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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701, rue West Georgia
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APPEARANCES / COMPARUTIONS

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

APPEARANCES / COMPARUTIONS, cont'd.

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

APPEARANCES / COMPARUTIONS, cont'd.

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

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THE REGISTRAR: The hearing is now resumed.

MS. GAERTNER: Commissioner Cohen, it's Brenda Gaertner for the First Nations Coalition, and I am going to pick up from where I left off yesterday with my questions of Mr. Lapointe.

On my walk in through the slush this morning, I remember a principle that I find useful in the work that I do, and I wanted to share it if I could, it takes half a second. I heard it first in South America, and it's a principle called "ayni", a-y-n-i. And it's a principle which they use in all of their decision-making within their families and within their communities and much broader within the resources that they work with. And it's a principle of for everything that they receive from the Creator, they return to the Creator. And I love that word and I love that concept as a principle or an ethic.

And so when I returned to my work here in British Columbia, I began asking questions of the tribes that I work with along the Fraser and otherwise as to how they would interpret that principle and whether that was a fundamental. And they quickly went to the principle of reciprocity as a fundamental in how they relate to the resources and the way that they make wise decisions.

And so I just thought that was a useful thing to throw into the mix in our work and share that with all of you. It's a really simple principle and it actually applies almost always in our day. That's how they taught it to me in South America. And so hopefully today we can -- I can, with the benefit of Mr. Lapointe's excellent educational principles, give back a little bit to what we're doing today.

CROSS-EXAMINATION BY MS. GAERTNER, continuing:

Q Mr. Lapointe, we left off with a dialogue around timing assumptions becoming a little less predictable within the in-season time period. And because the Fraser Panel has such an important

role in-season, most of my questions will focus on that as we continue on, but I have some questions about post-season analysis and what happens with that.

A Sure.

Q And I just wanted to ask you to start with a reflection, as distinct from anything else. And one of the things that I'm hearing a lot, and Grand Chief Ken Malloway taught me this last week in my discussions with him. He was of course at the Fraser Panel meetings last week with you, and he reflected on how things have been changing over the last while from that principle of risk aversion, or risk averse, and then we went to precautionary. But we're not really sort of staying with precautionary, really. He finds the word now has become more flexibility. And so we went -- his sense of it, and you know how Grand Chief Ken Malloway is, he sometimes gets right to the point, and I thought that was an interesting observation, if nothing else.

And so I was going to ask you if you could reflect with us this morning on where you're finding in your work, both in the pre- and in the in- and in the post-season, that it's compelling you as technical staff and otherwise to be more flexible in how you interpret the data and how you work with the data, and then also the flexibility that you're finding is required in the decision-makers.

A Sure, Brenda, thanks very much.

Mr. Commissioner, I had an aha! moment this morning. I realized if I just turned the mike slightly, I could actually speak to you. I was finding it quite difficult yesterday to focus on questions and not direct my comments to you, which I realize is -- hopefully I hadn't made it more difficult for you.

First on just the general pretext of your remarks, all the words you used, depending upon who hears them, can cause certain reactions. If I was to explain what I would interpret to be the impressions that get left by those words, in some folks, "flexibility" would be interpreted as excuse to go fishing, for example. That would be one observation I would -- I would share with you. In some folks the word "precautionary" would be

interpreted as an excuse not to go fishing, and "risk averse" might be interpreted as an even better excuse, or a more substantive excuse, I guess. And so in trying to answer your question, then, I'm thinking about the various contexts that these words get interpreted and in the various groups that interpret them. And so I am trying to be -- it may take me a few minutes to compose my thoughts because of that.

Q And if you're more comfortable, think about your work.

A Sure.

Q And think about your work within creating the -- asking the questions of the data.

A Sure.

Q Working with the data, all of that which is necessary as part of your work.

A Sure. Sure. So --

Q Start there, if that's the most comfortable.

A Sure. So in the context of our work, then, I think it's about providing information about all the potential alternative outcomes, whether it's one particular focus on run sizes, for example. We try to provide the full range of run sizes.

Over the course of my career now, we had a number of run size models and they've changed. As recently as, you know, 2006 we probably had four or five different run size models that we're using. And so the way that we approached the information from a run size perspective was to provide the results of all the models. And so you can see in the minutes of different meetings, you'll see a range of model results provided. And we didn't have the capacity in the technical sense to quantify the uncertainty in the models. Maybe I need to help you understand the difference between those two.

But so the uncertainty, if you like, up until the last four or five years was quantified by the range of potential estimates that could result from different assumptions, different scenarios, if you like.

More recently, because of the desire and understanding of risk, and this comes a lot from my background with Randall Peterman originally, and then as it evolved over time and coming into the fisheries world more generally in the

literature, we've been trying to focus more on still providing this range of estimates but also providing some concept of the probability distribution around these outcomes. So not only what does a particular model say, given a certain set of assumptions, but what's the likelihood of a particular outcome, given the data that you have.

And so I spoke yesterday about, you know, the treatment of a new staff member to make sure that if folks decided they want to move towards a formal risk assessment type framework, and I'm probably not going to do a very good job of trying to define that for you, but that we would have a tool - a tool - that would do a comprehensive job of accounting for all the sources of uncertainty. And we're getting really, really close. We've made some incredible strides.

There's a number of challenges that are associated with that. Technically there's challenges, for sure. You need some bright people and we're very fortunate to have a particular individual who is extremely good in this area. But it's also understanding. And you know, I think in the last day or so we spent together, that communication of concepts like uncertainty, like distributions, it's if -- if you're making a decision about whether to have a fishery or not, the comfort of and experience of folks is to deal with a number.

Q How?

A You deal with a number, and everything else falls out. In all the review we went -- or in-season data flow, you see the numbers and you see, okay, how do you define the TAC? Well, it's the total run, minus the spawning escapement, minus the management adjustment. It's an arithmetic equation which all it has is pluses and minuses. And trust me, sometimes even that very simple arithmetic equation can be pretty hard to understand, as I'm sure folks have appreciated in my testimony up until this point.

So now what happens if you say, well, there's a 10 percent chance that the run is one million, there's a 50/50 chance that it's going to be bigger or less than four million, and there's a ten percent chance it could be as big as eight million. How do you take that information, do you

generate a distribution of TACs, and so, and how do you -- and all the technical part of that, like generating the distribution of TACs, all that stuff can be worked out relatively simply, even if it's not trivial. But then you've got to communicate it and you've got to have some understanding about what are you going to do with that? The key element that's needed from a policy perspective to move ahead on this is some idea of risk tolerance.

Q Exactly.

A And risk tolerance involves two things: what's the likelihood of something happening, and what's the consequences of that happening?

So let's turn our attention just to the consequences side of it because the likelihood is something that can technically be solved. Now we're back into the discussion we had yesterday about framing the terms of reference for judging the consequences. We talked about it in the context of escapement yesterday. So if everyone has a hundred percent agreement on the measure of the various consequences, we could make a very significant progress towards defining the risk tolerance.

We now bring into that equation the fact that you have different jurisdictions. You have a treaty between the United States and Canada. Each of those would interpret their risks and tolerances differently, just because of the nature of the size of their shares, where they fish, all these things. So while I have, since two thousand and --

Q Could you go one step further with me --

A Sure.

Q -- right on that thought.

A Sure.

Q You know the parties that inform each of those parties, and within each of those parties there is different measures --

A Yes.

Q -- of risk tolerance also.

A Absolutely. Absolutely. Absolutely.

Q And so there's a complexity one step further than the --

A Yeah, I didn't mean to stop where I did.

Q No, it's okay. I just want to work with you.

A Yeah, thank you.
Q That's fine.
A Thank you. So, you know, beginning around 2004 or so, I started to just try to get the Panel thinking about probabilities, okay? And I did a few presentations, and the goal was just to see if I could make some headway on the educational side of things. And it wasn't agenda driven, it wasn't like you shall develop, you know, risk assessment procedures, and trust me, I can show you how to do it type thing. You know by now from the time you spent with me, I hope, that that's not who I am, and it's not -- certainly not an appropriate role for me in my function in my job.

But it's challenging. It's really challenging. And Randall has come to talk to us, you know, because I know Randall is an excellent communicator. He's come and talked to the Technical Committee and the Fraser River Panel about uncertainty and risk. And so who better than one of the best people on the West Coast to start getting folks to embrace it.

But I think the crux of the issue is that it's the complexity of understanding and the complexity of the players, of all the players, the jurisdiction, jurisdictional players, that makes that a very formidable challenge. I've not, you know, given up in terms of my role to communicate, like we're still working hard, we're developing some new tools now that we have the run size models that -- that quantify these probabilities.

But I do have to admit that it's -- if -- it's a fair amount of effort to do this, and if there isn't strong policy direction on whether it's going to be used or not, sometimes I ask myself whether I'm -- you know, why am I spending so much time building this tool, because I don't know where it's going to go. Not that I'm an outcome-driven person. I am definitely a process-driven person because I have to be in my job. But it does -- I don't see a clear endpoint. I don't know where it's going.

And so you sit there and ask yourself, well, I'm spinning my wheels in the mud here and it's -- you know, I'm pushing hard and it's taken a lot of work and where is it going? And so there's an element of that with respect to this topic that,

you know, losses of staff, can only, you know, do our part, our little part of it. And there's a bunch of other parts that have to be done by folks with other responsibilities, particularly on the policy side. So, you know, kind of the gentle nudges and opportunities, providing opportunities are kind of the role that I see us playing. But beyond that it starts to get into kind of outside the role, I think.

Q Okay. I'm just going to -- you've said a lot and I'm just going to work with a couple of the things that you've moved to.

A Okay.

Q And one of those is that I heard you give amazingly useful examples of where as technical staff you're measuring uncertainties and risks within the data.

A Right.

Q And you're also making decisions about which ones you're going to run, and for what purposes. That's just the nature of your work. And those are informed by the questions you received from either of the parties, or your own technical work, but those are all decision-making that is --

A Sure. Sure.

Q -- being done at the technical level. And that as it's -- at the technical level, then, you are challenged to respond to the complex team that you're working with. And I'm going to keep going with that in a number of ways.

A Okay.

Q And so let me just now take you briefly to the pre-season. And I would like if Ben could bring forward document 13 on our First Nations Coalition list.

A Mm-hmm.

Q And that's a summary article by someone you -- you've spoken of quite a bit, Dr. Randall Peterman. And as I understand your evidence, and I think it is clear, is he is a very useful communicator and very informed on forecasting and forecasting models. Would you agree with me on that?

A Last night I heard Randall speak at the Vancouver Aquarium where he received the Murray A. Newman Award for Education and Scientific Excellence and he gave a presentation which actually contained

some of these slides.
Q Oh, good, collective consciousness at work, shall we say. And, Commissioner Cohen, one of the reasons I'm bringing this forward is not so much that Mr. Lapointe needs it, he clearly doesn't need it. But I'm going to refer to it as we continue in the work together, because I describe it as a layman's approach to pre-season work. And I think again you're familiar with this presentation are you, Mr. Lapointe?
A Randall has a gift.
MS. GAERTNER: And so I want to turn you first to page 11 of that document and I want to go to Tab 3. Perhaps we could mark it as an exhibit at this point.
THE COMMISSIONER: Yes, thank you, Ms. Gaertner. Is there a cover page for this document?
MS. GAERTNER: I'm sorry?
THE COMMISSIONER: Is there a cover page for this document?
MS. GAERTNER: The only cover page that I have begins with "Can we do pre-season forecasting effectively? If not, what can we do instead?"
Commissioner Cohen, if you would like me to find out where this is published, or I can do that. It was in Ringtail, and so I just --
THE COMMISSIONER: No, I don't need to put you to that trouble. I just --
MS. GAERTNER: Okay.
THE COMMISSIONER: I just didn't know if I could personally identify this. So you're marking -- what is it exactly you're marking as an exhibit?
MS. GAERTNER: I'm marking document 13 on our list of documents.
THE COMMISSIONER: Okay.
MS. GAERTNER: It's CAN number 17837, I believe, and it's -- it begins with the title of his presentation called "Can we do pre-season forecasting effectively? If not, what can we do instead?" I, when reviewing this document, wasn't clear on its age. I notice that it came out of somebody's material at the bottom in 2009.
Q Mr. Lapointe, you may know roughly when this was done? I don't.
A He's done this a few times. I think it was at the -- one of the public meetings of the think tank. It might have been March 2009. So I bet you could

find this on the proceedings of the SFU Continuing Studies website.

Q I'm confident -- I'm not using it for controversial material. I'm using it so that it can help organize thoughts. And so I'm going to take you to Table 3, and in particular that is a summary of the various different types of pre-season forecasting models that are used. It's on page 11, sorry.

THE REGISTRAR: That will be marked as Exhibit 334.

MS. GAERTNER: Thank you.

EXHIBIT 334: Presentation of Randall M. Peterman entitled "Can we do pre-season forecasting effectively? If not, what can we do instead?"

MS. GAERTNER:

Q So he's just summarized the various different types of pre-season forecasting models. And from your evidence and from this list, I have collected four primary ones. I have some questions about that.

A Sure.

Q I just want to start with a factual question, which is, for the models that he's listed there, is our model in there in any particular number, or are we actually using a hybrid of many of these where we have that information? I'm just trying to understand that part.

A So I think you're going to have someone come to talk to the forecasting. And I'm a little bit -- I mean, I can answer your question, okay, but I just want to make the Commissioner aware that there may be a presentation on pre-season forecasting, and pre-season forecasting is the responsibility of DFO. But because I've been involved --

Q Let's stay strategic.

A No, I understand, but I just -- I just think that just so sometimes I feel like I'm saying things that someone's going to say in another three days, and maybe that's okay in terms of this context.

So the way that the forecasts work is that there's a whole suite of models. There's probably -- this is probably a pretty good list. I think all of these would be used in Fraser sockeye.

There would be some variation, depending upon the particular stock.

For example, juvenile data isn't available for all the stocks.

The sibling models is kind of an interesting one, and I suspect this paper that you brought up has some information about it. It's the idea that if you have different age classes and you have an age class like an age 3 age class that returns the year before the age 4, is you can use the prior year age 3s to forecast the next year's age 4s. That was actually a very, very good method for Fraser River sockeye, because age 3 fish are typically called "jacks". There's also some "jills", just as the case -- just for the sake of letting people know. But that the portion of those jacks has decreased dramatically. And so those models have deteriorated in their capacity. Interestingly enough, another benefit to the Alaska situation that we talked about yesterday is they have a lot of different siblings to choose from.

Q Mm-hmm.

A Which gives them an advantage in the forecast side. Although I suspect you'll see in this paper, it will show that the forecast performance of Alaska and British Columbia salmon forecasters is about the same. I don't know if equally good or equally bad is the correct way to describe it, but they're pretty much the same.

So this, the way it works is there's a suite of models. Each of those models is fit to the data. There is something called the retrospective analysis that's done that compares -- that kind of asks the question retrospectively, if I'd used this model in 1962, how would it have forecast in 1962 run? And so forth, going through in the sequence.

So when I talked yesterday about how the best model is chosen, it's the model that performs best in that sort of hindsight analysis. And one model of all the suite that are evaluated is chosen typically to make the forecast, based on --

Q One model for all of them?

A One model for each stock. This analysis is done for each of the 19 stocks.

Q Okay.

A And the best model for each stock, one -- one model for each stock is chosen as the best model, and that's used in the forecast.
Q And who chooses that?
A It isn't a person who chooses it. It's the statistics that defines it. In other words, there's the statistic --
Q The work of the PSC technical staff?
A It's DFO staff that --
Q DFO.
A -- conduct these.
Q Okay. So this is now the work that goes into FRSSIs, or I'm getting it -- no, it's not.
A This is -- this is part of our pre-season planning. Canada has a responsibility to do the pre-season forecast. Before in-season data is collected, we receive those forecasts from Canada, and I'm just describing the methodology used to select the best model.
Q Okay. I'm going to keep going, then.
A Okay.
Q We will have more people giving us more details on this.
MS. BAKER: If I can just clarify, we will have the modeller who does the pre-season forecast modelling here to explain all the detail of how it's done, so...
MS. GAERTNER: I'll stop.
MS. BAKER: Yes.
MS. GAERTNER: Yes.
Q All right. The place where I was going to go with this list, and is to then say we take those different technical things. There is staff that you're not -- that within DFO that does this. The whole goal in the pre-season work, once it gets to -- to managers, perhaps, is to help prepare, I heard you say -- help prepare decision-makers in in-season complexities to consider all the options, helps to set the minimum target escapements, and before we get into the in-season complexities to some extent, and it helps to reduce some concerns that may have been worked out amongst the parties by projecting into the future what are possibilities so you don't have to work out all the details in-season.
A Yeah, I think the best word I would use is -- or two words would be contingency planning. I think

it -- I think that's what the idea is, that it defines a range of potential returns for contingency planning. So for example --

Q Thanks. Can I just go one more step further --

A Sure. Sure.

Q -- before. And it helps harvesters and fishers to prepare for the season ahead perhaps.

A Yes. Yeah, I mean they -- you know, I think processors, for example, are quite interested in potentially the number of cans they might need to purchase going into a coming year. Fishermen might want to know the likelihood of the fact that they have their old nets. Should they -- if they're going to only fish for a day, maybe they just want to fish the old net. If they think they'll need a lot of fishing, they may want to fix their nets. So it does impact investment decisions that have to be made prior to the season about, you know, potential probabilities of outcomes.

Q And if I understood your evidence to date, one of the challenges associated with that is that typically you're using numbers to explain those options. More and more those numbers are becoming challenging to rely upon, or potentially dangerous to rely upon. And so how much help do the local -- the harvesters of Fraser River sockeye within the migratory routes of B.C. and Washington need that fourth item any more?

