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Chair

Mr. Scott Simms

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● (0850)

[*English*]

The Chair (Mr. Scott Simms (Coast of Bays—Central—Notre Dame, Lib.)): Good morning, everybody.

We are now continuing on with our study of marine protected areas.

Before I get to our special guests, our witnesses, I want to say hello to Mr. Wayne Long, all the way from the riding of Saint John—Rothesay, who's subbing in and doing a valiant job already, I must say.

Mr. Wayne Long (Saint John—Rothesay, Lib.): Thank you, Mr. Chair.

The Chair: Everybody this morning is joining us via video conference.

First, we have Dr. Isabelle Côté, professor of marine ecology, Simon Fraser University, from Burnaby, British Columbia. Second, we have Dr. Callum Roberts, professor of marine conservation, environment department, University of York, from the United Kingdom. Finally, third, and certainly not a stranger to this committee in terms of both his appearance and his work, is Dr. Boris Worm, professor of biology, Dalhousie University. He's currently in Halifax, Nova Scotia.

Thank you for joining us this morning, everybody.

Dr. Worm, I'm going to leave you for last, because I understand you have a PowerPoint presentation for us.

We're having a hard time hearing Dr. Roberts, so we will start with Dr. Côté.

Normally this is how we do it. We start off with your statement. It can be 10 minutes, or less if you so desire, but we run up to about 10 minutes.

Professor Isabelle Côté (Professor, Marine Ecology, Simon Fraser University, As an Individual): Thank you.

Can you hear me?

The Chair: Sorry, Dr. Côté. I'm going to get you to hang on for just one moment. We're having a hard time hearing you.

To our guests, I apologize for this. We have a technical glitch. We're going to suspend for a few minutes so that we can get this worked out. You have our sincere apologies.

● (0850)

(Pause)

● (0905)

The Chair: We are back on.

Dr. Roberts, we are going to make accommodations for you either today by teleconference, or at another time. In the meantime, we do have two witnesses with us.

Dr. Côté, I'm going to ask you to start again. Our apologies, once more. Dr. Côté, you have 10 minutes, please.

Prof. Isabelle Côté: Thank you very much.

Can you hear me okay?

The Chair: Yes, we can.

Prof. Isabelle Côté: I'll just begin by thanking the committee for allowing me to contribute to the study of the Oceans Act's marine protected areas.

I'd like to give you just a little bit of background to explain my expertise in this area. Over the past three decades I've written more than 160 scientific papers on marine-related issues. My group pioneered the use of meta-analysis to evaluate the effectiveness of conservation intervention.

Meta-analysis is a mathematical way to combine the results of many separate studies. Several of my papers have focused on using this method to measure the effectiveness of marine protected areas, particularly their effectiveness at rebuilding fish populations and understanding the characteristics of both MPAs and the fish themselves that lead to positive outcomes for protection.

I've acted as an expert for Parks Canada's science advisory group for the designation and zoning of Gwaii Haanas, an MCA in B.C. I was part of the Royal Society of Canada's panel on sustaining Canada's marine biodiversity. I have also served, since 2010, as an academic representative on the Bowie Seamount MPA advisory committee.

Today I would like to make three points about marine protected areas in general, which are relevant to our MPAs in Canada.

My first point is that we already know what it takes to make an MPA successful. There have been dozens upon dozens of studies to date that have compared the numbers, sizes, and diversity of fish and invertebrate species in and out of marine protected areas. Very few of these studies, you should note, have been conducted in Canada, largely because we don't have enough meaningful MPAs to do these kinds of studies.

The lessons we've learned from other countries, whether they're temperate or tropical, apply to our waters as well. When you bring all the results of these studies together in meta-analyses, they point to five characteristics of MPAs that are necessary to rebuild depleted populations. These five features have come to be known under the acronym NEOLI. “N” stands for no take; “E” for effectively enforced; “O” for old, meaning they're older than 10 years old; “L” for large, meaning that they're larger than 100 square kilometres; and “I” stands for isolated, usually by deep water or by sand.

The more of these features an MPA has, the more effective it is. MPAs with just one or two of these features have a biomass of fish that is not distinguishable from the biomass in unprotected areas. The benefits of protection start being seen in MPAs that have three of the features. In those MPAs there is about 30% more biomass than in unprotected sites, and the benefits increase greatly in MPAs that have four or five of these features. In MPAs that have five features, you see a whopping 244% more fish biomass than at unprotected sites.

These are figures across all species. If you focused only on the very large fish species, which are the species that are targeted by fishing, then the results are even more staggering, with upwards of 800% more biomass inside MPAs.

The five features all contribute to the success of MPAs, so we can't just create, for example, very large MPAs and then expect them to perform if they don't have the other characteristics as well.

My second point is that strict protection is crucial. This is the “N” in NEOLI. Many studies have compared the effectiveness of marine protected areas that are completely closed to all forms of exploitation or extraction with the effectiveness of MPAs that are only partially protected, meaning that they do allow some extraction or some exploitation within their boundaries. Again and again, the compilations of these studies in meta-analyses show that partially protected MPAs are far less effective at meeting conservation objectives than fully protected MPAs.

A recent paper by Sciberras and colleagues in 2013, for example, found that across more than 50 MPAs around the world, fish biomass was about 50% higher in partially protected areas than in unprotected areas, which is pretty good, but it was 90% higher in no-take areas compared with partially protected areas.

● (0910)

Partial protection is actually what we provide right now in most of the 10 Oceans Act MPAs we currently have. Five of our Oceans Act MPAs have no areas within them that are designated as no-take areas. The other five have some no-take areas that vary from 3% to 100%, but large proportions of some of these are open to exploitation.

My third point is related to this proportion of area that we need to protect. It's a clarification, really, on how much of the ocean we need to close. There are several reports and peer-reviewed papers that have specifically examined how much of the sea should be closed to fishing to meet a variety of goals, including protecting biodiversity, but also preserving ecosystem services such as fisheries yields, as well as achieving various socio-economic priorities. Interestingly, these reports and papers all point to around 30% of an area that needs to be closed.

Now, there are two things that really alarm me about this evidence.

The first is that our national goal of protecting 10% of our marine and coastal areas doesn't even come close to 30%. I know that 10% is a minimum target, but given that we now stand at 1% and that we only have about three years to reach our goal, I cannot imagine that we're going to go much beyond 10%.

The second thing that alarms me is that the results of these studies are actually very often misinterpreted as meaning that one third of the area of MPAs or of networks of MPAs should be designated no take. Just yesterday, for example, I reviewed a paper for DFO on design strategies for the northern shelf bioregional MPA network, and there it was—a recommendation that 30% of the MPA network should be in no-take reserves.

This interpretation is incorrect. The targets for strict protection documented in most of these studies do not apply to individual MPAs, and they don't apply to networks of MPAs. They apply to the whole ocean, or to the whole fishing grounds, or to the whole ecosystem that were targets of these studies.

This is critically important, because if Canada reaches its target of 10% of oceans under protection by 2020 and we implement this common misunderstanding, it means that a mere 3% of our waters are going to be strictly protected. I seriously question how effective that's going to be to sustain our marine biodiversity into the future, so I have two key recommendations that are really simple.

First, let's aim far higher than the 10% that we've set for ourselves. All the evidence right now tells us that 10% is simply not enough.

Second, let's not be shy about implementing no-take areas. They are really what works best when it comes to MPAs. I believe that it's time for everyone to start seeing no-take marine areas not as fortresses that keep fish and other harvestable species locked up and away from fishermen, but as fish banks with very high interest rates. In fact, these no-take MPAs are leaky fish banks, because the accumulated interest in the form of harvestable biomass spills out and enhances fisheries, if given enough time.

Now, I know that MPAs are not a silver bullet. They're definitely not the only tool in our tool box for managing the oceans, but they are a very effective tool that we're not using effectively at all right now.

Thank you very much.

The Chair: Thank you, Dr. Côté. I appreciate that.

