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Chair

Mr. Tom Wappel

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● (0850)

[*English*]

The Chair (Mr. Tom Wappel (Scarborough Southwest, Lib.)): We have a quorum and we're ready to start. We don't want to keep our witnesses, who are here on time, waiting. Thank you very much, Dr. Neis, for coming.

I just want to put on the record the purpose of our visit here, so that it is clear to everyone. On February 8 of this year, our committee agreed to undertake a study of the northern cod, including the events leading to the collapse of the fishery and the failure of the stock to re-establish itself since the moratorium. That's why we're here.

We've met in outlying communities with fishermen, and now we're here in St. John's to meet with whoever we need to meet. I think that today is our academic day, if I could put it that way.

You're the lead-off batter, so to speak, so welcome. The procedure is very simple. You'll make your opening remarks as you see fit, and then I'll simply ask members of the committee if they have any questions, and then there will be an interaction. All right? It's fifteen minutes maximum for your presentation, if you don't mind.

Dr. Barbara Neis (Professor of Sociology, Memorial University of Newfoundland, As an Individual): Okay, but you'll indicate the time?

The Chair: I'll let you know, yes, in a gentle way—and the time doesn't start till you start.

Dr. Barbara Neis: Good morning. Thanks for inviting me.

I have a couple of background comments before I start.

The presentation I'm going to give is actually a substantially reduced version of a paper that was published a few years ago. I have given copies of that paper to somebody, if you're interested in looking more closely at it. There's also a second paper. There were two somewhat key papers that came out of this research.

The other comment I'd like to make is that it is interesting, given the focus of this panel, that you're starting with a social scientist and not a biologist. In my comments, I'm going to in fact focus on the importance of interdisciplinarity for understanding this particular problem.

The third comment is a cautionary one. I know your interest is in recovery issues. While we worked a lot on the collapse of the cod stocks in the 1990s, in the case of northern cod, a lot of our work since that time has been focused on the northern gulf, which has a different stock. We have also worked in southern Labrador, but the main focus of our work in the last four or five years has not been on why the northern cod did not recover. I have some comments that we can get into on that, but it has not been the main focus of our work in the last few years.

The simple response to the question of why fish stocks collapsed, in this case the northern cod stock, is that stocks collapse when the mortality rate for a given stock exceeds its capacity to successfully reproduce. This response tells us nothing about the dynamic processes that bring fish stocks to this point and that exert considerable influence on responses to such collapses. For example, what do you do when it happens, and what did we do?

For several decades now, both social and natural scientists have struggled with this problem. The fact that humans play a key role in marine fish stock collapses is well recognized. Those stocks that are known to have collapsed or to be collapsing have almost always been the target of major commercial fisheries. Recognition of the capacity for humans to bring marine fish stocks to commercial, if not actual, extinction and of the costs associated with unmanaged fisheries has led to the development of a complex array of institutional and management regimes, the 200-mile exclusive economic zones, quotas, marine protected areas, and so on.

One of the interesting and significant things about the collapse of the northern and other cod stocks is that it took place in the context of a science-based management regime. This was not pre-1977, although I think the historical work that has been done suggests that we underestimated the extent of the damage prior to 1977.

I think it's important to try to understand why this problem has occurred in the context of a science-based managed fishery. It was probably one of the best that existed in the world, and also one of the species that was best understood in the world, in terms of the amount of investment that had been made in science and in management. It's an absolutely critical case.

Our view is that part of the problem has been disciplinary boundaries. In terms of the research that has been done and also particularly within the context of bureaucracies, the exclusion of social scientists from the Department of Fisheries and Oceans as a bureaucracy in fact contributed to this problem. The result of the disciplinary boundaries and that exclusion is that natural scientists and managers responsible for fisheries have tended to be somewhat ignorant of or even hostile towards the substantial and diverse social scientific literature related to fisheries. They paid insufficient attention to the way social factors mediate the data they rely upon to produce fishery science, as well as the scientific and management paradigms that gain ascendency at different points in time, and the relationship among these paradigms and people and marine ecosystems.

Disciplinary boundaries and institutional fragmentation, we're suggesting, had significant negative impacts on fishery science and management. I will get to some of those impacts. I think that they been well supported by our data and they're now well recognized in the literature. Social science also suffered from that disciplinary split.

● (0855)

Social scientists did not understand clearly the social and technical processes involved in stock assessment science and management initiatives, the different paradigms that existed within fisheries biology, and the relationship between the natural environment, fish populations, and fishing activities. One of the consequences of this was that as social scientists, for the most part, we took for granted that the stock assessments were correct, that they knew what they were doing. And so social scientists, who are often the people who are talking with the fishermen and certainly were the people talking with the fishermen in the 1980s and the 1970s, were not questioning this and not necessarily listening carefully to what they might have to say about those stock assessments.

So the material I want to present is drawn from two different studies. We began in the 1990s working in the area of Bonavista and Trinity Bay, trying to gather fishermen's knowledge in a systematic way, aggregate that knowledge, and try to compare it to what we'd learned through stock assessment and fisheries biology. Since that time in the Coasts Under Stress project, as I said, we have continued this work, but our focus has been more on the northern gulf and southern Labrador.

We treat fishermen's knowledge, fisheries science, and fisheries social sciences as different knowledge systems. They're social-ecological systems. They come out of a particular context, or paradigm, or way of thinking. They're based on certain kinds of observations. They have different temporal and spatial frames, if you like. So fishermen, scientists, natural scientists, and social scientists are often looking at different things, but we think that by putting together these different ways of looking at the world and comparing and contrasting them we can develop a better understanding of how we got into the mess we're currently in.

So what did we learn when we tried to do that? When we tried to gather in a systematic way fishermen's knowledge over their lifetime, doing career history interviews, we were trying to reconstruct the changes in their fishing, and in cod and other species in the ecosystem, over a 40- to 50-year time period—and that long time period is, we think, important—and then look at that and use it as a lens to look at stock assessment science, but also use stock assessment science to look at what the fishermen were telling us.

If we look at the northern cod stocks, when stocks collapse it's not immediately obvious what's going on, and one of the interesting things is that in the early 1990s there was a huge amount of disagreement regarding the factors that were responsible for the collapse in the northern cod stocks. That debate has gone on, but at that time it was seen as a sudden unexpected collapse, and the tendency was to assume it was due to natural factors. Natural variability, which had been largely ignored in stock assessment science, suddenly became the main focus of the northern cod science program.

But since that time it's become generally accepted that basically it was overfishing. The fishing mortality was two times greater than the recommended fishing mortality level of 18% of the harvestable biomass, which was supposed to be the management target, between 1978 and 1983 and more than three times greater between 1984 and 1989. So a huge amount of the harvestable biomass was removed, and while people had some sense that this was going on, it took about ten years for them to get their heads around what was happening.

So in retrospect it's not surprising that the stocks collapsed. They took too many fish out.

Going back to our issue around a recruitment failure, you didn't have enough spawners and so on, and again, the contemporary science suggests that this is one of the reasons why we haven't seen recovery as well. The effects of fishing, the small number of spawners, the fact that they tend to be smaller, they live less long, and so on—these factors have contributed to the failure of the stocks to recover.

So it's not surprising that they collapsed. What's interesting, in a sense, is what led to that situation of collapse. Again, that's a long story and I can't get into it in a lot of detail, but what our work suggests is that stock collapses like the northern cod stock's collapse need to be thought of in a longer-term, wider kind of way. They're the product of what we call a fishing up, or what Daniel Pauly calls a fishing down, a sequence that takes place over quite a long period of time and is fairly complicated. But what it involves essentially, what we're suggesting, is a process of intensification and expansion, and this is one of the things that come out of talking to fishermen.

When we interviewed fishermen in Bonavista Bay, for example, what we found is that we had a complex fishery. We had the offshore dragger fishery, we had the longliner fishery, and we had the inshore small boat fishery. What we saw was that in the dragger fishery offshore, due to increases in efficiency, mobility and also due to the biological response to the effects of fishing, which includes range contraction so that you can actually keep catching fish at high rates as ranges contract as long as you're mobile, those kinds of things really contributed to overfishing in the offshore. But similar patterns were going on in the inshore, so it's important to be aware of that.

● (0900)

Fishermen reacted to declining catches in the cod trap fishery by shifting to different types of cod trap designs. So they went from traditional traps to Japanese traps. They could fish more Japanese traps, they took smaller fish, they retained the fish, and they could set them in more areas. A process of intensification is what we would call that.

In the longliner fishery, they increased the number of nets that they were fishing, the gillnets. They fished with smaller-mesh nets and they started to shift spatially. Again, if the scientific people and managers had been talking and listening carefully to fishermen in the 1980s, it would have been pretty clear that a fisherman who had fished 20 miles off Bonavista with a small number of nets, large-mesh size, who found himself fairly quickly 80 or 90 miles offshore, wasn't going there because he wanted to go there; he was going there because there was nothing left in between.

One of the things that happened in the 1980s was a real neglect and lack of understanding of what was going on in terms of catch rates. So when inshore fishermen were complaining about what was happening and the stock assessments being too high, there was a lack of real understanding of what was going on in that fishery. The tendency was to say they'd reduced effort, they were fishing other species and that's why inshore landings were going down, or it's cold water or something else. But the fact was that they were intensifying effort and they were really seeing some very substantial changes.

Similarly with the offshore dragger fishery, the catch rates in that fishery were used with the research vessel survey data as though they were not based on fishing on aggregations and following the fish. So that was a major contributor to the failure to see the impending collapse.

So we've got these different axes, and I've talked about spatial and temporal intensification and expansion. By temporal, we mean that people start fishing in the winter and not solely in the summer, so they keep their catch rates up by intensifying temporally by hauling their nets more frequently, returning to them more often, or by fishing in the winter. This happened, for example, in Trinity Bay. In the bottom of Trinity Bay they developed a winter gillnet fishery that kept their landings up, but they themselves were quite concerned, and it looks as though they probably were targeting a spawning aggregation in their own waters. So that's what we mean by a temporal intensification and expansion process.

The other thing that can happen is ecological. Again, a change in mesh size means that though it may look as if you're landing the same amount of fish, you are actually landing different fish. They're fish that used to swim through the mesh and are now coming up in the nets. So ecological intensification can mean moving to smaller fish. It can also mean moving to larger fish. One of the things we heard from fishermen was that with the introduction of gillnets in the early years of gillnetting in the inshore area, they suddenly found their gillnets full of fish that they had not been catching with previous gear. You can imagine the same thing going on in the dragger fishery. So there had been large, older fish, what they called "mother fish" or "spawners", that had not been intercepted by fishing gear in the past suddenly being intercepted, and they described them as "fished out", basically.

So we have to have some awareness of this dynamism. Probably the major failure in stock assessment science was to really not have any understanding of how to interpret commercial catch rate data, or to have any understanding of what was going on. That hampered their capacity to communicate with fishermen and to understand what their concerns were about.

● (0905)

I've given you a little diagram, which is actually from the northern gulf but could be from anywhere we've done research. It basically maps a fisherman's career. This was somebody who started in a small boat and went into a dragger, essentially. You can see that his boat went farther and farther, going from two or three miles from shore and ending up 200 or 300 miles from shore. The other thing about—

The Chair: Excuse me, Dr. Neis. You may not have heard the beep, but believe it or not, 15 minutes have flown by. That's not to say that I'm going to cut you off, but I'm going to ask you to wrap up, because there will be lots of questions and you'll be able to continue your presentation as part of your answers.

Dr. Barbara Neis: The other point I wanted to make about ecological intensification is that as one type of fishery goes down, we tend to see people shifting their effort to another species. We've certainly seen this since the cod collapse. When you shift to another species, you don't necessarily stop having an impact on the original species you were targeting.

This is a photograph of bycatch. Again, while it's actually from the northern gulf, it was in the 1980s and does show you some of the bycatch that was in that shrimp fishery at the time.

So you may reduce your effort on cod and move over to shrimp, but actually maintain the fishing pressure—particularly in those days before the Nordmore grate—on the species you've moved away from because you can't make a living from it any more.

So those are some examples of ecological intensification.

One of the concerns, of course, is that as we shift effort across species and move down ecosystems, we're targeting the food species, or are affecting perhaps the juvenile areas, that are essential for cod recovery. One of the things we've been focusing on in our work with fishermen is the juvenile cod areas. Where are those areas? It's very clear that juvenile cod need complex habitat in order to do well. We're quite concerned, and so are a lot of fishermen, that things like inshore dragging for scallops, which has developed in the last decade, may be seriously affecting juvenile cod habitat, but we don't even know where that habitat is. I remember interviewing a DFO scientist in the 1980s, and he said that from the point of view of DFO, the bottom was there to hold the fish in. There really has not been enough attention to benthic habitat and to its critical role in cod recovery.

I'll stop there. That's the work we've been doing, and these are, I think, some of the issues that have emerged from it.

● (0910)

The Chair: Thank you very much.

We're going to start with Mr. Hearn for 10 minutes.

Mr. Loyola Hearn (St. John's South—Mount Pearl, CPC): Thank you very much, Mr. Chair.

Let me thank Professor Neis for coming this morning. Also, let me welcome you and all our colleagues to the great riding of St. John's South—Mount Pearl. We're glad to have you here, particularly on this important topic.

It's not the first time the committee has been to this province. It's been here on a number of occasions on a number of issues, which unlike what a lot of people think...you see people, you make presentations, and they're shelved. Ours have not been. Ours have been presented in the House of Commons; they have been responded to by the minister. In some cases, for instance, in the case of the coast guard report and the overfishing, despite the fact that we have a long way to go there, certainly over the last three years since we began that journey we have seen a lot of international attention being paid to the problem, and hopefully we'll see action.

So we're glad to be here, and hopefully we'll see some results coming out of this.

Professor Neis, I listened to you carefully, and I'm hearing what we've heard from fishermen and others. You've basically encapsulated a number of reasons why the cod fishery has failed, which is really our mandate here. However, we want the tag-on question, what can we do about it? Of course, one of the things we can do is learn from the past, and in order to learn from the past we have to have knowledge, and that knowledge has to be collected and documented. I believe you're doing a good job of that.

I don't agree with everything you said. Certainly you used the term “unmanaged fisheries”. I totally agree with that. Our fishery has been completely unmanaged or mismanaged. You mentioned making decisions on stock assessment science. I'm not sure how dependable that is. I think you went on to expand on that. You made your own presumptions based on a lot of other things besides pure stock assessment science, because it was our scientists who told us we had lots of fish and who kept setting a very high TAC, until the bottom went out of it. From the fishermen we have talked to around the coast and from our own knowledge in the fishery, the amount of pure science in relation to the assessment of our stocks, I would think, is minuscule. We heard of one fisherman yesterday, who was 98 years of age, who can remember seeing a scientific study being done once in his lifetime. So we question how reliable the assessments are. I think we have a lot of estimations.

The only thing that concerns me is when we have people doing the work from the social side, which is the important side because you're affecting people and that's what this is all about.... When you gather the type of information that you have...and you hit the nail on the head on the progress from the 1980s certainly to the present day, and many of the changes, many of the reasons.

You mentioned one other thing, by the way. You mentioned that the boats got bigger. In some cases, unfortunately for a lot of fishermen, their own boats didn't get bigger; somebody else came along with a bigger boat. Because of the rules preventing them from lengthening their boats, they were shoved far out to sea, chasing the species—and you're dead on there again—in a smaller boat.

Where we have such information collected, where we know some of these things, which some of us know and some of us are hearing, why hasn't somebody acted on it? Who would somebody like you and the people who do the type of work you do talk to—bureaucrats, ministers, politicians? Have you talked to them, or is it only a matter of collecting the information? If you've talked to people and nobody has done anything—and that doesn't surprise me, by the way—that's extremely serious, because we're here in 2005 talking about some of the things you talked to people about in 1995 or 1985.

So what's gone wrong?

● (0915)

The Chair: Thank you very much, Mr. Hearn, for your welcome. That was five minutes and twenty-two seconds.

Dr. Neis, please.

Dr. Barbara Neis: I have just a couple of comments.

First of all, part of the point I was making is that there were serious problems with stock assessment science, particularly in the 1980s. Part of that problem had to do with the fact that they did not fully understand, or they weren't paying attention, what was going on in the fishery. They were using commercial catch rates as a basis for arriving at stock assessments in addition to the research vessel survey data.

One of the other problems was that the research vessel survey data was exclusively offshore data. When things were happening and inshore fishermen were saying there were things going on in the inshore fishery, they really didn't have data on the inshore that would allow them to intelligently interpret that information. So there was some misinterpretation in terms of what was going on there and a tendency to dismiss those fishermen who were arguing that there were serious problems.

