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

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Errata for the Transcript of Hearings on April 15, 2011

Pages	Line	Error	Correction
63-89		Cross-exam by Mr. Dickson (STCCIB)	Cross-exam by Ms. Gaertner (FNC)

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Keith Lowes	B.C. Wildlife Federation; B.C. Federation of Drift Fishers ("WFFDF")
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No appearance	Musgamagw Tsawataineuk Tribal Council ("MTTC")
Lisa Fong	Heiltsuk Tribal Council ("HTC")

TABLE OF CONTENTS / TABLE DES MATIERES

EXHIBITS / PIECES

Vancouver, B.C. /Vancouver
(C.-B.)
April 15, 2011/le 15 avril
2011

THE REGISTRAR: Order. The hearing is now resumed.

KARL ENGLISH, recalled.

THE COMMISSIONER: Mr. Leadem.
MR. LEADEM: Good morning, Mr. Commissioner. The fact that I'm occupying a centrist position today should not be construed as my abandonment of my usual position on the far left.
THE COMMISSIONER: We hadn't noticed, Mr. Leadem.
MR. LEADEM: It actually has more to do with my hearing disability and the ability to see the witness than anything, Mr. Commissioner.
THE COMMISSIONER: You're welcome wherever you stand, Mr. Leadem.

CROSS-EXAMINATION BY MR. LEADEM, continuing:

Q Mr. English, we have been discussing your report, which has been entered into evidence as Exhibit 718 in these proceedings, and I was reviewing some of the recommendations in your report, because I found them to be informative and some of them to be very worthwhile. The one that we had specifically focused upon yesterday was your recommendation number 6. And I want to take you, before I take you there to revisit that slightly, is to refer you to your text, because I think in the body of the text I think you flesh out that recommendation very nicely. And if I could ask Mr. Lunn to pull up 102, page 102 of Exhibit 718, right at the very top of the page you say these words:

> The lack of clearly defined escapement targets for each indicator stock and the large year-to-year variability in escapement targets for each run-timing group makes it difficult to regulate fisheries and evaluate management performance.

And you go on to say:

> The trend towards increasing complexity in the definition of escapement goals may have become an impediment to achieving these goals.

And to that I say, amen. And you go on to say at the end of the paragraph:

> A clearly defined set of escapement targets for each indicator stock and run-timing group would be much easier to communicate to fishers...

I'm just going to stop there because I would ask you to insert the words "ENGOs" and "First Nation community" as well as fishers. Would you be okay with me inserting those words in that sentence?

A Sure. Certainly, yes.

Q

> ...than the current complex Total Allowable Mortality (TAM) rules and still allow managers the latitude to implement harvest rate ceilings to protect less productive stocks when returns of the target stocks are large.

And I think you're onto something really critical here, Mr. English, and that's why I'm spending so much time here.

You may recall the discussion that we had yesterday with Mr. Commissioner, as well as me and yourself, about setting definable goals, setting some numbers so everybody knows with certainty what those numbers are. Do you recall that discussion?

A Yes.

Q And I agree with you that that position of setting definable numbers and definable escapement targets is critical both to conservationists, to First Nations and to the fishers, so that everyone knows what the goalpost, or where the goalpost is located, as you eloquently put it yesterday. And you still stand behind that evidence, do you not?

A Oh, certainly, yes.

Q All right. So I want to then focus upon TAM, because TAM to me is totally confusing, and to my clients, some of whom are excellent scientists,

it's confusing as well. And I would suggest that if we're going to resort to TAM and we either have a problem in communicating it, we should find a more discernible model or better model to use. Would you agree with that?

A Yeah, I think that it has a role, but it is complicated from a lot of people's understanding.

Q Right. And so because of the complication, it's not just a matter of complication, but as I understand the TAM rules, they're based on aggregates. It's not based on individual conservation units. Do I have that correct?

A That's correct. I set TAM rules for each of the run-timing aggregates.

Q Right. And so if you're really focused upon the conservation unit, as the Wild Salmon Policy tells us we should be, then the TAM rules really aren't going to be able to help us, are they.

A Well, they don't deal with the goals for the specific population units, if that's what you mean.

Q Right. And so, as a consequence, what's going to eventually happen if we keep on using these TAM rules is that fish are going to be caught inadvertently, or for example, we take the example of the Cultus Lake sockeye, we're going to still harvest Cultus Lake sockeye by using the presently construed TAM rules, are we not?

A Yeah, well, the harvest of the fish is dependent on the timing of the runs and what the overlap is. So because unless you move fisheries into areas where certain stocks are not accessible or not vulnerable, then you're going to harvest those along with the -- the less-abundant stocks along with the more abundant stocks.

Q Right. And that's the problem that we see, for example, with the Late run and the Cultus getting caught up with the Late run. So the Cultus gets caught up with some of the abundant runs, such as the Adams River and the Shuswap Lake complex runs, isn't that correct?

A That's correct, yes.

Q And so, as a consequence, we end up inadvertently, or not meaning to, overharvesting the Cultus Lake stock or the Cultus Lake conservation unit; isn't that right?

A Yeah, in some years there's been very high harvest

rates on Late run. Not so much in recent years because of the efforts to actually protect Cultus, they harvest a lot less Late run than they would have if they hadn't had the Cultus concerns.

Q Right. Now, yesterday, when I went through with Dr. Sean Cox's critique of your commentary and your recommendation, you may recall that one of his critiques had to deal with: that's all very well to say that we're going to set escapement goals, but how do you do it? And I think you give us clues in the final paragraph in that on page 102, because you then go into -- and if we can look at this together, you go into the Wild Salmon Policy and you say:

> The [Wild Salmon Policy] has identified the need to define lower benchmarks (LBs) and upper benchmarks (UBs) for each Fraser sockeye stock.

And then you refer to Carrie Holt's paper and Sue Grant's paper, and both of them have given evidence to this Commission, and you go on to say -- and this is where you have an innovative recommendation. You said:

> There should be at least two different LBs and two UBs for each cyclic stock.

And we talked a bit about that yesterday. And what I'm driving at is that if you, instead of using the terminology "stock", because a stock, I say, is old school, is old terminology, would you agree with me that what we really should be focusing upon with respect to the Wild Salmon Policy is the conservation unit.

A Yes, that's what the intent is under the Wild Salmon Policy is to manage things by conservation unit.

Q Right. And then further on in that paragraph you give an expression of how fishing can be conducted once you know what those lower benchmarks are, and you say:

> For example, if the run size is below the LB for a stock, no fisheries should be permitted to target that stock.

And so that is why it's so critical then to define the lower benchmark so that we can define a point at which there would be no fishing to occur on that specific conservation unit. Do I have that right?

A Yes, and you know, there is the challenge of combining the lower benchmarks and also the goals for specific stocks into groups where you can actually manage the fisheries, and look at opportunities to have fisheries in certain areas, and times where you can disaggregate this stock management problem.

Q Did you say disaggregate?

A Yes.

Q So if you can separate the stocks in some way by going to a more terminal fishery, then you can perhaps achieve that result, as well?

A Yeah, and the intent is that, or the idea there is that you don't have to eliminate all mixed stock fisheries in order to have some opportunity to harvest in those areas. You just have to spread the harvest out so that you're not harvesting all your fish in one area where they have a problem with mixed stock fisheries.

Q And you think that can be done.

A Yes, I think it can be done. It has been done in a number of locations.

Q But can it be done on the Fraser? I mean, we saw Bristol Bay and it can be done easily there because of the geographic differences, or because it's easier in the context of Bristol Bay. But can you do it in the Fraser?

A Yes, there's places in the Fraser where you can target the more abundant stocks. There's a trade-off, obviously, of fish are closer to spawning and in some runs can be less valuable, or more than they will be if they are harvested in a mixed stock area. But these are trade-offs that people need to evaluate against the concerns over the different trends for the different populations.

Q Does that mean that what you're conceiving of in your answer to me, does that mean that you're thinking of a different fishery than the one that we presently employ on the Fraser?

A Yes, definitely it's different than the current one for Fraser.

Q And that would still take into consideration First

Nations interests, would it?
A Yes, definitely. Yes. Or it must, as well, because they have significant interests in these resources.
Q All right. I want to go on to recommendation number 8. I'm pretty limited in terms of time, and so I want to at least look at some of the recommendations that you make with respect to number 8. And if we can flip back, Mr. Lunn, to page 174 of Exhibit 718. In this recommendation you emphatically say that:

> DFO needs to maintain its commitment to the recovery efforts for Cultus Lake sockeye and the monitoring programs needed to evaluate these efforts.

Now, one of the critiques to your report was done by Mr. Al Martin; is that right?
A That's correct, yes.
Q And Alan Martin was the former Director of Fish and Wildlife for the Province of B.C., is he not?
A I think he was that, yes. He's retired now, I think.
Q And now I take it he's a consultant at this time?
A Yes, I guess they hired him as a consultant to do this review.
Q Mr. Lunn, could I have page M-12, it's Exhibit 718, Appendix M -- actually, M-11 to begin with, and then it carries over to M-12. And under the item 4, "Are the recommendations provided supportable?" Under "Recommendation Number Eight" Mr. Martin says:

> I agree with the recommendation as far as it goes. However there are a variety of sockeye salmon stocks at risk in addition to Cultus Lake. An integrated program is required. There is a need to examine the range of drivers affecting the sustainability of the species for successful recovery and a requirement that information be provided to prevent similar events occurring in other MUs if possible.

I'm not sure what he means by "MUs". I wonder if he means CUs. But he's not here, so he can't

clarify that for us. And your response under 8 is, if we can carry over then to M-12 under the "Recommendation Eight" and you say:

> Recommendation #8, only relates to Cultus sockeye because one of our tasks was to assess the status and recovery plan for Cultus sockeye. We agree that Cultus is not the only sockeye stock at risk within the Fraser watershed and recovery plans for these other stocks at risk should be developed.

I'm going to just stop there. So I take it that because your terms of reference for your report limited you to Cultus Lake, you did not focus upon other conservation units that might also be in a similar situation as the Cultus Lake conservation unit; is that correct?

A That's correct, yes.

Q And so are you aware from having read some of the reports, such as the Sue Grant paper, that there are something in the -- I think there's eight conservation units that are in the red zone, at least insofar as the draft copy of that report is concerned?

A Yes, I've seen that report.

Q Right. And we heard from Sue Grant, and she has gone back to the drafting board, so to speak, and she's going to come up with a redraft of that, and hopefully before the end of this Commission we will be able to see a copy of that. You're aware of that CSAS process that underlies that, the review of that particular paper?

A Yes, I was there for the initial review last fall.

Q Okay. You go on to say, and this is where I'm not sure I understand what you mean, you say:

> However, we do not agree that the concerns identified for these few stocks would justify concerns regarding the sustainability of the species.

I don't take this to mean that you're just saying we should just write off these stocks because they're of limited value, or because they're so small. You're not saying that, are you?

A No. No. I'm saying they don't threaten the sustainability of the species sockeye.
Q So you're then taking the view, when you say the sustainability of the species, you're taking the view of the sockeye species as a totality. You're not breaking it down into conservation units. Is that fair to say?
A That's fair to say, yes. And to be fair, it would be even within the context of the Fraser, not globally the species sockeye.
Q Right. And so you're leaving out of that equation the whole concept of biodiversity, are you not?
A Yeah, I'm not talking about biodiversity. I'm talking about sustainability of the species.
Q Okay. But and perhaps you may not be competent enough to be able to comment on it, because you are an expert in fisheries management, you're not necessarily a conservationist biologist. Is that fair to say?
A I've got a lot of the same background, I guess, as others, but I haven't focused on conservation biology to the same degree as other people have.
Q Right. But in terms of biodiversity, you would agree with me that that's a worthwhile concept to protect if we're going to be talking about Fraser River conservation units; isn't that fair?
A Yes, and that's one of the reasons for defining these goals, so that we know what we're striving for with regard to each of the CUs.
Q Now, I want to go back to the recommendation number 8, and specifically I wanted to refer to Cultus Lake and Appendix K in your report. What you've done, as I understand it, in Appendix K through Table K-1 and K-2, is to provide to the Commission a summary of actions that have been taken by both the Department of Fisheries and Oceans, as well as what you call "Partners", in order to protect and help the conservation unit that is known as the Cultus Lake sockeye. Is that what you've done here?
A That's correct, yes.
Q And so dealing with K-1, it strikes me that when I reviewed this that there's a lot of people, not just DFO, that are involved in this initiative to try to protect the Cultus Lake sockeye; is that correct?
A Yes.

Q A number of conservation groups, a number of local groups, a number -- I see Fraser Valley Salmon Society, I see First Nations groups, the Soowahlie Band is involved in some of these initiatives. It strikes me that this is something that where a lot of people, and by the way, I understand also that the commercial fishing sector also contributes by way of funding to some of these projects, does it not?
A Yes, that's what I'm aware of. Yes.
Q Right. And it strikes me that this is an example where people have come together to try to protect an endangered stock, and it provides an example of how people with disparate interests could actually work together to achieve some common goal. Would that be a fair statement?
A Yes, I think people have come together for quite a number of reasons to try and make sure that the stock sticks around and is brought back, recovered as much as possible.
Q All right. And then under your second table under that appendix, Table K-2, you go into the summary of actions that have been proposed but not pursued by the Cultus Sockeye Recovery Team.
A Mm-hmm.
Q Do you happen to know why some of these things have not been done? Is it a question, once again, of lack of resources, lack of funding?
A I think it's a combination of reasons. I think with any one of these plans there's a priority set, and so certain things are higher priority than others, and some may be reviewed and thought to be, you know, not likely to be successful, so they decided not to do those.
Q Now, in the few minutes remaining, I want to move off of Cultus Lake and I just want to jump back again to the escapement targets and escapement goals. Because I want to keep focused upon that, Mr. English, because I think it provides an interesting key to some of the issues that we're dealing with here. The whole issue of sockeye salmon and the biology of sockeye salmon, it's complex, right?
A Mm-hmm.
Q I mean, the management of sockeye salmon is a fairly complex topic; is that correct?
A Yes, it is, it's not simple.

Q It's not simple, but it's not -- it's not a situation where we can't solve it, right? We're not at that stage where we just throw our hands up in the air and say, well, it's too complex, we've just got to go away and hope for the best. We're not there yet, are we.
A No. No, it is -- it is solvable, and it requires cooperation with all the people involved because you've got to manage the people as well as the fish.
Q And the reason why I want to focus upon the escapement goals, because it does provide a really simple way of trying to address a complex problem, that if we have a definable goal in sight, that everyone can turn their attention to and provide some certainty to all the disparate elements in this room, then, it strikes me that that's one way of moving forward on this issue of what to do about the decline in the sockeye population. Is that fair to say?
A Yeah, very much so. And just like we talked about yesterday, in the opposite context, if we don't have agreement on the goal, we're definitely not going to get there.
MR. LEADEM: All right. Thank you. Those are my questions.
MS. BAKER: Thank you. Mr. Commissioner, we have a very tight schedule to get all the questions completed today, and the next questioner is Mr. Harvey for Area G, and he has 60 minutes as an allocation of time.
MR. HARVEY: So it's Chris Harvey for the Area G Trollers and the United Fishermen and Allied Workers Union.

CROSS-EXAMINATION BY MR. HARVEY:

Q Mr. English, I'd like to start with the farming analogy that you gave at the end of the day yesterday, because it seems to me that population dynamics, fisheries biology is no more complicated than that. Escapement is the equivalent in this field as seeding in the agricultural field, is that...
A That's the idea.
Q That's the idea.
A Putting the seeds, in this case eggs, in the

gravel.
Q Yes. And you said, I think, seeding at only half is obviously less than optimum. I want to suggest to you also that seeding at double the capacity that a field can produce in that area would produce a stunted and unhealthy crop, and therefore is also not optimum.
A Yeah. It's a little more complicated in the case of fish than in the case of agriculture in that regard, with regard to what the effects of having too many, having more than the optimal number of eggs in the gravel is --
Q Yes.
A -- because of the other parts of the life history.
Q Yes. But the analogy I'm using is not with the spawning ground so much as the rearing lakes, because it's the nutrient capacity and the carrying capacity of the rearing lakes that very much, well, in a number of our systems determines the optimum amount of escapement, does it not?
A Yes. And the ability of the fish to produce that number, the optimal number for the lake depends on the spawning ground habitat.
Q Yes.
A Such that if the spawning ground habitat is limited, it will control the numbers of juveniles that get produced that can then migrate downstream, or upstream, in some cases, to the lake and then rear in the lake.
Q Yes. I think, well, let's use the analogy of the Shuswap system and the Quesnel system, because both those systems have been described here as being lake limited, as opposed to spawning ground limited. Is that consistent with your understanding?
A Definitely for Quesnel. There are components of the Shuswap system, most notably the Lower Adams River, which is clearly spawning ground limited and has in some cases shown that you get very large returns that are confined to a very small area.
Q Yes. All right. Well, at any rate, there are those two limitations.
A Mm-hmm.
Q If we take the lake-limited areas, such as the Quesnel, there's another analogy with farming, isn't it, that if you over-seed the area, you will

deplete the nutrients, just as a farmer can deplete the nutrients in his field and thus there is a carryover effect in following seasons. That analogy applies, as well, does it not?

A Yes. So in the case of Quesnel, the idea of putting -- you have more juveniles in the lake rearing, that affects, because it is more complicated than what we call primary production with seeds in agriculture, in that there's a whole food chain that supports those juvenile sockeye, and there's effects on that food chain and the dynamics of those populations, that in the case of Quesnel have shown in a few instances, not a large number, because there's not been a lot of cases where a huge number of fish have been put on the spawning grounds and essentially over-seeded the lake.

Q Yes.

A But in the few instances that have, it's shown that the juveniles don't grow as large, and then you end up with a potential for less returns.

Q Yes. And with carryover effects in the following years, because once the food web is driven down, it will take time to recover.

A Yes. And as the variety of studies, some of the best work done in Alaska related to carryover effects, but as they've noted there and elsewhere, there's a lot of -- there can be substantial differences between lakes because each lake is a different ecosystem.

Q Yes. But with respect to escapements and lower benchmarks and upper benchmarks, there is a kind of a sweet spot which is meant to be right between the upper and the lower benchmark, isn't it, and the more precise the better?

A Yes. Definitely that's the rationale behind the goal set for Bristol Bay, for example, is --

Q Yes.

A -- there's a range and I think that if they're right in the middle of that range, they're probably the happiest.

Q Yes. So from a biological perspective, quite apart from the economic perspective, it is important to adhere to both the lower benchmark and the upper benchmarks?

A There is, I think, let me clarify that the benchmarks defined for -- that are being proposed

to be defined under the Wild Salmon Policy might not be viewed as equivalent to the ones done in places like Bristol Bay.
Q Yes.
A The Bristol Bay ones would be more like bounds placed on an upper benchmark.
Q Yes.
A As opposed to the lower benchmark, which is envisioned as a location where you don't want to go near if you can avoid, if you can have returns greater than -- you don't want to have fisheries certainly if you're in the vicinity of the lower benchmark.
Q Yes. And that's one of the differences between Bristol Bay and our system in the Fraser, isn't it, that we don't have bounds placed on the upper benchmarks here, the way they do in Bristol Bay.
A Well, essentially we don't, we haven't defined the goal which is the intent of the upper benchmark --
Q Yes.
A -- for these stocks.
Q And the goal that you are speaking of with respect to the upper benchmark is a biologically driven goal, correct?
A Yes.
Q Yes.
A Yes, that's the idea, is that you'd use information on the biological system capacity, both spawning and rearing areas, to determine what would be the appropriate goal for seeding.
Q Yes. Yes. And it's biologically driven because if you don't have an upper benchmark in the sense you've described, you're basically ignoring other elements of the ecosystem, namely the food web, that is critical to the health and long-term survival of sockeye, correct?
A Yeah, you should be taking all those things into account in setting that goal.
Q Yes. Finally, with the farmer analogy, the farmer is obviously looking for long-term maximum sustainable yield from his field, and I take it your suggestion is that fishery managers should be looking for the same thing, long-term maximum sustainable yield from the sockeye fishery resource.
A Well, there's quite a bit of debate about whether you need to be looking at the maximum, but you can

set targets that will produce good, sustainable returns. Whether it's the maximum that you're targeting, or some optimal level, is the subject of a lot of debate.