Now I understand, Dr. Roberts, that you're joining us by phone. Can you hear us?

● (0915)

Professor Callum Roberts (Professor, Marine Conservation, Environment Department, University of York, As an Individual): I can hear you. I can also hear you through my computer now.

The Chair: We can hear you loud and clear at this point.

For presentations, we usually give the opening remarks 10 minutes or less, sir. Please proceed for 10 minutes or less.

Prof. Callum Roberts: Thank you very much for the invitation to speak to you. I appreciate that, following Isabelle Côté's presentation, there's a lot that I don't need to say now, which is always convenient.

I know that in previous evidence you have heard some fairly glowing remarks about the English marine protected area network and how we've gone ahead and protected more than 20% of our seas in about six years or so. I think this is from Linda Nowlan, who is from the West Coast Environmental Law Association.

Let me just put a slightly different complexion on the experience of England so far. I might title this, "How not to build a national network of marine protected areas". I have to say, I have skin in this game, in that I was part of a science advisory group that was helping to oversee the process. I also provided advice on design criteria.

To start at the beginning, we created a marine act and passed that in 2009, enabling us to create a national network of marine protected areas; so far, so good. Then the government's agencies, the U.K. equivalent of DFO put together a "cookbook" on how to establish or design a network of marine protected areas. The advice was based on very good science, and if you follow the recipe in this cookbook, then you're going to come up with a network that covers the right habitats to the right degree, and puts them in big enough marine protected areas, close enough that they are well connected.

Then, taking good advice that stakeholders should be a key part of the process of establishing protected areas, the government set up four stakeholder bodies with broad participation, and asked them to meet a number of times over two years to design a network according to these criteria.

The first big mistake was to leave fish out of MPAs. These MPAs then suddenly became focused on seabed habitats only. The argument was—and this was from the fishing organizations—that because fish move around and things in the water column move around, they can't be protected using MPAs. This flies in the face of all of the evidence that Isabelle has already talked to you about and that I'm sure previous speakers have talked to you about, but this was the process that we had then.

The next thing that really was a departure from common sense was to ignore historical evidence of change in ecosystems around the U.K. We took the present situation and asked, "What's it like now?" and set our conservation objectives on the basis of what things were like at that moment. One of the paradoxes of this is that if you like the look of what you have now, then you'll be fine protecting it from essentially nothing, because existing activities are obviously compatible with nature conservation.

For 90% of the different habitats that were identified and made part of this process, the conservation objective set was to maintain the habitat in the present condition; only 10% of the habitats were restored. This ignored historical evidence that showed that many fish species had declined by greater than 95% in abundance over the last hundred years or so, and that much of the seabed habitat of complex invertebrate structures had been swept away by bottom trawls and dredges. That was another big mistake.

Once the stakeholder groups gave their advice, that advice was checked by the science advisory panel and was found to be good. The designs that they came up with would achieve almost all of the objectives and criteria. That was then passed on to the minister.

If you want to build on a process of trust and goodwill, you don't then ignore what your stakeholders say and consult on only a minority of the protected areas that were being recommended. As soon as you do that, you no longer have a network of protected areas, so it begs the question why you went to such elaborate lengths to put together these design criteria, if in the end all you were going to do was cherry-pick a few sites.

● (0920)

The other thing the minister did—and this was post hoc—was to say, "Although we said we want you to work on best available evidence, now we want best evidence." Again, there is a strong suspicion that this was because of pressure from the fishing industry coming after the process and saying, "Sorry, we're not going to go with this, and we want you to whittle down the number of protected areas that are going to be established."

Another problem, another flaw, is that instead of settling on a number of simple marine protected area types that have a particular type of protection—for example, completely no take in one type, and exclusion of mobile fishing gear like bottom trawls and dredges in another type—the government, in its wisdom, decided that it would set management objectives habitat by habitat. Let's say you have a marine protected area with 10 different habitats. That means you have to have 10 different kinds of management going on in the protected area, which swiftly makes it completely impossible to implement as a practical approach.

Another thing that happened at this stage was that 65 no-take zones were dropped from the plan, all of them. There is not a single proposed no-take marine protected area left in the U.K. national plan at the moment, so we are in a position of having probably the world's most elaborate network of paper parks at the moment. Since the establishment of these protected areas—and I'm putting "protected areas" in inverted commas—no new management has been applied to any of them.

Although it looks good on paper—there are now 50 marine protected areas around England, for example, with 30 around Scotland—the English ones are not worth anything. They're completely paper parks. The Scottish ones go a bit further towards genuine protection. There is a significant area of those that is protected from mobile fishing gear, but again very little of that is actually no take, which is the gold standard of protection and which science says will deliver the highest level of benefits.

We have many pitfalls, and I think negative role models are a good thing for people to learn from, as are positive role models.

I'd just like to make one final comment on the coverage of marine protected areas. I authored a study, probably one of the ones Isabelle was referring to, on how much of the sea you need to protect. All of her comments are absolutely right. Ten per cent is an unashamedly political target for the establishment of MPAs. It's more than nothing, and it's not so bold that it's unlikely ever to be achieved, but it is a political target.

If you want to actually ramp up towards having a real, genuine, biological benefit that is going to be fish in the bank, for example, that will sustain fisheries, and that will provide resilience against global change, you need much more than that. I would say that the studies are showing that we need in excess of 30%, so a target of 30% by 2020 is now being promoted by environmental organizations. I'm fully behind that. Ten per cent by 2020 is a waypoint, on the way towards effective ocean governance and protection. We really need to be moving in the direction of 30%, and even potentially higher than that. But we need to do it in an adaptive way as we're going beyond these higher values.

That's fully justified, and what is remarkable is that we ever considered that we could do very much at all with 10%. It's really at the level of tokenism at that sort of protective stage. We need to get beyond that to make ocean management effective.

Thank you.

● (0925)

The Chair: Thank you, Dr. Roberts. We appreciate that.

Just on a point of clarification, since some of us may not be aware, who manages fisheries within the U.K. government?

Prof. Callum Roberts: It's DEFRA, which is the Department for Environment, Food and Rural Affairs, that is in charge. It gets advice from CEFAS, which is the Centre for Environment, Fisheries and Aquaculture Science in Lowestoft. It, obviously, is also beholden to Brussels on matters of fisheries management beyond 12 nautical miles.

The Chair: For now, yes.

Prof. Callum Roberts: Yes.

The Chair: Understood.

Dr. Worm, you have 10 minutes or less. I understand you have a PowerPoint presentation as well.

Professor Boris Worm (Professor, Biology, Dalhousie University, As an Individual): Correct.

Thanks again for inviting me. It's a pleasure to talk to you again, in this case about protected areas.

The title slide shows two bottlenose whales, which are the species that are protected by the east coast's first sizable MPA, the Gully MPA, which is 14 years old now, and which has actually been successful in achieving its objectives. We have a positive precedent on this coast, and I think we can build on this.

The next slide shows the latest data on global coverage of protected areas worldwide. In red is the total coverage, all protected areas of any kind in the ocean. In blue are the strongly protected areas, those that fulfill the gold standard that Callum Roberts mentioned. What you can see is that the growth rate of protected areas has been pretty steady at 8% per year since 1960, which is a very healthy growth rate if you consider a current stock portfolio. For example, strongly protected areas, since 2000, have been increasing at 20% per year. For this reason, protected areas have become a major target for impact investment from big foundations and governments because they are growing at a very rapid rate, much like renewable energies.

Why are protected areas growing so rapidly? It's because an increasing number of governments realize that they're not just good tools for protecting biodiversity. They're also tools for recovering and safeguarding fisheries that have been compromised in the past. Of course, this has happened in Canada as well. We did a study with a large interdisciplinary panel of fisheries experts from around the world. I think it is today still the most comprehensive study on how to bring fisheries back from the brink. It's called “Rebuilding Global Fisheries”, published in *Science* a few years ago. What we showed there was that closed and protected areas were the second most important tool after dealing with different fishing gears, like the trawls and dredges that Callum Roberts mentioned. Those areas were the second most important tool, not for protecting whales, dolphins, and seabirds, but for bringing fisheries back. As such, they have worked. These are case studies we have compiled from around the world where fisheries actually have started to recover, because of, among other things, closed areas, which are part of the tool box, but they're a key part of the tool box, in fact, the second most important part of the tool box globally speaking.