A You know, I think you'd have to -- have to put that question to them. I do get phone calls occasionally from processors saying, you know, I haven't seen the forecast yet, Mike, but, you know, what do you think? And that may, you know, be used to, you know, drive some decisions about the number of cans they buy, and so forth.

So it's clearly been understood and perhaps there's less confidence now than there was 25 years ago, that fishermen live this every year. And so they have experienced the uncertainty. They understand that when a forecast is made that they can't necessarily bank on it. And I would not be surprised if the confidence or the, you know, impression about that has changed in this period of declining productivity, because we have seen a number of years in a row where the run has been less than forecast. So if you're a

fisherman, you might consider that to be a -- well, all of us would consider it to be a disappointment. Fishermen might consider it disappointment in a different way.

So maybe now fishermen are more sceptical than they were in the past, but they are not surprised by a situation where a run size forecast point estimate doesn't materialize. And in the last probably close to 15 years - what's the year, 2011, 15, yeah, easily 15 years - those forecasts have been presented as probability distributions. Distributed, so with a very broad recognition. I mean, you probably have tables on Ringtail you can pull up, but there's a pretty wide range of potential outcomes. And so not only are fishermen used to it from their personal experience, but they're being reminded of it every year when they see the forecast now that, hey, you know, could be this, could be that.

So there's no lack of understanding in those of us that are involved, including fishermen, user groups, about the uncertainty that's associated with pre-season forecasts.

Q All right. Then I'm going to now then take you to Table 5 of that document of Mr. Peterman's and that's at page 16. And he's done again a useful layman's summary for implications of errors within the pre-season forecasts.

A Mm-hmm.

Q And some suggestions on what we might do --

A Yes.

Q -- in relation to those. And I'm going to have you just briefly review those and see whether you'll agree with them, and then I'm going to turn you to a couple of them. Particularly getting your assessment of where you think we're at in the work that Mr. Peterman has succinctly summarized there for us. How are we doing in improving in-season monitoring and the updating of forecasts and linking that to decisions that are being made?

A Well, that, I mean, you know, this is a great list. I agree with every one of them, and the first one, of course, is kind of in my alley, and so you might think that I'm kind of the -- defending my empire, so to speak. But this is exactly where I would focus the energy in.

Q Is in number 1?

A Is in number 1.
Q All right.
A Yeah, absolutely.
Q But he goes to six more places and so we (indiscernible overlapping speakers).
A Yeah, and I'm not trying to suggest that those others aren't --
Q No, but I'm going to ask --
A -- important, but I don't think there's an accident of the order that he's listed them here.
Q Ah, thank you. Great. And I -- you know, again it's not a criticism. What I was going to next was this improving the monitoring of ocean environments. As I understand the evidence Commissioner Cohen has heard, there is a growing trend to ensuring that our work is in-river and at the mouth is complemented with increasing knowledge about the ocean environment.
A Mm-hmm.
Q And he lists that as second. Would you also agree that that would be a useful next area of priority for understanding more of the information, or gaining more of the information we need?
A I would agree. But I would provide a bit of a context, and this is where I may disagree with some of my colleagues, I'm not sure. But there's a tremendous value on the understanding side to doing oceanographic research, no doubt about it, particularly in the context of a changing ocean. But the challenge, if we want to link the study of the ocean to improving our forecasts, which is quite often the link that's made. In other words, this is a document about pre-season forecasts and here's a list of things that we should do, is that is the complexity of trying to link understanding of the ocean to improvements in forecasting.

Right now - and this may even be a slide that's in this presentation, I'm not sure, it was a slide certainly that Randall presented last night - about two-thirds of the variation in returns cannot be explained, is unexplainable by the information we have in that list of models that you showed me initially. About two-thirds of it can't be explained. So there's certainly a lot of room to improve. No doubt about it.

I mean, you know, one-third, and the interesting thing about this, or maybe it's the

kind of somewhat depressing thing about that, that's if you knew historically what the best model was in each of the years. So Randall did a very large grant and said if we'd known what the best law was for picking 1962 and we'd picked that one, we could explain about 30 percent, which means about two-thirds of it is not explainable.

So coming back to this ocean monitoring thing and this may be an unfair comment for me to make, because I'm not an oceanographer, but I think that the benefit of the ocean study is more on the knowledge side and I would be quite sceptical about the likelihood of being able to take that two-thirds that we currently don't understand and shrink it substantially by going out into the ocean.

And the reason should be somewhat self-evident, but it's -- think about all the events in a fish's life from the day it leaves the mouth of the Fraser River. And as a fish that's about 80 millimetres, or two-and-a-half inches long in the case of the Fraser sockeye, makes it way into the Strait of Georgia, swims up most of the time through Johnstone Strait, ends up something like 2,500 kilometres away from the mouth of the river, swims around in the Gulf of Alaska for a year or two, swims all the way back, 2,500 kilometres, and ask yourself whether you think there's a high prospect of developing some sort of a mathematical model that explains even if a hundred of those guys left the mouth of the Fraser River, how many do you think would come back?

Remember the presentation I gave at the very beginning, Exhibit 1, and I provided an example for you of the ratio of the best year and the worst year for Chilko sockeye. The worst year was 2009, not too surprisingly, where three out of every one of those 1,000 smolts that left Chilko Lake - not reached the mouth of the river, we don't have that number - made it back. The best year, almost 24 out of 100 made it back.

And I made that point that that ratio is about a factor of 100. That's the amount of variation we've seen in just the last 50 years - and I say "just" because you've got to take kind of a long-term view here - in just one stock and its relative survival in the ocean.

So what we're trying to do is explain something that could vary by a factor of 100 by building some sort of model that explains each of the events in that little fish's life over that broad, broad spatial area. And just think about the logistics of conducting a research program, and you can talk to folks who work on the high seas about how difficult it is to work on the high seas.

So I'm not trying to say don't invest any money in the ocean. That's not my advice. My advice is don't -- don't believe that that investment will result in a substantial decrease in the amount of unexplained variation. I think that's a tremendous -- it's too much to expect.

So I'm sorry if I'd spent more time on that one than perhaps...

Q I'm just going to want to ask you, actually, if I could, one question arising from that, which is again an --

A Sure.

Q -- observation. Which is we can work very hard at a scientific level to run a lot of models resulting in a lot of data, resulting in a lot of uncertainties and a lot of risks, and eventually where we get to is decision-makers who rely on that data.

A Mm-hmm.

Q And one of the key important things in ensuring wise decisions is to make the decision -- make sure that the decision-makers reflect a balancing of the risks. Would you agree with me on that?

A Yeah, and so circling right back to the first one, then, if I had, just throw out a number, $10 million to invest or something like that, I would invest that -- and this is where perhaps I'm not the best person to say this, because you could probably, you know, accuse me of conflict of interests because this is what I do, right? So I'll be upfront about that. But I would invest it in the in-season monitoring and in the uncertainty side of the equation. Because look what in-season monitoring has done for us.

Start with the pre-season forecast. Yes, I guess the way I'll put it to you, ask the question: If we'd started the season with 1.5 million sockeye forecast for 2009, how did the

behaviour, how had the season differed? How it had -- because what happened was, and I'm not saying we get it right every year, okay, because we don't. We detected a low run very early. We put - we put, wrong way to say it - only eight percent of the run was harvested, 92 percent of the run was made available for escapement. Ask yourself how the outcome would have been different if we'd started the season with an estimate of 1.5 million fish. Would it have been 100 percent of the run that would have been made available for escapement and none of it harvested? How different would the outcome be?

Q And those are exactly the types of decisions that people are looking at in-season when they're beginning to get data which has a lot of different types of potential interpretations; is that correct?

A Yeah, for sure.

Q All right. So I'm going to take you to a couple of examples on that as we go forward. But it is a continuing complex measuring of risks. We have agreement on that, I think, yes?

A Absolutely.

Q And one of the ways that I've observed that we're trying to sort of alleviate some of those risks and uncertainties is to be begin to develop decision-making guidelines or rules. As I understand it, and we're going to hear much more detail on this, both FRSSI and IFMP within Canada's work is beginning to do that. But if I understand the Policy and Practice Report and the information that I think you provide in the evidence, and I want you to speak on this, that has not been done at the Fraser Panel level, is that correct? We don't have in-season decision-making guidelines or rules in any written form at the Fraser Panel?

A No, no. No, we do have rules. We have very specific set of rules that relate to the earliest decisions that the Fraser River Panel makes, the initial fisheries. And do I have -- I don't think I have anything that I can pull up that I can help you understand this. But it relates to what I said yesterday about trying to compare the in-season data to date to what we might have expected under different forecast levels.

We have actually a very formal process where we look at three things. We look at the stock proportions and the samples relative to what would have been expected, given the pre-season data. We look at the relative abundance through the approach areas. And when I say approach areas, I mean through Area 20 in Johnstone Strait. And we look at the escapements to date.

And we ask the question before we make any decisions about fishing in -- on those early -- earliest fisheries, these are fisheries that are being contemplated before the data is sufficient to provide any credible estimate of abundance that's different, substantially different than the pre-season forecast.

So you're -- you're in kind of a no-man's land in terms of your in-season flow. You have just a few pieces. So we picked out the three or four pieces that we thought we could use to help the Panel. And so, for example, if there's a particular stock in the stock proportions that we're expecting that looks particularly weak, then that might be reason that the Panel would say, well, wait a minute. The abundance is there, the escapement to date is there, but one of these stocks is not there, so that's a -- that's a red flag. Another red flag would be raised if the abundance to date is not yet at the level. And another red flag would be raised if the escapement to date is not to level. So there is a --

Q There's a practice. What I'm hearing you say is there's a practice of approaching the information.

A There's a practice and it's a well-defined protocol. Like the Panel understands -- that's one of the purposes of the pre-season model, it defines the context for making the judgment that, yes, the in-season data, it's the only thing that we can use and is used in very -- I mean, it's not, I guess, written down as a formal policy document, but the Panel clearly understands that the data has to be consistent with what you're expecting; consistent with a level that could sustain a fishery in order to open a fishery.

So that's, you know, if you characterize as a practice, I guess, I don't know, maybe it's bit of -- bit of semantics. It's definitely a well-understood approach, a policy guideline that we

follow for those early season decisions.
Q I think that's important. And I just want to -- Ben, if you could also call up the Policy and Practice Report, which I believe is the Policy and Practice Report 5. And if you could go to page 96, and I'm just going to see if we need to clarify this.
A Sure. And maybe the things you are referring to are things that aren't a part of the Fraser Panel, and maybe that's where we're at. I'm not sure.
Q And I guess that's important for me, because that's where the decisions are being made at the in-season; that's correct?
A Sure.
Q All right. So as I understood paragraph 258, 259 and 260, and particularly the last sentence, and it's the end of 259, and if we just need to tweak this, let's tweak it, but let's just make sure we have this correct.

I understand Canada and Canada's caucus relies in some ways on the IFMP guidelines, but I'm looking to see where we've got guidelines for the Fraser Panel members and how they're going to make decisions in-season. And I really do make a distinction between a practice, which is built up over time, based on the people that have participated till that point in time, and policy guidelines going forward into the future which have been developed by those that balance risks and certainties in different ways. And as I understand it, we're at a -- we might be what we call that, have a moment in time, at the Fraser Panel because at paragraph 259, there are no strict in-season decision rules for the Fraser River Panel, although through the caucus they adhere to the IFMP. So could you tweak that for us, if you need to, or comment on that.
A Well, just let me look at it and see if I can help you.

All the FRP decisions, first of all, within Canada, would follow the guidelines of the IFMP. Is that clearly understood? In other words, the Fraser Panel is -- the Canadian section of the Fraser Panel is not independent. It is in fact the same individuals in some cases domestically. So there is no distinction between --
Q No, are there guidelines and rules that the Panel

members of -- representing the United States and Canada collectively use at the Fraser --

A So you're talking about bilateral -- bilateral rules.

Q Absolutely I'm talking about --

A So that the example --

Q -- the rules of the Panel.

A So the example that I gave to you is one example that I would characterize in that sense. In terms of some written set of rules or formal structure decision, kind of, you know, recipes, or something like that, there's nothing like that that I'm aware of that kind of drives the -- formally drives those decisions.

Q Okay. Ben, if you could go then back to the other exhibit that we had already opened, and let's go back to Table 5 for a moment. And that was helpful, and we now have that in the evidence to help us with that paragraph.

I want to go back to the implications of errors in pre-season forecasting, and I just have one more topic on this. And in particular I want to go to paragraph 6, because it's in which Dr. Randall Peterman says that one of the implications of errors in pre-season forecasts are reducing expectations about accuracy of the forecasts. And the -- and I thought his comment there was somewhat picked up in what I understood your evidence to be yesterday, that it is difficult to explain uncertainties to the public, to managers, to the media, to the harvesters of the fish. You're just using the one page of all the numbers.

Those were -- you know, looking at those numbers, often actually requires, as you said this morning, expertise and understanding how to use them. But it looks -- but a number goes a long way pretty quickly, you know, if you say the run is going to be nine million and if the run is actually two million, there's a lot of work that has to be done as a result of that.

A Mm-hmm.

Q But if you say this is the type of fishery we're anticipating and here are some of the complexities associated with it, that's a different story; is that correct?

A Yeah, and so I think what I tried to describe yesterday when I went to the pre-season, is that

in fact the Panel for sure, and I think Canada also separately, and I should perhaps provide an example, uses -- well, I shouldn't say Canada separately. Canada in addition would do additional things sometimes because of their context, but uses that uncertainty. Like the uncertainty range defines the set of scenarios that the Panel would consider. And for example, because of the last several years of runs being less than forecast, I know in Canada there's been additional work done at even lower run sizes, run sizes low enough so that the available -- total available Fraser River aboriginal harvest would not be available, for example.

So that if the eventuality happened where the run was so low that the full - for a notional sense - 750,000 was not available, and there was a need for groups to understand how they would share a less than full amount, then that kind of contingency planning gets done and the probability distribution of the forecast provides some help about the likelihood of that event happening. And I'm not part of those meetings, but I do understand that those kinds of plans get done, and perhaps you're aware of some of the more detail.

So that that, as I said yesterday, that kind of contingency planning can be started in the winter and spring and there's time, and not have to be dealt with in the heat of the moment, because you didn't think about that possibility.

So but the challenge, you're right, on the communication side we need to use better words. We need to perhaps consider some different kinds of pictures. There may be lots of different ways we could improve the understanding out there.

Q Thank you. I've just got a couple of technical questions that are a little bit less strategic in nature. Sorry, Commissioner Cohen.

THE COMMISSIONER: Ms. Gaertner, I wonder if I could just -- and I apologize for interrupting, I just want to --

MS. GAERTNER: No, please.

THE COMMISSIONER: -- understand this one point. And I'm not being facetious, Dr. Lapointe, but why is this called a "forecast"? And the reason I ask that is from the last several days of your description of the process, if I can draw an

analogy that some counsel have to weather forecasting --
A Mm-hmm.
THE COMMISSIONER: -- where you do have satellite images, where weather forecasters or scientists or meteorologists can actually visualize what's coming, and subject to a change in wind or something of that nature, they can reasonably say to the user groups in the next five days, or perhaps at the most ten days, we can tell you this. But you've just told us that you really don't have any information about what's coming. So what does this word "forecast" mean in your world?
A You know, the history is, you know, it probably comes from the statistical jargon. You know, it's a statistical forecast. That's a prediction. That it's not -- there was no kind of -- well, I don't know when it was first used, but there's no kind of deliberate thought about trying to use a different word and maybe the choice of a different word would do a better job of conveying that it's not the same as a -- as a weather forecast. But it's interesting that you bring that up, and I don't know...
MS. GAERTNER: Is it more accurate if I may, Commissioner Cohen, to actually call it a pre-season possibility?
A Maybe that would help folks understand it better.
THE COMMISSIONER: I wasn't trying --
MS. GAERTNER: And range of possibilities, because it is actually exactly as you're suggesting.
THE COMMISSIONER: Well, I wasn't trying to split hairs. I was just --
MS. GAERTNER: No.
THE COMMISSIONER: -- thinking in my own mind as you've started to --
A Sure.
THE COMMISSIONER: -- describe the process that, yes, the humans are doing models, but you've indicated to us that the information you have on the ground is almost nothing.
A Well, it's -- the analogy of weather forecasting is excellent, and in fact Randall uses it in his presentation and I heard him use it again last night. You're exactly right. We, the public, is used to dealing with weather forecasters, and

weather forecasters have something like -- well, first of all, they never want to -- everyone would understand that once you get ten days out, weather forecasters get quite nervous about making more than a ten-day forecast. For their five-day and ten-day forecasts, they probably have a thousand or more satellite observations, as you say, fairly direct measurements with some predictable understanding of the physics, which they can use to make a forecast.

So characterization on the salmon side is that we have a few pieces of data and we're making a projection that pretty much most of the time is four years out. So it's kind of a ratio of two things, the observational dataset that you have, and the amount of time in advance, or into the future you're looking.

If the weather forecaster isn't willing to make a more than ten-day forecast and he's got a thousand times more pieces of information, why do folks expect, or perhaps you could ask the question, why do we even try, perhaps. But I think there is a value, as I said yesterday, it's not surprising that the public would misperceive the capacity because of their personal experience.

So I'm not sure if that's why you brought the weather analogy up, but that's -- but it is a very good one.

THE COMMISSIONER: Thank you. I did bring it up for that purpose, because you indicated a few moments ago that as an example that a user group may contact you or look at the information and make decisions about investments. And is that because that's just the way they have to function, or is that because they have a certain degree of reliance upon these forecasts, or is it...