Q Yes. Well, I've assumed that everyone in this room would be happy with the maximum sustainable yield in the sockeye resource, and so I don't really know how controversial that is. But we'll get to the -- the point of your criticism is that the FRSSI model loses sight of the goal, whether it's maximum sustainable yield or a good long-term sustainable yield, it tends to lose sight of it, is that...

A Yes, it's defining a harvest rule that will produce an escapement without any reference directly to what the goal is for those particular stocks.

Q Yes. There should be a brief of documents in front of you. At Tab 15 is the latest Pestal and Cass document, which I looked to, to see what goals, if any, there are. And the best I could find was at page 0024, using the Ringtail numbers. Under "Performance Evaluation" it says:

> The overarching goal of the FRSSI process is to seek a balance between the fundamental objectives of (1) ensuring spawner abundance and production for individual stocks and (2) accessing catch-related benefits from the timing aggregates.

That's anything but clear to me. Would you agree with that?

A I can certainly see how it's unclear. I do understand what it's trying to say.

Q Yes. But I searched in vain in this document for a clear statement that maintaining the largest sustained abundance of sockeye or a good sustained abundance of sockeye in terms of what the ecosystem can support is a goal. Did you similarly find that somewhat unclear?

A Well, I can't say I've gone through every one of these documents. I'm not sure whether there is something clearer in this document that I could find.

Q Okay. You mentioned in answer to questions from Mr. Leadem a moment ago that the individual

conservation units have to be taken into account. But there is a way, is there not, of maintaining a large overall abundance of sockeye and protecting weak stocks, and I'm going to suggest that the way to do that is to use what Carl Walters described in his evidence here, a sustainable overfishing of the weaker stocks. And I think, if I've got it right, what he was explaining is that stocks such as the Cultus are habitat limited and there are habitat degradation problems there, but a small number of a small return will sustain that genetic unit. A small return in an unproductive lake will sustain the lake. It doesn't have to be a large return in an unproductive lake. Is that something you basically agree with?

A Well, I understand what he's driving at there, and the concept is, and it's a similar concept has been identified on the Skeena with analysis that Carl Walters has done and others, to look at whether the smaller stocks can sustain themselves at these lower levels for a period of time.

Q Yes.

A And the real issue in that regard is it appears to have been the case historically, or we wouldn't have a lot of these small stocks today if they couldn't do as Carl has identified.

Q Yes.

A But the concerns, I think, as have been expressed by a number of people are that as you go forward into the future with other challenges on these populations, that that may not be the case, that what we've seen in the past may not bode out into the future.

Q Yes. But there is no firm evidence to support that, because in the past we have seen that where either a spawning or a lake-rearing habitat has a small number, as opposed to an overlarge number of fish in it, it will respond well. In other words, the productivity of the fish will be good.

A And that's the principle behind the stock recruitment analyses and --

Q Yes.

A -- most of the evidence regarding salmon is that at lower abundance levels, they tend to be more productive.

Q Yes.

A As long as there's not a predation effect.

Q Yes.
A So this predator pit-type effect that you can get, where very small populations, the predation is great and hold the population down at that level.
Q Yes. Yes, thank you. Well, getting back to the central point in your paper, that without, about an absence of clearly identified goals, that has led, I think, I think to a confusion as to how to deal with the escapement. That's the basic point that you make in your paper; is that correct?
A Yes.
Q Now, it is agreed, I think, and if we look at this paper, at page 0017, it is agreed that there is -- by everybody, it seems, that there is a productive capacity limit for every stock. There's a paragraph beginning "The productive capacity" down at -- yes:

> The productive capacity of Fraser River sockeye stocks is limited in the freshwater environment, either by available spawning habitat or by available lake rearing habitat. Several approaches have been used to estimate productive capacity for individual sockeye stocks, including available spawning area, lake productivity, and numerical estimates of the capacity parameter from population models... This information can be used to shape prior assumptions about density-dependent parameters in the spawner-recruit model.

So that's basically generally agreed what's set out there; is that correct?
A Yes, and very consistent with what I've just been saying.
Q Yes. And but what is discussed here, what the authors seem to leave out, is the empirical method or what I think is also called the stock recruit method, stock recruit analysis method of determining the carrying capacity of spawning grounds or rearing areas. That is another familiar method, is it not?
A I think the stock recruitment models are used to look at returns, essentially returns per spawner, where you're getting the best returns per spawner.
Q Yes.

A And they are naturally integrating a lot more than just the freshwater habitat.
Q Yes.
A They're looking at the returns being the fish that come back after rearing in the ocean and completing their life history.
Q Yes. If we look at page 102 of this paper, we see an analysis here, and I think this is the sort of thing that one looks at for a stock recruit analysis, is that right? We have the years down the left, the run size, the spawners, the effective female spawners, and then the recruits, which would be the recruits four years later, generally, including some five-year-olds.
A Yes. This is done by brood year, this would be exactly what I'm talking about. yes.
Q Yes. And if we look in the upper right-hand column, there's some shading bars, for example, the 1954 year, the shading, the bars on the right, that those indications are the productivity, are they not? So that indicates a high productivity in 1954.
A Yeah, it looks like it's the portion of the maximum for each variable. So it's indicating how much greater that variable, that value is, or what portion of the maximum I guess of that variable is occurring in that year.
Q And the way these analyses work, you can look down, let's say, down the "Effective Females" column, and then look at the "Recruits" beside it and determine what is the right level or what seems to be the right level of effective female spawners. For example, 1954 just over one million effective female spawners led to a high productivity, whereas four years later, in '58, with half a million, more than half a million, about 600, or half a million more effective female spawners, you have far less productivity. And then you go through the cycles in that manner and it gives you an idea of what is the right level of escapement. Is that...
A Well, what this is, is showing you the range in returns or recruits.
Q Yes.
A And you can see from a given level of spawning.
Q Yes. There are of course other factors --
A Yes.

Q -- in play, but this gives you a pretty good idea. For example, if we take the one million effective female spawners we have that again in 1978 with a lot of bars beside the right-hand columns, good productivity.
A Yes, and you also see in 1982, for example, escapement very similar to what was in 1958.
Q Yes.
A And it produced a substantial larger return than what was seen in the returns from the '58 escapement.
Q Yes. But then in 1986 there's a smaller escapement again, closer to the 1954, and it's got a better productivity. It's produced even more returns than the larger escapement in '82, correct?
A Yes.
Q Yes. And just following through, it's interesting that the 2006 effective female spawners, 1,170,000 is again seems to be right on the sweet spot. We haven't got the 2010 returns here, but we know that they were the record along with the '54 or '58 return. So this, looking at this, this gives a biologist an idea that on the stock recruitment or empirical method, just over one million effective female spawners seems to be about right, correct?
A It's certainly in that range, and I think if you look at the capacity for the lake, like rearing capacity for Shuswap Lake, the estimates that I've seen are in the order of something similar, but it can go as high as 1.9 million, spawning escapement to produce the juveniles that will achieve that capacity.
Q 1.9 million spawners in total?
A Yes.
Q So about half that would be effective female spawners.
A Yes.
Q Yes. I've got a paper in here at Tab 2. I don't think we need turn to it, but that's based on an analysis of the rearing capacity of the lakes using cone shaped nets to trap the fry and the little daphnia flies and other species that are used as feed, is that correct, as you understand it?
A Yes.

Q And through sort of a completely different type of analysis, about the same number, around about a million effective female spawners, slightly less, I think in Hume's analysis. slightly less is optimum.
A Yes. You may want to be aware that the egg-to-fry survival is obviously an important issue, so if that's low for whatever reason, lower, then you need more effective females --
Q Yes.
A -- to seed the right number in the lake.
Q Yes. All right. Now, is it your understanding that the old International Pacific Salmon Fisheries Commission used basically the stock recruitment analysis method? They didn't have the advantage of Hume's habitat measurements, but they used basically an empirical method to determine what they thought was optimum spawning levels; is that your understanding?
A Yeah, I think that it was more the case back a few years ago.
Q Yes. And the Alaskans used basically an empirical method supplemented by some pretty good scientific experiments. Is that as you understand it?
A That's my understanding, yes.
Q Yes. Well, let's turn to that in your report at page 4, your report, Exhibit 718. At page 4, the Bristol Bay fishery is described. They say in that second sentence that:

> One aspect of the Bristol Bay fisheries that should be considered seriously for application to the Fraser is the clarity and priority associated with their escapement goals. A clearly defined set of escapement goals for Fraser sockeye would not guarantee success but is one way that the management of stocks could be made simpler and increase the potential for achieving these escapement goals.

Now, the report at page 126 discusses this in more detail, and I think in the interests of time, I won't deal with that in detail, but under "Management", towards the bottom, you describe how the "local Area Management Biologists (AMBs)". The "ADF&G's", that's Alaska Department of Fish

and Game, I think?
A That's correct.
Q

> ...Research Biologists develop biological escapement goals for individual river systems based on sustained yield and/or maximum sustained yield (MSY) principles using relationships between escapement levels and subsequent returns (termed stock-recruit analyses).

So that's the sort of analyses that we looked at a moment ago.
A That's correct, yes.
Q That's correct.

> The primary duty of all AMBs is to hit these goals and distribute the escapements across the season based on historical run timing schedules.

Et cetera. And you say they've been very adept at hitting the goals.
The AMBs, as I understand, have I got it right, there are four senior biologists who basically run this system?
A Effectively, yes.
Q They have a staff, but it sounds like the cost of running that system, which is far larger in terms of run size than the Fraser, the cost must be miniscule compared with what the DFO spends doing an equivalent exercise. Do you know anything about that?
A I've heard it referred to that the costs there are substantially less. The exact amount I'm not familiar, I can't tell you today.
Q Okay. Then at page 128 -- so I guess we could summarize. That is a science-driven system, whereas ours seems to lean more towards being a consensus-driven system. Would that be a fair statement?
A There's a lot of focus on consensus, certainly on the Fraser.
Q Yes. Page 128, the paragraph beginning:

> Although the Bristol Bay fishery is seen as a biological success story, from an economic

standpoint...

And then you go on. Halfway down that paragraph:

> Hilborn (2006) argued that the biological success story of Bristol Bay is due to clear biological objectives and clear lines of authority...

So that's something you agree with, I think; is that correct?

A Yes.

Q At page 137 there's an interesting graph here, if we could look at it. The grey area at the bottom is the escapement numbers and the area at the top is the catch, or harvest numbers. And it looks like the escapements fluctuated wildly until about 1980 or '82, the last of the big escapements, and then they comparatively levelled off. Is it a fair comment that the big escapements stopped in Alaska about the same time as they started in the Fraser?

A I don't know that that is particularly the case in terms of timing. I think it's really important to note, I did ask Michael Link, who prepared this part of the report and understands the fishery up there in detail, what the reasons for the very different shape of this graph was, between the pre-1980 period and post-1980 period, and he said that it was very much related to the regime shift, where the productivity increased two or threefold after '77. There was a well-known regime shift that resulted in higher productivity for Alaskan sockeye stocks, and the breakdown of a previous pattern of cyclic dominance for the -- this is the Kvichak stock that we started to talk about the other day, that showed a very cyclic return for a number of years and was contributing a very large portion of the production, and that broke down here just shortly after the -- at the same time as this change in productivity occurred. And so you get more production from lower levels of escapement, as you're seeing in the subsequent period.

Q Well, without going into the chicken and egg question of which caused which, it's accepted, isn't it, in this field, that high escapements

will trigger wild variations in -- that's been referred to as cyclic dominance, cyclic variations. In other words, a very high escapement in one year will lead to depressed runs succeeding, and then if the ecosystem recovers, a high escapement can be supported four years later, but then the food web gets driven down again, and we get -- as long as we have the very high escapements, you're going to have cyclic dominance, high cyclic variations.

A Yes, it's hard to get into the subject without a lot more discussion, but there are what they refer to as broodline interactions --

Q Yes.

A -- associated with cyclic dominant stocks when the cycles are very large.

Q Yes. And it's the relationship between the carrying capacity of the freshwater system and the number of spawners that will trigger wild cyclic variations, or extreme cyclic variations, isn't it?

A In the case of the Shuswap stocks we were just talking about.

Q Yes.

A You can still hit the carrying capacity on the dominant cycle close, or even be under the carrying capacity on that cycle, and still have the cycle continue as cyclic, and the carrying capacity is not changing appreciably between the different years, so...

Q But presumably if you lowered escapement dramatically so that the food web remained consistent, you could iron out the cyclic patterns over time.

A Well, there's been a lot of debate about whether you can remove the cyclic pattern and produce a higher yield of a population without using the cycles.

Q Yeah. And it's very much a lake-specific concept, isn't it, because lakes differ.

A Yes.

Q But it has been observed, well, if I'm right, that there is this correlation, necessary correlation, the cyclic variations could be triggered either by high escapement or by the carrying capacity of the lakes being lowered through habitat degradation. It would have the same effect, either lowering the

carrying capacity through habitat degradation, and I'm thinking of the Cultus, as would have the same effect as increasing escapement if the carrying capacity had remained the same.

A Yeah. I think you want to keep habitat degradation that is not occurring in a cyclic nature, you know, habitat degradation generally takes place and then the overall capacity is reduced because of that.

Q Yes.

A Milfoil or --

Q Yes.

A -- loss of lakeshore spawning habitat, or other things that have been noted for Cultus.

Q Yes.

A That's separate from the estimate of the capacity of the system and how close to that capacity you're seeding it in a given year.

Q But doesn't that all go to determining what the capacity is? For example, if there's a lot of milfoil and if you're approaching a eutrophic state, doesn't that reduce the capacity?

A Certainly it affects the capacity, but what I'm saying is doesn't tend to occur on a cycle, like you have it in one year but not in another.

Q Yes. No, I wasn't meaning to suggest that.

A Mm-hmm.

Q All right. I think I have to move ahead in the interests of time. If we could just go to the next page, 138, in this. I wanted to note something here towards the bottom of that first long paragraph. The sentence beginning "However":

> However, the regulations --

- this is in Alaska -

> -- specify that the [Alaska Department of Fish and Game's] highest priority is to obtain escapement goals and maintain genetic diversity of the escapement... When conservation concerns arise, management plans often set out how ADF&G should strive to address such concerns amid allocation issues.

It seems that they've got the same priority for maintaining genetic diversity that we have here in

the Fraser.
A They're referring to the same terms.
Q Yes. It's not as though they're ignoring conservation concerns in Bristol Bay.
A No, they want to have a good seeding of the available habitat and production from all the lakes that are within a district, not just one or two of them.
Q Yes. But they're -- yeah, they're not managing the system. They're producing a very successful fishery there in the way they do it with their upper and lower boundaries. They're doing that whilst not in any way ignoring conservation concerns or genetic diversity; is that correct?
A Yeah. They're -- I'd say to be fair to the two systems, there's less focus on the small stocks in Alaska.
Q Yes.
A Than on the productive stocks.
Q Yes. But those small stocks continue to tick over year-by-year, thus preserving the genetic makeup of them don't they.
A I can't say I know exactly what's going on with the smaller populations and the amount of interaction of interplay, how distinct the small populations are in Bristol Bay.
Q And that's just your lack of familiarity with...
A Yeah, and it's also fair to say that their assessment programs are not focused on determining that --
Q Yes.
A -- to the same degree that we are on the Fraser.
Q Thank you. Do you know anything about MSC certification with respect to the Bristol Bay fishery?
A I know that it was part of the certification process. I don't know all the details --
Q Yeah.
A -- regarding their evaluation.
Q All right. So they're going through the same process that we are here with respect to MSC certification?
A Yes. They have gone through it initially before British Columbia did, before the -- for sockeye fisheries, and then they've gone through a reassessment a number of years ago, so they're using right now -- their initial assessment didn't

use the same criteria that was used for the B.C. sockeye fisheries, but their current assessment does use the same criteria.

Q Yes. all right. Now, I want to look at some of the science that they've based their fishery management strategies on, if we could look at Tab 1 of the binder you have. This is the Koenings and Kyle 1997 paper on Consequences to Juvenile Sockeye Salmon and the Zooplankton Community Resulting from Intense Predation. The paper discusses the effects of over-escapement at page 120 of the paper. It's, yes, the bottom of that page. That's it. The right-hand column about halfway through the paragraph it reads:

> In fact, successive escapements 2-3 times above the rearing capacity in Frazer Lake...

They're talking -- that's one of the lakes they focused on here, Frazer with a "Z":

> ...caused the collapse of a dominant year run, and subsequent brood year return per spawner ratios fell below replacement levels. Such top-down effects, if related to overgrazing the forage base, are reversible by nutrient treatment...

Mentions a number of papers.

> Top-down control by rearing sockeye salmon reduces the size of prey items, lowers zooplankton fecundity and density, displaces vulnerable prey species, and thereby restructures the zooplankton into a predator-resistant community... Once established, such an assemblage may resist immediate reversal to bottom-up (producer) control, either through decreased predation or increased primary production.

So that, I think, encapsules the detrimental effects that they found from successive over-escapements; is that correct?

A That's what's written in the paper, for sure. Yes. It looks like it happened.

Q Yeah. And the paper, the Frazer Lake that they

discuss, it's mentioned in the next -- or on this page, in the right-hand column beginning:

> Frazer Lake (57°5'N, 154°10'W) is the second largest lake on Kodiak Island...

Gives the surface area. The lake has an outlet barrier:

> ...that until 1962 precluded salmon access. In 1962 a single steeppass fishway was installed and another was added in 1979. ...enabled a major run of sockeye salmon to become established... This lake has not been stocked in recent years, but nutrient treatment was conducted...

So that was a good area for testing there that's discussed here. And it goes on. They discuss also two landlocked lakes in the paper, landlocked lakes that were then stocked, and then they watched very carefully what happened in the ecosystem once sockeye fry were introduced. And I'd like to turn to page 129 of the paper, which shows in the form of a graph what happens. If we could just read the words at the bottom first, Mr. Lunn, the Figure 5:

> Seasonal mean macrozooplanton biomass and density by taxa in Pass Lake...

That's the "A", the top one:

> ...before stocking of sockeye salmon fry --

- which is the -

> -- (control), during stocking, and during either nutrient treatment or no stocking.

So if we go back up to the top, the control, that's before stocking of sockeye, and the almost black and white and the other shading areas, are described as the food web, "Cyclops, Daphnia, Diaptomus, Bosmina and Holopedium", those must be very interesting little critters, but very critical to the life of sockeye, it appears. So

without this sockeye fry there's a big mass of them. Then after sockeye stocking, 1988, they are being depleted and by 1989 it's all black, which means that Cyclops is the only one of the five that remains, the other two are wiped out, if this is correct. And then nutrient treatment, and a very slow return.

So this is part of what's discussed in this paper and it encapsules what happens when a whole lot of sockeye fry are introduced in a lake rearing system, is that...

A I think you want to be very careful that it's what happens when they did this experiment in this particular lake.

Q Yes.

A Each lake can have a different zooplankton community. These are all zooplankton species.

Q Yes. If we go back to page 127, the page before this, Mr. Lunn, something that I -- oh, I'm sorry, two pages before this. Yes. In the right-hand column near the top, the last line of that top paragraph beginning "However":

> However, *Diaptomus* never returned to 1978 levels of abundance, even after 6 years of nutrient treatment.

I just, I found that somewhat alarming because it indicates that once you do drive down these little creatures that the lake system ecosystem produces, it can take a very long time for them to recover, depending, of course on a number of things. But it can take a very long time for them to recover, correct?

A Yeah, it appears to be the case here, and I'd certainly recommend, because I'm not an expert in limnology, to the -- anywhere near the extent that someone like Jeremy Hume could --

Q Yes.

A -- probably provide you a lot more useful information on the Fraser lakes, the Fraser Watershed lakes --

Q Yes.

A -- for a comparison to this type of paper.

Q Yes. Why I found this alarming, it reminded me of the northern cod situation on the East Coast, once you get a stock knocked down, whether it's a

miniscule stock like these, or a large fish, it can take a long, long time to recover. So that's the Alaska system, what the Alaskan, the science, part of, a glimpse of the science that the Alaska system is based on.

The problem with the FRSSI model, isn't it, is that it's open-ended at the upper benchmark or upper boundary level. It doesn't have an upper boundary in the sense that once you -- well, let me see if I can find an example. I think we might have to -- well, let's just deal with it this way. If one million effective female spawners is the optimum in the Shuswap, let's say 1.5 million is set as the upper benchmark under the FRSSI model, 1.5 million, if we had a return, a huge return like we had in 2010, where you might have 10 million effective female spawners, after you reach the -- after the managers in their models have determined that you've exceeded 1.5 effective female spawners, then the harvest continues, the exploitation continues at 60 percent, which means that 40 percent of all the excess ends up on the spawning grounds. Am I interpreting it correctly?