Protected areas in Canada have also yielded some surprises. Apart from protecting endangered species and helping out fisheries, we see that protected areas are a key tool for enhancing tourism. In this slide, we can see kayakers in the Musquash protected area in New Brunswick; divers in Race Rocks, B.C.; bottlenose whales, which are doing fairly well, in the Gully protected area, which is 14 years old; and we see a typical sight in the past two years of cruise ships in Halifax harbour. The reason for that is that ocean tourism is one of the most rapid growth sectors in tourism, and of any industry worldwide, in fact. All of these cruise ships were not there 10 years ago. One reason they're coming to our area now is that they pass through the Gully MPA, which nobody, as it was protected, ever thought would become a tourism destination. It has become a major whale-watching hotspot for those cruise ships, among other attractions.

There is one important point I would like to make that the previous speakers have not made. The recent study just out last month in *Nature* showed there is something very important that MPAs need to have on top of good protection and the other criteria that were mentioned—like they're large and they're protected for some time—and that is that they're appropriately staffed and funded. In fact, staffing was the most important predictor worldwide in this study of increases in fish biomass in the reserves and of other desirable socio-economic outcomes.

This is a cautionary note, I think, to the Canadian process. As we're ramping up protected areas to that interim target of 10% by 2020, we have to make sure those areas are managed, staffed, and funded in the future; otherwise, they will not provide the full benefits they could provide. I think this is a very important result out in the scientific literature just this past month.

● (0930)

The other aspect that we're missing in Canada—and this point was made by the previous speaker—is that the areas need to be strongly protected, and Canada lags woefully behind other G20 nations in strongly protecting the areas that we do protect. The reason for that is that the Canadian process is very fair and inclusive, and I will say, somewhat lengthy. I understand that there's a need for that, and particularly aboriginal and fishing groups have been extremely extensively consulted, more than I'm aware of in the U.S., in the U.K., and other nations like us. This has slowed the process down, but it has also made the process very inclusive and comprehensive.

I think that the process being so inclusive is a good thing. Unfortunately, it has resulted in strong protections, like in the U.K., falling a little bit behind, and that goal of strongly protecting the areas that we do protect has not yet been fulfilled. We need to pay more attention to that while talking to these interest groups.

I will make a final point that Canadians as a whole, as a population—apart from special interest groups that harvest from the ocean—very strongly support increased ocean protection. We actually measured this scientifically. There is a paper in preparation to be published later this year where we surveyed young people in schools and adults in Nova Scotia in 2013. People thought that a lot more of the ocean was already protected, and that is not the case. For youth, it peaked at about 11% to 25% and, for adults, it peaked at 2% to 10%.

When they are asked how much they would like to see eventually protected, the numbers are much higher, and they're at or in excess of the 30% target that Callum and Isabelle have mentioned. This says that people intuitively wish for a level of protection that actually matches what scientists around the world are recommending. This is the Canadian public that was polled here, and I feel quite strongly that the Canadian public has not had a proper say in this process. It has been very much about interest groups, which are important. They need to be heard, and they have talked to this committee repeatedly, but I think there are also 35 million other Canadians who have a voice and who very evidently care about increased ocean protection.

In order to draw these people in and give them the tools to have a voice and an informed opinion about how much of the ocean is already protected and how much should be protected based on scientific evidence, I will make the point that ocean education is something that is very important. I'm happy to report that the Department of Fisheries and Oceans is funding a program that Dalhousie University and the National Film Board are running called "Ocean School", where we're bringing ocean education into schools across Canada and other countries.

We tested this recently in France, Nova Scotia, New Brunswick, and Manitoba with great success, giving students immersive experiences and the tools and data they need to make informed decisions about the oceans. I think this is something we haven't done enough of in this country and around the world. We've committed to doing it under the Galway agreement, and we're providing the tools to do this.

Let me wrap up with conclusions. There are four points I would like to make. First, marine protected areas are a key tool of modern marine governance. They are used around the world. Canada has lagged behind. We're catching up now on a tight timeline, but we need more strongly protected MPAs to realize the full benefits.

Second, as I said, strong protection also entails proper staffing and funding once the MPAs are in place.

Third, the process here is extremely thorough. It's well executed. I hope it can be sped up enough to meet the Aichi target that the previous Conservative government agreed to reach, and that's now being implemented.

● (0935)

Finally, there's this point that I see through polling but I also see through talking to Canadians every day in various fora, which is that a large majority in the country strongly supports increased ocean protections for the benefits that have been mentioned and that have been so thoroughly documented elsewhere and in Canada.

Thank you very much.

The Chair: Thank you, Dr. Worm.

Now we go to the questions and answers. Just as a reminder to our witnesses, if you wish to get in on the conversation or you want to put in your opinion, or you have a question, just raise your hand and hopefully the person asking the question will notice you and we'd be able to refer to you at that point.

As a reminder to my colleagues here, please, when you're asking your question, say the name of the person you are addressing. It makes it a lot easier for them, especially since they're joining us by video conference.

The final thing is, if we lose you in the midst of all this, if your video disappears, we will call you and we'll patch you back in that way. That's just in case. We had a couple of glitches there from Dr. Côté, but if we lose you, Dr. Côté, we'll call you back.

To begin the questions, we'll have Ms. Jordan for seven minutes, please.

Mrs. Bernadette Jordan (South Shore—St. Margarets, Lib.): Thank you, Mr. Chair.

I'd like to thank all of our witnesses who appeared today. I have a number of questions so I would like to ask that you try to keep your answers as concise as possible because we do only have seven minutes.

Dr. Côté, I'm going to go to you first. You talked about making successful MPAs and the five areas that need to be addressed and you said that this was based on what you have heard from other areas that have strong MPAs. Do any of those others have indigenous populations that required special fishing rights? I think that Canada is a unique country, and therefore, we maybe have to look at things a little bit differently. I'm just wondering if there were any other areas that have indigenous fishing in those studies that you've looked at.

Prof. Isabelle Côté: No. There's no other country that has a system quite like Canada's. I believe that the amount of exploitation that first nations or indigenous people in Canada are allowed to take under our Constitution would not present a major issue even within no-take marine protected areas.

Mrs. Bernadette Jordan: With that statement then, does "no take" mean absolutely no take, or does it mean take but just a little?

Prof. Isabelle Côté: I really think it means absolutely no take.

Mrs. Bernadette Jordan: Okay.

Prof. Isabelle Côté: I think that in Canada we cannot do this but we need to be able to negotiate extremely minimal takes for these no-take MPAs to actually be effective.

Mrs. Bernadette Jordan: My other question for you is with regard to effective enforcement. We've heard, time and time again, throughout this study and others, that enforcement is lacking, that DFO doesn't have the resources necessary to enforce a lot of the concerns that we have. Do you see that as an ongoing problem within DFO or is that something you can even comment on?

Prof. Isabelle Côté: It is an ongoing problem.

Mrs. Bernadette Jordan: Thank you.

I'm going to go to Dr. Roberts. I thought your testimony was extremely interesting when you talked about your paper parks and the 20%, because of course England has been held up as a model of what we should be doing. Then you said that 10% is a political win.

Would it be better to have 10% of an actual MPA that works or 20% of paper parks?

● (0940)

Prof. Callum Roberts: This is a question that I think there are divided opinions on and largely that comes down to tactics. I think that some people feel that it's a good idea to put the protected areas out there and then once there is a protected area there is a legal requirement for it to actually do something. It's an opportunity to hold whoever's in charge's feet to the fire and say, "Look, you've set up this protected area and it should be working and why isn't it? You haven't resourced it properly. There's nobody monitoring it. There's no enforcement, or whatever, or there's even no management plan." I would say that most English MPAs fail for lack of ambition to begin with. It's not just that they don't have the resources to implement the management plan. There are no management plans either. There is no ambition to recover things that have been depleted.