For the most part, the dragger skippers were not arguing that there were problems, because draggers can catch fish. I mean, Les Harris had it right. They could catch fish until there was nothing left. In fact, that's largely what they did in the offshore. The other things they did, I think, are a whole other issue. That's just a point of clarification.

As for stock assessment science today, I think there have been changes. When we started saying in the early 1990s that fishermen have knowledge and it's important, the standard view was that it was mumbo jumbo and it was of no use to science. That is no longer the view. I think nobody would stand up and say that fishermen have no knowledge. There have been steps taken. The sentinel fishery is one example: the log book data, and so on. There have been efforts to involve fishermen more in the stock assessment process and to open up that process to public input.

How effective those have been I think is another question, but certainly there's something there. They've tried to fill the hole in terms of the lack of knowledge about the inshore, partly because it's absolutely essential. The only cod left, for the most part, are in the inshore sector, and that's been a huge challenge from the point of view of management. The only cod we have left are in areas where we really don't know the history, and we don't have a good stock assessment basis. We still don't have much in the way of a timeline of data, and I would argue that we have pretty thin coverage of that area. I raise that, and you're going to be hearing from people who know more about this than I do this afternoon.

One of the things that have been of interest to us is the issue of local stocks, the stock structure of cod. Again, in the 1980s the northern cod stock was managed essentially as one stock. Then they started to break it up into three units—2J, 3K, 3L—but there was really no attention to the complexity of the stock structure. We have clear examples like Gilbert Bay, where you have a genetically distinct stock. That stock has been studied intensively. We know there's the Smith Sound aggregation. Again, what we would hear from fishermen is, “I don't think that's a new aggregation”. Some cod may have stopped migrating offshore, but for a lot of them there was an aggregation there—as far as I can tell, historically—that had always spawned in Smith Sound and that they fished from. They also fished the offshore migrating cod.

But how many other stocks are there like that? What's their life history and so on? I think that's important, because if you have sparse sampling and we don't have that many sentinel fishermen, and we don't have a huge and dense sampling of the inshore area, and we don't have much history, what we may see is that there's variability from place to place in terms of abundance and recovery. I think there's certainly more work that could be done there.

The other thing is that if we don't know the stock structure, we could be continuing to target a small stock in an unanticipated way and fish it out. We've got very high vulnerability, very high uncertainty, and again, ongoing disagreement between fishermen and scientists.

● (0920)

Mr. Loyola Hearn: I just have a brief comment. What you're saying is generally what we have heard over the last two days about the localized base stocks historically from people directly involved day after day. It's certainly consistent with what we've been hearing.

Dr. Barbara Neis: I think the question is what you do with that information. First of all, what you hear in meetings and what people say in a survey that's anonymous and so on is not always the same thing. Again, how do you interpret that information? But it's important to understand the information and, if we have disagreement, to try to understand where the disagreement is coming from. What are people observing? Are there real gaps in our knowledge that we need to fill? What are the points of vulnerability? But also, are there points of strength that we're unaware of that we need to know more about?

Mr. Loyola Hearn: That's why we're here.

The Chair: Thank you very much.

[*Translation*]

We will now move on to Mr. Blais.

Good morning. You have seven minutes.

Mr. Raynald Blais (Gaspésie—Îles-de-la-Madeleine, BQ): Thank you.

Good morning. I have been carefully listening to your comments. To start, I would like to address the sociological effect rather than the resource as such; in other words, how do we assess, accept or consider information from local fishermen, or those in the in-shore fishery?

Do you get the impression that these local fishermen or that fishers in general have not been listened to much in the past? If that is the case, is the situation still the same, and how could we correct it? Has there been any evolution in this respect? Why is it that those who have a practical knowledge due to the fact that they fish and observe the situation day after day are not recognized for it?

[*English*]

Dr. Barbara Neis: A couple of comments, I guess.

A lot of the fishermen we have asked...and again, let me caution that the main focus of our research in the last five years has not been what's happening with northern cod. We've been working mostly in southern Labrador, where there are no cod, for the most part, and in the gulf, where there is certainly the perception that there's a lot of cod. I haven't been in Bonavista Bay or Trinity Bay in the last five years, so I'm not sure exactly what fishermen are saying. But one thing I will say is that a lot of them will say, “We don't know”. They may then go on to say their catch rates are really high in their nets and it's a real problem in the turbot fishery and so on, but don't ignore the “We don't know”, because what they're saying is they don't get much time on the water, so they don't really have the same sense as they would have had in the past in terms of what's happening. They're not scientists, but listen carefully to what they say and, I think, be careful about what gets said in a public meeting, because this is a political place.

I think everybody should say “I don't know”. There's a lot of uncertainty here, but I also think there's no question that there's nowhere near the cod there used to be. The real issue is this variability in terms of the inshore and what's going on there, and then what can we learn from fishermen.

Again, what I'm suggesting is that we need a systematic approach to working with fishermen to try to explore with them what they know, not simply walk away from a meeting and say "Well, three fishermen said X or Y in that meeting", because certain people go to meetings and certain people don't. So I would recommend a systematic approach. And again, in my experience, where approaches have been systematic, there has been attention to what fishermen have to say.

● (0925)

[*Translation*]

Mr. Raynald Blais: Could you expand a bit on the systematic approach you are referring to? Does that mean that we should be focusing more on sentinel fishery, for instance, ensuring that a majority or a large part of fishermen are targeted so that we can then collect and analyze the information collected on each boat?

[*English*]

Dr. Barbara Neis: By systematic, I mean that you have a fairly large sample of people, that you talk to them in an anonymous environment, ideally, as opposed to a public political environment, and that you ask systematically.... You say, "You know this; how do you know it?" in the same kind of rigorous way as we would of science. I am a scientist, I'm standing in front of you and making a claim; what is the basis for my claim? That's part of what I mean by systematic—that it is a straightforward, balanced and focused way to do it.

Do we need more in the way of sentinel fisheries? As I've indicated, I think the coverage has been sparse, and there may be complexities there that we're missing as a consequence of that. I really would like to know more about.... You know, fishermen mentioned there was a bay stock, it looked like, in some parts of Bonavista Bay and so on. We've picked up information in White Bay on the historical existence of a bay stock, and I don't think any of that's been studied systematically.

Given the issues around abundance, you might want to look for acoustic surveys or something that has less fishing mortality but that involves and engages fishermen. You have to involve and engage them, because we are in a period of vulnerability and uncertainty and fishing mortality will go on. If people don't believe in what you're doing, you're not going to protect the stocks.

[*Translation*]

Mr. Raynald Blais: If you'll allow me, I would like to get back to my first question. I get the sense that you did not give me a clear response. Moreover, my time is running out.

Was the data from fishermen ignored in the past? Are they less so today? What is your assessment of the situation?

[*English*]

Dr. Barbara Neis: I would say that the inshore fishermen's data was largely ignored in the stock assessment process in the mid- to late 1980s.

In terms of what's happening now in the stock assessment process, I haven't been at the meetings. I know there's a sentinel fishery. I know there's an open discussion of the meetings. I'm not sure that people understand each other when they speak. I know there was a survey of fishermen about the sentinel fishery—

[*Translation*]

Mr. Raynald Blais: Excuse me, but I would like to know why, at the time, this data was ignored?

[*English*]

Dr. Barbara Neis: It was because the view was that the inshore fishery was a complicated, messy thing. The research vessel surveys were draggers. The offshore fishery was dragger based. The view was that the types of data you got from the offshore fishery and from the research vessel survey data were easily comparable, and so they did not collect or pay much attention to analyzing the information that was coming from the inshore sector.

[*Translation*]

Mr. Raynald Blais: However, this type of answer, for those people who say they were being ignored, is no justification. Data on the offshore fishery is a great deal more complicated than that on the in-shore fishery. The complex nature of the data itself is no reason not to consider it.

[*English*]

Dr. Barbara Neis: There were probably cultural and other reasons as well. Again, a lot of the scientists were not necessarily...I mean, they were modellers; some of them were mathematicians. Their focus was on what we call "paper fish". They needed fish that would feed into the stock assessment process and data, and they were gathering essentially simplified, decontextualized data. Yes, the offshore fishery is complicated and they weren't paying enough attention to the complexity of the offshore fishery.

The Chair: You have no time left.

[*Translation*]

Mr. Raynald Blais: This goes to the issues which have an effect on people.

Thank you.

[*English*]

The Chair: Merci beaucoup.

Mr. Stoffer, five minutes.

Mr. Peter Stoffer (Sackville—Eastern Shore, NDP): Thank you very much, Mr. Chairman, and thank you, Madam, for appearing before us today.

Yesterday in Port Blandford, a fisherman by the name of Don Blackwood said something that I thought was very poignant. He said he trusts scientists like he does politicians.

Having said that, I could only assume from my own discussions with fishermen across the country that his view is widely held. How do we break that impasse? Consulting with fishermen is one thing, but earning their trust is another. In your experience, should that come from governmental initiatives, should it come from provincial-federal initiatives, or should it come from university initiatives in order to bring the traditional historical knowledge of fishermen and their communities into the future of stock assessments, studies, etc.? How do we break that impasse? There may be the odd scientist who disregards fishermen because of the so-called.... Fishermen always say, “Look, I don't have a university education. My education is on the water”. We reinforce to them, all of us do, that that education is just as valuable as any you can learn from a book. How do we break that impasse?

● (0930)

Dr. Barbara Neis: We've been trying to do it essentially by trying to gather the knowledge they have in a systematic way, putting it together with the science, feeding it back to them, and then getting into discussions with them about the picture that emerges.

Again, there are trusted scientists out there. I can think of Gerry Ennis, for example, a lobster scientist who I think has a lot of trust in many areas. In my view, some of the distrust of science is really disgruntlement with management. This is a complicated problem. Essentially, the situation has backed fishermen into some very serious corners. Backed into those corners, they are struggling with a lack of information, a sense of lack of control, a sense that they're overregulated and that they are being criminalized in order to continue their lives as they've known it. In order to feed their families, they catch fish that doesn't necessarily get reported, or their grandfather can't go fishing, and so on and so forth. They see scientists as having played a role in that.

Part of the problem is language. I mean, my presentation wasn't as accessible as it should have been. I didn't have the time to turn it from academes into accessible language for stock assessment meetings. I still think a lot of the information isn't accessible.

Fishermen have a very different kind of knowledge from science, and what they see is localized. They're a complicated group. They have different gears, and some of them are older, some of them are younger. Younger fishermen don't even necessarily see the same thing as older fishermen, and the same is true of scientists. It's what Daniel Pauly calls the problem of the shifting baseline syndrome. He says that when a scientist comes in and starts working on an ecosystem, he tends to judge what's there later in his life based on the abundance that was there when he entered. He will see things in particular kinds of ways.

I think the same is true of fishermen, and that's why we often target older, retired fishermen. We want to get back before the serious destruction of the stock that happened in the 1970s so that people can get a sense of what abundance that stock is actually capable of producing. Most younger fishermen have never seen that abundance. When they talk about abundance, the timeframe for their estimate is quite different from that of older people. There's not always a mechanism there to promote discussion and conversation between older generational fishermen and younger. Their knowledge is also local.

So when stock assessment scientists, or people like Jeff Hutchings, who you're going to hear from, stand up and say that we've lost 99% of the spawning stock biomass, and yet they're going out there and getting higher catch rates in their gillnets than they've ever gotten in their lives, you can understand that they may not be able to figure out where he's coming from. But there, his scale is northern Labrador to the bottom of the Grand Banks and out to the 200-mile limit and beyond. Their scale is what's going on in their bay, basically.

One of the real issues...and we've talked about this. Joe Wroblewski and I just published a paper on local stocks. The underlying thing here is that the small people feel they're being forced out, that management is doing that, but they also....

The issue is that if we're going to recover the northern cod stocks, the only fish we have left is their fish. It is their bay fish. If we're going to ask them not to fish for 10 or 20 years in case those stocks can help the offshore recover—and that's the spatial scale that Hutchings has operated at, or science is operating at—then you have to ask the question, recovery for who? Why should they do that? Why should they give up their lives when there is no future there for themselves or their children?

● (0935)

The Chair: Thank you.

Mr. Matthews, ten minutes.

Mr. Bill Matthews (Random—Burin—St. George's, Lib.): Thank you very much. If some of my colleagues want to take up a question or two, Mr. Chair, I'd be willing to give up some time. I have just a couple of quick questions.

Dr. Neis, you just said that the only fish left, basically, are bay fish, or bay cod.

Dr. Barbara Neis: That's my understanding. There's virtually nothing in the offshore.

Mr. Bill Matthews: But what are you basing that on?

Dr. Barbara Neis: It's my understanding from what I've read in the scientific literature.

Mr. Bill Matthews: That's the basic problem, you see.

Dr. Barbara Neis: Do you think there is fish offshore? Do you think there is?

Mr. Bill Matthews: I couldn't sit here today and say there's not. I don't know if anyone we're going to hear from in the next two days... they will probably come here and say there's not, but I would like to see the evidence. That's the problem.

At least in the bays...I've listened for the last two days to people who are out on the water. They tell me there's cod in lump nets, which they never had before. They tell me there's cod in lobster pots, which they never had before, and all this stuff. So at least I know there's cod there. But when I hear comments from certain individuals, which we'll hear in the next two days, that there's no cod offshore, I don't think they can look me in the eyes and tell me that, because they don't have the evidence.

How do you respond to that?

Dr. Barbara Neis: I guess it's possible that there are aggregations offshore. I mean there's been some discussion about the Virgin Rocks, for example, and a fairly sparse research vessel survey may not be picking those up. But I haven't come across shrimp fishermen who are out there dragging—and if there were cod, they would see them—who are saying there's a lot of cod out there. I haven't heard from inshore fishermen or offshore fishermen that there's cod out there, but I haven't gone looking to see if that's the case. Certainly we have much better, longer, and stronger research data on the offshore sector, in terms of stock abundance and relative abundance, than we have for the inshore sector. So I'm more inclined to trust research vessel surveys for the offshore data, because I think there's less uncertainty about it. There are all kinds of issues, I agree.

Again, I lean to being somewhat precautionary here. I hate to assume there are fish where I have no evidence that there are fish.

Mr. Bill Matthews: Yes, and of course vice versa, because I have difficulty with someone telling me there are no fish when they don't know if there are or there aren't. I guess we'll leave that at that.

The basic problem is there's no trust. What offshore scientific research is taking place now? It's probably not a question I should ask you; I should wait for other people. But since we're into this, I guess we'll go around this a dozen times over the next two days. What exists now? What are we basing it on that we're saying there's no offshore...?

As to the people we've listened to over the last couple of days, I think there's been a significant change in the migratory patterns of northern cod. There are those who think the cod have gone south off the edge of the continental shelf and are being caught by foreigners. Whether they're correct or not, there are all kinds of theories around. There are those who think the cod are in abundance in the bays now because they've moved inshore and are really staying there. Whether that's true or not I don't know, but these are things we're hearing. It's complex.

You said back in the 1980s, because of the offshore catch rigs that were monitored, the research vessels, and so on, the inshore fishermen were not listened to. Now you're saying there's no cod offshore, but people are saying there are cod inshore, which we accept. I guess it's debatable how much there is, but there are certainly cod inshore. How can you explain that they're still not listening to the inshore fishermen? You didn't listen to them before because you were concentrating offshore. Now you're saying the only cod left are in the bays. How can you explain why these people are not being listened to now again?

Dr. Barbara Neis: I wouldn't assume they're not being listened to. There is a sentinel survey. Again, ask the people who've had a chance to study these data; I haven't. Some attention is being paid to the inshore. There was a survey done. The sentinel fishery data, as I understand it, of 2002-03 do not show major recovery. Now we can ask questions about those data. Again, what are they saying? You hear what a few people say in a meeting. What fishermen as a whole are saying is always the question I have to ask, as a scientist.

● (0940)

Mr. Bill Matthews: Are you suggesting we talk to the fishermen individually, one on one, in those areas? What are you suggesting?

Dr. Barbara Neis: No, I'm not saying that. But where I will agree with you is that I think there has.... One of the unfortunate things about science is that in some sense it tends to follow fisheries around. There has not, in my view, been enough investment in science—

Mr. Bill Matthews: Oh, no question.

Dr. Barbara Neis: —since the collapse the of the northern cod stocks. The pressure is enormous here. The fish that are left, as far as we can tell—unless there's a lot offshore that nobody is seeing—are largely in the inshore bays. They're very visible. They could easily be caught up, for the most part.

We actually know hardly anything about them. We don't know the stock structure, I think, still. We don't know enough about them: we don't know where the juvenile areas are; we don't know whether we're protecting them.

There's huge space here—this goes back to your question, Peter—to involve fishermen in a much more comprehensive way in identifying more about the ecology and the dynamics of the fish that are left, and then developing with them some kind of effective stewardship regime for them. But that's going to require investment and active involvement by fishermen.