A So you're saying that the total run size might have had a potential for 10 million effective females?

Q Yes.

A With a 20 million run size.

Q Yes.

A Yes.

Q And if 1.5 million effective females was the upper benchmark in the FRSSI model, everything between 1.5 and 10 million, 40 -- well, I guess I have to go back to the 20 million run size, let's say, which on run size, three million would be the upper benchmark. So between three million and 20 million, under this model, harvesting takes place at 60 percent, which means 40 percent goes on the spawning grounds.

A Yes.

Q Yes. All right. So effectively, you've got a situation under the FRSSI model where you can very seriously over-seed the spawning grounds; is that correct?

A If all those fish that entered the river survived their upriver migration, in the example you've presented, you could have eight million fish

arrive at the spawning area.
Q Yes. Do you happen to know how many arrived there in 2010?
A I actually have those numbers somewhere, but I can't remember what it is off the top of my head.
Q Could we have that --
A It's probably in the six million range, I think.
MR. HARVEY: Yes. Yes. In other words, substantially over the -- well, I'll let the numbers speak for themselves. Could this document be marked, please, as an exhibit.
THE REGISTRAR: That will be Exhibit 726.

EXHIBIT 726: Koenings and Kyle, Consequences to Juvenile Sockeye Salmon and the Zooplankton Community Resulting from Intense Predation, 1997

MR. HARVEY:
Q There's another Alaska paper which is Exhibit 419. In fact, that's already been exhibited. I don't think I have time to go into it.
I believe you have done some work on the Columbia River, Mr. English; is that right?
A That's correct, yes.
Q If we could bring up Tab 3, the paper entitled "Habitat Based Evaluation of Okanagan Sockeye Salmon Escapement Objectives". I note that in the reference page it references one of your papers, which is why I asked that question. This, what I find interesting in this document is that before escapement increased in the Columbia area, an evaluation was done of the carrying capacity. I found that curious, because it seems that the same thing wasn't done in the Fraser before the large escapement increases we had in the late '90s. But in this paper at page 24, I'll start. The Columbia, of course, one arm of the Columbia goes off to the Snake River area, and the other up to the Okanagan. That's correct, isn't it? So Osoyoos Lake and Okanagan Lake are part of the Columbia River system.
A That's correct, yes.
Q Yes. The recommendations in this paper at page 24 number 1:

We recommend:

(1) Provisional escapement objectives for Okanagan sockeye be set at 58,730 adults (in Wells Dam units) or 29,3655 adults as peak visual counts...

Do you know why it is that in the Columbia we have a focus on the carrying capacity of the rearing areas that seems to be absent in the Fraser?

A I don't think it's fair to say it's absent.

Q Yes. Yeah, that's -- I agree with you, and I'm putting it too strong, but we have more of a focus in the Columbia area.

A Yeah, and there have been extensive studies on the lakes that Jeremy Hume can probably relate to, and/or describe to you, that will let you know what they've found, and that information's not been ignored, but it's using that information to clearly define what these escapement goals are, is --

Q Yes.

A -- is part of the challenge.

Q Yes. But here in the Columbia we've got a precise number recommended, and I've not seen anything like that for the Shuswap, the Quesnel, the Chilko, or any of the other systems, any of the other lake systems. Perhaps I've just missed it, but why have we got such a precise number in the Columbia, and not so far as I've been able to tell in any of the Fraser system lakes?

A Well, there are -- it is curious why there hasn't been agreement for using the available data to identify a precise number, but that is exactly what I've been talking about with regard to setting escapement goals.

Q Yes. Yes, thank you. all right. Do you think it may be that the Columbia has a large U.S. involvement and influence in the way they manage the fishery and that's resulted in this analysis being done there, or is that...

A Well, there's certainly a lot of pressure coming from groups on the Columbia, like the ones that -- or companies, the Douglas County Public Utility District that runs the Wells Dam, for example, wants to know what is the target. So there's pressure from the hydroelectric power industry on the Columbia. There's the cross-border nature of that stock. And there's a lot of things that

affect how -- how those dams are operated that are related to sockeye and chinook and steelhead returns.

Q Yes. All right. But at any rate, the Columbia experience is that in 2008 and 2009 they had record returns in their sockeye fishery, whereas in the Fraser we've had somewhat dismal returns, is that...

A Yeah, they seem to be on a different pattern of returns definitely than the Fraser, and it's really important to note that the Columbia River sockeye stocks, specifically the Osoyoos Lake ones, are ones that are -- have an adaptation to handle higher water temperatures than any of the other sockeye stocks. They're the most southern abundant sockeye population and they have to swim through rivers that are even warmer than the Fraser during the spawning, during the migration period.

THE COMMISSIONER: Mr. Harvey, how much longer do you think you're going to be?

MR. HARVEY: Yes, I think I'll be four or five minutes longer.

THE COMMISSIONER: Why don't we take the break now.

MR. HARVEY: Yes.

THE REGISTRAR: The hearing will recess for ten minutes.

THE COMMISSIONER: Fifteen.

THE REGISTRAR: Fifteen minutes.

(PROCEEDINGS ADJOURNED FOR MORNING RECESS)
(PROCEEDINGS RECONVENED)

THE REGISTRAR: The hearing is now resumed.

MR. HARVEY: Yes, Mr. Lunn, could we please mark that document as the next exhibit?

THE REGISTRAR: That will be Exhibit 727.

MR. HARVEY: Yes.

CROSS-EXAMINATION BY MR. HARVEY, continuing:

Q Now, Mr. English, in the few minutes left, I'd like to turn to something that's directly relevant to the failure of the Quesnel run in 2009; 2005 and 2001 were the preceding years of that cycle. In 2001, there was a huge unprecedented escapement level in the Quesnel system. And one of the

reasons we've heard for it was the fact that there was some Late-Run fish migrating Early mixed up with it. Now, you've looked at the possible reasons for the early migration of Late-Runs, I think; is that right?

A That's correct, yes.

MR. HARVEY: And I'd like to turn to two papers. One is at Tab 16. I'm sorry, Tab 10, if you like, Mr. Lunn. We'll start with Tab 10. That's the order I gave Mr. Lunn.

Q This is one of your papers; is that right?

A That's correct.

Q Explains it.

MR. HARVEY: Could that be marked, please, as the next exhibit?

THE REGISTRAR: That's Exhibit 728.

MR. HARVEY: 728.

EXHIBIT 728: English *et al*, Influence of Summer-Run Sockeye on the River Entry Timing of Late-Run Fraser Sockeye, 'Stay with the School' Hypothesis, 2005

MR. HARVEY: And the next one at Tab 10.

THE REGISTRAR: We were just at Tab 10.

MR. HARVEY: Oh, I'm sorry. I was at Tab 10. Tab 16.

THE REGISTRAR: And our list of documents only goes up to Tab 15, I'm sorry.

MR. HARVEY: Oh, did I not give notice of this one? There's another one. Oh, well. October 2009, an oral presentation you gave.

Q I think this was -- was this to the Simon Fraser University seminar on the 2009 collapse?

A I think that's what it was. I don't have the document in front of me but I think I was sent a document that was a presentation I gave.

MR. HARVEY: Do you have any problem if -- well, I guess we can't put that on the screen, if I haven't given notice of it.

Q All right. Well, at any rate, I'd like to ask you to explain, if you would, the theory, the hypothesis that you presented here to explain the early migration of the Late-Run fish in recent years.

A Okay. In as brief a manner as I can, essentially looks at the overlap in the timing between Summer-Run stocks and Late-Run stocks, as they're

migrating through the approach waters in the ocean and the relative size of those two populations with the basic principle being that because sockeye are a highly schooling species so they swim in dense schools.

And for one sockeye to the next, probably the picture that you have on the screen is the most appropriate, they can be often very close together and there would be no way for one fish, *per se*, to know what fish it's swimming beside, whether it's a Summer-Run or a Late-Run fish. And they densely school for a reason. It's for protection from predation. And it's sort of safety in numbers type of rationale that they follow right from when the times they were juveniles through their entire life history.

And the behaviour of fish when almost all the runs to the Fraser, other than the Late-Runs, migrate down the coast and directly into the Fraser with very little delay at the mouth. But the Late-Run, historically, a large portion of the stocks have delayed in that last stage. And the idea here is that when there's overlap, a lot of overlap between Summer-Run and Late-Run and Summer-Runs are very abundant, the dominant behaviour is going to be to migrate into the river. And so these Summer-Runs are essentially drawing Late-Run fish in with them when they're abundant and migrating earlier than normal. When the Late Runs are the dominant return or there's separation between the run timing groups then the Late-Runs become the dominant behaviour and there is an evolutionary advantage to those fish to delay in Georgia Strait so they'll stay out there and delay, as they did, in 2010 where they resided for two to three weeks off the mouth of the Fraser.

Q Yes. Now, the Quesnel is a Summer-Run; is that correct?

A That's correct.

Q If it had been cropped in the gauntlet fisheries in Johnstone Strait and other places in 2001 or these years that you have considered, if it had been cropped before arriving at the mouth of the Fraser, would that have mitigated that effect that you've just described?

A Well, there's huge differences in the abundance.

It's too bad you can't pull up the graph because you could see that on the dominant cycle for Quesnel the difference in abundance between Late-Run populations and Summer-Run populations is massive. Late-Run populations are definitely less than a million off and less than 500,000 returns. And it probably also is in this report, just not the graph. It's on page 19 in the report you entered as Exhibit --

Q Tab 10.

A Yes, page 19 in the report is a table. It's the top table in that tab.

Q Yes.

A If we look on the returns of Summers and Lates, you can see that the numbers are increasing, are getting larger in terms of total numbers arriving in Georgia Strait. So for 2001, for example, there's 4.238 million fish estimated arriving and the Late Run in that year was estimated at 334,000. So to not have an effect in the dominant Summer Run years, you would have to crop down the return to well below the escapement goal, the logical escapement goal for that population. So this type of activity probably occurred and the paper talks about our ability to detect the early arrival of Late-Run fish prior to the development of the DNA stock identification techniques that were developed in or actually started to be implemented in 2000/2001.

So historically, we couldn't distinguish between Early, Summer and Late-Run Shuswap sockeye because they rear in the same lake and the scales look the same. And a scale stock ID technique was being used to distinguish them. Now, with genetics, we can distinguish between the populations that rear in the same lake. And so what we couldn't detect before we are detecting now and have been ever since 2001 very clearly. The early arrival of Late-Run fish, which, in my theory, has been going on at some level for quite a while because these fish that migrate along with the Summer-Run fish are going to have a high probability of continuing their migration up-river with that massive amounts of Summer-Run fish, especially in the dominant year like 2001.

MR. HARVEY: Yes, thank you. Those are my questions.

MS. BAKER: Mr. Commissioner, we have a bit of a

problem in that we're now over our schedule. And it's been pointed out, and I think it's a fair point, that the people that are typically at the end of the line-up get the short end of the stick when the estimates go over at the front half of the day. So we have the next group is Mr. Eidsvik and Mr. Rosenbloom. The original estimate for these two people were 45 minutes for Mr. Eidsvik and 15 minutes for Mr. Rosenbloom.

And I understand they were going to try and potentially reallocate some of that time but I don't know exactly how that will work. But I'm concerned now that we're going to have no enough time to complete the people in the afternoon. So we either have to ask the next two groups to reduce their time or we could rearrange the day so that they go towards the end. But we have a problem and we don't have enough time to complete today.

MR. ROSENBLOOM: Just for the record, Mr. Rosenbloom's original estimate was half an hour, 30 minutes, not 15.

MS. BAKER: I understand that. I can tell you that we had about over eight hours estimated and about six-and-a-half hours available so everybody's been cutback.

MR. ROSENBLOOM: I appreciate that. You just said the original estimate was 15 and it was actually --

MS. BAKER: The original allocation for Mr. Rosenbloom on my numbers.

MR. EIDSVIK: Good morning, Mr. Commissioner. Good morning, Mr. English or Dr. English.

MS. BAKER: I'm sorry. Mr. Eidsvik, before you start, could we have some understanding about what we're going to do here? Are we going to have a reduction in time with the next two questioners or will we move them to the end of the day? Or how are we going to proceed?

MR. EIDSVIK: I'm certainly going to try and accommodate the Commission. And while I was sitting there, you saw me with my papers. I was cutting substantial material from my argument. How much time do we have, Ms. Baker?

MS. BAKER: If you and Mr. Rosenbloom can complete in a combined 45 to 50 minutes, we would probably be back on schedule.

MR. EIDSVIK: Perhaps if I get near the end, again,

maybe some written questions to Mr. English might clean up some of the stuff and I'll do my best. How much time did you need? I'm just trying to get a sense of how much time I should be spending here.

MR. ROSENBLOOM: Well, I need at least 20 minutes. I'm not happy with 20 but I'll live with 20.

MR. EIDSVIK: Okay. And that gives me till...?

MS. BAKER: Twenty-five minutes.

MR. EIDSVIK: Twenty-five, thank you. For the record, it's Philip Eidsvik for the Area E and the Fisheries Coalition.

CROSS-EXAMINATION BY MR. EIDSVIK:

Q Dr. English, I'm mostly interested in catch reporting. And if I had time on Cultus Lake, I'd deal with it. But I don't think we're going to. But first, before we get into that, a couple of clarifications in your report. In many places in your report, you refer to commercial fishing. And there's a couple of commercial fisheries in the Fraser River. And just for the record, when you refer to commercial fishing, are you referred to the public, all-Canadian commercial fishery, or are you referring to Aboriginal commercial fisheries as well?

A Okay. In the commercial fishing section here, it is the public fishery not the First Nations. And the First Nations fishery is covered under the economic opportunity and pilot sales fishery.

Q Okay. So wherever we see commercial fishing in your report, we automatically know you're talking about the public commercial fishery?

A Within that section, yes. I may have referred to commercial uses of fish within the First Nations.

Q Okay. And what type of fish harvest and mortalities aren't in your report? And I guess I just want to try and figure out the scope of your report. And fish harvested in illegal fisheries is not in your report?

A Presumably if they've not been monitored, if there's no statistics on those catches then they're not in the report.

Q Okay. Fishing-induced mortality, such as dropouts and set net fisheries, not in your report?

A To the extent that they're included in the en

route loss component of -- there's some graphs that have en route loss accounted for, for recent years. To the extent that they're in there, they're included in the report.

Q Okay. So all types of fishing-induced mortality are in your report then. Is that what I can assume?

A Well, they could be. For specific years, there's a lot of uncertainty with what the true values of en route loss are for Fraser stocks.

Q Okay. Fish caught in one fishery and landed in another fishery not considered in your report?

A Well, the information we have looked at is what's been assigned to each of the fisheries. So I'm not sure what you mean by "caught in one fishery and landed in another".

Q Well, if you had fish that were caught, say, in a food fishery and were landed in a public commercial or an EO fishery, that would show up as EO or public, rather than food, right?

A Yeah, they would be included in the total, if you like. But the assignment, I think I mentioned the assignment of some of those catches in the 1990s to a specific fishery are questionable.

Q Okay. I'm not quibbling with you. I'm just trying to get the scope of the report proper here.

A No, no, that's fine.

Q So as a general overview of catch reporting systems, in designing an effective system, there's probably factors unique that might affect what type of system you need. For example, geography. If you have a different model of catch reporting might be needed for an area that's a hundred yards versus 500 miles?

A That's correct, yes.

Q The number of fishermen or vessels could influence the type of system you want?

A Yes.

Q If you have fishery with ten versus 500?

A Certainly, yes.

Q An incentive to cheat? Might have a different, say, in an IQ fishery, we have pretty rigid monitoring systems in halibut, black cod. We have cameras, dockside monitoring versus in competitive fisheries the monitoring is not as strict. Can you explain why?

A Reasons for the difference in the fisheries is

probably multifaceted but there's been a greater pressure created, I think, by the fishermen to increase the monitoring systems in fisheries where they have defined allocations, such as individual vessel quota fisheries and it's also some of the crab fisheries who have been promoted largely by the fishermen to ensure that everybody plays by the same rules.

Q Yeah, basically, if you're in an IQ fishery and you have an allocation of a hundred fish and you only report 50 of what you caught and you actually did catch a hundred, you get to go out and catch another 50; is that correct?

A Yeah.

Q Okay. And that's why we need pretty tight enforcement in an IQ fishery?

A Yes.

Q Thank you. And the number of fisheries might influence what type of system you need, whether you had fish for two days a year or 50 days a year. That would also make a difference?

A Yes, it would, yeah.

Q Thank you. And I'm going to move on to catch reporting in the Aboriginal fishery. I have a couple of quick things I want to correct before we get there. You say at page 26 that Native fisheries are open 365 days a year. And I think it's just a mistake in your report because, although they may be technically open 365 days a year, no Native organization fishes that much. It's actually they open it by a licence, is that correct, rather than a -- see in the bottom paragraph there?

A Yeah, it depends on the area but definitely, yes, it's not open 365 days a year on the Fraser.

Q Yeah, okay. It's just worth clarifying that. At page 25 of your report, you state that in 1992:

> The Aboriginal fisheries strategy was implemented to address several objectives related to First Nations and their access to the resource and response in the Supreme Court of Canada decision in ***Sparrow***.

Now, you're not a lawyer and, as everybody knows, I'm not a lawyer here, but where did that statement come from?

A The recognition that there was a major change in '92 and the impetus for it, as I understand it, was the legal precedent set by the Supreme Court needed a response. It wasn't something that was spelled out in the Supreme Court decision, that they had to respond this way, but DFO, I think, realized they needed to respond to that particular legal decision.
Q Okay. And I guess it's important to clarify this because you relied on it. For example, greater involvement in management is not a requirement of ***Sparrow***, is it?
A I don't think -- I can't really talk about the details in ***Sparrow***. It's been so long now since I read the decision.
Q Yeah, well, I guess you've cited it and that's the problem I'm having.
MR. DICKSON: Sorry, Mr. Eidsvik, I object to that line of questioning, Mr. Commissioner. We've established that Dr. English is not a lawyer. That's clearly interpretation of a legal decision.
MR. EIDSVIK: I'm happy to drop that line of questioning.
Q Perhaps maybe you can just clarify it for me that you're not a lawyer and didn't really understand what ***Sparrow*** meant when you wrote that paragraph?
A No, when I wrote this paragraph, I said that was implemented to address the objectives related to First Nation fisheries and their access in response to the decision. It doesn't say that each one of these actions was spelled out in the ***Sparrow*** decision. It just says it was a response to.
Q Okay. That's fine. Thank you.
MR. TAYLOR: I might offer that we could all take this paragraph as written by someone who's not a lawyer and read it in that light and it'd be fine, I think.
MR. EIDSVIK:
Q And I'd bring you there but at Exhibit 77 in the John Fraser 1994 report at page 63, I don't think we need to go there. He says that DFO went beyond the ***Sparrow*** decision in this policy. I guess we can assume that.
MR. EIDSVIK: Maybe Mr. Taylor can direct the proper way to ask that question.
MR. TAYLOR: We can assume John Fraser wrote what he

wrote but we can't assume that he's right or wrong. I think we're into an area where lawyers have spent decades making submissions to judges about this and judges have ruled on it and I think we need to leave this aside in terms of the witness here.

MR. EIDSVIK: I'll agree with Mr. Taylor and we'll move on to simplify matters. I'm sure this will be debated strongly at another point in these proceedings.

Q At page 23 in your report, you state that:

> Regulations for mandatory landing sites for pilot sales and EO fisheries since 1993 --
>
> - I'm going to skip a bit -
>
> ...have substantially improved the catch reliability of catch estimates.

There's actually no regulation for mandatory landing sites, is there?

A I think there is a requirement that for the EO fisheries or pilot sale fisheries, they have to have landing sites. That was in the Bert Ionson report.

Q Okay. Perhaps I'm being too technical again. There's a difference between a licence condition and a regulation. Licence conditions can be changed tomorrow. Regulations have to go before Governor-In-Council for change.

A Okay. Well, these would be --

Q Okay. A requirement.

A -- conditions of licence then.

Q Okay. Thank you. The level of Aboriginal harvest. If we could go to page 21 at Table 2 of your report?

A Yes.