We really need to go back to the drawing board here. What we do have overseas are some fantastic marine protected areas. The Chagos Marine Protected Area in the Indian Ocean is fully protected and covers something like 600,000 square kilometres. The Pitcairn Islands MPA has just been established; that too, is fully no take. On Ascension Island, half of that exclusive economic zone there is also to be fully no take. We're doing it right overseas and that's under the Foreign and Commonwealth Office, but we're not doing it right in our domestic nearshore waters.

To go back to your question, I think if it were just that the MPAs were to remain unmanaged and paper parks, I would want the well-managed smaller area to be the one that we had. Otherwise, you have nothing at all.

Mrs. Bernadette Jordan: You did say that the 30 in Scotland were actually doing a little bit better than the 15 in England.

Prof. Callum Roberts: Yes.

Mrs. Bernadette Jordan: You also mentioned the mobile fishing gear, that it's a difference in the way that they fish. Are any of those areas in Scotland no-take zones?

Prof. Callum Roberts: There's only one that is fully no take, and it's tiny. It's a couple of square kilometres. We've been studying it in great detail for the last six or seven years or so, and we've been looking at the recovery of life in that protected area.

In the long haul, more and more fully protected marine reserves will be established in both Scotland and England. Eventually, the regulators will catch up with the science and will start to implement that level of protection. The proposals in Scotland that initially came out from management were dreadful. They were proposing to continue with bottom trawling and scallop dredging within about 90% of the area of the MPAs. What's the point of having an MPA if you're just going to carry on trashing it?

Luckily the environmental lobby is pretty strong in Scotland, and it managed to push back on that, so there's a lot more protection there than there is elsewhere in the U.K.

Mrs. Bernadette Jordan: Thank you.

I'm going to go to Dr. Worm now.

With regard to the Gully, you said that it's an extremely successful MPA. It's 14 years old now. Is it a no-take zone? I'm sorry; I should know that.

Prof. Boris Worm: It's not strictly no take. As you saw from the graph I showed, there are hardly any no-take areas in Canadian MPAs. However, it does not permit bottom-touching gear that could destroy the corals that are the target of the MPA. Also, they only allow fishing in an area that is not frequented by the bottlenose whales, which are the other target of the MPA. It has been successful in maintaining the population of bottlenose whales and the corals that were the targets of the MPA. It was not done for fisheries management purposes. I believe the fisheries effects have not been studied, although they should be. That wasn't part of the original objective.

Mrs. Bernadette Jordan: So—

The Chair: Thank you, Ms. Jordan. I'm sure you'll have another chance.

Next we have Mr. Sopuck, author of the book, *A Life Outdoors*, which you can probably pick up on Amazon.

You have seven minutes, please.

Mr. Robert Sopuck (Dauphin—Swan River—Neepawa, CPC): Thank you very much.

Dr. Worm, I was a little taken aback by your phrase "special interest groups", referring to the fishing community. There are four million anglers in Canada, and I would argue that those four million anglers represent much of the entire country. We are not a special interest group. We are the fabric of society. In B.C. alone, there are 300,000 anglers who fish in the tidal waters. I think we have to be careful about terminology—and I haven't even talked about the food fishery in Newfoundland.

Dr. Worm, is it by necessity that MPAs would have to be in waters within a nation's 200-mile limit? Is it essentially impossible to set up an MPA in international waters?

● (0945)

Prof. Boris Worm: The answer to that is no. It is possible to set up MPAs in international waters, and there are a few examples: the OSPAR areas on the Mid-Atlantic Ridge, set up by various regional fishing management organizations and other intergovernmental organizations. So it is possible to do something on the high seas. In fact, there is a proposal that's being seriously discussed to make the entire high seas an MPA, and, as such, realize large fisheries benefits for individual countries' EEZs, including the Canadian one.

Let me apologize for saying "special interest group". I should have just said "interest group". These are groups that have an interest in a particular aspect of ocean governance, and I didn't mean to—

Mr. Robert Sopuck: That's fair. Thanks.

Your comment on the international waters.... I came across an article in *The New York Times* called "China's Appetite Pushes Fisheries to the Brink". China has some 2,600 vessels right now, and they are subsidized to the tune of $22 billion a year. The tragedy that's unfolding off the west coast of Africa is truly horrific in terms of the loss of fish stocks. I think these international MPAs are desperately required in some areas, but I think making them work in the face of this kind of fishing pressure and subsidization by quite a rapacious government will make it extremely difficult.

Prof. Boris Worm: Could I comment on that very quickly?

Mr. Robert Sopuck: Yes, real quickly.

Prof. Boris Worm: We've done research on that very issue. I fully agree with you that the situation is dire in much of the high seas. However, we have a new tool to globally monitor our fisheries worldwide. We wrote a paper in *Science* on this last year called "Ending hide and seek at sea". The tool is called an automatic identification system, which allows us to track fishing vessels in real time and see foreign overfishing in distant waters, for example, off West Africa.

Mr. Robert Sopuck: Dr. Côté, honestly, I think you should stick to your guns on no take. No take means no take by everybody. The courts have been quite clear that conservation comes first when we consider fisheries allocation.

In your view, does catch-and-release angling count as no take? Hooking mortality in catch-and-release fishing is sometimes as high as 5%. With the Atlantic salmon and the white sturgeon, however, it's zero. In your world, does no take include catch-and-release angling?

Prof. Isabelle Côté: Definitely, I will stick to my guns. The disturbance caused by catch-and-release should not be occurring in no-take areas. If there's any associated mortality, we want to eliminate any kind of disturbance in these areas.

Mr. Robert Sopuck: Naturally, we will agree to strongly disagree on that point.

I would like to talk about the California experience with MPAs. Witness Phil Morlock from the Canadian Sportfishing Industry Association knows the California situation very well. The authorities very cleverly carved out, according to the sportfishing groups, all of the best angling areas, leaving the marginal areas for the anglers. The ensuing disruption to local economies was dramatic in boat and pickup truck sales, angling gear, guiding, and outfitting. Mr. Morlock presented figures on it, so this is not just an opinion.

How do we avoid cherry-picking the best areas and leaving behind second-rate fishing areas for everybody else?

● (0950)

Prof. Isabelle Côté: I wasn't part of the California experience and I haven't followed what happened there. I'm sure in the research the committee has done you've heard about programs like Marxan, which allow you to plan. Programs like that allow you to find the optimal compromise between protection of areas that have lots of biodiversity and areas that are used a lot by various groups. It is possible to close areas that optimally fulfill the goals of protecting biodiversity while minimizing conflict with users.

In respect of MPAs, we're not talking about closing all the best areas. There has to be protection and some access to good areas, and at the end of the day it is a compromise.

Mr. Robert Sopuck: Dr. Worm, the shipping interests have come before us in other meetings and said that important shipping lanes need to be protected during the creation of MPAs. Can commercial shipping coexist with MPAs?

Prof. Boris Worm: It can, but special care must be taken as it was in the Bay of Fundy, where shipping lanes were rerouted at minimal cost to the shipping industry but with maximum benefit to the endangered marine life that use that area as a critical habitat. Mortality has decreased by over 90%, and I believe the additional travel time is three minutes for the ships. It can be done but it takes careful planning.

Mr. Robert Sopuck: Great. Thank you very much.

The Chair: Thank you, Mr. Sopuck.

As you've noticed, we've lost the video for Dr. Roberts. We're going to try to patch Dr. Roberts back in. We seem to have lost him temporarily. I'm not sure whether he's able to hear us or not.

We're going to suspend for about a minute or two to patch Dr. Roberts back in via the phone. After a suspension for two minutes, we'll get to Mr. Donnelly's question. I'd ask everyone to hang on just for a couple of minutes.

