisions as to what the
14 best strategy is for balancing escapement needs,
15 biodiversity versus yield, I think it has some
16 serious deficiencies that need to be looked at.
17 And so there are some explicit trade-offs made
18 that rule out a lot of the analysis of some of the
19 options. For example, we talked about having a
20 maximum 60 percent TAM rule in our discussions
21 yesterday and there's no analysis within this
22 process to what might be the implications of a
23 maximum 65 percent or a maximum of 70 percent or
24 80. It's just sort of been taken off the table
25 and there's no analysis at all done.

26 So from that point of view, we're limiting
27 the options and we're limiting the information
28 that's being put in front of decision-makers. So
29 it's -- while it might characterize the underlying
30 biology better, it's, I think, a not a very good
31 way to analyze this trade-off currently between
32 yield and biodiversity.

33 THE COMMISSIONER: Mr. Wilson, thank you very much for
34 your patience. I realize you have to leave and
35 thank you, panel members, for those answers.
36

37 (MR. WILSON LEAVES HEARING ROOM)
38

39 MS. GAERTNER:

40 Q I just want to pick up on this discussion again,
41 if I may, one more further question. It seems to
42 me that one of the possible benefits of having
43 some rules before you go into in-season is the
44 complexities of in-season. And so we've at least
45 established a guideline in-season one less
46 variable. Would you agree with me that that's
47 useful during the in-season hecticness of

1 management, Mr. Staley and Mr. Morley?

2 MR. STALEY: Well, it does sort of take one of the
3 moving balls off the table, so we can focus on the
4 other ones. But that being -- well, the other
5 thing it does is it provides a -- for those who
6 are outside the room, which much of this decision-
7 making is taking place, such as both inside DFO
8 and the Fraser Panel, it provides some
9 understanding of what the goalposts and what the
10 guidelines are for those decisions to those who
11 don't follow -- who are affected by it but don't
12 follow it as closely as people like myself and Mr.
13 Morley. So it's important from that perspective.

14 Q Mr. Morley, would you agree that helping to
15 determine some goalposts prior to in-season is
16 useful?

17 MR. CASS: I think absolutely trying to set out some
18 goalposts and some ways in which you are going to
19 evaluate changes to those goalposts is something
20 useful to do ahead of the season, yes.

21 Q Thank you. Just while we're on the topic, there
22 is this move of from FRSSI, the IFMP and then
23 we're in-season. How has the FRSSI process and
24 the work that's been done help to inform perhaps
25 the usefulness of more concrete or transparent
26 guidelines for in-season decisions?

27 MR. STALEY: Could you ask it again, please?

28 Q All right. You've done some work at across -- you
29 know, you're struggling with representation from
30 First Nations, we've heard that evidence, but
31 let's assume that for a moment you're doing work
32 cross-sectorally and with the department to
33 establish certain rules and guidelines that help
34 to make decisions in-season. From that experience
35 with participating in that process, would it be
36 useful to have clearer in-season guidelines or
37 decisions, decision-making structures that you
38 would implement? And having had the FRSSI
39 experience, what type of guidelines would be
40 useful and, you know, you're using objectives and
41 performance measures and you're trying to use both
42 of those actively. Would that be useful for in-
43 season discussions and guidelines associated with
44 that at the Fraser Panel?

45 MR. STALEY: It might be useful. I expect that the
46 pace at which decisions get made in-season, it
47 would be a challenge to implement, you know, an

1 analysis -- sort of a real-time analysis of the
2 type and debate and discussion of the type that
3 goes on in the -- well, did go on in the
4 development of the work associated with FRSSI.
5 That being said, I guess as Mr. Morley said, there
6 also needs -- the guidelines and goalposts are set
7 up pre-season, we've had some experience that
8 they're -- you know, that there may be reasonable
9 reasons to adjust them in-season and we don't have
10 a process, a transparent process, in order to do
11 that now and so perhaps some work on the -- how to
12 -- in addition to guidelines like FRSSI and other
13 parts that are in the IFMP, some mechanism that
14 can make adjustments to that but that the others
15 who are not in the room are made aware of and is
16 -- I mean, I don't like the word "transparency"
17 either, but are available to and accessible to
18 others who are going to be affected by it.

19 Q Mr. Morley?

20 MR. MORLEY: I would agree with that.

21 Q Thank you. Just turning briefly, I -- the logic
22 of the order is a bit skewed 'cause I was helping
23 -- trying to get Mr. Wilson out of the room. I
24 want to go back to the generation of the options
25 and I just want to ask some basic questions. Who
26 does the initial short-list of these options? Is
27 that a DFO exercise? You could have a hundred and
28 fifty options, as I understand it from the
29 evidence. The modellers might have fun doing
30 that, but you don't come up to the first meeting
31 with a hundred and fifty options. You come down
32 with three to five, as I understand it. Who
33 selects those three to five?