One of the things that really strike me when I go to these communities is that they're all raising children, they're all leaving, and a lot of them are maybe doing a degree in environmental science, or whatever. They're developing capacity to understand science; they also could potentially understand the fishery. And they're not going back, so we don't have scientific capacity at the level of communities. That's what you need.

And you need to invest. We've invested in Gilbert Bay—a huge amount, really, for a very small population of cod—to develop a marine protected area and so on. What about all of the other cod populations? Where's the investment in developing knowledge and stewardship of those cod?

Mr. Bill Matthews: What an admission of failure, though, isn't it, that 13 or 14 years after a moratorium was imposed, we're here saying those kinds of things today?

Dr. Barbara Neis: Well, I'm astonished you're here asking me why the northern cod stocks left.

Mr. Bill Matthews: I'm sorry?

Dr. Barbara Neis: I'm astonished that you're only asking now why the stocks collapsed.

Mr. Bill Matthews: Well, no one else did, you see, so—

Dr. Barbara Neis: Well, it's astonishing.

Mr. Bill Matthews: As a committee, we had a piece of business to choose to do and we thought we'd come here and listen to the people. Of course, we know we're going to get two different stories. We heard our first story in the last two days and are going to get a totally different one here for two days. But at least no one has said yet—

Dr. Barbara Neis: I think you're probably getting four or five stories. I think it's more complicated than that.

Mr. Bill Matthews: But the point is that no one has zeroed in on the question, why haven't the damn cod come back? We keep saying they haven't, and of course there's a difference of opinion; there are those who believe strongly that they have.

Dr. Barbara Neis: Well, where are they sitting, and what cod are we talking about? We're not talking about the northern cod stocks; we're talking about cod in bays. That is, as far as I know, where it is, and that's not coming back.

Mr. Bill Matthews: These people think there are two components of northern cod. These people say there are two components—both northern cod, but there are two components: one inshore and one offshore.

Dr. Barbara Neis: I think there probably are ten components; that's my point. I think it's very complicated, and we don't actually understand it very well, but we know more than we did ten years ago.

Mr. Bill Matthews: Do you guys want to go?

The Chair: You have two minutes.

Mr. Simms.

Mr. Scott Simms (Bonavista—Gander—Grand Falls—Windsor, Lib.): Thank you very much.

You mentioned a term earlier that I thought was interesting. You said “shifting to intensification”. You mentioned it as in fishing practices, as in saying we've become far more intense. In other words, are we abusing the stock in that way?

Dr. Barbara Neis: In a fishery that's badly managed—and it was a managed fishery, but it wasn't well managed.... What happens in fisheries is that when people stop catching fish, then they start doing things to try to catch fish.

Mr. Scott Simms: But you mentioned smaller species as well.

Dr. Barbara Neis: Yes, they will go to smaller mesh size; they will shift effort over to capelin or to something else if they can't catch cod. That has potential consequences, both in terms of.... If you're going to smaller fish, you're going to smaller mesh size, so you're potentially intercepting juveniles. That's one of the things that happened in Trinity Bay in the 1980s, from what fishermen told us; there was a very high catch of juvenile cod in the capelin traps. They knew it was there, they were concerned about it, there were potential mechanisms for dealing with it, but there was no management pressure to deal with it.

● (0945)

Mr. Scott Simms: Okay. We're not painting a picture of desperation here amongst the people fishing, as much as of decline.

Dr. Barbara Neis: Well, it can be desperation if you end up with virtually nothing left. People will do a variety of things in order to survive, and I don't think we can blame them for that. We have to accept that.

Mr. Scott Simms: Certainly. I don't blame them at all.

How much time do I have, Mr. Chair?

The Chair: About two seconds. Thank you.

In order to keep us on time, we have only time for five minutes of questioning from Mr. Keddy and one question from me.

Go ahead, Mr. Keddy.

Mr. Gerald Keddy (South Shore—St. Margaret's, CPC): Thank you, Mr. Chair, and thank you to our witness for—

[*Translation*]

Mr. Raynald Blais: Mr. Chairman, point of order.

The Chair: Mr. Blais.

Mr. Raynald Blais: I do not mind Mr. Keddy having an opportunity to ask a supplementary question, but I would like you to be fair, and allow others to do the same. I would find it inappropriate for Mr. Keddy to get the opportunity to ask a question and for the rest of us not to.

[*English*]

The Chair: We only have five minutes, and as we've seen, it takes five minutes to ask a question. You've had a chance, Mr. Keddy hasn't. I'm trying to keep it fair, but there's not enough room for everybody in all the parties to have another round. I think it's fair to have Mr. Keddy go ahead and then we'll manage it as best we can, given that we've only got one hour per witness, including their evidence.

Mr. Keddy.

Mr. Gerald Keddy: As you can see, Professor Neis, fishermen are not the only ones who fight over scarce resources.

The Chair: Excuse me, Mr. Keddy.

Mr. Blais.

[*Translation*]

Mr. Raynald Blais: Point of order once again. I understand your view of things, but I do not agree with you at all. Fairness would dictate that it is not strictly the number of members in a given party, such as the Conservative Party, which will mean... There are three of them, I am alone, and so is Mr. Stoffer. From your point of view, Conservative Party members and Liberal Party members would automatically have the opportunity to ask supplementary questions when there is time remaining, whereas we would not, because we are on our own. I challenge your sense of fairness, sir, based on this argument.

[*English*]

The Chair: Thank you, Mr. Blais.

Considering I'm a member of the Liberal Party, I don't think you can accuse me of giving extra time to the Conservatives. But we have a resolution of this committee that provides the methodology by which we ask questions and the order in which we ask those questions, and I'm following what the committee's instructions are in that regard. I'm doing the best I can. It is a circumstance of the last election that there is one of you and one of Mr. Stoffer and three of them and three of the Liberals, four actually. That's the way it is. I'll try to be as fair as I can. We'll keep an eye on the clock, but if we're going to end up eating up Mr. Keddy's time, it's a disservice to the witness, who has some expertise to give us.

So I rule your point not well taken.

Mr. Keddy.

Mr. Gerald Keddy: Thank you, Mr. Chair.

I will try to be as quick as possible, which is difficult for me.

It's an interesting discussion, Professor Neis. You obviously, somewhere in your sociology degree, picked up some biology or you learned it on the street, so to speak, or on the water. I have half a dozen questions and I'd like to try to keep to some fairly brief answers.

In regard to the information you've collected, who pays for your research and where does that information go?

Dr. Barbara Neis: This research has been funded by the Social Sciences and Humanities Research Council and the Natural Sciences and Engineering Research Council. They have been the main funders of it.

In terms of the eco-research results, there was some feedback made to fishermen when we did that work in Bonavista and Trinity Bay and it's certainly gone out in publications. In the Coasts under Stress project, we've just finished a round of feedback meetings with fishermen. We're developing a report to them on those meetings and we will be publishing a policy booklet from that work that should be available within the next six months.

Mr. Gerald Keddy: So there is some funding from the fishing community directly?

Dr. Barbara Neis: They haven't funded the work, no. It's from the granting councils, but we have an obligation to try to do feedback and communicate our results widely, and we do try to do that.

● (0950)

Mr. Gerald Keddy: Excellent.

One comment was made earlier, I think by Bill, about.... In your answer you said something about managing the fishery for the offshore. I immediately thought—and we did, quite frankly, manage the fishery for the offshore, especially since the advent of the mobile gear fleet—what's wrong then with managing the fishery for the inshore?

Dr. Barbara Neis: I think there's nothing wrong with that, but I think what we need is an intelligent discussion about this. I think everybody would like to see recovery; the question is how to achieve recovery. And again, to ask one sector to sacrifice its life for another sector, where we may never get recovery offshore.... I think if we're going to ask that question, let's ask it. Let's get it on the table.

Mr. Gerald Keddy: I don't know how much time I have left, but —

The Chair: One more question.

Mr. Gerald Keddy: Okay.

The other thing I really find quite frustrating amongst the discussions we've had is the disconnect between fishermen and science. I have my own thoughts as to who's to blame for that; I think everyone is to blame a little bit, but there seems to be a real resistance on behalf of fishermen to buying into science.

I saw the same thing in agriculture when I was growing up. There was a real resistance to buying into science. When people finally do buy into it, they find that it works for everyone involved.

I wonder if somehow we can break that cycle, and also if there's a possibility of actually having fishermen fund some of that science, or having them partially fund the biologists. We did it in forestry. We've done it in agriculture. It worked well in those communities.

Dr. Barbara Neis: Yes, science is complicated. There are different types of science and different kinds of fishermen. I think there is real potential to work together. We have the example from Eastport with the lobster fishery, which I think has worked really well. Gilbert Bay seems to be working. There are examples. We need to look at those examples that work and figure out how to do it, but it doesn't just happen. We need a framework that's going to make it happen, and we need to invest in making those things happen and support them. What we've got right now is a lot of investment in a couple of places and, for the most part, no investment anywhere else. It doesn't work for cod; they're all over the place.

Mr. Gerald Keddy: The other thing we find is that because we have a complicated species and a huge geographical area, and different recruitment years and different year classes in the resource....

But to get back to Bill's comment, fishermen in the Trinity Bay and Bonavista Bay area certainly have been saying consistently that they're seeing more recruitment, they're seeing more cod in the inner bay, and they're catching cod in gear types that they would have never caught before. The government opened a blackback season obviously so they could have a sentinel fishery on cod this year. They caught more cod in shorter periods of time. It certainly sounds —at least from the witnesses I've heard—that there's a huge biomass of cod in the inshore with significant year types, with year classes, with everything from small cod to large cod. There's the northern cod and there's offshore cod mixed in with it.

If we take a precautionary approach and have a reasonable inshore fishery—and I certainly wouldn't want to be part of any organization or government or party that would make a recommendation that would cause this fishery to collapse again—I really question if we would lose more fish than gather information from that.

Dr. Barbara Neis: You might destroy what's there; that's the risk.

The Chair: There is no time left for my question, Doctor, so thank you so much for your appearance today. We appreciate it, and you're welcome to stay and listen to some of the other evidence. We thank you again for the time you've given us, especially for being the first or lead-off witness this morning.

Dr. Barbara Neis: Thank you, and I'm not a scarce resource. I am around.

● (0955)

The Chair: Excellent.

Could we have Mr. Kim Bell come up, please.

We will suspend for a few minutes.

● (0955)

(Pause)

● (1000)

The Chair: I'd like to get started so we don't lose time. We've already lost 15 minutes.

Dr. Bell, welcome. We look forward to your evidence. We'll get right into it so that we can ask as many questions as possible. You have 15 minutes from the time you say hi.

Dr. Kim Bell (Ecologist, As an Individual): Hello. Thank you very much for inviting me. Time is ticking.

I enjoyed Dr. Neis' presentation. I'm going to be probably a little bit more blunt on some points.

Your stated focus today is the cause of the collapse and of non-recovery, and those have implications as to where we should go from here.

I've given you all a handout. There's a figure and two tables. What I'm reading from....

Do you have the handout?

The Chair: Dr. Bell, just so you are aware of it, you have every right to hand out your handout in the language of your choice. I have no right to hand it out in only one language. So if you've given it to us in only one language, which of course is your entire right, then that's great and you can refer to it, but I cannot hand it out to the committee members unless I have it in both languages, and I do not have it in both languages, so please do not assume that the committee members have it.

Dr. Kim Bell: Do those who want it have it?

The Chair: I can't do that. It needs to be translated. It will be handed out in due course, but not while you're speaking.

Dr. Kim Bell: Okay.

The Chair: You'll just have to assume that no one has seen it.

Dr. Kim Bell: That's unfortunate.

The Chair: Yes, but that's the way it works.

Dr. Kim Bell: Okay, let's move on.

Your stated focus is the cause of the collapse and the cause of non-recovery, and those have implications as to where we should go from here.

As Dr. Neis said, overfishing was the main direct cause of the collapse. However, mismanagement was the underlying cause. For instance, inattention to available cautionary signals—figure 1 in the handout you don't have—and extensive disregard for the F0.1 benchmark, which was determined in 1977 to be the target.

The F0.1 target was consistently exceeded by TACs. For example, in the last three years leading up to the moratorium, for 2J3KL all along, bureaucratic and ministerial levels added 278,000 tonnes above that target. Taking all areas from 1987 to 1991, the TAC added at bureaucratic and political levels was closer to 600,000 tonnes. That was no straw; that was a truckload of bricks that broke that camel's back.

Other information indicates that high-grading was rife. Under-reporting was extensive. For example, as quoted from DFO, “it is suspected that many landings were not reported...and that many small fish were discarded”.

And here is how Bill Doubleday, on behalf of the DFO bureaucracy, responded to the observation that the F0.1 target was not met, and with catastrophic consequences:

> We do not contest the F0.1 target was not attained. However, this was a rebuilding target, not a status quo target. Missing a rebuilding target does NOT necessarily have “disastrous consequences”. A conservation target was not consistently exceeded. The author should differentiate a management target from a conservation limit.

Maybe you could put that to music. But sung in any key, that is still mismanagement. Somebody made those decisions. Those decisions are traceable. Worse, there was a system in place that allowed it to happen. That system and that attitude of unaccountability seems to me to still be in place. As a nation, we have not yet learned.

That's all I have to say about the causes, but where do we go from here? Regarding non-recovery, are the causes parametric or are they fundamental? It is possible that any population may fail to recover due to parametric causes such as demographic parameters—for example, if it suffers too much mortality, has insufficient food, or damaged habitat, etc. Those are very important to investigate.

But also, we should consider what if, as now increasingly seems to be the case—and Dr. Neis also alluded to this—cod were not one single population but, instead, a complex of many independent populations, and the ones that are gone are simply gone. A population that's gone has zero mortality. You can't get its mortality any lower.

Ted Ames showed that the decline in the Gulf of Maine cod fishery was not a gradual fishing down of one single large population, but a fishing out of populations one bank at a time. With as much as 40 years recorded checking on fished-out banks in the Gulf of Maine, nothing came back to spawn even though nearby banks were well frequented. It was not climate, not some cause like that. That is like harvesting apples by cutting a tree or two each year. CPUE stays the same until you run out of trees; then there are no more apples.

Ames' analysis shows us that cod can be different populations, one for each spawning bank, just as trout or salmon spawn in a particular gravel bed in a particular tributary. I'm mentioning Ames, but there is much other documentation on this, including documentation from DFO. If anybody wants that, I can certainly get those references to you.

There are credible accounts of bay populations or bay stocks or local stocks—whatever you want to call them—that are doing better than some other stocks, whether offshore or other bay stocks. If so, we need to establish what's going on. We need to establish what did go on. We need to establish as far as we can how many populations there were. We need to develop some ideas of how they got established there in the first place, ecologically in evolutionary time. We need to know what cues bring adults back and at what ages those cues are taken up or learned by cod larvae. We don't yet know how to replant cod; we'll have to find out, if we're serious about this. It will be expensive and it will probably take five years from any introduction to see if it worked.

● (1005)

For the future we have to consider the research and conservation needed and the frameworks and organizational structures needed. Here is a short list, not a complete list by any means, of research and conservation initiatives:

Reinstate or increase egg and larval surveys to help identify where recruitment failure is occurring.

Populations. What are they? Where are they? What's their history? What is their present state? In short, repeat Ames' work and some of the work that has been done by Dr. Neis and others.

We need to critically review any proposal that wishes to shift traditional fisheries management roles to the private sector, which is not to say that we shouldn't encourage co-management initiatives.

We need to hold an inquiry into how TACs were consistently over the declared management target.

We need to eliminate discards, either by law or regulation. We must require a Permit to discard, and that will at least will help us ensure that discards are not also data black holes. We will be able to know what went on.

Mr. Gerald Keddy: Permit to discard

Dr. Kim Bell: Pardon me?

I don't expect everybody is going to like all my ideas.

● (1010)

Mr. Gerald Keddy: We'll get a chance to ask questions. I apologize.

Dr. Kim Bell: Frameworks and organization in the future. There are the three main headings in here, just to briefly introduce it.

If recovery is to be a serious effort, what role can there be for agencies that are negligently responsible for the problem in the first place? That's a question. You can take it as rhetorical, if you want, but it still will need to be answered.

Next, we need to replace the organizational structures that had a role in the mismanagement of these fisheries.

Third, Law of the Sea—and this is the most important, I think—should not mean “no law at all”. Unrestrained fishing is incompatible with sustainability.

The EEZ must have a framework that will enable conservation. We need to take Iceland's initiative to the next step: to take Newfoundland-Canada's authority to the edge of the slope, or to take it to equidistance or some measure like it.

