

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.

Thursday, March 10, 2011

Tenue à :

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

le jeudi 10 mars 2011

APPEARANCES / COMPARUTIONS

Wendy Baker, Q.C. Lara Tessaro	Associate Commission Counsel Associate Commission Counsel
Tim Timberg Geneva Grande-McNeill	Government of Canada
Tara Callan	Province of British Columbia
No appearance	Pacific Salmon Commission
No appearance	B.C. Public Service Alliance of Canada Union of Environment Workers B.C. ("BCPSAC")
No appearance	Rio Tinto Alcan Inc. ("RTAI")
Shane Hopkins-Utter	B.C. Salmon Farmers Association ("BCSFA")
No appearance	Seafood Producers Association of B.C. ("SPABC")
Lisa Glowacki	Aquaculture Coalition: Alexandra Morton; Raincoast Research Society; Pacific Coast Wild Salmon Society ("AQUA")
No appearance	Conservation Coalition: Coastal Alliance for Aquaculture Reform Fraser Riverkeeper Society; Georgia Strait Alliance; Raincoast Conservation Foundation; Watershed Watch Salmon Society; Mr. Otto Langer; David Suzuki Foundation ("CONSERV")
Don Rosenbloom	Area D Salmon Gillnet Association; Area B Harvest Committee (Seine) ("GILLFSC")

APPEARANCES / COMPARUTIONS, cont'd.

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

APPEARANCES / COMPARUTIONS, cont'd.

No appearance	Sto:lo Tribal Council Cheam Indian Band ("STCCIB")
No appearance	Laich-kwil-tach Treaty Society Chief Harold Sewid Aboriginal Aquaculture Association ("LJHAH")
Ming Song	Heiltsuk Tribal Council ("HTC")
No appearance	Musgamagw Tsawataineuk Tribal Council ("MTTC")

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1
PANEL 26
In chief by Ms. Baker

Vancouver, B.C. /Vancouver (C.-B.)
March 10, 2011/le 10 mars 2011

1
2
3
4 THE REGISTRAR: Order. The hearing is now resumed.
5 MS. BAKER: Mr. Commissioner, today we are addressing
6 another technical report. This report is Project
7 Number 3 and it's titled, Evaluating the Status of
8 Fraser River Sockeye Salmon and the Role of
9 Freshwater Ecology in Their Decline.

10 We have with us, to deal with this report,
11 Mr. Marc Nelitz and Ms. Katherine Wieckowski.

12 THE COMMISSIONER: Thank you.

13 MS. BAKER: And for the record, it's Wendy Baker and
14 Lara Tessaro with me. So if we could perhaps have
15 these people sworn, then we'll begin with the
16 report?
17

18 KATHERINE WIECKOWSKI,
19 Affirmed.

20
21 MARC NELITZ, Affirmed.
22

23 THE REGISTRAR: State your name, please.

24 MS. WIECKOWSKI: Katherine Wieckowski.

25 MR. NELITZ: Marc Nelitz.

26 THE REGISTRAR: Thank you.

27 MS. BAKER: Thank you.
28

29 EXAMINATION IN CHIEF BY MS. BAKER:
30

31 Q So Mr. Nelitz, you're the author of this report;
32 is that correct?

33 MR. NELITZ: The lead --

34 Q The lead author?

35 MR. NELITZ: Lead author, yes.

36 MS. BAKER: So why don't I start by marking this report
37 as the next exhibit and then I'll go through the
38 qualifications of the authors?

39 THE REGISTRAR: Exhibit 562.
40

41 EXHIBIT 562: Evaluating the Status of Fraser
42 River Sockeye Salmon and the Role of
43 Freshwater Ecology in Their Decline
44

45 MS. BAKER:

46 Q All right, I'll start with you, Mr. Nelitz. As
47 you've identified, you're the lead author of this

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In chief by Ms. Baker

1 report. You work at ESSA Technologies Ltd.?
2 MR. NELITZ: That's correct.
3 Q All right. And you have a masters of resource
4 management from Simon Fraser University?
5 MR. NELITZ: Correct.
6 Q Your CV is on the screen before you. I can just
7 ask you, perhaps, to identify that this is your CV
8 setting out your professional qualifications?
9 MR. NELITZ: Yes, it is.
10 Q And it sets out the projects that you've worked on
11 and publications that you have authored as well?
12 MR. NELITZ: Correct.
13 MS. BAKER: Could I have that marked, please, as the
14 next exhibit?
15 THE REGISTRAR: 563.
16
17 EXHIBIT 563: *Curriculum Vitae* of Marc A.
18 Nelitz
19
20 MS. BAKER:
21 Q All right. You are a registered professional
22 biologist with the B.C. College of Applied
23 Biology?
24 MR. NELITZ: Correct.
25 Q And you have also completed the Canadian
26 Environmental Leadership Program with Hollyhock?
27 MR. NELITZ: Yes.
28 Q All right. You joined ESSA in 2004, and there
29 you've worked as a systems ecologist with the
30 environment management team, focusing on four
31 domains: regulatory and policy implementation;
32 vulnerability and adaptation, especially climate
33 change; adaptive environmental assessment and
34 management; and state of environment reporting; is
35 that correct?
36 MR. NELITZ: That's correct.
37 Q And as the lead author, you reviewed the work done
38 by all of the contributors to this report?
39 MR. NELITZ: Yes, I did.
40 Q All right. I think what I'd like to do, then, is
41 go through the -- just briefly go through the CVs
42 of the other people that worked on this report
43 with you, except for Ms. Wieckowski, who I'll go
44 to individually.
45 So the next CV is for Katherine Bryan, if you
46 could pull that up on the screen. This is Ms.
47 Bryan's CV. She's also an employee of ESSA

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3
PANEL NO. 26
In chief by Ms. Baker

1 Technologies?

2 MR. NELITZ: Yes, she is.

3 Q All right. And she was responsible for what
4 aspect of the report?

5 MR. NELITZ: Doing the GIS analysis. That's the
6 spatial mapping and analyzing the data related to
7 the spatial layers of stressors and the habitat
8 information for the sockeye units.

9 MS. BAKER: Okay. And I'll have that marked, please,
10 as the next exhibit.

11 THE REGISTRAR: Exhibit 564.

12

13 EXHIBIT 564: *Curriculum Vitae* of Katherine
14 Bryan

15

16 MS. BAKER: Thank you.

17 Q I'll skip Ms. Wieckowski and go to Alexander Hall.
18 And Mr. Hall, again, an employee of ESSA. What
19 was he responsible for?

20 MR. NELITZ: Largely the summary and presentation of
21 the information in the dashboards for all of
22 the --

23 Q The dashboards?

24 MR. NELITZ: The dashboards for all of the conservation
25 units.

26 MS. BAKER: Okay. I'll have that marked, please, as
27 the next exhibit.

28 THE REGISTRAR: 565.

29

30 EXHIBIT 565: *Curriculum Vitae* of Alexander
31 Hall

32

33 MS. BAKER:

34 Q Next is David Marmorek. Again, he's also with
35 ESSA Technologies. And what was his
36 responsibility in this report?

37 MR. NELITZ: Mr. Marmorek offered advice and guidance
38 on the design of the analyses that we conducted,
39 and also reviewed the report as well.

40 Q And he's the president of ESSA Technologies?

41 MR. NELITZ: President of ESSA, yes.

42 MS. BAKER: I'll have that marked, please.

43 THE REGISTRAR: 566.

44

45 EXHIBIT 566: *Curriculum Vitae* of David
46 Marmorek

47 MS. BAKER:

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In chief by Ms. Baker

1 Q Next is Diana Abraham. And again, with ESSA, what
2 was her responsibility in this report?

3 MR. NELITZ: As a research assistant, so would be
4 guided by others on the team in terms of pulling
5 together different references, citations, other
6 research, digging into data sources, those kinds
7 of things, and then providing those to some of the
8 senior authors on the report.

9 MS. BAKER: All right. And if this could please be
10 marked as the next exhibit.

11 THE REGISTRAR: 567.

12
13
14
15

EXHIBIT 567: *Curriculum Vitae* of Diana
Abraham

16 MS. BAKER:

17 Q Next is Eric Parkinson. He gives us a picture;
18 that's nice. And is he an employee of ESSA or was
19 he a contractor to ESSA for this work?

20 MR. NELITZ: He's a subcontractor to ESSA.

21 Q Okay. And what work did he do?

22 MR. NELITZ: So Eric Parkinson, Mark Porter and myself
23 worked together in terms of designing and
24 considering all the information for the stressor
25 in habitat components to the report, and so Eric
26 was a senior person offering the guidance and also
27 conducting some of the assessments of different
28 sections, the mining the IPPs.

29 Q All right. And he's a professor at UBC Fisheries
30 Centre?

31 MR. NELITZ: No, he's not a -- well, he's an adjunct
32 professor, but it's an adjunct role there. I
33 can't comment on, specifically, what he does as
34 part of that role.

35 MS. BAKER: All right. But that's set out in his CV --

36 MR. NELITZ: Yeah.

37 MS. BAKER: Which I'd like to have marked, please, as
38 the next exhibit.

39 THE REGISTRAR: 568.

40
41
42
43

EXHIBIT 568: *Curriculum Vitae* of Eric
Parkinson

44 MS. BAKER:

45 Q Finally, Mark Porter, who you just mentioned, also
46 with ESSA. And what was his responsibility on
47 this report?

5
PANEL NO. 26
In chief by Ms. Baker

1 MR. NELITZ: So again, in terms of that, the three of
2 us, Eric, Mark Porter and myself, working together
3 in terms of designing the analyses on the
4 freshwater influences side.

5 MS. BAKER: Okay. I'll have that marked, please, as
6 the next exhibit.

7 THE REGISTRAR: 569.

8

9

EXHIBIT 569: *Curriculum Vitae* of Marc Porter

10

11 MS. BAKER:

12

Q And then if you can turn to Ms. Wieckowski's CV.
13 Sorry, my monitor's died here. Okay, everybody
14 else has it up, so that's fine; I've got a paper
15 version.

16

Ms. Wieckowski, you have a masters of
17 resource management - fisheries science, from
18 Simon Fraser?

19

MS. WIECKOWSKI: Correct.

20

MS. BAKER: And you have a BSc from McGill University
21 in biology and international development studies?

22

MS. WIECKOWSKI: Yeah.

23

Q All right. And you are a systems ecologist with
24 ESSA?

25

MS. WIECKOWSKI: Correct.

26

Q All right. And your areas of interest include
27 analyzing the interface between the science and
28 policy and developing tools with which decision-
29 makers can make informed decisions?

30

MR. NELITZ: Correct.

31

Q All right. And that includes identification of
32 project goals and objectives, development of
33 quantitative tools to evaluate alternatives to
34 determine which option is best to achieve goals
35 and objectives?

36

MS. WIECKOWSKI: Correct.

37

Q All right. Thank you. And this document that you
38 see before you is your CV that sets out your
39 professional experience, programs you've worked
40 on, and publications you've authored?

41

MS. WIECKOWSKI: Yes.

42

MS. BAKER: May I have that marked, please, as the next
43 exhibit?

44

THE REGISTRAR: 570.

45

46

47

EXHIBIT 570: *Curriculum Vitae* of Katherine

Wieckowski

1
2
3 MS. BAKER: Thank you.

4 Q Now, I'd like to go back to you, Mr. Nelitz. As
5 we identified, you were the lead author and I'd
6 like to take you to the terms of reference for
7 this project. If you could turn to page 130 and
8 132 of the report, the terms of reference are set
9 out there. Sorry, 130 to 132. There. The
10 resolution isn't great on that, but hopefully you
11 can see it alright.

12 The scope of the work is set out in section
13 3. Just conceptually, is it fair to say that this
14 report was designed with two sort of discreet
15 parts to it: one is a review of methodologies for
16 assessing the status of CUs; and then the second
17 component was to evaluate freshwater habitat and
18 stressors in relation to the decline of the
19 aggregate sockeye population in the Fraser River?

20 MR. NELITZ: That's correct, yeah.

21 Q Okay. So the first kind of component, which is
22 its own discreet component, is this assessment of
23 CU status, and that work is identified in two
24 paragraphs which are numbered 3.2 under the Scope
25 of Work; do you see that?

26 MR. NELITZ: Yes, they are.

27 Q Okay. And then the work -- the habitat assessment
28 and the stressor assessment in relation to the
29 overall decline of the aggregate population on the
30 Fraser River is the work that's set out in
31 sections 3.3 down to 3.11; is that right?

32 MR. NELITZ: That's correct.

33 Q Okay. Now, once this scope of work was provided
34 to you, there was certain adjustments made to it,
35 is that right, and certain things were not
36 ultimately contained in this report?

37 MR. NELITZ: That's true.

38 Q Okay. And paragraph 3.4, perhaps you can identify
39 what work was actually done under that heading?

40 MR. NELITZ: So the first two bullets, in terms of
41 quantitative estimates of life cycle and life
42 stage productivity, we examined that. As well,
43 the habitat quantity and quality issue. The last
44 four bullets, though, we did not address. Those
45 were being addressed through other projects that
46 the commission was requesting to be completed.

47 Q Okay. Thank you. And then 3.6, was there any

1 aspect of this which you didn't ultimately deal
2 with?

3 MR. NELITZ: Yes, we didn't look at the gravel mining
4 in the lower Fraser River. Again, there was
5 another project that was included to address that.

6 Q Okay. 3.7?

7 MR. NELITZ: Yes, the last sentence, in terms of
8 reviewing the efficacy of water regulation
9 projects designed for temperature control
10 purposes, we didn't address that.

11 Q Okay. And then 3.10, is there any aspect there
12 that wasn't covered?

13 MR. NELITZ: And the last sentence in 3.10, looking at
14 the effects of dredging in the lower Fraser River.

15 Q Okay. Thank you. The first part of the report
16 deals with the CU status assessment work, and that
17 was work which was performed by Ms. Wieckowski; is
18 that correct?

19 MS. WIECKOWSKI: Yes.

20 Q Okay. So I'll move my questions to you, then.
21 You were the lead on this section of the work; is
22 that right?

23 MS. WIECKOWSKI: Correct.

24 Q Okay. So maybe just in terms of framework, you
25 could help us understand what a status assessment
26 is, so just explain what that is, and then why do
27 you do it? What does a status assessment tell us?

28 MS. WIECKOWSKI: So a status assessment is a tool or a
29 method that's, in the context of the work that we
30 did here, it's used to assess the condition of a
31 population; so how well is the population, in this
32 case Fraser sockeye, doing? And the indicators --
33 and it's the way that it goes about assessing
34 status is by using various indicators that have
35 metrics associated with those, where you have the
36 indicators that one selects are how you are
37 interested in defining status. So you could have
38 indicators on vulnerability, you could have
39 indicators on habitat condition, you could have
40 indicators on abundance.

41 And the reason for assessing status is
42 ultimately you want to inform some sort of
43 management decision or action, so it has an
44 application to it, it's not just to know what the
45 status is, but ultimately you want to be able to
46 do something about it.

47 Q And what are the different ways that a status

1 assessment can be done? You've mentioned a couple
2 of indicators. How does that work? What are the
3 kind of indicators that are used to evaluate
4 status?

5 MS. WIECKOWSKI: So the approach taken to evaluating
6 status is there are multiple approaches and
7 ultimately the approach one takes depends on what
8 sort of management questions or decisions you want
9 to inform. So for example, if your objective is
10 to be able to assess status based on just
11 population numbers, you would have indicators that
12 speak to abundance, whereas if your management
13 interest is looking at diversity or perhaps
14 response -- or ability to withstand threats or
15 vulnerabilities in that population, you would
16 maybe have indicators that spoke to not only
17 abundance, but you'd have indicators that spoke to
18 distribution as well, because the more -- the idea
19 being the more distributed a population is across
20 a larger area you'd have more diversity of habitat
21 uses and life histories types.

22 And that being said, regardless of what
23 question or management objective you want to be
24 able to address through your status assessment,
25 all status assessments have this overall
26 fundamental framework where they have the same one
27 where you have the approach of you have a context
28 that -- or baseline that sets the reference frame
29 for what it is you're interested in and then you
30 have indicators that are selected which are
31 relevant to that reference frame.

32 That being said, within those indicators you
33 can have indicators that are of a qualitative or a
34 quantitative nature, so they can differ in that
35 respect. And then for each of those indicators
36 you can similarly -- you would similarly have
37 benchmarks. So for example, if the indicator is
38 abundance, the way you would set about defining
39 those benchmarks for determining how well the
40 population is doing, you can set those either
41 qualitatively or quantitatively, and how you
42 choose to set them depends on -- it's a value
43 judgment where you want to put them. It's not
44 something that's necessarily driven by science
45 alone.

46 Q Okay. Thank you. For this project, what was the
47 scope of the status assessment that you were

1 tasked with?

2 MS. WIECKOWSKI: So we were asked by the commission to
3 address three things within the CU status
4 assessment component. The first one was to
5 summarize the existing delineations of
6 conservation units, and the second one was to
7 review Holt et al's 2009 methodology that DFO
8 released, and the third -- and within that task we
9 were also asked to compare Holt et al's method
10 from 2009 to alternative methods of assessing
11 status. And then the last element that the
12 commission asked us to address was to determine
13 status of Fraser River sockeye for each of the
14 CUs.

15 Q All right. And on that point there, did you
16 perform your own, independent qualitative or
17 quantitative assessment of the CUs on the Fraser
18 River?

19 MS. WIECKOWSKI: No, we did not. We, by virtue of just
20 the amount of time and the amount of resources
21 available, it was not possible for us to undertake
22 our own independent assessment of status.

23 Q So how did you then address that last question?

24 MS. WIECKOWSKI: What we did was we took work that had
25 already been done by -- and out in the public
26 domain that had assessed status for Fraser River
27 sockeye CUs and then we -- there was two methods
28 that had done so, and then we compared those
29 individual status assessments and came up with
30 what we thought was a reasonable approach to
31 assessing status based on the results of those
32 work -- that work.

33 Q Okay. So you reviewed and assessed other people's
34 work where they had done some kind of status
35 assessment work; is that right?

36 MS. WIECKOWSKI: Correct.

37 Q Okay. On page 7 of the report, which is in your
38 section dealing with assessing status, page 7, the
39 second full paragraph, which begins with the
40 words, "Each method will have different strengths
41 and weaknesses," you state that you used four
42 considerations to summarize the details underlying
43 each approach. You looked at ecological criteria
44 and indicators used for assessing conservation
45 status. And then you identified their measures
46 describing abundance, trend, distribution,
47 diversity, productivity, fishing mortality and

1 habitat conditions. You also looked at the
2 approach used for setting benchmarks. You looked
3 at data needs and availability, and also the
4 feasibility of implementation of different
5 approaches. And then you summarized overall the
6 strengths and weaknesses.

7 And that's a fair summary of the work that
8 was done?

9 MS. WIECKOWSKI: Correct.

10 Q Okay. You mentioned that you looked at three
11 different reports, I think, and if we return to
12 Table 2, this is just to give us a shorthand for
13 this, Table 2 is on page 93. All right. You can
14 see at the top bar it indicates, Holt 2009; Holt
15 et al 2009, under the first heading, and then
16 Pestal and Cass 2009, and then Faber-Langendoen
17 2009. Are those three different methods that you
18 looked at?

19 MS. WIECKOWSKI: Yes, they were.

20 Q And why did you choose those three?

21 MS. WIECKOWSKI: We chose the Holt approach because
22 that was something that the commission had
23 specifically asked us to look at, and it was, at
24 the time, it was the method that had been peer-
25 reviewed by DFO and it was released, and this was
26 sort of the only one on the table at the time.

27 We chose Pestal and Cass 2009 because it
28 proposed an alternative way of assessing status
29 that was based -- that was a more qualitative
30 approach, so that was not necessarily as -- didn't
31 require as much data or intensity to assess
32 status, and also it had actually performed a
33 status assessment for each of the conservation
34 units, so we were able to see how the method
35 actually was -- how it could be applied and what
36 the results of the application of that method
37 were.

38 And so both Holt and Pestal, they were both
39 salmon -- designed specifically for salmon with
40 regards to their indicator selection. And so we
41 wanted to contrast those approaches to something
42 that was more generic, which is why we chose the
43 Faber-Langendoen report which is -- it's published
44 by NatureServe and it's a more general approach to
45 status assessment where the primary -- it can be
46 applied to salmon, to elephants, to any flora and
47 fauna; it's not salmon specific.

1 Q All right. I'm not going to ask you to go to
2 these reports now, but just for the record, the
3 two Holt documents that you referenced there have
4 been marked as Exhibits 153 and 154, and I wonder
5 if those pages could just be pulled up so she can
6 identify that those are the works that she
7 reviewed?

8 So this is the one that's identified as Holt
9 et al 2009?

10 MS. WIECKOWSKI: Yes, it is.

11 Q Exhibit 153. And then 154? This is the one you
12 identified as Holt 2009?

13 MS. WIECKOWSKI: Yeah.

14 Q Okay. And then the Pestal and Cass document as
15 well, just for the record, that has been provided
16 in the documents Canada will be potentially using
17 in examining you today, and that is at Tab 1 of
18 Canada's documents, and perhaps that could just be
19 pulled up as well to identify this is the document
20 that you reviewed?

21 MS. WIECKOWSKI: Yes, it is.

22 Q Okay, thank you. There was a draft report
23 prepared by Sue Grant and others in 2010, and
24 that's been marked as Exhibit 184 in the
25 proceedings. I wonder if that could just be
26 pulled up as well? All right, this document, did
27 you review this? This is also a document or a
28 method which looked at status assessment; is that
29 right?

30 MS. WIECKOWSKI: Yes.

31 Q And did you see this document or use this document
32 in preparing your work?

33 MS. WIECKOWSKI: We did see it and we did use it, but
34 we didn't explicitly review the document because
35 it came out mid-project and there wasn't -- we
36 just didn't have the resources available to do a
37 thorough review. And in addition, it's a draft
38 document, so we didn't feel it was appropriate to
39 be reviewing something that was still in the
40 process of being developed and reviewed by DFO and
41 the peer-review process.

42 Q Okay. Thank you. All right, I'd like to go back
43 to the main report. So if we can turn, again, to
44 page 93 (sic) of Exhibit 563? Sorry, is 562 the
45 main exhibit?

46 MR. LUNN: Yes.

47 MS. BAKER: 562, thanks.

1 Q So if we turn back to page 97, this Table 2
2 reviews the different methods. But if we can
3 carry it on and go to the end of that table and
4 move to Table 3, which is actually on page 97, I
5 just wanted to review with you these indicator
6 classes that you have set out. What do these
7 different indicators assess? Why are they
8 relevant? What issues are they addressing?

9 MS. WIECKOWSKI: So each indicator class speaks to a
10 different aspect of status that one could
11 potentially be interested in, depending on what
12 management objectives are or what actions are on
13 the table or one would want to take -- pursue.
14 And so abundance speaks to just the sheer number
15 of sockeye that would be out there, and there's
16 various metrics that each of these methods
17 proposed to assess abundance.