34 MR. CASS: I'm thinking back a few years now, but it's
35 in the 2008 report with Pestal et al that there is
36 a working group, a cross-sectoral working group.
37 Now, I had to think back when I read that about
38 what that really meant, but in that report it --
39 there is -- there was some choices made annually
40 based on the outputs from FRSSI to render down the
41 number of choices to some options, and part of
42 this was in 2007 I think was also this so-called
43 structured decision-making was designed to, if you
44 like, separate the important from the unimportant
45 based on the preferences that were explored then.
46 Others might have a...

47 MR. STALEY: It's my recollection that, yeah, that the

1 set of options that emerged for the early part of
2 the implementation of FRSSI which was in
3 2006/2007, were discussed and I guess reviewed in
4 these workshops that have been identified. Since
5 then, it's been my understanding that it's been
6 basically those -- the sort of general character
7 of those options hasn't changed very much and
8 there's been some slight alterations, but they've
9 been basically carried forward and the sort of --
10 the process of doing that's been done internally
11 in DFO for 2009/2010, I think.

12 It was my understanding that the original
13 implementation was going to be for one cycle,
14 2006-2010 we were going to -- there was going to
15 be a process to review it for 2011 which, I guess,
16 given where we are in the season and what people's
17 schedule is already is unlikely to happen before
18 the 2011 season, according to my understanding.
19 But maybe I'll be surprised. But -- and at that
20 review, that would open that up and there perhaps
21 would be different approach to setting those. But
22 my recollection last two years anyway has been,
23 you know, -- has been proposed by DFO. They've
24 been effectively proposed, but they were based, in
25 part, on the discussions that went on for the
26 earlier seasons, sort of modified to whatever --
27 minor ways to sort of match 2009/2010 seasons.

28 MS. GAERTNER: Mr. Commissioner, I have two areas left
29 to ask questions of. Would you like to take the
30 break now?

31 MS. BAKER: Mr. Commissioner, I do note we have two
32 other parties that still need to ask questions
33 before this panel sets down.

34 MS. GAERTNER: I'm still within my time estimate.

35 MS. BAKER: You said 45 minutes. I think we're past
36 that now.

37 THE REGISTRAR: Hearing will now recess for ten
38 minutes.

39
40 (PROCEEDINGS ADJOURNED FOR AFTERNOON RECESS)
41 (PROCEEDINGS RECONVENED)
42

43 MS. GAERTNER: Mr. Commissioner, the benefit of a break
44 is that I've gotten rid of a couple of questions.
45 I'll only be a few more minutes on my feet.
46
47

1 CROSS-EXAMINATION BY MS. GAERTNER, continuing:
2

3 Q Mr. Staley, I just wanted to pick up and have you
4 assist the Commissioner a little bit in
5 understanding. We spoke briefly yesterday about
6 the trust issue and the challenges associated with
7 trust. And I don't want to go over that too
8 quickly because sometimes people just assume that
9 it's just a historical distrust, that's the only
10 distrust that we're talking about. Could you
11 provide other examples of distrust that occur and
12 perhaps if you want me to give you some
13 suggestions on that, what happens when First
14 Nations, in your experience, see models that are
15 being run by desk science and aren't ground-
16 truthed in particular ways, there aren't
17 involvement of ground-truthing. Does that cause
18 concerns? What other kinds of distrust occurs in
19 this kind of setting that we have to be sensitive
20 to when moving forward?

21 MR. STALEY: Well, certainly, that is one. Most of the
22 First Nations that harvest these fish live in the
23 area, they're in the field so to speak, they're
24 not at the desk, although a lot of them I work
25 with spend a lot of time in meetings these days,
26 but they are field oriented. Many of them do fish
27 themselves and so they try and relate what people
28 like myself and Al talk about in terms of what
29 they see on the river and it's almost impossible
30 to make that connection for them. They also -- I
31 mean, their trust, there's a phrase that strikes
32 me quite often that I hear some of the leaders use
33 and that's "being planned out of the plan." And
34 that's a trust issue. They don't have confidence
35 that they'll be planned into the plan. And
36 especially when they don't understand how the plan
37 is developed, they don't have a good ability to
38 grasp it.

39 In some cases, I've been able to, you know,
40 sort of use my position with some of the people to
41 say, "Well, as far as I know, this is what it
42 means to you," and that's come some way, but they
43 have difficulty trusting things that they can't
44 see, they can't feel, doesn't appear real to them.