Listing under the Endangered Species Act is a tool that can help, because it underscores the urgency that demands and justifies action, especially to protect offshore stocks that are endangered and some that are perhaps gone. We need the listing, but we must revise it as soon as possible to reflect the major population groups—inshore, offshore, major banks, particular bay stocks, or whatever—and continue revision to address populations at the finest scale at which they exist. And those populations should be managed independently of each other.

NAFO, despite the moratorium, continues to retard the pace of progress. That is not the action of any party that sincerely believes it has a legitimate and enduring stake in a resource; that is the behaviour of a looter. Looters have no place in a fishery. NAFO will go when all the fish are gone, but we shouldn't wait until then. I've heard bureaucrats wail, “You can't be unilateral”, but NAFO itself is unilateral: objection procedures, unilateral quotas, unilateral double log books.

What would you replace NAFO with? Guest fishing would need to be brought under full Newfoundland-Canadian authority. Guest fishing should only be permitted—I see a smile there—at the discretion of the guest fishing authority, and only if guest applicants post bonds against stiff penalities for non-compliance. In other words, you don't have people coming back trying to sue you in court eight years later because you arrested them for breaking the rules.

As for DFO, I have or have had a lot of friends in DFO. DFO has done a lot of good work, but that doesn't apply to the bureaucratic levels. It doesn't negate anything I've said about mismanagement; those are bureaucratic decisions. They say hindsight is 20/20, but it is not 20/20 for DFO's bureaucracy. There are many good scientists, as I've said, but the bureaucracy has yet to show where and how the wrong decisions were made, and has yet to discipline or dismiss parties responsible.

Excuses followed the collapse but were debunked. Bureaucrats let the blame fall on science, which contributes to the dialogue barrier that exists between fishermen and scientists. Very few people realize the extent to which scientists were constrained by the official spokesperson policy—a.k.a. gag rule, to which there are references—but the scientists should have spoken up just the same, because I think their duty as scientists transcends some duties that they may have been imposed upon them as a condition of employment.

The existence of populations can explain why fishermen in some places along the coast see healthy aggregations of cod. Those may reflect populations that came through the collapse better than other populations did, whereas we know that in some places we have certainly populations in bad shape.

With regard to populations, DFO's tactical shenanigans within the listing process, within COSEWIC, may have painted itself into a corner, preventing it from now productively dealing with those questions. DFO at one point demanded that COSEWIC must designate by populations. But then it changed its mind. The change of mind is purely tactical, to combat a listing. And COSEWIC played along.

● (1015)

It's very regrettable that the recent COSEWIC listing, which is an update of the listing that was done following my report in 1998, lumped northern Labrador to the southern Grand Banks as one unit. I don't think it is plausibly one unit. My report in 1998 proposed that it be addressed as 10 separate areas, at least for the management areas, because we had data for those. But I also said that there are almost certainly small populations within those areas that ought to be followed up on, individually designated, and individually managed.

DFO's recent SARA consultations are another tactic. They were not mandated by SARA, not provided for by SARA, and are totally outside SARA. They were wastefully redundant, because better consultations are provided for by SARA in sections 39, 48, and 66. The summaries of the consultations have still not been released. The evident aim was to harvest a list of objections that would bolster the hoped for ministerial decision under SARA to deny a listing. A listing should never be a political decision anyway. That's a complete mistake in the conception of SARA.

The Minister of the Environment also seems to be trampling on the timelines of his own legislation, apparently at the behest of DFO and with advice from Justice, some advice of which, I believe, has not been followed.

In a word, these were all expensive and anti-democratic shenanigans, the tail wagging the dog. Ministers in cabinet have been made aware but have not answered, except for a DFO response that dodged the issues.

With what could we replace DFO? To learn from the mistakes of the past and to not repeat the mistakes of the past, the new system needs to reflect several principles:

(a) Sustainability requires keeping harvest below certain limits that are best scientifically identified, and that can certainly include input from fishermen as they have a lot of good information;

(b) Science behind closed doors is not science. It has to be independent and open so that the public can keep an eye on what's going on;

(c) Catches, or TACs, or any conservation measure must not violate those limits—

The Chair: Please slow down, Dr. Bell.

Science must be independent and what?

Dr. Kim Bell: It's all in the handout that you don't have.

The Chair: Science must be independent and what?

Dr. Kim Bell: Science must be independent and open so that the public can keep an eye on what's going on.

The Chair: What was item (c)?

Dr. Kim Bell: (c) Catches, or TACs, or any other conservation measure must not violate those limits;

(d) Those provisions, (a), (b) and (c), have to be set out in law;

(e) Ministers and bureaucrats and any other persons who override or circumvent or falsify advice must be subject to statutory penalties.

The Chair: Good luck.

Dr. Kim Bell: I didn't say that I was going to be popular.

That concludes my presentation. Thank you. I welcome your questions.

The Chair: Thank you, Dr. Bell.

Okay. I think I got them all.

We'll go to Mr. Kamp. Are you going to share time or are you going to use it?

Mr. Randy Kamp (Pitt Meadows—Maple Ridge—Mission, CPC): I'll start and we'll see. I might give Gerald 30 seconds.

Perhaps I can begin by asking this. Is it Dr. Bell?

Dr. Kim Bell: Yes, it's Dr. Bell.

Mr. Randy Kamp: Could you give me a really quick thumbnail sketch of who you are and your background, except for ecology areas?

Dr. Kim Bell: I work on tropical gobies. When COSEWIC asked me to do a report on the status of cod in the early 1990s, I said, "What are you asking me for? I work on tropical gobies. Why don't you get Don Steele or Ransom Myers to do it?" They came back to me and came back to me, but I kept saying, "Look, it's going to take me months to catch up on cod. What do you want me for?" They went away and thought about it, and they came back and said they wanted somebody who was not currently publishing on cod. Well, I was pretty green at the time, and I thought that was a good reason, but the real reason was that, that way, if they didn't like what I said, they could say, "Oh, he doesn't know much about cod".

Does that halfway answer your question?

I'm an ecologist. I have a Ph.D, Doctor of Philosophy, with a specialty in fisheries ecology and marine ecology.

Mr. Randy Kamp: Who employs you?

Dr. Kim Bell: I am self-employed.

Mr. Randy Kamp: Okay. One of the good things that are happening today is we're finally redefining science. For the last couple of days, science has been defined as data collection—that there hasn't been enough data collection. That may well be true, but Dr. Neis and you are certainly leading us in a different direction from that definition, and I think that is a good thing.

Dr. Kim Bell: Thank you.

Mr. Randy Kamp: As somebody who's looking at it from the outside, it seems incredible to me that something as basic as the stock structure of northern cod has not been adequately investigated. Can you comment on that? Why is that?

● (1020)

Dr. Kim Bell: Okay. This is a really interesting question because it shows the best of DFO and it shows the worst of DFO.

The best of DFO is interested in stock structure. In 1997 they had a cod stock components workshop, which took some very good information from a large number of scientists, and they came up with the conclusion that almost certainly there were independent stocks. You had to look back a long way. You look back to Templeman, who said there's probably going to be a spawning stock that corresponds to each bank, and each bank is probably going to be an independent stock. But then DNA came along, and we were all so wowed—even scientists, and we should not have been so green—because it was new. It was newer than microwave ovens, so we thought this was fantastic.

When the first DNA work failed to show differences, we thought, oh well, it's all one. Of course, it's quite convenient if you can consider that everything is the same. If you've taught, you know that your students are not all the same. If you have a family, your children are not all the same. Nothing is all the same. It certainly would be a lot easier if everything was the same.

So that was in 1997, cod stock components workshops; and 1996, which was just leading up to that, was a time when DFO had strenuously objected. In a letter from Bill Doubleday, there was a very good objection amidst a host of not very good objections to my report. The good objection was, “The author cavalierly ignores” the differences between different populations. He gave good reasons, and he also pointed out that within COSEWIC rules they should be considered separately.

I had already had this worry myself. I had already gone back to COSEWIC and said, “What's my mandate here? I think this probably should be done as separate populations”. They had already said, “No, no, do it as one”.

So with this letter from Bill Doubleday, I thought, “Thank you”, and I revised the report. DFO promptly changed its mind, and within COSEWIC it argued, “No, we've just had a cod stock components workshop, and this stuff is all out of date”. It took me months to get the cod stock components workshop and discover that it didn't go against what I said; it actually supported what I said.

So that was purely tactical. It's tactical. You can even read it in the scanty minutes from COSEWIC itself.

Now that DFO has taken the position that there is only one population, for the purposes of lumping together in COSEWIC—because that reduces the number of designations you have to argue against, it reduces the number of designations that you actually have to deal with should one of them come through—it also creates a basis for opposition and objection. It also creates the opportunity of raising the spectre of closing down everything because you've lumped everything together in your listing. It's ridiculous to close out everything. If something is doing well here, manage it. If something is doing badly there, manage that too. You don't have to lump everything together. This was tactical, and as I said, I think DFO painted itself into a corner.

Mr. Randy Kamp: Okay, I think I understand that now.

The fishermen, of course, are telling us that there are lots of fish in the inshore, and yet I think I'm understanding that there's not a really clear sense of the stock structure and how populations even interact, and even possible changes in migratory patterns, and so on.

As an ecologist, are you in favour of allowing any sort of inshore fisheries to be opened?

Dr. Kim Bell: Only after you assess them. That means you have to assess each inshore fishery. That means you have to do the population work. I think some preliminary assessments probably can be done fairly quickly. I don't know why the inshore has been marginalized as an analysis sector and as a management sector. I don't know why, because I know people who manage fisheries and assess fisheries on little lakes, like Lake Chicamba in Africa. I don't even know where Lake Chicamba is, and I can tell you, it's not as big as the inshore.

So yes, if you analyze them and manage them separately, and designate them separately, and list as endangered those that are endangered and list as not at risk those that are not at risk, then you can manage them separately.

You may find advantage in saying, can we take some of the production of this one that's not at risk to somehow support some conservation efforts aimed at restoring some that are at risk? You may have those questions. We don't yet know how to do that, as I said, but that may be a consideration. Generally I have no objection to fishing something that is in good enough shape to fish.

● (1025)

Mr. Randy Kamp: In your presentation I think you said that a SARA listing would help. So is that the way you're describing it—to list just certain populations?

Dr. Kim Bell: You list them all, but some of them may be listed as not at risk. Do you understand what I mean?

Mr. Randy Kamp: I'm not sure.

Dr. Kim Bell: The listing is a process that results in a decision, and that decision shouldn't be interfered with at a political level. If your accountant says you've got 67¢ in your account, that's what you've got. There's no point taking it to cabinet and saying, “How do we feel about the 67¢? Should we pretend maybe we have three dollars?” That makes no sense. So just list everything according to what it is. Call it like it is.

Mr. Randy Kamp: But do we list it as endangered?

Dr. Kim Bell: Only if it's endangered—and there are established criteria for that, based on decline. There may be a need to make a judgment call because you lack data. We shouldn't lack data, but we do lack data. We have present data, but we don't always have historical data to measure it against, because most of the criteria for listing are based on declines.

So some will end up being listed as endangered. Some will probably be listed as extirpated in their area. Some will be listed as not at risk.

The Chair: Mr. Keddy.

Mr. Gerald Keddy: Thank you very much.

Welcome to our presenter, Dr. Bell. You made a statement about the permit to discard. I just have to go back there, because I don't think any of us has the immediate answer to what we do about discarding. I think it's a bit less of a problem than it used to be, but that's not the answer.

Dr. Kim Bell: Why is it not the answer?

Mr. Gerald Keddy: Why get a permit? Have you ever been on a boat when they've discarded? You've obviously talked to people who have discarded.

Dr. Kim Bell: I can imagine. I've been on boats.

Mr. Gerald Keddy: So how's a permit going to...? They're not allowed to discard now.

Dr. Kim Bell: I would encourage you to think a little bit more flexibly about what a permit to discard could be. For instance, if you had onboard monitoring gear, you could say that the observer—or the onshore observer if the observation were entirely electronic—could give you, by radio, a permit to discard that, because they've photographed it and it has entered a form in which it can become data, so that the actual mortality imposed on the stock can then be more accurately measured.

Mr. Gerald Keddy: You're probably the first ecologist I've ever heard say we should be able to discard, and I really take exception to it. I take exception to the fact that we should throw any fish overboard that comes on the deck of a boat.

Dr. Kim Bell: I totally misread where you were coming from.

Mr. Gerald Keddy: I know it happens, but I don't think that's the answer to it. I've raised this before with fishermen and that committee. For instance, the way the quota is divided up today, if you're allowed 5,000 pounds of cod and you catch 5,500, you're going to throw the little ones overboard, because you're not allowed to catch them and you're not allowed to eat them; you have to monitor them and bring them ashore. It's a catch-22.

Dr. Kim Bell: I'm with you on that.

Mr. Gerald Keddy: Let's take it a step further. Wouldn't we be better off to simply say that if you've got so much quota, you have to bring it ashore; we won't penalize you for it, but we will take it from the quota you have for another species, or we'll take it off your quota for next year?

● (1030)

Dr. Kim Bell: Or you'll somehow take it into account. And that's a matter to be discussed, I agree with you. There shouldn't be discards. If you pull up gravel, maybe you can discard that. But as it is now, no permit is needed for discard. You just toss it over.

Mr. Gerald Keddy: But it's against the law, and if you're caught you could be reprimanded.

Dr. Kim Bell: Is it against the law?

Mr. Gerald Keddy: It certainly is.

Dr. Kim Bell: I've heard of an awful lot of discarding. I've heard of people being 18,000 pounds over their trip limits in 3Ps in 1997 and just dumping it all. So that shouldn't happen, but your trip limits invite that.

The Chair: Thank you.

We'll go to Monsieur Blais, for seven minutes.

[*Translation*]

Mr. Raynald Blais: Thank you, Mr. Chairman.

Good morning, Mr. Bell.

I would like you to tell us about a specific issue.

First, what is the difference between the in-shore and the offshore regions? Where do you draw a line?

[*English*]

Dr. Kim Bell: That's about inshore versus offshore. Where does it stop? Where does it start? I'm a scientist. Therefore, I should feel very comfortable saying I don't know. We can all say inshore and offshore and look at the coast and so on, but what we're really interested in is what is an inshore stock and what's an offshore stock. And this is where it starts to get complicated, because although a stock may be an inshore stock in the sense that it may spawn inshore or spawn offshore, in non-spawning seasons, as far as I understand, there's considerable mixing, considerable dispersion. You might be in one place and you might at that one place have both inshore and offshore components present. But there are probably many more components than just inshore and offshore.

[*Translation*]

Mr. Raynald Blais: According to the definition we heard earlier this week, vessels under 65 feet are in-shore, and those over 65 feet are offshore.

Do you agree with this definition?

[*English*]

Dr. Kim Bell: I couldn't speak to that at all. That's a regulation question, and I just don't have the knowledge.

[*Translation*]

Mr. Raynald Blais: All right.

Let's now talk about species at risk. What do you have to say about seal versus cod?

[*English*]

Dr. Kim Bell: I'm not quite sure what you want me to answer. Cod and seals are different species.

[*Translation*]

Mr. Raynald Blais: There are 7 million seals eating cod. They eat a lot of cod, and that could put it at risk. According to you, what can be done about this situation?

● (1035)

[*English*]

Dr. Kim Bell: The Species at Risk Act deals with prohibitions that do not apply to non-human animals. So the Species at Risk Act does not allow for prosecuting a seal for eating a cod. If you're asking about the role of seals in the non-recovery, that's a matter for research, but I think the results are equivocal. Cod are not the main component of seals' diets. I don't object to having a harvest of seals if there's a market and it's justifiable and sustainable. I don't object to that at all. But I think they are two separate questions, and I think it's very difficult to make the argument that seals are responsible for cod not coming back.

As I say, the possibility is that some component of non-recovery may simply be due to the fact that population elements have been completely wiped out. They're not there to grow anymore. The tree has gone.

So as for seals and cod, you will hear from other people about them, but cod are a minor component of seals' diets.

[*Translation*]

Mr. Raynald Blais: You just touched on another aspect of the issue: reopening the in-shore cod fishery. This is something which can be done here, in Newfoundland, as well as in the Gulf of St. Lawrence.

I would expect that if this fishery were to be reopened, it should happen everywhere, not strictly in Newfoundland.

And this leads me to the following question. You mentioned a five-year period in order to have the various data necessary to decide whether or not to reopen the in-shore cod fishery. On what basis have you set a five-year period?

