Keith Clarke

KEITH: Slide 1: So I'm from Canada. How many Canadians do we have in the group? Oh nice, nice number. I really appreciate the opportunity to speak to this group. It's an interesting situation. I get to travel 14 hours and across four and half time zones because I actually live in the other end of the country. And if I fall down and have a nap, don't worry about it, I will get up and finish the talk at some point in time. [Laughter]

So the theme here is uncertainty. I won't talk directly about uncertainty a lot in this situation. This talk has a lot more 'Gee whizz' and the 'what happened' later. I will show you what we did and how we came upon looking for a national strategy which was quite an undertaking when you think about the size of Canada and I'll show you something about that in a few minutes. We were looking for some national consistency for my department which is the Department of Fisheries and Oceans.

In Canada we're a bit different to what our American colleagues would be used to. In Canada the federal agency or the DFO basically has a control of fisheries and while that is an oversimplification to some extent, we are involved in fishery resources across the country. We're in fresh water and we're also in marine. I guess if you wanted to look at us, it would probably be a mixture between the US fish and wildlife service and NOAA. We're somewhere in between that but we also own the Coast Guard in our organization so we get a little bit more complicated than that sometimes too.

Slide 2: First off, acknowledgements: I get to be the mouthpiece here today, but an undertaking like this takes a lot of people. Roger Wysocki who was my colleague in DFO in Ottawa was the co-chair of the process that we are going to be talking about. Roger and I work really well together; we've done a few of these national processes. Roger is the person who actually does all the leg work and all the writing, and I'm the person who herds the cats. I'm the person who ends up in the meeting for three to four days and tries to make 50 scientists come to consensus in the end of those three days.

We actually had a great group put together a review document for this advisory workshop that was headed by Tommi Linnansarri from the Canadian Rivers Institute; of University in Brunswick in Fredericton. They did an excellent job in reviewing methodologies from around, mostly for Canada and the upper Unites States, but from around the world as well. And then if you have an advisory process and you're trying to develop something for managers and you have mostly scientists in the room, the participants are actually the people that do all the work and they're very instrumental in developing these types of processes. We had an array of people; we had 30, to 35 I think. We had a nice mix of experts from academia, government institutions, managers, NGOs, we had international experts Tom (Annear) was up and the provinces. So we had a fairly wide range of experts in the room talking about instream flows in Canada.

Slide 3: So a little bit of an outline of the talk, first is the question and issue of why we were asked to do this particularly advisory document. Because we're in the United States mostly you won't even know what CSAS is. I'll go over one slide of what a CSAS process is, why it exists and where it fits into the regulatory framework for DFO. Then we'll have a little really quick overview of the review document, I'll go more in detail of what came out of the advisory document, and then we'll have a look at what happened next and some uncertainty. What happened next in interesting because this was done in 2012 and we had some pretty significant changes happen almost immediately after we had this meeting. And then a couple of slides on what we learned to date and in the "what we learned to date" will be where this is actually starting to get used in 2015 after three years.

Slide 4: So the question or the issue: Canada is a big country. I don't know if it's a good thing or bad thing from instream flow or environmental flow perspective, but when you look at the county as a whole, actually a lot of our water is not allocated. We actually have a lot of water. We have a lot of areas that don't have a lot of people in them so we don't have a huge amount of water resource issues in large tracks of the country.

Now saying that, you'll see that there is red on this graph as well. Our friends who are from Alberta and Saskatchewan certainly have water issues because they basically live in a desert – well, semi-arid area, you would say, Andrew? Semi-arid is good description and also of course the Golden Horseshoe in Ontario which is highly populated. They actually have water issues as well.

But we would need a consistent method for, and this is important to remember, for projects that are coming into the department for an authorization and it's all based on fisheries. This is where we live in the water world. The federal government doesn't regulate water in most parts of the country, mostly that's the provinces unless you are in federal lands or you're in some of the Northern Territories. So our very narrow view of the world is fisheries in this case.

Slide 5: So because the way our department is set up I had to have one slide here on the CSAS process. We have the science branch which provides scientific information and scientific advice to a variety of groups within the department. So what happens is a management or a policy organization within the department will ask question. It can be a regional question or in this case, it can be a national question. They'll ask a question that gets posed to science. Science then develops a team to put that question to the best available knowledge, the best available information that exists in the scientific literature and we come up with an advisory document hopefully at the end of the day.