45 Q And another example I wonder if you could comment
46 on so, for example, with the FRSSI model in
47 particular, again, the assumptions behind that

1 model, and which is that one fishery that occurs
2 in time, when they learn about assumptions like
3 that, does that make it a model that, in some
4 cases, makes it more difficult to trust?

5 MR. STALEY: Well, they don't see themselves in that
6 one fishery so if they can't see themselves there,
7 they can't trust it. So yes, that does affect
8 them. As I said, they need to see things. They
9 need to see themselves, where they fit in, where
10 is their -- where has their reality been
11 reflected? And it's hard to demonstrate to
12 anybody that their reality is somehow running
13 around on electrons inside of a little box on the
14 top of the table. So there's problems that side,
15 but there's also just the general problems, even
16 of trust even amongst -- particularly, I guess,
17 amongst some of the leadership for the dealings
18 that have occurred over generations and, in some
19 cases, continued to with Department of Fisheries
20 and Oceans, some interactions with them which find
21 their way into venues similar to this eventually.
22 And it's difficult to overcome those, difficult to
23 bridge that gap.

24 That being said, the relationships that are
25 -- some of that trust needs to be personal. The
26 leaders have to develop real relationships with
27 real people and I think in some places on the
28 Fraser River, that has started, both with some of
29 the DFO staff, with some of the participants in
30 some of the other sectors that meet with them on a
31 regular basis. There's beginning to be at least a
32 degree of trust that not necessarily that their
33 interests are being preserved in any way, but at
34 least they understand what the other party might
35 be doing to them.

36 Q All right. And then I wondered whether or not
37 when explaining the FRSSI model, has it been
38 difficult for them to understand that the model is
39 geared towards a 40 or 50-year horizon, especially
40 when they're not seeing any changes in the
41 immediate future?

42 MR. STALEY: Well, that sort of cuts both ways. They
43 don't see anything in the immediate future and 40,
44 50 years isn't long enough. It's not seven
45 generations so it does cut sort of both ways. But
46 that was a -- the choice of the horizon was, I
47 guess, a convenience for the modellers as much as

1 any sort of policy decision. It was -- and maybe
2 that can be reviewed, but yes, they haven't seen
3 much change recently in their position amongst the
4 -- in the management of the resource and at the
5 same time, it doesn't appear like -- it appears
6 like 48 years may be too short a time horizon for
7 some of their cultural needs.

8 MS. GAERTNER: Thank you. Mr. Commissioner, I only
9 have one remaining question and it's not
10 particularly on topic.

11 Q Mr. Staley, when I was asking questions of Mr.
12 Lapointe quite a while ago, or maybe even just
13 last week, we went to one of your reports in June
14 2007, and Mr. Lapointe wanted to, from his
15 perspective, correct something, a paragraph in
16 that report. Am I correct that in that report,
17 you chose the Bayes model to reflect the range
18 that was being considered, but at that time, you
19 were -- but there were other models that were also
20 being considered and those were not included in
21 your report?

22 MR. STALEY: Yes, that's the case. The Bayes model of
23 the time, the new version of the Bayes model would
24 have -- the sort of misunderstanding that Mr.
25 Lapointe and I had over that paragraph would not
26 have occurred.

27 MS. GAERTNER: All right. Those are my questions, Mr.
28 Commissioner.

29 MR. WATSON: Mr. Commissioner, it's Chris Watson. I'm
30 counsel for the Area G Trollers on the West Coast
31 of Vancouver Island, and the United Fishers and
32 Allied Workers' Union.

33
34 CROSS-EXAMINATION BY MR. WATSON:

35
36 Q I'm going to start with one or two general
37 questions, but leading into that, put out a couple
38 of trite points that I believe that there's
39 consensus on, but correct me if that's not the
40 case. There's consensus among the panel that with
41 increased escapement at some point along the
42 range, there is decreased productivity and to
43 maximize productivity, the returns of fish, you
44 want to avoid both under-escapement and over-
45 escapement. So I don't think there's any doubt
46 there's consensus on that. But with that in mind,
47 what I'm thinking about is what Mr. Cass said, I

1 think it was yesterday, there were -- I heard the
2 phrases "harvest ceiling" and also a "no fishing
3 point." So you have, at both ends of the run size
4 range, cut-offs for harvesting. With the points
5 that we have consensus on, though, that with
6 increased escapement, there is a decline in
7 productivity, would you agree that there ought to
8 be an escapement ceiling, Mr. Cass?