Q Now, if we see up on the chart, we see at the percentage of catch: Canadian First Nations, 29 percent; Economic opportunity, 6 percent. So that's about 35 percent, if my math is good. Now, at page 18 of your report, we go to Table 1. I think it would be helpful. Page 18. So if we look at this table now, and we'll start off at 2009, if we see "commercial", and again I'm assuming that's public commercial. We see they

harvested zero. We see First Nation catches of 71,800. So much more than 35 percent in that year; is that correct?
A Yes, in that particular year.
Q In 2008, we see the commercial harvest of 16, the Aboriginal harvest of 447, much more than 35 percent in that year?
A That's correct.
Q 2007, the same thing. 2005, 2004, we're kind of about 50 percent for commercial, 40 percent for Aboriginal. 2002, about 50 percent. 2001, we see a much higher Aboriginal catch. 2000, we see a similar catch. 1999, we see a much higher Aboriginal catch. And in 1995 and 1996, again, we're fairly close. So you could say in the last ten years that the vast majority of fish caught in the Fraser River, setting aside 2010 at least on an annual basis, can look a lot different, that the major fishery on the river is the Aboriginal fishery?
A It can be and is in years when run sizes are very small and the commercial fishery is obviously not opened or given very little opportunity.
Q Yeah. I'm looking at some three, four, five, six -- so a lot of years in the last ten years then?
A Yes.
Q Okay. Thank you. I notice in your report, you don't have any discussion about the amount of fishing time. And as we noted earlier, and you agreed, the amount of fishing time can have an impact on the type of catch monitoring program that you need. And I just briefly want to go through, and based on your knowledge, the amount of fishing time. Do Aboriginal organizations generally start fishing somewhat in January?
A They are fishing for different species at different times of year based on the permits issued. So the initiation of their fisheries could vary depending on the specific group. And there's a lot less fishing, you know, and it also varies from year to year. So if they start fishing at every January or don't start fishing until mid-June, which is the case the last couple of years because of chinook conservation, you know, it varies from year to year.
Q So in comparison, if you had to guess, how many days would, say, the Area E public commercial

gillnet fleet fish in an average year?
A Well, in some these years, as you've noted, they might not fish at all. So depending on the size of the run, they're going to get different days. But it could be as little as a few days, less than five, to 15 or 20.
Q Okay. And Aboriginal organizations typically, say when the sockeye are running, usually fish every weekend through August and July?
A Yeah, the typical fishing plans that I've seen involve starting fishing on Friday, fishing through Saturday and Sunday, depending on the abundance of the runs, the timings, the other management considerations.
Q Okay. Aboriginal fisheries catch reporting, 1992 to 2000, you break those out, that period compared to the 2000 and on, 2001 on period in your report. And at page 29 at Table 6, you conclude the accuracy of catch reporting in Aboriginal fisheries was fair, variable and likely the highest precision achieved. And I'm a little bit confused.
MR. EIDSVIK: It's at the bottom of the page, Mr. Lunn. Right there.
Q The footnote. I'm kind of confused. Can you tell me what that means? I don't mean what exactly "good" or "fair" means but the footnote.
A Okay. Well, the footnote is referring to those specific years where precision estimates were available through reports for those two specific fisheries. So it's that the precision in those years was likely higher than it is in other years of catch monitoring. The reason for that is that I think the levels of effort in those years were close to peak levels, levels of monitoring effort.
Q I'm sorry. I must be a little thick.
A Okay.
Q Again, I'm not quibbling with you. So if we look at "Fraser - below Sawmill", 1992 to 2000, it says "variable". Can you try it one more time? Sometimes I don't get this.
A All right. Which footnote, I guess, is you're referring to? It's Table 6 or Table 7?
Q In Table 7, "likely highest" -- sorry, Table 6.
A Okay.
Q "Likely highest precision achieved".
A All right. Yeah, so Table 7, the bottom one is

talking about the 2001 to 2009 period. And there is unknown precision for the marine fisheries so there weren't any published documents that showed what the precision estimate was.
Q Okay. That helps a lot.
A But there are for the other two.
Q And I can see that my major mistake is not looking at the footnote right underneath Table 6.
A Yes.
MR. EIDSVIK: Thank you. And I appreciate the other counsel for correcting that. I want to go to one of the documents we want to review is the Peter Pearse Managing Salmon in the Fraser, Mr. Lunn, CAN002473. And if we could go to page 15 of that report?
Q Have you seen this report, Dr. English?
A Yes. By the way, it's Mr. English.
Q Is it Mister?
A Yeah. So there's no confusion.
Q Okay.
A I don't have a Ph.D.
Q Thank you.
A Yeah.
MR. EIDSVIK: Could I have this marked as an exhibit, Mr. Lunn?
THE REGISTRAR: Exhibit 729.

EXHIBIT 729: Pearse, Managing Salmon in the Fraser - Report to the Minister on the Fraser River Salmon Investigation, Nov 1992

MR. EIDSVIK:
Q If we go to page 15 of that report, in the right-hand column, about the last almost about halfway down the paragraph where it starts with "By". And this is referring to the 1992 fishery. And it says:

> By May, fishing activity was increasing as numbers of chinook in the river increased. This activity was largely out of control.

MR. EIDSVIK: If we can move to page 17, please? And if we go to the first column, the first paragraph there, Mr. Lunn.
Q And he talks about towards the bottom of the column:

> Reports in evidence I received of fishing from Mission to Lillooet tell the story of unprecedented intensity, management confusion, weak surveillance and enforcement and general excess.

MR. EIDSVIK: If we go to page 19?
MS. BAKER: Mr. Commissioner, I'm wondering if there's a question here or is there...?
MR. EIDSVIK: There is a question coming. If we go to page 19? And in the middle column, or sorry, the bottom of the first column, and we're talking about estimates of catch that were unreliable.
Q This says:

> Under intense fishing the method of estimating catches in the lower river broke down. The established technique for estimating catches developed by fishery officers over many years involves assumptions about fishing practices which changed. The catch monitoring system administered by the LLFA was also inadequate.

And it goes on. And my question is, does that fit in with your conclusion of a fairly accurate catch data program?
A Well, the programs that I was referring to are ones that were just being initiated for the first time in these years, like '92. And so they evolve from where they were initially and the reason for a lot of the effort that's been put in is to try and address these concerns.
Q Okay. But despite those findings by Mr. Pearse's investigatory team, you considered that fair?
A Well, it's different years that we're talking about.
Q Okay. Well, we're talking about 1992 to 2000.
A Well, these are referring specifically to '92, I think, are they?
Q This is the 1992 report, that's correct.
A Yeah. Yeah, and the period that I'm talking about is that period over which the fishery monitoring systems were changing quite dramatically within the lower Fraser.
Q Okay. So let me just step back then. So if you looked at '92 in isolation, you wouldn't consider

this type of sales slip and catch reporting system as fair?
A Well, there were definitely problems with the early catch reporting systems on the Fraser and ones prior to '92.
Q Okay. If we could go to Exhibit 77, please, page 21? And it's the second paragraph, estimates of in-river catch. And the part that I'm looking at is the second paragraph there, the inset.

> Given the information from numerous interveners, we agree with the in-river catch estimation working group that the reliability of in-river catch estimates cannot be verified.

So given the lack of ability to verify the catch in 1994, would you describe that year as fair?
A Well, it's consistent with what we're saying here, is that the number that -- it's why they've got a fair rating rather than a good or a very good rating. There were some estimate of catch but they're not as good as the more recent time period. So it's a relative evaluation of these different catch reporting periods.
MR. EIDSVIK: And Mr. Lunn, if you could go to the report of the auditor general at Chapter 20?
THE REGISTRAR: I think that's at Tab 10 of your list?
MR. EIDSVIK: I think so. I'm sorry. Yes, it is.
THE REGISTRAR: Thank you.
MR. EIDSVIK: If you could go to page 20-18, please?
Q So this report is discussing the 1997 fishery. So we've had five years since the beginning of 1992. And at paragraph 2060, it states:

> At the time of our audit, the Science Branch had received catch data for 1997 from only 15 percent of the bands required to report it.

Is that in keeping with a fair catch reporting system?
A Well, the requirement to report may be different than what is actually done with regard to reporting. Are you suggesting that only 15 percent of the bands actually reported catch data in that year?
Q That seems to be what the auditor general is

saying.

> At the time of our audit, the Science Branch had received catch data for 1997 from only 15 percent of the bands required to report it.

A Well, I'm not familiar with what the requirement was versus what the catch numbers were. And the presumption I have from talking with people at DFO is that they're getting catch numbers from all the bands.

Q Well, we're looking at the period from 1992 to 2000, I guess, and so that's why I'm trying to determine your assessment. I'm trying to get a good understanding of what "fair" means because you've graded the catch data reporting in this fishery as fair for that period.

MR. EIDSVIK: If we could go to the decision in ***R. v. Douglas*** at paragraph 53, Mr. Lunn?

A If I could clarify that "fair" is not a good rating. It's lower than good, okay?

Q Yes, I agree.

MS. BAKER: Mr. Commissioner, I note that we're just about out of time for Mr. Eidsvik so if you want to bear that in mind as you ask your last question.

MR. EIDSVIK: Okay. I think we could go to that court decision, Mr. Lunn, if you could bring us there, and go to paragraph 53.

A I should also note, if I can, that in the table that they have in the report, actually talk about the estimates above Sawmill being fair in that period and the marine fisheries being fair but the below Sawmill fisheries are rated as "variable", which addresses some of these issues in that we don't know the reliability of the estimates in each of the years to be consistent with the other ones.

Q At paragraph 53, Judge Jardine stated:

> On the evidence of Mr. Quipp, Mr. Wood and Mr. Victor, no one actually counts how many fish the Cheam catch. Mr. Quipp estimated his catch with Mr. Wood, his partner, to be conservatively 10,000 or more sockeye, as well as more than 1,000 chinook. If he's correct and there are 60 such fishers, the

Cheam take a large number of fish. This would constitute an estimate in the hundreds of thousands. Mr. Quipp was candid when he said that of the fish he caught he first satisfied his need and then sold approximately 90 percent of the remainder.

You would say that that's not fair catch reporting, would you, there?

A Well, this is in the context of interview with an individual or a statement? What is the document this is in?

Q It's a court decision and it's the conclusion --

MS. BAKER: Mr. Commissioner, this is not a fair line of questioning. He's being asked about a court decision of an individual prosecution and the questioner is asking this to be applied to statistics that he's looked at for an entire sockeye fishery on the Fraser.

MR. EIDSVIK: So perhaps I could just word it easy.

Q Were you aware of that court decision?

A What is the court decision again?

Q In your review of the sockeye counting system, were you aware of that court decision concerning the 2000 fishery?

A Which court decision was this again?

Q The one we're looking at right now, the ***R. v. Douglas*** one?

A ***R. v. Douglas***. I think I've heard of the decision but I have not read the decision, no.

MR. EIDSVIK: Okay. Mr. Commissioner, I, of course, have another 15 or 20 minutes and I see my friend, Mr. Rosenbloom. So we'd like to follow this up with some written questions. Thank you. And I'd like to mark the court decision as an exhibit, please.

MR. TAYLOR: There's no need.

MR. ROSENBLOOM: That would have livened up the proceedings. Thank you. For the record, my name is Don Rosenbloom. Mr. English, I represent --

THE COMMISSIONER: Mr. Rosenbloom, just half a moment. There's just a little confusion here with marking things. Exhibit 729 is the Pearse report. The auditor general's report, which Mr. Eidsvik referred to, Tab 10, has that been marked?

THE REGISTRAR: Not yet.

THE COMMISSIONER: Not yet.

MR. EIDSVIK: It should be marked as an exhibit.
THE COMMISSIONER: All right.
MR. EIDSVIK: I'm sorry, Mr. Lunn, if I didn't ask you that.
THE REGISTRAR: That'll be Exhibit 730, seven three oh.

EXHIBIT 730: Chapter 20 of the Report of the Auditor General of Canada, Nov 1999

THE COMMISSIONER: Thank you, Mr. Rosenbloom.
MR. ROSENBLOOM: Thank you. Mr. Commissioner, my name is Don Rosenbloom. I represent Area D Gillnet/Area B Seiner.

CROSS-EXAMINATION BY MR. ROSENBLOOM:

Q Mr. English, I have a number of questions for you. I'm limited to 20 minutes. It is now approximately 20 minutes after 12 o'clock. I want to be as surgical as I can because I have a number of topics. The first one is the non-retention fisheries. I don't believe you've been cross-examined about the substance of your report in respect to non-retention fisheries. So I want to very quickly go to a quote from your paper, report number 7, and it is a quote at page 57.
MR. ROSENBLOOM: And if Mr. Lunn can have that before us? And it is a quote at the end of the first paragraph, the conclusion of the first paragraph.
Q You said:

> However, there has been little research to quantify levels of mortality or to understand the mechanism underlying mortality in order to better mitigate or prevent mortality.

And this is in the context of a paragraph, "Non-Retention Fisheries". You said:

> Without this type of information, especially in an era of warming waters wherein we expect higher stress-related mortality, it is difficult to ensure sustainability of salmon fisheries and conservation of stocks.

Then what you have in your report, Mr. English, is reference to the Carleton University study. I'll refer to it as Carleton University *et al*, with a

number of other parties. You make reference to the Donaldson study. This paragraph that I just read to you, which speaks in the present, are you satisfied that the two subsequent studies referred to, both Carleton University and Donaldson, does provide us with the kind of information necessary on non-retention fishery, or are you still saying in a dramatic fashion it is difficult to ensure sustainability of salmon fisheries and conservation of stocks without further study being done?

A Well, those two studies provide some of the initial indications. They're not complete. They're sort of the first steps towards trying to get at these questions.

Q All right. And you would agree with me, sir, that those two studies and what we now know as of the last couple years, provides some very dramatic evidence of high mortality, particularly with the catch and release with the recreational fishery and with the beach seine fishery?

A Well, the mortality rates you see in those tables, that's why it's important to view those as relative, they're fish that are released and then could encounter other fisheries or other factors further upstream towards the spawning ground. So it's not saying that the mortality you're seeing is directly related to the actual capture and release by the sports fishermen.

Q Well, it's a combination of catch and release and then other factors that may be playing on mortality, such as, for example, temperature of river, you'd agree?

A Yeah, temperature of the river and the -- because the numbers in here, and to be really clear, the table on the subsequent page there, I think it's on page 60, I just don't want people to think that when a person catches a fish and releases it, only 36 percent of them will make it through to the spawning grounds because of that capture and release stress.

Q But the catch and release is an event or factor that is contributing to the mortality rate, as set out in your table, which is Table 18, found at page 60, correct?

A Yeah, and what you want to focus in on is the difference between something like a beach seine,

which should have less stressful or have a different stress - not necessarily less - than angling, comparing those two values and saying what's the difference between those two gears?
Q Yes.
A More than the absolute value.
Q And when analyzing this data, and I have so little time, I obviously can't get into this in the way I would like to, we are left with, obviously, at least some information through these studies that is significant in terms of pre-spawn mortality of fish migrating up the Fraser River, in part, related to both beach seine and to the other forms of fishing encounters that we're speaking about.
A Yeah, and it's the initial information. What's really important to note is these studies were done at a specific time of year. There may be conditions about the river at that time of year that are going to be different between that time of year that year versus other years. So that's why they're intending to continue this work using different gear, looking at different times periods, which have different stocks, as well as different temperature regimes to see what differences they get in terms of survivorship.
Q Right. And so a lot of work still has to be done. But in the context of the little that we know now, as reported to us through your paper, does that cause you to revisit the issue of how to deal with, for example, the recreational fishery and the catch and release program?
A Yes, well, I think you can say that from this and other information it's not a good idea to be doing a lot of catch and release on sockeye at high temperatures.
Q And appreciating that opinion, where does that take you in terms of recommendations to DFO and its managers and to the government generally about catch and release programs?
A Well, be aware of the temperature factor. Where you have high temperatures, you probably need to consider not having those fisheries or conducting those fisheries during periods when temperatures are lower because you know you're going to have less impact on a stock.
Q Thank you. Are there more studies that you know in the process of being done in respect of this

subject?
A Yes, there's ongoing research. There was some done last year and there's work that's planned for 2011, this summer, by the same groups, Carleton University and University of British Columbia.
Q To the best of your knowledge, is there a shortage of money for this research or what you feel is necessary and should be done is being done?
A Well, there's always a shortage, a limitation on the funds available. A lot of the money that is available for this is coming through the NSERC program. But there's limitations on setting up the telemetry arrays, for example, within the Fraser in order to track these fish that are being released.
Q Thank you. I go to the second of my areas of focus, which relates to catch monitoring and relates to the chart that we were just referring to a moment ago. All this is found at page 40 and the table at page 42. And I want to focus, in particular, on my clients, the seine fleet, Area B, and the references you make to that to your assessment of quality of catch estimate. My clients give me the following instructions so I've got to do this so quickly, Mr. English, I'm going to tell you what my instructions are and you tell me whether you have any reason to dispute what I say. Before saying that, can you tell me, where did you glean this information to provide this table to us, which is Table 14 at page 42?
A Table 14. Well, the information on the catch was obtained from the catch reporting datasets from the Salmon Commission on the distribution between the different gear types. And the evaluations were based on information provided by DFO from interviewing the DFO representatives that monitor these fisheries.
Q Well, let me try to be surgical here by telling you what my instructions are and please tell me whether you have any reason to dispute them. I'm told in respect to Area 20, which is found within your table, that since 2001, the seiners have had imposed upon them what truly is the gold standard for catch monitoring. I am informed of the following, that all the fisheries in Area 20 seine fishery, and I gather Area 20 is exclusively a seine fishery, all the fisheries have been closely

monitored, there's been mandatory logbook and hails required.

For most of the fisheries in those years, observers were required; in some cases, they were assigned to vessels for the day, others have roving or random sampling. For all fishery sets we're monitored by DFO managers with fishermen providing set-by-set hails of all species caught. And they needed authorization from managers even to set nets. Now, I don't want to get into a dog fight with you; we just don't have the time here. Do you have reason to agree with me that that is the standard that is being utilized in Area 20 by the seiners?

A Well, I know that they have the logbook requirement. I know that there are hails done by Fisheries officers. It's usually not a hundred percent. And I didn't hear you mention any dockside monitoring requirement, which I don't think has occurred for those fisheries. But the information we provided here was what was provided by the Department of Fisheries and Oceans that conducts a lot of this work.

Q Because this is very much in dispute, could you provide the Commission and, in turn, to me what DFO provided to you that gives you the information, as set out in this chart?

A Yes.

Q Thank you. I move on the same subject to your analysis of the quality of catch estimates for Area 11 to 16, which I understand to be both of seiner and gillnet. I'm instructed as follows, that in respect to the seiners, they have a mandatory hail in of catch and delivery and logbooks. They have roving observers that were present for many of the fisheries, charter patrols which station themselves at strategic locations at the conclusion of fisheries to request hails from vessels as they headed to fish plants and that more than 90 percent of the seine caught fish are landed at major processors. Most are very diligent in ensuring numbers are passed on. In other words, the processors are diligent in ensuring that numbers are passed on. Do you have any reason to dispute any of that?

A No, those seem like reasonable statements. What they're not including is the dockside monitoring

by an independent group in that.
Q And you believe that that would place the catch monitoring in respect to the seine fleet in that area to be simply fair for accuracy?
A It's just the lack of verification. It's very possible the catches are completely accurate and a complete record of what was caught. The question is whether it's been verified. It's the lack of verification that gives it a lower rating.
Q And that again might or would put the accuracy at only fair?
A Yes.
Q Okay. Again, would you provide the information that has been provided to you by DFO to speak to this chart, okay?
A Sure.
Q Thank you. I go to the third of my subject matters. You had an exchange with the Commissioner yesterday in respect to target escapement. And much has been said in cross-examination and much as I'd like to deal with you about that, I have to leave the record as it is. But let me ask you this, in the context of what you're recommending, which is a target escapement, you say at page 172 of your report, and I want to briefly explore this with you. At 172 down at the bottom of the page under "Abundance Estimates", the last five lines, six lines:

> However, the future of this valuable time series and the conversion of historical and future data into catch escapement total abundance estimates for each CU will depend heavily on the resources available to support critical monitoring programs, effort to capture these data in structured databases and the work needed to complete the necessary analysis.