18 Trend in spawner abundance speaks to the
19 general trend in that population, whether that
20 abundance number, whether it's declining or
21 whether it's increasing or whether it's stable,
22 and so that gets at a different aspect of
23 abundance. It sort of gets at what the trajectory
24 is for the population and gives you a frame of
25 reference with regards to where the population was
26 historically, perhaps.

27 Distribution speaks to spatial distribution,
28 and that is an indicator class that is a potential
29 interest if one wants to know about the extent of
30 the spatial -- the spatial extent of the
31 population. So for example, a population that is
32 restricted to one area might be more at risk to
33 some sort of environmental phenomenon, whether it
34 be a huge landslide that maybe ruins that spawning
35 ground, that population is more at risk than one
36 that is more spatially distributed. And so you
37 might want to get at how spatially distributed a
38 population to get -- to understand how vulnerable
39 it is to certain environmental factors.

40 Diversity speaks to genetic diversity, but
41 also it can speak to diversity in life history
42 traits, and that's of interest to people that --
43 to questions around, you know, maybe, for example,
44 disease susceptibility or climate change, for
45 example.

46 Productivity is an indicator that's of
47 interest, because it speaks to essentially how

1 productive a population is. So for a given number
2 of adults, how many recruits are produced for a
3 given number of spawners, or how productive that
4 population is.

5 Fishing mortality is of interest if one is --
6 one would like to have information on a potential
7 threat to that population, so it's one aspect of a
8 vulnerability to a population, so how many fish
9 are being removed from that population.

10 And then habitat condition is similarly of
11 interest from a vulnerability or threats
12 perspective; so how good is the habitat upon which
13 that species relies.

14 Q Okay, thank you. And as you indicated earlier,
15 you didn't include the Grant draft paper for a
16 variety of reasons, but in the text of your
17 report, at page 9, you do make some observations
18 about indicators that were not present in the
19 Grant draft paper and I just wonder if you could
20 explain what were the indicators of significance
21 that were different or missing from the Grant
22 paper and why do you consider those to be
23 important?

24 MS. WIECKOWSKI: Well, Grant's paper, as far as I
25 understand, builds off of the work that Dr. Holt
26 had done in the previous year, and in Grant et al
27 they looked at just two classes of indicators;
28 they looked at just abundance and trends in
29 abundance and they did not look at distribution
30 indicators or fishing mortality indicators, and
31 within their report they described the reasons for
32 having decided to take those particular actions.

33 I think ultimately whether or not something
34 is important depends on what it is that one is
35 interested in -- one is interested in and what one
36 thinks defines status, and so I don't think I'm in
37 a position to say that one particular indicator is
38 more important than another; rather, it is a value
39 judgment, to an extent, about what criteria you
40 think are important in terms of assessing status
41 and ultimately what management and what sort of
42 actions one is able to take -- one would like to
43 take in response to that status assessment.

44 So for example, if you're not interested in
45 taking, or if -- I shouldn't say "if you're not
46 interested", if it's not within your scope to be
47 looking and taking actions with regards to habitat

- 1 condition it doesn't make sense to have indicators
2 that speak to habitat condition within your status
3 assessment.
- 4 Q Okay. But I do note in your report, at page 9,
5 you state that Grant et al do not include
6 distribution metrics in their assessment method
7 and that, in your opinion, was a substantial
8 oversight because Fraser River sockeye salmon
9 conservation status and population viability
10 within a CU is a product of spatial distribution,
11 habitat condition and abundance, not population
12 abundance in and of itself, and you stand by that
13 statement, I take it?
- 14 MS. WIECKOWSKI: I do stand by that, and I think that
15 the work that Holt had done sort of supports that
16 statement where -- and similarly in the comments
17 and there was a workshop or a series of review
18 sessions back in November that spoke to Grant and
19 that was a theme that came up repeatedly
20 throughout those sessions, that distribution is an
21 important aspect to take into consideration.
22 And my impression is that based on those
23 discussions I'm not privy to what happens within,
24 you know, the subcommittee meetings or internal
25 discussions with DFO, but my impression was that
26 there's a recognition by the authors of Grant that
27 distribution is an important aspect but it just --
28 they decided not to pursue it for various reasons.
- 29 Q All right. Moving back to Table 2, which is where
30 I had originally taken you to, this, again, it's a
31 useful summary of the analysis you did of each of
32 the different reports and if I could ask you just
33 to identify, first of all, down the left-hand
34 column there's various criteria set out and I take
35 it you assessed each of these methodologies
36 against those different criteria?
- 37 MS. WIECKOWSKI: Yes.
- 38 Q Okay. The first criteria, which is described as
39 Definition of Status, what is that addressing and
40 can you summarize for us how each of these
41 methodologies addressed status, the definition of
42 status?
- 43 MS. WIECKOWSKI: Yeah. So Definition of Status is,
44 just a point of clarity, it's not so much a
45 criteria but, rather, a frame of reference in
46 which to put each of the specific methodologies,
47 so the idea being that each method defines status

1 differently and that's important to recognize when
2 looking at those methods with regards to the
3 indicators that they select as well as their
4 respective metrics and benchmarks and their
5 strengths and weaknesses. So the intention of
6 that row is to sort of set the stage for all the
7 subsequent criteria in the comments below.

8 So for example, just starting with the
9 NatureServe method, they're largely interested in
10 defining the risk of extirpation or extinction,
11 and so that is how they define status.

12 Pestal and Cass and Holt et al define status
13 differently than NatureServe, and they use a
14 different subset of indicators to define status,
15 where Holt's method uses four classes of
16 indicators, so statuses of function of abundance,
17 trends in abundance, distribution and fishing
18 mortality, where within those indicator classes
19 status is largely a function of productivity.

20 So a status assessment from that method is
21 serving a different management question or
22 different -- it has a different management lens on
23 it than, for example, NatureServe's, and
24 similarly, Pestal and Cass define status by using
25 several indicator classes. They had abundance,
26 they had trends in abundance, they had
27 productivity, diversity, fishing mortality,
28 distribution, habitat condition. And so within
29 their assessment of status they made -- they
30 differ from Holt's approach, because for them
31 status was important not from just a productivity
32 and abundance perspective, but they were also
33 interested in habitat condition. And so it wasn't
34 just the status of the population but the status
35 of the habitat in which that population lived.

36 Q Thank you. The next series of criteria are really
37 the indicators that we've just reviewed with
38 you --

39 MS. WIECKOWSKI: Mm-hmm.

40 Q -- on Table 3. And so you've gone through each of
41 those indicators and assessed each of the methods,
42 and I'm not going to take you through that,
43 because we can all read what's there.

44 With the feasibility criteria which shows up
45 at the bottom box on page 94, what is meant by
46 "feasibility"? What's being assessed there?

47 MS. WIECKOWSKI: So by feasibility, what we were trying

1 to assess was looking at how easily implementable
2 is that status assessment methodology, and not
3 just from using -- so from feasible and
4 implementable from a variety of ways. So how
5 easily can one analyze all the data and how easily
6 can one then roll up the various results from the
7 indicators into an overall score for the CU
8 status, what is the degree of effort required for
9 each, and so essentially, given a certain level of
10 resources, is it possible to implement each
11 method?

12 Q And the Holt method you identify as a high effort
13 and the Pestal and Cass and also the NatureServe
14 you identify as medium levels of effort. And
15 without getting into a lot of detail, is there
16 just some examples you can give to the
17 commissioner as to why one is classed as high and
18 one is classed as a medium effort?

19 MS. WIECKOWSKI: Yeah, I think the primary reason for
20 why Holt's is a -- requires a higher level of
21 effort is its more quantitative approach to
22 setting benchmarks, where it's much more data-
23 intensive and requires a lot more statistical
24 know-how, to use just a colloquial term, to apply
25 that method, whereas the other two methods, the
26 Pestal and Cass and the NatureServe method are
27 qualitative in their approach to assessing -- or
28 to benchmark-setting and so it doesn't require the
29 same level of statistical rigour. That's not to
30 say that they're not defensible in their own
31 rights, but it's just a different approach to
32 setting benchmarks, and so the level of effort is
33 probably distinguishable on that benchmark.

34 Q Thank you. And the next criteria is benchmarks,
35 and what's being assessed there; what are you
36 looking at?

37 MS. WIECKOWSKI: So for that criteria we're looking at
38 how each method sets those benchmarks within a
39 given indicator, so defining that line between
40 poor and moderate condition and moderate and good
41 condition.

42 Q And the last one is criteria -- the fifth criteria
43 you have there are data needs. What's being
44 looked at there and, you know, how does that, for
45 example, distinguish -- how is that distinguished
46 from, say, feasibility? They sound like they're
47 talking about the same thing.

- 1 MS. WIECKOWSKI: Yeah, data needs is different in terms
2 of it's looking at specifically given the list of
3 indicators and metrics that each method has put
4 forward, what specific data do you need to inform
5 those indicators and metrics and how available is
6 it? Have we been collecting it; have we not been
7 collecting it? And the difference between the
8 feasibility and the data needs and availability is
9 data needs and availability doesn't speak to or
10 doesn't get at how easy is it to work with the
11 data, and that's what feasibility is getting at.
- 12 Q Okay. And then the last part of your analysis is
13 to look at the strengths and the weaknesses of the
14 different methods. What was your objective in
15 setting out the strengths and weaknesses?
- 16 MS. WIECKOWSKI: So the objective there was not -- the
17 objective there was to essentially do just that,
18 was to lay out the strengths and weaknesses of the
19 alternative methods, and it wasn't to make a
20 judgment about whether or not one method was
21 better than another, because ultimately which
22 method is the preferred method for a given -- will
23 depend on what the management objectives are and
24 what the actions and decisions that you want that
25 status assessment to inform are.
- 26 Q So your work is really to understand the tools
27 that you have chosen to look at as tools that
28 could be used in assessing status?
- 29 MS. WIECKOWSKI: Correct.
- 30 Q All right. If I can ask you to turn to Table 1,
31 which is on page 92, this table sets out various
32 status categories for all of the different CUs.
33 Where did the data for this table come from?
- 34 MS. WIECKOWSKI: The data on this table came from
35 Pestal and Cass, and the only addition to this
36 table that we have made is we've added the last
37 column and we've also sort of reorganized how the
38 information is presented from Pestal and Cass, but
39 essentially the same data is there, it's just
40 represented in a different way.
- 41 Q Okay. And I understand there's some corrections
42 that need to be made to this table. If I could
43 just ask you, on the CU index there's a bunch of
44 codes, and if we move to the bottom third of the
45 page you'll see L-4-1, which is Lillooet, and it's
46 shown as status category 3 on this table; is that
47 correct?

1 MS. WIECKOWSKI: No, there's two revisions that need to
2 be made. So Lillooet should be status category 1,
3 and similarly, Shuswap Complex should -- so L-9-3
4 should be status category 1.
5 Q Okay. And do you have any explanation as for why
6 that error is on that table?
7 MS. WIECKOWSKI: It was sort of a -- it was a
8 propagation error from a mistake that was made in
9 the labelling of a previous figure and...
10 Q So it wasn't new data that came in, it was just
11 a --
12 MS. WIECKOWSKI: No, it was just a --
13 Q -- a typo?
14 MS. WIECKOWSKI: -- a typo.
15 Q Okay. Thank you. And if you turn to page 109,
16 which is Table 18, I think we might need to
17 address a similar error. L-04-01, which is
18 Lillooet on this table, shows as "poor"?
19 MS. WIECKOWSKI: Yes, so that should be modified to say
20 "good", and similarly, the L-09-03 for Shuswap
21 Complex should also say "good".
22 MS. BAKER: Okay. So does everybody have that? That's
23 Table 18 on page 109.
24 Q And just following up on that, in the executive
25 summary of this report at page ii, all right, if
26 you could just hold that page, you'll see at the
27 bottom of the first paragraph, about four lines
28 up, it says that:
29
30 Based on the results of the best available
31 assessments, we found that 17 of 36
32 Conservation Units have a poor population
33 status...
34
35 Is there a correction to be made there?
36 MS. WIECKOWSKI: Yeah, it should read just 15 of 36
37 conservation units have a poor population status.
38 Q All right. And we also, before today, circulated
39 a revision to Figure 5, which is found on page 64
40 of the report. So if you can turn -- yes, the
41 bottom half of that page which is, sorry, Figure
42 5, page 64. There, yes, stop the screen there.
43 So that figure which is being pulled up, we
44 circulated a change to this document that you've
45 provided us?
46 MS. WIECKOWSKI: Yes.

- 1 MS. BAKER: And if that could be pulled up, Mr. Lunn,
2 it's a loose page which replaces this figure. All
3 right.
- 4 Q And the changes that were made here are the
5 Lillooet and the -- sorry, maybe you can just
6 explain; what's the change that was made to this
7 figure?
- 8 MS. WIECKOWSKI: Yeah, there were two changes that were
9 made. The first is that the Lillooet and Stuart
10 labels were -- they were, in the initial figure
11 they were reversed, so we've switched them back to
12 their proper place, so Lillooet/Stuart is now --
13 they're the ones that are in the centre page just
14 around the line that comes up from the 3; so
15 Stuart is now the blue square and Lillooet is
16 now --
- 17 Q The red line?
- 18 MS. WIECKOWSKI: Yeah, the red and the green -- or the
19 red and grey circle. And then the other change
20 was that the -- in the legend, where the grey dots
21 are actually from Pestal and Cass and the red
22 diamonds are Grant et al, the modified status
23 based on Grant's work.
- 24 Q Okay. And then while this figure is up, you
25 indicated that Stuart is now on this vertical line
26 you see coming up from the number 3 on the
27 severity line.
- 28 MS. WIECKOWSKI: Mm-hmm.
- 29 Q What is the significance of that number 3 on the
30 severity line?
- 31 MS. WIECKOWSKI: So that's something that we have
32 carried over from Pestal and Cass. This figure is
33 a modified version of a figure that Pestal and
34 Cass had originally used to present their status
35 assessment, and so that figure is just -- that
36 line, and similarly the line that comes across on
37 the -- from the Y axis for uncertainty, it was
38 just a way of dividing up the entire graph into
39 four regions where you could then categorize the
40 CUs that fell within a certain box as either poor
41 or good or uncertain data or certain data. And so
42 things that, on the severity scale, CUs that were
43 below 3, we said that those were good; whereas CUs
44 that fell to the right of 3, so 3 to 5, we
45 classified as poor.
- 46 MS. BAKER: Okay. Canada had provided a document in
47 its list, it's Tab 6, but it was, again, a new

1 document was provided this morning. Mr. Lunn,
2 have you got the most current version, the one
3 that came this morning? It's a table. Sorry, it
4 came in yesterday, not this morning.
5 MR. LUNN: I'll just bring it up. This is what I have.
6 THE REGISTRAR: Ms. Baker, did you wish to mark that
7 Severity document as a *bona fide* document?
8 MS. BAKER: Yes, thank you very much. Figure 5, the
9 revision, should be marked as the next exhibit,
10 thank you.
11 THE REGISTRAR: I'll mark that, as it's affiliated with
12 the other document, I'll mark it as 562A.
13
14 EXHIBIT 562A: Modified Figure 5, page 64, of
15 Evaluating the Status of Fraser River Sockeye
16 Salmon and the Role of Freshwater Ecology in
17 Their Decline, revised March 8, 2010
18
19 MS. BAKER: That's perfect.
20 MR. LUNN: I'm not sure if you can verify this?
21 MS. BAKER: Yeah, I don't think that's the right one.
22 MR. LUNN: It'll just take me a moment to bring up the
23 correct one.
24 MS. BAKER: Do you want us to take our break and we can
25 sort this out, or what do you think?
26 MR. LUNN: It'll be about 30 seconds. I'll leave it to
27 you which way you want to go.
28 MS. BAKER: No, no, let's carry on, then. That's the
29 one. Okay.
30 Q So this is the revised sockeye CU assessment score
31 document that was provided by Canada and you've
32 reviewed this, have you?
33 MS. WIECKOWSKI: I have, and there's one error that's
34 on it.
35 Q Okay. So this replaced the previous one, which I
36 think was trying to address the changes that were
37 made as reflected in Exhibit 562A --
38 MS. WIECKOWSKI: Yes.
39 Q -- but this one still doesn't look accurate, from
40 your perspective, so can you --
41 MS. WIECKOWSKI: The scores in the Figure 5 column are
42 now all correct; however, in the exec summary
43 column there should not be a "poor" next to
44 Lillooet/Birkenhead.
45 Q Okay. So this document shows your assessment of a
46 number of these -- 15 of these CUs as poor status.
47 The Grant et al shows much fewer in the red

1 category, the 3 category. How do you read this
2 document and what is this information as presented
3 telling you and I guess what's your reaction to
4 it?

5 MS. WIECKOWSKI: Yeah, I think that the main -- there's
6 a couple of points that it sort of speaks to me
7 on. The first is sort of illustrating the
8 judgment call that one makes about where you draw
9 that benchmark in terms of what defines something
10 as either poor or good or moderate.

11 So when we, going back to Figure 5, which
12 sort of illustrates, I think, how we drew -- how
13 we decided to draw that benchmark and what we
14 thought was reasonable, was we only did a binary
15 classification where we chose to say that
16 everything below 3 on the severity axis was
17 classified as good, whereas everything above 3 was
18 classified as poor.

19 And the reason we chose to do that was
20 because by only looking -- by only classifying,
21 for example, the seven CUs that were identified as
22 poor under Grant et al, it didn't necessarily, in
23 our opinion, explain the productivity -- the trend
24 in productivity that has been observed for Fraser
25 sockeye over the long term. It's where the seven
26 CUs that are marked as poor are smaller CUs that
27 aren't doing very well, but that same general
28 trend in declining productivity is something that
29 is more broad, it effects CUs that are also larger
30 and it's not just the seven smaller CUs.

31 And so we felt it was reasonable to, and it
32 sort of -- and it aligned with the questions that
33 we were trying to address within the freshwater
34 work that Marc Nelitz will speak to later. It
35 seemed reasonable to us to define a benchmark in
36 that way.

37 Q All right. And one last point. This document
38 doesn't show one CU, the Stuart -- I can't
39 remember what "E-s" --

40 MS. WIECKOWSKI: Yeah, the Early Summer -- or no, E-s-
41 t-u, Early Stuart.

42 Q And the note on this document, that's been deleted
43 because of -- or as reflecting the Grant document.

44 What is that, on your analysis, is that a --

45 MS. WIECKOWSKI: That's a poor.

46 Q It's a poor. So that --

47 MS. WIECKOWSKI: So within the exec summary column

1 there's only 14 there that are marked with "poor"
2 after the modification of Lillooet. And there was
3 another, the Stuart-Estu is also poor, but it
4 doesn't appear in this table.

5 Q All right. But that makes up the 15?

6 MS. WIECKOWSKI: Yeah.

7 Q Thank you very much. Now, I'm going to move to
8 Mr. Nelitz and talk about the habitat and
9 freshwater stressors part of the report. So if I
10 can ask you just an overview question: What was
11 the scope of the work that you were tasked to do
12 in this part of the report?

13 MR. NELITZ: In general terms, what we were trying to
14 do is, given the pattern of declines in sockeye,
15 illustrated through Figure 1, so in analytical
16 terms, if that's the Y variable that we're trying
17 to explain through our analysis, then the X
18 variable, in terms of the predictor variables were
19 things like the stressors and freshwater
20 environment, the habitat conditions and
21 vulnerability of those freshwater habitats, and to
22 see is there a relationship between the stressors
23 and the habitats and the declines in productivity
24 illustrated in Figure 1.

25 Q Thank you. I meant to mark that exhibit that we
26 just had on the screen that we were dealing with
27 the previous witness. So I should have that
28 marked, please, as an exhibit, and then I'm sorry
29 to interrupt your evidence, Mr. Nelitz.

30 THE REGISTRAR: It's 571. Is that affiliated with
31 the --

32 MS. BAKER: No, it's not. It should be its own
33 exhibit.

34 THE REGISTRAR: 571.

35

36 EXHIBIT 571: Comparison of CU Status Scores
37 for Technical Report 3, revised March 9, 2011

38

39 MS. BAKER: Thank you.

40 Q Sorry about that, Mr. Nelitz. So thank you for
41 your overview, and I just wanted to take you to
42 page 62 of your report, which sets out a graph,
43 Figure 1. This overall decline, is that a
44 reference point that you used in your work?

45 MR. NELITZ: Yes, it is, as an aggregate description of
46 the decline for Fraser sockeye.

47 Q And again, looking at it, as you've said, as an

1 aggregate, not as an individual CU?
2 MR. NELITZ: That's this image, yes.
3 Q Okay. And we've heard about the CU work that was
4 done. How is that relevant, if at all, to the
5 work that you were doing on the habitat and
6 freshwater stressor side?
7 MR. NELITZ: So can we turn to Table 1? I don't know
8 the page number for that. Page 92.
9 Q Page 92, yeah.
10 MR. NELITZ: So if you look across the top of the table
11 and you look to some of the last columns you'll
12 see stock names for productivity data, data
13 availability, total, that's referring to total
14 productivity and juvenile productivity and you'll
15 see X's there. So where there are stock names
16 aligned with the CUs and X's referring to the
17 total or juvenile productivity, those are the CUs
18 for which we had productivity data relating to
19 which is more of a disaggregated version of what
20 is seen in Figure 1.
21 Q Okay.
22 MR. NELITZ: And so we used those CUs in our analysis
23 of the stressors and the habitat vulnerabilities
24 in a quantitative form.
25 Q All right. If I can just ask you to turn to your
26 report starting at page 19, this sets out habitat
27 vulnerability. Before I go there, I understand
28 that you looked at two kind of broad topics of
29 things; you looked at habitat vulnerability as one
30 broad topic, and then you looked at what you
31 describe as stressors or pressures as another type
32 of indicator; is that right?
33 MR. NELITZ: That's correct.
34 Q Okay. So this section that I've just asked you to
35 turn to, section 2.2.4, looks at the habitat
36 vulnerability side of that equation; is that
37 right?
38 MR. NELITZ: That's correct.
39 Q What were the indicators that you used to assess
40 habitat vulnerability for each of the different
41 freshwater life stages? So let me back up: what
42 were the freshwater life stages that you assessed
43 habitat vulnerability for? Let me start with
44 that. I understand it to be migratory -- maybe
45 I'll just lead this, it might be faster. The
46 migration distance was one; total area of nursery
47 lakes was one; and the ratio of lake influence to

1 total spawning extent is the third, and that's set
2 out at page 19 of your report; is that right?

3 MR. NELITZ: That's correct.

4 Q Okay. Can you explain what those indicators I
5 just described are? What are they and why were
6 they chosen?

7 MR. NELITZ: So if I can start with the last part of
8 that, why were they chosen, we thought it was to
9 improve our ability to test for the effects of
10 stressors in the freshwater environment. We also
11 believe that it's important to consider how
12 vulnerable are those habitats to disturbances, and
13 so this led us to look at specific indicators that
14 we thought would describe that vulnerability, and
15 we wanted to select indicators that would
16 represent the different life stages, and so
17 migration distance for both the adult upstream
18 migration and the smolt outmigration we felt
19 captured a representation of the potential
20 cumulative stress that those life stages might be
21 exposed to along their migrations.