9 MR. CASS: In a perfect world, and you knew what that
10 ceiling was, I would say that's correct. It would
11 pose challenges in mixed-stock fisheries where
12 different components of the aggregate in a mixed
13 stock have different optimal or fully-seated
14 capacities, they have different sized lakes and
15 nutrients, that kind of thing. So it's a yes and
16 no answer. It's what you don't want to hear, but
17 that's what --

18 Q And Mr. Morley?

19 MR. MORLEY: I mean, I would agree somewhat with Dr.
20 Cass that, in fact, certainly, if you were looking
21 at maximizing total productivity across the range
22 of stocks, then you would look at wanting some
23 kind of escapement ceiling. If you were concerned
24 about impacts on certain individual stocks, then
25 that could cause a problem in mixed-stock
26 fisheries, but that's the kind of trade-off
27 analysis that needs to be undertaken to look at
28 just what the extent of biodiversity impacts there
29 may be and whether or not some of these other
30 populations can be sustained at a lower level than
31 their optimum level, and doing those kind of
32 analyses could help determine, you know, where we
33 might want to get to in that maximum escapement
34 level.

35 Q That brings me to another point. One of the
36 questions of Ms. Baker in direct yesterday, and I
37 thought it was one of the most important questions
38 that we heard, and that is how much biodiversity
39 is enough? And I don't, from what I picked up in
40 the answers, I didn't pick up a very clear answer.
41 I heard from Dr. Staley, though, albeit this was
42 in response to a different question, that we just
43 don't have that information. But would you agree
44 that finding out to the extent possible the answer
45 to how much biodiversity is enough is a critical
46 thing to have in determining the right escapement
47 numbers? Dr. Staley?

1 MR. STALEY: Well, I don't -- I'm not sure it's
2 directly relevant to what the escapement should
3 be. The biodiversity is more about what are the
4 different kinds of animals in different kinds of
5 habitats you might want to have, not -- so it's
6 the numbers of occurrences of them, not the
7 density or the population of any particular
8 population as much. So you want to -- you know,
9 biodiversity is about having a variety of
10 genetically-programmed responses that the fish
11 might have to unexpected or unknown, or even known
12 potential threats. And that's usually by having
13 representation of different kinds of fish as
14 opposed to the total number.

15 In terms of whether there can be too many
16 spawners, I think that's where you're getting to,
17 and whether there should be an escapement cap, I
18 guess two comments to that. One is that it is --
19 some people would say it's still just a hypothesis
20 that there is sort of a bending down of the stock
21 recruitment curve at higher points. That was a
22 proposition by Dr. Ricker over 50 years ago, I
23 guess. Some observation of the data suggests that
24 we haven't observed very many occurrences out at
25 that range. Others would suggest that what we've
26 seen in -- as referred to earlier, what we've seen
27 in the last decade, or so, of the declining
28 productivity is as a result of that downturn on
29 the productivity. I don't think the answer to
30 that is clear yet. I don't think we've seen
31 enough of either side of that. The 1987
32 rebuilding strategy, one element of that was to
33 try and test to see if there is a bending down of
34 the stock recruitment curves. And also to deal
35 with issues of whether the cyclic dominance was a
36 limiting factor in the total production from the
37 resource. But those two -- I don't think, at
38 least my observation of the data, and look at the
39 information that we haven't answered those
40 questions, the test isn't over yet.

41 Q But you would agree, Dr. Staley, that the
42 decreasing productivity with the increasing
43 escapement numbers, that's the leading hypotheses
44 or the leading theory; isn't that true?

45 MR. STALEY: The models that assume that are the models
46 that are most prominently used. Whether it's
47 because that part of the model is the most likely

1 or most believed is a matter of question. Dr.
2 Ricker, in his original proposition of that model
3 proposed several mechanisms for why that might
4 occur, and those are all reasonable mechanisms.
5 But as I suggested, we have had little -- over the
6 time period when we've been observing these
7 animals with precision and with the kinds of
8 precision we have over the last 50 years, we
9 haven't observed many -- enough occurrences at
10 that high population to know statistically whether
11 it exists, or not.

12 Q I'll ask you about the rebuilding strategy that
13 you referred to, but before we get to that, just
14 approaching it chronologically, prior to 1987,
15 prior to the rebuilding strategy, or the
16 rebuilding plan as it's called, we've already
17 heard that the harvest rates were in the range of
18 75 to 80 percent. And Mr. Eidsvik took you
19 through what the returns were, what the
20 productivity was when the harvest rates were in
21 that range. He took you through various decades
22 and asked you answer.

23 One other question about the state of returns
24 prior to the rebuilding plan is were the returns
25 more stable than after the rebuilding plan and
26 FRSSI came into effect?