A I think it's mostly the former, sir. I think that they have to make a decision -- you know, you can't order the number of cans you need ten days before the fish arrive. It's a constraint on the time lag between the process of making that decision, whatever has to happen and when you may know more about what's going on.

THE COMMISSIONER: Thank you. I apologize for interrupting.

MS. GAERTNER: No, no, I'd actually like to ask a follow-up question on that, if I may.

Q Which is, you keep referring to the processing plants that need the advance warning. And so there's two things that I'm just curious about, which is one, the small bite fisheries that we're beginning to talk about, and the ITQ fisheries, and many of the aboriginal fisheries are actually fairly easily accessible to the water. They don't need to travel long distances --
A Mm-hmm.
Q -- like in Bristol Bay, or any of those things. And so the importance of them understanding the risks is actually much more complex. They need to know what kinds of decision may get made in-season and what they're going to do. They don't really need a guaranteed number ahead of time. Would you agree with me on that?
A Yeah, and the reason I bring up the processing one is just because it's an example that came to the top of my head.
Q Well, I think it's important, and now I'm going to go one step further. Because cans don't rot. They can -- they can be put in a -- in a warehouse. And these types of decisions are the kinds of decisions that there is pressure on the industry, and there's pressure on the fisheries about. And so the -- I actually would like to know whether or not it would be more useful for you to be very clear to those -- that this is, yes, pre-season work. These are the options that we've looked at, and there's a whole bunch of variabilities, and that these are the kinds of decisions and guidelines we're going to use in-season. Would you agree with me that that's actually a fairer picture of the complexity you're -- you're juggling?
A I'd like to think that we are clear. Like I don't -- when the gentleman calls me up and asks me what my take is, I provide a range of possibilities. I don't think -- and also the folks that do -- and it's not -- it doesn't happen that often. I probably think of a handful of times it's happened in my career. But when it does happen, the folks that are calling also have lived for many years and they understand. So they're looking for -- he might -- I might tell him something, he might go off and say, okay, well, he said this, and this person said that, and another person said that.

I'm going to do this, you know, and he might only buy half as many or whatever.

But in the context of the ITQ, I think it's a good thing to think about, because now on the economic side of the ITQ, which I didn't talk about yesterday, one of the things that's happening is the catch is being spread over the weeks. And part of the motivation for doing that is to try to have as many of the fish that are harvested go to the fresh market, because you get a higher price for the fresh marked. Whereas if you had a fishery that caught a million fish on a Monday and all those fish entered the plant, there's all the plant stuff related to that, but there's no way you're going to sell a million fish in the fresh market in Vancouver. But you spread those out over six, eight, ten days, then all of a sudden -- so there is a change in this sort of storage issue related to this change in the structure of the fishery, is I guess what I'm trying to say.

Q Okay. And I meant no disrespect to the industry in commenting that cans don't rot. I was just being clear that there are implications associated with these decisions.

A Sure.

Q I'm going to just try to ask a couple of technical questions and then we'll have another round of this strategic level. I just wanted to understand DBE's and MAs a little bit more before we get into more detail about them. And as I understand it, depending on the year and the particular stock, a DBE has the effect of increasing what we call the final run size; is that correct?

A If it's added to the total run. In the years when it's added to the total run, it does increase the total run relative to not including it.

Q Are they also then considered four years later when you're looking at the MAs? Because you've got fish added that haven't been observed or counted, and then you're going to start making decisions that that was the run size four years earlier, and we're now projecting what -- given that run size what this year is going to be. Do those DBE's then get considered when looking at the pre-season forecast four years later, and developing the MAs, or are they standalone --

standalone numbers?
A So there's -- there's some confusion here that I'm going to have to try to help you with here. The -- there's no feedback of a decision about a management adjustment on a future year's management adjustment. In other words, the management adjustment doesn't come bigger or smaller in a future year because of something, some decision you made about a management adjustment in the past year.
Q So the management adjustment is forward looking.
A The dataset for the management adjustment is not affected by whether or not the management adjustment is added to a total return in any particular years. The management adjustments that are in the dataset include both positive and negative deviations.

Where the feedback is to the forecast, and this may be more the question that you're asking, and so that we'll talk and we'll hopefully figure that out, is that if there's a -- if there's a year when we think there's been an en route loss, where we add the DBE to the total run, then in the forecasting sense the impact is that that total run influences the productivity because the run is bigger, right? So all else being equal --
Q If that -- if those fish got to the spawning grounds, the run will be bigger.
A No, the run -- the run part of the -- the forecast has got two pieces of information. It's got the number of fish that spawned, which are not impacted by DBE's at all. It's the estimate of number of fish that made it, right?
Q Yes.
A No DBE impact at all. And the number of fish that return from a particular spawning, right? I mean, you have to -- you have to be able to say in the past how many fish on average have returned for a given number of spawners. That's what the forecast analysis is. It's taking all of your historical data, lining up all the parents, the abundances and the parents, all the returns in the return years. So they're offset by four years, right, because the spawner from 2006 generates a return in 2010. So parents and -- parents and offspring, if you like.
Q I got it, yeah.

A You got that? That's the historical dataset. So whenever there's a number, like a DBE, added to the total run, it doesn't affect the parent number. Those number of spawners are the same, but it does affect the return. So your impression about the return in those years where you've added something to it, this DBE, is going to be that it's a larger number than it would have been if you'd hadn't added that number.

Q Right.

A So you might then if -- let's just take an example, a very simple example, where you have two datasets, one that's never had a DBE added to it ever, and another one where, say, 100 fish was added every year to the DBE. Okay? Two simple examples. One of those datasets would have a different impression about productivity. The one without the DBE would have a much lower impression of productivity, and by productivity I mean the ratio of that return number to the number of parents, than the one that had the 100 added just to the return column. Right? If you add the 100 to every one of those returns, that ratio is going to be bigger. So that's what we call productivity, that ratio. So the impact on forecasting is then when we add that DBE for those years, our impression about productivity is that it's higher than it would have been had we not added that number to it.

Now, just to complete the story so that we're not, you know, misleading anyone, we're aware that that is the impact of this. The reason that we make a deliberate choice about adding the DBE or not is that we believe by adding it we're getting a more accurate estimate of the total return than by not adding it. In other words, we don't add it to the total return to give the misimpression of higher productivity. There will be some years where it's not added. Right?

But because it's, as I said yesterday, an on/off switch, it's either added or it's not, there is this potential implication, which is why I've already spent too much time talking about why I want to attach some more discipline to these decisions, so that we are cognizant of that. And one of the things in this framework that we've been discussing in the Tech Committee is just the

simple task of making it easy for any analyst to do the analysis with or without. Do the analysis both ways and understand how -- in other words, do the analysis of both of those datasets, one that has the DBE in, and one that has it out. That's one of the first objectives that we have in trying to make it simple for folks to understand the implications.

So that's the feedback on the forecast. But this feedback with the management adjustment really doesn't affect the management adjustment datasets at all.

Q All right. So if I could summarize, and I want to just do that quickly, the DBE's could give the impression that we are going to get a larger return. You're aware of that, and I just want to know who the "you're" is in that sentence. "We are aware of that"; is that PSC staff?

A All of -- all of the folks that use the data in terms of particularly the forecasters, those folks on the Tech Committee are aware of this issue.

Q So this is -- this is particularly a technical analysis that -- or one of those technical practices that are being developed?

A Yes. Although we don't -- we don't work in a vacuum, right?

Q I appreciate that.

A So the Fraser River Panel is definitely engaged and aware and this is one of the reasons why -- why we are, you know, kind of focused on this issue right now is just to, you know, make sure there isn't anybody who isn't aware, right? So that there could be no misconceptions about the potential impact on the data flow.

Q Okay. Just a couple more questions on DBE's and MAs. As I understand it, it is one of the places within the numbers that water flow and -- river flow and river temperatures, is there anticipated that we will also be using other indicia of global change or climate change within that? Are there any soon to -- are the indicia being developed at the mouth, or further into the ocean, or other places that -- and particularly I'm also curious about whether there are any indicia you're looking at in there with respect to cumulative impacts and the complexities associated with that?

A Sure. First of all, the ability to calculate any

kind of -- anything called a DBE in the first place kind of requires two watches, if you like. In other words, you have to have two measurements to understand what it is, in this case, in sort of a context that whether there's a loss between them, right? So the ability to move out, say from the Fraser River out into the ocean, would be influenced by the ability to have a tool that told you something about whether there was a loss between the marine areas and, say, the mouth of the Fraser. And we do of course have our test fishing tools, but we haven't talked too much about trying to use those to develop sort of an equivalent concept to the DBE for the marine component of the migration, at least till they get to the coast.

Q I'm following you.

A That's the first part. I'm going to lose my train of thoughts. I may need to have you help me out. Oh, the other indices --

Q Cumulative impact indices.

A Cumulative impacts. We've talked -- we -- the folks that are most involved with DBE's on the environmental side are folks in the DFO's Environmental Watch Program, and you're going to have David Patterson here soon to talk about that. And David probably can do a better job that I can, but I'll just go briefly.

We've talked about different ways to account for the temperature effect. So things like accumulated degree days. So what I mean by that is like the temperature times by number of days that a stock might be in the river. So we're using an average temperature now. Maybe it's better to think about the cumulative temperature experience over that fish's life in the river as a better predictor. There's those kind of issues. There are things that we've talked about as what's the best way to capture the environmental impact on the fish in terms of an index.

Some constraints that we have relate to the in-season period, in that we need something that we can have in our hands at the time, in a timely enough way that it influences decisions. So what I mean by that is that in an ideal world, if we knew the temperature that the stock was exposed over its entire 30-day duration in the river, that

would be a way better predictor. But by the time we had that piece of data in-season, those fish would have been maybe on the spawning grounds, you know, so we have to make, you know, we are making decisions.

I don't say we have to make decisions. Currently we are making decisions significantly sooner than when the fish has experienced higher freshwater experience. Right? They're made a lot sooner. So the -- so it's just to understand that there are predictors out there that might be much better, but we might not have them in a timely enough way to be useful in our current timeliness of our decision-making that we have right now.

Q Primarily because the largest access to those fisheries is the marine?

A It varies by year. I mean, I'm sure you guys have gone through --

Q But that's the pressure. The pressure is that you're in -- no?

A I wouldn't characterize it as pressure.

Q Okay.

A I would characterize it as a reality of the way the allocation is currently set up. It's not --

Q That's fine. That's sufficient on that.

Just a couple more questions on the kind of indicia. Would it be useful to have health abundance and genetic diversity going up through the main stock of the Fraser and all the way up to the spawning grounds?

A Health indices are another one of those things that we're talking about. I think David could speak to this more, because he's done a lot of work in that area, David Patterson.

Q Okay. I just want to pause, primarily because I found your observations on the Bristol Bay comparisons quite useful, in particular that we only have one mouth in the Fraser, one main mouth. Cumulative and growing impacts of urbanization at the mouth of the Fraser must be something of interest to the -- to your work; is that correct?

A Not directly, because I'm not involved with that directly. But certainly folks who are involved on the Habitat side within the DFO would certainly be very interested in that.

Q And again, given the need to develop indicia for impacts, that would be an area that would be

useful to have for you when developing these numbers; is that correct?
A I believe it would be helpful, yes.
Q Thank you. One final thing on -- just you made a couple of comments on gear types and the impacts of gear types, particularly in warm temperatures. And am I right to hear that right, that we're talking about gear types in the river and that would probably be the significant impacts of the gillnets throughout the Fraser stem and further?
A Yes.
Q And let me just go one step further and perhaps just ask my question, which is: Do you see that that impact could be lessened if we began to look at some of the selective methods that have been traditionally used in the -- at the mouth and going through the Fraser, and particular the seines, beach seines and the weirs and the fish wheels and the tidal traps?
A The short answer is yes.
MS. GAERTNER: I do have more questions, Mr. Commissioner. I am over my time, and I will apologize to all the counsel in the room as soon as we're finished, but is this a convenient time to break?
A I can accept some responsibility for that.
THE REGISTRAR: The hearing will now recess for 15 minutes.

(PROCEEDINGS ADJOURNED FOR MORNING RECESS)
(PROCEEDINGS RECONVENED)

THE REGISTRAR: The hearing is now resumed.

CROSS-EXAMINATION BY MS. GAERTNER, continuing:

Q Mr. Lapointe, I'm now going to turn to asking a few questions so that we can understand the role and importance of determining the peak in-season, and how that informs decision-makers at that point in time. I'd ask if we could have Exhibit 315, paragraphs 5 and 6 of Exhibit B of Ms. Michielsens' affidavit, and Ms. Michielsens is one of your more recent staff. Three years now I understand she's been with the PSC and has been assisting you in understanding the risks and uncertainties associated with developing the in-

season model; is that correct?
A She's been leading a substantial overhaul in the uncertainty part of our analyses. She's not just assisting.
Q She's leading?
A Yeah, she's really, really helping.
Q All right. So then I'd like you to go to paragraph 6, and in particular the sentence that's beginning -- oh, actually, just before paragraph 6, you'll note that she's identified six uncertainties that this new Bayesian cumulative normal model that you're using to develop total run sizes in-season, these are uncertainties.
A Mm-hmm.
Q Just -- first of all before we -- well, this -- these are the certainties -- are calculated once the peak is observed; is that correct? That's when the model applies.
A No, there's uncertainty about all those things that are provided throughout the duration of the run.
Q Right.
A Estimates are made -- as soon as you have four or five days of observations we can generate an estimate.
Q Oh, I see, okay. So you're using that model as soon as you start getting information that informs it?
A Yes.
Q All right. So they're -- all of those uncertainties are calculated into the model, and those uncertainties also apply at the time in which the peak is observed?
A Yes, they apply before, during and after the peak.
Q All right. Those are -- thank you. That's useful in interpreting that list.

Then in paragraph 6, she says two things beginning with -- near the end, "Prior to observing the peak of the run...". There it is.
A Yes.
Q

> Prior to observing the peak of the run it is very difficult to estimate the run size. The run can either be early or small or later and large.

Would you agree with that, and could -- is that a

critical component of ensuring that once -- ensuring more accuracy in the estimates of the run size that you're doing in-season?

A Yes, it's the archetypal dilemma that all salmon managers face, and graphically, if it helps to think about it - and maybe you don't want to go into that detail - but we're comparing the observed data to what we would expect based on pre-season forecast, the curves that we saw yesterday that showed sort of the jagged dark lines and the smooth.

Q Yes.

A If you see more fish than you expect early on, there's two possible causes of that observation. One of them is that they're earlier, okay? See more fish than you expect, it may just be that the peak is going to be sooner and that's why you're seeing more fish earlier. Does that make sense?

Q Yes.

A The other possibility is that the run is bigger, because that would also cause you to see more fish than you'd expect early on. So the dilemma that you have early on is which of those hypotheses is true? If the run is early, it could still be small. But if the run is large -- so the -- this is what she's referring to in this sentence. So it's the consequences of those two alternative hypotheses about what might be causing the data that you're seeing right now that she's referring to.

The converse, if you don't see fish when you expect, it could be that it's a smaller run, or it could be that they haven't arrived yet. So that's the picture I'd like you to think about when you think about -- when you think about this sentence.

Q Okay. And that's helpful, very helpful, thank you. And then I just put -- wonder if this is a follow-up then. Is it a little bit more accurate just after the peak, then?

A Yeah, once you --

Q Would you agree with me?

A So in the statistical jargon, we would say that the timing and abundance are confounded. You can't tell the difference between the two hypotheses early in the run. As soon as you see the peak of the run, once you know the timing, then all of a sudden, well, it's not early or

late. It's this timing and so then the uncertainty is about how big it is, and that uncertainty is diminished greatly when you've seen the peak.

Q And you need to see it falling, given --

A Yes, you need --

Q -- earlier examples.

A It's not like you see -- yeah, it has to -- in order to say there's a peak, it has to have gone down.

Q And that may take -- again, in your two examples, that may take two more days.

A No, it's more than that.

Q Five, or...?

A So, as I said yesterday, just to help you again remember, is the spread of the run is about 30 days. So if the run came in just like the forecast, we'd have about 15 days of data before the peak was actually there, and then we'd have to wait another three or four days because you have to see it drop off, like you said, so there might be 18 or 20 days into the run before we've observed the peak.

Q And, therefore, before you have a more reliable sense of the size of the run.

A Exactly. Absolutely exactly.

Q All right. I'd like you to turn to -- it was -- it was document 7 on our list of documents. It's a new document. However, I'm -- last night I learned and advised everyone that the document 7 that I listed was a draft document, and in ringtail is the final document. So I'm going to -- and I understand there's no difficulty with it. I'm going to propose to put it into evidence as an exhibit, document CAN 043234, which is an article of Michael Staley.

You're familiar with Michael Staley and it was his review of the 2006 Fraser River Sockeye fishery.

A Yeah, Mike Staley is on the Tech Committee, so, sure, I'm familiar with Mike.

Q You've worked with Mike for many years, yes?

A I've known him for almost 30 years.

Q And perhaps for -- just as an opening comment, I don't need to -- we don't need to get into a ton of detail on this, but why I'd like to use this document and present it as an exhibit --

MS. GAERTNER: Perhaps we could mark it as an exhibit.
THE REGISTRAR: Exhibit number 335.