These things can be very broad; they can be anywhere from the development of TAC, so total allowable catch in regular fisheries. They can be recovery potential assessments for species at risk, or in this case, they could be looking at environmental flows to protect habitat at the time and protect fisheries now in the future. This organization is set up within the Department of Fisheries and Oceans, it's very busy, they produce about 200 publications annually and they have about 100 workshops, pretty broad array of workshops that they're dealing with at all times.

Slide 6: So we were asked in 2012 to have a look at the environmental flows in Canada. The big part of this is number four. They really wanted some technical

recommendations to go towards standardizing assessment for environmental flows and instream flows, for the management of fish and fish habitat in Canada. There were other objectives at the meeting. We were going to use the review document to have them look at methodologies. We were also going to provide mangers with a quick and dirty strengths and weaknesses for these types of methods that were being used in Canada as well as their benefits and assumptions. And probably just as important as anything else, we actually were asked to define some terms and terminologies in the document so that everyone would be at least reading the same terminologies in this case, because it's interesting how many terminologies for the same thing or how many definitions for the same term exist, especially in the environmental flow arena.

Slide 7: So this is what one of those review documents looks like. These are all published on the web. They're all public documents, which is an interesting thing, and even though the questions are asked by managers within the department, because they're public documents, they get used by NGOs, they get used by provincial agencies, they can get used by anybody. Actually it's interesting I've done one a few years ago, I never saw it, went to an environmental assessment, sat at the environmental assessment and had the document basically used against the department because we had made it public and they used all the information that was in it. And, you know, it's what happens, but sometimes NGOs pick them up and use then for other reasons that we are not really completely cognizant of.

The review document is important in these things. If you put 33, to 35 people in a room and you don't give them something to focus on, herding cats is an understatement; you end up spending three days going around circles and you'll never get to anywhere. A good review document, if you're doing this type of work, is pretty important.

Slide 8: So when we get consensus, and that's the important part of these processes as they are actually a consensus meeting. If there's not a consensus on an item, it doesn't go into the advisory report; it may go into a proceedings

document and just say ‘basically this was an issue that was asked and we couldn’t reach consensus on’, but the stuff that goes into an advisory document is actually consensus based from the group that was reviewing it.

Slide 9: The next few slides are just preferred highlights of the advice linked to the objectives. I don’t want you to read this table; there’s way too much information for this slide, but to tell you that the review document broke down the methodologies into four broad categories: hydrologic, hydraulic rating, habitat simulation and holistic frameworks. I put holistic frameworks in yellow because fisheries act authorizations for the frontline manager are usually not going to have a holistic framework type methodology presented to him in the first instance. Holistic frameworks are more akin to what we see for the Canadian environmental assessment act or other environmental assessment situations in Canada.

So this morning we watched a presentation on the hydro project from Alaska. Obviously that would not be something that would come into the department for authorization in a state where we would actually make fisheries authorization because they’re almost guaranteed that that is going to require a fisheries act authorization. We’ll skip that particular process and go right to the environmental assessment. So that’s where the holistic approaches fit in more readily than what we are seeing for most of our frontline assessors, . This process was to provide something for the frontline assessors, the person that sees smaller projects on a day to day basis. They can be small or medium-sized projects that may impact flow.

Slide 10: So again the objective two – again you don’t need to read all these but we actually define a whole bunch of things in the advisory document. It’s important to do this for our managers and is actually important to do it for ourselves, but the last one there was basically when we came to some kind of consideration of what we were actually trying to do in this particular process was to look at ecological flow when it comes to fisheries. It’s interesting in one of the presentations yesterday someone said the surrogate we use was fish

habitat, yeah, we used to. In Canada we don't use fish habitat anymore, not as surrogate in fisheries because of the change in fisheries act a couple of years ago.

Fish habitat does not go away but certainly the focus is put on more on the fisheries than fish habitat in the present situation. Slide 11: We also just pick an example out of the advisory document; we look at the examples of strengths and weaknesses. These ideally should be written in plain language so that anybody can pick this up and get some kind of context of what the strengths and weaknesses of the various methods are. You have to remember that you are writing complicated science in as plain language as possible for a very broad range of people that will be using this hopefully in the future. We really hope that people actually use this type of stuff in the future.

Slide 12: So the big thing that came out of it or I think that got the most potential for use is actually a couple of the screening tools. So when we went through, we looked at all the information. I mean, Tommi and his group looked at hundreds and hundreds, probably thousands of papers. Different methodologies, different case studies, have a look at situations that could be used in Canada, and we came up with a cumulative flow alterations basically a screening tool for first line mangers to look at. Basically we said if the instantaneous flow was going to be changed less than five percent, plus or minus, we didn't expect much effect on the fishery resources. We actually said it in nicer terms than that just low probability; basically we don't expect any effect on fisheries with that kind of change in flow.