22 The total area of nursery lakes, in general
23 terms of estimates of productivity of lakes, lake
24 area is an important component of a lot of models
25 of understanding how many smolts, say for example,
26 can a nursery lake produce? It's clearly a
27 function of size. And then also the ratio of lake
28 influence to total spawning. So the large nursery
29 lakes of the Fraser, when you're considering human
30 stressors, those lakes can act as a buffer against
31 upstream disturbances.

32 So for example, sedimentation, if you imagine
33 you have some kind of sedimentation disturbance in
34 a headwaters area, that sediment is transported
35 through the stream network, but once it gets to
36 the nursery lake it can settle out, and so it
37 might affect lake -- so it might have some
38 localized effects in the nursery lake, but in
39 terms of downstream spawning, any kind of
40 sedimentation upstream is not going to be -- is
41 unlikely to be transferred through the lake and to
42 downstream spawning areas.

43 So nursery lakes can act as a buffer against
44 a lot of those upstream disturbances, and so in
45 our view it's an important discriminator to say,
46 okay, well where are they spawning downstream of
47 lakes and where are they spawning in tributary

1 streams and watersheds? Those tributary streams
2 and watersheds are going to be much more
3 vulnerable than those that are downstream in
4 lakes.

5 Did that address your questions?

6 Q Yeah, that's very helpful. I also wanted to just
7 ask you a question about the -- we understand that
8 DFO has adopted CU habitat status indicators under
9 the Wild Salmon Policy's Strategy 2. I understand
10 those are slightly different or quite different
11 from what you've just described. Is there a
12 reason why you didn't use those indicators, the
13 DFO indicators?

14 MR. NELITZ: Certainly. Well, for one, the habitat
15 indicators under the Wild Salmon Policy have been
16 developed for all salmon species. We were focused
17 on trying to tailor the indicators specific for
18 sockeye. As well, we were driven by a need to try
19 to represent habitat vulnerability and stress for
20 as many of the conservation units as possible, and
21 in a lot of cases the indicators being proposed
22 and developed through the Wild Salmon Policy
23 aren't available across all of the conservation
24 units yet. So we needed to use the best available
25 data that we could to come up with some
26 understanding of how vulnerable and how stressed
27 those habitats are.

28 Q So it's not a reflection on those indicators that
29 DFO has adopted as part of the Wild Salmon Policy,
30 that's not the point; it's just that you don't
31 have enough data to actually implement all those
32 indicators; is that right?

33 MR. NELITZ: That's correct. And not as ideally suited
34 for our analytical needs for this project of
35 trying to test for cause and effect.

36 Q And one other clarification. On the migratory
37 routes that you're looking at for that life stage,
38 was temperature a factor that was looked at, or
39 were there other factors that were excluded from
40 your analysis?

41 MR. NELITZ: No. I believe we say it early on in the
42 introduction, but we did not look at en route
43 mortality and the effects of water temperature and
44 en route or pre-spawn mortality. Similarly, there
45 were other commission projects that were looking
46 at those things and issues such as disease and
47 parasites and contamination impacts of the lower

- 1 -- impacts in the lower Fraser downstream of Hope,
2 we didn't consider those in this report, in our
3 study.
- 4 Q Because they're being covered in other reports?
- 5 MR. NELITZ: Covered elsewhere, that's correct.
- 6 Q When you looked at habitat vulnerability and the
7 indicators that you did look at for this report,
8 was that work done or that review done based on
9 existing science or new work and assessments that
10 were done by people on your team?
- 11 MR. NELITZ: Certainly our rationale and our thinking
12 around the vulnerability indicators is based on
13 our understanding of the science, but the way --
14 what we developed and the analysis we did was new
15 for this project.
- 16 Q Okay. And then section 3 of your report your
17 address the other piece here, which is freshwater
18 stressors, that's how you described them, and
19 that's at page 21, begins at page 21. And you
20 looked at a variety of stressors in the freshwater
21 environment, and I think I'll just review those.
22 By big picture review, you looked at forestry, you
23 looked at pine beetle, log storage and handling,
24 mining, hydroelectricity, urbanization upstream of
25 Hope, agriculture and water use; is that right?
- 26 MR. NELITZ: That's correct.
- 27 Q Okay. And again, was the assessment of these
28 different stressors based on a review of existing
29 science or on new work done by your team?
- 30 MR. NELITZ: So in understanding the general pathways
31 or mechanisms of effect of these sectors on
32 habitats, we reviewed the science; however, in
33 terms of assessing the significance of those
34 sectors on declines in sockeye salmon, for the
35 most part they were new analyses with the
36 exception of log storage. We were largely
37 reviewing other studies that had been done in
38 terms of determining effects, and also the large-
39 scale hydro operations, and again, reviewing what
40 other studies are available and what others have
41 done.
- 42 Q How did you do the work? How were the stressors
43 assessed?
- 44 MR. NELITZ: So one of our first pieces of -- so as I
45 mentioned, we used, based on our own knowledge and
46 reviewing the science, we developed a hypothesis
47 of interaction, so what do we believe the

1 potential interaction is between forestry and
2 sockeye salmon habitats, for example, so we
3 developed those first. Then we moved on to define
4 very specifically the habitats across the
5 different life -- the freshwater habitats across
6 the different life stages. So defining the
7 migratory routes for all of the CUs using DFO's
8 spawning extent data and aligning those with the
9 conservation units and defining what we call zones
10 of influence on those habitats. So if we believe
11 that there's a potential for an influence of an
12 activity on that specific habitat location, then
13 we define that spatially using our computer tool,
14 GIS tools.

15 And so once we had our habitats for each of
16 the conservation units defined, we then took those
17 spatial delineations and overlaid them with the
18 best available information describing forest
19 harvesting, mountain pine beetle, mining, run of
20 river, hydro, urbanization, agriculture and water
21 use. And to summarize, what's the spatial
22 distribution and the intensity of those activities
23 on those habitats.

24 And in a few cases, mainly forest harvesting
25 and mountain pine beetle, we had some information
26 on time series, so year-to-year changes, and so we
27 also examined that in our analysis.

28 Q All right. I wonder if it would be useful to take
29 an example of a stressor and just sort of walk
30 through that process, like what was the hypothesis
31 you looked at and how was it assessed and what was
32 your ultimate conclusion? If there's one that's a
33 good example, I'd ask you to identify it.

34 MR. NELITZ: So we can take mountain pine beetle, for
35 instance. So both the Province and the Federal
36 Government agencies have good data on the recent
37 mountain pine beetle disturbance over the last --
38 since the late 1990s, so slightly before the peak
39 of the outbreak, and so we summarized the year-to-
40 year data and mapping of that disturbance,
41 overlaid that with the habitat layers that I
42 mentioned for each of the conservation units, and
43 then summarized the area of the zones of
44 influence, the percentage of those areas that are
45 influenced by the stressor, in this case mountain
46 pine beetle. So in some cases it was up to 90
47 percent of the terrestrial area upstream of those

1 habitats could be disturbed, and so it's those
2 measures that we used in our analysis and
3 examination of the declines in the productivity.
4 Q Okay. Now, in section 4 of your report is titled,
5 Freshwater Influences on Fraser River Sockeye
6 Salmon. What's described in this section of your
7 report?

8 MR. NELITZ: So section...?

9 Q Page 49, sorry.

10 MR. NELITZ: So just to set this in context, so section
11 2.2, the description of habitat vulnerabilities,
12 section 3, the description of the stressors, those
13 are descriptions of the predictor variables that
14 we examined, the X variables in terms of trying to
15 say, are these things significant or important to
16 the declines of Fraser sockeye.

17 Section 4 is the summary of our analysis of
18 those X variables, with the Y variable being the
19 decline in productivity.

20 Q Okay. In section 4.2, which is titled - and
21 sorry, this is on page 52 - it's titled,
22 Assessment Across Conservation Units, and it
23 states in this section that you've used three
24 different methods to -- or tasks to assess whether
25 freshwater habitat conditions and stressors on
26 habitats contributed to recent declines, and you
27 looked at a science review, you looked at habitat,
28 stressor analysis, and you looked at habitat and
29 stressor variables with time series data, and
30 those are described in your first paragraph at
31 4.2, and then each of those categories is
32 developed in some detail.

33 Can you just explain what those assessments
34 entailed and what your conclusions were?

35 MR. NELITZ: Right. So prior to our work beginning, I
36 believe it was last summer, the Pacific Salmon
37 Commission requested some work be done to examine
38 alternative hypotheses that could explain the
39 declines in Fraser sockeye, and so as part of that
40 work there was a similar kind of analysis which is
41 referred to in our paper as Selbie et al, which is
42 -- examined the role of freshwater stressors and
43 habitat conditions in the declines.

44 And so this is important for us to look at
45 because we also -- we wanted to use the insights
46 gained from that to help prioritize our analyses,
47 so we weren't going to repeat things that they had

1 done and we felt that they had done it -- that
2 were done well.

3 We also wanted to frame our analyses in a way
4 so that our results could be compared to theirs.
5 So for example, if ours said something very
6 contradictory to theirs, we needed to understand
7 why and evaluate the evidence to suggest -- to
8 explain the reasons why there might be differences
9 there.

10 So they examined things like looking at
11 changes in growth of smolts in some of the nursery
12 lakes and the timing of smolt outmigration. Those
13 things we didn't -- so they found, through that
14 work, that there was not a relationship between --
15 or that it was unlikely that changes in the
16 freshwater habitat were explaining the declines in
17 Fraser sockeye. So that's what they found, and
18 some of the specific things they'd done guided our
19 analyses.

20 In terms of the second piece of what we did
21 here, which is -- so given everything that I've
22 described in terms of the vulnerability of the
23 habitats and the stressors on those habitats, we
24 then used some statistical techniques to see
25 whether those variables and the variation in
26 stressor intensity and the vulnerability of the
27 habitats was related to the patterns of decline
28 across the different conservation units, and we
29 found that through that statistical examination
30 that there wasn't -- we didn't find significant
31 relationships there other than a relationship
32 between migration distance and trend of the
33 decline, which was consistent with what Selbie et
34 al found.

35 And in the last portion of our work in
36 looking at -- relating those for our juvenile
37 productivity measure, which is a measure of
38 productivity of the fry and smolt stage, meaning
39 that if there's any kind of influence on
40 freshwater -- of the stressors on freshwater
41 production, we would have been able to -- that's
42 one place where we would most likely be able to
43 asses that. And so for forestry and mountain pine
44 beetle, we looked at the year-to-year variation in
45 forest development in mountain pine beetle
46 disturbance and related that to year-to-year
47 changes in juvenile productivity in the freshwater

1 environment and found no relationship between
2 those measures.

3 MS. BAKER: Mr. Commissioner, I would like to take the
4 witness to some tables, now, and I would sort of
5 like that not to get interrupted, so I wonder if
6 we could take the break now? Thank you.

7 THE REGISTRAR: The hearing will now recess for 15
8 minutes.
9

10 (PROCEEDINGS ADJOURNED FOR MORNING RECESS)
11 (PROCEEDINGS RECONVENED)
12

13 THE REGISTRAR: The hearing is now resumed.

14 MS. BAKER: Thank you.
15

16 EXAMINATION IN CHIEF BY MS. BAKER, continuing:
17

18 Q If I could have you turn to Table 19, which is on
19 page 110. So Table 19, and also I will take you
20 also to Tables 20 through to 22. First if I can
21 just ask you to describe what Table 19 is,
22 assessing, or, not assessing it, but setting out
23 your analysis based on a certain method which is
24 identified as "Stewart-Oaten 1996". What is that
25 assessment method and what are you assessing here?

26 MR. NELITZ: So the Stewart-Oaten method is a
27 recognition that in many situations in
28 environmental assessment, the data don't exist to
29 clearly establish cause and effect linkages, or
30 assess cause and effect linkages in a quantitative
31 way. And so there's also value in assessing
32 evidence in terms of a weight of evidence kind of
33 approach, and a framework for that. So where you
34 can assess a number of pieces of different sources
35 of evidence to come up with a conclusion, or an
36 assessment of the significance or not. And so
37 Stewart-Oaten lays out a nice framework.

38 It's a generic framework that we applied
39 here. Sets out a framework by asking these series
40 of seven questions of the assessment that you're
41 doing to come to a determination of significance.

42 And so the first three questions in this
43 table on the left-hand column, refer to the
44 pathways of effect between the stressors and
45 sockeye habitats and their role in the decline.

46 The fourth question relates to the
47 consistency or the evidence related to the

1 different life stages of the species of interest,
2 in this case, sockeye.

3 The fifth question relates to the temporal
4 pattern of the stressor and the decline. So is
5 there consistency between the year-to-year
6 variation or the decline and the stressor, for
7 example.

8 And the next, the sixth, relates to is there
9 spatial overlap, say, for example, so in terms of
10 the stressor and the sockeye habitat. So if
11 there's no spatial overlap, then clearly there
12 isn't that coherence that this potential for the
13 interaction between the stressor and sockeye.

14 And then, the seventh question is looking at
15 the issue, or is asking the question about
16 contrast. So if we have contrast in the decline
17 across conservation units from high to low
18 magnitudes of decline, and the stressors similarly
19 have a similar pattern of decline. So where there
20 is a very severe decline but there's also a severe
21 stress, and at the opposite end there's a low,
22 less of a decline and less of a stress, then that
23 kind of gradient and the contrast across
24 conservation units would suggest that there's
25 evidence that there is a relationship.

26 So these seven questions, general framework
27 for how we can pull together all the different
28 pieces of information and analyses that we did
29 into a single framework for coming to a
30 determination of the likelihood of freshwater
31 influences having an effect or not.

32 Q All right. So just to summarize, all those
33 questions that you see on the left-hand column set
34 out this framework, and you for each of those
35 freshwater stressors that we identified earlier,
36 you did this analysis, you asked all of those
37 different questions vis-à-vis those stressors and
38 the Fraser sockeye population; is that right?

39 MR. NELITZ: That's correct. So we did it for each of
40 the individual stressors and then this table here
41 is a rollup, given all of the results from all of
42 the stressors. This is our belief about the
43 importance of freshwater habitats in general.

44 Q Okay. So the response side is, when you say the
45 rollup, that's sort of your pulling together all
46 of the different stressors and your overall
47 conclusion?

1 MR. NELITZ: Yes.

2 Q For each of those questions for all of the Fraser
3 River stocks.

4 MR. NELITZ: Yes, that's correct.

5 Q All right. And then Tables 20, 21 and 22 are
6 essentially those questions that you identified,
7 those Stewart-Oaten method questions, have been
8 asked against each of these different freshwater
9 stressors and those show on the tables below. So
10 the first question:

11
12 How plausible is the hypothesized causal
13 mechanism?

14
15 That's answered for "Forest Harvesting", that's
16 answered for "Mountain Pine Beetle" and that's
17 answered for "Roads", as an example.

18 MR. NELITZ: Correct. Yes.

19 Q And there's three tables to cover off all of the
20 different freshwater stressors that you identify
21 in your report.

22 MR. NELITZ: That's correct.

23 Q And it's a summary, really, this is a summary tool
24 of all of the work that you describe earlier in
25 your report and that you've already reviewed
26 today.

27 MR. NELITZ: That's correct.

28 Q Okay. And those tables are identified, they begin
29 at page 111 and they're Tables 20, 21 and 22.

30 All right, going back to Table 19, then,
31 where the "Response" is set out and that's just as
32 a reference. I just want to ask you overall what
33 was the conclusion that you reached, having
34 completed your analyses of all the different
35 stressors and having asked all the questions that
36 are identified in the methodology you used?

37 MR. NELITZ: So we recognized that it's plausible that
38 changes in the freshwater environment, due to
39 natural changes in habitat conditions, or
40 stressors on those habitats, it is plausible that
41 those mechanisms can have effects on production of
42 Fraser sockeye, and that the strength of those
43 effects can be large in some cases. And the
44 scientific literature supports that there's the
45 plausibility of those mechanisms effect, of
46 effect. However, given the plausibility of those
47 things, the evidence suggested that freshwater

1 influences are not explaining the declines in
2 sockeye.

3 So one piece of evidence in coming to that
4 conclusion is the measures of juvenile
5 productivity that were available for a subset of
6 the conservation units have not been changing to
7 the same extent that the measures of total
8 productivity across the entire lifecycle have been
9 changing or declining. So if there was a
10 relationship, or one influence of freshwater
11 habitats, we would have expected to see declines
12 in juvenile productivity measures in our analysis,
13 and we didn't see that.

14 Similarly, the timing in those cases where we
15 had time series available for some of the
16 stressors, the timing doesn't necessarily, doesn't
17 coincide with the timing of the pattern of decline
18 in sockeye. For instance, mountain pine beetle is
19 a more recent phenomena; 2003 is when it really
20 started to pick up. Given that we're trying to
21 explain a pattern of decline that began in the
22 late '80s, and also given lags, expected lags of
23 the effects of mountain pine beetle, say, for
24 example.

25 Forestry as another example, although there
26 have been varying levels of forest development
27 across the basin, in many watersheds the level of
28 disturbance has been relatively stable across
29 them.

30 And as well, in other examples, run of river
31 hydro, for instance, the spatial overlap wouldn't
32 explain the pattern of the decline, as well. The
33 run of river hydro that currently exists is
34 largely focused in the Lower Fraser basin, and is
35 not interacting in any way with the conservation
36 units of the Upper basin. So again that's a piece
37 of evidence that suggests that it's not possible
38 for things like run of river hydro to be
39 explaining the decline.

40 And lastly, the contrast in the intensity of
41 the stressors across the CUs, some do have high
42 stressors, some have low stressors, but the
43 pattern of that high and low does not coincide
44 with the patterns of higher and lower rates of
45 decline that have been seen across the
46 conservation units.

47 So the culmination of all that evidence leads

1 us to believe that it's unlikely that freshwater
2 influences are playing a role.

3 Q All right. And if we turn to --

4 THE COMMISSIONER: Ms. Baker, I wonder if I could
5 just --

6 MS. BAKER: Yes.

7 THE COMMISSIONER: I apologize. I should have asked
8 you this earlier as you were going through
9 particularly in this area of Table 19. But in
10 your report and in your evidence you use words
11 like habitat, freshwater environment, freshwater
12 habitat, freshwater ecology, watershed, spawning
13 habitat, are these terms all interchangeable, or
14 are you meaning different things when you use
15 these terms? Because you seem to use them
16 throughout your report, and I'm not sure whether
17 you're talking about the same thing or expanded
18 something, whether freshwater environment is
19 expanding freshwater habitat. Can you just tell
20 me what the baseline is here.

21 MR. NELITZ: Thanks for the question. I think it's
22 important to be clear that we describe freshwater
23 habitats specific to the sockeye conservation
24 units and their life stages. So in one sense we
25 do use a lot of those terms interchangeably, so
26 just to make that clear. And the concept that
27 we're trying to convey here is that sockeye salmon
28 at different life stages use different freshwater
29 habitats. Spawners use tributary spawning streams
30 and main stem spawning, or downstream of lakes.
31 So when we talk about habitats in a general term,
32 we are referring to the life stage specific
33 habitats like spawning, the nursery lakes, the
34 migration corridors.

35 So in the finest level of detail, I would
36 describe habitats depending on what life stage
37 we're talking about. But in a general term we
38 talk about habitats to capture all of those
39 things.

40 THE COMMISSIONER: And watershed?

41 MR. NELITZ: Yes, watershed. So the other thing to add
42 to that is there is a stream or a lake specific
43 section that sockeye use, but streams are not
44 disconnected from the land base. And so when we
45 talk about watersheds or zones of influence, we're
46 talking about that terrestrial area that has the
47 potential to influence those in-stream or lake,

1 nursery lake conditions.

2 THE COMMISSIONER: Thank you.

3 MS. BAKER:

4 Q Thank you. And page 57 of your report sets out --
5 or 56 and 57 set out your "Summary and
6 conclusions". And at page 57, the second
7 paragraph you state that:

8

9 Our assessment of the cumulative effect of
10 freshwater stressors suggests that the recent
11 declines in Fraser River sockeye salmon are
12 unlikely to be due to changes in freshwater
13 habitats.

14

15 Which is what you've just been describing.

16

17 An important piece of evidence in reaching
18 this conclusion is that juvenile survival has
19 remained relatively stable across CUs where
20 data are available...even though there is
21 substantial variation in stressor intensity
22 across CUs.

23

24 And this is what you've just described to us?

25 MR. NELITZ: That's correct.

26 Q The next paragraph -- let me just stop there for a
27 moment. If that's the overall conclusion, are we
28 to take from this that freshwater habitat and
29 stressors are something we shouldn't be concerned
30 about. Is that the upshot of your report?

31 MR. NELITZ: No. I wouldn't interpret that from our
32 report at all. In our analysis, we are examining
33 specifically the relationship between the
34 stressors and the vulnerability, and the specific
35 response variable, the declines in productivity.
36 Habitat stressors and vulnerability interact with
37 habitat, with other measures of the freshwater
38 environment, so water temperature, for example.
39 So forestry can interact with those habitats to
40 influence water temperatures. So there may be a
41 relationship when then has an effect on sockeye
42 salmon. It's just what we're saying here is that
43 translating some changes in habitat up to -- it's
44 unlikely that the changes in habitat are
45 transferring up to a population level effect that
46 is represented through the declines in
47 productivity. So there may be some intermediate

1 measures that we didn't assess through our
2 analysis where there could be relationships or
3 effects, but we just didn't look at those things.
4 Q When you say it comes up to a population level
5 effect, you're talking about the aggregate
6 population across all of the CUs on the Fraser
7 River?

8 MR. NELITZ: Yes. Both aggregate and across the whole
9 lifecycle. So if we have a certain -- the way
10 that, referring to an analogy that I've heard
11 elsewhere, that if you think of each salmon life
12 stage as a link in a chain, and that there may be
13 stressors that are interacting with those links in
14 the chain that is imposing some mortality on those
15 different life stages. If there is one link in
16 that chain that is having the most severe
17 constraint, or bottleneck, on the total production
18 across the whole lifecycle, that may be that
19 that's the most important driver, may be the most
20 important driver behind the declines in
21 productivity. So if in the presence of that, it
22 may be difficult to detect the effect of a
23 stressor on another link in the chain, because the
24 bottleneck is not alleviated, or there's that
25 overwhelming stress on a different life stage. So
26 it's not to suggest that there aren't other
27 stresses on those other links in the chain.

28 Q And as you indicated, you were looking -- all of
29 your analysis is measured against the productivity
30 changes, and there's other factors that could be
31 looked at, such as distribution of CUs or
32 abundance of CUs, and those were not part of the
33 work that you were doing.

34 MR. NELITZ: That's correct, yes.

35 Q Okay. And you weren't looking at habitat impacts
36 on distribution, for example.

37 MR. NELITZ: Correct.

38 Q You were looking at habitat impacts on
39 productivity.

40 MR. NELITZ: That's correct.

41 Q Okay. Does your report, is your assessment, help
42 us in understanding then, stream-specific or lake-
43 specific or any kind of site-specific freshwater
44 impact on the sockeye?