EXHIBIT 335: Review of 2006 Fraser River Sockeye Fishery prepared by Michael Staley

MS. GAERTNER:
Q Is that it provides examples of in-season decisions that were made, and will you agree with me there were in-season decisions made in 2006 with respect to a number of runs that were made before you identified the peak?
A Yes, we made decisions about run sizes, provided advice about run sizes prior to the peak.
Q And that that had implications in particular for the Quesnel run; is that correct?
A Yeah, this is the return from that 2002 example I've been talking to you about for the last few days.
MS. GAERTNER: And again, I'm -- the hope, Mr. Commissioner, is that in reading Mike's summary, it helps to educate Commissioner Cohen on the nature of the things that are going on in-season in the minds of the people that are having to make the decisions and the complexities associated with that.
Q So, if I could, I'd like to take you to -- where is my page -- page 9 of the report, and I'll take you to the paragraph beginning with the "Summer Run". If you could review those paragraphs and see whether they accurately reflect the description of what was going on, and particularly the times in which decisions were being made with respect to the Quesnel run and the implications. You'll have to review page 9 and 10 of the document.
A I can --
Q You're familiar with that season quite well?
A I can -- I can go through it with you if you like.
Q But there were signals in July that the Quesnel run wasn't -- was in trouble as Mr. Staley uses his words.
A There were signals prior to July. When I provided my review of the Fraser River Sockeye Forecast, the 2006 Fraser River Sockeye Forecast, which would have been probably in the fall of 2005, I was one of the individuals who flagged the issue

of the small fry size that we've talked --
Q Exactly.
A -- about prior. Because I try to practice what I preach. I got out and tried to push the truck, as it were, to see if I could come up with another set of models that would provide an answer different than the pre-season forecast, and I don't remember exactly what the pre-season forecast was, but it was probably, for Quesnel proper, something like 4 million, 5 million, which ended up generating the 7 million forecast for the Summer run aggregate in total, which would include Quesnel, Late Stuarts, Stellako, Chilko and that's it, those four groups.
So prior to the season, although we weren't able to come up with a better model that generated a different prediction, there's definitely wording in the pre-season forecast document about concerns about the small fry size and the potential impacts on the return.
Q Okay. So we knew going into the season that it was potentially in trouble, and the Summer runs then began tracking late; is that correct?
A Well, again, the -- the sentence there says "tracking six days late", and the caveat would be they would have to be six days late in order to achieve the forecast abundance.
Q And at that point in time, the recreational fisheries were opened in Canada, the Gillnet Assessment Fishery was planned, and low impact fisheries were also initiated; is that correct?
A I believe they would have been July 28th. That's probably a correct documentation of the decision, yes.
Q So then you --
A I don't recall the recreational fishery 'cause that's not within our purview, but I do recall some low-impact fisheries. Probably it was the Area 5 fishery in the United States being triggered at -- based on the in-season decision rules that we talked about previously.
Q Okay. And then we go to the next meeting of the Fraser Panel which is the August 4th meeting, and the Summer runs have -- again, in Mr. Staley's words, have not materialized in any abundance and the Early Summer stocks appear to be near the forecast abundance, although, again, late.

> The Late Stuart and the Stellako runs would have to also be late, but further fisheries are being planned in Canada and the U.S. The commercial trolls and the gillnets in the Johnstone Strait are planned:
>
> And in the U.S., the larger more effective fisheries near the mouth of the river were approved by the Fraser Panel.

So those are decisions that are being made before we're seeing the peaks of the runs; is that correct?

A August 4th would have been before we would have observed the peak of those runs. I don't know what the peak ended to be at the end of the year, but that would certainly be before the peak.

Q And so then we move into the next week, the August 11th meeting:

> The in-season run size prediction models could be used.

A That probably would have been the first time we made some sort of an in-season update, yes.

Q And what happens --

A I think we moved -- we moved to the 75 p, as I recall.

Q So then these models suggested a lower Summer run return?

A The numbers in this document from these paragraphs on are inaccurate. They do not -- they're not consistent with the minutes of the Fraser River Panel, and if you'd like me to walk you through an example for August 18th, I can explain to you how these are not a reflection of what I said at the time and what was recorded in the minutes that are approved by the Fraser River Panel, both in United States and Canada. It's a truncated range. It's incomplete.

MS. GAERTNER: Okay. I guess what I -- I'm not so worried about the actual numbers, Mr. Commissioner. If you'd like me to do that, I can.

A Mr. Commissioner, I am worried about the numbers 'cause they provide the context of the interpretation.

Q What I was -- and I don't want to shut you down in

any kind of way if that's important. I'm trying to -- and, Mr. Lapointe, maybe you'll agree with me on this. There were large impact fisheries that occurred in August of 2000 -- late -- yeah, August of 2006 prior to peaks that had a significant impact -- or it had an impact on run sizes of the Quesnel and the returns of the Quesnel, that if you had waited until after the peak to have observed the size of those runs, it would not have happened; is that correct?

A I would like to go through the record, because you've suggested this provides an accurate characterization of the in-season decision, and what I'm suggesting to you is that in fact it does not. It provides an inaccurate context.

Q Were the U.S. continuing to fish during the time this was -- this was occurring and prior to the peaks?

A I believe that there were small low-impact fisheries -- by this I mean the Area 5 fishery. I don't have a strong recollection of the cumulative catch of that fishery, but it would be on the average of 700 or 800 fish a day during this time period.

So there has to be some context associated with whether the Summer run was 7 million or 8 million or 2 million, relative to the magnitude of catches that were approved at that time that this document does not provide. I'm not proposing that I provide that context, but I do think it's important to provide the accurate estimates that were provided to the Fraser River Panel as a basis for their judgment as to what decisions they made.

You've indicated to the Commissioner that you think this reflects the way decisions are made, and I'm saying to you that it does not reflect it because the numbers that are in the document are inaccurate.

Q Okay. After 2006 and the management of the Fraser Panel decisions in 2006, has one of the practices been developed to resist opening fisheries prior to the observation of the peak?

A As I said, in describing one of the in-season protocols, we have a set of standards that we follow in order to determine whether fisheries are opened prior to the peak, and it pertains largely to fisheries that have a fairly low impact

relative to the size of the runs at that time. So I think that that protocol was followed pretty closely in 2006 as well. I think the Fraser Panel was quite careful about the fisheries they opened. So I'm not sure of the specific fishery that Mr. Staley is referring to in this, in the U.S. The larger more effective fisheries near the mouth of the river were approved by the Fraser River Panel, or what the specific magnitude of their catches are relative to the total return, but I can tell you that the total returns that are reported in this document are inaccurate.

Q All right. Well, Mr. Staley is coming to give evidence on FRSSI, so I'll check his inaccuracies in this document to the extent it's relevant.

Would you like to correct any particular number on this page that would help us?

A I would like to provide an example if I could.

Q Sure. That'd be great.

A The paragraph beginning, "At the August 18th meeting" --

Q Mm-hmm.

A -- where it says:

> Staff recommended staying with the 75p forecast (>4 million) for planning purposes, even though the models were producing estimates that ranged from 2.5 million to 4.7 million.

I'd like to bring up the minutes of the Fraser River Panel for that meeting on August 18th.

Q Okay.

A I'd like to start with the first paragraph where, in the second sentence, I'm reminding the Fraser Panel about the situation with Quesnel, consistent with the advice that I provided on the forecast [as read].

> Size of the Quesnel smolts in 2004 was 2.01 grams, was very small, and mainly it's contributed to their low marine survival.

So I'm reminding them that pre-season, I warned them that there could be a problem with Quesnel. So now go down to the next paragraph where we talk about -- that's the Early Summer run, so that

gives you the range of estimates for the Early Summer run, so Mike's focused on the Summer run, so let's go down to the Summer run which I believe is the next paragraph, then.

So at the point of August 18th, there were about 1.1 million Summer run that would pass -- were estimated to have passed the marine areas. The paragraph goes on to provide the range of estimates that were provided to the Fraser River Panel. As I said to you earlier today, we always provide the full range of all the values that are from all the different models. There are about three or four different models here. So you can see cumulative passage model generated three different possible estimates depending upon the assumption about timing, so consistent with what I was telling you. When you don't know what the timing is, you have to provide a range of scenarios because you don't know what the timing is. So they ranged from 3.1 million to 5.4 million.

Other models were suggesting a potential total returns, the cumulative normal models that fit the distribution, for the Summer run of 5.78 million.

The Bayes model which appears to be the one that Mike focused on did provide an estimate as low as 2.5, but also up to 4.7 million. So the actual range - go back to the document if you like - was 2.5 to 5.8 million. Staff advice was a 75 p forecast which was approximately 4 million. I don't know exactly what it was. If you take just the difference of 2.5 plus 5.8, the average of those two numbers is about 4.2 million.

So what we provided for advice was completely consistent with the range of estimates that we had at the time, and we stuck in the middle of the road. The 75 p value was already about half of the pre-season median forecast, consistent with all the information that we provided.

Now, the reason I'm bringing this up, Mr. Commissioner, is not to - although I believe it is very important to correct the record on this particular document - it's not about who's right or who's wrong. To me, this provides a fundamental example about what happens when the team -- in all this context of change, the change

I talked to you about when I first met you out at the Mission site this summer, this is what can happen to a team when there's a lot of change happening. You get a lack of trust being developed, and I'm not saying anything about Mr. Staley's motivation here, but you get situations where this happens, for whatever reason.

This particular document, when it was done for an audience that -- it's just not helpful. It creates the impression of bias in the staff advice in the sentence in that particular paragraph. Even though these models were producing estimates that ranged from 2.5 to 4.7, we suggested a number that was close to the high end of that range, I would suggest, and you can disagree with me if you would like, creates an impression of bias that was clearly not there in the information that we provided to the Fraser River Panel at that time.

So consistent with my behaviour from the time that the forecast was made until this day, and you can go through all these other paragraphs, have the same issues. I don't think it's important to go through them in detail, but you have the minutes of the Fraser River Panel for these meetings, every one of them, have this issue of incompleteness with respect to the run sizes that were provided, and --

Q So he didn't -- he didn't keep all the examples of all of it. He's focused on a couple in order to present the information that he does present in this.

A He's not provided the full range.

Q Right.

A If he's using words like "the range of estimates was" from this number to that number, clearly -- I'm not sure -- again, I'm not questioning the motivation, but clearly the range is not represented in the numbers that he's provided in this document.

Q Okay. So, then, let's go back to the issue of decisions that are made prior to the peak, and --

MS. BAKER: Mr. Commissioner, could that document be marked as an exhibit --

MS. GAERTNER: Yes, please.

MS. BAKER: -- given it's been referenced?

MS. GAERTNER: Thank you.

THE REGISTRAR: Exhibit number 336.

EXHIBIT 336: Draft Minutes of meeting of Fraser River Panel of Pacific Salmon Commission dated August 18, 2006

MS. GAERTNER: Oh, actually, isn't this document, Mr. Staley's document, already marked as 335?
MS. BAKER: Yes.
MS. GAERTNER: Oh, the minutes, sorry. I'm sorry.
MS. BAKER: I was talking about the minutes, yeah.
MS. GAERTNER: I'm sorry, Wendy.
Q All right. What decisions have changed at the Fraser Panel more recently? Of course ten years ago and 15 years ago and longer, decisions were made prior to the peak to open fisheries.
A And I'm not disagreeing with the fact that decisions were made prior to the peak in 2006. They clearly were. What I'm disagreeing with, and what I'm trying to clarify for the Commissioner is that the context of this particular characterization of those decisions is perhaps incorrect.
Q Right. And decisions that are made prior to the peak can have significant effects on stocks like it did in -- for the Quesnel in 2006. Do you agree with also?
A It is possible for those decisions to have an impact but, as I described to you earlier today, it's measured. The panel doesn't make decisions, for example, about having a large Johnstone Strait seine fishery that might catch a million sockeye. It doesn't make that decision until it has sufficient in-season justification in its mind, okay. I can't speak for the minds of the Fraser River Panel, but they have to have sufficient in-season justification.

I, if it's a Fraser Panel approved fishery, have to have an assurance that there is indeed an available TAC - in other words, the use of the run size minus the escapement target. The run size as adopted by the Panel minus the escapement target, minus the management adjustment has to result in available international TAC for me to approve any Fraser River Panel fishery. If it's not there, I say no, and they have to go back and come back with another recommendation for a fishery that would catch -- magnitude of the catch that is consistent with the available TAC. That is only

for the Fraser Panel fisheries. I do not have the Fraser Panel -- I shouldn't say "I do not have". The Fraser Panel guidelines that are in the treaty only apply to the Panel area waters. I have no formal role in the process of decisions on any non-Panel water fisheries. That would include the Johnstone Straits fishery, aboriginal fisheries. All those fisheries are outside Panel control. They aren't subject to the same decision rules of the Panel water fisheries.

Q Thank you. But they are relying on your in-season run size estimates?

A They all use the same run sizes, that's correct.

Q And it's clear that your run size estimates have a lot of uncertainties built right into them, in particular the state of the art one that is now being used has a whole list of uncertainties that we've just reviewed.

A Yes, it --

Q And it only actually becomes accurate for understanding the peak once you've seen the peak and after the peak. You'll agree with me on all of those?

A Yes, and I just would --

Q Would you also agree with me that it's useful --

MS. BAKER: Mr. Commissioner, I -- he was in the middle of a sentence when --

MS. GAERTNER: I'm actually struggling with time. That's what I'm struggling -- not with anything else. I'm sorry, Mr. Lapointe, I don't mean to interrupt you.

Q You did some -- would you also agree with me that that might be a useful in-season decision-making tool, a rule or guideline that would be used in a precautionary way? That's what I was thinking.

A I'm sorry, I missed the first part of your question.

Q That decisions that would result in fisheries that would access runs would await the application of this model, which would await the application of -- the identification of the peak.

A So if the question is -- first of all, you know -- I need you to rephrase the question, I'm sorry.

Q The potentials of large-impact fisheries -- would it be useful for -- as a guideline, that large-impact fisheries would not be opened until identification of the peak and the application of

the in-season model?
A I would say that the current practice is a fairly close characterization of the sentence you just said.
Q And so that practice --
A I wouldn't say that there never have been fisheries that have opened prior to the peak, but I'd say that there's a degree of precaution that relates to the uncertainty of the information as it flows where there's more precaution exerted by the Fraser Panel prior to the peak and afterwards. There's a clear understanding that there's a relationship between the risk and the consequence.
Q Thank you. And again, I do apologize for the interruption.
A It's okay.
Q The next place I just wanted to take you to is in -- we have had a fairly useful dialogue around the management of uncertainties that are occurring, a high level of them. Would you agree with me that wiser decisions -- and I'm picking up on the "wiser" that you used yesterday, Mr. Lapointe -- wiser decisions are made when you have the decision-makers reflecting a balance of understandings and impacts associated with those risks, so people have different risks in the fishery. You'll agree with me on that?
A Yes, I agree with the last part of the sentence you just said.
Q And that when decision-makers are -- like the Fraser Panel which are a team of people, that decisions there will be stronger if there's a balance of decision-makers and the weighing of those risks?
A I think that decisions that are made with a full understanding and agreement and consensus about the objectives are going to be better decisions. And in the sense of the understanding of the objectives, if it helps to have -- and I believe it would -- to have all of the folks that would be affected by those objectives, agree to those objectives, then those would be better decisions.
Q Thank you. And I was just curious -- and you made a couple of observations yesterday about the difference between the U.S. panel and the Canadian panel representatives, and that the tribes and the state in the U.S. have -- are actively involved as

decision-makers. In Canada, that's not your observation.

Then you went on to make an observation that you were concerned that that might not happen for the next 20 years or so. In particular, that you thought that that would only happen if treaties were resolved in Canada, and I was curious whether that's something you've been advised of, or is that something that's your assumption?

A I was trying to provide a context for the difference between the two countries, and perhaps in doing so may have provided an example that, you know, perhaps mischaracterized what I was trying to say.

I think that the effectiveness and the reason that the United States has an effective representation is because they have a defined share, not just between aboriginal groups and non-aboriginal groups, but also within aboriginal groups. So what I was trying to suggest is that to make that -- to make the aboriginal participation as effective as it is in the United States would probably -- let me try to say this another way.

The current capacity to be effective is limited by the uncertainty and perhaps associated disagreements with shares about both within and between. That's the context I was trying to make in terms of the representation. The representation -- there's nothing in the treaty -- in fact, there's articles in the treaty that talk about the need for whatever happens bilaterally to be consistent with aboriginal rights. There's nothing preventing aboriginal groups from participating and there'd be a clear value from a broader participation.

We have started, in the last three years, as you probably know, a listen-in line, so that aboriginal folks from all over the watershed can listen in on all the Fraser River Panel calls. There's a call-in line. They can call in and listen.

So there would be a value for -- from a knowledge perspective and from a participation perspective to be involved, but in terms of -- I think the context of the question I was being asked, and you can remind me, was in the context

of whether the Fraser Panel should be empowered or responsible for all those decisions. And my context of my response was that I thought they'd be ineffective at it because of the lack of agreement about how that part of the catch, and so forth, would be shared which doesn't exist in the United States.

Q So let me -- let me see if I've got this right. You -- that is something you've been advised by Canada that in order for First Nations representation to be --

A No, I've not --

Q -- present on --

A I've not --

Q You've not been told that treaties are necessary?

A No, I have not been advised that at all. It was just my --

Q And your --

A -- attempt to provide an example.

Q And your observation is that what we need is the people that are measuring uncertainties and risks, present, that's what's needed actually at some of the decisions that are making (sic) at the Fraser Panel in assessing what run -- what models you're going to use and what decisions are going to be made in-season. A broader team would reflect that broader representation; is that correct?

A From my perspective, I think the important thing is that we communicate those uncertainties and risks. From the decision-maker's point of view -- and the difficulty I'm having -- part of the difficulty I'm having in answering your question is that in the context of the treaty, it would be Canada's responsibility to ensure that all the players that are important to Canada's decisions -- because remember, we're talking about decisions on aboriginal fisheries which don't involve the United States. The United States is not involved with those decisions. Yes, they use bilateral information, but they don't -- the bilateral decisions are not made about non-Panel waters fisheries.