Let me ask you this. Whether one adopts your suggestions of how to approach the management or the resource by imposing target escapement or whether the FRSSI model or whatever, are you saying here that you are concerned that the DFO does not have the financial capacity to actually discharge these initiatives, be it as you promote it, or as DFO wishes to have it under the Wild

Salmon Policy and FRSSI model?
A I think it's drawing attention to the fact that resources are getting fewer and farther between and compared to what they were for a bulk of this valuable time series that we have before us. So the current resources are certainly less and the future resources may be less till than what they've been.
Q And that being the case, maybe it's self-evident, but where does that lead you in terms of your prognosis of DFO effectively setting out the benchmarks or the target escapements for these, be it, 19 indicator stocks, or indeed, I think something like 29 CUs. What's your prognosis?
A Will it happen, do you mean, in this case?
Q Yes.
A Well, there's a lot of pressure to make it happen for the Fraser because of the -- through the Marine Stewardship Council certification process, it has to happen or they'll lose certification. So there's a lot of pressure to do it on the Fraser so resources will probably be channelled there from other areas because it's a priority. I think it's on schedule. There's been a commitment. There's an action plan prepared to define a lot of these things, these lower and upper benchmarks, limits and target reference points for Fraser sockeye. So I think it's going to happen. It's just it'll probably have impacts of fisheries management and other areas.
Q Well, you, sir, probably as well as anybody can speak to the impact all over the province. You do work in the Nass for the Nisga'a, do you not?
A Yeah, we've done work with the Nisga'a for a lot of years.
Q And the Skeena?
A Yes.
Q And various other regions. Can you tell this Commission, because I'm going to suggest that the Commission cannot be blind to the impacts of putting priorities on Fraser stock at the expense of other stock, what are the implications of the financial crunch in respect to trade-offs where areas other than the Fraser are going to have less attention than you believe should take place?
A Well, it's all the more reason to conduct the analysis and reviews that look at what's the best

way to get the most for the resources that we have. So there's been programs elsewhere that have identified essentially core stock assessment programs. And what's critical is once those have been identified there needs to be the support to implement those so that you can maintain, in the case of the Fraser, and establish in other cases where there isn't a reliable long-term dataset, a dataset that's needed for management. So there's a real need to look at the available resources and figure out what the priorities are and how to make sure that you're not undermining these important long-term databases because those are the ones that tell you how the resource is responding to changes in the environment.

Q And you're destined to undermine those databases if there isn't more money injected into the system, aren't you?

A Yes.

Q The next area is relating to the unreliability of pre-season forecasting, and your report says that, I believe, and accepting that. There's been a significant exchange of you with various parties here at the Commission about the unreliability of the data and, therefore, not to invest too much import in the pre-season forecasting. My question is this. You appreciate that the IFMP is founded upon a pre-season analysis, correct?

A Yeah, the initial fishing plans.

Q Right. And one of the exchanges that has taken place at this Commission in the past is whether DFO has the flexibility or carries out amendments to the IFMP based upon changes in-season and so on. Would you agree with me, in the context of your opinions that the pre-season analysis is so unreliable that the IFMP should be approached by DFO in the most flexible manner in terms of ensuring that they can turn on a coin and make changes at the point where information is derived from an in-season database?

A Yeah, definitely, yes.

Q And do you believe, from the best of your knowledge, in terms of an expertise in management, that DFO has had that flexibility to that extent up to this moment in time?

A Well, there's some things that are determined in the IFMP that have been identified as significant

constraints to management and, therefore, not allowing the flexibility that you're talking about. But I think over the last two years we should have all really learned the lesson that we need a flexible system because we have to respond to some pretty substantial changes from what we're expecting.

Q Thank you. My last area, and hopefully I have a minute or two, this Inquiry, I suggest to you, is attempting, in part, to find the reasons for the decline in recruits per spawner. Would you agree that that, to the best of your understanding, is what we're really looking at here; it's the bottom line?

A Yeah, it was the trend observed over a number of years that had the lowest point in 2009 that created, I think, the purpose of the Inquiry.

Q Yes. And so in focusing on the decline in recruits per spawner, we're looking at what are the factors or factor that has caused that situation, that direction, correct?

A That's right.

Q And you would agree with me further that curtailing fisheries doesn't speak to resolving the problem in that over, for example, the last 15 years or so, there's been a diminished harvest, year by year by year, and in spite of that, what we're seeing here is a continuing problem of decline in recruits per spawner. Would you agree with that?

A That's correct, yes.

Q Pardon me?

A There has been a decliner in recruits per spawner and the reductions in the fishery have been occurring at the same time. So the fishery hasn't been the one that has changed the recruits per spawner; it's more the marine environment that's having a factor.

MR. ROSENBLOOM: Thank you. I have no further questions.

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

(PROCEEDINGS ADJOURNED FOR NOON RECESS)
(PROCEEDINGS RECONVENED AT 2:00 P.M.)

THE REGISTRAR: Order. The hearing is now resumed.

MS. BAKER: Thank you, Mr. Commissioner. The next questioner is Sarah Sharp for the Western Central Coast Salish First Nations.
MS. SHARP: Mr. Commissioner, Mr. English.

CROSS-EXAMINATION BY MS. SHARP:

Q I want to go to page 111 of your report, please. You're discussing the total abundance estimates and the extent of overharvesting here. You look at the extent of overharvesting by looking at exploitation rates?
A That's correct.
Q And exploitation rates are calculated based on estimates of catch as a percentage of estimated total abundance?
A That's correct.
Q Okay. When we look at Figure 22, on page 116, exploitation rates of the Early Stuart sockeye were high from 1960 to 1983?
A Yes.
Q Averaging 75 percent?
A Yes.
Q Exploitation rates for the Early Summer Run sockeye were high from 1960 to 1989?
A Yes.
Q Averaging 77 percent?
A That's what's in the report, I think.
Q Yes. Exploitation rates for the Summer Run sockeye group were high from 1960 to 1989?
A Yes.
Q Averaging 78 percent?
A Sounds about right. I don't think I have it.
Q It's on page --
A Yeah.
Q -- 114.
A Yeah.
Q 113. Exploitation rates for the Late Run sockeye group were high from 1960 to 1989?
A Yes.
Q Averaging 76 percent?
A Okay, yeah, that's what it says in the report. The outcome of the numbers --
Q We can go to the page, if you want. It's at page 114.
A 114, yes.
Q In that first paragraph there. These exploitation

rates, 75 percent, 77 percent, 78 percent, and 76 percent, they reveal that rates were high up until the mid to late '80s?
A That's correct, yes.
Q Your report also comments that the Early Stuart sockeye were probably overharvested between 1984 and 2000?
A The Early Stuart, yes. I think I clarified that it was just in the primary period when productivity was declining in the late '70s and early '80s, that there was very high exploitation rates at the same time as declining productivity.
Q Okay. And you also note the Early Summer sockeye were probably overharvested between 1960 and 1989?
A That's correct, yes.
Q And the high exploitation rates of the Late Run stocks pre-1993 have been implicated in the decline of the Cultus sockeye?
A Yes, they have been.
Q And since 1993, we see a declining trend in the exploitation rates for the Early Summer Runs, Summer Runs and Late Runs?
A That's right, yes.
Q Since 2001, the exploitation rate for the Early Stuart Run has also been low?
A Yes.
Q Averaging 13 percent?
A Yes.
Q Now, Fraser River sockeye stocks are cyclical?
A Some are; some aren't.
Q Okay. But distinguished from the Bristol Bay, Alaska run, the portfolio effect, we don't have anything like that here?
A Well, we have a portfolio of stocks, we just don't have as diverse a portfolio as they have in Alaska.
Q Okay. To the extent that the number of returning sockeye impacts the stock recruitment and the number of effective females, there's a pattern there in the four-year cycle?
A Yes. There's definitely a strong four-year cycle in Fraser sockeye and almost all the stocks.
Q Okay. And we can expect the effects of high exploitation rates to be felt in subsequent years, then, as they effect these numbers, the recruitment and the returning females?
A Yeah, the combination of exploitation rates and

productivity is the key. So you could have the -- there wouldn't be the runs that we see today if productivity had been low during this period when exploitation rates were high. Obviously, the managers wouldn't have permitted those kinds of high exploitations rates in that period if productivity had been lower. It's the challenges they face is adjusting the exploitation rates quickly to respond to changes in productivity.

Q Okay. But you did note that there was some overharvesting that was happening in that pre-1993 --

A Yes.

Q -- period?

A Yeah.

Q Okay. So to the extent the returns depend on the number of spawners, these effects can be seen for many generations. We've established that? There's a bit of an echo effect, perhaps --

A Yeah.

Q -- that happens in subsequent years?

A Yeah. No, if you -- it's the -- it's probably best described in the graph that shows for Late Run the building up of the Adams River stock, the Shuswap stocks on the strong cycle. That's in the Figure 22.

Q Okay.

A And you can see the progressive increase from 1962 on through to the peak there in '86.

Q That was for the Early Stuart you're speaking --

A No, this is the Late --

Q The Late --

A The Late Run is the graph --

Q Right.

A -- on the --

Q Okay.

A -- projector.

Q The lower right-hand side?

A Yes, and so it's a --

Q Okay.

A -- continual building of that as a result of, you know, good survivorship of those fish during the periods, obviously good productivity, and then success of the increasing returns.

Q Okay. But you'll agree with me that we will see the effects of returning salmon in subsequent years in terms of productivity in later years?

A Yeah, so if you -- the reverse of this is if you have a -- you're not seeding the grounds and you have lower productivity, then it will ripple on through to the other -- in the opposite direction.
Q Okay. So I want to take you, now, to Table 1 on page 18, please.
A All right.
Q So at the bottom here there's a calculation of averages from 1986 to '91, 1992 to 2000, and 2001 to 2009?
A Yes.
Q When we look at the averages calculated for the fisheries for these years, for the First Nations fisheries, we can actually see that for not the percentages but the absolute numbers, the First Nations fisheries harvest have changed very little in the past 25 years?
A Yeah, the absolute numbers, the averages, are similar, yes.
Q Okay. Now, the AFS was not introduced until 1992?
A That's correct, yes.
Q Okay. So to the extent that we see high exploitation rates as an issue for the Fraser sockeye salmon, this is an issue that predates the AFS?
A Yeah, definitely the exploitation rates that we're talking about here, most of the higher ones were prior to '92.
Q Okay. Now, I just want to briefly return to an issue discussed in your initial examination by Wendy Baker. You discussed some advantages, or we can call them distinguishing features of the less complicated Bristol Bay sockeye fishery?
A Mm-hmm. Yes.
Q You mentioned that one of those is that spawning occurs close to or a short distance away from the enumeration sites?
A Yes.
Q Okay. You noted to implement this in the Fraser would require managing the fishery as a terminal fishery?
A Yes. That's the only way you could do it similar to Bristol Bay, yes.
Q Okay. So it wouldn't be enough to fish at the mouth of the Fraser?
A Well, there are some stocks that are reasonably close to the mouth of the Fraser, but then others

are a long way --
Q Okay.
A -- distant.
Q So no ocean fisheries? No commercial --
A Sorry?
Q No ocean fisheries? With your idea of the terminal fishery, we wouldn't have ocean fisheries?
A No, I'm not saying we wouldn't have ocean fisheries. I say that if you wanted to reduce the exploitation rates on some stocks while allowing some fisheries on all stocks, then you could have a portion of the harvest taken in a traditional fishery, the traditional ocean fisheries, but then you'd have to look at harvesting the surplus, if you like, or the ones that are more productive, more terminally. So it isn't closing down one fishery and opening up a new set of fisheries; you have a mixture of fisheries.
Q Okay. So we're not talking about shutting down the entire ocean fishery, no fishing for the Heiltsuk, none of the Island nations, we're not talking about something like that?
A I'm not talking about that, no.
Q Okay. I just wanted to be clear. Okay. And you also said that it's possible to count the marine harvest, we're able to assess that -- those numbers if the --
A Is it possible to?
Q Oh yes.
A Yeah, it is definitely possible and there is an accounting of marine harvest and -- that you can see right here in this table. Those are the estimates of what is harvested.
Q All right. So now, I'm just going to go back, now, to you were brought to Table 6 and 7 earlier today, this morning?
A Yes.
Q And we looked at the accuracy, precision and reliability of the catch monitoring programs used to estimate the FSC harvest for Fraser sockeye?
A Yes.
Q And you were pointed to the table for 1992 to 2000, Table 6?
A Yes.
Q Okay. We also -- and then there's, for 2001-2009, just looking at this table, I see that the quality

of catch estimates, by your measure, has improved since 1992 till 2001, for those years you've assessed?
A Yeah, the --
Q They've gone from fair, variable and fair, to good, good, fair?
A Yes, definitely the reason for having the two tables is to emphasize the difference between the periods.
Q Okay. So for Table 14, then, we looked at - it's on page 42, sorry - we looked at the equivalent table for the commercial fishery?
A Yes.
Q Okay. We just have it for 2001 to 2009?
A That's correct.
Q Okay. You were asked, earlier, for the data for the years -- or the breakdown here for the different gear types?
A Yes.
Q Do you have the data for the years preceding 2001 for the commercial fishery?
A I have the data for -- that you see in Table 1 that goes back to the beginning of that time series.
Q Okay.
A And other tables that were prepared by the -- I think those ones go back, yes, to '86.
Q Table 1 goes back to '86, yes.
A Was that to '86? Okay, yes. So that all the tables that go back to '86 have information on the same panel areas and non panel area breakdown, because they come from the Pacific Salmon Commission files.
Q Great. Would you be able to produce that data, as well, for us?
A Sure.
MS. SHARP: Great. Thank you.
MS. GAERTNER: Mr. Commissioner, it's Brenda Gaertner, for the First Nations Coalition, and with me is Leah Pence. And I believe I have about 45 minutes for my time, and I am optimistic that my work with Mr. English, today, can be completed in that period of time.

CROSS-EXAMINATION BY MS. GAERTNER:

Q Mr. English, I wanted to thank you for the work

that's reflected in your report and your helpful evidence today and yesterday. I find it very direct and you're very easy to read, and I think that's a compliment that scientists should take.

A I appreciate it.

Q And I want to primarily focus on the methodology. My clients are pretty satisfied with the methodology and data in the report, which supports your conclusions. However, there's some facts and some recommendations that you have relied upon that we think could use some further explanation and perhaps go a couple steps further, if you will, with me. And ultimately, at the end of my questions, I'll take you to your recommendations and tweak some of them, or ask you to tweak some of them, if you're willing to. And then, if time allows, I've got a couple of questions relying on your expertise and the terms of reference that Commissioner Cohen has in front of him in this work.

A All right.

Q So I'm going to start, first, with page 1, paragraph 1, of your executive summary, right at the beginning of the report. And you mention a very strong statement there, I think, that there is:

> The limited documentation for DFO catch monitoring program, few estimates of precision, and minimal verification at landing sites for most Canadian commercial fisheries -

-- I think he's got it. They'll catch up with it.

A Yes.

Q "(42% of the harvest)", and then you say:

> - leave substantial room for improvement in the catch monitoring programs.

Q Now, I just want to just clarify, and this is probably my linear mind, so bear with me. Because it's so prominent in your material, it's your first thing that you go to and it's also one of your first recommendations, do we take anything from that? Is that, you know, a priority from your work and given the report that this is the

most important thing to look at, or is that just because that's how it was reflected in your terms of reference?

A No, there's no order to the points in the executive summary other than that they follow the order -- no, priority order, so they follow the order of the sections in the report.

Q Thank you. And that's similarly true for your recommendations?

A Yes. Yes.

Q Now, why is the level of verification used in the commercial gillnet fisheries and Area D and E so different from the verification that is now being used for First Nations gillnet economic fisheries in the -- at the mouth and in the Lower Fraser? And in particular I'll turn your attention to the evidence that came out yesterday and is in your report, that managers are achieving or are now imposing a 35 percent verification in the gillnet commercial fisheries and have now achieved 100 percent verification in the economic opportunity fisheries for gillnets First Nations?

A Well, there has been certainly a focus on the First Nation fisheries because of some of the problems that occurred in the 1990s to try and get a more reliable catch number for those fisheries, so that's created a lot of the focus.

During that same period in the 1990s, there was a reliance mostly on the sale slip system, and it wasn't until the late '90s that the deficiencies in the sale slip reporting system for the regular commercial fishery, I'll call it, the general commercial fishery it's sometimes referred to. That concern over the sale slips created a need to implement independent monitoring systems. So the solution was to conduct aerial surveys and obtain information on catch per effort as a sample. So treat the commercial fishery more like a sport fishery is being treated, where you're doing surveys and sampling coming up with an estimate that's independent of the fishermen reporting their catch in total.

And so that's the approach that has been used since and for most of the time from 2000. It was sort of in development in 1999-2000 and has been improved over recent years. I think the emphasis in -- towards going to 100 percent catch reporting

is it puts more of the cost associated with the fishery back on the fishermen. So these are for the seine ITQ fisheries and troll ITQ fisheries. And that -- because, you know, maintaining independent catch monitoring systems can be expensive, you have to do aerial flights or on-the-ground counts compiled, whereas if you could move to a 100 percent verification of catch at landing sites, then -- and have fishermen land their fish at specific sites, it's going to be less expensive to monitor it that way, and it puts the onus back on the industry.

And it's following a pattern that has occurred for similar fisheries with the ground -- we heard this morning about the groundfish fisheries and some other fisheries, halibut fishery.

Q So I'm still not -- thank you, but I'm still not quite clear. Why are we aiming for a 35 percent verification in the commercial gillnet marine fisheries, and 100 percent verification in the First Nations economic fisheries?

A Well, I don't think it's a question of what we're aiming for. There's a transition going on from this program of doing independent catch monitoring programs with gear counts and catch per effort estimates, to verification. So they went to 100 percent for the seine and troll ITQ fisheries in 2010, and they set the requirement at 35 percent for the Area E, I think, because of logistics associated with trying to go from where they were in 2009, or, I guess, it was a few years since they really had much of a fishery, so where we were in the previous year when they had a fishery, to what was being required for 2010.

Q And so, from your perspective, 35 percent is not a necessary accuracy requirement, it's more a stage in getting up to 100 percent; is that where --

A Yeah, I think it's an effort to improve it. Whether the Department's going to set a requirement to go 100 percent dockside monitoring catch verification for that fishery is yet to be seen. They obviously ran for quite a number of years without that requirement but doing the catch estimates by these other methods I just described.

Q Now, I'm aware, and this is a bit of a challenge, given where we are in the procedures with the

inquiry, but there's a policy and practice report that will be filed coming forward, and from that policy and practice report I understand that Area E gillnetters have strongly opposed the mandatory landing site requirements and that they've argued that those are time -- cost time and cost money and that they have to land these and set packing sites are going to restrict their abilities to deliver to their buyers and disrupt their marketing abilities; are you aware of that?

A Yes.

Q And for some reason in 2010 DFO agreed to drop the mandatory landing site requirement; are you aware of that?

A In 2010?

Q Yes.

A Well, this is for the Area E was the -- what I was told was that they had a requirement for 35 percent of the catch to go through the sites, not all the catch.

Q Were you able to review that information in preparation of this report?

A That's what I -- I got those pieces of information from the people who were involved in the Area E management in last year.

Q I guess as you can tell by my questions, my clients have always been concerned about making sure that fisheries are treated equally, and there is, at least from my perspective, from this vantage point, I can't see any difference between Area E and Area D and the Lower Fraser gillnet fisheries economic fisheries. They're all gillnet -- most of those are gillnet fisheries. They're all located pretty close to the mouth of the river or from it, they're often accessing the same markets. Why would one require 100 percent verification and another require 35 percent verification? You can appreciate that that might cause problems on the ground?

A Yes. And it has been raised with a number of the groups that I've talked with and -- First Nations groups, that they feel it's not fair that they have a requirement which is more stringent than those for the other fishermen.

Q And if I could take you to Exhibit 428 for a moment, are you familiar with the work that the ISDF has done, the Integrated Salmon Dialogue

Forum, on monitoring and compliance? Are you, first of all, familiar with the ISDF?
A I have heard about that process. I have not participated in it.
Q All right. If you go to page -- first of all, page 2 on the forward, you'll see that the monitoring and compliance panel describes itself as -- on page 2 of the forward, Mr. Lunn, do you see that -- yes, you'll see it.

> The M&C panel, as it has been dubbed, is an independent collection of representatives from the aboriginal, recreational, commercial and conservation sectors. But while independent, the panel also works [closely] with [DFO] in a collaborative attempt to map a better pathway for monitoring and compliance.