45 MR. NELITZ: No. Our report did not get into trying to
46 understand the cause-effect linkages of individual
47 CUs. So if one conservation unit is -- the

1 abundance or the returns are not as strong as they
2 have been historically, we haven't gone through an
3 analysis to try to explain specific situations in
4 conservation units. We were looking more at
5 across the basin, more broad scale, what kinds of
6 drivers might explain the variation in the
7 declines that we've seen across the basin, not a
8 specific CU.

9 Q And on page 57, which is on the screen, there is a
10 statement at the bottom line, actually, the last
11 line of the last paragraph that says:

12
13 Stressors that induce higher density
14 independent mortality may have no noticeable
15 effects unless another factor creates
16 additional stress on the population.

17
18 What is that; what do you mean by that?

19 MR. NELITZ: Well, this is reiterating, or going back
20 to the example that I just gave and reiterating
21 the point that given different links in a chain
22 and each life stage represents the different
23 links, if there is a severe constraint on one of
24 the life stages, say, for example in the marine
25 environment, that is acting as a bottleneck on
26 total production of Fraser sockeye, it would be
27 difficult for us to pick up what the effect of
28 impacts on freshwater environment would be, given
29 that constraint in the marine environment.

30 Q I'd like to move to your recommendations. At page
31 59 of your "Recommendations" there is a second
32 paragraph from the bottom, which begins with:

33
34 To improve our understanding about survival
35 at critical freshwater life stages...

36
37 That paragraph. We've heard so far in this
38 Commission of Inquiry about certain juvenile
39 assessments that are done on certain lake systems
40 and populations, certain CUs. In your view, what
41 kinds of data needs to be collected in addition to
42 what is being collected now, and why is that
43 additional information important?

44 MR. NELITZ: As you acknowledged, there are some
45 limnology studies and there is some estimates of
46 smolt conditions, and smolt departure from nursery
47 lakes, and fry. But it's not widespread across

1 the conservation units in the Fraser basin, the
2 existing information is largely focused on some of
3 the larger stocks. And so to have better
4 representation across the conservation units,
5 certainly feel that these measures are important.

6 Q Why would that data be important to have?

7 MR. NELITZ: Well, for one, helping us better
8 understand. So although we conclude that it's
9 unlikely freshwater is having a role, looking out
10 into the future, that conclusion is also based on
11 a handful of juvenile productivity data. Given
12 climate change and other things that are
13 happening, if we want to protect sockeye salmon
14 into the future, we're going to be able to want to
15 know and be able to assess more easily whether
16 changes in the freshwater or marine conditions and
17 the relative importance of those two things. So
18 if we have a better understanding of what's
19 happening in the freshwater environment, the
20 survival through the freshwater environments, we
21 will more strongly and quickly be able to act, if
22 possible, to try to mitigate some of the impacts
23 of mortality at those different life stages.

24 Q Okay. On page 60 you make similar sorts of
25 recommendations with respect to habitat
26 monitoring, and just in your answer now you
27 mentioned some limnology work that is done by
28 Canada. And we've heard a little bit about that
29 in the hearings, the Cohen Commission hearings
30 already. What additional limnological work needs
31 to be done, in your view, and why again is that
32 kind of limnological work important?

33 MR. NELITZ: Understand that there is relatively good
34 representation of some of the limnology work
35 across the nursery lakes. But again, given a
36 purpose under the Wild Salmon Policy is to
37 represent both strong and weak, to protect the
38 diversity of conservation units and strong and
39 weak stocks, small and large, believe that there's
40 better representation across nursery lakes is
41 important to fill some of those data gaps that
42 exist.

43 Q All right. If that kind of data had been
44 available to you, would that have allowed you to
45 better assess the impacts on the freshwater
46 environment?

47 MR. NELITZ: Yes.

1 Q At page 60 in the second paragraph, which begins
2 with the phrase:

3
4 To improve our understanding about the
5 population level effects of stressors...

6
7 You state here that:

8
9 ...the general mechanisms of effect are
10 known, but estimates of the population level
11 significance of a given stressor level are
12 crude...

13
14 So that begins on the third line and goes to the
15 fourth. Can you explain that further, what are
16 you addressing there, and what kinds of data needs
17 to be collected, or analysis needs to be done, to
18 better understand population level impacts.

19 MR. NELITZ: So given the analogy I referred to earlier
20 about different links in the chain, so I think we
21 also need to understand, have a better integrated
22 model of what's happening in the linkage, what's
23 happening in the freshwater environment and the
24 marine environment and the linkages between the
25 two. But as well we need to understand, I believe
26 we need to design deliberate experiments where we
27 have contrasts in stressors in the freshwater
28 environment, high disturbance/low disturbance,
29 where we have an integrated understanding of
30 nursery lake conditions and spawning extent and
31 quality, so we can understand better how the
32 freshwater environment and kind of how increases
33 in different stressors can cascade to a population
34 level.

35 Currently we are struggling to understand
36 those linkages and the translation, given some of
37 the issues we've talked about. We struggle in
38 terms of translating given increases in mountain
39 pine beetle or forest harvesting and how that can
40 translate to a population level effect.

41 Q At the bottom of this page 60, the very last
42 paragraph, it begins at the bottom with the
43 phrase:

44
45 To improve transparency in the science and
46 related decision making scientists, managers,
47 and the public need information that is more

1 accessible.

2

3 And you go on in that paragraph. What were the
4 challenges that you experienced with the data
5 available to you in doing your work?

6 MR. NELITZ: Well, certainly a large part of
7 establishing, I call it the baseline for our
8 assessment, was delineating and defining the
9 habitat information. So spawning -- sorry,
10 defining that and relating it to the different
11 conservation units. So we had nursery lake
12 delineations and spawning extents provided to us
13 from DFO. But at least for the spawning extents,
14 what that information wasn't also lined up with
15 the conservation units, as well, the watershed or
16 the zones of influence on those different habitats
17 was also not defined, so a big portion of our
18 early effort was getting some of that baseline
19 information to describe core habitats and
20 watersheds of influence on those habitats for the
21 different conservation units.

22 Q Right. So how could data be better integrated, I
23 guess, to allow you or managers or scientists to
24 do CU-specific work, or assessment.

25 MR. NELITZ: Well, I certainly think that given some of
26 the -- we talk about this, and in some of the
27 state of the science, but given some of the poor
28 resolution of information on the intensity of
29 disturbance, say, water use, for example, and the
30 lack of time series for a lot of stressors, we
31 believe that if there was a stronger linkage
32 between the agencies that are collecting those
33 data, and an understanding of the need for those
34 data to understand how human activities are
35 affecting freshwater environments. So if there's
36 a stronger link, linkage between those, that there
37 would be a bit of a feedback that the data would
38 be more suited and better suited to doing the
39 kinds of analyses that we were trying to do with
40 this work.

41 Q And for each of the life stages that you
42 identified in your report, that would be the
43 migration life stage, the spawning habitat and the
44 nursery lakes, in your view what are the key
45 pieces of additional data which would be useful
46 for managers and scientists in assessing
47 freshwater impacts in the future?

1 MR. NELITZ: Certainly along the migration, adult
2 migration, where Scott Hinch has worked, but think
3 having a good -- given the importance of water
4 temperature along the adult migration, and
5 understanding that for a greater number of CUs
6 further towards the -- not just kind of Fraser
7 main stem and some major river tributaries, but
8 having a greater understanding of temperature
9 conditions along the full extent of migration
10 corridors, and a greater number -- across a
11 greater number of conservation units would be
12 helpful. Having a better understanding of the
13 timing of smolt out-migration, which is currently
14 limited to a few lakes, a few nursery lakes, that
15 would be valuable information. Having information
16 that describes the -- so currently there's a
17 description of the spatial extent of a spawning
18 but it's a static descriptor. It doesn't reflect
19 the year-to-year changes in spawning habitat use
20 of different CUs. And so having information that
21 helps us understand how spawners are changing
22 their use of different habitats and the quality of
23 that habitat, the temperatures, the gravel
24 quality, flows, having that available and then
25 having, as it somewhat referred to before, having
26 greater, better spatial representation in terms of
27 lake sampling across the different CUs would be
28 valuable as well for the nursery, nursery rearing
29 conditions.

30 MS. BAKER: Thank you. Mr. Commissioner, when I went
31 through the qualifications for these witnesses, I
32 neglected to actually have them qualified as
33 experts. So I would like to do that now.
34 I'll start with you, Mr. Nelitz. We reviewed
35 your c.v. and that's now marked as Exhibit 563,
36 and we reviewed your educational status and the
37 work that you've done, and the work that you
38 focused on, and your c.v. sets out the various
39 publications and reports that you've been involved
40 with. And of course today we've talked about the
41 work that you did for this project. And I would
42 ask that Mr. Nelitz be qualified as an expert in
43 environmental management, which would include
44 policy implementation, management frameworks,
45 environmental indicators, performance reporting,
46 adaptive management, and in structured decision-
47 making, statistical analysis and environmental

1 assessments.

2 THE COMMISSIONER: Thank you, Ms. Baker. Is there any
3 participant who wishes to challenge the
4 qualifications of Mr. Nelitz? Thank you very
5 much.

6 MS. BAKER: Thank you. And with Ms. Wieckowski, again
7 her c.v. is at Exhibit 570, and again we reviewed
8 the work that your educational background, your
9 c.v. sets out your publications in a variety of
10 areas. We've reviewed the work that you did in
11 preparing this report. And I'd ask that Ms.
12 Wieckowski be qualified as an expert in structured
13 decision-making, risk assessment and management,
14 environmental planning and management, computer
15 modelling and simulation and statistical analysis,
16 all of which were involved in the work that she
17 did for this report.

18 THE COMMISSIONER: Again, any participant have an
19 objection to that qualification? If not, then
20 both of these experts are qualified in the fields
21 in which you have identified, Ms. Baker. Thank
22 you.

23 MS. BAKER: Thank you. And those are the questions
24 that I have for these witnesses. The first
25 participant to question these witnesses will be
26 Canada with Mr. Timberg.

27 MR. TIMBERG: Yes, for the record, Tim Timberg for
28 Canada, and with my colleague, Geneva Grande-
29 McNeill.

30 The first theme, Mr. Commissioner, I have ten
31 themes to my questions, which I'll be asking
32 today. And my time estimate is two hours.
33

34 CROSS-EXAMINATION BY MR. TIMBERG:
35

36 Q The first theme that I have for I think primarily
37 for Mr. Nelitz, is -- and Ms. Wieckowski, is going
38 to be some questions about the statement of work
39 of what you were asked to do. And so perhaps we
40 could turn to that. that's at page 130 of the
41 ESSA report. It's Exhibit 562, I believe.

42 MR. LUNN: Did you say page 30?

43 MR. TIMBERG: Page 130. Actually, perhaps it's easier
44 if we could go to Roman numeral iii, I think
45 there's a summary there.

46 Q And, Mr. Nelitz, you've stated here that your
47 report covers six freshwater stressors, forestry,

1 mining, hydroelectricity, urbanization upstream of
2 Hope, agriculture and water use. You'll agree
3 those are the six stressors you focused on?

4 MR. NELITZ: That's correct.

5 Q And isn't it true that those are the six stressors
6 that are in your statement of work, that's what
7 you were asked to look at.

8 MR. NELITZ: That's correct.

9 Q And so my question then is in your experience as a
10 habitat expert, are these the best freshwater
11 stressors to use to determine habitat status?

12 MR. NELITZ: In terms of on the stressor side, I
13 believe that the categories of stressor are
14 important ones and relevant. I think some of the
15 ways that are available to describe those
16 stressors could have been improved upon if we had
17 better data.

18 Q Okay.

19 MR. NELITZ: On the habitat condition, so I consider
20 habitat status, as we've talked about in the
21 report, as a combination of the vulnerability of
22 the habitats and the stressors on those habitats.
23 So on the stressor side I've just made those
24 points. On the vulnerability side, I think there
25 are other measures of vulnerability or habitat
26 condition.

27 Q Right.

28 MR. NELITZ: Water temperature, as an example.

29 Q Okay.

30 MR. NELITZ: We didn't have that across all the
31 conservation units, so that was not part of it.
32 And again that would be --

33 Q Right. So those six, though, stressors were
34 selected. That's because there is data available
35 for those six; is that correct?

36 MR. NELITZ: I can't speak to why those six stressor
37 categories were selected.

38 Q You were just provided with that.

39 MR. NELITZ: In our terms of reference, yes.

40 Q Okay. So you did what you were asked, which was
41 to focus on those six. And I'm just sort of
42 trying to get a sense of other, I think you said
43 earlier that there are intermediate measures that
44 also could have an effect, intermediate habitat
45 measures that might have an -- stressors that
46 might have an effect. Such as would you agree
47 that perhaps looking at amount of recreational

1 time spent on a lake might be an appropriate
2 habitat measure to consider the impact, or length
3 of foreshore development on a lake. Are these
4 other kinds of habitat stressors that would be of
5 assistance?

6 MR. NELITZ: In terms of understanding status of
7 habitats, yes, I do believe those are important.
8 In terms of what we were trying to do here with
9 our analysis, in terms of explaining patterns of
10 decline in the productivity, I am not certain that
11 they would have been as informative.

12 Q But I'm just trying to understand then, if, for
13 example, you talked about these bottleneck
14 stressors, and these sort of more localized
15 habitat stressors on particular CUs, that's
16 something that you've not done in this report; is
17 that correct?

18 MR. NELITZ: That's correct.

19 Q And I'm just thinking for the Commissioner's
20 benefit, if we could expand upon these
21 intermediate measures that perhaps are still --
22 that you'd agree these intermediate measures are
23 still relevant to habitat.

24 MR. NELITZ: Absolutely.

25 Q Okay. And so my list that I have here is amount
26 of recreational time spent on a lake. That's like
27 impacts of boats and recreational vehicles or
28 boats on lakes. What about infilling of swamps
29 and foreshore, or sewage drain discharge. Are
30 those something that you would normally be
31 considering in looking at habitat?

32 MR. NELITZ: Again I think it's going to be context-
33 dependent in terms of specific CU.

34 Q Right.

35 MR. NELITZ: So the amount of foreshore use of
36 juveniles in those nursery lakes say, for example.
37 So, in general, yes, I guess I'm wondering, I'm
38 trying to distinguish between what we were charged
39 to do, which was looking at patterns of decline,
40 trying to explain general patterns of decline
41 versus are these other intermediate measures
42 important to explaining cause and effect
43 relationships in individual CUs. I can't
44 speculate and kind of go through each of the CUs
45 individually and try to say, like that might be
46 important here, not important there, and whatnot,
47 in terms of local conditions.

1 Q All right.

2 MR. NELITZ: But they can be important. But an
3 aggregate level of what we were trying to do,
4 their importance is less in my mind relative to
5 the ones that we looked at.

6 Q Certainly. And my point is simply so that the
7 Commissioner is aware that there are other habitat
8 stressors that are out there that are not included
9 in your report.

10 MR. NELITZ: Yes. Yes, I would agree.

11 Q Okay, thank you. And would you agree you've
12 assessed these six freshwater stressors
13 independently and you've not assessed them
14 cumulatively?

15 MR. NELITZ: I'd say we have assessed them
16 cumulatively, both in terms of we developed a
17 cumulative stressor, a measure of the cumulative
18 stress on a conservation unit. So we did consider
19 across all the different stressors. We did
20 summarize that. As well, in the statistical
21 analysis that we did, we looked at alternative
22 models, so to speak, of interaction and whether
23 multiple stressors could be acting to explain the
24 patterns of decline. So we did look, I'd say, at
25 a bigger picture, not independently. We did both
26 an independent and more interactive cumulative
27 assessment.

28 Q All right. And if you had considered these
29 intermediate measures that we just spoke about or
30 these other habitat indicators, would that have
31 affected your outcome?

32 MR. NELITZ: My suspicion is no. Without having those
33 data and having a better sense of those measures,
34 it's hard for me to conclusively say whether it
35 would have or not.

36 Q The **Fisheries Act** and the Wild Salmon Policy
37 provide a definition of fish habitat, and I'll
38 read that into the record. It says:

39
40 "Fish habitat" means spawning grounds and
41 nursery, rearing, food supply and migration
42 areas on which fish depend directly or
43 indirectly in order to carry out their life
44 processes.

45
46 Is that a definition of fish habitat that you were
47 utilizing in working through your paper?

1 MR. NELITZ: I would say it's consistent.

2 Q Okay, thank you. And will you agree that fish
3 habitat refers to all species of fish and
4 generally it's not focused on a single species, it
5 generally includes all organisms?

6 MR. NELITZ: Yes, I would agree.

7 Q And as a general question, do you think that a
8 single species approach is an appropriate manner
9 to consider this topic of fish habit?

10 MR. NELITZ: I think that's a response that's
11 appropriate for a manager, or the values by which
12 somebody is managing a system as a scientist in
13 terms of -- as my expertise in terms of a
14 scientist, I don't think it's in my place to
15 comment on what's appropriate in terms of the
16 values that are being managed or protected. So I
17 just find that if you say is there a relationship
18 between a certain habitat condition and species
19 "X", I can comment on those things in terms of
20 what's appropriate. I think that's a societal or
21 a value judgment in terms of what the values are
22 that's guiding that. I would say there's a
23 relationship between habitats and all fish
24 species.

25 Q Right. And so with respect to habitat management,
26 what would you recommend if you were commenting
27 more broadly on habitat with respect to the
28 multiple species within the habitats you've
29 considered.

30 MR. NELITZ: I'm not clear on your question.

31 Q Well, I guess it's a simple question, is whether
32 looking at habitat with a single-species approach
33 is a way to go. Is that in your experience the
34 way in which habitat is analyzed? Or is it
35 analyzed looking more holistically at the general
36 habitat?

37 MR. NELITZ: I think from an analyst's point of view,
38 the hypothesis that you're testing which you can
39 design a hypothesis or analysis where you're
40 testing the relationship between habitat and one
41 species, or you can look at it in terms of a
42 habitat and multiple species. I just, I think
43 it's a value judgment in terms of what's
44 appropriate in terms of one species or multi
45 species, and I don't feel as though it's my place
46 to comment on what the right or wrong value
47 judgement is.

1 Q All right. Do you have knowledge of how DFO
2 manages habitat?
3 MR. NELITZ: Absolutely, yes.
4 Q And how do they manage habitat?
5 MR. NELITZ: I would say that, getting to what I think
6 you're trying to say, as I understand it, that DFO
7 is managing habitats for all species, all fish
8 species.
9 Q All right, thank you. And I think you said
10 earlier that there's a link between habitat
11 productivity, between land activities and water
12 use activities. You'd agree with that?
13 MR. NELITZ: Yes.
14 Q And would you agree that generally there are
15 higher levels of habitat stress in areas of
16 increased development pressure?
17 MR. NELITZ: "Development" being defined broadly in
18 terms of industrial sectors and urban
19 developments, and...
20 Q That's correct.
21 MR. NELITZ: Yes.
22 Q Thank you. And is the goal to habitat management
23 to ensure that development pressure does not
24 negatively affect habitat?
25 MR. NELITZ: I don't think I can -- I don't feel
26 comfortable to comment on that, or I don't feel I
27 can comment on that. I'm not a manager, so I
28 don't feel well versed enough to comment on what
29 the goals of management are.
30 Q And perhaps you can just explain the limitation in
31 your background with respect to why you can't
32 comment on that.
33 MR. NELITZ: I feel that my role in terms of this
34 report is providing technical expertise and
35 analysis around understanding the role of
36 freshwater stressors and vulnerabilities. It's
37 more of a scientific perspective. I'm separating
38 that from what I think are management values and
39 social judgments that managers, policy makers,
40 impose on some of that science in terms of what's
41 appropriate and what's not, and that's as an
42 independent analyst. That's not my role to, I
43 believe, to impose those value judgments.
44 Q All right.
45 MR. NELITZ: Given the terms of what we've been called
46 to testify on for these proceedings.
47 Q Yeah, and I'm just trying to understand a bit more

1 of your background, so that's helpful.

2 MR. NELITZ: So in terms of if you're asking me about
3 my background. My background, I work with
4 clients, the interface between science and
5 management and policy. So I certainly have an
6 understanding about what the linkages are, and how
7 science can inform management and the values. But
8 when I work with clients, I don't interject my own
9 values and, say, tell my clients that these are
10 the values that I think you should be managing
11 for. I help them elicit their own values, and to
12 be very transparent about those, and to try to
13 match that to some of the science.

14 Q Thank you. My second theme is to ask some
15 questions with respect to the objective of the
16 Pestal and Cass report. And so, Ms. Wieckowski,
17 are you aware that -- perhaps we should turn to
18 Pestal and Cass report, actually. This is at Tab
19 1 of Canada's binder. And, Ms. Wieckowski, have
20 you seen this document before?

21 MS. WIECKOWSKI: Yes, I have.

22 MR. TIMBERG: If this could be marked as the next
23 exhibit.

24 THE REGISTRAR: Exhibit number 572.

25
26 EXHIBIT 572: Pestal and Cass, "Using
27 Qualitative Risk Evaluations to Prioritize
28 Resource Assessment Activities for Fraser
29 River Sockeye", Research Document 2009/071
30

31 MR. TIMBERG:

32 Q If we could turn to page 5 of the report, that's
33 page 12 of 88 at the bottom right, and the bottom
34 paragraph there, section, 1.4 "Project Outline".

35 Ms. Wieckowski are you aware that the
36 original purpose of the Pestal and Cass report was
37 to develop a ranking tool for Fraser sockeye that
38 would allow a prioritization of assessment
39 projects, and that it was commissioned by the
40 Pacific Salmon Commission because they had funds
41 through the Southern Endowment Fund, and they were
42 getting peppered with a variety of proposals from
43 various researchers to do different work to assist
44 Fraser River sockeye salmon, and they didn't have
45 a methodology to set out who gets what, and where
46 certain projects should be funded and where they
47 should not. Are you aware of that background?

1 MS. WIECKOWSKI: I was aware that the Pacific Salmon
2 Commission had commissioned the report. With
3 regards to the other details you mentioned, I was
4 not aware of that. By reading the report you get
5 a sense that there is strong emphasis about being
6 able to prioritize CUs, but that was based on my
7 own understanding of the report, and not based on
8 information.

9 Q All right. And so will you agree then that the
10 primary purpose of the Pestal and Cass report was
11 not to assess the status of sockeye conservation
12 units. Instead, its purpose was to prioritize
13 assessment projects.

14 MS. WIECKOWSKI: I don't know if I can agree either
15 way, not having been privy to the information from
16 Pacific Salmon Commission about why they
17 commissioned the report. Hearing it from you
18 perhaps I can make that conclusion, but I don't
19 know the true -- I don't know the underlying
20 rationale for the report.

21 Q Well, if we look at this paragraph, though, it
22 says:

23
24 The ultimate goal of this work is to
25 establish a consistent, transparent framework
26 that translates general policies and
27 objectives into practical guidelines for
28 prioritizing assessment projects.

29
30 You're aware of that.

31 MS. WIECKOWSKI: Mm-hmm. Yes.

32 Q And then it goes on talking about:

33
34 These different end-users generally bring
35 their own assessment priorities, and
36 sometimes even their own budgets, into a
37 complex multi-agency planning and
38 implementation process.