So I think it would be up to Canada to decide what level of participation would benefit its decisions. From our perspective, we want to make sure we make that information accessible and understandable so whoever it is that wants to be

engaged in those decisions can be fully engaged in those decisions.
Q And those decisions include measurements of risks and assessments of --
A Absolutely.
Q -- uncertainties?
A Absolutely.
Q And that --
A And the implications of them, and the consequences of them, absolutely.
Q And the different people and different views and different fisheries --
A Yes.
Q -- measure those differently.
A Absolutely.
Q And those assessments of risks aren't necessarily determined -- dependent on an allocation of the amount of fisheries that you're going to receive, is it?
A Perception of risk related to allocation, no, not necessary.
Q And so it wouldn't necessarily have to wait until the allocation issues were resolved; is that correct?
A The capacity of Canada to obtain input from all its players about risk does not necessarily require that the allocations be settled.
Q Thank you. All right. I want to turn to a couple of follow-up questions I had around your observations on the challenges with the Late Summers, some of which are --
A Sure.
Q -- pooling, and Mr. Woodey's concerns and how they were borne out. As I understand the concern, is that it would be precautionary to harvest abundant Summer runs in a way that reduces or eliminates the impact on the Late stocks, and in particular, those that are pooling at the mouth of the river. Did I understand the evidence correctly on that?
A So I'm not sure that the pooling at the mouth of the river is correct, but let me see if I can restate it and see if we've got a consensus on this in terms of you and I on this.
So the issue is that Late run sockeye and Summer run sockeye are mixed together in virtually all the places they are harvested. One has a very significant conservation issue with respect to

Late run sockeye that requires, you know, a different than normal average approach to the management -- their management. The past practice has been to have a much lower available harvest on Late runs, a much lower exploitation rate on Late runs, whereas the same -- the application of Canada's escapement policy would result in a much higher exploitation rate on the Summers to reach the escapement targets in both cases.

So if they are mixed together and one stock has a very low allowable harvest and the other one a very high allowable harvest, then clearly the stock that has the lower harvest - in this case the Late run - is going to constrain the ability to catch the available harvest on the stronger stock which, in this case, is the Summer run.

That is true throughout the migration of these fish, not just at the mouth of the river. There has been some discussion about protecting the mouth of the river a little bit more intensively because that happens to be where the Late runs hold. But even if we're talking about fisheries in the marine areas, Johnstone Straits, you still have this mixture of stock. So it's not -- the conservation problem is pervasive throughout the migration of these stocks, not just at the river mouth.

Does that help at all, or...?

Q But at the river mouth is where they're mixed; is that correct?

A No, they're mixed, actually, from --

Q Until --

A In every fishing area from the first fisheries, the most seaward fisheries in Northern Johnstone Straits all the way up until the -- well, primarily, I guess the Late runs would stop migrating, they would peel off at the Thompson, so the Adams would peel off at the Thompson, and Portage would peel off at -- so above those confluences, there would be no more Late runs. But everywhere else, there would be Late runs and Summer runs mixed together throughout their migration.

Q All right. So it would be actually at that confluence that if we were trying to ensure that the Lates had segregated out from the Summers --

A Upstream of that confluence you could have -- they

would be segregated out, primarily.
Q And that would actually be a place where the fishery would be the most precautionary then; is that correct?
A That would be the place where the most selective harvest of Summer runs could occur, would be upstream of the confluence of the Portage/Seton -- where the Seton dam spills out into the Fraser there. Lillooet, I think it is.
Q Great. Thank you. I just wanted to understand, if I may, make sure I've go this correct, you gave, in answer to Ms. Baker's questions around mixed-stock fisheries, I believe -- if I've got it right, but let me -- I'm not sure if I've got --
A Okay.
Q -- you asked the question right --
A I want -- I want --
Q -- but here's the issue.
A -- to help you out.
Q Is that -- as I understand it, you thought that we didn't necessarily need to go to more segregated out-fisheries if we had access to better data in the marine, in particular -- as I think I heard you say -- instantaneous DNA data that would tell us quite quickly the mixed stocks; is that correct?
A Yeah, and I also suggested to Mr. Leadem about the possibility of another alternative that could perhaps accomplish the same goal, and that was just to lower the overall exploitation rate in the mixed-stock areas to the level that's sustainable by the weakest link, so to speak --
Q Right, so --
A -- the weakest stock.
Q I just wanted to just be clear that we don't have access to that type of DNA data right now, and it is quite --
A No.
Q -- expensive, and we won't have access to that in the -- in the short term time frame, right?
A No, and I know you're limited in time and I don't want to take too much of it, but I just think there's a context here that might provide the reason that I'm kind of careful about this, and it kind of relates to the importance of place, and I think that the importance of place, in all fisheries -- and perhaps it's best understood in

aboriginal fisheries, you know, the concept -- and I can relate to this 'cause I'm a fisherman and I have places where I fished with my dad that are important to me whether or not I have a rod in my hand or not, and I'm sure folks are familiar with aboriginal situation of -- I can't imagine how much more it would mean to me if I was fishing on the same rocks that my father fished on that his father fished on and his father fished on.

I think there's importance of place that's attached to commercial fisheries as well. That's an important value that folks have. This has been a -- going a long way around here, but it's not the entitlement part of that, not -- and I don't mean that in an aboriginal right sense. It's the value attached to those locations, not just the allocations that -- I think in moving forward, and thinking about options, we should be respectful of, in the sense that if there are solutions that don't require -- that could be made that don't preclude, that don't sort of ignore that value of place that could be accommodated by other means, then it's keeping everybody on the bus, so to speak.

We're not saying this location has no future in Fraser sockeye, because by doing that, I think it's -- you know, we're missing -- we're missing out. We're missing out on a possible member of the team. We're missing out on information that could be valuable, and -- so it's not really about, you know, who's fishing where and trying to defend the interest of somebody fishing here and somebody fishing there. It's just providing some equal respect to that value of place that a prescription, a geographically prescribed solution rejects. And fundamentally, I don't think the fish is the problem, the mixed-stock problem for example. It has a geographic -- a clear geographic prescription.

The example that we talked about just now about the confluence of the Lillooet, yes, that's an opportunity. But what about all of those folks that fish below the confluence of the Lillooet? Are we going to tell those folks that they have no future because the only way to accomplish this objective is to only fish above?

And I know that's not what you're saying, but

sometimes it's characterized that way. Sometimes it's characterized in a very exclusive way, that the only way to solve this problem is by particular geography. I just suggest to you that that, (a) is not what the fish are saying. There are other options and the one I provided, I agree is unrealistic in terms of where we are right now. But it keeps the -- all of the ideas, all of the team, so to speak, in the same room. Because they may have some pretty valuable perspectives.

And so I'm sorry I've taken more time than I should, but I just wanted to provide you some context for why I use careful words about that, and not just because I'm a member of the Salmon Commission and walking this fine line of neutrality. It's because I really believe that all of those folks, all that place part is really important, and if you carry it to the extreme, you know, what about the marine First Nations? Is there importance of place for those, so --

Q Mr. Lapointe, I just -- I thank you. If there's -- what I'm hearing you say is that in finding solutions, we need to consider all of those that have historically, aboriginally, quite -- and in a modern context have a relation to the fish?

A Yes.

Q And what -- and, thank you, I -- for that observation. Could I just -- it was important to make sure the record is clear that the recommendation or the suggestion you made of having the DNA sampling in-season right at the mouth is -- I just heard you say is unrealistic right now. That's not something --

A It costs about $20 a fish right now.

Q Right. And so one of the interim steps that might be useful is to become a little bit more flexible on how we manage the fishery and not so attached to thinking that that's how we'll manage it in the future, but that until we have type of data, it may be extremely useful to become more flexible on where we hold those -- hold those fisheries and staying flexible into the future. Would you agree with me on that?

A Yes.

Q All right. I need to go to Policy and Practice Report number 5 again, and I just needed you to help us with some language on this -- this one.

A No, it's okay.
Q If we could go to paragraph 45, I'm going to just turn your attention to 45 and 46. In paragraph 45, I need to take effort -- if I just correct the sentence. Paragraph 45 and 46 -- oh, sorry, page 25, and I'm going to go to the second sentence:

> Management of Fraser River sockeye salmon assumes that exploitation rates on each stock are the same for all stocks within the group.

A Yeah, that's incorrect. The -- I don't know what the context of that sentence is. It might refer to the assumptions about the -- if you model an aggregate group and you apply an exploitation rate, it's assumed to apply equally to each of the stock groups, but in fact, as I talked about yesterday, when we're monitoring in-season, we have more than the four groups. We have sometimes as many as 15 groups. So in fact it's conceivable to estimate the exploitation rates for however many DNA reporting groups that we have, which varies by year, but can be as many as 15.
So I'm not sure what the sentence was intended to mean about management of Fraser River sockeye assumes that the exploitation rates on each stock group are the same. We certainly understand that the sustainable exploitation rates could vary across each of the 19 stocks. It is true that Canada's escapement policy does aggregate those to four stock groups, but developing those harvest rules, it is -- and you'll find out more about this later, I guess, when the FRSSI folks come.
But it is -- those harvest rules are sensitive to the exploitation rates of the other -- of the 19 stocks, because there are benchmarks that measure things like the probability of that aggregate harvest rule -- one of the implications of an aggregate harvest rule for, say, the probability of a stock falling above a benchmark and so forth, so --
Q So this is --
A -- I don't know how to rephrase that sentence in a way that helps the record, because there's a lot of subtleties here. I'd be happy to try to, you know, spend some time perhaps, but I'm trying to

provide sort of different contexts in which exploitation rates come up, in productivity, in actually monitoring what they are and so forth, so --

Q But that sentence is not correct, and we'll take steps to try to see if we can correct it or -- at least we now have it on record that it's inaccurate.

Then I also wanted to take you to the next sentence, and it says:

> However, depending on each stock's production, each stock within an aggregate can theoretically sustain different rates of harvest.

A Yeah, that's consistent with what I just finished saying.

Q That's not accurate either.

A No, that's consistent. That is accurate. That's consistent with what I was just saying. That statement that each stock within an aggregate can theoretically sustain different rates of harvest is in fact correct.

Q Okay. But can I then add that it's not only that they can sustain, they're also exposed to different risks within different rates of harvest?

A The level of risk to future productivity on a stock would be related to the level of harvest it could sustain, among other things, so that's certainly one of the considerations, yes.

Q Thank you. And then if you could go to paragraph 46, how does -- and I just need to understand -- at the end of this sentence, there -- I mean, it may be important for you to read all of paragraph 46 so you get the context.

A Okay, sure. So --

Q And my question was -- is how do managers assume conservation and harvest rules developed for an aggregate consider the weak stocks in that aggregate?

A So this comes back to some of the comments I made yesterday, and I'll just provide the one example. That is, one of the ways that this would be represented in the harvest rules would be in the cap, 60 percent maximum total mortality. That's one example.

And this paragraph seems to be referring to mean mostly to development of the escapement policy because there's the 19 stocks that are part of that model, and they're aggregated into the four aggregates, so I think the way that it would be the most -- best example I could give you would be the one I provided you.

Q Okay, and I'll pick that up again with the FRSSI models -- modellers, then. Thank you.

I have two remaining topics of questions. One is just a couple of very brief questions on this topical -- question of over-escapement and delayed density dependence, and then I have a couple of questions with you around the post-season run sizes.

A Sure. Sure.

Q If I'm correct, the delayed density dependence that's being measured right now is on the next year after there's been a lot of spawners on this -- on any particular spawning ground. Am I right in that?

A So there's -- it depends upon the stock. They try to measure -- the delayed effects typically have -- I think there's four -- like the four years of the four-year cycle are included, so it's the -- we talked about this yesterday, and I thought we had a good example going with one of the other counsel. I'm trying to remember now to help -- 'cause this gets -- this topic is one of the most --

Q Perhaps, then, again, we're --

A -- confusable.

Q -- going to spend a lot more time on it.

A Yeah, so --

Q I just needed to understand are they measuring delayed dependency over a four-year cycle or --

A Yeah, it's over the -- it's over --

Q -- an eight-year cycle, over a 12-year cycle? We're just down --

A Normally, the models that are measured to -- that are used can only detect anything in the four-year cycle, beyond four years, and there are some stocks for which those signals are only apparent in the first couple of years, and there's some that are more -- so it just depends upon the particular stock as to which -- whether there's evidence delayed dependence across the four years

or just over two of the four and so forth.
Q Thank you. And you'll agree with me that the benefits of biodiversity, for example, and the longer-term benefits of spawners into an ecosystem would likely need to be measured over a much longer period of time; is that fair?
A Some might be. I don't know that the sort of sockeye-centric benefits that I talked about before, like within the sockeye, you'd necessarily need to go beyond four years.
But if you thought about things like delivery of carbon and nitrogen from carcases, I don't know how long those nutrients would persist in the ecosystems for the forest, for example, but there could be some things that would persist longer. I think there's probably a range of things that persist, you know, like most ecosystems, a very short period of time, and some might persist longer. I'm just not as familiar with all of the different system impacts to think about those long-term examples for you, but maybe the forest one is one.
Q Great. And then, as I understood it, what is -- the challenge is either competition for food and/or capacity of the spawning habitat, and -- is that correct?
A So when you say "the problem", you mean the mechanisms for the delayed density dependence? Is that what you're --
Q Well, if you're beginning to identify delayed density dependency, what I heard you say yesterday is that there may be difficulties with food in the lakes.
A Common hypotheses are competition for food. Another one is the impact on predators. And the predator idea is like -- is if you have a very abundant run that has a bunch of offspring and the predators do really well, when the next runs come and they're lower, those predators that have become more abundant may impact the subsequent run. So predation and competition are the two things that have been proposed as the primary mechanisms for that phenomenon.
Q And again, I'll be -- well, I'll just leave it. But let's turn now to the post-season run sizes.
A Sure.
Q From the outline of evidence that we were

provided, one of the questions you were going to answer is why is post-season run sizes so important, and I wanted to ask you how has it become more complex, and is it -- are they becoming more accurate or less accurate from your perspective?

A Okay. So on the important side, did we touch on that a little bit on the productivity impacts and stuff, or did you need more on that? When we were talking about the DBE, I was talking about the implications of post-season run sizes for the datasets for the forecasting, for the FRSSI models and so forth. Was there more examples that you wanted on the importance side, or did you want me to turn to the other -- the second-party question?

Q I'm actually -- perhaps let's just turn to this question, which is how are they becoming more difficult?

A Okay. The second part is the one that you'd like me to focus my answer on?

Q Yes, please.

A Okay, good. Thank you. I didn't want to spend any more time repeating myself.

Okay. So there's a number of ways that one might say they're becoming more difficult. The first is that we've had a larger fraction of the total run, and it's more important in some stocks than others, and some of the graphics that I provided yesterday on the Early Stuart and Weaver give you two examples of that DBE, the size of that red bar relative to the other bars. There is an example of where there's another challenge in the run size that was never there -- I shouldn't say it was never there. It wasn't there as systematically in the past as it is now. It's become a -- the magnitude of that difference being -- estimate has become a much more important factor in recent years.

The second difference, and I don't know if it's making the estimates essentially more accurate or less accurate. It would probably depend upon your perspectives on the accuracy of catch estimation and escapement estimation. But the ratio of the magnitude of the escapement -- so now I'm talking about the size of the -- I can't remember which colour was catch. The blue bars and the green bars on that chart, that ratio is

also changing. Where historically, say, 70 percent -- 75 percent exploitation rates they were talking about, what that means is 75 percent of the total run was in catch and 25 percent was in escapement.

If you go to a 30 percent exploitation rate, that would be more consistent with kind of the recent years, even some lower years, than now all of a sudden you have 70 percent of the run being in escapement and 30 percent in catch. So the ratio of what -- the components of that total run in catch and escapement is changing. And, as I said, I don't -- intuition-wise, and probably my first cut at thinking about this, I would say that probably those big catches were estimated, you know, more accurately than we have in the escapement. There's perhaps more certainty in the catch than there is in the escapement. But I would open that up for some discussion. I wouldn't provide it as a concluding remark. It would just be my -- so that could mean if you're putting more fish into escapement, there could be a decreased accuracy.

But that's not -- that may be a state of what could be true now, but it's not necessarily, you know, insoluble and so forth. You could increase the accuracy of the escapement and achieve the same accuracy of the total run is what I'm trying to say. So --

Q Okay, so then maybe if I could ask, just bringing it right here right now, we don't yet have the post-season for 2010 yet; is that correct? The final post-seasons. And I was just wondering whether that is a good example of some of the challenges that are associated -- as I understand it, you typically give the post-seasons to the Fraser Panel in their January meeting. That did not occur this year; is that correct?

A Yeah, but it's not typical. The reason that we don't have post-season run size for 2010 is that the folks that are involved with completing the analysis for the spawning grounds are under a huge challenge because of the numbers of -- the amount of data that they had. So it's not a -- as we all know, last year was a great return, but it's not a very frequent occurrence.

Most other years, we would certainly -- they

would have the capacity to get those numbers to us in January. This is the first time I can remember in recent memory that we haven't had preliminary escapements at least by January.

Q Okay. So part of it is just capacity. We're asking for more data, we're using more data, we need more capacity to gather that data in order to complete that; is that --

A Well, I guess it's a combination of what the fish did, which was not very predictable, and I suppose that you could make the argument that if we had, you know, twice as many staff, we might have gotten an estimate out sooner. It's kind of -- you know, one of these -- as a manager, I'd be asking myself, well, if I only need that staff once every 100 years, maybe I wouldn't provide a strong justification for someone to give me the money to do it but -- in this particular example.

Q All right. So, then, what I -- I'm also curious on is, as I understand it, the in-season estimates for this year's run size was around 34 million in-season; is that correct?