A Yes.
Q If that helps you understand a little bit of the work that this group is doing. And if you go to page 5 of that report, and in particular Principle 2, they strongly recommend using consistent monitoring standards. Do you see that?
A Yes.
Q I'm wondering, you didn't mention that in your report as part of your recommendations. I wonder if you could take a moment to look at that principle and wonder whether or no you might add that as a necessary or a useful step in ensuring, going forward, we've got good monitoring and compliance standards? Sorry, page 5 of the report.
A Mm-hmm.
MS. GAERTNER: Sorry.
MR. LUNN: My apologies.
MS. GAERTNER: No, that's okay, it's me probably just going too fast. I'm sorry.
A Unfortunately, I had page -- I had page 5 here, so --
Q You've got it, right?
A Yeah.
Q And you've got Principle 2?
A Yes.
Q Is there anything in that principle that you disagree with, or are you happy to adopt that recommendation as a useful way of going forward in

monitoring and compliance within Fraser River sockeye fisheries?
A I think the issue of just consistent monitoring standards is good as long as those standards are adequate, like I can have consistently poor --
Q Yes.
A -- so they may have to be a little inconsistent, initially, to get things -- to change things for fisheries that are not believed to be monitored adequately now or in any one period. But once you've established a reliable set of catch monitoring systems, yes, maintaining them consistently. And I think that was hope, is that initially the sale slip system was going to provide that for commercial fisheries, for example, continuously, as it had, for many years, but it kind of broke down. There was a change in how fish were being landed and how catch was being sold, and so what they had to do was adapt.
So you need to be consistent where you can be, but adaptable to a change -- changes in the fishery over time.
Q All right. And finally, just a last question on the catch and our catch monitoring component of your paper, at page 44, and I don't think you need to go there, you just mention the 100 percent monitoring for the ITQs. You'll agree with me that ITQs aren't a necessary part of getting 100 percent monitoring? I mean, they're not linked at the hip, or anything like that, it's just a sufficient way of -- or it seems to be an incentive that DFO is using, now, to try to get some of these fisheries to increase monitoring and the cost of monitoring on ship?
A Yeah, you don't have to have an ITQ fishery to have 100 percent dockside monitoring.
Q Thank you. And my next line of questions, Mr. English, are really going to -- perhaps what I was trying to do yesterday, I'm going to take you to page 25 of your report, which is where you begin to summarize the First Nations FSC fisheries.
And it's my assessment that a number of facts that you rely upon and present in the pages from 25 to 26 and onward do not actually go directly to your assessment of the catch monitoring accuracy precision reliability of the First Nations fisheries, but really are background or

descriptions of the fishery. And I need to draw your attention to some of the things that are said there because, from my clients' perspective, they're either inactive or incomplete, and I don't know what these pages in your report might be used for in the future.

A Okay.

Q So I am going to point out, again, and you've agreed with me as you began this, that your expertise is not necessarily on traditional fisheries practices of Aboriginal people; your expertise lies in the scientific management processes in a modern context; is that correct?

A That's correct, yes.

Q All right. So then just bear with me for some of these questions and we'll get some of this looked after.

You are the author of this part of the report, if I got your evidence correct, right?

A That's right.

Q So if you can go to page 25 and that first paragraph. First of all, you call it First Nations FSC fisheries, and then you describe it as the management structure. You're going to -- you'll agree with me that it's the management structure presently used by the Government of Canada, through DFO, to manage the FSC fisheries by First Nations?

A That's correct.

Q And you'll agree with me that the special obligation you're talking about in that first paragraph is the constitutional obligation that DFO has to manage the fisheries pursuant to s. 35 or treaty rights that are concluded; is that what you're referring to there?

A Yes.

Q And what did you mean in that first sentence when you said that:

> Since the late 1800's, when Canada asserted management control of Pacific coast fisheries, the ability of First Nations to harvest for "food" purposes has been integral -

-- I found that word to be fascinating --

- integral to the overall fisheries management system.

What were you trying to communicate to us there?

A I guess there's -- it's been an issue making sure that First Nations have access to salmon for food for most of that period. There has been periods when it has been -- has been a problem, but it's been an integral challenge for the management agencies to deal with that one in one form or another throughout that period.

Q All right. Integral challenge is something, I think, my clients could live with. So let's move onto AFS. You describe AFS as the management structure. You're aware that DFO is trying to use a bunch of tools in their toolbox, now? They've got an AAROM, and they've got a PICFI, and now they've got treaties with Tsawwassen, and so it's not the only management tool, by any means, that DFO is trying to use; is that correct?

A That's correct.

Q But it is, for some reason, the one that you focused on in this report?

A It's the one that was noteworthy in terms of how it has affected the catch monitoring component of the First Nation fisheries.

Q And for that you mean it was the funding arrangement beginning in the post-***Sparrow*** environment that helped to put some capacity into First Nations to provide some better collaboration with DFO; is that what you meant?

A That's what I mean, yes.

Q Okay. And are you aware, also, that there are strong concerns by First Nations around the type of management that arises from the AFM, in particular the notion that DFO has the ultimate decision-making powers and that they have to sign agreements that say that in order to obtain this funding?

A Yes, I'm aware of --

Q You're aware that that causes --

A -- lots of details, yeah.

Q You're aware it causes significant friction between DFO and some aboriginal groups?

A Yes, and it's the reason why there is not agreements in every year, as identified later in the report.

Q All right. So then, at page -- well, 21, and then you say, again, and then at page 26, you suggest that 72 First Nations target Fraser sockeye. Where did you get that number?
A I think that's the total in the table that is provided under Table 5.
Q All right. And so that's at page 28. And then you go on to say that 39 groups representing most of these First Nations have AFS agreements, and currently most First Nation groups in B.C. have AFS agreements with Canada. You say all of these things. Are you relying on that conclusion all on Table 5?
A It's largely being -- because this is -- we asked for this, actually, for multiple years, and we were only able to get it for 2009, so a lot of the conclusions, yes, are derived from the information from the 2009 documentation that was provided by DFO.
Q Maybe I'll just ask this question, then: Are you aware that the Nlaka'pamux communities that are along the main stem and the Stl'atl'imx communities, do you know those two tribes?
A Yes, I do.
Q Are not signatories to AFS agreements?
A I know that there's groups that met within the Fraser that are not signatory.
Q And you know their territories. You would describe them as fairly significant areas within the middle part of the Fraser that don't have AFS agreements?
A Yes.
Q Yes. So when you say "most of them" have AFS agreements, that might be a little bit of an overstatement?
A Yes. And, you know, and I guess it would look at it from -- you could look at it two different ways. One, is that just the portion of the total number of First Nations versus the portion of the First Nations that -- in terms of their catch of Fraser sockeye, so...
Q Now, you weren't relying on the fact of whether they were an AFS signatory, to do your catch monitoring assessment --
A No.
Q -- though, were you?
A No.

Q So that helps us in terms of that conclusion. Are you also aware that the outstanding issues between First Nations and DFO regarding the responsibilities around management and appropriate co-management are significant hurdles that have not yet been overcome and are hurdles for the management of the Fraser River sockeye?
A Yes.
Q And you're also aware that aboriginal traditional fishing locations within the Fraser are very -- the actual locations are very culturally relevant, and in many, many situations they are longstanding within families that have used very specific sites that are sacred responsibilities for that family?
A Yes.
Q And would you agree that respecting those relationships and those locations will be highly useful and helpful in developing functional management structures for ongoing management of the Fraser River sockeye and the FSC fisheries?
A Certainly, yes.
Q And including the movement towards terminal fisheries?
A Yes. You know, it's very important that whatever fisheries are conducted in an area where First Nations have a tradition of harvesting fish respect the use of those fishing sites and areas. We've experienced it firsthand in just doing research where I understand that if we don't talk with the First Nations in the area then we're going to create a lot of problems for ourselves, and so we do -- we abide by that and virtually everywhere we've done work, whether it's the Fraser or the Nass or the Skeena, we're working very closely with First Nation groups for those reasons.
Q Great. And then would you also then agree that that longstanding knowledge and relationship to the fishery and those very local situations is an asset to the long-term management of the Fraser River sockeye salmon and not an impediment?
A Certainly. Definitely working with people that understand how the fish move through their territory is absolutely vital.
Q So often when we hear the challenges with a number of First Nations along the Fraser, we could actually change our glasses and see it as an

opportunity to obtain local and historical information that will be extremely useful in developing assessments of things like habitat and habitat abilities?

A Sure. The more information the better.

Q All right. So I'm going to turn, now, to the non-retention fishery section of your paper. And I just want to pick up on a couple of things that Mr. Rosenbloom touched on earlier today and take it a little further. And I want to start with what you've done at page 56 of your report, and take you to that last paragraph and, in particular, beginning with the sentence:

> Although salmon fisheries are typically managed to harvest a specific species or stock it is often impossible not to intercept other co-migrating salmon, including some that are threatened.

And my clients took quite a bit of interest in the three options that you set out there, in particular, you can either continue to harvest abundant stocks until they're extinct. That's one option, hopefully not an option that we're looking for. Second, you can shut down lucrative fisheries to protect threatened ones. And third, you can apply restrictions in the form of release requirements for non-target species or stocks. And you look at the various different options that you have there.

And then you go onward and say:

> Release requirements have been applied to several gear types,

And then you say:

> Releasing fish...has become used increasingly in management but is predicated on the assumption that true release mortality estimates are known

And then you spend two pages, and Mr. Rosenbloom has taken you to some of these in which you clearly identify that that assumption is not founded in the information we have today; is that

correct?
A Yeah, that we're lacking information on the release-related mortalities for a lot of the different species.
Q And it's not just the catch and release on the anglers, it's the catch and release in the marine, also, that we don't have information on either; is that correct?
A Wherever catch and release occurs, there's variable levels of information. So you can go to sport fisheries at different parts of the coast and you'll find better information in some areas, or in other areas you can look at releases from seine vessels fishing in the north coast or in Barkley Sound that have been studied in those areas, and you can see there is some information.
This specifically is looking at the fisheries associated with Fraser sockeye and the areas where Fraser sockeye are being released in these fisheries, so therefore it's focused mostly on the fact that there's very little Fraser sockeye being released in other south coast fisheries, commercial fisheries. Most of it occurs in -- associated with the in-river fisheries for sport fisheries.
Q So if you go back to those three options that you had at page 56, Mr. English, I can only make the assumption, if we don't want it to be extinct and we don't have the information to rely upon for catch and release, the only thing we can do is change where we're fishing?
A You can change the -- alter the methods and locations of fishing, yes, to reduce the impacts for cases where you are releasing. If you're retaining the fish, if you're not releasing them, then they're dead and you're harvesting them.
Q All right.
A So it's only those places where you're actually releasing the fish and with the intention that they survive where this is an issue.
I think it's -- the writing here was to indicate that a lot of the research -- you know, it's a broad subject and a lot of the research has been focused on chinook and coho and steelhead, because these are species that are typically needed to be released in fisheries that are targeting sockeye and pink, for example, or chum.

And so there's a broader, seems to me, wealth of information than just what is applicable to Fraser sockeye fisheries.

Q Sorry, I just got sidetracked with how much time I have left. All right. But what I read your -- that earlier paragraph to say was you've got three options when you're dealing with co-migrating stocks --

A Mm-hmm.

Q -- that some of which are running the risk of extinction. Two of those options aren't on the table right now, as I see it, as I read your report; one of them could be.

A Yeah, well, obviously they're extremes and, you know, the intent is that they find -- we get more information -- where you allow release fisheries, where you're can release fish, you get more information on the survivorship, so you aren't just assuming 100 percent survival. So you've got to look at and say, "What's the likelihood of survival of these fish," study it directly, or relate it to other studies done, that what's likely to be the survivorship of those fish being released.

So it doesn't remove three -- what's proposed under 3, as an option.

Q Okay. So then I want to go on, because the next part of this is en route losses and what you do at page 61. You'll agree with me that we only call a dead, uncaught salmon an en route loss once it's lost in the river after it's been enumerated at the Mission; that seems to be the nomenclature right now; is that correct?

A Where the en route loss is really referring to fish that go -- that we estimate have gone by Mission but didn't make it to the spawning grounds.

Q So we don't have data on en route losses in the marine before the Mission, but clearly there may be en route losses after fish have passed by the marine fisheries going into the river?

A Yes, could be there, too.

Q And so water temperatures could, as they're increasing, effect a fish that's been caught and potentially released, either deliberately or undeliberately from nets in the marine?

A Yes.

Q It's not just in-river fisheries that we're worried about with respect to that?
A Well, the reason for the focus of in-river fisheries is because the temperatures are much higher in-river than in the ocean.
Q But if the marine fisheries are causing some of the challenges the fish is experiencing by the time they get into the river, we shouldn't close our eyes on that?
A No, they're all having their impact. If we weren't in the way of these fish, they would have a lot less stress on them.
Q And I need to take you to page 61, at the bottom of the paragraph beginning, "The 2002-2009 sockeye telemetry studies," and particularly the last sentence, because I'm very concerned with what you're suggesting here and want to make sure we understand this:

> While there is little that can be done about annual water temperatures or difficult passage points, it is possible to minimize cumulative effects environmental and fishery related factors by dissociating the timing and location of in-river fisheries from these other stressors.

You're not suggesting that we close First Nation fisheries in the canyon or other places where there may be, what did you call them, difficult passage points, those are very traditional aboriginal fishing sites, are you? That's not what you're suggesting in that sentence, are you?
A Well, there may be years when, with extreme temperature, that you need to look at different harvesting methods.
Q But surely -- different harvest -- but first of all, surely you'd be looking at making sure there's enough fish that pass so those first in priority can access those fish?
A Yeah, so they can access the fish, but at the same time we don't want to have -- conduct fisheries where we know they're going to be -- we're going to be stressing fish in warm periods of time and some of those fish are not going to be removed.
So you have a target number of fish that you would like to catch in a fishery and you want to

have those fish removed without having an impact in the other fish that are either going to fall out of nets or not be captured efficiently.

So there's different capture measures that can ensure that all the fish that are encountered are retained and the other ones swim upriver and are able to spawn.

Q All right. Let's go to net fallout, just on that, for a moment. In your report, you seem to focus on net fallout in the river. A gillnet is a gillnet, if I understand it, and a gillnet in Johnstone Strait or in Area E or any of those things could also have net fallout --

A Yes.

Q -- will you agree with me on that?

A Yes.

Q Why is it that you seem to be worried only about gillnets in the river?

A It's a cumulative stress issue and it's because we don't -- with the tools that we have been using and the complexity of working in the marine environment, it's more difficult to assess the impact of marine fisheries in terms of -- and the survivorship of fish in marine fisheries due to potential things like net fallout. This information is coming from the in-river telemetry studies that have been done in looking at locations of losses.

Q But surely if we've got gillnets with dropout in the Johnstone Strait or in Area E we're going to -- we want to look at that, don't we? That's one of the first things the salmon are getting --

A Yes.

Q Yes.

A We want to -- wherever you have a -- you know, the theory here is that the combination of temperature, difficult passage points, stress and migration, and fisheries, is probably the case where you're going to have bigger stresses, but it doesn't mean that you're not going to have any stress associated just with net fallout. In fact, one of the biggest stresses might be fish not being retained in the net, because they struggle as they encounter the net and they -- if they struggle long enough some of them escape, and they may have to do that several times in order to get from A to B.

Q And in addition to other fishing methods, there's lots of things we can do to improve gillnets; is that right?
A To improve gillnets, as opposed --
Q Yes, so we can make sure they're using the right monofilaments, where we can make sure they've hung them right, we can make sure they've got the floats and that they've let -- the lead lines are properly located within -- depending on where -- there's a lot of education that could be done; is that true?
A Yeah, there is definitely better gillnets and worse gillnets, for sure.
Q And the obvious point is that Bristol Bay is almost all gillnets, aren't they?
A There's a lot of gillnetting. Well, it is, effectively, all gillnets. Either set gillnets or drift gillnets.
Q Okay, I'm going to move, now, to preseason forecasts, and I just want to -- I know there's been a lot already said, I don't want to take too much time, but the -- there seems to be two options for precautionary management in a situation where we've got -- hold on, let me rephrase this, I'm rushing too quickly.
Given the unreliability of preseason forecasts already agreed upon, would you agree that no significant or strong fisheries in the marine should be occurring before in-season data confirms the peak of the runs?
A Before the peak.
Q So by the time we get some accuracy and the actual abundance of the run.
A It's common to allow fishing to occur as you approach the peak with it being conservative, like you're not going to, you know, start off with a multi-day fishery, for example, you might start with a fishery that lasts a few hours earlier in the run just to get a sense of how many fish are coming back. But definitely it's the closer -- the more you can be confident that you're near the peak the better your test fishing, and the peak, really, is the 50 percent point. So you can see, "Oh, we've seen this many fish so far, if we're roughly around the 50 percent point, then we can expect there's another half of the run to come."
So that's often done for the early components

of runs, so that gives you an indication of whether the run in that particular year is coming back early or late.

Q So what I want to stress is that, as I understand the changing climate conditions and the lack of certainty going into any particular run, the only time you can really become more secure about the size of a particular run is just after the peak has been identified?

A Yes.

Q And so if we're going to be precautionary, we're going to have to wait for that, for any significant effort fisheries to occur?

A Yeah, there's two goals, though, in the fisheries management, is to harvest a -- to not exceed what can be sustainably harvested or you know, not harvest into your escapement target, but at the same time distribute the fishing pressure over the run of the fish so you're not always waiting until the last half of the run to mount all your fisheries. So that would alter the run-timing and the -- and possibly have negative effects on the biology.

Q All right. So there's two options that flow from that with the Fraser River; you can either move your test fisheries further out and get your data better and before and do your stock composition before you open any of the marine commercial fisheries, or you can move the fisheries further up the river so you've clearly had an opportunity to identify the peak and identify the stock composition. Would you agree with those two options?

A Yeah, there's those options and the fact that you -- with the current test fishery locations they're providing information in advance of other fishing areas in the marine environment, because they're occurring in Johnstone Straits and Juan de Fuca Straits anywhere between five and seven days prior to when fish will arrive at the mouth of the Fraser or the Lower Fraser.

Q So do you want to move them further out so you can get the necessary information on the peaks and stock composition, which I understand takes at least two days of DNA sampling before you open the marine?

A Well, moving the fish -- the test fisheries

further to the ocean -- further along the migration of salmon becomes problematic because the location of landfall, these stocks may vary. Some years you could have information from Alaska, for example, telling you what's coming back, because a lot of them are migrating through the Alaskan fisheries. Other years, virtually none of them will be migrating through the Alaskan fisheries. So you have to conduct your test fisheries at locations where Fraser sockeye are going to be consistently vulnerable to those test fisheries, and that's why they're located in their current locations.

Q So you agree with me, then, that the most obvious next choice is to move the fisheries more in-river?

A The earlier fisheries, the -- our conservative approach is to have those definitely inside those test fisheries and more towards the river or upriver than in the approach waters.

Q So going forward, as we begin to look at re-managing the fisheries for sustainability, we should strongly be looking at how we can catch more fish in-river?

A Yeah, do it in a way which is not going to have these other problems with temperature.

Q Thank you. Let's just turn, briefly, to in-season estimates, and I note at page 85 of your report - I'm going to read it while Mr. Lunn finds it - you say:

> In general, the in-season forecasts have been sufficiently accurate, precise, reliable, and timely to make the management decisions needed to achieve the harvest rate goals defined for each of the four run-timing groups.

And I note you didn't say "the escapement goals", and I note you didn't say "conservation units", and I expect that was deliberate on your part; is that correct?

A That's correct. Yes.

Q And so we don't have in-season forecasts that are sufficient to ensure escapement goals for conservation units?

A Well, it's not how they're being used, so we can't

evaluate it the -- what's being done until -- once they're defined, then the test of whether the current in-season forecasts or in-season estimation system is adequate will be once those goals are defined and then how well we do to achieve them.

Q Right. So we don't have it. Now, I want to ask you about these four run-timing groups. They're often used for much of what we're doing in-season right now. As I understand it, there are a number of Early Summer sockeye populations, in particular the Scotch and the Seymour and others that are migrating with Summer stocks, and particularly the Stellako and the Late Stuarts. Why are they located in the Early Summer populations, and is that causing problems, from your perspective?

A Well, certainly there's a significant overlap, and in more recent years it may have been historically that there was less overlap between those run-timing -- or between those stocks and there -- were in those run-timing groups for those reasons. I'm not clear, I haven't asked the people who were managing the resources back when those stock run-timing groups were defined, why they chose those specific stocks.

Q But you'd agree with me that they're more accurately part of the Summer stocks as they -- and it's where they're actually migrating than they are the Early Summers?