39
40 And this paragraph goes on to explain that this is
41 the point to this project. You'll agree with
42 that, obviously.

43 MS. WIECKOWSKI: I agree, yes.

44 Q My next theme is to talk about Pestal and Cass's
45 determination of conservation status. Now, the
46 Pestal and Cass used the conservation units from
47 the Wild Salmon Policy as they were known in 2009;

1 isn't that correct? To your knowledge they built
2 upon the initial work of Holtby and Ciruna in
3 2007?

4 MS. WIECKOWSKI: Correct.

5 Q And if we could go to Figure 13 of this at page
6 64. I think I've got the wrong page here -- 64 at
7 the top yes. And we're going to look at that
8 table on the left. Yes, we can just focus on the
9 left-hand side here.

10 And so, Ms. Wieckowski, Figure 13 is a table
11 of Pestal and Cass's evaluation of 36 conservation
12 units, isn't that correct, that's their
13 assessment?

14 MS. WIECKOWSKI: Part of it, yes.

15 Q It says at the bottom:

16
17 Treemap of status evaluations for 36
18 conservation units of Fraser sockeye.

19
20 MS. WIECKOWSKI: Yeah, their assessment also included a
21 component of vulnerability, which is not included
22 in this figure.

23 Q All right. And at the time that Pestal and Cass
24 was working in 2009, the work of Dr. Holt was
25 happening simultaneously; isn't that correct? And
26 that Pestal and Cass did not have the benefit of
27 the work that Dr. Holt was doing.

28 MS. WIECKOWSKI: I can't comment on that. I don't
29 know.

30 Q Okay. And will you agree then, that Pestal and
31 Cass's assessment of conservation units is not
32 based upon the Wild Salmon Policy of upper and
33 lower benchmarks between the red, amber and green
34 zone. They use a different system. You'll agree
35 with that?

36 MS. WIECKOWSKI: They do have a method for defining
37 benchmarks. Their method for how they came about
38 categorizing those benchmarks is different.

39 Q They don't use the red, amber and green assessment
40 under the Wild Salmon Policy; isn't that right?

41 MS. WIECKOWSKI: No.

42 Q They don't use it.

43 MS. WIECKOWSKI: No, they don't.

44 Q Thank you. And Pestal and Cass's focus is on the
45 current status of the conservation units and how
46 much confidence could be placed on that estimate.
47 And because of this focus, they evaluated severity

1 and uncertainty as their primary indicators; isn't
2 that right?
3 MS. WIECKOWSKI: Sorry, could you repeat the question?
4 Q Pestal and Cass focused on severity and
5 uncertainty, and you can see this in -- well,
6 perhaps we can go to Figure 12, the page before,
7 page 63. These are the two focuses that Pestal
8 and Cass rely upon.
9 MS. WIECKOWSKI: As one component, yes.
10 Q And as I understand it, severity is about the
11 status of the CU, and uncertainty is about the
12 availability of data on the CU; is that right?
13 MS. WIECKOWSKI: I think it's more than just
14 availability. It's the confidence in the data.
15 So whether there be data gaps, or errors in the
16 estimates, or I think it's more comprehensive.
17 Q Yeah. And they were looking at that because they
18 were trying to decide which project gets money for
19 which CU, where there's an absence of data. So
20 they were looking at absence of data as a
21 significant factor in their outcome because that's
22 what they were being asked to do; isn't that
23 right?
24 MS. WIECKOWSKI: I can't comment on why they were
25 looking at uncertainty.
26 Q Okay. So if we go back to Figure 13, Pestal and
27 Cass then, under the "Severity" column, here use
28 the numbers 1 to 5 to rate each CU. You'll agree
29 with that?
30 MS. WIECKOWSKI: Correct.
31 Q And their rating system is "1" is very good, "3"
32 is moderate and "5" is very poor. You'll agree
33 with that rating system?
34 MS. WIECKOWSKI: Yes.
35 Q And on the issue of uncertainty, if we could go to
36 page 57, and we've got Figure 6 here, 64 of 88.
37 So I guess my question here with respect to this
38 figure to assist us, uncertainty is largely a
39 question of the availability of data and its
40 quality. Those are the two factors, that
41 information needs to be accurate and needs to be
42 available over time.
43 MS. WIECKOWSKI: Mm-hmm.
44 Q And then the uncertainty indicator is there, and
45 that's relating to the information as to whether
46 it's available and whether it's available for at
47 least ten years. Could you comment on the

1 importance of having data available for a long
2 period of time when it comes to looking at sockeye
3 salmon. Why is that significant. Why is it if
4 you just get data from one year, why is that not
5 very helpful. Why do you need longer term data
6 information?
7 MS. WIECKOWSKI: You need longer term information
8 because you need to -- if you only have
9 information for a given year, you don't know
10 whether or not, you don't have a frame of
11 reference in which to place that one year. You
12 don't know whether some anomalous environmental
13 event occurred in that year. So having a longer
14 time series allows you to put that one data point
15 into a context, a historical context.
16 Q And so any recommendation that this Commission may
17 make about data collection, it's important that
18 any new data that is collected, is collected in
19 the long term. Would you agree with that?
20 MS. WIECKOWSKI: I'd agree with that.
21 Q Okay. And the source of the data that Pestal and
22 Cass is relying on is the salmon escapement
23 database system maintained by DFO. Are you aware
24 of that?
25 MS. WIECKOWSKI: Yes.
26 Q And we've created a new document which my friend
27 Ms. Baker took you to this morning. It's Exhibit
28 571. And what we've done here for the assistance
29 of the Commissioner and yourself is we've created
30 the Pestal and Cass column here, four over, and
31 what we've done is we've reproduced the numbers
32 here from the Pestal and Cass document at Figure
33 13, and those are, would you agree, that those are
34 the same numbers. We've taken them from the
35 severity column.
36 MS. WIECKOWSKI: Yes.
37 Q And --
38 MS. WIECKOWSKI: With the caveat that there are some
39 CUs that are not there, which Pestal and Cass did
40 look at.
41 Q Well, let's consider that. What I'd like to do is
42 explain the index here. So we've got Pestal and
43 Cass severity scores in the fourth column, and
44 then what we've done is we've removed the Stuart,
45 Early Stuart conservation unit as per the
46 recommendation of Sue Grant in her paper. She
47 says that that's not an appropriate conservation

1 unit. Do you agree with Ms. Grant's
2 recommendation that that be removed as a CU?
3 MS. WIECKOWSKI: I don't think I'm in a position to
4 comment on that.

5 Q Okay. I think it's worthwhile looking at it,
6 though. This is at Ms. Grant's paper, which is
7 Exhibit 184. And it's page 88, or 97 of 194. And
8 at the bottom there you'll see a section entitled
9 "Stuart-ESTu". And I'll just read this. Ms.
10 Grant says:

11
12 There are two sites in the Stuart-ESTu CU,
13 both of which have only one year of data...
14 or negligible escapement data...
15

16 And then further on she says:

17
18 Sockeye are observed in these creeks only
19 when spawner abundance in the Takla-Trembleur
20 CU is high or migration conditions have been
21 stressful...
22

23 And then she says:

24
25 These populations are not genetically
26 distinct from the Takla-Trembleur-ESTu CU and
27 are not persistent. Therefore, this CU
28 should be removed from the Fraser Sockeye CU
29 list.
30

31 Are you able to agree with Ms. Grant's
32 recommendation?

33 MS. WIECKOWSKI: My understanding is that there are
34 internal discussions within DFO regarding the CUs
35 and that it's an iterative process, and I'm not
36 privy to all the nuances that are ongoing with
37 regards to what constitutes a CU. And so I stand
38 by my previous statement that I don't think I'm
39 qualified to answer that question.

40 Q Okay. And the one thing that Pestal and Cass,
41 Grant et al, and yourself agree upon, is that
42 there are 11 CUs in which there are insufficient
43 data. That's part of your conclusion at present?

44 MS. WIECKOWSKI: Again, we didn't actually do our own
45 assessment of status, and so conclusions that we
46 made in this report with regards to CU status and
47 availability of data are based on the work of

1 Grant, and then Pestal and Cass.
2 Q All right.
3 MS. WIECKOWSKI: So they should be in accordance.
4 Q Okay. So that's an important point, then, that
5 the work that you've done is you took Pestal and
6 Cass's work, and then you looked at the work of
7 Grant et al, and then you've come to your
8 conclusion. That's what you've done?
9 MS. WIECKOWSKI: Correct.
10 Q And so you've used the same data and the same
11 statistics that they used.
12 MS. WIECKOWSKI: Correct. We didn't do our own
13 independent analysis, or checked their analyses.
14 Q All right.
15 MS. WIECKOWSKI: We took them as is from their reports.
16 Q And I think you just agreed with me that over time
17 the determination of CUs may vary as new
18 information comes to light, or circumstances
19 change.
20 MS. WIECKOWSKI: Yeah. I don't think the list has --
21 my understanding is that DFO has not published a
22 definitive list. They've acknowledged it's an
23 evolving iterative process.
24 Q Thank you. And looking then at - if we could
25 turn, Mr. Lunn, thank you - looking back at
26 Exhibit 571, you'll agree then that Pestal and
27 Cass, their conclusion is that five of the CUs are
28 in poor or very poor state. And at the top of the
29 list we have Cultus Lake is very poor, it's a "5".
30 Kamloops, Takla and Widgeon are "4", so they're
31 poor. And Takla-Trembleur are "4". That's --
32 those are just reproduced from their table.
33 MS. WIECKOWSKI: Yeah. NO, I'd agree with that.
34 Q Okay, thank you. Then my fourth theme is looking
35 at the work of Dr. Carrie Holt.
36 THE COMMISSIONER: Mr. Timberg, I apologize for
37 interrupting, but I notice the time. Do you want
38 to start...
39 MR. TIMBERG: Oh, yes. I would like to take the break.
40 Thank you.
41 THE COMMISSIONER: Thanks very much.
42 THE REGISTRAR: The hearing will now adjourn until 2:00
43 p.m.
44
45 (PROCEEDINGS ADJOURNED FOR NOON RECESS)
46 (PROCEEDINGS RECONVENED)
47 THE REGISTRAR: Hearing is now resumed.

1
2 CROSS-EXAMINATION BY MR. TIMBERG, continuing:
3

4 Q I'm now moving on to my fourth theme for my
5 questions and with respect to the work of Dr.
6 Carrie Holt and Ms. Wieckowski, you'll agree that
7 Dr. Holt's work focuses on the determination of
8 upper and lower benchmarks to separate the red,
9 amber and green benchmarks as set out in the Wild
10 Salmon Policy?

11 MS. WIECKOWSKI: I would agree that a portion of her
12 work focuses on that.

13 Q Okay. And that's a good point. I'm really
14 speaking about her paper, which is Exhibit 153, if
15 we could perhaps have that. This paper focuses on
16 her work on determining the upper and lower
17 benchmarks that separate the red, amber and green
18 zones under the Wild Salmon Policy?

19 MS. WIECKOWSKI: Yes. And also within this paper,
20 though, I think a portion of it is just looking at
21 what metrics to use, as well, 'cause there's --
22 she puts forward a number of metrics and there's
23 discussions about which metric is the best to use.

24 Q That's fair enough. Right.

25 MS. WIECKOWSKI: Yes.

26 Q And so she makes those considerations and she
27 comes up with her recommendation; is that correct?

28 MS. WIECKOWSKI: For some of them, yes.

29 Q Okay. Thank you. And Mr. Lunn, if we could have
30 the Wild Salmon Policy up just briefly to refresh
31 ourselves about the benchmarks and this is at page
32 17.

33 MR. LUNN: Seventeen on paper?

34 MR. TIMBERG: Yes. There we are.

35 Q And we have heard from Dr. Holt earlier, she's
36 testified here, but just in the middle -- the
37 beginning of the second paragraph states that:

38
39 The lower benchmark between Amber and Red
40 will be established at a level of abundance
41 high enough to ensure there is a substantial
42 buffer between it and any level of abundance
43 that could lead to a CU being considered at
44 risk of extinction by COSEWIC.
45

46 And will you agree that that -- that Dr. Holt has
47 applied that principle in her work?

1 MS. WIECKOWSKI: Yes, throughout. I'd agree that
2 throughout her paper she makes reference to this
3 for several of the lower benchmarks.

4 Q Right. And that's to -- okay. Thank you. And
5 then Dr. Holt set the upper benchmark to separate
6 the amber and green zones at a level that is 80
7 percent of the spawner number that yields maximum
8 long-term catch; do you agree with that? I have a
9 page reference if you'd like I could take you do.

10 MS. WIECKOWSKI: Yes, please.

11 Q It's at the Holt paper, so that's Exhibit 153,
12 page 15 or 23 of 82, and in the bottom of that
13 second paragraph, she talks about:

14
15 ... we recommend an upper benchmark to be
16 equal to (or greater than) 80 percent of the
17 SMSY.
18

19 MS. WIECKOWSKI: Well, as it's phrased in this report,
20 it's DFO's decision-making framework that
21 recommends that benchmark. From this I don't see
22 that it being Carrie's recommendation. She's just
23 being consistent with it.

24 Q All right. Well, that's fine. Thank you.

25 MS. WIECKOWSKI: Or Dr. Holt's, I should say.

26 Q Yes. And then if we -- yes, thank you, Mr. Lunn.
27 And if we go back to the Wild Salmon Policy on the
28 right-hand column there in the blue there's a
29 definition of what the amber status and it implies
30 caution in the management of the CU and is it a
31 fair summary to say that the amber CU is a CU that
32 is at a low risk of extinction but are at levels
33 that do not provide optimal yields? Is that a
34 fair summary of a -- of what the amber zone?

35 MS. WIECKOWSKI: I think conceptually that is true but
36 ultimately it depends how you define risk or low
37 risk of loss. So one person's perception of low
38 risk of loss is going to be different than an
39 individual, so I don't think you can unanimously
40 say that it does actually do that. It depends
41 what your perspective is and where you're coming
42 from.

43 Q Right. And that's part of the process that Dr.
44 Holt has gone through with the peer review process
45 to establish a scientific methodology to the
46 determination of benchmarks in a way that's
47 acceptable by the larger community.

1 MS. WIECKOWSKI: Yes. But I think where you decide
2 regardless of the approach one takes to setting
3 benchmarks, ultimately where you set that
4 benchmark is a value-based decision based upon
5 what your perception or your risk tolerance is.
6 Q Yes. And so I guess my point is that taking that
7 process through a peer review process is probably
8 an established methodology of how certainly DFO
9 moves forward.
10 MS. WIECKOWSKI: I think it's a peer review process of
11 the method that Carrie used. It's not a peer
12 review process of whether or not it's the correct
13 value judgment of where you set that benchmark.
14 Q Fair enough. I'm just --
15 MS. WIECKOWSKI: Yeah.
16 Q -- saying that Dr. Holt's process has gone through
17 peer review, you're right.
18 MS. WIECKOWSKI: It has. Yes.
19 Q And if we could turn to page 97 of the -- your
20 paper, the technical report. Yes, and this
21 morning you commented that Dr. Holt's work does
22 not include habitat condition as an indicator
23 class; is that -- do you recollect that from this
24 morning when we looked at this chart?
25 MS. WIECKOWSKI: I don't think I actually said that,
26 but based on this chart, yes, I would say now that
27 there is not -- there are not indicators that
28 speak to habitat condition within --
29 Q Within Dr. Holt --
30 MS. WIECKOWSKI: -- Holt et al's method.
31 Q Right. And that's why there's no "X" in that box
32 there?
33 MS. WIECKOWSKI: Yeah.
34 Q And would you agree that Dr. Holt specifically did
35 not include habitat indicators because her work is
36 on Strategy 1 of the Wild Salmon Policy and
37 habitat indicators are being designed and created
38 under Strategy 2 of the WSP and that's not --
39 that's not her business?
40 MS. WIECKOWSKI: I would agree that she does not
41 include habitat condition indicators and she makes
42 reference to how there's overlap between Strategy
43 1 and Strategy 2 on this front and she's going to
44 defer to Strategy 2. But she does acknowledge the
45 importance of it --
46 Q Yes, they are important.
47 MS. WIECKOWSKI: -- within the distribution in terms of

1 affecting distribution and other indicators within
2 her work.
3 Q Yes. And you'll agree that Strategy 2 of the Wild
4 Salmon Policy is to come up with habitat
5 indicators? You're aware of that?
6 MS. WIECKOWSKI: Yes.
7 Q Okay. And are you aware of the work of Heather
8 Stalberg who testified before us earlier this year
9 on the work she's doing -- or she did in creating
10 habitat indicators?
11 MS. WIECKOWSKI: yes.
12 Q And you're aware that Ms. Stalberg's habitat
13 indicators recommend indicators for particular
14 salmon species?
15 MS. WIECKOWSKI: Yes.
16 Q And so that -- her work has recommendations with
17 respect to like sockeye and coho, she separates
18 those out?
19 MS. WIECKOWSKI: Yes.
20 Q All right. And Mr. Nelitz, this morning I think
21 you said that -- you said -- would you agree with
22 that, that Ms. Stalberg's work includes habitat
23 indicators with recommendations for particular
24 salmon species?
25 MR. NELITZ: I would say that -- I guess I would want
26 clarity on the specific reference you're citing
27 there. So if you mean the -- well, let me ask,
28 which reference of Stalberg's work are you
29 referring to, a specific citation document?
30 Q I'm just referring to her testimony before us in
31 this courtroom where she described her work as
32 providing recommendations.
33 MR. NELITZ: I haven't seen a transcript of that
34 testimony, so I'm not --
35 Q Okay.
36 MR. NELITZ: -- exactly sure what she's referred to.
37 Q All right. Well, we'll let the record --
38 MR. NELITZ: In terms of a specific species.
39 Q We'll let the record speak for itself then. I
40 don't have the transcript, I'm sorry --
41 MR. NELITZ: Okay.
42 Q -- handy to read that to you.
43 MS. WIECKOWSKI: When I say that I'm aware of her work,
44 it would be in a specific reference where I've
45 seen her speak to -- and it was the -- it has a
46 green cover. I can't remember what the exact
47 reference is, but in previous documents --

1 Q All right.

2 MS. WIECKOWSKI: -- it's not in there.

3 Q So then now moving on to my fifth theme which is
4 the work of Ms. Grant, and earlier, Ms.
5 Wieckowski, this morning -- or at page 9 of your
6 report, you state at the bottom, at the very
7 bottom of that page:

8
9 On a separate note, Grant et al do not
10 include distribution metrics in their
11 assessment. In our opinion this is a
12 substantial oversight.

13
14 Will you agree that Ms. Grant is aware that
15 distribution is not included in her work, that
16 this was not a substantial oversight on her part,
17 but a deliberate choice?

18 MS. WIECKOWSKI: I guess to clarify my statement there,
19 I'm not saying that it was an oversight on her
20 part, but rather an oversight of the method that
21 -- she is aware of distribution, in that, that
22 it's not included in her method. I think it's a
23 shortcoming of the method.

24 Q Okay. And you're aware that in her opinion there
25 isn't existing -- the existing data is not
26 appropriate to include distribution in her
27 analysis? That's what she says in her report.

28 MS. WIECKOWSKI: Yes.

29 Q Okay. Thank you. And would you agree that
30 distribution is less significant for sockeye, the
31 sockeye species, as compared to other salmon
32 species, as they tend to spawn in concentrated
33 spawning beds and therefore distribution isn't as
34 relevant as it is, for example, for coho or other
35 species?

36 MS. WIECKOWSKI: Yes.

37 Q Thank you.

38 MS. WIECKOWSKI: However, I think with respect to the
39 Holt method, the initial intent was to develop a
40 status assessment method for across all salmon
41 species, so Grant's method isn't necessarily
42 applicable beyond sockeye. She says in her title
43 it's for sockeye.

44 Q Right. Okay. And so you'll agree that Ms. Grant
45 applied Dr. Holt's benchmark methodology to come
46 up with her draft assessment of the sockeye salmon
47 CUs and she utilized the red, amber and green WSP

- 1 benchmarks; isn't that correct? Just to summarize
2 that Ms. Grant applied Dr. Holt's benchmark
3 methodology?
- 4 MS. WIECKOWSKI: She applied the methodology, but the
5 benchmarks were not always the same. There were
6 modifications made to the method that resulted in
7 different benchmarks.
- 8 Q Yes. But my simple point is that she, Ms. Grant's
9 work is built upon that of Dr. Holt.
- 10 MS. WIECKOWSKI: Yes, it is.
- 11 Q Thank you. And Ms. Grant presented the results of
12 her assessment at a CSAS, Canadian Science
13 Advisory Secretariat meeting on November 15th and
14 16th, 2010; were you at that meeting?
- 15 MS. WIECKOWSKI: I wasn't at it in person. I attended
16 over the telephone.
- 17 Q Okay. And so you'll know that CSAS recommended
18 that Ms. Grant's initial assessment should be
19 considered preliminary pending decisions on how to
20 combine information from multiple sources in the
21 assessment.
- 22 MS. WIECKOWSKI: I'm not aware of the final
23 recommendations that came out of that proceedings.
- 24 Q Okay. Are you -- with respect to feasibility this
25 morning you were talking about feasibility. Are
26 you aware that DFO and Ms. Grant has undertaken to
27 complete a WSP assessment of all Fraser River
28 sockeye CUs?
- 29 MS. WIECKOWSKI: Can you clarify what you mean by a WSP
30 assessment?
- 31 Q Oh, Wild Salmon Policy.
- 32 MS. WIECKOWSKI: I know. But what does that entail?
- 33 Q Well, that she -- that her draft report that we're
34 discussing right now, that she's undertaken to
35 provide a finalized version of that report which
36 will include an assessment of all the Fraser River
37 sockeye salmon CUs.
- 38 MS. WIECKOWSKI: From a population perspective or a
39 habitat perspective or...? I'm just wanting more
40 clarity, 'cause WSP has multiple strategies within
41 it.
- 42 Q It's Strategy 1, population assessment. Just --
43 it's a simple question, just following up on the
44 draft work that she's done.
- 45 MS. WIECKOWSKI: Mm-hmm. I was not aware that that's
46 what she was doing.
- 47 Q Okay.