A 34.5 was the final Panel-adopted run size, yes, that's correct.

Q And is it your understanding that that's going to be decreased in the total tallies, or do you know that yet?

A The reason for that, the reason that there's a perception or perhaps information that might suggest it would be lower is the post -- the final adopted post-season run sizes for the Late run were based on the models at the time, and I can't remember what the Late run component is of that, but it's something like 24 million of the 34.5.

We then estimate -- so this is based on a model fit, the kind of stuff that Catherine described, the fit of a model to the data.

Q Yes.

A We then estimate the fish at Mission, and if we estimate the Late run at Mission, the abundance at Mission is about 20 million or so, and so it's about 4 million less than the model estimate. And so that's where that perception comes that the run might be lower. So it's an in-season accounting-based estimate, so to speak.

I provided that information to the Panel October when we were at the Adams River, and they

decided that since we hadn't seen the spawning escapements yet, that they'd rather wait on the final -- you know, change the run size once was kind of their call on it. I didn't make a recommendation, but I just advised them it looks like we might end up lower. So they decided to wait for the spawning escapement numbers, and we're still waiting.

Q And do you know when we'll -- when it's likely we'll see those?

A We've been told that we should get them around the time of the February meeting which starts on Valentine's Day.

MS. GAERTNER: Great. Those are my questions, Mr. Commissioner.

MR. BAKER: Mr. Commissioner, we have two more counsel who would like to cross-examine Mr. Lapointe. One, Ms. Schabus has estimated 30 minutes, and Ms. Fong has estimated ten minutes. We could potentially ask Mr. Fong to start now and see if we could get that finished before the break, or we can come back at 2:00, whatever you would like to do.

THE COMMISSIONER: I think -- I can only speak for myself, but I'm sure Mr. Lapointe would like a break at this stage, so let's take the lunch break now.

MS. BAKER: Thank you.

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

(PROCEEDINGS ADJOURNED FOR NOON RECESS)
(PROCEEDINGS RECONVENED)

MS. SCHABUS: Mr. Commissioner, Schabus, S-c-h-a-b-u-s, first initial N., co-counsel for Sto:lo Tribal Council and the Cheam Indian Band. I'm here with my co-counsel, Tim Dickson. And just following the image we've been using about where we are in the run, I'm the late run. But I've learned that it's good to wait so I think I'm following the example of the sockeye, building up knowledge in the process.

CROSS-EXAMINATION BY MS. SCHABUS:

Q So Mr. Lapointe, I'll start with a few points of

clarification.
MS. SCHABUS: And I -- I'm asking Mr. Lunn's replacement to please bring up the transcript from yesterday.
Q On page 71, going to line 8, and this is just a point of clarification because I think we might have an issue with some years that are being quoted. You start off talking in line 8 about the 2005 example and we're here dealing with differences between estimates, right?
A Right. That's correct.
Q And you're bringing up 2005 as an example. But if I take you down into the course of that very answer into line 31, you're now talking about 2006.
A So both those years were years when we had issues with the lower river estimates.
Q Yes.
A The 2005 example that we explored last time with the species composition issue --
Q Yes.
A -- is one that we explored in detail. In 2006, it was a different issue. There were obviously no pink salmon in 2006 because they're only there on the odd years.
Q Because it's an even year, yeah.
A But in 2006, the Mission hydro-acoustic estimates which are -- how do I phrase this -- the upstream estimates observed on the spawning grounds were significantly larger -- larger than were observed -- than were estimated to be expected based on Mission. So in that case, that would be one of those points above the diagonal line in that graph I showed and it would be a case where the spawning ground estimates would have been used with some adjustment for en route loss based on radio tagging to get the total return. So both of those years are years that I would provide as examples of circumstances where there was evidence of bias in the lower river estimates. I'm not sure -- I believe that a draft of the 2006 report was provided. I don't know if it's in the record. I know we don't have the printed document yet because we're behind but I thought a draft of 2006 and 2007 were provided and the details of the 2006 situation are described in that document.
Q Okay. And so just to clarify, you are indeed

speaking about problems in 2006 as well and you don't --
A That's correct.
Q -- you do not feel those have yet been properly -- like if that situation was to reoccur that same problem could arise?
A We think because of the changes in the methodology in response in part to 2006 -- we're doing experimental work this year, for example, in the mid channel -- that we would detect the problem in-season. And indeed this year in part because of the work at Mission but also because of Qualark, we did detect a similar directional signal and that Qualark was seeing more fish than Mission for a period of time. So we think we have got -- made progress so that we would not have a repeat of 2006 but we haven't got the final -- final solution yet.
Q Okay. Now, in pink salmon years, so in uneven years, there is also an issue with where the fish migrate. Pink salmon are often closer to shore, sockeye more in the centre of the river?
A Yeah, this is the species composition issue, which was raised in 2005.
Q Yeah, and I'm not going to take you into that --
A Sure.
Q -- in detail because we discussed that --
A Sure.
Q -- they took us last time.
A Sure.
Q With species composition and the issue being that almost three million overestimate of sockeye salmon because pink were being counted as sockeye.
A 2005, we're talking about?
Q Sorry. Did I just say a wrong year, too?
A No, no, no, I thought you weren't going to take me into 2005 and then we talked about 2005. That's the only reason --
Q Yes. No, no, no, just -- I was just making a very quick summary. But that was when we were looking at almost three million different species estimates.
A The in-season estimates, yes.
Q Correct.
A Yeah.
Q And that was because of the pink salmon being counted as sockeye salmon in --

A Sort of, yeah, sort of.
Q -- or estimated it as...?
A Yeah, sure.
Q Okay. Now, so there's also that issue that sockeye tend to travel more in the centre -- in the middle of the river. But you talked yesterday about seeing more fish in the middle of the river at Mission after fishery, right?
A Yeah. So the reference you -- you made in the first part of your statement about sockeye being more in the middle is relative to pink salmon.
Q Yes.
A The reference I was making yesterday about sockeye being more in the channel after fisheries was relative to where the sockeye are when there aren't fisheries. So there's a little bit of an apples-and-oranges comparison there --
Q No, no.
A -- so there's a change in the distribution.
Q For sure. I just wanted to move onto that as the next point.
A Sure.
Q Now, you see that at Mission so that is obviously after a fishery that's below Mission, right?
A Yes, that would be the case. It would have to be below Mission --
Q Now --
A -- in order to be manifest at Mission.
Q Exactly. Now, I want to take you to a specific example there and I want you to comment on after you see a derby-style fishery in the Fraser River with very large boats and equipment, you actually see relatively a larger gap in fish coming up at Mission, I would expect.
A That's --
Q And -- and how many days after?
A It -- so geography-wise, the below-bridge fishing area, as it's called, I think the Pattullo Bridge -- Bridge is the boundary, is about a day or day-and-a-half between there and Mission. And for the above-bridge fishery, the boundary is actually the Mission Railway Bridge or highway bridge --
Q Mm-hmm.
A -- so that would -- it would depend upon where in that area the intense fishery is, a day or so, something like that.
Q Okay. Now, and -- and you see a gap in the number

of fish coming through after that (indiscernible - overlapping speakers).
A Yeah, what we tend to see when those fisheries occur in is a -- is obvious evidence of removal.
Q Some of my -- some of the fishermen upriver would describe it as a gap or a hole that there's actually --
A Yeah, it's been described as a hole in the migration.
Q Okay. Now, so for example, if the Aboriginal food fisheries open just above Mission in that timeframe, so those one-and-a-half/two days after, what you would expect is a much lesser number of fish available?
A Yeah, there's -- they call -- sometimes call that the "shadow effect", fishing in the shadow of a fishery downstream.
Q Now, we already heard about the issues and I'm not going to take you through those again --
A Okay.
Q -- about the issues with forecast and pre-season -- especially pre-season forecasting or probabilities, as the Commissioner --
A Sure.
Q -- has -- has pointed out the problems with the term. But it is those DFO -- those pre-season forecast derived by DFO that form the basis for the Integrated Fisheries Management Plan?
A Yes, they wouldn't have access to any in-season information at the time that that plan is developed so --
Q Correct.
A -- it should be one of the elements they would be using.
Q And that is -- but that is what the -- the consultations happen on, right? Like it's actually --
A It would be my understanding. I don't participate in those consultations but that would be my understanding.
Q And so then in-season decision-making shifts over to the Fraser River Panel. And while you've made attempts to increase information-sharing and at least have a listen-in line, there is not a full scope of consultation at that stage?
A I don't know what the consultation process is. You would have to rely on the two panel

representatives for First Nations, Ken Malloway and Marcel Shepert. And my understanding is that Mike Staley is a -- who is on the Tech Committee, has a pretty extensive information-sharing that occurs after the Tech Committee meeting because I actually c.c. him the whole package that's given to the Tech Committee and he -- he asks for that for his consultation. So I don't know what the consultation part of that is because I'm not a participant in that.

Q But there is nothing that's being facilitated through the Fraser River Panel --

A Only the information flow.

Q The information flow, having the listen-in line?

A Yes.

Q Correct. But no information coming back that direction. You have a one --

A Oh, you mean two-way flow?

Q With the listen-in line.

A Yes.

Q Now, regarding the run size estimates. They do not *per se* take into account environmental factors?

A There are some stocks that an environmental covariate are used -- is used for. I'm trying to think of a sockeye example but the one that comes to mind immediately is a pink salmon example where there's something called the Pacific decadal oscillation, which is a Gulf of Alaska phenomenon that's actually used as a covariate. And I think it might be used -- there might be -- Birkenhead might use a discharge covariate. There's a few.

Q Okay.

A A smattering of them.

Q But -- but generally in the majority of them, actually environmental factors are being brought in for the management adjustments?

A Yeah, so those are two different kinds of environmental factors. One's affecting -- on the forecast side that factor is affecting the number of fish that might return relative to the forecast. On the management adjustment side, it's saying how many fish would we expect to reach the spawning grounds given how many fish have reached Mission. So they're conceptually quite different in the way they impact the management.

Q Correct. But management adjustments are the

vehicle for taking into account environmental factors --
A On the successive --
Q -- on the run.
A -- migration of Fraser sockeye up the -- up the river.
Q And they're taken -- obviously you have those management adjustments in the pre-season and in the in-season planning process, right?
A Yes.
Q But then we get into the post-season and obviously you can't have management adjustments or call them that so that's where the environmental factors and how they affected the en route mortality of the salmon gets calculated in as part of the difference between estimates, along with the bias in estimates?
A That's correct.
Q So just to -- to recap, the difference between estimates constitute -- is both, the bias in estimates and the impact of environmental factors on en route mortality of the salmon?
A Absolutely. The list of the five things that I showed yesterday.
Q Now, let's go briefly to the term "DBE", the difference between estimates. I'm suggesting to you, and I think you'll agree with me, that that's a misnomer to a certain extent and it really doesn't help -- it's not a very helpful term *per se*?
A I wouldn't agree. I would agree that when it's used in different contexts, we might want to think about using different words because of the confusion that's being caused. But it is a pretty -- what is it -- descriptive term for what it actually is. It's the difference between two numbers. That's what it is. And so if we called it "en route loss", then we would be saying that those other factors that are on that list are irrelevant. And I think that would be a much poorer term than "DBE". Now, I'm happy to entertain suggestions for a better term but I think DBE is actually intended to make sure that there's no ambiguity about the fact that it's the difference between two estimates and any of the things that could cause those differences are part of the number that results from that calculation.

Q And I'd agree with you. One thing that -- that seems good about it is that it actually makes it quite clear that we're dealing with estimates.
A Exactly.
Q One of the issues that I have with en route loss is it makes it sound like such a definite number and you tend to forget that the en route loss is actually also an estimate, right?
A Yes. I hope -- well, yes. I think that -- that you could -- without using the word "estimate" then that -- that misconception could be there.
Q And when it comes to the bias in estimates issue, you -- you talked about Mission escapement bias, in-river catch estimation bias and spawning escapement bias. One of the things when we were talking about 2005, it's actually a combination of them sometimes. Like it's --
A Mm-hmm.
Q -- a Mission escapement bias combined with an in-river catch estimation bias and like it just shows how all those things are quite interconnected, right?
A Yes, that's exactly right.
Q And there's also the -- the overall issue that you had listed of imposition of -- of estimates?
A Yes.
Q Then the en route loss in itself also being an estimate?
A Yeah, and it probably should be listed that way on that list. I don't know if it is but probably should be.
Q Yeah. And in your testimony in chief, you said that the vast majority of -- of that is due to environmental factors like higher temperatures, river flow levels, timing of migration, et cetera.
A For the years that were shown in that pie chart, which are the years 1992 to 2008 and only for the part of the difference between estimates that was assigned to the total return.
Q Correct.
A There are other parts, DBE's, that would have occurred in those years that weren't part of the total return and I'm not making the assertion that those DBE's were mostly due to en route loss.
Q Yeah, like the 2005 example --
A Exactly.
Q -- that we were talking about where you then had

to revise --
A Yes.
Q -- the DBE.
A Exactly.
Q Okay.
A The one that we used for the total return, for sure.
Q When you -- when you had to post-season basically revise the DBE --
A Yeah.
Q -- down three million.
A Exactly. To remove that part of the -- if we can remove the part of the DBE that's due to bias, we certainly don't want to be adding those numbers to the total return.
Q Now, there are also environmental factors that contribute to mortality before Mission.
A Yes.
Q Now, ocean temperatures -- or things that happen in the ocean, obviously.
A There's nothing wrong with saying "ocean temperatures". The only reason the Fraser River gets focused on is because the degree of temperature change has been substantially greater than what we've seen. It's been more variable in the ocean, in Georgia Strait and so forth.
Q As well.
A Yes.
Q And -- and I mean obviously also other things that -- that happen in the ocean can contribute to higher degrees of mortality.
A Sure.
Q One of the things that I was thinking about there is when do you start calling it the "run size", right? Like because we were kind of talking about -- and it's hard --
A Mm-hmm.
Q -- hard to conceptualize around that because talking about the run size at the spawning grounds, talking about the run size in-river, talking about the run size in the ocean, so where do you start?
A Yeah, so when we talked -- when we use the term "run size in-season", we're effectively talking about the run that was estimated to make it to the most seaward test fisheries. So because our first point of assessments in both -- you know, we have

the -- the Johnstone Strait seine fisheries and we have the Juan de Fuca Strait test fisheries, there's actually another gillnet fishery that's slightly -- test fishery that's slightly seaward, Round Island is slightly more seaward. So it's the run that enters those -- the tops of those two areas. It's not the run that might be estimated. If the test fisheries were closer, it would be the run that reached those areas. So it's a function of the location of our first assessments.

Q Okay. But -- that's helpful. Now, there are really just a limited range of environmental factors that you take into account. And I think Mr. Commissioner will appreciate a lot of those are actually forecast. Those are weather forecasts, snow melt forecasts --

A The river -- yeah, the river management adjustment -- in-season management adjustment is a ten-day out river conditions forecast, which one of the major inputs is a ten-day weather forecast.

Q And while there is some modelling for management adjustment, in-season it's really dependent on those -- on those forecasts that you just spoke to?

A That is a major driver, the temperature forecast, in flow factors -- flow forecasts that we receive.

Q Now, I want to take you a little bit to broader environmental factors. And obviously, we have seen broader environmental factors. There's no denying it affecting those stocks, right?

A Sure.

Q That's why we're having to deal with a lot of those uncertainties. Now, but you do not in the modelling include -- of environmental factors, the impact of increased overall temperatures over time?

A You mean it's the -- you mean the way that we incorporate it in the river? Is that what you're referencing?

Q No, like in -- in your models overall. Like obviously since at the latest the early '90s, even before then, we've seen environmental factors more and more impacting the runs, right?

A So the -- yeah. So the dataset that constitutes the management adjustments begins in 1977 --

Q Okay.

A -- and ends -- well, we'll have the 2010

difference as soon as we get the spawning ground estimates. So -- so it doesn't go back prior to 1977. But anything from '77 on would be in the dataset.

Q Okay. Now, I'm also thinking about modelling, for example, like the intergovernmental panel on climate change --

A Mm-hmm.

Q -- the modelling they do --

A Mm-hmm.

Q -- about different temperature rise scenarios and how that is going to impact. They're including they do it for different species, right? Like IPCC has quite detailed --

A Sure.

Q -- analysis. That is not something that is, in effect, done and put into the management models here?

A The work has been done specifically to Fraser River sockeye. I can -- I can't get -- I don't have the papers in my head right now but there's been -- David Patterson when he's here actually could provide you some good examples. There's been a couple of papers written specific to Fraser sockeye to ask the question, "What if the IHPC Panel predictions are correct? What are those implications for the region of the Fraser? What are the implications of those temperature changes in the Fraser for potential mortality across a number of stocks?" So that work has been done. We have not -- we do not have an extra forecast related to the long-term trend in temperature in our management adjustments. We just have the intra-annual ten-day forecast as part of our management adjustment so...

Q Yeah.

A Yeah.

Q That was my question. I was aware of the studies being done but my question was, how do you translate it into the planning? And that is not really happening yet. So broad environmental issues and their effect on the run size could be built into run size estimates. But that is not currently being done, correct?

A It's technically feasible to do so.

Q And it's not being done.

A And it's not being done.