Slide 13: There was a corollary that was put into that screening tool to also look at areas of low flow, or the zone of highest risk, and this one used 30 percent of the mean annual discharge. They have a heightened risk of impact, the ecosystems that support fisheries and we said that if you were doing anything in that period within the hydro graph, then the department was interested in it and we were actually going to ask you to do a more in-depth analysis. Slide 14: So those two pieces of information came into basically what we were advising the

department to use as a screening tool. There is no guarantee that the department would ever implement this, but you know this is the way this works. We provide the advice and we hope the managers pick it up afterwards.

So to bid the first one is just reiterating the same concept that we just went over in the last two slides. There was one thing that we did actually not come to consensus on, partially come to consensus on, I guess. There are a few jurisdictions in Canada that actually use cutoff values that protect drought conditions or historical low flows. So we made up wiggle words. Basically we said, "Yeah, these are wonderful and we think that they are great and we should include them but we can't come up with one that fits all of Canada and maybe we should do some more research and we should eventually come up with one of these in the next 30 or 40 years." We said, "In all intents and purposes we understand that these are important and they're probably will be very useful for protecting ecosystems but we couldn't come up one for the entire part of Canada."

Slide 15: So what did the process provide? The process provides an update review of the methodologies with comments on the strengths and the weaknesses for managers, frontline managers. It comes up with a set of definitions to help with national consistency. As we've said before, Canada is a big county, a lot of things going on in Canada. It comes up with a set of screening criteria that was based on natural flow that could be used nationally to help protect fisheries. I haven't covered it here but within the document we actually go through what we would consider a natural flow and how to use the hydro graph to actually use these screening tools. You know, basically if you have a gauge, 20-plus years, and then there is a whole bunch of criteria after that. If you don't have a gauge—in most places in Canada you're not going to have a gauge especially up north—how you could actually come up with some calculations to create a hydrograph that you could be reasonably certain that might be useful in something like this.

What we didn't provide, which is important as well? We didn't provide a cookbook for e-flows. There's lots of them out there, there's building block manuals, there's the IFC manual that everybody has seen over the last couple of days, there's a few from South Africa, from Australia. There's lot of manuals out there and lots of messages as to how to actually implement these methods. This wasn't what we were trying to do in this situation. We were trying to give some very relatively easy-to-understand rules of thumb to frontline mangers when they got a project come across their desk that may affect flow. And we couldn't come up with a "one size fits all" cutoff limit that could be used throughout Canada.

Slide 16: Okay. So what happened next? Well, I said we're not going to talk about uncertainty, but then the government decided to change the Fisheries Act. This was all predicated on the Section 35 of the Fisheries Act which protects habitat in Canada. This process happened in March 2012. In June 2012, lo and behold there was an announcement in a very large budget bill that they were going to make significant changes to the Fisheries Act and change the wording of Section 35. Well, that caused some interesting discussions across the country. In the scientific literature, I put a couple up there. There was a paper in science, there was a paper in fisheries, there was a paper in nature; actually if you wanted a paper published in nature or science at the time, if you had this on it, you actually can almost get it published the next day. It was the way to get your paper in nature; it really was.

It also lit up the news media. I mean people were uncertain; they were certainly uncertain with this situation because they didn't know what the new act was going to do. We had lived with the old version of the Fisheries Act since 1977 to 2012. People were kind of comfortable with it, they knew what to be expected, and this was a fairly significant change. So this kind of threw us a bit of a curve ball, so it slowed down the implementation or any potential implementation I think of the recommendations for a couple of years. Originally I was one of the few people; there were six of us brought to Ottawa, put in a room the day the act was announced in Ottawa, and we were told they

were going to implement the changes in six months. It was an interesting meeting, to say the least.

So a little bit of history, the original habitat provisions in the Fisheries Act were introduced in 1977. We didn't have a policy until 1986, which was nine years. They were expecting us to not only to come with policies but also all the scientific information in six months. So we basically said, "No, that's probably not going to happen but we'll try," and we did, and in the next two years we had six national advisory processes up to November of 2013 when the full implementation of the Fisheries Act – the new provisions in the Fisheries Act came into force, and so all the effort within the department—I won't say all the effort—most of the effort in the department on habitat issues were focused on actually trying to come up with some science to implement this Fisheries Act change for two years, for all intents and purposes from 2012 to 2014. That's one of the reasons why some of the other things never moved forward as quickly as we like. So it really was a major curve ball for us.