1 MS. WIECKOWSKI: If your -- your question was whether
2 I'm aware she's doing a redraft of it?
3 Q Yes.
4 MS. WIECKOWSKI: Right. No, I'm not.
5 Q You're not aware of that.
6 MS. WIECKOWSKI: No.
7 Q Have -- are you aware that CSAS has directed Ms.
8 Grant to convene a workshop to finalize the
9 protocol and make a final determination on the
10 status of Fraser River sockeye CUs?
11 MS. WIECKOWSKI: No.
12 Q Okay. If we could then turn to Ms. Grant's paper,
13 that's Exhibit 184, at page 36, which is 45 of
14 194. So you'll agree that this page is Ms.
15 Grant's overview of stock status for the 26
16 accessible CUs?
17 MS. WIECKOWSKI: Yes.
18 Q And her conclusion is that seven CUs were
19 consistently poor or which we would call in the
20 red zone under the Wild Salmon Policy?
21 MS. WIECKOWSKI: Yes.
22 Q And that 13 CUs were generally all between the
23 median low and upper benchmarks or in the amber
24 status and she clarifies with the exception of the
25 Shuswap ES and the Fraser S which were above their
26 median upper benchmarks in the green status.
27 MS. WIECKOWSKI: Mm-hmm. Yes.
28 Q And that five CUs were in very good status.
29 MS. WIECKOWSKI: Yes.
30 Q And so those would be consistent with the green
31 zone in the Wild Salmon Policy.
32 So will you agree that Dr. Holt's calculation
33 of benchmarks and metrics is quantitative,
34 repeatable and has been peer reviewed?
35 MS. WIECKOWSKI: Can you define what you mean by
36 repeatable?
37 Q Well, I understand that what's important under the
38 wild to have -- ensure credibility of the
39 assessment that -- so that all members, all
40 stakeholders who have -- and the Canadian public
41 in general can put weight and reliance on these
42 benchmarks, that it's important that the
43 benchmarks and the metrics are quantitative and
44 repeatable in the sense that we can -- they're
45 reliable -- it's a reliable scientific approach.
46 I may be using the wrong language, but that's what
47 I'm getting at.

1 MS. WIECKOWSKI: I'm still trying to understand what
2 you mean by repeatable. Do you mean that you can
3 repeat it for multiple CUs? It's not one that's
4 specific to a particular CU?
5 Q How would you define repeatable?
6 MS. WIECKOWSKI: Well, I would define it as something
7 that -- her benchmarks are based upon a time
8 series in terms of how she went about deriving
9 them and so it's something that she can do every
10 year and update those benchmarks based on a new
11 point in your time series.
12 Q All right. So using your own definition of
13 repeatable, would you agree that Dr. Holt's
14 calculation of benchmarks and metrics is
15 quantitative, repeatable and has been peer
16 reviewed?
17 MS. WIECKOWSKI: Yes.
18 Q Thank you. And would you agree that there's --
19 that Dr. Holt has provided a documented rationale
20 for her choice of most of the benchmarks?
21 MS. WIECKOWSKI: Yes.
22 Q And --
23 MS. WIECKOWSKI: Although some -- she hasn't defined
24 benchmarks for many of the indicators that she's
25 put forward.
26 Q Right. But you're aware that Dr. Holt said that
27 further fine-tuning will take place but the
28 procedure has a substantive basis already.
29 MS. WIECKOWSKI: Yes.
30 Q And will you agree that Ms. Grant's work now, Ms.
31 Grant's status categories, are consistent with the
32 Wild Salmon Policy and with the criteria for
33 evaluating species at risk used by COSEWIC?
34 MS. WIECKOWSKI: For the indicators she selected, yes,
35 but again, there's indicators that she has not
36 taken into consideration which are important for
37 COSEWIC such as distribution.
38 Q Right. And we've talked about distribution. And
39 will you agree that Dr. -- okay. So that's --
40 sorry. Let me just... And will you agree that
41 Ms. Grant did not assign numbers to her rating
42 system of 1 to 5 but instead Ms. Grant's work was
43 to assign the CUs to either red, amber or green?
44 MS. WIECKOWSKI: I'm not aware of her having a rating
45 system of 1 to 5. I think that might be Pestal
46 and Cass you're referring to.
47 Q Right. And that's my point. Pestal and Cass had

1 a rating system of 1 to 5 for their purpose and
2 Ms. Grant's work has a rating system of red, amber
3 and green.

4 MS. WIECKOWSKI: Yes.

5 Q And so my point there is, I guess, that it's
6 difficult to compare Ms. Grant's work under the
7 Wild Salmon Policy to Pestal and Cass' work for
8 the Pacific Salmon Commission to make
9 recommendations on where funding or projects
10 should be made because they have different rating
11 systems.

12 MS. WIECKOWSKI: I disagree with that system, because
13 there are -- there -- if you take the bookmarks or
14 bookends of those two rating systems, everything
15 is scalable in between in terms of so you take the
16 worst, the red, and you make the red spectrum,
17 which is what I did which you make red equal to 5
18 and green equal to 1, all the CUs within came out
19 in between relatively and so you can qualitatively
20 sort of align the two together. I don't think
21 they're non-comparable.

22 Q So you made 1 red and 5 green and what did you do
23 with 2, 3, and 4? Did you make them amber?

24 MS. WIECKOWSKI: I made 3 amber and then depending on
25 the description and that Grant provided for each
26 of the CUs for those CUs that were -- I then
27 determined whether or not I thought it should be
28 at the far end of a 5 or a 1 or whether it should
29 be at a 2 or a 4, so it was a qualitative
30 assessment.

31 Q All right. And has your assessment been peer
32 reviewed?

33 MS. WIECKOWSKI: No.

34 Q Okay. I'd like to now turn to my sixth theme
35 which is comparing Pestal and Cass to Grant to
36 understand how you reached your conclusions. At
37 page 8 of your report at the top there, you state
38 that:

39
40 The work of Grant et al is useful for our
41 purposes because they determined status for
42 all Fraser River sockeye salmon CUs, thus
43 providing a point of comparison with Pestal
44 and Cass.

45
46 So that's what you did?

47 MS. WIECKOWSKI: Yes.

- 1 Q And earlier this morning you said you didn't rely
2 on Grant's work in your direct examination, but
3 clearly you did rely on Grant's work in
4 considering her assessment of the CUs.
- 5 MS. WIECKOWSKI: I think what I said this morning was
6 that we didn't actually review Grant's work from
7 the four criteria that we put forward for looking
8 at each of the status methodologies.
- 9 Q Oh, I see. You just accepted her work within the
10 corners of the work that she'd --
- 11 MS. WIECKOWSKI: No, we just didn't -- we didn't review
12 it because it's something that is still a work in
13 progress.
- 14 Q Okay. Thank you. And if we could then turn to
15 Figure 5 which is the new Exhibit 562A, I believe.
16 And so if I understand things right, this is --
17 this is perhaps the most -- this is the figure
18 that explains what you did. You took Pestal and
19 Cass and then that's the circle and then Grant et
20 al is the diamond; is that right?
- 21 MS. WIECKOWSKI: It's -- the diamonds are not just
22 Grant. It's -- those -- so this goes back to what
23 I was talking about earlier with respect to my
24 approach I took. The red diamonds are a modified
25 score that is informed by both the work of Grant,
26 as well as that of Pestal, so it doesn't represent
27 either one or the other.
- 28 Q Right.
- 29 MS. WIECKOWSKI: It's a way of trying to summarize both
30 pieces of work.
- 31 Q So the index there, I'm going to suggest, is
32 actually incorrect, that the red diamond should
33 not say Grant et al 2010, but instead it should
34 say something like ESSA assessment, ESSA's
35 modified scores.
- 36 MS. WIECKOWSKI: Yeah. And I think that's captured in
37 the actual caption for the figure where it says
38 red diamonds represent modified CU status based on
39 input from Grant et al.
- 40 Q Right. So we should just be cautious about the
41 top left-hand corner box that says Grant et al.
42 That's actually a modified --
- 43 MS. WIECKOWSKI: Yes.
- 44 Q -- ESSA score. And part of that is the fact that
45 Grant et al did not use this rating system 1 to 5,
46 she assessed them based upon the Wild Salmon
47 Policy green, amber and red zones.

1 MS. WIECKOWSKI: Yes.
2 Q So if we then turn to Table 1 which is in the same
3 exhibit at page 92, so on the far right-hand
4 column here, this is where you describe your
5 status adjustment based on Grant et al. That's
6 what you've -- that's what you've done there?
7 MS. WIECKOWSKI: Yes. We're -- just to clarify, 1-2
8 would mean 1.5. It doesn't mean 0.5 in terms of
9 how I was depicting the information in that right-
10 hand-most column.
11 Q Right. And seven -- the seventh column "status
12 scores sev", that's from Pestal and Cass?
13 MS. WIECKOWSKI: Correct.
14 Q So that's Pestal and Cass, the seventh column
15 down. And then the far right is your adjustment
16 that you've made?
17 MS. WIECKOWSKI: Correct.
18 Q And you've then -- really, you're not using the
19 Wild Salmon Policy red, green or amber zones.
20 You're using numbers 1 to 5 like Pestal and Cass?
21 MS. WIECKOWSKI: Correct. And the rationale for doing
22 so stems back to things that I've brought up
23 earlier about how where you define those
24 benchmarks in terms of classifying something as
25 either red, green or yellow is a value-laden
26 decision and we were not tasked with making that
27 decision. And it was therefore felt to be
28 inappropriate for us to assign where to put that
29 benchmark to make it equivalent to Wild Salmon
30 Policy purposes.
31 Q Right. So you're not working with the Wild Salmon
32 Policy framework. You're using this separate
33 framework that you've just described.
34 MS. WIECKOWSKI: It's not that we're not working with
35 the Wild Salmon Policy framework, but rather we're
36 not -- what we've done is transferable to that.
37 We just not -- we have just decided that it was
38 inappropriate for us to make a value-based
39 judgment about where to put a benchmark. We were
40 not tasked with deciding where to put the limits
41 between red versus yellow, yellow versus red or
42 yellow versus green.
43 Q Right. So we can't -- we can't use your numbers
44 for that purpose.
45 MS. WIECKOWSKI: Yes, you can if, for example, someone
46 who is in a position to place those benchmarks,
47 they can decide whether or not they want to put a

- 1 benchmark at, for example, 2 to distinguish
2 between green and yellow, then what we have done
3 then becomes transferable to the yellow, green,
4 red framework of Wild Salmon Policy.
- 5 Q But you have not done that.
- 6 MS. WIECKOWSKI: We have not done that.
- 7 Q And if we could turn then to page 109 of the same
8 document, this is Table 18, Summary of Population
9 Status, where did this language of population
10 status, poor, moderate, good, come from in the
11 fourth column over? It says CU index, management,
12 conservation unit and then population status,
13 where did that descriptor come from?
- 14 MR. NELITZ: We were tasked to translate the -- we were
15 tasked to assign classifications of poor,
16 moderate, good to the conservation units, so these
17 are based our interpretations of the work that Kat
18 mentioned, not -- it was not our intent to apply
19 our value judgments about what a poor status is
20 and that that poor status is directly relatable
21 to, say, a red zone under the Wild Salmon Policy.
22 That is not what we were trying to do here.
- 23 Q All right. And this is then so I'm clear, Mr.
24 Nelitz, with your answer, so this is part of the
25 habitat analysis which from my perspective would
26 be Strategy 2 of the Wild Salmon Policy; is that
27 fair? This is a habitat portion?
- 28 MR. NELITZ: No, this is the population status was the
29 translation of some of the work that Kat was
30 talking about in terms of the binning --
- 31 Q Okay.
- 32 MR. NELITZ: -- and the scores into the status,
33 population status.
- 34 Q So when you say poor, moderate and good, then what
35 do you mean by that?
- 36 MR. NELITZ: So the way that we interpreted that -
37 again, we were not trying to overlay our own value
38 judgments.
- 39 Q Mm-hmm.
- 40 MR. NELITZ: What we were interpreting in Figure 5 CUs
41 that had scores from 3 or above as having poor
42 status.
- 43 Q So you used -- and so if it was the number 3, that
44 became --
- 45 MR. NELITZ: That's correct.
- 46 Q -- that became poor?
- 47 MR. NELITZ: That's correct.

1 Q So that was your line?

2 MR. NELITZ: Yes.

3 Q Okay. So that's -- okay. So that --

4 MS. WIECKOWSKI: And --

5 Q Right. So that explains -- okay. So let's
6 just --

7 MS. BAKER: I think the -- one of the witnesses had a
8 comment to make.

9 MS. WIECKOWSKI: Just the rationale for why we chose
10 the line -- the line of three was because -- it --
11 including all the CUs on that side of the line
12 better addressed the long-term decline in
13 productivity that is visible across Fraser sockeye
14 than, for example, using a smaller subset of CUs
15 for -- just -- for example, just the seven that
16 Grant has identified as poor -- or as red, that in
17 itself does not describe -- or would not -- does
18 not adequately characterize what's happening in
19 those seven CUs does not adequately characterize
20 because they're just small CUs what is happening
21 to Fraser sockeye as a whole. So we felt it was
22 more reasonable to use all the CUs that are on --
23 were to the right of the line, the vertical line
24 going through 3.

25 MR. TIMBERG:

26 Q All right.

27 MR. NELITZ: If I can add a point to -- some points to
28 clarify, so Figure 1 -- I mean, given our overall
29 task of trying to explain declines in productivity
30 of Fraser sockeye and that's represented through
31 Figure 1, if we just looked at -- considered the
32 seven CUs -- we're not -- I'm not trying to say
33 that one method or one outcome is right or wrong.
34 I'm just trying to offer our reasonable -- our
35 interpretation, which we thought was reasonable,
36 of these classifications. And so if we had only
37 thought that -- the seven that have been rated as
38 red through the discussions we've had today, the
39 declines in productivity cannot be fully explained
40 through those seven alone and there is evidence of
41 the other stocks that are represented in the
42 "poor" categories here, given the productivity
43 data that we had, that are showing declines. And
44 it's the collection or the aggregate of those
45 which we interpreted as being in part explaining
46 some of that decline in productivity across the
47 Fraser as an aggregate.

1 Q So that was your -- that was your decision?

2 MR. NELITZ: It was our interpretation --

3 Q It's your interpretation.

4 MR. NELITZ: Interpretation, yes.

5 Q Okay. Thank you. I'm on to theme seven and I'm
6 going to ask questions about your conclusions at
7 page 2 of your report. And that's Roman Numeral
8 II at the front. So when I received the report it
9 said that there were 17 -- here we go. I'll just
10 read this into the record:

11
12 ... we found that 17 of 36 Conservation Units
13 have a poor population status and are
14 distributed across all timing groups...

15
16 And I understand this morning you've now corrected
17 your evidence, that it's now 15; is that your
18 testimony today correcting it?

19 MS. WIECKOWSKI: Yes.

20 Q And so since we received this three weeks ago and
21 today we've got two CUs that have been taken out
22 of this category and you've removed the Lillooet
23 one; is that what I understood this morning?

24 MS. WIECKOWSKI: Yes.

25 Q And can you explain how you could have made that
26 mistake with the Lillooet?

27 MS. WIECKOWSKI: The -- can I see -- could you put
28 Figure 5 up on the screen, please?

29 MR. TIMBERG: That's 562A.

30 Q You had those inverted, didn't you?

31 MS. WIECKOWSKI: Yes.

32 Q The Pestal and Cass and the --

33 MS. WIECKOWSKI: Yes.

34 Q Yeah. You had those inverted. Okay. So that's
35 -- that's -- so now we're not at 17, we're at 16.
36 And then the other one that you are --

37 MS. WIECKOWSKI: Was Shuswap complex, the -- and that
38 was just -- that was a typo.

39 Q And that was a typo?

40 MS. WIECKOWSKI: Yeah.

41 Q Are there any other mistakes that you're aware of?

42 MS. WIECKOWSKI: No.

43 Q Okay. So page 2 and we've discussed earlier this
44 morning that it's Ms. Grant's opinion that the
45 Early Stuart CU, she recommends that it be removed
46 because it's not a significant conservation unit.
47 We went over that this morning.

1 MS. WIECKOWSKI: We did discuss that, yes.

2 Q Yeah. And you don't agree with her
3 recommendation?

4 MS. WIECKOWSKI: I didn't say that I didn't agree.
5 What I said was that I'm not in a position to give
6 an opinion on that.

7 Q But you're going to keep that conservation unit in
8 your statistics as a "poor"? You won't take it
9 out?

10 MS. WIECKOWSKI: Until a final list -- I think it's DFO
11 who is in the position to say what the list of CUs
12 is and so no official statement has come out from
13 DFO regarding, to my knowledge anyways, regarding
14 a modification and that list of CUs and so this
15 report stands, the CUs that we use in this report
16 are based on the list of CUs that has been put out
17 by DFO.

18 Q All right. If we could then turn to Exhibit 571,
19 so I'm just going to try and summarize this, so we
20 can move on to the next theme, but the -- if I
21 look at this, then we've created this document to
22 help us understand what you've done, so Pestal and
23 Cass said there were five CUs that were poor,
24 those are the numbers 4 and 5. And then Grant et
25 al said that there were seven CUs that she would
26 rate as in the red zone. And if I understand it,
27 you've looked at Pestal and Cass. You modified it
28 with Grant. Then I would think if we go to the
29 right - and these are your ratings on the right-
30 hand side - then I would expect that given that
31 it's the same data and the same information, that
32 you would have similar results of poor or on the
33 right-hand side. But instead what I see is that
34 you've added seven additional CUs that you rate as
35 poor. And why is that? I thought that you'd have
36 -- given that you're using the same data and
37 information, I would expect you'd have similar
38 results.

39 MS. WIECKOWSKI: This relates back to the discussion
40 that we'd been having just about -- with regards
41 to Figure 5 and the line that goes along 3 where
42 we felt it was -- we decided that it was most
43 reasonable for us to say that everything to the
44 right of that vertical line would be poor and
45 everything to the left of that is considered good,
46 so we did not feel it was appropriate for us to
47 put benchmarks in in terms of further delineating

1 the different --
2 Q All right. So that was --
3 MS. WIECKOWSKI: More bins.
4 Q Right. That was your decision. You'll agree
5 though that Pestal and Cass used a different
6 methodology than Ms. Grant did and yet their
7 outcomes are fairly similar?
8 MS. WIECKOWSKI: Correct.
9 Q And your interpretation is a different
10 interpretation, your results.
11 MS. WIECKOWSKI: It's an interpretation that takes into
12 consideration the two methods. And I think
13 they're all within reasonable ranges of each
14 other.
15 Q And perhaps then we should just look at page 12 of
16 your report. And at the top here again you're
17 providing another conclusion here. So at the top
18 there when it says you recommend modifying nine on
19 the severity score, that should now read seven; is
20 that correct? If we take out the Lillooet mistake
21 and we take out the typo, then that would come
22 down to seven; is that correct?
23 MS. WIECKOWSKI: One second.
24 Q Our Exhibit 571 is how I figured out the number
25 seven. If we could turn Exhibit 571 to assist
26 you, Ms. Wieckowski, all I did is I looked at Ms.
27 Grant has her "7" in the red and then on the
28 right-hand side you have "poor", the first seven
29 match Ms. Grant and then you have one, two, three,
30 four, five, six, seven and you've corrected that
31 the Lillooet should not be poor this morning, so I
32 get seven that is the change.
33 MS. WIECKOWSKI: What was the -- was the original
34 number nine in that document?
35 Q It was eight.
36 MS. WIECKOWSKI: Nine?
37 Q It had --
38 MS. WIECKOWSKI: No, I'm --
39 Q Oh.
40 MS. WIECKOWSKI: It was nine.
41 Q Yeah.
42 MS. WIECKOWSKI: That number of nine still stands true
43 in the sense that there are nine scores between
44 the column of Figure 5 and those of -- there are
45 nine scores that were modified.
46 Q Where are you getting that?
47 MS. WIECKOWSKI: So there are nine scores that were

- 1 modified from Pestal and Cass to Figure 5. That's
2 where the figure -- so there's nine sets of red
3 and grey dots. That's where that number is coming
4 from.
- 5 Q One, two, three -- I only count seven. One, two,
6 three, four, five, six, seven, eight, I count.
7 Are you counting them from -- you're counting nine
8 there?
- 9 MS. WIECKOWSKI: From --
- 10 Q From Figure 5?
- 11 MS. WIECKOWSKI: So there's Chilliwack, Fraser,
12 Quesnel, Lillooet, Shuswap Complex,
13 Takla/Tramblour, Bowron and Nahatlach and Taseko,
14 that's nine.
- 15 Q All right. Why wouldn't you mark 3 on your scale
16 as moderate and amber under the -- as moderate, as
17 opposed to poor?
- 18 MS. WIECKOWSKI: I believe we've already answered this
19 where by only taking -- by changing from -- by
20 taking 3 as our dividing line between poor and
21 good, we only had two categories in this figure.
22 We were -- it was better able to explain the long-
23 term productivity decline in Fraser sockeye.
- 24 Q All right. I'll move on to theme eight. A few
25 comments on a number of miscellaneous points
26 throughout the report, so I'm going to jump around
27 now. If I could turn to page 17 of your paper,
28 you make a general statement here. This is with
29 respect to indicators of rearing habitat
30 quantity/quality. A general statement is made
31 that sockeye production is limited by lack of
32 spawners. That's what you say there?
- 33 MR. NELITZ: Yes. Sorry, you're talking about
34 recruitment limited?
- 35 Q Yeah, I'm just talking about this section here.
- 36 MR. NELITZ: Yes.
- 37 Q And then later in the section you suggest that the
38 lack of carcasses has added to nutritional
39 limitation in the rearing lakes.
- 40 MR. NELITZ: Yes.
- 41 Q And --
- 42 MR. NELITZ: Has likely resulted.
- 43 Q Yeah. So will you agree that these statements
44 cannot be generalized as many of the largest lakes
45 are, or have recently exceeded the number of
46 spawners needed to maximize smolt yields?
- 47 MR. NELITZ: That's fair, yes.