Thank you.

● (0950)

(Pause)

● (0955)

The Chair: Welcome back, everyone, with apologies to all. We're still unable to reach Dr. Roberts, but in the meantime we're going to have to proceed, because Mr. Donnelly hasn't asked his questions yet.

I apologize, Mr. Donnelly, if some of your questioning was towards Dr. Roberts. As you can see by the buffering symbol on the screen, we're trying to get hold of him now. If he's able to join us during your seven minutes, I'm willing to extend some of your time to compensate.

Mr. Fin Donnelly (Port Moody—Coquitlam, NDP): Do you want me to do half now and then half when he's available? My two questions are—

The Chair: That's entirely up to you, if you wish.

Mr. Fin Donnelly: Yes.

The Chair: Okay. Let's do three and a half minutes, or four roughly, and then we'll go to Mr. Morrissey and then come back to you as Dr. Roberts becomes available. Is that okay?

Mr. Fin Donnelly: Okay.

Mr. Ken McDonald (Avalon, Lib.): Is he going to bank his time?

The Chair: He's going to bank his time, yes.

Mr. Ken McDonald: Is that like infrastructure banking, or...?

Some hon. members: Oh, oh!

The Chair: Let's just move on, shall we?

Mr. Donnelly, take three and a half to four minutes, please.

Mr. Fin Donnelly: Thank you, Mr. Chair.

I'd like to thank all three of our guests and their witnesses for providing excellent concise and helpful testimony today.

Dr. Worm, let me start with you. You referred to a study about global case studies. I think you were talking about tools for fisheries recovery. I'm wondering whether you could send that report or that study to this committee.

Prof. Boris Worm: Yes, it's no problem. I'll send it to the clerk. We call it “Rebuilding Global Fisheries”. We presented it at the time to the fisheries minister, Gail Shea, and also to the United States Senate and Congress..., so it has broad media coverage as well. I'll send some of that information also.

● (1000)

Mr. Fin Donnelly: Great. Thank you.

This is to all our witnesses. If there are studies that you have referenced in your presentation, I would certainly ask that you forward them to the committee, if you can. They become part of the record. I think it's really important for Parliament and for the government to have that information.

While I'm on this subject, Dr. Worm, you also referenced a study, and I think it's in your deck, about the importance of staffing and enforcing MPAs. Is it possible to send that study as well to us?

Prof. Boris Worm: I will send all the studies that underlie this deck.

Mr. Fin Donnelly: That's great.

Dr. Worm, you mentioned, and I think in the last round of questioning you were talking about the compatibility of some tourism activities with MPAs. I wonder whether you might talk about fishing and the compatibility of some fishing with MPAs. What are your thoughts there?

Prof. Boris Worm: Are you talking about commercial or recreational fishing, or both?

Mr. Fin Donnelly: I mean both.

Prof. Boris Worm: As we've heard from other witnesses, the main target of protection is fish populations that have been impacted, although other MPAs like the Gully have been designated to protect other entities, like the bottlenose whales, which also could be impacted by bycatch, for example, and cod, which could be impacted by bottom-touching gear. It often is about fishing, and many forms of fishing are incompatible with many of the uses and objectives of MPAs, like rebuilding fish populations and protecting sensitive bottom habitats.

There was a question about recreational fishing. A lot of the strongly protected MPAs have zones that allow for recreational fishing, but the evidence has shown, for example, in New Zealand, that even light recreational fishing—not catch-and-release fishing, this is fish and take—does roll back some of the benefits that MPAs otherwise can offer. I've studied this myself, and there are many papers on this particular example from New Zealand, where you have side-by-side areas that are fished by recreational anglers and others that are not. You can see that the fished areas often are not distinguishable from areas that are not protected, which is surprising, but that's what the data shows us.

Mr. Fin Donnelly: Dr. Côté, you mentioned that you feel this committee, and I'm assuming the government, should aim higher than 10% protection. Can you elaborate a little about why you feel 10%...? I think you talked about 30%. How did you arrive at these figures? We heard that 10% was more of a political target, and it seems to be accepted, but 30% is something that you seem to be recommending. Why would you recommend one third?

Prof. Isabelle Côté: There are a large number of studies. In my speaking notes, which I've sent to the clerk, I cite at least six different studies that have compiled various empirical or modelling studies that look at the proportion of the total ecosystem of the ocean that needs to be protected to recover fish populations. It's uncanny, all these studies point to between 20% and 40%. On average, all the values across those studies are about 30%.

A lot of evidence points to 30%. A long time ago, that was the target. That global target was eroded when it became clear that it would not be reached. We're now stuck with the 10%, which to be honest is meaningless. No evidence supports the 10%.

The Chair: Thank you, Dr. Côté. Sorry to interrupt.

Mr. Donnelly, if we reach Dr. Roberts, we'll put you back in for your extra three and a half minutes. If we do not reach him, since you get the last question in the second round, I'll add that time onto that. You are entitled to seven minutes.

Mr. Morrissey, you have seven minutes or less, please.

Mr. Robert Morrissey (Egmont, Lib.): Thank you, Chair.

Dr. Worm, I assume you would be familiar with the MSC certification that refers to certified sustainable fisheries. This standard is now achieved in the lobster fishery in the gulf region of Atlantic Canada, which is one of the better-managed fish stocks in Canada, along with snow crab in the gulf region.

Do you see a contradiction between allowing certified fisheries that have achieved very rigorous standards for sustainability of the fishery being conducted in areas that would potentially be designated as an MPA?

● (1005)

Prof. Boris Worm: It's a very good question. It certainly depends on the objectives of the MPA. I'm aware that lobster fishing, in particular, is currently permitted in many of the MPAs and in protected areas in Canada. It's considered a low-impact method of fishing, but it does have a bycatch problem that's not fully assessed under MSC criteria. That could be incompatible when considering endangered wolffish that are caught as bycatch with MPA criteria.

It's on a case-by-case basis.

Mr. Robert Morrissey: What bycatch does the fishery impact on? I'm not familiar with what bycatch would be impacted. You referenced it.

Prof. Boris Worm: You have lobster traps that not only catch lobster. They're essentially fish traps and they're designed to catch lobster. They catch other fish as well, like sculpins and wolffish. Wolffish now have a mandatory release back into the water, alive if possible, because this species is protected under the Species at Risk Act now. A number of fish species that co-occur with lobster also go into the trap, attracted by the same bait that the lobster is attracted to. A lot of these species are then in turn used as bait by fishermen, so they don't survive the bycatch process. It then depends again on the objectives of MPA if that bycatch problem needs to be addressed and how serious a threat it is to the objectives of the MPA.

Mr. Robert Morrissey: I want to go to the shipping question again, which was addressed by one of my colleagues.

In some proposed areas that you're looking at—and I'm referencing and staying with the east coast of Canada—there could be an impact on shipping. Do you want to elaborate a bit more on how this was successfully negotiated within the Fundy region? Could that be applied to the gulf region as well?

Prof. Boris Worm: It could.

I think the Fundy example is a glowing one. I can send some of the related papers and documentation to the committee. It was very science-based. It was science actually done at Dalhousie University by Professor Chris Taggart and his associates, documenting very carefully the seasonal and spacial distribution of endangered right whales, of which there were only 300 left, which were also protected under the Species at Risk Act. They worked with the shipping industry to help reroute shipping lanes in a way that would avoid the particular habitat for the right whale.

As you possibly know, the right whales are now relocating, possibly due to the impact of the changing climate, to the gulf region. They are much more commonly seen now in the gulf region. There have been ships striking them as well. Shipping in that region would have to be addressed once we know exactly where the new critical habitat for the right whales is in that region. It can be done. As I mentioned earlier, all ships have automatic identification systems by which we can track their movements second by second in real time across the regions.