A Certainly that's been my observation in recent years. Most of my intensive work on the Fraser started in 2002, and in all the years that -- since then, when we've been looking at the runs and the migration timings, it appears there's a lot of overlap between Scotch and Seymour, for example, and the other summertime stocks -- Summer Run stocks.

Q And so to the extent that we're moving forward making decisions right now on run-timing groups, would you agree that it would be useful to make sure we redo the composition of these run-timing groups so they accurately reflect how these fish are returning?

A That would be good, yes.

Q And so that would be a recommendation you would add to your paper?

A To the extent that it's appropriate, because I'm

not sure that -- I think my paper's submitted and final.
Q But you can adopt it, now, as a recommendation that you would make to the Commissioner for something to consider in the improvement of the Fraser River sockeye?
A Yeah, in the context, I guess, of this hearing or testimony. I don't think they're - correct me if I'm wrong - but I'm not -- I don't get the impression I'm supposed to go back and make edits to the --
Q No, I'm not asking you --
A -- report. Okay.
Q -- to make edits.
A Yeah.
Q But you would adopt that as a useful recommendation for --
A Yes, for sure.
Q -- the improvement of Fraser River sockeye?
A Yes.
Q And is it your understanding that the four run-timing groups is mainly a constraint of the Pacific Salmon Treaty?
A I guess because it's a traditional approach that has been used by the Fraser Panel to manage these stocks. I don't know whether it is actually referred to in the Pacific Salmon Treaty that it must be done in that way, but it could be in there.
Q All right. I just have, briefly, and again, I think I'm going to be pushing my time estimates, but let's see how I do. I want to turn to escapement targets very briefly, and then particularly I adopt the work in the -- that Mr. Leadem did, today, with you, and was grateful for it being done, but I have to go a couple more steps with you, if I may.
The challenge of using stock recruitment data to set targets is that right now we have data on 19 indicator stocks, correct?
A That's correct.
Q And as I understand your report, of the seven of those indicator stocks we don't have sufficiently reliable stock recruit data to do assessments on escapement targets; is that fair to say?
A For seven of the 19?
Q Yeah. If I take you to paragraph two on page 75,

that might help us. I just want to make sure I've got this right, because if we're going to start anywhere to do this, let's start with the indicator stocks.
A Yes. So which page is it on?
Q Page 75, paragraph two.
A Paragraph two.
Q This is how I best understand that.
A Okay, so I want to really help clarify this. This is related to preseason forecasts, so it doesn't say you can't do stock recruitment, it just means that there isn't a good relationship between the forecast and the return.
Q But that is the information we would also be using to - or maybe it isn't - what information would we use for escapement targets on the 19 indicator stocks?
A Well, one very basic piece of information would be the capacity of the freshwater habitat to support.
Q All right. I'm going to take you there in a second, but I just want to get a sense of what other data do we have -- what data would we have for the 19 indicator stocks that we could immediately turn to, to start setting escapement targets?
A Well, it's well laid out in the Sue Grant report, et al, working paper for all these 19 stocks, the data that -- and they go through it in exhaustive detail. It's stock recruitment data, not run forecasting data that we're using.
Q Okay. All right, let's leave that. So your other option, and I'm going to go to that, because that's really where I wanted to focus, and I wanted to make sure we had the data right, is you say we've got to start with what I -- what's often been called as the garden, and I'm going to call it a wild garden as distinct from anything that sounds domesticated --
A Mm-hmm.
Q -- and we need to understand the nature of that wild garden. And do you agree with that --
A Yes.
Q -- as a good place to start? And you need to confirm this at the present spawning habitat, and the Commissioner has actually heard from a number of my clients about their views that a lot of the present habitat is underutilized in some of the

areas and that there's a lot more habitat that could be used. Is that your understanding of the Fraser?
A I don't have that, I guess, level of detailed understanding, certainly not equal to your clients.
Q And so you would actually agree that working closely with First Nations to understand that wild garden would be a very useful step?
A Yes, definitely.
Q And, in fact, it might be one of the more useful steps in quickly moving to some collaborative and co-management opportunities?
A Yes.
Q And so what we would want to do is assess from there historical knowledge and otherwise the true larger capacity of some of the spawning ground areas of the Fraser?
A Yes, certainly.
Q That would be a good place to start?
A Yes. And understanding that the -- there might well have been substantial changes over time. Some of those areas may be better today than they were historically; some may be worse.
Q All right. I just have a couple of final areas that I want to cover. I want to briefly turn to Bristol Bay.
As I understand it, and of course we can't change geography, and we can't -- but we can change fisheries and management styles, and so if we wanted to learn from the Bristol Bay and, in particular, wanted to adopt some of their conservation approaches and more effective management approaches, one of the ways we can do that is to move our fisher closer to the natal streams and the lakes. That would make us closer to the nine areas in Bristol Bay; is that correct?
A In principle, yes.
Q Well, it's actually practical and possible?
A Yes, to the extent that you could do the harvesting in those areas similar to what -- if you wanted to harvest similar numbers of fish, there might be logistical differences or difficulties doing that in some terminal areas. But the idea that -- the principle -- the concept or principle of moving fisheries closer to the spawning areas gives you a lot more control over

the returns to specific stocks.
Q As I heard your evidence yesterday and as I read your report, that's as critically important component of the success of Bristol Bay, is they've got a very close relationship between when the -- the people who call the -- open the commercial fisheries and that which is happening on the spawning grounds, correct?
A Yeah, it seems to have worked to ensure that they get their escapement goals.
Q And so what we might want to do is increase capacity to allow ourselves to do that?
A Certainly that's one approach, yes.
Q And I didn't see that in your recommendations, in your written recommendations. Is that a recommendation you have for Commissioner Cohen?
A What, to --
Q Increase --
A -- increase terminal fisheries?
Q Yes. And increase our knowledge about terminal fisheries and increase our abilities to act -- to harvest large amounts of fish in terminal areas, therefore allowing ourselves to make more precautionary decisions associated with escapement?
A I think it's one that needs to be evaluated, just like we need to evaluate what escapement goals should be. So there's a -- once you define the goals for the different stocks, you can determine to the extent to which you can harvest those in mixed stock fishing areas, and the extent that you'll need to move fisheries more terminally, and that may vary from year to year and stock to stock. But we shouldn't be eliminating opportunities that exist for -- and eliminating alternative forms of harvesting fish just because it wasn't used in the past or wasn't used in recent history.
Q Thank you. And in fact, it's not only we shouldn't eliminate, we should take active steps to figure out how we can do that?
A Yeah.
Q Would you agree with me on that?
A Yeah. I would say that it goes in a sequence that you determine what you need to do, look at the fish and say, "What do we need to do to achieve the goals that we have for these populations of

fish," and then implement the fisheries in a way which allows you to achieve those goals.

Q And in order to do all of that is fairly complex, primarily because of the longstanding vested interest we may have in the Fraser, would you agree that it's also going to be very useful to have structured decision-making processes that are clear and transparent in order to make those decisions that would be extremely useful from a management perspective?

A Yeah, clear and transparency is really important.

Q And that wouldn't necessarily be the Fraser River Panel, because that's 50 percent of the U.S., but, rather, we need to have that at home, in Canada, dealing with our terminal fisheries; is that correct? Would you also go with me as far as that?

A Yeah, we have to deal with our domestic fisheries separate from international obligations.

Q Thank you. I'm going to just -- I think I've just been given a little bit more time by my friend, and so I'm going to take about five more minutes -- or maybe five more minutes with you, Mr. English. Thank you for your patience.

I'm going to take you to your recommendations, because I just want to be clear, in addition to the ones that we've talked about, and they're found at page 173 of the report. And so I just wonder if, given our discussions on consistent monitoring across the sectors would be something you would add, now, to recommendation number 1?

A Certainly consistently good monitoring across the sectors, yes.

Q Thank you. And to recommendation number 2 you would add commercial gillnets in Area E and D as something that we need to look at, as it relates to net dropout?

A Certainly, yes, you could add that.

Q And given the discussion you had with Mr. Taylor, would you also be willing to unlock the recommendation in 3 to say that higher priority for human and, if necessary, financial resources should be placed on setting clear escapement goals and in-season decision-making management models to help ensure we meet those goals?

A Certainly, yes.

Q And that we need to clearly communicate to all harvesters and the public the limited usefulness of preseason forecasts and the uncertainties associated with them?
A Yes.
Q And then, with respect to number 6, as I understand your evidence, that we should be talking about conservation units rather than indicator stocks and run-timing groups; would you agree with that?
A I think we're talking about both. Some of them are the same. Conservation units are very similar to indicator stocks, and the indicator stocks will provide us information on conservation units and, in fact, they may be all the information we have for specific conservation units because we don't have a monitoring system in place, or some of these conservation units are so small that we don't have a history of data for a specific conservation unit.
Q And would you also add the discussion we had, then, that we need to work closely with First Nations and others with local information to better understand the habitat abilities?
A Yes.
Q And then finally, with respect to recommendation number 9, we're not just really -- really we're not just talking about managing better the in-river fisheries, we're talking about managing better all of the fisheries to deal with the changing environmental conditions and meeting commitments related to First Nations agreements and the Wild Salmon Policy?
A Certainly it applies to all fisheries with the understanding that the current trends are -- have been focused on in-river fisheries because of the increasing water temperatures that have been observed in freshwater.
Q Thank you.
A So it's a special emphasis there.
Q Taking into consideration cumulative effects that begin in the marine?
A Okay, yes, it's accumulative effects, definitely, that we're looking at.
Q So those are my questions on your report. I just have two remaining questions that go to the terms of reference that Commissioner Cohen is facing.

The first one is: Would you agree that when you look at, overall, the fisheries management on the Fraser River, that some of the key challenges for it are developing a management system that is collaborative rather than competitive? It's one of the challenges?
A Yes.
Q You'll also agree that the challenge is shifting it from a harvest-focused management to a conservation-focused management?
A I think that shift is already starting to occur.
Q You also agree that we will need to carefully need to look at incentives for ensuring that the changes that are necessary in the management are welcomed by those that respect and rely upon the fisheries?
A That would be nice, yes.
Q And do you agree, also, that we need to have an increasing willingness on the part of scientists to look a little broader, look outside the box, often is the expression, and not rely on historical datasets as being the only way of making hard decisions but go broader than that?
A I think it's the job of scientists to include all of the information that they can obtain and provide the best advice they can.
Q And that clearly will include, as we go forward, relying and working more closely with First Nations and the expertise that they can bring to the table?
A Yes. I've certainly experienced that first-hand, the benefits of doing that, and definitely support it.
Q Now, this is an even broader question, my next one, and this is my final question.
A Mm-hmm.
Q What are your views on the extent to which DFO's management of Fraser River sockeye salmon, historically and currently, has contributed to the decline of the sockeye? To what extent has the current model, with test fisheries located in the same areas as the strongest catch efforts and management systems that are reliant on inaccurate run-timing groups and mixed stock fisheries contributed to the decline on sockeye?
A Well --
MS. BAKER: Sorry, that's an extremely big question,

and --
MS. GAERTNER: It is a big question.
MS. BAKER: -- I don't know if we can --
MS. GAERTNER: He's definitely got the expertise. You've qualified him as an expert --
MS. BAKER: It's not the --
MS. GAERTNER: -- in this hearing.
MS. BAKER: -- expertise that's the issue, it's just there's so many assumptions in that question, I wonder if it could be either broken down or left in a more general way, or let the witness know that --
MS. GAERTNER: All right, I can -- thanks Wendy -- or Ms. Baker. I'll just leave it as the general.
Q What are your views on the extent to which DFO's management of Fraser River sockeye salmon has contributed to the decline of sockeye?
A Well, there are some that argue that the declines that we've seen were heavily related to environmental conditions that none of the managers have any control of, in terms of ocean productivity. There's others that believe that we could have implemented a more precautionary approach earlier with regard to the management structure.

There's a lot of complexities that you guys have heard tons about with regard to balancing the international responsibilities and the domestic ones, dealing with a lot of different groups, and I think that's all created challenges for implementing fisheries management rules, if you like, quickly to have the best impact on the stock.

So I think -- I would hate to see that people think that it's the sole responsibility of the Department or any one group to oversee the success of management. It's all our combined responsibility. The scientists bear some of the blame, the fishermen bear some of the blame. If the stocks have declined because of human decisions, we all are sharing some of the responsibility and blame for what's happened.

There is a lot of evidence to suggest that the stocks that we have can produce substantial returns, even under the current conditions. We got that very graphically in 2010. So I think the jury is out, if you like, on what exactly has

caused -- and what the -- which group has been more responsible or another. I think we have a collective responsibility to all work together to ensure that the stocks don't continue to decline, if they are declining, and if they're improving, continue to improve.

MS. GAERTNER: Thank you, Mr. Commissioner. Those are my questions.

MS. BAKER: Mr. Commissioner, there's two more counsel to ask questions and, in fact, Mr. Lowes would like to ask questions if there's time at the end. So I don't know if you wanted to take an afternoon break?

THE COMMISSIONER: Sure, we'll take a 10-minute break, thank you.

THE REGISTRAR: The hearing will recess for 10 minutes.

(PROCEEDINGS ADJOURNED FOR AFTERNOON RECESS)
(PROCEEDINGS RECONVENED)

THE REGISTRAR: The hearing is now resumed.

MR. DICKSON: Mr. Commissioner, it's Tim Dickson and, Mr. English, I represent the Sto:lo Tribal Council and Cheam Indian Band.

CROSS-EXAMINATION BY MR. DICKSON:

Q I'd like to start by saying that along with Ms. Gaertner, my clients are also generally impressed with your report, and I only have a few questions on it.

I heard my friend, Mr. Eidsvik, question you this morning regarding challenges with catch monitoring of First Nations' fisheries in the 1990s. As a general proposition, do you agree that catch monitoring of those fisheries has improved substantially since then?

A Yes.

Q And I just want to take you to a couple of statements in your report, if I can, in that regard.

MR. DICKSON: They're on page 23, Mr. Lunn.

A Yes.

MR. DICKSON:

Q In the middle of that paragraph after the notation of Table 4, there's a first statement that says:

> Catch monitoring for First Nation fisheries was rated having higher quality than commercial fisheries because of the extensive efforts to verify effort and catch rates using independent surveys instead of reports from fishers.

And then you cite a report, Alexander 2002. And so am I right in thinking that that statement relates to the state of affairs as of 2002?

A The 2002 report was on a First Nations catch monitoring program I think conducted in 2001.

Q Very well. And so as of that point, you're saying that the catch monitoring for First Nations fisheries had a higher quality than for commercial fisheries; is that so?

A At that point in time was when the commercial fisheries -- the concerns about the sales-slip system were substantial and the reason for the shift in monitoring systems for commercial fisheries at the time.

Q Yes. And then on First Nations' fisheries catch monitoring, since then there have been subsequent changes as you set out in the next sentence:

> Regulations for mandatory landing sites for "Pilot Sales" and Economic Opportunity (EO) fisheries since 1993, and --

Here's the real point:

> -- separation of FSC and EO fisheries since 2004, have substantially improved the reliability of catch estimates for EO fisheries.

That's true?

A Yes.

MR. DICKSON: Thanks. Now, I just wish to turn to page 37, Mr. Lunn. There are two sentences at the end of that main paragraph, that last paragraph that I would like to ask you about. It says:

> ...the reported FSC harvests for years without Sto:lo Agreements tend to be larger than the reported FSC harvests for years with Agreements.

Obviously some years are agreements, some years are not agreements. And then you say:

> If we exclude the years prior to 1998 when FSC catch was likely underreported, the average FSC catch in years without Agreements...was 1.3-fold larger than the average of the reported FSC catches for years with Agreements.

Obviously you're saying that the FSC catch is, in non-agreement years, is larger than in agreement years.

A That's correct, yes.

Q And are you noting that because one would expect the FSC numbers to be the same?

A Not necessarily. I would just -- because there was a natural split here between agreement years and non-agreement years, it seemed appropriate to compare the results.

Q To observe the difference.

A Yeah, observe the -- see what the differences there would be.

Q And just because I read that and I note the difference, I just want to see if I can put two propositions to you that might explain the difference a little bit and see if you agree with me.

A Okay.

Q And the first is that my clients report to me that following the implementation of AFS in '92, there's been a revitalization of fishing in their communities. There are more fishers now more interested in fishing. There's been a resurgence of this aspect of their culture, more smokehouses, more ceremonies. It's been a very good thing for their communities.

But, in any event, there are more fishers, and when there's an agreement, there's an economic opportunity component obviously, as well as FSC, and so some of the fishing effort goes to economic opportunity. In years with no agreement, and so only FSC, all of it is going to FSC, and so there's more FSC fish caught. Does that make sense to you? Does that...?

A Yeah, it definitely makes sense that in years where there's an economic opportunity fishery,

it's going to take some of the fishing pressure away.

Q And the second proposition is that the Sto:lo are not what you would call a rich -- population rich -- rich in money, in any event --

A Mm-hmm.

Q -- and there's not a lot of discretionary cash in the communities, and so when there's an economic fishery and there's some money generated from that, a substantial portion of it, I'm told, goes to food. And when there's no economic opportunity, there's more pressure to go and catch fish for food for the winter. Does that make sense as well?

A Yeah, seems reasonable to me.

Q Thank you. I just have one more question and it's really a follow-up from Ms. Gaertner. It's this: If the stock recruitment relationship being used to forecast is not reliable, that is, that it's producing some randomness, producing random guesses, does that imply a weakness in using the relationship between stock recruitment -- stocks and recruitment to set escapement goals?

A Well, when you have a strong stock recruitment relationship, you'll have more confidence in those goals than you will if you have a weak one or one that is not as reliable.

The problem with forecasting is you're asking it to predict what's going to happen in terms of return in a subsequent year. The goal -- the idea of escapement goals is to say for this particular population, this is the number of spawners, if you like, if that's what it's based on, the number of spawners that we think will produce, on average, a better return. That's a different thing than asking somebody to say right now, 2011, we're in April, I want this scientist to tell me what's going to come back in July and August. That's a totally different question.

You can sit here today with -- going (sic) all the best biologists in the region that know about stock assessment or the Fraser sockeye, sit them down and talk about what they think are the values that will produce the best return, and there will be much more agreement on that than will be on what's going to come back next year, or this year.

MR. DICKSON: Thank you, Mr. English.
A Mm-hmm.
MS. FONG: Mr. Commissioner, Lisa Fong for Heiltsuk Tribal Council.

CROSS-EXAMINATION BY MS. FONG:

Q Mr. English, I only have one question. It's regarding your response that you gave to Ms. Gaertner. I understood your testimony to be that because of where and when test fishing occurs, it would be better fishery management to move fisheries up river. What I want to understand is this: What you're not saying, however, is that there should be no interception fisheries on the coastline.

Before you answer, just let me give you an example. I'm counsel for Heiltsuk. You're not saying that the Heiltsuk should not fish in their traditional territories because, at the time that the salmon passed them, there has been no test fishing information. You're not saying that, correct?

A I'm saying we would -- you should evaluate, look at the fisheries, see what potential impact they might have on the stocks, and whether they could safely, in the case of Heiltsuk food, social and ceremonial fishery, allow that level of harvest even in the absence of a lot of in-season run size information. You wouldn't want to initiate a large fishery that was going to have a big impact on a stock before you had a good handle on the returns.

Q We've heard testimony in this proceeding, and my clients tell me, that at the time that the test fishing data is available - we're talking, if I remember correctly, July and August - by that time, the Fraser River sockeye salmon have passed where the Heiltsuk are located. They're located in management area 7 and 8.

A Right, yes.

Q So there isn't -- would you disagree with me that there's no real sense of in-season management for them as it relates to this Fraser River sockeye salmon?

A Effectively, yes, and the issues there should be to know just how many Fraser fish they are

catching in those fisheries because there's a lot of stocks in area 7 and 8, or close to there, like areas 9 and 10, sockeye stocks, that are not Fraser stocks. So you need to know what the stock composition is in those fisheries.

In a year like this year with a very small Early Stuart run, and everybody agreeing that there shouldn't be harvest on that particular population because of its size, then presumably people at Heiltsuk would also support that conservation approach and agree that they shouldn't be fishing either on the timing of Early Stuart, for example.

Q Correct. So that might apply to Early Stuart but, for example, that couldn't be done with -- I'm just thinking like the run after Early Stuart where the information would not be available until after the fish have passed Heiltsuk.