Q Now, on Tuesday, you talked about Dr. Woodey --
A Yes.
Q -- a scientist who has -- your predecessor and who has been around sockeye salmon for a long period of time. And I suggest to you what you were describing to us is that through his observations he developed knowledge over time that is invaluable for management decisions?
A Absolutely.
Q Now, one of the proposals that he made has to do with the mortality of the early migrating late run. And so one of the suggestions that he made is because those would then coincide with the salmon run, that there could be -- you could actually allow fishing on -- at that time and for the lower Fraser, I want to put that scenario to you. That would mean fishing in August.
A That's correct. That's correct.
Q That's -- that was his suggestion. And -- correct?
A That's correct. So the key element there is that the entire thing is based on the observation that the fish that are in the river in August are going to have an unlikely probability of survival. So it's definitely in the river and it doesn't have to be in the lower Fraser River; it could be anywhere in the Fraser River. Those fish that are migrating in the Fraser River in August are very -- have a very low probability of surviving to the spawning grounds.
Q Some of them as low as up to 90 percent mortality?
A Yes.
Q And so the suggestion would like -- the suggestion that comes along with that is to actually enable more fisheries in August that would catch mixed stocks, summer run and early/late run?
A Within the Fraser River, yes.
Q And -- and based on the observations and -- and that knowledge that we've talked about, that would be something that you could support?
A I could support the biological concept that -- I believe the data actually support it very strongly. The data that's been collected since Jim's intuitions almost ten years ago provides a compelling biological argument. I did outline to you yesterday the -- the counter-argument about evolution -- the potential evolutionary value of

those early fish. And I think what I suggested is that that biological question should be subject to some intense analysis to make sure that there's a clear understanding because I believe that biological argument to have some validity. It's just a question about the relative merits of the early migrants versus the later migrants. So in a general sense, I support it. But I think that there's still some questions that need to be answered.

Q And you've been around sockeye for quite a while, too. And like over that period -- so I'm saying historically but really looking back, that has been -- like that time in August has actually been a key fishing time for, for example, Aboriginal peoples in the lower Fraser.

A Yes, and that's one -- one of the policy challenges I suggested would be associated with any such policy where there was a desire to increase fisheries at that time depending upon whether or not -- what -- what the policymakers decided and -- as to who was going to catch those fish.

Q Okay. Now, you spoke about Dr. Woodey as "Mr. Sockeye".

A He is. He is indeed.

Q And basically, based on -- on his knowledge, he has built over time on observation and can also be verified by science?

A Yes.

Q Now, I'm putting it to you that I know quite a few of those and I'd call them "Mr. and Mrs. Sthéqi", which is the Halq'emeylem term for sockeye Indigenous knowledge holders and fishermen who have been around sockeye all their life and have over that time through observation and also knowledge passed on through generations built an invaluable knowledge base about those fish and all those interactions.

A I would a hundred percent agree.

Q And it actually can -- can really help and be a very important contribution to the management process because that knowledge actually integrates and -- and puts together a lot of those interconnected issues that you are telling us you are struggling with in science --

A Sure.

Q -- how to overlap all -- all of those issues. But actually that knowledge base kind of can show you the way through that.
A Yeah, I mean my introductory comments to my very first words in front of this Commission reflected that value.
Q So you would agree with that, that that is --
A Yes.
Q -- a very important knowledge base and data source because indeed -- and I think you touched on that yesterday as well -- Indigenous knowledge is -- carries within the most, longest datasets -- the datasets going the furthest back that we do have about sockeye salmon?
A Yeah, I believe there's a tremendous opportunity to improve on the way that's incorporated in management assessment.
Q And -- and so my point there is it's -- it could be used more in the management and in the planning process also regarding causal interactions?
A I believe there's a tremendous value -- potential value there.
Q Now, the reality, though, is that Indigenous knowledge is not currently being taken into account in those management decisions?
A I think that's a fair characterization.
Q It's also not being taken into account when assessing a lot of those environmental factors that we are dealing with?
A I would also agree that's probably a fair characterization from what I know.
Q Now, on -- on Tuesday and since, you've talked about externalized values or what is currently still externalized values like the benefits of salmon to biodiversity. And I think you also mentioned culture. And I would put to you the key importance it has for Indigenous cultures.
A Yes, I agree that we need to do a better job of defining those things.
Q And now, there is a way of -- and when you say "defining", we talked about externalized values. There's a way of internalizing those values in a management process, right?
A I think we might mean the same thing but I'm not exactly sure what you mean by "internalizing".
Q I'll take you --
A What I think I'm trying to say is more explicitly

accounting, as opposed to implicitly accounting is I think what I -- what I mean. In other words, you have to understand the pluses and minuses of the impacts of any management objective on all the values that are relevant.

Q When I say "externalized values" what I mean is they're not fully being taken account -- in current models -- taken into account in current models. But there is a way to incorporating them into models and, therefore, internalizing them.

A That's part of the challenge, yeah.

Q Now -- and ecosystem-based -- more ecosystem-based planning is one of the things that we've already discussed. You've discussed some of it with Mr. Leadem so I won't go into detail. But you'd agree with me that such policy recommendations can be translated into planning models and management decisions, right?

A If there's a clear policy guidance it should be translatable.

Q Now, when it comes to ecosystem values, they can be taken into account when talking about escapement?

A That's one -- one place that they could be taken into account for sure.

Q And we've already had that discussion so I'm not going there again.

A Sure.

Q But there can also be provision made in planning to ensure that enough salmon return to sustain Indigenous cultures. So not dissimilar from an escapement target where you ensure that a sufficient part of a run after is made available. So after considerations for conservation --

A Mm-hmm.

Q -- you could also make provision to make sufficient fish available for Indigenous peoples and build in an additional percentage given the uncertainties to make sure that those requirements are met?

A Yeah, and I would say that the Fraser River Panel -- I won't comment on the -- you know, the degree of adequacy of what's been done -- but the Fraser River Panel has been managing something called "gross escapement", which is intended to provide a number of fish to the bottom of the lower Fraser equal to the sum of the requirements of the

management adjustment spawning escapement target in what we have been informed to be the Aboriginal FSC or economic needs. You brought up an additional factor, which I don't believe is explicitly being accounted for now and that is whether there would be some influence of uncertainty on the magnitude of that number.

Q Exactly. That was -- you detected that right, to actually build in a buffer on that as well. So that could be done. But it's not currently being done.

A Yeah, I don't know -- I know how the gross escapement calculation is being done. What I don't know is the degree to which Canada, in particular, and the reason I'm focusing on Canada is because they do have 83-and-a-half percent of the catch. I don't know the degree to which their decisions are influenced by some buffer; in other words, I don't know that Canada manages to exactly that number. They may make decisions allowing some error but I'm not part of that decision-making so I can't -- maybe -- maybe Barry or Jeff could comment on that better than I could.

Q For sure. Their number. But you don't see a management adjustment or anything like we've discussed?

A We don't see anything added to our numbers but it doesn't mean they couldn't react in a management sense by not, for example, catching all the fish that result in the exact gross escapement number. They might catch fewer and deliver a larger number than the target at certain times of year. And I just -- I'd have to go through our data to see if there's any signal in that but I -- they could be making decisions that have a buffer in them without affecting our numbers *per se*.

Q But it could -- it could be done.

A It could be done, for sure.

Q It could definitely be done.

A But it might be -- part of it might be being done is what I'm trying to say. I just don't know. I'm not part of that process.

Q We'll talk to Canada about it.

A Sure.

Q But obviously, it can be done and it can be built in as a buffer and it could be --

A Could be done.

Q Now, you talked about the ecosystem and that we shouldn't be looking in from -- from the outside but that we are actually all part of it, right?
A Mm-hmm.
Q Now, I think that is very much a point that we've heard in the Indigenous world view hearings, that is very much the Indigenous world view being one that is very clear and you're taught that for your knowledge. Now, you'd agree with me that building those values, that you are part of the ecosystem into the management approach would actually help overcome some of the problems of a too-compartmentalized approach that we are currently struggling with.
A It helps with the broadening perspective.
Q And could lead to a more integrated and sustainable management approach?
A I hope so but I don't know. That's a -- that's a lot to ask.
Q Sure. But we've been on that strategic thinking level so I was --
A Sure.
Q -- going to carrying it on -- carry on that way. Now, in a similar vein, climate change is not a phenomenon that we have no control over. It's actually agreed --
A Yeah.
Q -- that it's a human-caused phenomenon and --
A Yeah. I didn't want to go there yesterday so I tried not to get into that because --
Q Well, I'm sorry. I thought I'd --
A -- we've broadened our debate enough that I didn't really want to open that one but --
Q I thought I'd take you there.
A -- I agree with you. I agree with you.
Q And Fraser River sockeye salmon could be seen as an indicator species for climate change and the impacts of climate change?
A Yes, there's some excellent work on temperature effects on Fraser sockeye.
Q Now, you would agree with me that on the basis of that, measures could and should be recommended in terms of mitigation of climate change and adaptation to preserve the Fraser River sockeye salmon and that they -- those can also be built into management models and pre and in-season planning models?

A Yeah, and more specifically -- or a specific example is some of the work that's been done by Tony Farrell on aerobic scope. There's clearly differences in the degree of temperature tolerance of different stocks. He's only looked at, I think, three Fraser sockeye stocks so far. And one of the ways I've thought about a potential use of that work, and I realize I want to brief here, so I'll try to be very quick -- is in a triage sense, you know, which populations are more or less susceptible to climate warming?

So we can anticipate in advance which populations might be potentially more vulnerable. With Fraser sockeye being at the southern end of the species range, there's already going to be an increased pressure on Fraser sockeye relative to something like Bristol Bay, for example, just because of their geographic location. So the idea of using a tool that would predict vulnerability and triaging is one example of a piece of science that I think could be brought to bear on the climate change issue.

Q Triaging but also triaging with the hope it -- not just leaving some to the side but helping them.

A I know, well -- well, I agree, and I wouldn't want to provide anyone with an excuse to give up on any stock. There's certainly a morality there that is not very good. However, if you want to really look forward and ask how warm is the climate going to get, then the issue of triaging is not about giving up; the issue is can we afford, not in a fishing sense, can all of the stocks be preserved? Or what is the cost of preserving all of the stocks relative to making sure we have some around? And I'm not talking about giving up. I'm just talking about, if the climate -- if the Fraser River gets to be 25 degrees Celsius, there may be some stocks that just will not be able to survive 25 degrees Celsius. And some will.

And so at some point those very tough decisions may get kind of forced on it whether we like it or not. And all I'm suggesting is that some foresight about that -- I'm not -- I'm not suggesting -- I realize the danger. We have laws. I said this once in the United States in a meeting and I got lectured on the ***Endangered Species Act*** and it wasn't my intent to suggest we should give

up. We shouldn't. But we've got to be prepared for the possibility no matter what we do to the resource, the environment may do some things to these -- these populations potentially.

Q Well, and I think that -- and I'll just very briefly go there. I think that's why in the climate change talks and generally we break the issues down into mitigation and adaptation, right?

A Mm-hmm.

Q And adaptation being much more controversial than mitigation. So in the short-term and in the immediate point where we are already dealing with it, mitigation measures through management are key and very important. They're not happening yet but they should be put into a place. You would agree with that?

A I think more could be done.

Q And then adaptation -- I mean the big hope there is also that these species have adapted over time. So -- and also adaptation measures that can be taken.

A Yeah, the key point there is the speed. How fast will the climate change relative to how fast the fish can change?

Q And how fast can we start acting?

A Part of it.

Q Now, the -- and I'm just going to close on a point that I -- because I've, again, looked over your transcript. I don't really need to take you there. We've discussed the issue with the difference in U.S. Tribal participation under the Pacific Salmon Commission in comparison to Canada. And what you spoke to the other day is, basically what happened is that in the U.S. they had the ***Boldt*** decision on priority resource allocation and the government implemented it. So you saw that implementation at the level of the Pacific Salmon Commission but you now have the tribes involved as independent decision-makers and equal decision-makers?

A They are -- in the United States, the system of decision-making on the Fraser Panel says that all three parties, federal, state and Tribal --

Q State, yeah.

A -- all must agree before a position can be taken.

Q So they are full decision-makers. And --

A I would say that's full decision-making, yes.

Q And it was the choice of the federal government to actually implement that, the U.S. federal government?
A I'm not familiar with how that happened. I suspect all three parties were involved in that negotiation.
Q Sure.
A But that's before my time.
Q And then basically also the priority resource allocation and the sharing of the catch was agreed. It's overall half of the catch but in terms of Fraser River sockeye salmon, two-thirds?
A The current sharing arrangement with -- between Tribal and non -- or -- there's different terms used on different sides of the border -- Treaty Indians and Non-Indians in the United States is two-thirds for Treaty Indian and one-third for Non-Indian --
Q Now --
A -- on sockeye.
Q Now, and just because you brought up the treaty issue, and obviously that's a controversial issue in British Columbia, and not all tribes are part of -- of treaty talks and insist on Aboriginal rights. The point that I just want to make is there's also been decisions in Canada about priority resource allocation so it's really an issue of implementation that we are dealing with, whichever means it gets implemented by?
A Yeah, I think I already tried to clarify that I was not trying to suggest the treaty issue was a requirement in order to move forward.
Q Exactly. So there could be implementation. And that implementation would -- could be and would be welcomed, obviously, if that was the decision at the Pacific Salmon Commission level?
A Yeah, it would be -- if Canada came to us with that decision, we would implement it the best we could.
Q And then just last -- really last question is the question I had asked you last time, and I'm just checking in if anything changed, the Pacific Salmon Commission does not have an independent forum for Indigenous participation like the Convention on Biological Diversity, the U.N. Framework Convention on Climate Change?
A I mean to be honest, I've been trying to think

about just my knowledge on the Fraser Panel and trying to step outside the Fraser Panel because you're asking about the Commission and think about what Commission processes there are. And I'm aware of a process on the U.S. side that's more broader with respect to tribes. I'm not aware of the -- how the tribes are being integrated at the PSC level in Canada. I believe there are some tribal meetings.

When I go to the meeting last week, I see groups getting together but I don't know the mechanism that they are contributing within the bilateral process. They would contribute through their -- through their interaction with Canada because the treaty is between Canada and the United States. So it would be what's happening on the Canadian side there, which I -- you know, I only attend the Fraser Panel one so I'm not sure what's going on there. That's -- I just want to be --

Q But -- but -- no.

A -- clear about that.

Q I agree. But no independent one at the -- I call it "international" at the bilateral level because like those other agreements, they have a lot of parties and then there's independent forums for -- for Indigenous peoples. That doesn't exist?

A I'm not aware of it. I'm not aware of it.

MS. SCHABUS: Thank you. Those are all my questions.

MS. BAKER: Thank you, Mr. Commissioner. The final questioner is Lisa Fong for the Heiltsuk.

MS. FONG: Mr. Lunn, if you can assist to pull up Exhibit 70? I'm sorry. It's not Mr. Lunn.

MR. BISSET: Ben.

MS. FONG: It's all those screens. Thank you. Lisa Fong for Heiltsuk Tribal Council.

CROSS-EXAMINATION BY MS. FONG:

Q Mr. Lapointe, Exhibit 70 is the report of the Fraser River Panel to the Pacific Salmon Commission on the 2002 Fraser River sockeye salmon fishing season. And you were the chief biologist for the Pacific Salmon Commission in the 2002 fishing season, correct?

A That was my very first year.

Q Okay. And you've held that position ever since?

A I have.
MS. FONG: Okay. If you could please scroll down to page 4? Page 4, there's a map. There should be a map on page 4. It has a number "4" in the bottom.
A There it is.
Q There it is. And I don't know if you can see it on you screen well enough but Areas 12 and 13?
A That's correct.
Q Okay. Can you tell us, since 2002, Areas 12 and 13, are they still Areas 12 and 13 today?
A As far as I know, they're still Areas 12 and 13 unless they've changed how they -- what they call them.
Q Okay. But they haven't, for example, migrated north? That's roughly where they are, at 12 and 13?
A Are you talking about the boundaries for 12 and 13? Is that what -- I'm just trying to clarify the question. I'm sorry.
Q Sorry. I'm just trying to establish that the management Areas 12 and 13 are still the same because this is a map of 2002.
A I -- oh, I see what you're saying, sorry.
Q And your answer is yes?
A Yes.
Q Thank you. Now, as I understanding -- as I understand it, the test fishing authorized by the Fraser Panel begins in Area 12; is that correct?
A Yes, that's correct. The most seaward location would be an area called Round Island, which is sort of just -- how can I help -- it's just around the point from Port Hardy there.
Q Okay. Thank you. And the test fishing continues south into Area 13. That's correct?
A So Round Island gillnet, Area 12 purse seine, which fishes as far south as south of Robson Bight and then the Area 13 purse seine, which is -- operates out of the Brown's Bay and fishes in that area around Brown's Bay, which is just north of Campbell River there.
Q Okay. And the test fishing, and this is the Fraser River sockeye salmon test fishing authorized by the Fraser River Panel, is not conducted north of Area 12?
A That's correct.
Q Okay. And one of the purposes for test fishing is to assess the run size of a particular stock?

A That's correct.
Q Okay. And if I understand your evidence earlier today, because a stock run takes about 30 days, it would then take about 30 days before you could assess the size of the run?
A No, it's not quite correct. As the discussion happened with Ms. Gaertner, it's the peak of the run that's the critical part of the assessment so it would be --
Q Right.
A -- about halfway through the run, a little bit past halfway because you have to know that there's a peak so you have to have seen it fall off. So that what I would say is that the assessments begin as soon as we receive data, even four or five days worth of data, but they become much more certain after the peak of the run. So there are assessments made after, you know, five days and every day on a daily basis right in through the season. Estimates are provided and made all through the season based on all that data but they become most certain once we've seen the peak of the run.
Q Right.
A So what happens is --
Q Mm-hmm.
A -- the uncertainty gets smaller and smaller as we see more data.
Q Right. And just so we're clear here, though, for the test fishing because test fishing only begins in Area 12 and at a particular time you would only have -- you'd only be able to assess run size even at different levels of certainty, after --
A Yes.
Q -- the test fishing begins?
A So it's -- the 18-day reference I made would be reference to their first point of sampling.
Q Right. And so you'd agree with me that like the first assessment of size of run, you know, somewhere between pretty certain, around pretty certain --
A Yeah.
Q -- would be in Area 12?
A Yeah, at three days or so after the peak of the run passes Area 12, we would provide the first fairly firm assessment of run size data during the summer.