This is also something that is easily enforceable and it does not require heavy-handed regulation, necessarily. Roseway Basin is another right whale hot spot off the coast of southwestern Nova Scotia. Dr. Taggart actually worked with the International Maritime Organization and the shipping industry on a voluntary basis so that they reroute their ships around their critical habitat, which again came at a minimal cost. They all did. It worked on a voluntary basis. It actually didn't take regulation in this case.

Again, on a case-by-case basis it can be worked out. It requires data and it requires a commitment from all stakeholders.

● (1010)

Mr. Robert Morrissey: Can this model that was developed in Fundy be applied anywhere within Canada, from a shipping perspective?

Prof. Boris Worm: Absolutely.

It is actually a model now around the world for similar whale-shipping conflicts and how to resolve them. It can be used elsewhere, for sure.

Mr. Robert Morrissey: I have one final question to Dr. Côté, if she can hear me.

Given the option of having the gold standard of protection, which is no-take area versus a marine protected area that continues to support a certified sustainable fishery, do you see that the two can coexist?

Prof. Isabelle Côté: I don't think you can do any kind of extraction in a no-take area. If you decide to have no-take areas, you cannot justify fishing in there because the fishing is sustainable. You should see the presence of a no-take area as something that will provide additional biomass to harvest within the sustainable fisheries outside of the boundaries of a no-take area. I see the sustainable fishing practices and the no-take areas as two ways to manage the ocean that complement each other.

Mr. Robert Morrissey: Thank you.

The Chair: Thank you, folks.

Dr. Roberts, can you hear us?

Prof. Callum Roberts: I can hear you. Can you hear me?

The Chair: Certainly we can, very clearly. In your absence, Mr. Donnelly, one of our colleagues here, wanted to ask you a few questions. We're going to return to Mr. Donnelly for three and a half minutes, to finish off his questioning for you, Dr. Roberts.

Mr. Fin Donnelly: Thank you, Mr. Chair.

Dr. Roberts, you might think this is a basic question, based on your testimony, but why do you think we need to protect in excess of 30%? What has it come to that we're at the point now, globally and in many different countries, where we need that level of protection? Do you understand my question?

Prof. Callum Roberts: I do, yes.

One thing you have to do is to look at the historical context of fishing. Where people have fished for long periods of time, what tends to happen is that we remove the large-bodied animals. We deplete those populations. We start moving on to less desirable species, and then those species get depleted and we move to others. Progressively, we ramp up fishing technology to become more efficient, which also means it is more invasive and destructive.

One problem we see is the supplanting of, let's say, hook-and-line and net fisheries for species like cod, with bottom trawls. The bottom trawls are then supplanted by bottom trawls for prawns, which have finer-mesh nets. Those also are used alongside scallop dredges of seabed habitat. Progressively, what we see is a reduction in abundance, diversity, habitat complexity, integrity, and viability. We've seen that happen over very large areas of the sea around northern Europe, eastern Canada, and eastern U.S.A, for example. It's a progressive process.

We have to start thinking about how we rebuild populations to levels that are much more productive, where habitats are able to recover, where long-lived species are able to rebuild their populations, and where big fish can survive for long enough that they become highly successful reproductively and are the engines of reproduction within a population. We need to provide space for ecosystems to achieve that level of complexity, integrity, high biomass, and high diversity once again.

If you want the cod back in eastern Canada, you need to get the prawn trawls out of large areas of the fishing grounds there, because they're catching juvenile cod. They're not going to be surviving up to reproductively active ages. We see this in the Irish Sea in the U.K. The cod population was hammered, and then we replaced that fishery with fisheries for prawns and scallops. As long as that fine-mesh netting is going on, there is no prospect of recovery of the biggest species that have been lost as a consequence.

If we want those back, we need spatial management. There need to be areas that are off-limits to mobile fishing gear. There need to be areas that are zoned for prawn trawling, which are going to be exploited in that way. We need scallop-dredging zones, but we need no-take zones too. It's part of the portfolio of management to achieve a broad mix of outcomes for the marine environment.

Apart from anything else, we need to rev up the engine of ocean ecological processes once again, because they underpin the habitability, not only of the sea but of the planet as a whole. The oceans occupy most of the living space on the planet, which means that what goes on in them is profoundly important to all of us. If we let those ocean ecosystems get knocked down to the low abundances and diversity that we're seeing, then we're in trouble over the long term. It's part of improving the resilience of the system and enabling it to recover to levels of higher productivity. That will sustain fisheries and surrounding areas, and that's a good management portfolio.

● (1015)

The Chair: Thank you, Dr. Roberts.

Thank you, Mr. Donnelly.

Now we go to Mr. Doherty.

You're sharing your time with Mr. Arnold, I understand.

Mr. Todd Doherty (Cariboo—Prince George, CPC): Perhaps.

The Chair: Okay, you are if he's lucky. I'll let you know when you're halfway through your round of questioning for five minutes.

Mr. Todd Doherty: Thank you.

Thanks to our guests for being here today.

To all of the guests, you've provided some insightful testimony and commentary today.

Mr. Roberts, I'm going to direct some questions towards you. You made a comment about consultation. I think it was your comment that Canada tends to over-consult. I believe that's exactly what you said. Would you say that conservation should take precedence over consultation?

Prof. Callum Roberts: I don't think it was me who said that Canada over-consults, but—

Mr. Todd Doherty: Perhaps then it was Mr. Worm.

Prof. Boris Worm: You can look at my speaking notes, but I said we're having a very thorough and fair process that is lengthy and that has resulted in a low coverage with strongly protected areas. That's exactly what I said.

Mr. Todd Doherty: Should conservation take precedence over consultation?

Prof. Boris Worm: I believe it should not. I think the process we have in Canada is fair and just. It is long, but I think I made it clear in my remarks that I think it's appropriate for what we're trying to set out in this—

Mr. Todd Doherty: Okay. Thank you.

Mr. Roberts, do you believe we should speed up our consultation process?

Prof. Callum Roberts: I think we have to speed up consultations. To give you an example, in the Firth of Clyde off the west coast of Scotland, the Community of Arran Seabed Trust is a local group of people who organize themselves to fight for enhanced protection of their local marine environment. It took them a decade of intensive lobbying to even get the government to really start listening, and it took another five years or so before the protected area was set up. As I mentioned, it's absolutely tiny. You can't carry on with that length of consultation.

Mr. Todd Doherty: Thank you. I appreciate that.

Ms. Côté, do you believe we need to speed up our consultation process or should conservation take precedence over consultation?

Prof. Isabelle Côté: It's Dr. Côté, thank you.

Mr. Todd Doherty: Sorry, Dr. Côté.

Prof. Isabelle Côté: If that stage is the longest element in establishment, then I think it should be sped up.

Mr. Todd Doherty: Okay.

Prof. Isabelle Côté: Right now, it's really too long.

Mr. Todd Doherty: Dr. Côté, how do we balance the socio-economic impact on the communities that are adjacent to and dependent on the areas that will eventually be protected?

● (1020)

Prof. Isabelle Côté: Fairly easily, I think. Right now, a lot of consultation goes on, and the location of MPAs and the level of protection that we afford in those MPAs are the results of compromise between the biological benefits of MPAs and the perceived socio-economic impacts, which are often perceived as being negative, at least in the first instance.

Mr. Todd Doherty: Your comment earlier today was that we should absolutely go to 100% no take. Is that correct?

Prof. Isabelle Côté: In a larger portion of our MPAs, definitely. We're still talking about a tiny fraction of the total area of our oceans.

Mr. Todd Doherty: Okay, so how do we balance it? We have colleagues on the east cost who have families and communities that depend on fisheries for their livelihoods and the community economy. How do we balance that with MPAs that are going to 100% no take or fairly stringent rules on this?

Prof. Isabelle Côté: We have to see the extent to which the displacement of people from the small areas that are no take in the ocean actually results in economic hardship for people.

Mr. Todd Doherty: That would have to be through consultation, to see the benefit or the impact. Is that correct?