27 MR. STALEY: I'm not sure what you would mean by
28 "stable." I believe the variability from year to
29 year was similar, it may have been somewhat
30 smaller, but it may not have been as -- I'd have
31 to look at the data, look exactly what you mean by
32 that. I know that the variability in the last 10
33 years, or so, has been significant. There have
34 been significant periods of variability in
35 historical record. There's also been other
36 changes in the environment. We've had other
37 occurrences of warm and cold events. And whether
38 the variability may have as much to do with those
39 kinds of things as it does with harvest, we don't
40 have the tools yet or the data yet to completely
41 answer that question one way or the other.

42 Q I'll ask the same question of Mr. Morley. Are you
43 able to say whether before the rebuilding plan in
44 FRSSI the returns were more stable than after?

45 MR. MORLEY: I mean, I think that it's difficult to
46 take your perspective away from what's happened in
47 2009 and 2010 and, clearly, there is no period in

1 history where you had returns as dramatically
2 different from one year to the next as that. And
3 in terms of the overall timeframe from 1987
4 upwards versus what happened prior to that, I
5 think we had a time period when we saw some fairly
6 strong returns in growing returns from 1985 to the
7 early 1990s. Since then, I would say that -- I
8 guess it's really a matter of your timeframe that
9 you're looking at in terms of stability, and you
10 can pick 10-year periods where things are stable,
11 but if you look over 30 or 40-year periods,
12 there's variability in both regimes.

13 Q Okay. I'll press ahead here. The rebuilding
14 plan, we've heard, started as an experiment, and
15 you were asked why FRSSI, but I'd also like to
16 step back and ask why the rebuilding plan? And my
17 understanding from what I've heard so far is that
18 the only issue that led to the rebuilding plan
19 was the Salmon Treaty. And we've heard, a short
20 while ago, of the U.S. having a fixed number of
21 fish under the treaty and so Canada wanted
22 increased escapement. But was that the only
23 issue? That was the only if it can even be called
24 a problem that led to the rebuilding plan?

25 MR. MORLEY: Well, one of the other issues at the time
26 was this debate surrounding, again, cyclic
27 dominance and whether cyclic dominance was an
28 artefact of the Harvest Management Plan where, in
29 fact, the IPSFC for the non-dominant cycles
30 actually had exploited them at a higher rate and
31 deliberately put fewer spawners on the spawning
32 grounds. So whether that was an artefact of that
33 harvest regime, or whether there was some
34 underlying biological cause of that, and part of
35 the experiment was, in fact, to try and increase
36 production on the off cycles in the ones that had
37 cyclic dominance. So that was part of the
38 experiment, as well, and part of the reason for
39 it.

40 MR. CASS: Yeah, I was just going to add, Mr.
41 Commissioner, that at that time, too, as the
42 populations were growing, there was a realization
43 that there was still high uncertainty in what the
44 habitat, freshwater habitat could support. And
45 quite varying estimates, depending on whether you
46 were looking at the spawning ground areas, and the
47 lake rearing capacity. Quite different estimates,

1 depending on whether you looked at the spawning
2 grounds, or within the lakes where the juveniles
3 rear. So apart from what's already been said,
4 there was still a lot of uncertainty about how far
5 you could increase the production capacity of the
6 Fraser system and, hence, the economic yield from
7 that.

8 Q And by that, you mean increasing production?
9 MR. CASS: Yes.

10 Q Increasing returns?
11 MR. CASS: Yes.

12 Q And the rebuilding plan, as it's been called now
13 several times, being an experiment, we did not
14 see, of course, increasing production following
15 the introduction of the rebuilding plan, you would
16 agree with me with that?

17 MR. CASS: Well, we say, you know, depending on which
18 year you want to pick in the '90s as a turning
19 point, a peak in say, '93, and a decline since
20 then so --

21 Q Right. Persistent declines, I've heard, being the
22 evidence through the '90s. But an initial
23 increase, and then it went into persistent
24 decline; is that right?

25 MR. CASS: Some of the large lake populations went into
26 a persistent decline, others did not.

27 Q All right. And so this experiment that was
28 followed by years of persistent decline in the
29 '90s wasn't the subject of a scientific review
30 until 2002; is that right, with a research paper
31 produced in 2004, 17 years later?

32 MR. CASS: Sorry, the 2002, are you referring to the
33 DFO --

34 Q It's Exhibit 396, by my note. I don't know what
35 it's called offhand.

36 MR. CASS: Yeah, this particular exhibit is the 2004
37 research document, but you mentioned 2002, which
38 I'm assuming was the original review of the Fraser
39 River at that time.

40 Q My recall of the evidence was that in 2002, the
41 research that led to this paper started.

42 MR. CASS: Oh, I see. That's correct.

43 Q Yes. So 17 years later, though, there's a
44 research paper that shows the results of what was
45 an experiment through the rebuilding plan, is that
46 -- do I have it right?