Slide 17: So how does this fit into the new world? So the new world, instead of the habitat management program now we have the Fisheries Protection Program. Sometimes you'll see Fisheries Protection Policy. Both of them are both FPP, which confuses everybody. The program went under a major reorganization. Not only did the Fisheries Act change, they lost a third of their staff, they closed many of the satellite offices around the country, they had a new way of doing business which was basically to use self-assessment to be as minimal in people's lives as possible, so the whole way of doing business was different. But we can see where the advice fits, because it's still in all its essence, about fisheries.

So the screening tools are actually quite useful to anyone who wants to self-assess and to utilize the 10 percent rule or the 30 percent MAD rule. Since FPP is set up a little different than it used to be. Now there is a triage in each region that actually gets these projects that could potentially become authorizations. The triage usually will look at it and say, "If it has a potential to affect fisheries,

then we will pass it along to the appropriate authorities within the department. If we don't think it has a potential go ahead." You might get a letter of advice basically telling you to use standard practices and be happy, or you may not, but you can go ahead and do your project but there is no authorization from a federal fisheries perspective at all. That's not saying there are no other permits and authorizations from a provincial regulatory office or possibly even other regulatory situations. But from a federal fisheries perspective they may be just told, "Go ahead, have fun, here's the rule book on building culverts. As long as you adhere to this rule book, then we don't really need to see what you're doing."

So that's a little bit different the way it's done now, and obviously other interested parties could still use the document and the information it contains. Slide 18: Actually it's interesting because I've found that last night here in this room or pretty much in this room over a beer or two , several areas where this document is actually being used and up to that point in time I had hardly known of anyone who had used it. And lo and behold it's actually showed up in a bilateral agreement between two governments in Canada. So it actually is being picked up and used.

So in the situation that we ended up in, we had a couple of law change issues with implementation. What did we learn from this process? Tom said yesterday in his talk that we couldn't be pessimistic, so I can't be pessimistic up here today. I did find out last night, like I said, that there's been some use of this process. It actually shows up as one of the triggers in the Mackenzie River basin bilateral water management agreement, which was actually signed days ago, March 18, 2015, so it's actually being picked up and utilized within those documents, which is really cool to see. It's like having your child go off and grow up and actually do something that you thought he was going to do, and there it is, he is actually going to do something.

And it's been studied and used in Alberta, according to Andrew, and he's going to talk, or he's going to at least mention it. I do know that FPP stuff is finally

starting to pick it up in the central and Arctic region. It has recently been conducted or the focus of the training exercise for their staff in Central and Arctic area so slowly. It's a slow process, but it looks like these things are starting to catch on a little bit.

Slide 19: So I've been doing a lot of these science advisory documents for mangers over the last five years, so much so that I almost consider half my life is now stuck in Ottawa, even though I live on the farthest East Coast in Canada, but they still seem to reach out and get me to do these things. And I just wanted to put up one slide up about some of the pitfalls, and most of these items are actually all on the same theme.

When we are developing advice for frontline mangers, we have to try not to be too complicated. We're scientists; we have tendency to want to go to the most complicated model with the most information possible and we want to produce wonderful graphs, we want to produce all the scenarios that are out there. But for frontline mangers usually what happens is they see that document, it glazes over them, and they throw it in the garbage pile or possibly on the shelf and it collects dust.

So we have a couple of things that we try to remember when we are doing this. We have got to try and use plain language. We have got try to stay within our mandate. I know we don't want to do that as scientists. We want to be holistic. We want to look at the environment and the ecosystem. We have to do that but we also have to make sure that they understand that their mandate is also served in the information that we're providing them. The other one that we get all the time, once the science document or the advisory document is released, science walks away from it. We never provide any follow-up or learning. We're not a very good learning organization, which was mentioned this morning. We are actually a very poor learning organization. We'll be very helpful if we could actually become a better learning organization and help everybody involved in protecting fisheries.

Slide 20: And just because I did not show one river or one person fishing, I had to put up one picture. I'm standing on a hydro project which actually has an instream flow for fish passage. I'm looking down at the Exploits River which is the largest Salmon River in Newfoundland and Labrador, and you probably can't see it but there's literally hundreds of people in that three- or four-kilometer stretch fishing for salmon. So many people fish in this one spot that during the run you actually line up; you get half an hour in the pool. If you don't catch a fish, you go to the back of the line and the next guy comes in. You hook a fish and you don't catch it, you go to the back of the line, and so when you hook it, you better haul it in. Anyway, thanks a lot and it was great to be here. Thanks.