Prof. Isabelle Côté: I don't think it's a matter of consultation as much as of research to establish whether there are real costs to closing small portions of the ocean.

Mr. Todd Doherty: Okay.

Prof. Isabelle Côté: We do know—

Mr. Todd Doherty: Sorry, I have only a very short period of time.

My next question would be that a lot of our science comes from what we can tell of the impact, I guess, of our fisheries management that would come from the harvesting of the fisheries and the stocks around there. Is that correct?

Prof. Isabelle Côté: Yes.

Mr. Todd Doherty: We have areas that are 100% no take. How do we evaluate the impact of the MPAs or the protective areas that we're putting forth?

Prof. Isabelle Côté: How do we evaluate their impact? By that, do you mean their success or their effectiveness at rebuilding populations or...?

Mr. Todd Doherty: Correct.

Prof. Isabelle Côté: That's the kind of comparison that's been done over and over again since we've been monitoring and surveying inside and outside, before and after. Over and over again we show that no-take areas very quickly rebuild populations, if given enough time, to reach a spillover of this biomass into areas that can then be fished.

I'm not arguing that there is never an economic, an immediate, possibly small economic loss to closing an area, but if given enough time, those losses are more than recouped by the spillover.

The Chair: Thank you, Dr. Côté.

We have Mr. Hardie for five minutes, please.

Mr. Ken Hardie (Fleetwood—Port Kells, Lib.): Thank you, Mr. Chair.

Thanks to everybody for being online off and on this morning.

Dr. Roberts, you would characterize, I guess, charitably your experience in the U.K. as being somewhat mixed when it comes to MPAs.

I wanted to follow on my colleague Mr. Doherty's comments about the social and community impacts of all of a sudden setting aside large tracts of the ocean as no-take zones, which, of course, are ideal in terms of recovery of stocks. Are you aware of any place in the world where they've really done a good job of achieving a balance, some place that we can look to and say, all right, this represents a decent model going forward as we look at the possible dislocation that MPAs can cause?

Prof. Callum Roberts: There are examples. I've studied one in St. Lucia, in the Caribbean, where they set aside 35% of their coral reef habitat on the southwest of the country. Over a period of seven years, we saw an increase in the fish stock inside the marine protected areas, which were no take, by five times. Outside the protected areas in the fishing grounds the fish stocks increased by three times, and the fish catches more than doubled in those surrounding areas despite the fact that the area for fishing was smaller.

This is a case in which these are local people who had no other options. They decided that they were on a high road to nowhere with declining fisheries. They needed to step in and do something to turn the situation around, and they used marine protected areas as the core of their strategy, particularly no-take zones—

● (1025)

Mr. Ken Hardie: Thank you. I'll have to leave it at that, Dr. Roberts. I have limited time as well.

Dr. Côté, your colleague Dr. Cox was with us from SFU a few weeks ago and allowed for the fact that MPAs are a tool, but not necessarily the only one and not necessarily the best one. I wanted to get a quick overview from you of what alternatives exist or what complementary activities exist to MPAs.

Prof. Isabelle Côté: I think that was shown fairly clearly in one of Dr. Worm's slides in his presentation. It showed a range of other management measures that include, for example, regulating take, regulating gear, and so on. There are a variety of other measures that regulate various aspects of fishing that can work very well alongside marine protected areas.

As I said to another person who asked the question, I think those two are very complementary, and I think if you want to manage the oceans well, you need to use all the tools in that tool box.

Mr. Ken Hardie: What about alternatives to MPAs?

Prof. Isabelle Côté: Do you mean in terms of spatial management?

Mr. Ken Hardie: Yes.

Prof. Isabelle Côté: Anything to do with fisheries management, regulating gear, regulating quotas, and all of that, I see all of those as tools that are complementary to spatial closures.

Mr. Ken Hardie: Dr. Worm, you mentioned that there has to be adequate staffing, etc. I believe you've offered to send along some papers that would outline that, but let's also talk about measuring and monitoring regimes. Are there structures in place that, again, tend to work well in telling us what we need to know?

Prof. Boris Worm: Most definitely. A good management plan would have a plan for assessing and monitoring, and that would be carried out by a staff that is funded adequately, as pointed out in that publication. I will also send around a publication with a table about the variety of tools that can be used. I will say that there are no tools that can be used instead of MPAs. As I've pointed out, in eight out of 10 regions that rebuilt their fisheries, MPAs were a key tool, in concert with other tools. But they can't be replaced by anything else because they do something that's unique, which is to fully protect all the species in the ecosystem.

Also, with respect to your question about monitoring—

Mr. Ken Hardie: If I could, I have just a second or two left, if any of you have any reflections on the impact of aquaculture on some of the objectives that we're trying to achieve, again, it's maybe something that you could send to us off-line, because aquaculture is an area that we really do need to focus on, particularly on B.C.'s west coast, where it's quite an issue.

Thank you.

Prof. Boris Worm: Also, here on the east coast aquaculture is a big concern to lots of fishermen now, this and open-net pen aquaculture. It is broadly seen as incompatible with some of the goals of ocean conservation, and protected areas as well.

The Chair: Thank you.

Mr. Arnold, you have five minutes, please.

Mr. Mel Arnold (North Okanagan—Shuswap, CPC): Thank you, Mr. Chair.

Again, as everyone else has said, thank you very much to the witnesses for being available.

My first question is around the area of protection, or the area of jurisdiction more so. Do all countries share the same jurisdictional boundaries offshore? We have our 200-mile limit that we are responsible for. Do all countries share that same spatial responsibility as Canada does with our big offshore areas?

Prof. Boris Worm: Yes, all countries do.

Mr. Mel Arnold: Okay.

Canada has a huge coastline and a huge claim to a large landmass, with Alaska taking a big chunk out of that. Has Alaska been meeting these targets or goals anywhere near the 5% or 10% or the 30% that some of you have been recommending? Obviously, their fisheries activities have a huge impact on some of our west coast fisheries. Has Alaska been in line with some of these goals?

● (1030)

Prof. Boris Worm: Alaska is a well-known example—which I have in the table that is in my presentation and in the paper I will forward—and has a reasonably good track record in fisheries management. It does not have a very strong track record in marine protected areas. It has not yet fulfilled the 10% goal, which, by the way, is a national goal. It's not a regional goal. Even if Alaska would not fulfill it, the U.S., as the national entity responsible for Alaska, could fulfill the 10% goal, and will fulfill the 10% goal, often also by protecting offshore territories like the U.K. did with the Chagos Islands. The U.S. has done the same, but not in Alaska.

Mr. Mel Arnold: Thank you.

I'm going to carry on a little bit further with something that Mr. Doherty started down the path towards. Often a lot of our data that we achieved or gained for management of our fisheries, for understanding the biomass that's out there, comes from our harvest, our recreational and our commercial harvest fisheries. How would you propose that we obtain that data if we impose these absolute no-take areas, with no recreational, no aboriginal, no commercial fisheries? When we have limited resources to run the country to manage all of our fisheries, how would you obtain that data if those activities were removed?

Prof. Boris Worm: One possibility that we just implemented for the Galapagos Marine Reserve is that you look at the fisheries around the marine reserve over time. What we see there is very interesting because it's a large protected area that has been protected for some time, about 17 years now. Fisheries around the area are doing better and better, but only around that area.

In the rest of the eastern tropical Pacific, they're not doing better. It's around that area that those areas do realize. By monitoring the fisheries—again through this tool I mentioned, automatic identification systems but also through on-board observers—you could document large benefits on tuna fisheries, which have now led to fishermen's associations supporting the reserve, rather than being against the reserve, as they initially were, because they see those benefits realized. We can document those benefits even without fishing inside the protected area.

Mr. Mel Arnold: Have the other two witnesses any comments?

Prof. Callum Roberts: I can add a little bit.

There's a great deal that you can do to measure and monitor things inside protected areas without killing them—you do it by scuba diving, you do it by remote video, for example. This is a great way to bring in the university academic sector to assist with research, to look at the management, and to examine how well the management is working. We've been doing it in the Firth of Clyde on the west coast of Scotland since the protected area there was implemented, and we have some excellent data.