[*English*]

Dr. Kim Bell: I'm afraid that's a misunderstanding. What I said was that if we engage in a program to actually reinstall fish where fish have been fished out—in other words, the population here is gone and we start trying to repopulate that area—I'm saying it will take five years to know if that experiment works. That does not prevent us from saying right now in Smith Sound, for example, or in some place where a population is deemed to exist—and we should deem it carefully; we should get our facts right when we do that—that there's a population right now that we can open. We should have the data right now, but we don't, because as I've said, the population issue has become political, and because it's political it hasn't been attended to. And that is why we cannot right now at this moment say those and those and those bays should be closed, and those and those and those other bays should be opened.

So I did not say we would have to wait five years before knowing if we could open anything anywhere. I didn't say that. It's only related to the experiment of replanting.

[*Translation*]

Mr. Raynald Blais: How much time do I have left?

The Chair: You have one minute and 18 seconds.

Mr. Raynald Blais: Thank you.

Towards the end of your presentation, you were talking about a new management system and you referred to independence. I'd like you to expand a little bit on that.

[*English*]

Dr. Kim Bell: I'm saying that just as you would ask the accountant how much money you have before you go out and buy new furniture, just as you'd check your bank book before you make a major expenditure, so you have to know how much is there before you propose to go and fish it. You have to know it's sustainable.

What I said in point (b) was that science behind closed doors is not science. That is because dialogue and communication are fundamental to science. It has to be independent and open, so that the public can keep an eye on what's going on. That is to say, we are in a democracy, this is a public resource, and every citizen deserves to know what is happening with that resource. The science must be independent of the decision to allocate quota here or there, but the quota should never exceed what is judged scientifically to be sustainable.

The Chair: Before we get to Mr. Stoffer, Dr. Bell, what is the current 2005 status of DNA evidence with respect to cod? Is it one species, or are there different varieties?

Dr. Kim Bell: You have to bear in mind that according to the Species at Risk Act and also according to the COSEWIC criteria that preceded the Species at Risk Act—and it is similar in the United States, as well, with their endangered species legislation—when the legislation talks about species, it means either a species or an independent population. On the status of DNA, microsatellite DNA has shown differences for various populations. This has been shown since the middle to late 1990s. Papers showing microsatellite differences started to appear from around 1996 onwards. I would imagine those have increased a lot. I haven't really been following those in great detail.

The Chair: Are these different species or subspecies? For example, there are different species of wolf; a timber wolf may not be endangered, while a red wolf would be, but they're both wolves.

Dr. Kim Bell: Understood. Biologically we differentiate a species and a population, but for the purposes of legislation, a species is a population; they're the same thing. In other words, those differences that are required to satisfy the criterion of being a species under the legislation are, I believe, there. Furthermore, I don't think you need genetic evidence. I think the definition of a species or a population you want to conserve should be that it is that which, if removed, won't come back by itself.

In relation to your red wolf, if I take half of them away, there's a potential the other half may increase their numbers, and after a little while you've got the same number again. If I take all of the red wolves, then they don't come back. That was at least a population. If you can recognize an eastern Alberta population of red wolf, and I take all of those, then that one doesn't come back.

A species, for the purposes of the act and purposes of conservation, should be that which, if removed, will not come back on its own.

● (1040)

The Chair: Thank you.

Mr. Stoffer is next.

Mr. Peter Stoffer: Thank you, Mr. Chairman.

Dr. Bell, thank you for your presentation.

You talked about the fact that science should be more independent—although you didn't say it—of government because of the transparency of it. Are you indicating that because...? I have before me an old news article. I read the Hutchings-Ram report—I think it was in 1998—when they accused the government of manipulating their own science. That was quite a heady thing for them to say; I mean, these guys risked their reputations. They're now out of DFO, of course, but still doing fisheries research. Is it your belief that it was possible, and that it happened, that DFO misrepresented science for a political objective?

Dr. Kim Bell: Yes.

Mr. Peter Stoffer: May I ask, if it's possible, your opinion as to why they would have done that?

Dr. Kim Bell: It's hard to answer, because it's so obvious, in a way.

Mr. Peter Stoffer: I'm trying not to do it in a political way, Dr. Bell, I'm trying to do it in a non-political way, because your point is very debatable. I've argued for years that science within DFO should be greatly enhanced, greatly increased, and that there'd be a way of whistleblower protection so this kind of thing wouldn't happen again. There are others who say that if we had more independent scientists like you or Trevor Kenchington of Nova Scotia and many others who work independently, they would not be handcuffed, I guess, by the bureaucracy in that regard.

So it's a debatable point, one that I don't think this committee has really got into, but I'd sure like your viewpoint expanded a bit more on that.

Dr. Kim Bell: For whatever reason, the bureaucracy seems to have a pattern of controlling information or needing to be able to say something is the way it is when it really isn't. For example, when Dr. Rice came to the COSEWIC meeting in 1997 and he announced that DFO now thought it was a mistake to consider cod by each management area—I wasn't even dividing it up at the finest level that it should be, we didn't have the data—he wanted COSEWIC to consider all cod, from northern Labrador to Maine, as one population.

He quoted from the stock components workshop, and he said about my study, “Well, this is all out of date, because we've just had this cod stock components workshop and there was nobody there who thought there was any particular component at risk”. Now, nobody at the meeting heard that “at risk” part, because the significance of that “at risk” part was that the cod stock component workshop was not about risk. You might as well have said there's no cod component out there that wears jewellery. It would have made the statement true, but what was taken from it was that there was no component out there. Actually, that same workshop that he was citing supported everything I was saying, and more so.

Now, if that's not information control, I don't know what it is.

Mr. Peter Stoffer: You had also mentioned that quite possibly you could differentiate the stocks in terms of putting some on listings, or it all could be listed, but some endangered, some at risk. If, for example, the offshore stock was listed as an endangered species, if it was—

Dr. Kim Bell: Which it probably would be.

● (1045)

Mr. Peter Stoffer: Okay. How does that work? Does that mean all activity surrounding that stock stops? That means fishing, oil and gas, and seals. Exactly how would you explain that to the general public?

Dr. Kim Bell: This is where you get tied up in knots, because of the way SARA is written. SARA is an act that puts the cart before the horse. SARA is an act that does not recognize due diligence. It prohibits the killing or harming of any individual of any listed species. So you're driving through Banff springs park and you're doing the speed limit and a butterfly hits your windshield. When you're coming out of Banff springs park, some Mountie stops you and takes out a Q-tip and he wipes that smudge off your windshield, puts it in a bottle, and you get charged with killing an endangered butterfly.

There's no component in SARA that acknowledges due diligence. So that's the first problem.

The second component that I keep saying about SARA is this. Whether it's endangered or not, it's like saying, how much do you have in your account; how much money do you have in your corporation; what's the value of your corporation? That's the decision for the accountants to make, and you hire them to do that. Once they've made that, don't go in and mess with it and say, I'd like you to come up with a different number, or I would like to call that success instead of failure, or I would like to not call that failure when it really is failure. Leave it alone.

You're politicians, you're all politicians, but why do politicians want to have people on their backs saying, if you make this decision, it's going to hurt my business? Why not make it methodical? Why not do that? Who wants to control all this stuff? Somebody wants to control it. That's why SARA is written in that way.

Your question was, what happens if you say “endangered”? Well, it depends. Are you going to go with a SARA that's written the way it is, or are you going to say, okay, we're going to post an amendment to SARA and we're going to revise SARA, but in the meantime, while we're revising it, there's going to be this amendment and there's going to be a truly open process that's going to make a better SARA—and get rid of this.

All members of COSEWIC are appointed by the minister. That's supposed to be an arm's length committee. It's not arm's length; it's armpit length. You can't have that kind of thing going on. Politicians are there to look after the public good, and law is supposed to follow a public objective. It's supposed to follow an honourable objective. There's no honourable objective in having somebody going through Banff park and being charged for having a dead butterfly on their windshield. So you have—

The Chair: I'm sorry, Mr. Stoffer, your time is over.

Dr. Bell, just so that we can get the answer to Mr. Stoffer's question, if the offshore cod are listed as endangered, assuming there's no tampering, assuming that the act is enforced as it is currently written, what happens with respect to that endangered species? Suppose the seals continue to eat it, for example. You've already said that the act doesn't apply to non-humans, but what do humans do about non-human interaction on an endangered species, and in a perfect world under SARA, what happens to that species once it's listed as endangered?

Dr. Kim Bell: What I said about accountants applies to your question about seals and cod. You get some scientists to look at it and you ask, what are the main factors that are affecting the cod recovery? What are the main factors affecting the parameters, the demographic parameters, of cod in that area that we've declared endangered? And you go from there.

Right now, the scientists are telling you that, no, it's a minor component of the diet. Yes, lots of people can see something, and there's a salience. "Salience" is a nice word because it means that which sticks in your mind. When you see some seals tearing the stomach out of a cod, you think, well, that's what's going on. We all do that; we all process immediate information.

But in a system that's bigger than our immediate observations are, we have to move on and use another method. You don't estimate the population of Newfoundland by dumping a net on the Avalon Mall on Christmas Eve; you do it by taking random samples. Just because you can catch a lot of cod somewhere, it doesn't mean there's a lot everywhere. Just because you see some cod-eating seals here, it doesn't mean they're eating them everywhere. You just have to go with the numbers.

The Chair: But Mr. Stoffer asked you what the effect is of listing the species as endangered.

Dr. Kim Bell: The short answer is, on seals, no effect. On fishing, the effect depends on whether section 73 of SARA is invoked. Section 73 of SARA allows enormous latitude in how a listing itself can be handled.

The Chair: Thank you.

Mr. Murphy.

Hon. Shawn Murphy (Charlottetown, Lib.): Thank you very much, Mr. Chairman, and thank you, Dr. Bell, for appearing.

There are three areas I want to cover, Dr. Bell. I want to preface my remarks by saying we're here in Newfoundland to study the failure of the northern cod to return to its 1960s level of biomass.

Over the past two days we were in Bonavista and we were in Terra Nova. We had a number of witnesses appear before us—fish plant workers, fishermen, and others—and they basically all said the same thing. They were unanimous that the stocks in certain bays, Trinity Bay, Bonavista Bay, Notre Dame Bay, were healthy, and they wanted two things. All of them, right to a man—it was, I suppose, men and one woman—wanted a not insignificant commercial quota re-established. Secondly, and this was not unanimous, but a good 75% to 80% of them wanted the reinstitution of the recreational/food fishery, where people in Newfoundland have the right to fish a limited number of cod for their own consumption.

You can see the complexity of the situation we're dealing with. We come down to study why it has returned and all we hear is, it's here, it's here healthy, and they want a commercial and a food fishery. We have other scientific reports stating that 99% of the cod are gone, and from what I've read, I'm inclined to believe that. There are some very significant socio-economic factors at play here.

My three areas I want to touch on are the management practices, the apparent disconnect of science and the fishing industry, and the role of politicians vis-à-vis science.

Dr. Bell, I assume from your evidence that you've studied ecosystems in other countries, in other areas, some successful, some not as successful. We have an extremely complicated way of managing our fisheries. We've got the inshore and offshore. We manage effort, gear type, size, seasons, boat size, you name it. And the fishermen are right, they're regulated to death, and no one's going to argue with that, I hope. If you were given a blank sheet of paper, from your vantage point of studying other areas of the world, do you have any comments or suggestions as to what you would do, having regard to the very severe socio-economic situation here in the province of Newfoundland and, I should add, other parts of Atlantic Canada?

● (1050)

Dr. Kim Bell: Your points were about quota and recreational fisheries versus the observation that 99% of the cod are gone. That 99% figure is averaged from northern Labrador all the way to the southern Grand Banks. As I've said already, I think that was a mistake. I think it was a very unfortunate mistake for COSEWIC to have done it that way. It didn't have to do it that way, and I trace it to a tactic of DFO combat a listing. I consider that, yes, 99% are gone, but not when you just look at the bays. If the bays are independent stocks, then I think they should be managed separately and there should be a target.

It's very conventional to say that you want to manage some stock at a certain fraction—60%, 70%, something like that—of its unexploited biomass. In other words, if before you fished it something was 100,000 tonnes, you fish it down to about 75,000 tonnes and keep it there. There are a number of reasons for that, but worldwide you see many stocks going down to about 5%. So if the bay stock that you want to fish is at 75%, then I would say, sure, put a quota on it and get going, but do it after you've assessed it properly. But if it's down at 5%, then I would say, no, don't do it.

If your bay stock turns out not to be a stock and if it turns out that COSEWIC is correct and it's all one big shemozzle, then your bay stock may expand to the offshore. I don't think that's the case, but if that is the case, then you want to say to yourself, well, your bay stock is actually critical to getting that growth offshore. You would invest in the short-term by forbearance in order to be able to recoup greater benefits in fishing down the road.

What percentage of your question have I answered?

Hon. Shawn Murphy: You don't have to answer if you don't want to, but you've obviously looked at other ecosystems.

Dr. Kim Bell: Oh, a blank piece of paper.... Okay.

If you find that there is a stock like Gilbert Bay, for example, because that one's been reasonably well studied.... To me, stock of that size invites a co-management approach, whereby most of the authority for the surveillance and immediate management would go to a local group. But there would have to be supervision. Co-management doesn't mean totally signing off. Some local group would manage it. They would have their stake in it, and they would presumably manage it for sustainability, but they would be assisted in that with technical advice from some fisheries management authority. They could lose their right to co-manage if they drove it down, just as I'm saying DFO should lose its right to manage because of what it's done. If the co-management authority in Gilbert Bay fishes its stock down to nothing, it should also lose its franchise.

There are options other than co-management, but it has to be managed at a very fine scale so that if something is an independent unit, then that's the way you have to manage it.

● (1055)

Hon. Shawn Murphy: Do you have any suggestions or comments on this whole issue?

Mr. Keddy brought up—and it's blatant here—the disconnect between the fishers and science. There's a lot of mistrust here, and I don't blame anyone. I agree with the statement that science has been underfunded and there have been problems, but in defence of some of the scientists, most of the people....

There was a 21-page report written about the state of the cod that was issued in May 2005. I asked the associations, the unions, and the fishers if they've seen it or read it, and the answer was, unanimously, no. They had never seen it or read it.

So there's a total disconnect. One group is on Venus; the other group is on Mars. There's mistrust, but I don't think you can blame one side.

Dr. Kim Bell: But if you and I get to talking about something and you find that I'm not being forthcoming, and you're asking me questions and I'm saying, “Well, you know, that depends”, you're not going to develop trust in me. If you sense that I am very sincerely saying, “I don't know”, or “That depends”, that's not going to bother you, but if you have a feeling that I am hiding something I know or that I'm not speaking my mind, you will not trust me.

You've had a bureaucratic policy under which employees of DFO could not be seen to disagree with the minister. That means that when the minister added 278,000 tonnes to the quota over three years, nobody could say that was a foolish thing for him to do. It was foolish, because the fishery collapsed. It was obviously foolish. So when somebody cannot speak common sense, nobody can trust them. So the first thing you must do is have a system that encourages people to speak out.

This is not a problem only in the fisheries department; it's also in the department of health. You've had whistle-blowers in the health department who have been badly treated. They weren't respected for whistle-blowing, and if you look at the follow-up after that, the people who seem to be responsible for making decisions that they really didn't have the right to make still have been promoted. In the health case, there are simply too many indications of a cozy relationship with client industries. And some people have said the same thing of DFO. They have said that National Sea Products could easily call the minister and call the minister's aides and so on and have their point of view heard at the highest levels. But a fisherman can't—

Mr. Gerald Keddy: He sure can.

Dr. Kim Bell: My feeling is that in a democracy—this has nothing to do with your hearing, and yet it does, because this hearing is about democracy, really—every public servant has an obligation to give a straight answer to a question. Your straight answer can be, “I don't have a clue”, or it can be, “I'm not allowed to answer, you have to ask this other guy”, but you have to give a straight answer. When you get an answer that says differentiate between a management target and a conservation target and a rebuilding target and this and that, when everybody can see what happened, that's only looking for excuses; that's not a straight answer. There ought to be a statutory penalty for that, and the citizen should be able to go to somebody and say, “You're the officer of statutory penalties; I want my answer and I want this guy to get a statutory penalty.”

Hon. Shawn Murphy: We're following up on that, Dr. Bell—

● (1100)

Dr. Kim Bell: Thank you. I look forward to hearing you act.

Hon. Shawn Murphy: It's a very interesting point we're discussing here. You talk about the scientists. In justification to some of the scientists, I've talked to them and they have said, “Yes, I did recommend that the catch be lower, I did say that, but the politicians didn't follow my advice”. You've just said that.

Dr. Kim Bell: True.

Hon. Shawn Murphy: So it's not the scientists who are wrong; it's the politicians. And the politicians...I assume both sides are guilty here.