A Yeah, so you might want to look at these outside fisheries. A prudent approach would be to look at stock timings that you're very confident you're going to get an abundant enough return in 99 out of 100 cases, or 95 out of 100 cases, and so you would focus in on -- it would suggest that for fisheries that are going to occur before you can do an assessment, you want to do it on stocks that you know are going to be able to withstand that level of harvest, for sure.

Q Right. So then you're relying on pre-season management information for folks like Heiltsuk.

A Yeah, and looking at -- with the context that has been mentioned here, there's wide bounds, but there are certainly, even within the wide bounds of those pre-season estimates, there's an indication of whether you've got runs that'll be the size of Early Stuart versus a Chilko or a Quesnel or a Shuswap stock.

Q Okay. And just, sorry, just coming back to my original question, I'm not sure if I got the answer to that. But in agreeing with Ms. Gaertner that perhaps moving the fisheries further up river, you aren't saying no to interception fisheries at all. You're not saying all those fisheries on the coastline have to stop fishing, and that the only fisheries that should occur would be on river.

A Yeah, no, I'm not saying that you close down all

your marine fisheries because you want to move to a system more like Bristol Bay. I want to say you look at the different locations of fishing and choose a suite of fisheries that gives you the best management control for the stocks and the management issues you're trying to deal with.

MS. FONG: Thank you. Those are my questions.

MS. BAKER: Mr. Commissioner, Keith -- oh, did you have something...? Keith Lowes will follow and then, Mr. Commissioner, because it looks like we'll have a few moments, I talked to Mr. Eidsvik over the break and could he complete his examination without having to do it in writing at the end of the day? That's what I'd like to suggest we do.

THE COMMISSIONER: If there's time, yes.

MR. LOWES: I'll be quick. J.K. Lowes for the B.C. Wildlife Federation and the B.C. Federation of Drift Fishers. Mr. Lunn, could you call up Exhibit 531, please?

CROSS-EXAMINATION BY MR. LOWES:

Q Mr. English, are you familiar with the document on the screen, Exhibit 531?

A I haven't read that particular document, I don't think. Is that a PowerPoint, though? I might have seem some of these --

MR. LOWES: I'm sorry, why don't we call up 528.

A I've just been given that document today, and I may have seen that other PowerPoint presentation.

Q All right. So I think you've answered my question. You've just seen that document today?

A This one here, this printed version. I probably saw an earlier draft of it possibly in 2009.

Q Yeah. Are you aware of a three-year study conducted by J.O. Thomas on the recreation hook-and-release fishery on the Fraser River?

A Yes, I've been aware that they've been doing a study.

Q Did you take it into account in doing your report?

A Yes.

Q And J.O. Thomas is a reputable monitoring and assessment firm?

A Yeah, no, I've seen Jim's work and I --

Q You know Jim Thomas?

A I know Jim Thomas, yes.

Q And he does a lot of this kind of statistical and

analytical work for the Department and others?
A Yes, I've known him for a lot of years. He's probably worked pretty much the same time frame that I've worked on Pacific salmon.
Q You wouldn't have anything to quarrel about in his mortality report after three years of study?
A I guess I'd have to review it to know whether I would have any differences of opinion, but --
Q But as of today, right now, at about a quarter to 4:00, you don't?
A I don't have an opinion on it right now, no.
Q Yeah. And I understand, and evidence has been led in these proceedings, that following that report, the mortality rate for the recreational hook-and-release fishery was dropped from ten percent to three percent in terms of the assumption made by the managers. Are you aware of that?
A I was not aware that they'd dropped it from ten to three percent, no.
Q Yeah. If they did, would you quarrel with that?
A Well, I think there's a concern in that this is -- this report is a document of short-term mortality.
Q Yes.
A It doesn't address the longer-term effects and all the different types of factors that would come into play under those longer term --
Q Yeah, you've cited two reports. One, I think you called the Carleton Report and there was another one in your report; is that correct?
A Yeah, Donaldson's work.
Q Yeah, and you haven't cited Mr. Thomas' work.
A No, I didn't cite his work in here.
Q And your recommendation number 2 is, in effect, that First Nations and recreational fisheries continue to work with the Department to learn more about catch-and-release mortality?
A Definitely, yes.
Q And would you agree that Mr. Thomas' report is an example of that kind of work?
A It's an example of part of that kind of work. I think the work that's being done right now by Carleton and UBC, looking at extended periods of time after the release of fish, is the natural extension over what Jim had done in his earlier years.
Q Well, what about what Jim has done last year?
A Well, he may have done a similar study. I'm not

sure whether he was actually working with the same crews. At various times there's been overlap between what Carleton and UBC people have been doing and what Jim has been doing, but I think most of Jim's work is looking at short-term survival or mortality related to angling.

Q Yeah, well, but you wouldn't have any quarrel with the Department relying on his advice with respect to the mortality rate?

A Short-term mortality rate, he's probably assessing that reasonably. The real question we need to focus in on here is the -- you don't account for the longer term effects. We've done a lot of work on this over the last number of years on the Fraser with applying tags to fish and looking at how well they survive through to the spawning grounds, as opposed to just how many are alive at the time you release them.

Q Yeah, and those long-term effects obviously, by definition, won't be known until there's a long term.

A No, they're known -- long-term effects, it's from the point of release to the spawning ground, so that's often within three to six weeks for the slowest-moving fish.

MR. LOWES: Okay. Thank you.

MS. BAKER: Then we'll complete with Mr. Eidsvik's questions today.

MR. EIDSVIK: I like your smile, Ms. Baker. Always the happy assumption. Phillip Eidsvik, for the record, Mr. Commissioner. I did break my original cross down into several sections, and I'll try and get a couple more done so they're out of the way and save you, Commissioner, having to read questions.

Mr. Lunn, perhaps if I could go to Exhibit 606, please, page 18.

MR. LUNN: Thank you.

CROSS-EXAMINATION BY MR. EIDSVIK, continuing:

Q And in the first part of my cross-examination, Mr. English, I dealt with the aboriginal fishery in the Fraser from 1992 to 2001. That was the breakdown you had. I'm not going to take you into detail on the subsequent 2001 to 2009 period that you cover. But this one report was done by the

former Chief Justice of the B.C. Supreme Court, the Honourable Brian Williams.

At page 18, we can see that -- again, we're talking about catch reporting. He says:

> However, in a number of areas the Committee was advised that the catch monitoring regime for local First Nations was undermined by largely uncontrolled and/or unauthorized fishing.

And that section goes on. So my point is simply that again in 2004, at least, we have another situation, but you're still content to call that catch reporting good at this point?

A Yes. The focus we did was on the sockeye catches and monitoring systems. There could be problems with other species, other times of year that occur, but our focus was on sockeye.

Q You're aware that this report was to do with the sockeye fishery?

A Yeah, but it also has mentions for chum openings and other things, so I'd have to read the context for the section to know what exactly is being referred to.

Q Okay. Thank you, and we'll move on.

MR. EIDSVIK: Mr. Commissioner, there's much data and papers and documents that will come up in subsequent hearings, so I can set that aside for the moment.

If we go to your report at page 31 would be helpful, Mr. Lunn, if you don't mind. Before you do that, Mr. Lunn, I want to raise one point.

Q And it's with respect to terminal fisheries -- you could stay right there. There's been quite a bit of discussion, Mr. English, about moving to terminal fisheries. Those are pretty red sockeye on the front cover of your report. Have you any idea what a sockeye like that would be in a Japanese sushi market compared to a Johnstone Strait silver-bright?

A I don't suspect it would command as large a price, no.

Q Thank you. If we could go to page 31? Now, in this, if I understand it correctly, at Table 8 this describes the surveys that are done of fishers in certain areas on the Fraser, and I

gather the average kind of goes from 22 to 47 percent. Can you tell me exactly what that is?
A Okay, this is --
Q What are you summarizing in that table?
A Okay. So this is the interview coverage of the set net fishery expressed as a percent of the total nets counted during aerial surveys.
Q So what exactly is an interview?
A This is talking with the fishermen and recording their catch per effort in an interview.
Q So somebody comes up to a fisherman who's leaving the fishery or at some point in the fishery, says, "How many fish have you caught?"
A That's correct, yes.
Q And who asks that?
A So there's a variety of surveyors. Usually they're First Nations fisheries technicians in these fisheries interviewing their fishermen.
Q Is there any verification of the catch or is it simply, "I caught 100, Joe." "Okay, Joe, thanks."
A Yeah.
Q Or is there -- do they unload the fish and count them like in an IQ fishery in a dockside monitoring program?
A They often are encountering people with the fish so there's an opportunity to actually count the fish in many instances, and sometimes they're at specific landing sites where a lot of people are going through and offloading their catch. I'm sure there's variability in the numbers of fish that are actually counted versus ones that are obtained from an estimate. The intent of the interview is to get a reliable estimate of the number of fish caught in a particular length of time fishing.
Q Are you aware of any audits done to determine how valid that data is?
A I think audits are done by DFO working with the First Nations fishermen, but I have not seen the results of those particular audits, no.
MR. EIDSVIK: Mr. Lunn, if you could perhaps pull up one of the documents that I enclosed. I'm sorry, I don't have the tab numbers: GILL000562.
Q Now, you know there's a problem both in the commercial sector, what we call the public commercial sector, and in other sectors with hails.

A Mm-hmm.
Q Because of accuracy issues not only in the aboriginal fishery, but in the commercial sector, the public commercial sector. Are you aware of that?
A Yeah, that's the idea for dockside monitoring so that you're not relying entirely on just what is hailed or given verbally.
Q If you could go to the second page of this. This is an email from Mr. Redekopp to Mr. Ionson, and it raises the hail issue again. It's simply -- under the conclusion it says [as read]:

> The catch data provided to DFO by the Musqueam Fisheries Department is poor at best and should not be used to make fishery management decisions, and misreporting is not a matter of making an error. The evidence collected by DFO fishery officers presumes some Musqueam fishers are deliberately misreporting to the AFOs.

Now, Mr. Ionson was aware of that memo because this is from him. Did he advise you of this type of issue around hails? You've relied on him throughout your report.
A Well, he provided a report and some information. He didn't send me any of these emails, no.
Q Did he tell you that there was problems with relying on hails?
A No, he didn't identify it as a problem for the sockeye fishery and I didn't ask him about the chinook fishery.
Q Okay. You suggested -- if I can move on to -- I'll do a little bit of catch reporting on the public commercial sector. It kind of raises this issue.
Now, the Native catch monitoring, the counsel for the Sto:lo and Cheam asked - my apologies, I've forgotten your name - he cited Alexander in 2002 for that conclusion that catch monitoring and First - at page 23 - catch monitoring and First Nation fisheries was better than commercial fisheries. You cite Alexander, 2002. When I looked at page 175, 76, of Alexander's reports -- he drafted two reports. Can you tell me which one that conclusion comes from? You refer to two

reports.
A Well, are there two reports with the same citation?
Q Yes, you didn't cite. You just said "Alexander 2002", and there's a 2002 A and B.
A Oh, okay. There's --
Q Perhaps --
A I don't know which one it came from off the top of my head, but it should have been quoted as "A" or "B".
Q So it would be a surprise to you if Mr. Alexander didn't make a statement like this, then?
A Well, the reference was to do with the reliability of the catch monitoring for First Nation fisheries, and that level of precision is better and more known than it is for the commercial fisheries.
Q I guess what I'm getting at, did Mr. Alexander specifically compare the public commercial fishery with the aboriginal fishery? I read the two reports and I couldn't find it in there.
A No. No, he didn't specifically compare the two.
Q Okay. So that statement, then, is in error then?
A Well, if it's interpreted that it's the comparison that's being made as opposed to the amount of effort used by independent surveys is greater than that for the commercial fishery. So it's going to give you a higher quality estimate because of the extensive efforts to verify catch and independent surveys instead of reports from fishers.
Q Okay. Thank you. At page 21 you cite U.S. commercial fisheries as having very good accuracy. Are the U.S. salmon fisheries IQ fisheries?
A No, they're not, as far as I know, IQ fisheries.
Q Yeah. You said that at page 48 you note that there's little or no dockside monitoring systems in Alaska or Washington, and you rate catch reporting in those fisheries as very good. Not just "good"; "very good".
A Yes. That's from talking with the U.S. fisheries managers that indicate that when they have done verifications -- they have a lot of enforcement, and when they do verification of their catch, they have found that compliance with, you know, from complete reporting has been very good. In the case of the Alaska/Bristol Bay fishery, the catch are going through very specific sites. There's

large volumes being dealt with so there's very little time for catch to go astray, if you like, go to alternative routes so they can't enumerate it. It's the nature of the fishery.

I think you brought the issue before. It's the size of the fishery, the nature of the fishery that gives these other groups much greater confidence and the level of enforcement that's applied in those areas.

Q Yeah. I think that's a good comment, because I think it applies probably fairly broadly where you have heavy intense fisheries. Part of the reason is I think it respects the ability of a fisherman, say a fisherman in a small boat, to sell a whole bunch of fish in a short period.

A Mm-hmm.

Q Especially if the fisheries are close together.

A Yes.

Q Okay. So it's fair to say, then, the dockside monitoring and phone-in systems aren't essential to get good catch data out of a commercial fishery.

A No, that's not going to be the only way you can do it. It's going to be -- the reason why it's been proposed in recent time, I think, is to reduce the costs associated with generating the independent estimates which is what has been done in the past in B.C., using boat counts and information on catch per effort from interviewing or hailing or phone-in reports from fishermen.

Q Now, did you do any analysis of what percentage of Area E harvest - I'm talking the lower Fraser public commercial gillnet fleet - has sold at the dock or brought home for food?

A No.

Q Did you talk to any of the processing companies to get an idea what they thought?

A That was sold at the dock or taken home for food?

Q Yeah.

A No. No, I didn't talk with them about those specific issues. I just assume the Area E fishery, being a commercial fishery, that the catch numbers that were being obtained for it were essentially tallied up as commercial harvest.

Q Do you know how much Canadian fish, ocean fish in Bella Coola, the major fish companies, what percentage of the harvest they would purchase on

the Fraser River?
A Not offhand.
Q Would it surprise you if it was more than 50 percent?
A Fifty percent of the entire harvest, or just the --
Q Of the entire harvest in the Fraser River in an Area E gillnet fishery opening. Would it surprise you?
A For the Area E?
Q Yeah.
A If it was more than 50 percent?
Q Would it surprise you if it was more than 50?
A No. I would presume historically it was probably a lot more than 50 in terms of -- it's just recent times where the concern was on a lot of these dockside sales not being captured in the sales-slip system that why the independent estimate of catch was being produced.
Q No, but dockside sales have been a factor for probably as long as there's been a fisherman fishing in Steveston and in places like that. How did the Salmon Commission and DFO account for that in the past?
A Well, prior to -- my understanding, from talking with DFO people who are responsible for the catch numbers is prior to 1998, they were using sales-slip information that was accumulated from whatever sales were recorded on sales slips to compute the annual catch estimates.
Q Were you aware that they added an expansion factor to offset the anticipated and expected dockside sales and did some surveys and analysis?
A It's possible. I was not aware of what expansion factors were used.
Q Now, on the aboriginal fishery, once the fish from the slips are totalled up, what then happens? How does that information get transmitted to DFO? What happens? What's the process for that?
A I think each of the First Nations' landing sites, the people collecting the data would collate it and provide it to the lower Fraser or whatever the regional management office is responsible for those fisheries.
Q Are you aware that in the agreements, there's a meeting between DFO people and the aboriginal groups and they have a meeting to decide what

number should be forwarded to DFO managers, and if the aboriginal side doesn't like the number, they get to appeal to the Regional Director General? Are you aware of that?

A No.

Q I guess my final point is on the catch monitoring. On the food fishery, a large fishery, and at your Table 31, only 47 percent of the people that are talked to, there's no dockside monitoring there. There's no independence in terms of the people at arm's length doing the counting. Yet you give that a very -- or a good rating from 2001 to 2009. Yet in the commercial sector where there's independence in the sense that an individual -- I'm sorry, Mr. Commissioner, I'm --

THE COMMISSIONER: Finish your question.

MR. EIDSVIK:

Q In the commercial sector, there's independence in the sense that most gillnetters pull up beside a packer, they offload their fish, there's a financial transaction and a sales slip is generated. I'm curious why you would think that the food fishery, based on talking to half the people, where there's a lack of independence, where there's no dockside monitoring program, but you're very critical of the commercial sector in the Area E for having no dockside monitoring program and you downgrade them for that, yet you hold that the aboriginal food fishery is good. Can you explain that contradiction?

A Well, the survey effort is just to generate a catch per effort estimate, and the portion of the individuals surveyed, as it's indicated in that table, is while it's not 100 percent of the fishermen, that's not essential. It's to do enough so that you're getting a reliable estimate of catch per effort. On top of that, there are fishermen counts, vessel counts, net counts that occur throughout those fisheries so that they can expand those catches to generate a total estimate. The same amount of information -- similar methods are being used for the gillnet fishery, but the phone-in compliance rate that I was told by DFO when I talked with them, was in the order of ten to 25 percent.

MR. EIDSVIK: Thank you for answering my questions today, Mr. English. Thank you, Mr. Commissioner.

THE COMMISSIONER: Thank you, Mr. Eidsvik, very much.
MS. BAKER: Before we close, Mr. Eidsvik, will you be continuing with written questions or are you complete?
MR. EIDSVIK: I'm sorry, I'm not complete. But I have greatly reduced number of written questions because of the last ten minutes.
MS. BAKER: Thank you. I wonder if we can just set a deadline then for getting those written questions in. Could you have them in to us by next Thursday?
MR. EIDSVIK: Of course.
MS. BAKER: Thank you. And, Mr. Commissioner, I will have some re-exam which I'll also put in writing.
MR. DICKSON: Mr. Commissioner, can I just ask are those questions going to counsel, going to the parties first? Because there may be questions that I object to, and I'd just like to be able to see them before they go to Mr. English.
MS. BAKER: Yes, the questions will come to us and we can circulate them to counsel. I don't know if it's possible, because next week is a short week and there's the long Easter weekend, Would it be possible to get the questions to counsel on Wednesday or is that too short? I don't know.
MR. EIDSVIK: I will do my best to get it to you on Wednesday.
MS. BAKER: Okay. Then maybe we can have other people -- if there are objections, they can be dealt with by Thursday so we can get them out the door to Mr. English.
MR. EIDSVIK: Thank you.
MR. DICKSON: I appreciate that, thank you.
MR. ENGLISH: In the interest of a livelier end to a long couple of days, I'd like to provide this hat to be held for the Commissioner for when he completes his job. It's the Fraser River 2005 Sockeye Stock Assessment hat. The work that was done in 2005 was on the parents of the fish that came back in 2009. Those parents had no idea what challenges and problems their kids were going to create when they spawned them in 2005. So I think it's a very appropriate hat that I would like to provide to the Commissioner for once he completes his job.
THE COMMISSIONER: Thank you. It's comforting to know that fish are no different than people when it

comes to problems with children and parents.
MR. ROSENBLOOM: Can we have the hat marked as an exhibit?
MS. BAKER: That comes off your time next time.
THE COMMISSIONER: Thank you, Mr. English, very much for your report and for your patience and willingness to answer the questions of myself and all counsel. I believe now, Ms. Baker, we're adjourned until 10:00 a.m. Monday morning; is that correct?
MS. BAKER: That's correct.
THE COMMISSIONER: And I charge you with the responsibility of looking after the hat.
MS. BAKER: Thank you.
THE COMMISSIONER: Thank you very much.
THE REGISTRAR: The hearing is now adjourned to Monday, April 18th, at ten o'clock a.m.

(PROCEEDINGS ADJOURNED TO APRIL 18, 2011 AT 10:00 A.M.)

I HEREBY CERTIFY the foregoing to be a true and accurate transcript of the evidence recorded on a sound recording apparatus, transcribed to the best of my skill and ability, and in accordance with applicable standards.

Pat Neumann

I HEREBY CERTIFY the foregoing to be a true and accurate transcript of the evidence recorded on a sound recording apparatus, transcribed to the best of my skill and ability, and in accordance with applicable standards.

Karen Acaster

I HEREBY CERTIFY the foregoing to be a true and accurate transcript of the evidence recorded on a sound recording apparatus, transcribed to the best of my skill and ability, and in accordance with applicable standards.

Karen Hefferland

I HEREBY CERTIFY the foregoing to be a true and accurate transcript of the evidence recorded on a sound recording apparatus, transcribed to the best of my skill and ability, and in accordance with applicable standards.

Diane Rochfort