- 1 Q And are there instances where the recent
2 escapement are at or exceed levels that result in
3 good smolt production such as Chilko or Quesnel?
- 4 MR. NELITZ: I can't comment on that. I'm not fully
5 aware or informed.
- 6 Q Okay. And will you agree that in many
7 conservations units, spawning takes place
8 downstream of the natal lake or in a few cases,
9 far upstream?
- 10 MR. NELITZ: To agree with many? I can't necessarily
11 agree with many, but I can say that the general
12 circumstances you described describe the variation
13 in spawning attributes or characteristics of
14 sockeye in the Fraser.
- 15 Q Yeah. Sometimes they're downstream --
- 16 MR. NELITZ: Yes.
- 17 Q -- and sometimes they're upstream. And so you'll
18 agree that in these lakes, carcasses will have no
19 bearing on lake productivity?
- 20 MR. NELITZ: Yes.
- 21 Q Okay. And so is it always true that the nutrient
22 from carcasses will benefit juvenile salmon?
23 Doesn't that depend on the location of the
24 spawning stream relative to the lake?
- 25 MR. NELITZ: Yes, but it -- in terms of sockeye, yes.
26 But --
- 27 Q Okay.
- 28 MR. NELITZ: -- there are other benefits to other
29 salmon species which --
- 30 Q Yeah, I just --
- 31 MR. NELITZ: -- are going to have nutrient benefits, as
32 well.
- 33 Q Okay.
- 34 MR. NELITZ: Can, yeah, derive benefits from -- or
35 those nutrients in the streams.
- 36 Q If we could then move to page 71 of your report on
37 -- with respect to mountain pine beetle. This is
38 a series of maps showing the spatial distribution
39 of mountain pine beetle and will you agree that we
40 should be a bit cautious in relying on this map
41 because the amount of dots and information is so
42 broad and generalized that there's a more detailed
43 story than -- that needs to be told about mountain
44 pine beetle than --
- 45 MR. NELITZ: Absolutely, yes. And our -- in other
46 places in the report, we certainly get into more
47 detail in terms of reporting on the values and

- 1 measurements.
- 2 Q Yeah. And I just wanted -- you'll agree then that
- 3 the level of pine beetle infestation varies
- 4 throughout the areas shown on the map?
- 5 MR. NELITZ: Yes.
- 6 Q And that some forests are all pine and other
- 7 forests are mixed?
- 8 MR. NELITZ: Yes.
- 9 Q And so the density of the forests and the pine
- 10 beetle infestation varies greatly?
- 11 MR. NELITZ: Yes.
- 12 Q And that's not shown on this map?
- 13 MR. NELITZ: Yes.
- 14 Q And will you agree that therefore that pine beetle
- 15 infestation does not have the same habitat impact
- 16 as logging?
- 17 MR. NELITZ: Would I agree that --
- 18 Q That pine beetle infestation does not have the
- 19 same habitat impact as logging?
- 20 MR. NELITZ: Freshwater habitat impact?
- 21 Q Yeah.
- 22 MR. NELITZ: Would agree with that and I believe we
- 23 make statements to that effect in the report.
- 24 Q Okay. And will you agree that at present the
- 25 habitat impact of pine beetle infestation is
- 26 largely unknown?
- 27 MR. NELITZ: I would say that we understand some of the
- 28 mechanisms of effect and that there is some
- 29 evidence that there are effects. There --
- 30 however, there are lots of uncertainties in being
- 31 able to predict what the effects might be.
- 32 Q All right. Thank you. So finally, it's still
- 33 unclear whether pine beetle infestations will
- 34 significantly impact sockeye habitats?
- 35 MR. NELITZ: I would agree with that.
- 36 Q Okay. Could we then move to page 77 to a map on
- 37 your small hydro projects, and again, I'm just
- 38 wanting to clarify what we can learn from this
- 39 map. Will you agree that not all of the dots on
- 40 this map are currently operating hydro facilities?
- 41 MR. NELITZ: My --
- 42 Q A number of these sites are only proposals, I
- 43 think you say that in the text, but you don't show
- 44 that differentiation here in the map.
- 45 MR. NELITZ: My understanding is -- so just to clarify,
- 46 I was not the lead author on pulling together the
- 47 data on small river run of river hydro projects.

1 My understanding is that these are operating run
2 of river operations in the Fraser.

3 Q Oh, okay. So I think we should then look at the
4 text at 3.3.2 and I don't have -- oh, I think
5 that's page 39 maybe? All right. So it's page 39,
6 if we could turn there.

7 I think what I'll do is I'll just -- I don't
8 have the cite handy and I'm conscious of time. I
9 think I'd just like to clarify on the record that
10 you are not the author of the small hydro project
11 section and you can't really speak to this map as
12 to whether or not they're showing currently
13 operating hydro facilities.

14 MR. NELITZ: My -- although I was not the lead on this
15 section, I am -- as lead author on the report, I
16 am certainly aware what others were doing and so
17 given that awareness and the guidance certainly
18 that we were all operating under is we were tasked
19 with investigating activities that are currently
20 in operation. And so --

21 Q Okay.

22 MR. NELITZ: -- my understanding is that the small
23 scale hydro operations should be in operations,
24 not proposed.

25 Q All right. And just -- I'm going to move on. I'm
26 -- I'll move on. I just note for the record that
27 my recollection is that the text is better at
28 explaining that.

29 Assessment of stressors at the CU level, if
30 we could turn to summary tables 11 to 14 which is
31 at page 102 to 105 of the report. So in these
32 tables you've ranked the relative -- you've
33 provided a ranking of conservation units; is that
34 correct?

35 MR. NELITZ: Yes, in terms of the cumulative stress
36 that those CUs are exposed to.

37 Q Yeah. And I'm curious about how you got to these
38 numbers on the right-hand column, stressor
39 summary. Did you add those different stressors up
40 to get, like, 15 and 14? How did you do that?

41 MR. NELITZ: In the report I can't remember which page,
42 we described the methodology for coming to those
43 -- to those scorings, so essentially we looked at
44 -- we used a statistical method to look at the
45 variation in intensity of disturbance across those
46 different stressors and to cluster the levels of
47 disturbance into categories of high, medium and

1 low, and then assigned arbitrary scores to those
2 to say well, high is going to be weighted more or
3 heavier than a moderate or low level of
4 disturbance and then sum of those across the
5 stressors.

6 Q All right. And so I guess my questions is do you
7 then look at those stressors separately and then
8 add them up? You didn't do an analysis of how
9 they all inter-react with each other?

10 MR. NELITZ: That's correct. And we make that
11 assumption clear in our report in terms of the
12 relative weightings of the different -- weightings
13 of importance. Just to elaborate on that, it is
14 -- there may be alternative assumptions about how
15 significant a mountain pine beetle disturbance may
16 be, for example, relative to forest harvesting, so
17 if you have a large portion of a watershed
18 disturbed by mountain pine beetle, the effect
19 might still be small relative to a watershed that
20 has a smaller amount of forest harvesting in it.
21 So we didn't -- we applied an equal weighting
22 across the stressors because we wanted to have a
23 measure of the cumulative amount of stress on a
24 relative scale and that's assumption that we made
25 in the report.

26 Q All right.

27 MR. NELITZ: In our analysis.

28 Q But there's no indication as provided of the
29 likelihood that any of the stressors will have a
30 tangible impact on sockeye productivity.

31 MR. NELITZ: In our report, we do talk about the
32 plausibility and the pathways of effects of the
33 different stressors on the sockeye life stages, so
34 we do talk about those stressors having likely --
35 that it is possible that those stressors can have
36 effects on sockeye.

37 Q All right. If we could then turn to page 107.
38 Going back to the IPP, it looks like I was wrong
39 with that map. At page 40 of your paper it states
40 in the beginning of the third paragraph:

41
42 To investigate the potential interaction
43 between these issues and sockeye salmon, we
44 gathered geographic coordinates for all
45 existing IPP locations in the Fraser River
46 basin (see Appendix 4).

47 So I think that answers the uncertainty that those

1 are existing IPPs; is that right?

2 MR. NELITZ: Yes. That was my understanding too.

3 Q Yeah. And I apologize for misinterpreting that.

4 MR. NELITZ: Thanks for clarifying.

5 Q Yes. At page 107 of your paper, so here you
6 conclude that stocks further upstream have
7 declined faster; is that a fair summary of your
8 conclusion?

9 MR. NELITZ: Yes.

10 Q And would you agree that your finding is
11 consistent with the work that DFO presented last
12 June at the Pacific Salmon Commission workshop?

13 MR. NELITZ: Yes, it's consistent and we should have
14 said that in our report, as well.

15 Q Right. And that -- perhaps we could just look at
16 Tab 4 page 67 -- oh, Tab 4 is Appendix C.

17 MS. BAKER: It's a different tab. Tab 4 is...

18 MR. TIMBERG: There's no CAN number. It says Appendix
19 C, Speaker's Handouts.

20 MS. BAKER: It should be the Gov (indiscernible - away
21 from microphone).

22 MR. TIMBERG: And then if we could go to page 67.

23 Q And so first of all, are you -- have you seen this
24 document before?

25 MR. NELITZ: Yes.

26 MR. TIMBERG: This is -- okay. If we could have this
27 marked as the next exhibit. It's an appendix to a
28 workshop on the decline of Fraser River sockeye
29 salmon that occurred in June 15th and 17th, 2010.

30 THE REGISTRAR: Exhibit 573.

31

32 EXHIBIT 573: Appendix C to Peterman et al,
33 Synthesis of Evidence from a Workshop on the
34 Decline of Fraser River sockeye - June 15-17,
35 2010

36

37 MR. TIMBERG:

38 Q And the top left-hand figure there, 1, has a
39 similar conclusion with respect to relationships
40 between the trends and total productivity and
41 distance from the ocean. Is that -- that's a
42 similar --

43 MR. NELITZ: Can you repeat the question?

44 Q Oh. And will you agree then that the Figure 1
45 that we're looking at here, that expresses a
46 relationship between the trends and total
47 productivity and the distance to the Pacific Ocean

1 is a similar conclusion to the one that you
2 reached?

3 MR. NELITZ: Yes.

4 Q Thank you. If we could then turn to your paper
5 page 80 and Figure -- and this is a map showing
6 urban areas. If we could just go up, Mr. Lunn,
7 slightly. Oh, there's nothing there. Oh, sorry,
8 we need to go down. And this map is to show
9 spatial distribution of urban areas as it relates
10 to salmon conservation units. And I just -- I
11 looked at this map and I just thought I should
12 raise the point that a number of the grey spots
13 don't seem to be urban areas. For example, the
14 top right there's a lake. I think that's
15 Barkerville. You've got a big, huge grey spot. I
16 don't have my pointer here. But there's a number
17 of --

18 MR. NELITZ: Yeah, it's near the Bowron conservation
19 unit.

20 Q Yeah. But what are these -- I don't know where
21 that -- I don't think you've got all the -- I
22 don't think these grey spots actually reflect
23 urban areas; would you agree with that? If you
24 look closely at the map? Like, if you look at
25 where Kamloops is down and then to the left you've
26 got a big splotch and I think that's a -- oh, I've
27 got a pointer. Nice. Like there, that spot,
28 that's not an urban area. That, I think, is a
29 mine. That's Kamloops. That's Cache Creek.
30 That's not a town. That's a mine, I think.

31 MR. NELITZ: I'm -- I'm not in a position to comment on
32 the quality of these data and what certain
33 polygons are representing. We were using the data
34 from the provincial government that has a
35 classification associated with these polygons
36 which is associated with urbanization or
37 municipalities. So...

38 Q Okay. If that's the source, I'm just -- for the
39 commissioner's sake, so he doesn't rely on this,
40 like here, it shows the town here, this is like in
41 the coastal mountains. I don't think that's a
42 town; would you agree with that? That's like the
43 Fraser Canyon and I don't know where that is. And
44 then up here, this one, I think is Barkerville.
45 Like that's the -- that's Quesnel.

46 MR. NELITZ: I don't feel -- without looking at the
47 data and looking into it --

1 Q Yeah.

2 MR. NELITZ: -- in more detail and understanding
3 specific areas and --

4 Q Right.

5 MR. NELITZ: -- I don't think it appropriate to go into
6 -- to agree or disagree about specific polygons.

7 Q What do you mean by polygon?

8 MR. NELITZ: Sorry, it's a technical term. A
9 geographic extent. So if it's a grey -- if it's a
10 dark grey shading there.

11 Q All right. I'm almost finished here, so the
12 Nechako River and Alcan, the -- your paper on the
13 Nechako River and Alcan fails to cite a published
14 DFO document on the efficacy of water releases and
15 impacts on migrating salmon and I'm wondering
16 whether you considered it or not? This is at Tab
17 7 of our binder, which is called -- oh, I've got a
18 CAN number, 002877.

19 MR. LUNN: I have that at Tab 5.

20 MR. TIMBERG:

21 Q Are you familiar with this document?

22 MR. NELITZ: I'm familiar with this document. Now that
23 it's put before me, I'm familiar with it through
24 other work beyond the work for the commission. We
25 did not look at it as part of this -- our exercise
26 with this work.

27 MR. TIMBERG: All right. If this could be marked as
28 the next exhibit.

29

30 EXHIBIT 574: MacDonald et al, Examination of
31 Factors Influencing Nechako River Discharge,
32 Temperature and Aquatic Habits, 2007
33

34 MR. TIMBERG:

35 Q And the abstract at page -- Roman Numeral six,
36 page 8 of 42, states that the report assesses
37 temperature and flow management options in the
38 upper and lower Nechako system with reference to
39 the needs of resident and migratory fish species.
40 And then under point 3 it states:

41

42 To introduce a model that examines downstream
43 consequences of possible future release
44 scenarios if a Kenney Dam release facility
45 were constructed.
46

47

So my question is would you agree that this

1 document is relevant to and provides insights to
2 assist the commissioner with respect to impacts of
3 water temperature management programs on salmon
4 populations with respect to this dam?

5 MR. NELITZ: Can you repeat the question, please?

6 Q Will you agree that the MacDonald report provides
7 insight into the impacts of the water temperature
8 management program on salmon populations and has
9 been influential in discussions about
10 modifications to the dam?

11 MR. NELITZ: Parts of that statement I would agree
12 with. Other parts I couldn't comment on. So as
13 providing insights, I agree, it can provide
14 insights.

15 Q All right.

16 MR. NELITZ: In terms of being influential or whatnot,
17 there is a long history of discussions and
18 technical evaluations going on in the Nechako.
19 Others much more knowledgeable than I are familiar
20 with those, so -- and I don't have a good sense of
21 the relative importance and role of all of those
22 technical evaluations in those discussions.

23 Q Are you aware of the work of the Nechako Watershed
24 Council?

25 MR. NELITZ: I'm aware that the council exists and some
26 of the things that they're involved in, but beyond
27 that I don't have a deep understanding of the work
28 that they do.

29 Q All right. If we could turn to Canada's exhibit
30 CAN096015 and if we could turn to page 29 of 37.
31 Have you seen documents like this on the Nechako
32 Watershed Council as part of your work?

33 MR. NELITZ: So I was -- to clarify, as well, as the
34 lead author of the report I did not prepare every
35 section of the report. The Nechako River
36 components were led by -- and the research was led
37 by another co-author, Mark Porter. So having said
38 that, I have not seen these kinds of documents
39 from the Nechako watershed, largely because I
40 haven't been working in this area for this project
41 or others.

42 Q Are you aware of the Nechako Endowment Fund
43 consisting of \$50 million which are linked to
44 downstream enhancement of the Nechako watershed
45 area?

46 MR. NELITZ: I'm not aware of that.

47 MR. TIMBERG: Okay. I'm wondering if this could be

1 marked as an exhibit and we can follow up with it
2 in future.

3 THE COMMISSIONER: I would suggest for identification
4 purposes then.

5 MR. TIMBERG: Okay.

6 THE COMMISSIONER: The next letter.

7 THE REGISTRAR: It would be T for identification.

8 THE COMMISSIONER: T for identification.

9

10 EXHIBIT T FOR IDENTIFICATION: Canada's
11 Exhibit CAN096015

12

13 MR. TIMBERG:

14 Q And with respect to your freshwater habitat
15 conclusion, this is going to be my summary, is it
16 fair to summarize your conclusion that the decline
17 of sockeye salmon in the past 30 years is not
18 likely to have been caused by a concurrent decline
19 in habitat conditions either across the Fraser
20 basin or in individual CUs?

21 MR. NELITZ: Can you repeat that question, please --

22 Q Sure.

23 MR. NELITZ: -- a little more slowly?

24 Q Is it fair to summarize your conclusion that the
25 decline of sockeye salmon in the past 30 years is
26 not likely to have been caused by a concurrent
27 decline in habitat conditions?

28 MR. NELITZ: I agree.

29 Q Okay. And going -- and this conclusion is similar
30 to a conclusion that DFO reached at the 2010
31 Pacific Salmon Commission workshop; would you
32 agree with that?

33 MR. NELITZ: Yes, I agree.

34 MR. TIMBERG: All right. Now, just perhaps for the
35 record, that's at Tab -- well, our Tab -- oh,
36 Exhibit 573 page 71 and then page 71 at the very
37 bottom there.

38 Q And it was concluded then that:

39

40 We were unable to find any quantitative
41 evidence to support the hypothesis that the
42 declines in the productivity of Fraser
43 sockeye salmon were related to changes in
44 freshwater habitat conditions in the natal
45 and nursery environments.

46

47 That's consistent with your conclusion?

1 MR. NELITZ: Yes.
2 Q Okay. My last series of questions, I see the
3 time, I'll try to finish in the next three or four
4 minutes, is I'd like to talk to you about your
5 recommendations at page 59 and 61 of your report.
6 So would you agree, Mr. Nelitz, that your report
7 is largely silent on recommendations for the
8 protection or restoration of habitat or any other
9 measures such as regulation of land use activities
10 that could impact sockeye habitats?
11 MR. NELITZ: I would agree with that because I do not
12 feel that we were tasked with coming up with
13 management recommendations in terms of what
14 actions need to be taken --
15 Q Okay.
16 MR. NELITZ: -- to address impacts on habitats.
17 Q So you focused your recommendations on science?
18 MR. NELITZ: Yes.
19 Q All right. Would you agree that the maintenance
20 of the amount, quality and connectivity of
21 habitats is important for continued sockeye
22 production?
23 MR. NELITZ: Yes.
24 Q And when you make your recommendations, have you
25 provided any or considered any assessment as to
26 the cost of your recommendations?
27 MR. NELITZ: No, we have not.
28 Q Could you speculate? Do you have any idea
29 whatsoever?
30 MR. NELITZ: No.
31 Q You don't. And is more information enough or are
32 other steps required? I'm just wondering if --
33 MR. NELITZ: Required for what?
34 Q With -- to ensure the freshwater habitat, the
35 protection of the freshwater habitat of the Fraser
36 sockeye River (sic).
37 MR. NELITZ: Sorry? Can you repeat the question from
38 the beginning, the full question?
39 Q Well, are -- you've made recommendations with
40 respect to information gathering systems and I'm
41 giving you an opportunity to explain if there are
42 any other steps that would be of assistance to
43 assure the ongoing protection of habitat in the
44 Fraser River.
45 MR. NELITZ: I guess -- I think this is consistent with
46 our recommendations but in general to say that to
47 ensure protection of the habitats, it's helpful to

1 have a stronger link -- or a strong link between
2 the response of those habitats and the actions
3 that agencies, DFO and others, the provincial
4 agencies as well as federal agencies, are taking
5 so those management actions, those policies, those
6 regulations, so there needs to be both -- I think
7 there needs to be both sides, need to -- we need
8 to have understanding on both of those sides, the
9 science and the management.

10 Q Okay. And in your recommendations you speak about
11 agencies and you talk about the need that they be
12 linked better in terms of data-sharing. What are
13 the agencies that you're referring to?

14 MR. NELITZ: In general terms, we do list the -- we do
15 list agencies here on page 61 and it was a general
16 phrase, given shifts in responsibilities certainly
17 within the province, I'm not fully informed about
18 how responsibilities have changed in the province
19 and who's collecting what data or responsible for
20 what data. But the federal and provincial
21 agencies that are listed on page 61.

22 MR. TIMBERG: All right. Thank you. Those are all my
23 questions.

24 MR. NELITZ: Certainly related to that.

25 MR. TIMBERG: Thank you very much.

26 MR. NELITZ: Thank you.

27 THE COMMISSIONER: Mr. Timberg, I just wanted to ask a
28 question going back to some of the evidence you
29 elicited earlier from these two witnesses. Either
30 witness could answer this. Can you explain to me,
31 you've talked about science and value judgments.
32 Is it easy or difficult to explain to me where the
33 line is drawn between science and value judgments?
34 In other words - and I'm talking here about the
35 CUs - I'm sorry, I should have said that - but I
36 think that's the way it was addressed in the
37 answers that were given. Is that question
38 reasonable and if it is, can it be answered?

39 MR. NELITZ: Can you try to rephrase your question a
40 little more concisely so I --

41 THE COMMISSIONER: Well, I think there was
42 discussion --

43 MR. NELITZ: -- get it clear?

44 THE COMMISSIONER: -- around where you were able to
45 give an opinion in your report and where you were
46 not? And in those areas which related to science,
47 you were able to give your view but there were

1 areas in which you felt you were not qualified to
2 give an answer because it would require a manager
3 perhaps making a value judgment. It just wasn't
4 clear to me where you were drawing that line and
5 what you meant by that.

6 MS. WIECKOWSKI: Well, with regard to the CUs, a large
7 part to which we were referring was where you draw
8 that line with respect to the benchmarks between
9 the red and the yellow and the green and so
10 depending on what your management objectives are
11 and what it is you're trying to do and what your
12 values are, those, where you draw those lines
13 between those three categories will be different.

14 THE COMMISSIONER: So that's helpful. So as a
15 scientist, if you're charged with the
16 responsibility of establishing benchmarks, are you
17 saying that there's no value judgment involved in
18 establishing those benchmarks?

19 MS. WIECKOWSKI: There is a value judgment in terms of
20 where you're establishing those benchmarks. It
21 depends what -- the science that's being carried
22 out in these methodologies is for an applied
23 purpose and so there -- the Wild Salmon Policy has
24 put forward those value judgments in terms of what
25 they want to achieve and then it was -- my
26 understanding is then it's the scientists'
27 interpretation of those and how they then
28 translate that into defining their benchmarks, but
29 they're taking their guidance for where to draw
30 those benchmarks based on either management or
31 policy and the values that were put forward in
32 those domains.

33 MR. NELITZ: If I can add some thoughts, as well, so in
34 terms of the science, if you pick a simple
35 variable like temperature, science can tell you
36 what's the ecological consequence of different
37 temperatures, ecological consequence on sockeye.
38 Overlaid on top of that is a value judgment about,
39 okay, when is -- say if we're talking about
40 impacts, when is a certain level of impact too
41 much that we don't accept that as a management
42 agency any more? That is a value judgment about
43 determining significance along a continuum. So
44 science can tell you the number, the continuum of
45 numbers and kind of what's going to happen along
46 that continuum in general terms, but what to do,
47 given a given number is a value judgment and it's

1 an interpretation of an agency and managers and
2 whatnot.

3 So there's in our experience in the work that
4 we do, there's a need for an interaction between
5 the scientists and the managers to work together
6 to understand, okay, the scientist can say this is
7 what's going to happen at this level, but what's
8 the societal consequences of that because there's
9 -- everything comes at a cost. If we try to
10 minimize impacts, that may lead to constraints on
11 other industries or sectors which then have
12 economic -- impose economic constraints on those
13 industries or sectors. So that's why it is a
14 value judgment and it requires trade-offs among
15 not just the ecology or the environment but
16 against other things that are also influenced by
17 those choices.

18 THE COMMISSIONER: So if I understand your evidence
19 then, you're not making that trade-off as a
20 scientist. You're accepting the trade-off and
21 then providing the results.

22 MR. NELITZ: Yes.

23 THE COMMISSIONER: All right. Thank you.

24 MS. BAKER: Thank you, Mr. Commissioner. It's 3:20.
25 We have the next person who is on my schedule is
26 Mr. Rosenbloom and I don't know if he's ready to
27 start this afternoon and then hopefully we can
28 complete his examination and that will probably
29 take us to the end of the day. If we finish
30 early, Mr. Eidsvik or Mr. Harvey would be able to
31 start their examination.

32 THE COMMISSIONER: We'll take a ten-minute break now.

33 THE REGISTRAR: Hearing will now recess for ten
34 minutes.

35
36 (PROCEEDINGS ADJOURNED FOR AFTERNOON RECESS)
37 (PROCEEDINGS RECONVENED)
38

39 THE REGISTRAR: The hearing is now resumed.

40 MR. ROSENBLOOM: Thank you, Mr. Commissioner. Firstly,
41 before introducing myself, Ms. Baker gave you the
42 impression that I would be so well completed
43 before four o'clock that Mr. Eidsvik would get on.
44 I have repeatedly told Commission counsel that I'd
45 be approximately 45 minutes in my cross-
46 examination so I want you to appreciate that.