What has happened is that National Sea or FPI or Clearwater, whoever, have come—and it comes back to the socio-economic thing—and said, “Okay, if you reduce my catch by 100,000 metric tonnes, I'm closing the plant in so-and-so. Not only that, but I'm going to close the plant in this community, this community and this community.” That's when the politics gets involved. That's when the wrong decisions are made, plus it might be compounded by the fact that there's an election six months down the road. The next thing you know, the politician is saying, “We will not reduce the catch”. We've seen this happen.

I wanted to make that comment. A lot of times it's not the scientist; it's the politicians who have done it.

Dr. Kim Bell: Yes, but there's a complex machinery going on there where people own plants and they have some sort of immediate control of the resource and so on. We had it here recently with a paper company wanting to shut down. Everybody who is in business wants to cut their costs. One way of cutting costs is to get subsidies or get concessions of one kind or another. Companies ask unions to take wage cuts. I'm still waiting to hear a union say, “We'll take a wage cut in exchange for profit share”. I'm still waiting for a union to say that, because it seems the obvious thing to do.

But if somebody says, “We're going to close that plant”, as the government, why don't we say, “Well then, you lose your licence for that plant and we can allocate it to anyone else we want. And if we want to allocate that licence for that processing plant...and, by the way, we'll take the plant as well because that's a condition of your licence. When you lose your licence, you also surrender the plant and all the equipment and improvements you've put on that site.” That way we can have continuity in the fishery. And somebody can say, “Well, I can't do it”, and you say, “Well, your economics are not working. As a multinational corporation working in our area, if you tell us your economics are not working, that's fine. We have local people whose economics do work and they will catch the fish and they'll bring it to the plant and they will realize more of the total profit out of that, more of the value added.”

I don't know. I am not an economist, but it seems to me it's too easy an answer to say you're going to keep the quota up and you're going to wipe out a resource in order to sustain the jobs of the people who depend on that resource.

Hon. Shawn Murphy: I'm not justifying that; I am just saying what's happening.

Dr. Kim Bell: No, I know that.

The Chair: I'm sorry, but we've hit a brick wall. It's 11 o'clock.

Dr. Bell, I want to thank you very much for your colourful and candid testimony in your answers to our questions. We very much appreciate your coming and giving us your opinions.

Dr. Kim Bell: Thank you.

The Chair: I'm going to declare a 10-minute humanitarian break for our staff, and then we will return with Dr. Jeffrey Hutchings at 11:10 on the nose.

● (1103)

(Pause)

● (1113)

The Chair: I will call the meeting back to order.

We now have Dr. Jeffrey A. Hutchings, a professor of biology and a Canada research chair in marine conservation and biodiversity at Dalhousie University.

Welcome, Dr. Hutchings. We look forward to your testimony and your responses to questions. As with the other witnesses, you have up to, but you don't have to use, 15 minutes to make your presentation, and then we'll go to questions and answers.

Professor Jeffrey Hutchings (Professor of Biology, Canada Research Chair in Marine Conservation and Biodiversity, Dalhousie University, As an Individual): Thank you very much, and thank you for the opportunity or invitation to come and make a presentation and respond to questions at this hearing.

In the points I'd like to make this morning, I basically want to focus on the collapse of northern cod and try to put the various proposed factors that have influenced the collapse into some perspective. Nonetheless, I do want to underscore the point that from my perspective, and from the science that I and others have undertaken on this, the primary reason for the collapse is, quite clearly, over-exploitation. To suggest otherwise would, in many respects, reduce or possibly eliminate our collective responsibility in the demise of what was once among the most abundant vertebrate species, if not fish, in Canada.

I then want to turn to a consideration of recovery and the various factors that can influence recovery and evaluate the relative importance of some of these for northern cod. What are the prospects for recovery of this stock? Is there anything we can learn from stocks and the demise of fish elsewhere in the world?

And lastly, I'd like to turn to what the elements of a recovery should be.

We need a plan. We need a strategy. We need decision rules for reopening fisheries. We need an explicit consideration of the biological and socio-economic trade-offs that are associated with any decisions on reopening, and we need to explicitly identify what our recovery objectives ought to be, from a biological and socio-economic perspective. My intent is also to focus on the future and the present and not so much to dwell on the past.

The fishery for northern cod has not been a static fishery. You will often hear people talk about what's normal or usual for this stock, but this is a fishery that has been exploited since at least the late-1400s, and in the last two or three centuries it is one that has undergone significant spatial- and gear-associated changes. In the 1820s, the northern cod started moving down to Labrador in a massive spatial shift for the fishery. If one looks at merchant records or newspaper accounts, declines in the catch rates of the inshore fishery have been experienced since the 1830s and 1840s. During the 19th century, there were all sorts of gear changes: the cod net or the gillnet came into play, as did the bultow or the longline and the cod trap. Some of these new technologies were of such concern that.... Many fishermen were worried about the degree to which bultows, for example, were able to catch the mother fish, the very big fish. In fact in the 1890s, the Newfoundland government restricted the use of bultows in Paradise Sound on the south coast purely to protect the spawning fish at that time.

The 1950s and 1960s, though, clearly saw the biggest change in this fishery, with the advent of the introduction of the stern-driven trawlers. These trawlers effectively resulted not only in historically unprecedented catches but probably also to a greater or lesser degree in the destruction or alteration of the bottom habitat. In 1968 the reported catch for northern cod was 810,000 metric tonnes. To put that into some perspective, at that time it was about 2% of the world's catch of fish. At one time this was a bounteous fishery.

We had a variety of other changes that took place at that time: the introduction of nylon, then monofilament gillnets, which resulted in the exploitation of fish in areas where we couldn't previously get them, and much larger fish were taken as a consequence. And then even in the 1980s, when fishermen were experiencing declining fish and declining catch rates, there was still spatial expansion to some degree, with the gillnet fishery, for example, moving from the offshore along the southern shore into the Virgin Rocks area on the Grand Banks. There were also changes in mesh size and trap design, including changes from Newfoundland traps to modified Newfoundland traps to Japanese traps, all of which were almost certainly responses to declining catch rates.

So what affects recovery? One hears a lot about temperature and physical changes in the oceanographic features along the Northeast Newfoundland Shelf and on the Grand Banks. When anyone is attempting to evaluate the relative importance of various factors influencing the collapse of northern cod, I think you need to have an appropriate timeframe, an appropriate temporal perspective. Typically people look to the late-1970s and early 1980s as the period of normalcy, because that's the timeframe to which Department of Fisheries and Oceans research surveys go back to—typically to 1978 in one area and to 1981 in another. But we don't know the degree to which that really constituted normal times. It's very difficult for anyone to ascertain what can be considered normal environmental conditions for these fish. People talk about temperature and how cold it was in the early 1990s. Bear in mind, it was just as cold in the early 1980s and in the early 1970s. Indeed, in the 19th century we were able to sustain catches throughout the 19th century at a level that was not sustainable in the 1980s, in a considerably colder environment. In the 19th century there was much more ice than there is today.

● (1115)

So we need to have an appropriate timeframe. It's important to realize, then, that the conditions we see today, in the early 1990s were almost certainly not unusual for cod. What is unusual, however, is the size of the stock relative to what it once was, and one of my key points is that, all else being equal, small populations are less able to deal with unpredictable environmental change than large populations, and small populations are less able to persist in the face of unsustainable harvest rates than large populations. When you reduce things to very low levels, you increase the chance of unpredictable events having dramatic consequences for persistence and recovery.

Predators. To what degree do predators affect recovery? Clearly, one can't talk about this without talking about seals, and the short thing I'll say about seals is that seals eat cod. Seals are almost certainly having some impact on recovery, but it's exceedingly difficult to ascertain precisely what that impact is.

Prey. There is equivocal evidence on capelin, the primary prey of cod. There are some studies to suggest that the condition of cod is less than what it could be, but there are others to suggest that cod are in excellent shape right now.

There have been significant changes in the age and the size at which cod reproduce, and these are important things to take into account. One product of reproducing at a younger age, which is what northern cod are doing today relative to what they were doing in the 1960s and in the 1950s, is that fish are reproducing at smaller sizes, and again, all else being equal, the smaller your size when you reproduce, the lower your chances of surviving into the future. This isn't just true of cod. This is true of all sorts of animals. The smaller you are when you first reproduce, the lower your chances of surviving into the future. So this might be one explanation for some of the higher levels of natural mortality that we've been seeing for cod, but it's a point that has not really been considered to a great extent.

We have seen genetic changes in cod. There's no question that the fishery has had some impact on the genetic composition of cod in the sense that fisheries target the fastest growing fish, the biggest fish, and the oldest fish, and we know there is a genetic basis to the size and the age and the growth rate of fish. So almost certainly there has been some fishery-induced genetic change in northern cod. Now what we don't know is whether the impact of that is going to be significant from a recovery perspective, but we can clearly, almost certainly say that it has taken place.

Of key importance, though, is the fact that fish are not living very long and they're reproducing at smaller sizes than ever before. And the smaller the size of a fish for a female, the fewer the number of eggs, the smaller the eggs, and the shorter the timeframe over which the fish will spawn. I'll come back to that point in just a minute. So small size is almost certainly affecting recovery as well.

Loss of stock structure. Stock structure is something that comes up time and time again. Do we have bay stocks? Do we have inshore stocks? Is the offshore all one single unit or not? This is a question for which there are almost no data available to address it. My own feeling, though, based on a number of studies I've conducted and from talking to fishermen, is that there is some degree of stock structure for cod. But defining what the boundaries are is going to be very difficult. We need to be concerned about the degree to which we have lost substocks to date. We've certainly depleted them. Have we lost some? If we have, that will certainly affect recovery as well.

There are issues pertaining to habitat, the degree to which trawling negatively affects the bottom and thus the survival consequences for fish, but again there are few data to address that.

● (1120)

We can also talk about the disruption of spawning behaviour during fishing. The highest catch rates for northern cod were achieved by fishing during the spawning season. We now know that cod produce sounds. Sound production is very important as a means of communication during the spawning event. We know that cod have fairly intricate and complicated spawning behaviours. If you fish during spawning time, you will almost certainly negatively affect those spawning behaviours, which can be expected to have negative consequences for reproduction and reproductive success and recruitment. So fishing during the spawning period is almost certainly not a good idea.

Lastly, and perhaps most importantly, what else affects recovery? Fishery reopenings, bycatches, quotas that are unsustainable. In that sense, we always need to acknowledge the fact that any catch today is done at the expense of recovery in the future. That draws attention to trade-offs.

So what do we need to do? We need to recover population size and, if possible, population structure. A good example of the necessity of recovering population size pertains to what happened in Smith Sound and Trinity Bay in 2003. In the late spring of that year, there was an unusual environmental event that resulted in a mass mortality of cod. A reported 780 tonnes of cod were recovered, but almost certainly the number that died was in excess of 1,000 tonnes. Is that something to be concerned with or not?

This comes back to my point about small populations being more susceptible than large populations are to unpredictable environmental events. That loss of 1,000 tonnes was probably a loss in the order of 10% of the estimated spawning biomass in the inshore at Trinity Bay, Bonavista Bay, and Conception Bay. So that unpredictable environmental event, which took about 1,000 tonnes, had a proportionately large impact on the population because the population was at such a low level. If the population was at the level that we saw in the 1980s or in the 1960s, that type of environmental event would not even be noticed from a population perspective.

So this is one of the risks of driving populations to low levels. They become more susceptible to unpredictable environmental change.

We need to recover age and size structure. Why? As I reiterated earlier, larger fish produce more eggs. Larger fish are older and will have been allowed to reproduce more times throughout their lives. This is fundamentally important. We need to ask ourselves, why do cod do what they do? Why is a cod a cod? Cod do what they do because of this very unhealthful or unusual reproductive strategy. They release their eggs directly into the ocean. They don't provide any care for them. They don't build a nest for them. The result is that the eggs are like lottery tickets, in many respects. The likelihood that any one egg will survive to reproduce is very minuscule because of the lack of parental care.

What do you do if you're going to have that kind of reproductive strategy? You need to produce as many eggs as you possibly can, you need to reproduce as many times as you can in a single breeding season, and you need to live as long as you can so that you have multiple chances to reproduce throughout your life. Today few cod in the offshore in particular are living beyond five or six years of age. Cod will not be sustainable simply because that is not the way they have evolved.

To put the importance of age and size structure into somewhat more perspective, in the 1960s roughly 30% of all eggs were produced by cod aged 10 and older. In the 1970s that dropped to 17%. By the 1980s and early 1990s, 11% or 12% of all eggs were produced by cod aged 10 and older. Today it's less than 1%. So this truncation of this loss of age and size structure is almost certainly having dramatic negative consequences for recovery.

Lastly, I want to talk about recovery strategies. Here we are, 13 years after the closure of northern cod, and we still lack a plan. We don't have recovery timelines. We don't have recovery targets. We have not always explicitly identified what the trade-offs will be, and we need to from a socio-economic and biological perspective. I can certainly address these issues to a greater degree in the question period.

Finally, I'd like to underscore the point that large populations are better able to withstand unpredictable environmental change and unsustainable harvest rates than are small populations. We need to explicitly recognize and identify the trade-offs. Any fishing done today is at the expense of future recovery. Now perhaps that's what we want. Who decides this? Society probably ought to decide it. But in any event, explicit recognition of the trade-offs needs to be made.

● (1125)

Lastly, we need to develop a recovery strategy. We need recovery timelines. This is done under legislation in the U.S. When stocks are overfished, legislation demands certain timelines and certain plans for recovery. Thirteen years later, we don't have them for northern cod, a fish that has experienced extraordinary and unprecedented world-wide declines. When we see fish stocks decline to the level that northern cod have declined to, we know that cessation of fishing alone will not ensure recovery. We also know that sometimes stocks recover and sometimes they don't.

To end this on a final and somewhat optimistic note, I think that some degree of encouragement can be had by looking at the research survey indices on the inshore and the offshore.

For the inshore, in particular, there was clearly a positive response to the reduction in fishing in the mid-1990s. Then the stock in the inshore started to decline at the same time we reopened the fishery. Now we're again seeing some signs of improvement. The inshore clearly responds in a reasonably short timeframe.

For the offshore, however, things are going to take much longer. But there are some modest signs of optimism in the sense that in the last four or five years the indices of abundance in the offshore seem to be somewhat higher than that of the mid to late 1990s. The stocks are still pitifully few, relative to what we had in the 1980s and 1960, but at least the signs are positive as opposed to negative.

Thank you, Mr. Chairman.

The Chair: Thank you very much, Doctor.

We'll go directly to questions, starting with Mr. Hearn for 10 minutes.

Mr. Loyola Hearn: Thank you very much, Mr. Chair.

Thank you, Professor Hutchings, for being here. We're all quite familiar with a lot of your work.

These past two days we have had here in the Trinity and Bonavista Bay area...you referred to that, and I know in the past you've interviewed fishermen in that area also. I just wonder if you have done any interviews over the last couple of years in that area.

● (1130)

Prof. Jeffrey Hutchings: No.

Mr. Loyola Hearn: Okay. So it's basically hearsay—like ourselves, I guess—about what's happening.

You mentioned the Smith Sound situation, which undoubtedly did have an effect on the bay stock. However, we're being told—and I'll quote some fishermen, because many of them use the same expression—there were more fish around this year than when John Cabot came. People are getting fish in lobster traps. Certainly they have the blackback fishery, which turned out to be a cod fishery, and whether it was designed that way we can argue. People who have set turbot nets off in deeper water are catching significant cod. So it seems to be widespread. They also said the year classes are quite extensive, which is sort of surprising, from very large fish to very small fish.

So I'd like your spin on that—there seems to be an almost immediate resurgence there—or your view as to whether these are isolated bay stocks, but they seem to be fairly widespread compared to even five or six years ago. How does it tie in with the overall cod biomass? Undoubtedly, years ago we had the whole infiltration of the northern cod along the coast, following the capelin, or whatever.

There's another question I'll throw out and then give you time to get into both. We just listened to Dr. Bell before you came, and he mentioned the possibility of listing northern cod. When fishermen hear that they cringe. However, they cringe because they think if you list northern cod, boom, the fishery will be shut down and all the associated fisheries.... Dr. Bell basically talked about the different stocks, isolating those that perhaps should be protected and utilizing those that may have generated enough to utilize. I'd certainly like your spin on that, because I know you've had some involvement.

On the main question.... Your summation of what happened is dead on. If you ask any fisherman or anybody associated, they will agree with you. You could have thrown in maybe the advent of sounders and fish finders that can now find the last fish out there. That was about the only thing you didn't have. We hear from people like yourself and Dr. Bell who have been in this racket for quite some time and are very knowledgeable on this, but where does this knowledge go? The expertise you've built up should be able to convince the people who make decisions on our fisheries to make the right ones. Where is the blockage?