47 MR. CASS: Well, this certainly started, you know, the

1 development of FRSSI started in, as you say, 2002.
2 I've sort of lost track, but --
3 Q Okay. Just in terms of the harvest rates, in
4 terms of percentages, we have it already that the
5 harvest rate prior to 1987 was in the range of 75
6 to 80 percent. Under the rebuilding plan, 1987 to
7 2002, am I right that it was in the range of 60 to
8 70 percent?
9 MR. CASS: The intent was to reduce the harvest rates
10 from the 75 to 80-percent range down to, I can't
11 remember the exact numbers, but say, 65 to 70, in
12 that range, in order to increase escapements.
13 Q All right. And under FRSSI, it turned from
14 talking about harvest rates to talking about TAM
15 and it's a 60-percent cap. I want to ask you a
16 couple of questions about FRSSI really quick here.
17 In direct examination, Dr. Cass, you talked about
18 the no-fishing points again, and by my note, you
19 defined the no-fishing point as the point below
20 the fully seeded population. Now, I interpret
21 that to mean, by "fully seeded," that fishing,
22 harvesting doesn't begin until there would be
23 enough fish on the spawning ground to parent the
24 next generation of fish. So correct me if I'm
25 wrong, but fishing wouldn't start until we're in
26 the, or beyond the optimal escapement point. What
27 am I missing there?
28 MR. CASS: That wasn't the intent of FRSSI. The intent
29 of FRSSI was to have a benchmark that was less
30 than that point that you're describing to guard
31 against the conservation risk.
32 Q Let me ask it in a different way.
33 MR. CASS: But no, you've got it wrong, that that was
34 not the -- the no-fishing point was not at a fully
35 seeded population.
36 Q Okay. Okay. Perhaps you're going to have to give
37 me the definition again, then, because that was my
38 note of what the no-fishing point was. What is
39 the definition of the no-fishing point?
40 MR. CASS: Well, the no-fishing point is really the
41 result of the simulation testing given a
42 particular benchmark and given the objectives,
43 what is the shape of that TAM rule down where
44 you're calling it the no-fishing point, or the
45 minimal fishing point that satisfies the objective
46 based on a performance measure. So the no-fishing
47 point in the TAM rule is a result of that, a

1 result of how well a set of TAM rules compare to
2 other TAM rules that don't meet the objective.
3 Maybe others can describe it differently.
4 Q Does anybody else wish to weigh in? All right.
5 Nobody wants to touch that. There was another
6 question. This question flows from a question
7 from the Commissioner earlier today. It was asked
8 whether there is a double accounting for
9 uncertainties. And what I noted from your
10 evidence yesterday, Mr. Cass, is that the 60-
11 percent TAM rule was a policy choice made, in
12 part, because of knowledge gaps or data gaps, but
13 in coming up with the TAM, or the total allowable
14 mortality, you also have to apply the management
15 approach. And does the management approach also
16 account for uncertainties in the sense of not
17 knowing how many fish are going to make it, or
18 not, to the spawning beds, or spawning grounds?
19 MR. CASS: Each component has uncertainty associated
20 with it in this model.
21 Q Because management adjustments account for en-
22 route loss?
23 MR. CASS: Yes.
24 Q Correct. And you would agree with me that we
25 don't know how many fish are going to be lost en-
26 route to the spawning grounds so there's
27 uncertainty --
28 MR. CASS: Yes.
29 Q -- in that sense?
30 MR. CASS: Yes.
31 Q All right. All right. Is there, in determining
32 the 60-percent rate, already an accounting for
33 that uncertainty in terms of the number of fish
34 lost en-route?
35 MR. CASS: Well, that is a candidate for -- although,
36 as you say, there's an uncertainty around that and
37 the sort of history of the en-route loss, what's
38 been called the difference between estimates,
39 which includes en-route loss, or whatever, any
40 other factor that may result in a difference. And
41 so that is accounted for in the TAM rule, given
42 that there's uncertainty around that estimate.
43 That is part of the simulation model, the testing
44 that's an input. So that's the, you know,
45 simulation model to develop, in terms of the long-
46 term strategy, to have a TAM rule that accounts
47 for that.

1 The 60-percent cap, if you like, on harvest
2 is a buffer. Imbedded in that is a buffer to
3 guard against uncertainties in terms of, as we've
4 talked about, unmodelled stocks with different
5 productivities than which are modelled to account
6 for uncertainties in their in-season run size
7 estimate, to account for the fact that the target
8 harvest rate based on the TAM could not be
9 achieved. So the 60 percent has these -- I would
10 call them buffers, but it's to guard against the
11 gaps in the information that we have. But it does
12 include an estimate of the management adjustment.