47 For the record, my name is Don Rosenbloom. I

1 am counsel for Area D Gillnet and Area B Seiner.
2 I have a number of questions for this panel.
3

4 CROSS-EXAMINATION BY MR. ROSENBLOOM:
5

6 Q Firstly, directing my attention to you, Mr.
7 Nelitz, I want to focus on the terms of reference
8 that were imposed upon you for the preparation of
9 the report that is now filed before us. And as I
10 understand it from the exchange that you've had in
11 your evidence today that basically you were
12 instructed to focus on six stressors from forestry
13 to mining to hydroelectricity to urbanization
14 upstream of Hope, agriculture and water use. And
15 then you got into an exchange, I believe, with Mr.
16 Timberg where you spoke of intermediate stressors,
17 and I don't know if that was your language but it
18 seemed to be adopted in your exchange with Mr.
19 Timberg. And you recall that evidence, correct?

20 MR. NELITZ: Yes.

21 Q Now, what I want to ask you is, having been
22 instructed to confine your report to those six
23 stressors, was that not at the expense of some
24 critical stressors, whether we call them
25 intermediate or whatever we choose to call them,
26 that have been absent from your analysis at this
27 inquiry through this report?

28 MR. NELITZ: Well, I think your point or your question
29 is getting at -- well, the terms of reference that
30 we had was to look at freshwater influences in
31 explaining Figure 1, the Patterns of the Decline
32 in Fraser Sockeye. And so that's what we were
33 looking at in terms of our response variable and
34 the influence of the stressors and the habitat
35 vulnerabilities on that variable. It would not
36 have been helpful to our analysis to look at
37 intermediate measures in terms of how to explain
38 that pattern of decline. It wouldn't have helped
39 get us to understanding or assessing the relative
40 influence of freshwater influences in that
41 pattern.

42 Q Well, I don't appreciate why it wouldn't help.
43 When you come before this inquiry and you inform
44 the inquiry that from your analysis the stressors
45 that you did analyze cannot in themselves explain
46 the decline in the abundance of the stock, why is
47 it that it would not be useful to this inquiry to

- 1 have you also analyze such stressors, call them
2 intermediate, call them whatever you wish, as for
3 example, sewage, as for example, recreational?
4 MR. NELITZ: Well, certain items were outside of the
5 terms of reference of our work because other
6 studies were being commissioned to look into those
7 issues. You said sewage so I'm relating that to
8 some contamination and water quality issues, which
9 I believe there's another Cohen study that is
10 looking at those things.
- 11 Q I see. So you're obviously more familiar with
12 what we have coming down the pipe than I am.
13 Recreational will be fully canvassed to the best
14 of your knowledge?
- 15 MR. NELITZ: Recreational harvesting?
- 16 Q No, not recreational harvesting but recreational
17 impacts, for example, at Cultus Lake. The
18 stressors to the habitat from recreational use.
19 That is my question.
- 20 MR. NELITZ: We did not look at that. I'm not aware of
21 whether -- I can't say whether other studies have
22 or will be looking at that or reporting out on
23 that.
- 24 Q All right. And the fact that Ms. Baker has not
25 jumped up to interrupt me on this I'm going to
26 assume for a moment that that information is not
27 slated to be before the inquiry. Now, assuming
28 for a moment it isn't, would you agree with me,
29 sir, that recreational impacts can have dramatic
30 effect on the habitat in various CUs?
- 31 MR. NELITZ: I don't feel like I'm in a position to
32 comment on that.
- 33 Q You aren't?
- 34 MR. NELITZ: I don't feel as though I am on terms of
35 specific cause/effect relationships in terms of
36 what's driving impacts or situations for a
37 specific conservation unit. We looked at a broad
38 scale at stressors across the Fraser basin and, as
39 we've talked about, not localized conditions or
40 situations in terms of how are these kinds of
41 activities leading to impacts on specific
42 conservation units.
- 43 Q Well, if you had the opportunity to re-draft your
44 terms of reference for your report, report number
45 three, yes --
- 46 MR. NELITZ: Yes, three.
- 47 Q -- would you have incorporated into the terms of

1 reference an analysis of the recreational impact
2 to habitat? Do you believe that that would have
3 made your report more comprehensive?

4 MR. NELITZ: I feel that you're asking me to speculate
5 on -- I don't know. You're asking me, would I re-
6 define the terms of reference? I was tasked to
7 respond to the terms of reference and that's what
8 I feel that we did. So to speculate on other
9 things, I think is beyond my position in terms of
10 doing the work that we did and commenting on that.

11 Q Sir, let me make myself very clear to you. I'm
12 not in any way critical of what you have done
13 because you have done it pursuant to your
14 instructions, nor am I critical of anybody else.
15 But it is my responsibility to ask you whether
16 indeed we are left with a vacancy in this inquiry
17 in not having someone with your skills and
18 background provide information to this inquiry
19 about the impact of recreational activity on
20 habitat.

21 MR. NELITZ: I think there is -- in any kind of
22 scientific investigation like this, the number of
23 things that could be investigated is very long and
24 I think you need to be wise and smart in terms of
25 focusing in on those things where you can do the
26 investigations to answer the questions that we
27 were tasked with, which is looking at the patterns
28 of decline the Fraser as an aggregate. So I think
29 it's a reasonable thing to do in terms of
30 developing a terms of reference that is manageable
31 within scope. We could have gotten into looking
32 at the Nechako River and specific roles that flow
33 operations have on Nechako and the related
34 conservation units and whatnot. It would have
35 expanded our terms of reference and I don't think
36 it would have been feasible to do within the
37 timeline that we had so I feel comfortable with
38 what we've been tasked. Let me respond in this
39 way. Is it comprehensive in terms of addressing
40 every potential issue that could be influencing
41 conservation units across the Fraser basin? It is
42 not comprehensive in that way in terms of
43 addressing every issue.

44 Q No, of course it isn't. But one has to prioritize
45 what are the critical potential impacts to
46 habitat, correct?

47 MR. NELITZ: I would agree.

1 Q And would you not agree that when one focuses in
2 certain CUs within the Fraser watershed,
3 recreational impact is a critical impact to that
4 habitat?

5 MR. NELITZ: I would defer to the judgment of those
6 that developed the terms of reference in terms of
7 prioritizing given the scope of what we were
8 tasked to do and looking across the basin scale.
9 For example, how important are recreational
10 pressures across all conservation units? If it's
11 specifically important for one, does that
12 automatically put it as a priority that we need to
13 consider for all conservation units? I can't
14 comment on the prioritization process in terms of
15 developing the terms of reference and why certain
16 things were included or not.

17 Q I'm not suggesting that if it's critical to one CU
18 that it has to be applied as critical to all CUs.
19 I want to direct your attention for a moment to
20 Cultus Lake. As no doubt you're well aware at
21 this inquiry, repeatedly Cultus Lake comes up as
22 an example of a CU that obviously has an
23 endangered status to it in terms of being a very,
24 very low abundance. You're obviously well aware
25 of that?

26 MR. NELITZ: I'm aware of that, yes.

27 Q All right. And surely you're aware, sir, that
28 Cultus Lake is well known to be a highly-utilized
29 recreational lake in the Province of B.C.?

30 MR. NELITZ: Yes, I'm aware of that.

31 Q And you, therefore, would agree with me that when
32 focused on Cultus Lake and focused on that CU,
33 that recreational impact is critical in doing
34 habitat assessment of that CU?

35 MR. NELITZ: I don't enough about the Cultus Lake
36 situation specific to be able to confidently
37 comment on the relative importance of that. I
38 also know that there are other issues in terms of
39 management and stressors on the Cultus Lake
40 conservation unit.

41 Q Right. But as a specialist in habitat assessment,
42 you're telling us at this inquiry that you're not
43 prepared to say that recreational activity at
44 Cultus Lake would have a critical impact on
45 habitat?

46 MR. NELITZ: Let me be clear on some things. I am the
47 lead author but I am not the sole author in this

- 1 report. We do have others in the team that are
2 more experienced lake biologists and more
3 experienced with understanding lake productivity
4 dynamics and things like that and understanding
5 the Cultus situation much better than I. So I'm
6 saying to you that in terms of the review of the
7 materials that we did in preparation of this
8 report, I didn't look at specific documents
9 related to Cultus Lake and understanding the
10 relative importance of those different factors in
11 terms of determining the status and situation in
12 Cultus. So given that background, I don't feel
13 comfortable commenting on the specific situation
14 for Cultus.
- 15 Q Yes, you complied with your terms of reference.
16 Nobody's criticizing you for that. Would you be
17 comfortable in informing the inquiry today whether
18 you would advise, as a habitat specialist, that
19 they look at some of these intermediate stressors
20 at least for some of the CUs?
- 21 MR. NELITZ: That depends on what question you're
22 trying to answer. If you're trying to explain the
23 pattern of decline in Fraser sockeye as an
24 aggregate whole, I'm not sure that that would be
25 helpful.
- 26 Q No, not aggregate whole. Let's say we were
27 attempting to explain the decline in sockeye
28 salmon at the Cultus Lake CU.
- 29 MR. NELITZ: If that were the terms of an
30 investigation, I would say that, yes, it would
31 make sense that you would want to look at those
32 kinds of stressors in Cultus.
- 33 Q In fact, I'm going to suggest to you it would be
34 critical to look at it, wouldn't it, in that
35 context?
- 36 MR. NELITZ: Critical is more a value judgment, implies
37 a value statement to that, which I can't support
38 saying it that way or characterizing it that way.
- 39 Q But you'd recommend it?
- 40 MR. NELITZ: I think it would be important to look at
41 to understand the situation in Cultus.
- 42 Q What other intermediate stressors come to your
43 mind that weren't part of your mandate that at
44 least this Commission should reflect upon as not
45 having evidence before it? For example, sewage?
- 46 MR. NELITZ: To be clear in terms of the way that I was
47 understanding the discussion about the

1 intermediate measures, I was talking about there
2 are intermediate effects on habitat that stressors
3 can have so forestry, mountain pine beetle can
4 affect water temperatures, as an example, which
5 then affects incubation of eggs in spawning
6 gravels and affects growth of juveniles in lakes
7 and those things. So there are intermediate
8 measures where we could design an analysis where
9 we understand that there are effects of, say,
10 forestry on that water quality parameter. But
11 then taking it to the next step, okay, well, given
12 an impact on water temperature, do we understand
13 what that means at the population level? Is that
14 actually affecting the productivity of Fraser as
15 an aggregate?

16 I'm saying we haven't kind of gone to that
17 intermediate step to look at effects on
18 intermediate habitat variables that are necessary
19 if there is a role or an influence of the changes
20 in freshwater environment on population level
21 effects. If the freshwater were affecting at the
22 population level, if it was a driver of the
23 declines, then we would expect that gravel
24 quality, as an example, is deteriorating, water
25 temperatures are getting worse, nursery lake
26 conditions are deteriorating, those kinds of
27 things, and we should have been able to measure
28 those as intermediates. I'm saying as part of our
29 work we didn't look at those intermediate
30 measures, intermediate habitat variables, to see
31 if the stressors are having impacts on those.

32 Q Well, let's not talk about --

33 MR. NELITZ: So I guess what you're getting at is, what
34 is the scope of other stressors that could be
35 interacting with --

36 Q Precisely.

37 MR. NELITZ: -- freshwater environments?

38 Q Not the measures but the stressors.

39 MR. NELITZ: Without a more careful consideration of
40 like a complete list and trying to think about how
41 they may or may not be important to sockeye, kind
42 of doing that on the spot here, I don't feel
43 comfortable kind of going through that
44 prioritization and making statements about that
45 certain things are essential or critical. Yeah,
46 so I don't feel comfortable kind of going through
47 a list of other stressors at this time.

1 Q You made mention a moment ago that one of your
2 colleagues was the specialist within the area of
3 lake habitat analysis, correct?

4 MR. NELITZ: Yeah.

5 Q And who was that?

6 MR. NELITZ: Both Marc Porter and Eric Parkinson have
7 much more lake ecology experience than myself.

8 Q And because we're going to have the benefit of
9 your presence back here on Monday of next week,
10 are you able to consult with your two colleagues
11 between now and then to respond to my question
12 about Cultus Lake and the consequence of not doing
13 an analysis of recreational activity as a stressor
14 on that lake? Are you able to consult with them?

15 MR. NELITZ: I could consult with them if that's deemed
16 necessary. I'm still left confused at how it's
17 helpful in necessarily understanding the pattern
18 of declines in Fraser as a whole. If the point of
19 an analysis is to understand what's happening at
20 Cultus and why, which I don't think is what it is,
21 but that's a very different task than what we did
22 and what we were required to do or what our terms
23 of reference were.

24 Q What if it explained the decline in a number of
25 CUs? Would that be a worthwhile exercise to this
26 Commission?

27 MR. NELITZ: If it were a number of CUs, I don't know
28 offhand like what number of CUs would be a
29 critical threshold for making that determination.

30 Q Well, I'm going to ask you to consult with your
31 colleagues and you can consult with your counsel,
32 I guess that's Commission counsel, about whether
33 you do so or not. Since I will continue to be
34 examining you first thing on Monday morning, I
35 would make that request since obviously we don't
36 have all the authors before us at this panel.

37 MS. BAKER: Mr. Commissioner, the witness has said that
38 they were asked to look at population level
39 effects across -- and by saying that he means
40 across all of the aggregate populations in the
41 Fraser River. And he said that while looking at
42 recreational impacts may be useful, looking at an
43 individual CU, that wasn't what they did. That
44 wasn't the scope of the report and that from
45 reading the report you'll know that that's not the
46 scope of the report to do an assessment of
47 individual CUs and the particular stressors and

1 habitat influences within one particular CU's
2 environment.

3 So I'm not sure what Mr. Rosenbloom is
4 thinking the witness can do, if he thinks that
5 over the weekend he can have his colleagues do a
6 quick CU assessment for an individual CU,
7 obviously, that's not practical. And I don't know
8 that any of his colleagues are going to get much
9 further than he is to say that wasn't the scope of
10 our work. So these witnesses are under cross and
11 I don't know that there is -- and I accept that we
12 don't have all the authors here and that would --
13 but I just don't see that there's any benefit in
14 going down that road and I would ask that they not
15 be directed to go and consult on something, which
16 is obviously outside the scope of the report, as
17 has been said repeatedly by the witnesses.

18 MR. ROSENBLOOM: All right. In response to Ms. Baker,
19 I'm not asking for a quick and dirty analysis
20 between now and Monday morning. Obviously, that's
21 unreasonable to request. What I am requesting is
22 whether or not it is the opinion of this panel and
23 those authors that have provided this report that,
24 in fact, the Commission should also be looking at
25 recreational impacts as a stressor and as a
26 possible causal linkage between the stress and the
27 decline of the stock in certain CUs. That's my
28 purpose in making this request of this author.

29 THE COMMISSIONER: Well, I think you've put your
30 request on the record, Mr. Rosenbloom, and
31 Commission counsel can consider it and speak with
32 the witness for that sole purpose and determine
33 whether or not it's something that can be
34 addressed for you on Monday morning.

35 MR. ROSENBLOOM: Thank you. And all that I expect in
36 terms of it being addressed is that the panel
37 members come back and indicate whether indeed they
38 are of the opinion that to add that analysis to
39 their work would be beneficial to the inquiry and
40 they would obviously be instructed to file an
41 addendum in respect to that matter. That's all I
42 ask. Thank you.

43 Q I would like to come to the second area of my
44 focus. And that relates to the database that was
45 provided to you for the report that you have filed
46 with the inquiry. And what I read in our report,
47 and you correct me if in any way I misrepresent

1 it, is that there was a real data deficiency when
2 it came to habitat analysis for this report, that
3 you speak in a number of places and I can lead you
4 to those references, where the data was not to the
5 quality that you felt was necessary or you would
6 have been comfortable working with. Is that fair
7 to say?

8 MR. NELITZ: I'd say there could be improvements in the
9 quality of the data, some of the data that we
10 used. However, given the stressors that we looked
11 at, I don't believe that it would dramatically
12 change our assessment that changes in the
13 freshwater are unlikely to be contributing to the
14 decline.

15 Q Well, if that is the case, why do you write in the
16 report, and I'll lead you to reference, if you
17 wish, that you say in part that:

18
19 Section 5.0 highlights that there are
20 significant data gaps which hinder our
21 ability to effectively manage sockeye salmon
22 populations, habitats, and human activities.
23

24 I'm happy to show you the page, if you wish. How
25 can the gaps be significant and how can it affect
26 and how can it hinder your ability to do a certain
27 analysis and at the same time say that you don't
28 think it would affect the outcome of your report?

29 MR. NELITZ: Well, as mentioned before, we took this
30 weight of evidence approach so although we weren't
31 able to design a very nice statistical model where
32 we had all of the variables measured very
33 precisely, I'd suggest there are multiple lines of
34 evidence that we used in coming to our conclusions
35 that it's unlikely that there was a role. So yes,
36 we could have had improvements in data and we make
37 those recommendations or references given terms of
38 reference that as part of our work we're looking
39 retrospectively what happened in the past and can
40 we use the best knowledge we have to date to see
41 if the data can explain what happened in the past.
42 But also, we're trying to understand and improve
43 the situation going forward.

44 And so if, say, for example, it's not the
45 freshwater, something, say, in the marine
46 conditions are changing, but going forward into
47 the future, say, if there's some shift in the

1 environment, say, marine conditions improve,
2 freshwater conditions all of a sudden become a
3 constraining factor on production of sockeye
4 salmon, we're going to be able to want to have
5 better information and better data to be able to
6 discriminate between the relative importance and
7 contributions from those different habitats. So I
8 think both from looking retrospectively and I also
9 think looking forward in terms of trying to
10 improve our understanding in management going
11 forward, I think those recommendations are valid.

12 Q Well, taking the very quote I gave you a moment
13 ago, and just for the record it's at page 59,
14 under "Recommendations", you say, and I want to
15 break it down, pare it down word-for-word,
16 "Section 5 highlights that there --

17 MR. NELITZ: Sorry. Can you refer to the page number
18 so I can look at this?

19 Q I'm sorry. At page 59 of your report, Exhibit
20 562, under "Recommendations", second paragraph.
21 It's now before you on your screen. It says:

22
23 Section 5.0 highlights that there are
24 significant data gaps which hinder our
25 ability to effectively manage sockeye salmon
26 populations, habitats, and human activities.
27

28 Firstly, will you document for us what are those
29 significant data gaps? What was missing that you
30 felt was significant?

31 MR. NELITZ: Well, one of the things, this is talking
32 about populations, habitats and activities. So
33 certainly from the whole pathway from what we do
34 on land and with water and how that translates to
35 effects on habitats and populations, as an
36 example, from the provincial databases, we have an
37 understanding of the allocation of water on
38 different rivers. However, those are licensed
39 allocations and we don't have actual values in
40 terms of the amounts of water that are actually
41 being taken. There isn't a confirmation that the
42 allocations are consistent with what's being used.
43 And so again, from between like the actions of
44 taking water in terms of the allocations and kind
45 of what's in the stream, there isn't that link
46 between those things.

47 Through our analysis, I think that the

1 surrogates that we use in terms of the
2 allocations, the number of water licences
3 restrictions, we think those are good surrogate
4 measures to assess on a relative scale what's the
5 relative level of stress and pressure on the
6 different conservation units, say, of water use,
7 given this example. So I think the measures help
8 us discriminate on a relative scale but on an
9 absolute scale of understanding, very
10 specifically, what amount of water is actually
11 being used and withdrawn from a stream, we don't
12 have that information. So I think that's an
13 example where it would have improved our ability
14 and reduced the amount of unexplained variation in
15 our statistical models.

16 Q Ms. Stalberg testified at these proceedings last
17 year and spoke of the fact that there wasn't even
18 a habitat status report for Cultus Lake. Are you
19 aware of that?

20 MR. NELITZ: I wasn't aware of that.

21 Q Would you not have become cognizant as to which
22 CUs had status reports in the course of preparing
23 your report?

24 MR. NELITZ: No.

25 Q That wouldn't be relevant to your report?

26 MR. NELITZ: It wasn't within the terms of how we
27 defined and developed our analyses.

28 Q So that in coming before this inquiry and
29 informing the inquiry that from your position
30 there is no significant linkage between habitat
31 deterioration and the declining stock of the
32 Fraser, you would not have to look at habitat
33 status reports?

34 MR. NELITZ: One of our key drivers in doing our
35 analysis, we needed to be able to have data that
36 was representative across all the conservation
37 units to be able to make some assessment of the
38 aggregate. And so my understanding of some of the
39 habitat status reports, they're very site-specific
40 in terms of conservation unit and understanding
41 the cause, effect, linkages and kind of what
42 stressors and limitations are on specific CUs but
43 that those status reports are also available
44 across all conservation units. So again, given
45 our need to pull together datasets that we could
46 use to represent all conservation units, they
47 wouldn't have matched those requirements and those

1 criteria. And then having the consistency of the
2 numbers and types of variables across all the
3 conservation units the status reports, in my view,
4 don't provide that.

5 Q Thank you. And I see it is four o'clock but just
6 squeeze this last question in before we adjourn.
7 Would you say it's a shortcoming to your report
8 that you were limited in your analysis to this,
9 what I'll call holistic approach of the entire
10 watershed, as opposed to focusing on particular
11 CUs? Is that a shortcoming of the report from
12 your vantage point?

13 MR. NELITZ: Given a task of trying to explain the
14 patterns of decline in Fraser sockeye, I don't
15 think it was a shortcoming of the report. It
16 doesn't answer the question of what's happening in
17 specific CUs and what factors are important in
18 contributing to the situation in a specific CU.
19 That's not what we were tasked to do and we
20 haven't provided that kind of insight.

21 Q I appreciate it's not what you were asked to do.
22 My question is, would it have been advisable and
23 beneficial to this inquiry if you had been asked
24 to do not just what I'll call the holistic
25 approach but also focusing on certain CUs?

26 MR. NELITZ: It wouldn't have been helpful, I don't
27 think, to answer the question about explaining the
28 patterns of decline in the Fraser as an aggregate.

29 MR. ROSENBLOOM: Thank you very much. Obviously, I'm
30 not finished, Mr. Commissioner. Thank you.

31 MS. BAKER: Thank you, Mr. Commissioner. I guess we'll
32 end for the day and I'll talk to my friends about
33 their time estimates for Monday to make sure we
34 are still going to be on track.

35 THE REGISTRAR: The hearing is now adjourned for the
36 day and will resume on Monday at ten o'clock.

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38 (PROCEEDINGS ADJOURNED TO MARCH 14, 2011, AT
39 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.
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10 _____
11 Karen Hefferland
12

13 I HEREBY CERTIFY the foregoing to be a
14 true and accurate transcript of the
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16 apparatus, transcribed to the best of my
17 skill and ability, and in accordance
18 with applicable standards.
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21 _____
22 Pat Neumann
23

24 I HEREBY CERTIFY the foregoing to be a
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33 Susan Osborne
34

35 I HEREBY CERTIFY the foregoing to be a
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40 with applicable standards.
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45 Karen Acaster
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