We had the same problem with some people this morning. We heard them say they publish their work. Well, how many people actively involved in the fishery read scientific publications? Very few. Sometimes information feeds back to fishermen, which quite often they don't understand. How much of it gets to the decision-makers who set the quota and do the international negotiations? Somewhere there seems to be an awful wall that prevents the information you've had for a while—and Dr. Bell, Professor Neis, and others.... Why are we here looking for information you have?

Prof. Jeffrey Hutchings: Thank you very much, Mr. Hearn. There are a number of questions there.

The Chair: Did you get them all?

Prof. Jeffrey Hutchings: I think I got most of them.

Concerning the stock structure—seeing a lot more fish in the bays today than ever before—I don't suspect for a second that what people are saying is not true: that in certain areas, certain bays, certain parts, and in certain fisheries, catch rates go up and down. We haven't had a commercial fishery in the inshore since 2002, and the size structure of fish in the inshore isn't bad. I mean, it's not unhealthy relative to the offshore, which is clearly in very dire straits.

We also have no fisheries right now, and catch rates will be perceived to be very good, or abundance will always be perceived to be very good, when essentially nobody is fishing for them.

I think the difficult thing here is to put into perspective seeing lots of fish—whatever lots of fish means, and this will differ from individual to individual, community to community, and place to place—when there are no other fisheries taking place, against what a healthy stock is, or what a virgin biomass is, or what the catch rates are that we're seeing today, or the incidence in the blackback fishery, for example, relative to what we would have seen in the 1960s if there had been no other fisheries taking place.

This is the difficulty often in trying to balance or interpret what it means to see a lot of fish, because right now there are essentially, for the most part, very few people fishing them. I think in certain localized areas what people are seeing and interpreting as high abundance is probably true, but in the broad perspective, if one includes the offshore as well, things are still very low.

That falls right into your next point about stock structure. How many stocks of cod are there? This is an old question. William Cormack, who in 1826 crossed Newfoundland, wrote about this. Fishermen have talked about stock structure for cod stocks for a long period of time.

I think at some level a lot of scientists would say almost certainly there are more units, more stocks of cod in the northern cod area than are currently being recognized. It makes sense biologically; it makes sense based on anecdotal evidence from a lot of different sources.

While we might say we probably think there is more stock structure than is currently acknowledged in management plans and so on, the difficulty is determining what those boundaries are; that's the difficult thing. These are things that will almost certainly fluctuate over time. So while it might be nice for some to say it would have been useful to identify what these stocks are and provide protection for them, the difficulty lies in unambiguously identifying what the stocks are.

Currently what we're dealing with is the offshore and the inshore. That seems to be the question at hand in the minds of many people. To what degree has the inshore suffered from the offshore? I think it's reasonable to believe there is some separation between the two.

Having said that, we do know that cod in the offshore have historically, and almost certainly still are today, migrating inshore in the spring of the year and migrating back off again in late summer or early fall. Any fishery that were to take place in the inshore would almost certainly catch some of these offshore fish. Would this significantly impede recovery? That's a question that's basically unanswerable. It would probably have some negative impact on recovery in the offshore, but it's difficult to know how much, and perhaps there are ways to help alleviate it.

As for a listing for cod, one of the difficulties in dealing with this question of a listing is I think that a year ago when the information sessions were being conducted, perhaps people weren't provided with the fullest amount of information they could have been. Basically, if northern cod were listed as endangered under the Species at Risk Act, the perception of many if not most people—and I understand why this perception exists—is that all the prohibitions that come into play in the Species at Risk Act would automatically be enforced and automatically be there: no fishery, no incidental harm, no destruction of habitat.

● (1135)

In fact, that's not the case. What the Species at Risk Act does, based on my reading of the act, and I've published some of this with a lawyer at Dalhousie, and based on my involvement on COSEWIC and based on some legal opinions I've heard from Environment Canada and the Department of Fisheries and Oceans—but this is my interpretation, and I don't want to give you the impression that I'm speaking for them—is that quite clearly in the act a recovery strategy is what comes into play under a listing.

There's a lot of discretion in the Species at Risk Act. The minister in particular has extraordinary discretionary powers under the act.

Number one, what would a listing mean? It would mean that you'd have to have a plan. It would mean you'd have to identify recovery targets, timelines for achieving that recovery. How would you come up with a plan? The act says you have to involve all interested parties, stakeholders included. This strikes me as a good thing because we don't have targets, we don't have timelines, and we don't have any legislated mandate to have input from all sources.

Number two, the act indicates that recovery strategies can recognize explicitly spatial differences or differences in status within the unit that has been designated. There are species that are listed across Canada but recovery plans that recognize that perhaps in Ontario the species is doing much worse than it is in Alberta. So recovery strategies can take into account differences in status within a unit. If northern cod were to be listed, any perceived differences in status between the inshore and the offshore, for example, could be taken into account.

What the minister needs to do under the act in order to permit various activities that you would think would not be permissible, such as a fishery, is to be of the opinion that a fishery or a take will not jeopardize the survival or recovery of the listed species. This is straight from the act. So the minister needs only to be “of the opinion” that “the activity will not jeopardize the survival or recovery of the species”. So if the minister is of the opinion that an activity such as a food fishery or whatever activity you can think of will not jeopardize the survival or recovery, then the recovery strategy can take that into account.

So the Species at Risk Act is actually far more forgiving in many respects than I think people are aware of. The notion of having a plan in place strikes me as a good one, and the suggestion that the most draconian measures that could possibly be implemented under the Species at Risk Act would automatically come into play for any listed species is not a viable one, because it really depends on the recovery strategies.

In terms of other activities taking place—oil and gas, bycatch and other fisheries—what happens is you apply for what are called incidental harm permits. Again, the minister simply needs to be of the opinion that the harm on the listed species that is taking place will not jeopardize the survival or recovery of the species.

We have two listed species of marine fish right now: the northern and spotted wolffish. There have been thousands of incidental harm permits that have allowed fishermen to continue fishing, even though they are catching northern and spotted wolffish, but there are measures put into place to ensure that when those fish are released, to the extent possible, these fish will survive and persist. So the act has actually quite a lot of flexibility, and more than I think most people would be aware of.

● (1140)

The Chair: Thank you.

[*Translation*]

Mr. Blais, please, go ahead.

Mr. Raynald Blais: Thank you, Mr. Chairman.

Good morning, Mr. Hutchings. I'd like to hear what you have to say regarding stock structure. Could you give us more detail?

I would be remiss not to ask you the following question. Are the stocks in 2J3KL and off the coastline of Newfoundland experiencing the same thing? According to you, does the same situation apply in the Gulf of St. Lawrence, close to the Quebec zones and in other areas? Is the structure the same? Is the situation the same?

● (1145)

[*English*]

Prof. Jeffrey Hutchings: Thank you very much.

Almost certainly they are not the same populations. There are good reasons to believe that cod, for example, in the northern gulf off Quebec live different lives, they have different life histories, different growth rates, and experience different conditions than do northern cod.

There have been a number of studies increasingly conducted to date from a genetic perspective and from an ecological perspective to suggest that biologically meaningful differences among cod units exist on much smaller scales than we previously appreciated. I think some of those differences are manifested by certain migration patterns. I remember talking to fishermen in Bonavista Bay who would talk about cod moving in a certain direction at a certain time of the year, a very repeatable pattern along a certain part of the coast, and moving out again. It seems reasonable to believe that has a biological and genetic basis.

We see differences in cod stocks. When we take cod from different places and we rear them under the same environmental conditions, we see that they differ in terms of their growth rate and their survival and even their shape. The important thing about an experiment like that is we might see these differences in the wild and say, are these maybe just because they live in a different environment, with different temperatures, different food? Maybe there's no genetic basis, maybe it doesn't matter, and maybe they're all one cod. But when we take those cod and we put them into the same environment and we still find differences, then we can say the environment didn't generate those differences; this must reflect an internal, a genetic, basis for these differences. Once we can determine that these differences have a genetic basis, then this makes us think these are biologically meaningful units and should be treated as such and should be managed differently.

Again, to return to your general question, are cod in the northern gulf likely to be different from northern cod, and within the northern cod unit are there likely to be important differences that we might identify as different stocks? In my opinion, yes.

[*Translation*]

Mr. Raynald Blais: Regarding stock structure, you clearly stated that a smaller population is more fragile, so anything could happen. In other words, something which would have a small effect on a large population, such as a change in the weather, will have a greater effect on a smaller population. So you've arrived at a theory according to which a larger group is less fragile, whereas a smaller group is far more so.

To what extent is there such a large difference? Has this been studied? Is there enough data in order to state that there may be species and areas where the structure of cod stocks may be more fragile than elsewhere? Could these types of variables exist?

[*English*]

Prof. Jeffrey Hutchings: Thank you. That's an excellent question.

To what degree does the size of the population affect the ability to persist, to recover, to withstand unpredictable environmental change? The best way to address that is through work that I've conducted and some work of others to look at what has been the experience of collapsed fish stocks worldwide, including cod, herring, and all sorts of different species. What we see is that the greater the decline in abundance, the lower the likelihood of recovery. So the greater the degree to which populations have fallen, the lower the chance that recovery will take place. If populations have declined by 60% or 70%, we tend to see that they have a better chance of growing. But if they decline by 90% or 95%, the chances of recovery are much lower, and there are many examples where we see no recovery at all, when we look at fish stocks on a worldwide basis.

Perhaps the best way I can answer your question, then, is to look not only at northern cod but at the experiences of fish worldwide. What we can say is that the greater the degree to which we reduce their abundance, the lower their chances of recovering. That would be consistent with what I mentioned earlier.

[*Translation*]

Mr. Raynald Blais: Given the structure of the stock we were referring to earlier, do you get the impression that the in-shore cod fishery would more easily withstand reopening?

[*English*]

Prof. Jeffrey Hutchings: That is the key question. What we see right now in the inshore is a much healthier age structure than we see in the offshore.

Could the inshore sustain a fishery? Again, this comes down to what we want. What are the trade-offs? What are we willing to trade off in the future for potential benefits today?

Could the inshore sustain some level of take, some level of catch? Again, it depends on what we want. If we want the inshore stock to continue to grow—and it can continue to grow to larger sizes—then that will influence what our decisions are in terms of catch.

I know the Department of Fisheries and Oceans has made estimates suggesting that a 2,500-tonne catch in the inshore would likely result in little or no growth in the next one to three years for the inshore, or very modest levels of growth. That would suggest to me that if we want the stock to grow, we should not establish a catch greater than 2,500 tonnes—this is the inshore. In fact, we should probably establish a catch much less than that, because we have a tendency, when setting quotas, to always work at the edge. We're always working at the edge. We constantly do that. We like to know what is the most we can get out of this, and that has never been a healthy way to deal with fisheries, because our past practices show that when we work at the edge, negative things will happen.

So what would be a reasonable take? It would probably be 500 tonnes, maybe 1,000 tonnes. If, based on the data from the survey indices and other sources of information, the stock is lower in the inshore than it was even five or six years ago, then the fisheries of five or six years ago of 5,000 tonnes to 9,000 tonnes would not be sustainable today.

They weren't sustainable back then. The exploitation rates, the harvest rates from those so-called limited fisheries, were very, very high. They were unsustainable. So what happened? We see the stock declining. It showed up in the sentinel fishery catch rates for gillnets and line trawls. We see declines in the catch rates. There is every indication that those limited fisheries of 5,000 tonnes to 9,000 tonnes had a negative impact on the inshore cod.

Taking all this information into account, can the inshore withstand a harvest? Again, it depends on what we want out of this fishery, out of this group of fish.

Second, if we decide that some form of a take is appropriate, then from a science perspective, quite clearly, in my perspective, a take of 500 tonnes to 1,000 tonnes would permit some growth in the inshore.

I can go into other questions as to who I think should take that, but in terms of the degree to which it would negatively affect recovery in the offshore, we could deal with that to some degree by determining the timing of the fishery so that any fish migrating into the inshore waters from the offshore would be less likely to be caught.

So any inshore fishery would probably have some negative impact on the recovery in the offshore, but it's difficult to say whether that would be a lot or a little. And could it sustain some sort of take? It probably could, but it would be a very small one, and again, it depends on what we want out of these fisheries.

● (1150)

The Chair: Thank you, Doctor.

Just to be clear, you did say—and you repeated it—on a purely scientific basis, any inshore fishery would quite likely affect offshore recovery.

Prof. Jeffrey Hutchings: It quite likely would, but when I say that, I'm across the continuum. We really don't know whether the effect would be a lot or a little.

For example, one could—if you had an inshore fishery—not start it until the end of August, or have it prosecuted in September or at some point at which, based on what we know of cod in the past, the offshore fish would have started to move away again.

The Chair: Thank you.

Mr. Stoffer.

Mr. Peter Stoffer: Thank you very much again for your presentation. I find you explain things in a way that I can actually understand them, so I greatly appreciate it.

The other day we were in Port Blandford and a fisherman told us in no uncertain terms that he trusts scientists as he does politicians. It didn't make us all look very good.

One of the questions I asked one of the earlier presenters was how.... Fishermen are saying—at least the ones we spoke to—that they don't see scientists, they don't see surveys. One gentleman indicated that with all the 300-something years of fishing experience, they've seen one. So your indications of where your statistical information comes from...where does that data come from? How is it collected, and is the input or knowledge of traditional fishermen used as your basis?

The second question I have is...you've indicated fishing on the spawning grounds would not be a good thing. I couldn't agree with you more, but there are other activities that happen on the spawning grounds on which we don't have enough knowledge, according to my understanding, and that is seismic testing.

As you know, off Cheticamp they did some seismic testing and people were concerned about what effect that might have on crab larvae. Afterwards, there was mixed opinion that it would have an effect or that it wouldn't have an effect, and the jury is still out on that. I would like to know if you have done or if you know of anyone who has done research on what seismic testing does on possible spawning grounds.

My last question for you is one you said you could answer later on. If there is an inshore fishery available—be it commercial, be it food, recreational, or a combination of both—what type would you advise? Then, who would you prefer, or if you were the minister or a scientist advising the minister, what would you advise him or her?

● (1155)

Prof. Jeffrey Hutchings: Thank you very much, Peter.

In terms of fishermen's knowledge, to what degree has knowledge from fishermen been part of what I have said today? I published a paper with Mark Ferguson in the science literature based on interviews with fishermen, 47 fishermen from Fogo Island down to Cape Royal. Fishermen there were involved in the inshore. To my mind, that was one of the most illuminating experiences I've ever had. There were different types of information about catch rates, discarding, soak times, spatial changes in the fishery, mesh sizes, and changes in trap design. It's information that is not routinely collected. In fact, if you try to find or obtain any information on efforts in the inshore, some of these significant changes that occurred in gear, and why fishermen did this, you can't find it.

I think these are very important types of information because they tell you something about the state of the stock and the state of the fishery. For example, why would a fisherman spend more money on more twine to build a Japanese trap if a Newfoundland trap would do the trick?

There are a lot of different types of information that are fundamentally important and can be collected in a regular way. I would see it being perhaps tied to the licence, or in some instances there are logbooks. Many fishermen would be very eager to contribute, and for that matter you could make it a condition of the licence. There is all kinds of information out there that could be had and could be communicated in a better way.

There is no question that scientists in general do not communicate well with the public, for all kinds of different reasons. This is a significant factor. In fact, Mr. Hearn mentioned it too. I forgot to address this. How can this information be better communicated to decision-makers, the public, and society?

This is a great challenge. Many scientists are not very good at it. But in my experience as an outsider, looking at the Department of Fisheries and Oceans and what they have and have not been doing over the last 10 or 15 years, the degree of interaction has generally been much better than it has been in the past in terms of involving harvesters and communicating information. Could it be better? I suspect it probably could be. Is it better than it once was? I think it is.

On seismic testing of cod, I'm not aware of any specific studies that have looked at it. That's not to say there haven't been some. There have been some studies that look at the effects of anthropogenic sound on the ability of other fish to hear and to do things.

This might be very important for cod, because I made reference to the fact that cod produce sounds at spawning time. They have muscles attached to their air bladders that allow them to produce a sound that is heard mainly during spawning. We still don't fully understand the functions of the sound, but there is quite clearly some reason, some biological or adaptive reason, for why the fish produce the sound. It seems the males are more likely to produce the sound than the females are. Given that sound is of some importance to reproduction in the species, one could only think that seismic testing and anything that disrupts the ability of cod to produce sounds would have some negative impact on reproduction.