You don't have to kill fish to be able to measure their population sizes or to look, for example, at where they're moving.

Mr. Mel Arnold: Dr. Côté, do you have anything to add?

Prof. Isabelle Côté: Indeed, I completely agree. There's an increasing number of non-lethal methods to estimate the density of fish and other invertebrates. That includes, for example, using sound to estimate population abundance.

Mr. Mel Arnold: Thank you.

The Chair: Mr. McDonald is next, for five minutes, please.

Mr. Ken McDonald: Thank you, Mr. Chair, and thank you to our witnesses.

Dr. Côté, I know my colleague was questioning the economic and social effects of establishing MPAs and making them no-take zones. You made reference to 10% being nowhere near the level we should be. We should be more up around 30%.

Being from Newfoundland and representing an area that's very connected to the fishery, if I as an MP—or even the chair, Mr. Simms, who is also from Newfoundland—were to institute a 30% MPA with no take around the island of Newfoundland, we wouldn't be able to go back to Newfoundland and we would be shutting down many small communities. To say that there is economic benefit from it that moves outside the MPA.... I mean, you're still outside the area in which people traditionally made their living and supported their families and supported their communities.

I remember the days of the cod moratorium 25 years ago that shut down the cod fishery, which Newfoundland was well connected to, and it devastated rural Newfoundland, literally. Communities basically became non-existent because of it. To say, in a place such as Newfoundland, 30% with no take is, I think, beyond reachable on many of our coastlines and in many of our communities.

Could you comment on this?

● (1035)

Prof. Isabelle Côté: The 30%, as Boris said earlier, is a national goal. There's nothing that says that around Newfoundland specifically 30% of the waters would need to be closed to fishing.

I would argue, however, that the people of Newfoundland have been the first to experience a failure of fisheries management, which really should bring home to the people of Newfoundland that simply managing fisheries without the help of other methods that have been shown to be very effective elsewhere is perilous.

Mr. Ken McDonald: On that note, you mention a failure of fisheries management, but I could argue as well that, as somebody brought up, we have a 200-mile limit of what we control with regard to stock and allocations and whatnot. What happens beyond that 200-mile limit.... Ships from other countries around the world have continued to this day to take huge quantities and huge quotas of fish that never get the opportunity to move inshore to Newfoundland and Labrador.

Yes, to some degree it was mismanagement, but I think a lot more of the world than Canada has to stand up and take responsibility for that mismanagement.

Prof. Isabelle Côté: Possibly, but I don't think we can shift the blame completely to other nations for this particular problem.

Mr. Ken McDonald: My comment wasn't to shift it. It was to take responsibility for the part that we're responsible for.

Dr. Worm, you said that Canadians support increased ocean protections, and your graphs show that. In your questioning of protections or in the survey, did you include the term "no-take zones" in those protected areas?

Prof. Boris Worm: No. We just said "protected areas", without really specifying how they would be protected.

Mr. Ken McDonald: All right.

Thank you.

The Chair: Thank you, Mr. McDonald.

Mr. Donnelly, you have three minutes, please.

Mr. Fin Donnelly: Thank you, Mr. Chair.

I have three minutes and two questions. I'd like to put the questions to all three witnesses, if I could.

First, I'm wondering if all three of you could say whether you agree or disagree with the statement that the very industry that governments around the world are trying to support, to ensure that it carries on, is one of the root causes as to why these many countries are in the predicament of having to increase marine protection. I'm obviously talking about the fishing industry.

To all three of you, do you agree or disagree with that?

Prof. Boris Worm: I disagree, because I think protected areas have a broader objective than just reversing the damage of fisheries. They are also buffering against other threats. We've talked about shipping and other forms of habitat destruction. It's not just about fishing.

I think it's a false dichotomy to just pit MPAs against fishing. MPAs are one of the tools to support sustainable fisheries and healthy ocean ecosystems. It's a much broader mandate than just fisheries.

Mr. Fin Donnelly: Dr. Roberts.

Prof. Callum Roberts: Historically, fishing has been one of the major drivers of the decline we are now seeking to address.

Mr. Fin Donnelly: Dr. Côté.

Prof. Isabelle Côté: Yes, I agree that fishing along with climate change, I guess, are the major threats to marine life, but marine protected areas are about more than just addressing fishing.

● (1040)

Mr. Fin Donnelly: Right. I think the goal here is that we're actually trying to ensure that the fishing industry survives and carries on.

Finally, this committee has heard from previous witnesses that in fact MPAs don't work. There's some reference to MPAs in the Gulf of Mexico, for instance, that they haven't worked.

I'm just wondering if all three would like to weigh in on that comment.

Prof. Boris Worm: Some MPAs work; others don't work. There was the study that Dr. Côté referenced about the five criteria that make MPAs successful and the follow-up study that I referenced—and will send around—about the importance of staffing and funding. If you take those two studies together, you understand very comprehensively, globally, what makes some areas work and others not work.

I don't think there is any clear evidence that MPAs can cause damage for the entities they try to protect, but sometimes they're just ineffective. We know exactly why they can be ineffective and we know how to address it. We can learn in Canada from the mistakes other nations have made and do something that's strong and robust here.

The Chair: Thank you.

To our guests, before we go, there have been a couple of requests for very quick questions.

Please be very quick, folks.

Ms. Jordan, you have a very quick question, I believe.

Mrs. Bernadette Jordan: Yes.

The Chair: Do you as well, Mr. Doherty?

Mr. Todd Doherty: Yes.

The Chair: Okay.

Mrs. Bernadette Jordan: My question is for Dr. Côté. It's with regard to some of the testimony we heard in the past with regard to the definition of an MPA from IUCN and FAO. A lot of people feel that if we'd moved to the definition of an MPA used by FAO, we'd probably already be where we need to be.

Can you comment on that, please?

Prof. Isabelle Côté: I'm not completely familiar with the definitions of FAO, but I know there's a strong push in the conservation community to move toward the IUCN definitions and to have an IUCN category for each of our own MPAs.

The Chair: Thank you, Dr. Côté.

Mr. Doherty, very quickly.

Mr. Todd Doherty: Thank you.

To Dr. Worm, Canada has a unique marine landscape. Geographically we're very diverse. Socio-economically we're very diverse. We hear of a lot of examples being applied in the EU. Do you believe it's fair for others to unilaterally apply the same guidelines to those areas in Canada?

Prof. Boris Worm: No. I think Canada has its own process. It has designated a process for implementing MPAs that's made in Canada. It's based on Canadian values and Canadian particularities—the strong aboriginal voice, for example—and the particular aspects of the fishing industry here. I believe there has been a lot of time to hone the process. Now we just have to fulfill those goals that we committed to, using the very process we devised here locally in Canada.

The Chair: Thank you, Dr. Worm.

Go ahead, very quickly, Mr. Arnold.

Mr. Mel Arnold: Thank you, Mr. Chair, for your indulgence.

I don't need the answer back today, but I have a question, really quickly, for the witnesses. One thing that I don't believe we've heard anything about so far in this study is the impact of invasive species, both inland and marine. We're already seeing the green crab issue on the west coast of B.C. If any of you have any input on how we deal with the impacts of invasive species on these proposed and established MPAs or if you have anything that you could forward to us, I think the committee would really appreciate hearing it or seeing it.

Thank you, Mr. Chair.

The Chair: Thank you to our guests. Thank you for appearing and thank you for your patience, I might add, with the technical glitches that we had. We appreciate it.

Dr. Worm, Dr. Côté, and Dr. Roberts in the U.K., thank you again. We truly appreciate your insights and the depth of your knowledge. Thank you.

Committee, we're going to suspend for about one minute, so we can go in camera. I just need five minutes of your input. Do I have unanimous consent to proceed?

Some hon. members: Agreed.

[*Proceedings continue in camera*]