Q Okay. And when you say "provide the fairly firm assessment", you mean to the Fraser River Panel?
A Yeah, so that the -- the estimates, as reflected in some of the minutes, we -- we showed are provided at every meeting. So the difference would be there is a -- there is a point of judgment that PSC staff make in conjunction with the Fraser River Panel that involves the recommendation part of that. So in order for a run size to be adopted by the Fraser River Panel, we have to make a formal recommendation to the Panel. There have been a few cases where the Panel actually has come to us and suggested that there be a run size change. But the protocol is that we make a recommendation.

And so typically that would be nearer the peak of the run in it's -- but it's always relative to the forecast. So if, for example, in 2009, we had very, very strong evidence that the run was not anywhere near forecast, we might have -- in fact, I think it came up yesterday. We lowered the run sizes right across the board long before we'd actually even had any data for the late run, for example, because there was a very strong signal.

So it's always -- when I'm thinking about making a recommendation with my staff or discussing things like, "Is our best estimate the same as the forecast that's currently being adopted, or whatever the run size is that's currently being adopted?" If it's the same as whatever the current estimate is, we clearly would not make a recommendation because there would be no effect on the management. If it's different, then we clearly would want to say, "This is a different run." We make a recommendation and we tend to be pretty -- pretty proactive about that. Like as you probably noticed, there's an element of that judgment that's --

Q Mm-hmm.
A -- related to the policy aspect of the --
Q Okay.
A -- of the call so we -- the run's different.
Q Okay.
A That's our job, right, so...
Q Thank you. And are you able to comment on roughly what the stretch of time is between the test

fishing data being received, your making a recommendation or your team making a recommendation to the Panel and the Panel making a decision? Like are we talking days or weeks?

A No, it wouldn't be that long. So every morning of every day -- sometimes we don't every weekend depending upon the situation -- we make an assessment. Every day. So the only constraint then is when the Panel meets, which typically would be a minimum twice a week, Tuesdays and Fridays.

There's also a Tech Committee meeting on Thursdays and sometimes, as I said yesterday, we meet a lot more often than that. So you know, we're talking about the test fishery occurs on Monday, the data comes into the office on Tuesday, the Panel meeting occurs at ten o'clock, the recommendation is made and the Panel either rejects it or accepts it. So it's a fairly -- it's like an almost less than 24-hour turnaround provided there's a meeting.

Q Okay.

A If there's not a meeting, it would be longer.

Q And in terms of the decision, when the decision's made by the Panel and the flow of information to DFO, how soon after does DFO know?

A Well, this maybe is a point of confusion. The primary members -- well, there is a broad membership on the Fraser River Panel but DFO, the chair of the Fraser River Panel on the Canadian side is -- is a member of DFO.

Q So your point being that --

A They're notified immediately.

Q Right. So they know immediately?

A Yes.

Q Okay. And it's their -- are you aware, is it the responsibility of that chair to pass that information onwards into the internal DFO processes?

A My understanding is they have something called the Integrated Fisheries Management Team and those calls are kind of scheduled around our Fraser River Panel meetings. So it would be within -- whenever our meeting is over, within hours, I would think, is the -- would be the -- as long as they schedule their meetings right after ours, it would be a very short period of time.

Q Okay. Now, given that -- and sorry, the first test fishing just so we can kind of nail down the time, if you can recall? My understanding is that the first test fishing occurs in about the third week of July.
A It varies by approach. In the case of the -- and that's because of the diversion rate variation among the stocks. Early Stuart almost always comes down through the southern approach here, down through this Area 20, Juan de Fuca fishing labelled area.
Q Mm-hmm.
A And so we start there usually around the 21st of June.
Q Right.
A But the later stocks, well, the proportion of fish that come down through Johnstone Strait increases over time so we don't start to see fish in Johnstone Strait until about the 11th or 12th of July. So we start up test fishing in Johnstone Straits about the 11th or 12th of July.
Q And so with those fish, is it fair to say then usually by the end of July there would have been, for example, the first relatively certainly stock assessment --
A For the early summer run -- for the early summer run, run size it's right about the last week of July, within the first few days of August typically.
Q Okay.
A And of course, it varies because the stocks don't always come back at the same time, which is -- so some years it would be later and earlier depending upon the arrival timing in any year.
Q Okay. So staying with that stock then, given that the test fishing isn't really -- isn't conducted until sort of mid to late July because of when the fish arrive in that area, and the run size itself, the assessment wouldn't be known until late July or early August, now, would you agree with me the communities that are north --
A Mm-hmm.
Q -- of Area 12, like, for example, my clients who are in Bella Bella, they wouldn't have the benefit of the information from the test fishing for the Fraser sockeye -- Fraser River sockeye salmon, as it's passing their doorsteps?

A I think I understand what you're asking and it is an issue that relates to the timeliness issue. So we have been told not just by commercial interests but also by First Nations folks in those areas that by the time we might know that the run is larger, the fish may have largely swam past where those folks fish. And I don't know if that's the angle that you were asking the question about --
Q That's what I'm trying to understand, yes.
A -- but that -- that is true. So part of the issue relates to the verification of the test fisheries. So the test fisheries are -- we use the word verification. I'm not sure it's the appropriate word but we believe that the Mission site, on average, produces a much more reliable estimate because it samples a larger fraction of the fish. And it takes about eight days for the fish to get from these seaward test fisheries to Mission. So there's some desire on the part of the panel in some -- in some cases to wait to see that peak of the run be observed at Mission, which creates a further delay in the timeliness.

So now instead of eight -- 18 days after the peak reaching this northern area that you're talking about your clients being from, it's now, you know, potentially 26 days afterwards. And if that's the case, and the run was to be increased, for example -- and it only gets increased because if it stays low and there never was going to be an opportunity then perhaps there's not the same implication in terms of potential harvest as there would be in the opposite direction.

Yeah, it's something that we've called the sort of run size certainty catch allocation mismatch and it's something that we identified in 2003. If you go and look on our website, there was a run size workshop and that was one of the topics that came up and I don't know -- remember the gentleman's name but I was at the think tank in March and there was a gentleman who mentioned this to me and he was from one of the northern communities. And I'm sorry, I can't remember his name but he brought up the -- the fact that this is an impact on his communities as well.
Q And is that still a topic before the Fraser River Panel?
A Yes, it relates to the whole issue of how to

become more timely.
Q Now, I've just got one question about 2010, the 2010 fishing season. And if you're not the person to answer that, that's fine.
A Sure. I'll try.
Q And my simple question is, do you have a recollection as to when you and the Fraser River Panel became aware that the run as going to be larger than what had been forecasted?
A It was pretty early on. But you've got to remember that the -- the total, which is, you know, 34.5 or 29 or whatever set of numbers you want to use -- the official number is 34.5 until we see the -- the estimates on the spawning grounds, is mostly in the late run group. About 24 million of it is in the late run group. So it was very clear early on that we had a larger than expected early summer run. And it just so happens that the stock strength last year in the early summer and the late run were both in the populations that were in Shuswap Lake. It was the early time component of the Shuswap Lake, Scotch and Seymour and the later time component of Shuswap Lake, that both were very strong.

Maybe there's a signal there in terms of causal, I'm not sure, but -- so we were very aware that we had a very strong early summer run. The Early Stuart was strong but it wasn't as strong relative to its forecast as the other stock so had a little hint from Early Stuart. We saw Early Summers coming in and went, "Wow, this is a big Early Summer run." The summer runs were stronger than forecast but not that strong. And then the late runs came in so it would have been like -- confirmation of the Early Summers would have probably been sometime in that first week of August. And then the summer runs were coming in and they were kind of tracking better but not great. And then about the -- probably about the 10th of August or so or 15th because the late run was so large, like it was such a strong signal, it was clear that it was bigger. And if you go through the times sequence of our run sizes, you'll see we kind of stepped up gradually. Like I had estimates that were as high as we ended up probably two weeks before.

But it wasn't necessary to go that high for

any fisheries management purposes so why go to 20 million when 15 was more than sufficient to justify any level of desired harvest? You step up gradually because if you stepped up to 20, there's no real management consequence but there is this kind of run size going up and down and up and down kind of fluctuation that creates. So we do -- so the record of the run size estimates is clear. There's no -- no -- no ambiguity about it. We tell the Panel every week, every day, we meet, tell them what the run is. But the recommendations were tempered to smooth the transition up into that -- in that big run so that we didn't kind of create an over-exuberance, I guess, or any misperceptions or be wrong -- feel like we were wrong because doesn't matter whether the signal's strong you still have uncertainty early in the run and you still have possibilities of lower and higher. So you don't want to get too far out in front of that.

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

MS. BAKER: Mr. Commissioner, I have about five re-examination questions, which I hope we can move through pretty quickly and maybe we could do that and we could break for the day?

A I thought I was done.

MS. BAKER: Well, it's in your hands. We can be done fast.

A Okay. I get the hint, I get the hint.

RE-EXAMINATION BY MS. BAKER:

Q Ms. Gaertner showed you a document prepared by Mr. Staley. I just wanted to -- just a very quick question. Have -- did you receive that document in around the time it was written?

A Yes, I did.

Q Okay. And did you have any conversations with Mr. Staley about the content that you describe -- or you discussed here today with Mr. Staley?

A No, it happened right before the season and I just -- it was one of those things where you -- you want to let that sit for a little bit before you have a conversation with a friend.

Q But you have had that conversation since?

A I have.

Q Okay. I'm going to go back to questions that were

posed to you by counsel for Fisheries Survival Coalition, if you can remember. Seems like a long time ago now. But we looked at some -- or she had some questions about going back into the way things were managed under the old IPSFC system.

A Yes.

Q And one of the questions she posed -- and I don't have a transcript -- I just have my --

A Okay.

Q -- rough notes so I probably won't describe it as well as the transcript would, but she said, "What would be wrong with going back? There would be where you would have a forecast that perhaps underestimated. And if we had better, more timely detailed in-season data, what would be wrong with going back?" And you said -- you described some answers like, "If in-season estimates were accurate enough, it would probably work. In the past, 70 percent of the run was harvested in the marine areas. Now, it's different." And you said, "Look, if the models were accurate enough it might work." So the questions I have in re-examination is, are your current models accurate enough for it to work with today's fisheries?

A No, but it's the combination of the accuracy and the timeliness and it relates directly to Ms. Fong's questions. What she expressed to us about her clients is what I also hear from other members of the Fraser Panel about the need to be timely with respect to the desire for folks who only have opportunities in these areas to have access to fish if they're available.

Q Okay. So the way -- the timeliness that we can obtain the data now and the models that we have now are not accurate enough to put us in a better position, if we were to go back and use the old models?

A So it's sort of the combination of the accurate enough/soon enough type situation, if you understand what I mean. In other words, they're accurate enough but by the time they're accurate enough, it's too late for the folks that would like to have that information in the seaward locations. So it's that -- I think it's more timeliness than accuracy. The accuracy doesn't occur soon enough.

Q All right. And if you were to go back in time and

do things the way they were done under the one Commission's methods, would it improve management beyond what we have today?
A You're not helping me make this short. What do you mean by -- what do you mean by "improve management"?
Q Well, would it be any -- I mean the questions were posed, "Why don't we just go back? Wouldn't it be -- would it make -- you know, wouldn't it be possible?" And so you've said, Look, it could be possible except that the models and the accuracy pose some difficulties." And so I'm just asking, given those constraints, would we be in a better position adopting the old method than we are in today?
A Well, if we went to the old method, it wouldn't work with what we have today --
Q Okay.
A -- I don't think because of that. Because it's different, I think is what you're asking but I'm not sure that I --
Q Right. I think that's probably what I'm asking you.
A Okay.
Q Then there were some questions asked again about -- she asked you, "How does knowledge about First Nations fisheries get to the PSC?" And you gave an answer about how those First Nations harvesting decisions are made in the caucus -- at the caucus level. But my question is, once those decisions are made at the caucus level, does Canada advise the PSC about what the intentions are with First Nations harvest so that that can be taken into account?
A Yes, we provide -- we are provided information once the decisions are made about all of the -- Canada's plans for all of -- all the fisheries that Canada intends to conduct.
Q Okay. And you made reference -- and I'm sorry I don't have a note of when this came up but you made reference to a document -- I think it was in -- actually in response to some of my questions about Bristol Bay. You mentioned a paper by Daniel Schindler and Ray Hillborn and others. And I think you might have referred to the date 2002 for that article. Was that the right date?
A Yeah, that was in the context of the Bristol Bay

discussion.
Q Mm-hmm.
A And that is -- was incorrect, if that's what I said. It should be 2010.
Q And the title of that article is "Population Diversity and the Portfolio Effect in an Exploited Species"?
A That's correct.
MS. BAKER: Okay. I don't think we need to mark it but I just felt for the record we should be clear. Those are all my questions. Thank you. So we will -- we're completed with Mr. Lapointe's evidence unless there's something arising.
THE COMMISSIONER: I just had three very quick -- just for clarification, Dr. Lapointe.

QUESTIONS BY THE COMMISSIONER:

Q Do I understand that the test fisheries are the responsibility of DFO?
A No, that's not correct. Test fisheries, Fraser River Panel approved test fisheries, are authorized under the approval of the Bilateral Panel.
Q Okay.
A We have the responsibility for administrating them. There are test fisheries that are conducted in non-panel waters. The test fisheries that we're talking about in Johnstone Strait were the -- some of the -- a substantial amount of the work is done by DFO employees but they're administered by us under the auspices of the PSC and the authority and the responsibility is a bilateral one. It's just that we have that collaboration, which is more efficient than hiring our own folks to work in those areas.
Q So the number of test fisheries and their location are determined by the PSC?
A Yes, but just the broader context here is we have PSC test fisheries. There are also other test fisheries that DFO conducts for their own purposes that are outside of our purview. So there are others that are -- if you're talking about all test fisheries in the Pacific region on salmon, there's a lot that we don't do that's done for other reasons. But for the ones on Fraser sockeye, definitely bilateral

responsibility/accountability comes to us.

Q You did -- you may have mentioned and I apologize if I missed it but the hydro-acoustic station at Yale, is the data from that facility fed into your system as well?

A Not in a formal sense in the sense that it's not been formally adopted as part of our management *per se*. It still was conducted as partly an experimental program. It's conducted by DFO, as I'm sure you know. Last year, in an informal sense, we share. That information is emailed to us every three days and last year we did, for the first time, try to make use of that information because we saw signals there. So there -- it's just that because it's an experimental program it hasn't kind of been formalized as part of the management. It's a much more informal relationship right now.

Q And my final query is -- and you touched on this briefly but if I may impose upon you just to go back. When the Wild Salmon Policy is fully implemented, in what ways would that impact upon your practices and procedures at the PSC?

A It's hard to know because it's hard to know where it's going to go. I gather you guys spent quite a bit of time on this and you may likely know more than I do about where it's going, I guess. I gather there's quite a difference of views as to where it will end up but some of the nuts and bolts of things that I would expect to be affected would be things like how we account for stocks. So if we can at least align the groups that we can detect with genetics to match up more closely with the CU's, as they're called. So I see it mostly affecting the way we account for the different impacts in terms of -- because that's our main role in terms of in-season is to gather all the data and we're the ones that do the -- you know, apply the stock ID to these stocks.

So clearly, if we can align what we do closer to what would be needed on whatever the demands are for the Wild Salmon Policy, we would want to do that. We're also the joint holders of that 19 stock dataset that's used for forecasting with DFO, joint holders because DFO has a responsibility for the escapement. We do the stock ID on the catches. That's why it's a joint

thing. So again -- and we've already began thinking about this, you know, are those 19 groups aligned with CU's? Well, not exactly, but perhaps there is some alignment

And the challenge is to think about things like index stocks to try to -- if you -- if you can't have something that's explicitly that CU, maybe you have something that can act as sort of an index for that CU. So we're -- we're not as ahead of the curve as I would us to be but we are definitely aware of it and we're definitely prepared to do whatever part is necessary. I don't -- I won't say that it's going to be easy but we are definitely on the side of trying to make it work.

THE COMMISSIONER: Thank you very much. And I want to express my appreciation for the patience you've shown. You've been here several times and you've been very cooperative with counsel in answering their questions. And I appreciate that very much.

A Thank you. I want to appreciate -- express my thanks as well. I think that perhaps you've learned a little bit more about me than you cared to in the case of some of the remarks I may have made but I had -- I had a little cheat sheet in front of me. I don't have it today but it had two words on it. It had "appropriate" question mark and "succinct". And I figured I flunked the appropriate test last -- yesterday and I was really hoping I could bring my succinctness grade up today. I'm not sure how well I did but I'll try to do better next when I see you, okay? Thanks for your patience and time.

THE COMMISSIONER: Now, I take it we're adjourned until 10:00 tomorrow morning?

MS. BAKER: That's correct.

THE COMMISSIONER: And we'll adjourn at, is it, 1:30 tomorrow?

MS. BAKER: That's correct. And just in terms of timing, I'd like to propose that we would take a morning break at 11:15 and then maybe a second break at 12:15 --

THE COMMISSIONER: All right.

MS. BAKER: -- for tomorrow. Thank you.

THE COMMISSIONER: Thank you all very much.

THE REGISTRAR: The hearing is now adjourned till ten o'clock.

(PROCEEDINGS ADJOURNED TO JANUARY 21, 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
Registered Court Transcriber

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
Registered Court Transcriber

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.

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Karen Acaster
Registered Court Transcriber