Now if I was to make decisions about a harvest or a take, who should be permitted to take it? This is clearly my own individual opinion. It's not based on science, but the level of catch could be based on science. I would again reiterate that, based on the information at hand right now, a harvest of more than 2,500 tonnes would be very ill-advised and to even go to the limit of 2,500 tonnes would be ill-advised. However, I think there is merit in having some form of food or recreational fishery. I think people in this province need to have some access and some ability to be able to catch fish. I think this is good from a stewardship perspective. I think this is good from a data-gathering perspective. I think this is a good thing for society. It allows society to be better involved in what is in fact a societal resource. These fish are not owned by a few people.

So what will we do? I would suggest a 500-tonne food or recreational fishery. What's 500 tonnes? That's about 500,000 fish, about half a million fish. That's a lot of fish.

● (1200)

You need to regulate this to some degree. It doesn't mean that the means of regulation will automatically work—there are always holes—but you have to have some means of imposing or controlling catch to some degree. Controlling catch is important if we want recovery to take place. So I would suggest 10 tags per family. That would allow 50,000 families access to 10 fish a year.

I had a suggestion made to me just last night by Harry Rowe, who gave me the idea of a logbook. A condition of getting these tags is that you have to keep track of the size of the fish you catch, when you catch them, and where you catch them. Then you pass that logbook back in. If you don't pass the logbook back in one year, you don't get any tags the next year.

I think it's an excellent suggestion from a variety of perspectives. Again, it puts the onus on the individual and it provides them with an opportunity to communicate important information on the status of the resource. It also fuels the stewardship side of things.

The Chair: Thank you. I think we'll stop here, because we want to give other members an opportunity.

Mr. Matthews.

Mr. Bill Matthews: Thank you very much, Mr. Chairman, and thank you for coming, Dr. Hutchings. I've enjoyed your presentation and your answers. I have just a couple of questions for you.

You've referenced that the smaller cod, I believe you said, are now reproducing, and cod are not living as long. Where did you get that evidence from? Is that current evidence, or has that been around for a while?

Prof. Jeffrey Hutchings: That has been around for a while, but there has been some more recent work. There's been more prominence given to this in the last couple of years. Going back to the 1950s, for example, it appears as though northern cod were typically reproducing at six and a half to seven years of age, but today it's more like five to five and a half years of age. As well, they're maturing at a smaller size.

Mr. Bill Matthews: Would you say the same thing applies to cod in 3Ps or 3Pn, or would you say it's different in the south?

Prof. Jeffrey Hutchings: I'm not that familiar with it, but I don't believe the same changes have been as evident in 3Ps. They have been further south, on the eastern Scotian shelf. In the most heavily depleted stocks we seem to see these changes, but I couldn't say with certainty whether those changes have taken place in 3Ps.

Mr. Bill Matthews: Okay.

Now, you've referenced what I'll call, I guess, cod “love sounds”; I don't know how else to describe them. I just have to ask you, how would you know that? How would anyone know that a cod makes sounds when they're reproducing?

Prof. Jeffrey Hutchings: This was first suggested and first observed by Vivian Brawn, the first female scientist hired by Fisheries and Oceans. She observed this work as part of her doctoral thesis in the United Kingdom in the late fifties and early sixties. At Dalhousie, more recently, we've been doing work on this, but so have researchers in Norway as well.

Cod are brought into the lab, into very large tanks, tanks as large as this room, but cod will produce sounds in smaller tanks as well, as will haddock. You can essentially put hydrophones or recording devices in the water and detect and record these sounds. They're a low grunt is what they are.

Mr. Bill Matthews: Thank you for that. I just had to ask.

You referenced Smith Sound and what happened there. I guess you said approximately 1,000 metric tonnes of cod died a couple of years ago. What is the official reason for those cod dying there? I've heard tell of gills freezing and other things, but what is the official reason?

● (1205)

Prof. Jeffrey Hutchings: I couldn't say what the official reason is. As I said, 780 tonnes is the official estimate, but it was clearly more than that. My understanding is that it's been described as a cooling event, an unpredictable and unexpected cooling event from the water that supercooled the fish. It almost certainly would have impacted the gills to some degree and prevented the fish from breathing properly. My understanding is that the fish who died were in pretty good condition, and they died instantly.

Mr. Bill Matthews: I just raise the question because you talked at great length about population size and all this stuff, that it's harder to survive, and I guess about the factors that influence a smaller population versus a larger population. Then I think you went on to say that it was estimated to be about 10,000 metric tonnes in Smith Sound. So I guess if that's the case, we're fortunate that we didn't lose more.

Prof. Jeffrey Hutchings: That's right. My understanding is that DFO estimates of spawner biomass were in the order of 14,000 to 15,000 tonnes for the inshore. If indeed 1,000 tonnes, or perhaps 1,500 tonnes, died in this unpredictable event, that's a high percentage of what was there.

Mr. Bill Matthews: I want to conclude my questioning and then pass my time on to my colleagues.

In talking about the endangered species activity and what might happen there, and the flexibilities that may or may not be involved, if indeed cod is listed, what impact is that going to have on fishing outside of 200 miles? If the Government of Canada or the ministers list cod as endangered, and I understand there's a whole range of flexibilities and what not there, do you see this as a way then that...? What would be Canada's authority then...or can we then cease fishing outside of 200, because indeed they're catching northern cod?

Prof. Jeffrey Hutchings: I think that's an extremely important point. To my mind, by listing cod it would strengthen Canada's hand immeasurably in dealing with fishing outside the 200-mile limit. It would underscore the importance that Canada sees in conservation and in doing something about it. As I say, a recovery strategy that the act requires a plan and targets—I cannot see it doing anything but strengthening our hand in terms of dealing with foreign fishing outside.

Just of interest, you may or may not be aware that the Species at Risk Act actually is one of the few acts that allows for Canada to extend its jurisdiction, in a sense. If a sedentary species is listed under the Species at Risk Act, it's actually permissible for us to list it right out to the end of the Grand Banks, outside the nose and the tail. It's section 4.

Mr. Bill Matthews: Thank you.

The Chair: Mr. Simms, do you have any questions?

Mr. Scott Simms: Yes. I just want to follow up on that.

Mr. Hutchings, you mentioned earlier the food fishery itself. It seemed to be...I won't call it an endorsement, but it was a stamp of approval. Or would that be fair to say?

Prof. Jeffrey Hutchings: I don't really want to endorse one thing or another. I think the political reality is that some harvest is going to be recommended at some point in the near future.

Mr. Scott Simms: Right, and that's the one that you think wouldn't be detrimental to the species itself.

Prof. Jeffrey Hutchings: It would permit some recovery to continue to take place.

Mr. Scott Simms: Yes, okay.

When it comes to the species at risk legislation that you just spoke of, don't you think this flies in the face of that? If you had this particular 500 tonnes, I think the number was, with the tags, don't you think...? Now, with the species at risk and being listed as an endangered species, obviously that would be called off at that point, would it not?

● (1210)

Prof. Jeffrey Hutchings: No. That was my point earlier in response to another question, that in fact—

Mr. Scott Simms: I just want to be sure about this.

Prof. Jeffrey Hutchings: —this is the perception, but the act permits extraordinary flexibility in the recovery planning stages. The minister simply needs to be of the opinion that the activity under consideration does not jeopardize the survival or recovery of the species. If northern cod as a unit were to be listed, then spatial differences in the perceived status of the stock could come into play —no fishing in the offshore, but we might permit some small take in the inshore. The act clearly permits that. The recovery strategies permit it.

Mr. Scott Simms: Okay, let's go back to the key question you spoke of earlier, which is essentially about the relationship between inshore and offshore stocks, in this particular case.

Would it be fair to say that a growth in the inshore stock—in other words, a substantial amount more of fish next year—would increase the amount of offshore fish as well? Is there a direct relationship between the two such that we can rely upon the inshore stock to help repopulate what is offshore?

Prof. Jeffrey Hutchings: I don't think so, in a biologically meaningful space and time. I suspect—

Mr. Scott Simms: Can you define that timing in common speaking notions?

Prof. Jeffrey Hutchings: Well, not in our lifetime. The reason I say that—

Mr. Scott Simms: That's all I need to know.

Prof. Jeffrey Hutchings: But the reason for saying it is that I think at some level one could make the argument that if we allowed no fisheries whatsoever and simply allowed the stocks to grow and grow, the densities of fish in the inshore would be high enough that it wouldn't make sense for them to live in the inshore any more, and they'd be better off going offshore. There'd be pressure to move from the inshore to the offshore.

But in terms of inshore cod making a biologically significant contribution to seeding the offshore, from a science perspective I think that would take a much longer timeframe than would be meaningful to consider.

The more important consideration is not so much the degree to which the inshore will seed the offshore but the degree to which any harvest in the inshore affects recovery of the offshore. In terms of the interactions between the two, that would be the more worrisome thing and the more important consideration, from my perspective.

Mr. Scott Simms: There has been recent technology, including DNA.... I don't know the exact details of it. Do you know much about this? It was adopted by DFO. They get to track the species itself through DNA and also to clarify the relationship between inshore and offshore stocks.

Prof. Jeffrey Hutchings: You'll hear a lot about DNA and genetics. The key thing here is that it depends on the type of DNA you look at. There was an analysis done in the mid-1990s that suggested all cod are the same. Much more recent analyses, using other sections or types of DNA, have provided some evidence of inshore and offshore groups, evidence that the cod are differentiated at smaller scales. In my view, one simply takes that genetic evidence at face value. But you use it in conjunction with other types of information; you don't base judgments on that information alone.

Mr. Scott Simms: Then you are—

The Chair: I'm sorry, we are beyond our time, and there are so many questions.

Professor, would you object if you just stayed a few minutes longer? I'd be prepared to allow Mr. Keddy, Mr. Blais, Mr. Stoffer, and Mr. Murphy one question each, if you could stay just a few more minutes.

Prof. Jeffrey Hutchings: Yes, certainly.

The Chair: I mean one question each.

Mr. Keddy.

Mr. Gerald Keddy: Thank you, Mr. Chair.

Which question to ask....

Concerning your comment that listing under SARA would increase our ability under NAFO to regulate outside the 200-mile limit, if that possibility is there within the regulations, and I don't question that it is, why would we want to do it if we didn't, prior to that, list 2J, 3K, 3L, and all of our different zones that are separate management zones now, as separate entities? If we list it without doing that, then we effectively can shut everything down. If we divide it up into zones, we would have a stronger hand in saying there is a distinct offshore class and we want control outside the 200-mile limit but we're not interested in that finite control in Trinity Bay, Bonavista Bay, and other zones that northern cod are in.

Prof. Jeffrey Hutchings: If I understood your question, it was a question of the scale at which you list: whether to list all cod under one unit, or whether it's more appropriate to recognize differences in status within this area.

Mr. Gerald Keddy: I think there is a serious danger in listing under SARA, quite frankly, if we don't divide our species into subgroups beforehand—and into geographical areas, and we already have those in our fishing zones.

The Chair: He did understand your question correctly.

Could you answer?

Prof. Jeffrey Hutchings: Yes.

To answer your question, at the end of the day my own feeling is it wouldn't make a lot of difference in the degree to which it would strengthen our hand in dealing with what's going on outside and with respect to NAFO. The reason for saying that is, as I said earlier, recovery plans can recognize management units and differences in status. It's how we deal with the question at hand; it's how we deal with the fact that on the offshore there has been a 99% reduction in abundance. In the inshore it's impossible to say, because we have no historical estimates of abundance, but in the offshore this is one of the most depleted species of vertebrates on the planet.

To fiddle around trying to list on the basis of boundaries for which we have management units in some cases but don't know if they're meaningful ones or not.... The listing is really just a means of getting the ball rolling from a recovery strategy perspective. And the recovery strategy can do everything you just indicated, which is highly appropriate.

An appropriately constructed recovery plan would recognize differences in status within the unit in question. It's what you do about these issues that we as a country will be judged on, not so much the listing category per se. The recovery plan can allow for differences in status and should recognize and be responsive to those differences.

I'm not disagreeing with your point. It's simply that I don't see the listing category as being paramount in this. I see what we do about it as being paramount.

● (1215)

The Chair: You are saying that SARA, in your view, has enough flexibility to take into account Mr. Keddy's suggestion.

Prof. Jeffrey Hutchings: Yes.

[*Translation*]

The Chair: Mr. Blais, if you'd like, you may ask another question.

Mr. Raynald Blais: Thank you, Mr. Chairman.

What is your opinion on aquaculture, on stocking? Could that be a solution or a way to protect the resource and, possibly to get out of this bind?

[*English*]

Prof. Jeffrey Hutchings: Thank you.

The degree to which aquaculture or the potential seeding of cod into the ocean might assist recovery is a question that has indeed come up time and time again. In fact, this was a question addressed in the 1870s and 1880s in Norway and in the United States, and it was one of the prime reasons for having a cod hatchery built in Dildo in the 1890s—that is, the idea that you could grow cod and then put them back into the ocean and they would assist the fishery.

My view is it's likely to have a very limited impact; it will probably have no impact at all on a broad scale. I don't see the seeding of cod—taking cod and putting them in the ocean—as a meaningful measure of achieving recovery.

On the other hand, I think aquaculture of cod, from a marketing perspective, has a lot of advantages. If the aquaculture of cod could be done in an environmentally sustainable manner, an environmentally meaningful manner, you could potentially end up with very high-quality fish for which I'm sure all sorts of markets are available.

Specifically, though, with respect to recovery, I don't have the view that seeding of the ocean with cod reared in a hatchery would significantly enhance recovery, and I have seen no evidence to suggest it.

The Chair: Thank you.

Next is Mr. Stoffer.

Mr. Peter Stoffer: Thank you, Mr. Chairman.

Sir, you indicated that in certain sections of the act the minister just has to be “of the opinion”. I would hope the minister's opinion would be based on the best scientific evidence he has for his informational basis.

The previous gentleman indicated that science should be more independent and not so much within government, so that it could be more transparent and the public could better understand what scientists are saying about a particular species.

Please give your opinion or your advice. I was always of the thinking that science within DFO should be greatly enhanced with more personnel, more resources, and more money—more or less—and that at the same time, the same should be done in the university levels and academia. Would you think it should just be one—universities and independent scientists—or should it be more government, DFO, or should it be a combination of both, so that a minister at any level gets the best available scientific information available?

● (1220)

Prof. Jeffrey Hutchings: Right now, I would favour the hybrid form. Certain things can only be funded by and undertaken by government; I'm thinking of surveys in particular. Surveys are fundamentally important. They're very expensive, and if we lose the surveys—lose the capacity to monitor fish and invertebrate populations over time—we will be in dire straits.

That's something universities can't do, but university scientists can address questions of a biological and ecological nature, of a cod love sound nature, that fishery scientists and government bodies might not have the time, the expertise, or the personnel available to address.

I think questions of stock structure, biology, and ecology can be addressed by greater interactions between the two. One final point is that one of those interactions is occurring right now, in terms of recovery planning perspectives; I've been invited to attend meetings that address some of these questions of incidental harm permits and recovery planning for depleted species. I think the department now is making a good effort to involve scientists from outside government who have undertaken science in the areas in question. That flow of information and communication is much better than it once was.

The Chair: Thank you.

Mr. Murphy is next.

Hon. Shawn Murphy: Thank you very much, Dr. Hutchings, for appearing.

What is your view on the interaction and interrelationship between the cod and some of the shellfish species we see? Since the collapse of the cod biomass some 15 years ago, we've seen an apparent increase in the biomass of the shellfish—different species of crab, shrimp, and in certain areas lobster. Actually, in Bonavista one fisherman seemed to suggest that if we didn't get a cod cull going soon, we stand the risk of jeopardizing our lucrative crab industry.

Is there any scientific basis for this correlation as to the collapse of the cod and the increase of the shellfish biomass, particularly of crab?

Prof. Jeffrey Hutchings: Work conducted on this question in different parts of the world does find that a reduction in groundfish like cod is typically followed by an increase in the abundance of the things the groundfish used to feed upon, perhaps because of reduced competition or reduced predation, or for whatever reason. It reflects the interactions that take place between species. These hearings are on one species; we tend to talk about one species, but it's one species within an ecosystem, within a group of species that are constantly interacting.

The typical pattern that one sees—you don't always see it, but you often do see a pattern exactly as you're describing—is that following the demise of groundfish, you see an increase in invertebrates. The increase in shrimp, for example, is almost certainly a prime example of the consequence of reduction in cod and other species in the ocean.

The Chair: I guess that follows the axiom that nature abhors a vacuum.

You referred to a report you did with someone else regarding interviews with 47 fishermen. Would you be kind enough to provide the committee with a copy of it?

Prof. Jeffrey Hutchings: It's right here.

The Chair: Wonderful. Thank you.

That was an excellent presentation, Professor. It was very enjoyable. Thank you so much.

Thank you to all our witnesses this morning. We've gone on longer than we'd thought. We're going to return, assuming we have quorum, and start at 1:30 sharp.

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