13 MR. WATSON: Thank you. Those are my questions.

14 MS. BAKER: Thank you. It's two minutes to 4:00. Mr.
15 Lowes still has some questions. I don't know what
16 his time is now at, if it's still five to 10?
17 Five minutes? Can Mr. Lowes complete his
18 questions? Thank you.

19 MR. LOWES: Yes, J.K. Lowes for the B.C. Wildlife
20 Federation and B.C. Federation of Drift Fishers.

21
22 CROSS-EXAMINATION BY MR. LOWES:

23
24 Q I really have one question that kind of wraps
25 around a number of answers that were given
26 throughout the day and it boils down to a couple
27 of questions that the Commissioner asked, which
28 was the respective roles of FRSSI and human
29 judgment, I suppose, in in-season management.

30 Mr. Morley, you gave evidence of an
31 adjustment from the FRSSI-generated TAM rule in
32 2010 with respect to the Adams river run; do you
33 recall that earlier today?

34 MR. MORLEY: Yes, I do.

35 Q And as I understood your evidence, what happened
36 was that when someone, a human being, presumably,
37 put his mind to it, he realized that following the
38 TAM rule would result in a disproportionate trade-
39 off between foregone catch of the Adams component
40 of the run and savings of the Cultus stock; is
41 that correct?

42 MR. MORLEY: That's correct. I mean, the TAM rule per
43 se for Cultus doesn't actually come out of FRSSI,
44 the FRSSI modelling, but it was a limitation of an
45 exploitation rate that certainly provided
46 considerable restriction on how much of the very
47 populous Adams River run could be harvested.

- 1 Q Yeah, but somebody, in his wisdom, realized that
2 it would take a foregone catch of some one to two
3 million Adams River sockeye to save a couple of
4 hundred to a thousand extra Cultus; is that --
- 5 MR. MORLEY: Yeah, I don't know if the number's exactly
6 correct, but the order of magnitude are that we're
7 talking about millions versus thousands, yes.
- 8 Q Yes. And I guess the thrust of my question is
9 that -- and this is for Mr. Staley, too, because
10 he mentioned the 2010 adjustment. What was the
11 mechanism for that final -- whose mind was applied
12 to the issue and what was the mechanism in which
13 the decision was made?
- 14 MR. STALEY: Well, I suspect there were several minds
15 that did the calculation. I mean, it's a
16 straightforward calculation that Mr. Morley put
17 out. I'm not sure who did it first, probably Rob.
18 But you know, we could all do the math. It's not
19 that hard. And then the decision about the trade-
20 offs required -- well, a departure from the IFMP.
21 It's not necessarily a FRSSI problem, it's a --
22 how the IFMP has adjusted in-season.
- 23 Q Yes. Yes.
- 24 MR. STALEY: And my understanding was that, in part,
25 there were discussions with some of the First
26 Nations who have direct interest in Cultus, and
27 they made recommendations to DFO staff, and then
28 DFO staff took those, with other recommendations,
29 to the Minister, met with her and the Cultus
30 constraint was no longer operational within the
31 context of the information we had to make that
32 decision.
- 33 Q Yeah. And over what time period did that process
34 take?
- 35 MR. STALEY: Well, the key parts of it would have taken
36 place over about three days.
- 37 Q And you --
- 38 MR. STALEY: Maybe it was realized a little less than a
39 week prior to the decision.
- 40 Q And how many people were involved in sort of
41 assessing the information and providing the advice
42 and making the decision? I get the impression it
43 was a pretty small group over a pretty quick time?
- 44 MR. STALEY: Well, most of the panel was aware of it.
45 The technical committee was aware of it. There
46 were staff within DFO and as well as others that
47 were consulted with, some of the First Nations

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Re-exam by Ms. Baker

1 directly responsible, those numbers were provided
2 to them, and they provided some response back to
3 DFO on that.
4 Q Yeah.
5 MR. STALEY: So in terms of doing the calculations and
6 discussing it, it would have been the Canadian
7 section of the panel, maybe 15 people, of which of
8 that, there probably would be only eight or 10
9 that would be directly engaged in it.
10 Q So eight or 10 people over a period of about three
11 years made the decision?
12 MR. STALEY: Three days.
13 Q Three days, rather?
14 MR. STALEY: Well, the decision was made by the
15 Minister so --
16 Q Okay.
17 MR. STALEY: -- and there were more -- I suspect there
18 were --
19 Q On the advice of eight or 10 people who had put
20 their heads together for about three days?
21 MR. STALEY: I don't know what advice she got, I'm not
22 privy to that, and who provided it to her --
23 Q Yeah.
24 MR. STALEY: -- but the people who did the calculations
25 and made the original -- both made the original
26 suggestion, assisted in some of the calculations,
27 it's probably a matter of about 10 people.
28 Q Yeah.
29 MR. STALEY: 10 people.
30 Q Would you agree with me that the lesson is that it
31 all comes down, really, to decisions being made by
32 experienced people using their best judgment?
33 MR. STALEY: Well, one hopes that that's always the
34 case.
35 MR. LOWES: Thank you.
36 MS. BAKER: Thank you. I have one re-exam point, if I
37 could ask that.
38
39 RE-EXAMINATION BY MS. BAKER:
40
41 Q Ms. Gaertner asked a question about whether the
42 location of the fisheries was contained in the
43 FRSSI analysis in any way, and I just wanted to
44 ask you, is it fair to say that the point of the
45 FRSSI model is to set the global number by
46 aggregates of what the total mortality can be on
47 that aggregate to ensure escapement targets are

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1 met? That's the point of that model. Is that
2 fair? I'll ask Mr. Cass.
3 MR. CASS: Mr. Commissioner, that's one point of the
4 model.
5 Q Okay.
6 MR. CASS: I mean, the fact that you're considering
7 trade-offs between escapement and harvest is --
8 there are those objectives. Yeah.
9 Q Right. And in terms of figuring out what the
10 total mortality, total allowable mortality will
11 be, it makes no difference to the operation of the
12 FRSSI model where those fish are killed? It
13 doesn't matter whether they're killed by
14 commercial fishers, or sport fishers, or First
15 Nations fishers, or disease, or bald eagles,
16 they're -- how many fish can be killed to still
17 meet the escapement target is the point, right?
18 MR. CASS: That is correct.
19 Q And it doesn't make any difference whether those
20 fish are killed in the marine areas or the river
21 areas, it's just the total for that aggregate that
22 can be killed; is that fair?
23 MR. CASS: That's correct. The model makes no
24 distinction.
25 Q All right. And once that total allowable
26 mortality has been calculated, then it's up to the
27 managers to divide and allocate that mortality
28 amongst whether natural causes, or commercial
29 fishers, or sport fishers, or First Nations, or
30 however that's done, that allocation is then done
31 by managers once the TAM rule is set; is that
32 fair?
33 MR. CASS: Yes, those are different processes.
34 MS. BAKER: Okay. Thank you. That's my only question.
35 Mr. Commissioner, tomorrow morning -- sorry,
36 you'll recall we had planned to have Mr. Woodey
37 here this afternoon, and Mr. Ryall, as well. What
38 I've decided to do is to have Mr. Woodey come back
39 first thing in the morning and sit with the panel.
40 He was going to be part of the over-escapement
41 panel in any event so I'll just move his questions
42 on escapement to the front end of that panel and
43 then go right into the questions with the panel
44 overall. So we won't have a separate cross-
45 examination for Mr. Woodey on those points, we'll
46 just roll it into the overall panel. And we'll
47 try and figure out what we're going to do with Mr.

1 Ryall's testimony in the next few days, but we've
2 got some contingency plans that we're working
3 through. And we start at 10:00 tomorrow, I
4 believe.

5 THE COMMISSIONER: Thank you very much. Yes, I do have
6 something going on at 9:15. I should be here by
7 10:00, but I might be a few minutes late so I
8 apologize to counsel if I'm a little bit late.
9 You can study the models.

10 MS. BAKER: We have Mr. Walters coming on the screen
11 tomorrow so we might be ironing out a few wrinkles
12 anyway.

13 THE REGISTRAR: The hearing is now adjourned for the
14 day and we'll resume at 10 o'clock tomorrow
15 morning.

16
17 (PROCEEDINGS ADJOURNED TO FEBRUARY 9, 2011,
18 AT 10:00 A.M.)
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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

13 I HEREBY CERTIFY the foregoing to be a
14 true and accurate transcript of the
15 evidence recorded on a sound recording
16 apparatus, transcribed to the best of my
17 skill and ability, and in accordance
18 with applicable standards.
19
20
21

22 _____
23 Karen Hefferland
24

25 I HEREBY CERTIFY the foregoing to be a
26 true and accurate transcript of the
27 evidence recorded on a sound recording
28 apparatus, transcribed to the best of my
29 skill and ability, and in accordance
30 with applicable standards.
31
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34 _____
35 Susan Osborne
36

37 I HEREBY CERTIFY the foregoing to be a
38 true and accurate transcript of the
39 evidence recorded on a sound recording
40 apparatus, transcribed to the best of my
41 skill and ability, and in accordance
42 with applicable standards.
43
44
45

46 _____
47 Irene Lim