

Notes for Presentation to National Advisory Panel on Marine Protected Areas
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Dr. Paul Snelgrove,
Network Director, NSERC Canadian Healthy Oceans Network II
Associate Scientific Director, Ocean Frontier Institute
University Research Professor, Department of Ocean Sciences and Biology Department
Memorial University of Newfoundland
St. John's NL A1C 5S7 Canada

Slide 1 - Thank you for the opportunity to speak to you and offer my thoughts on your important task. I do not consider myself an expert on Marine Protected Area design, however, I am a professor recognized internationally for my expertise on marine biodiversity and marine conservation. I also lead the NSERC Canadian Healthy Oceans Network (CHONE), a partnership between Canadian universities, Fisheries and Oceans Canada, and the Port and Town of Sept Iles through their research arm INREST. Our research team of more than 40 university and government scientific experts from Victoria to St. John's and many locations in between focuses on sustainable ocean strategies, and particularly Marine Protected Areas. I will spend most of my time focusing on your first question.

Slide 2 – You have heard from my CHONE colleague Dr. Natalie Ban on indigenous issues in ocean conservation. I will not repeat her expert advice other than to note that although the emergence of IPCAs came to the forefront after CHONE began, we certainly support potential new legal instruments to improve ocean sustainability in Canada. I am also the Associate Scientific Director of the Canada First Ocean Frontier Institute which is involved in new research with the Nunatsiavut government in support of IPCAs, and also with DFO on other marine conservation tools currently in use in Canada. My three key messages for today are the importance of habitat, connectivity, and insurance.

Slide 3 - Most individual MPAs are designed to either sustain biodiversity (sometimes iconic species, sometimes biodiversity hotspots) or to sustain productivity, sometimes as fisheries productivity. These are all good objectives.

Slide 4 - The challenge with sustaining ocean ecosystems is our sea blindness. When we clearcut a forest, the results are obvious. In the ocean, human impacts are more difficult to see.

Slide 5 - But the devil is truly in the details. How can ocean managers actually demonstrate they have achieved the promised goals? Stakeholder support quickly fades in the absence of tangible benefits, pointing to a really important need for clear and measurable conservation objectives.

Slide 6 – I bring expertise in marine biodiversity – the diversity of life in the ocean from genetic to species to ecosystems, as illustrated by these seafloor habitats from Canadian waters. But more on habitat in a moment.

Slide 7 - I also bring expertise on population connectivity – the way that subsets of a populations of a species interlink. Airports offer a good analogy for population connectivity. If St. John’s airport shuts down it messes up connectivity between Newfoundland and mainland Canada – a nuisance for us here. But if Toronto shuts down, the ramifications for connectivity are much larger in scale. So some hubs are more important than others – the same is true with biological populations.

As your questions acknowledge, marine protected areas can provide a wide range of benefits, and those benefits depend on their design. Multiple MPAs should ideally be designed as networks that, when considered together, provide enhanced benefits beyond individual MPAs. Collectively, such networks should, above all, protect habitat - including both unique as well as representative habitat. They should protect connectivity of key species, and they should be based on meaningful but also clear and attainable conservation objectives.

Slide 8 - I would like to use my time with you to try to sell you some insurance. MPAs offer a form of insurance. I suspect most of us here insure our homes and cars – maybe even our pets. We don’t expect to crash our cars or expect that our houses will burn down, or that our dog will eat the remote control. But it can happen. This is not my house or car by the way, but it is my dog! And so we might set fishing quotas that we think are sustainable but what if we’re wrong? Northern cod right here in Newfoundland offers a textbook example. Perhaps if we had invested in some insurance 30 years ago we would have “rebuilt” cod stocks by now – or never crashed them in the first place

Slide 9 - Some experts estimate in excess of a million species in the oceans, most of which are unknown – let alone their biology and distribution. Protecting habitat offers some degree of protection to whatever species live in that habitat, and in light of this immense diversity, trying to protect one species at a time through MPAs is doomed to failure. Clearly too many species and too much complexity. But protecting habitat for species we care about will often simultaneously protect habitat for many other species. A “buy one get ten free” sort of outcome. And who doesn’t love a bargain? Protecting habitat helps to protect those species within that habitat even if we don’t know everything about those species. And when we protect DIFFERENT habitats we protect different sets of species.

Slide 10 – Seabed mapping offers one shortcut in identifying habitats. You have probably heard that we have better maps of the moon and mars then we do of our own planet’s seafloor. Don’t be fooled by the spectacular maps of the seafloor you may have seen – these are beautiful approximations based largely on satellites, and the reality of the resolution we have most seafloor shows little of the complexity that multibeam mapping can show. The loss of Malaysian Airlines flight 370 illustrates the problem – we had no idea where to look and the red lines show the tiny portion of the search area we have mapped in detail. Truly a needle in a haystack.

Slide 11 – When I mentioned sea blindness at the beginning I was referring to habitat destruction, which has many causes. These photos from the North Sea (and I could show you similar though less crisp images from the Arctic) illustrate what happens when bottom trawls go through sensitive habitat – in this case deep water corals. Some of these corals can be many hundreds of years old, growing only a few millimeters each year, so when they are damaged, recovery is extremely slow. But the issue is not just the corals themselves, but also the species they support such as redfish – which are fished commercially. If we were to zoom in you would also see shrimp and other species on these corals. So protecting habitat protects multiple species.

Slide 12 - Protecting habitat also helps to insure that we sustain ecosystem functions and services. Functions are the processes that keep the ocean working – like fertilizing your vegetable garden, whereas services are the direct benefits we reap such as the vegetables (or fisheries in our case).

So in summary, we need to conserve habitat in order to provide insurance for unknowns whether they are unknowns related to biodiversity, ecosystem functions and services, or even basic ecology.

Slide 13 - In this context, activities that damage habitat reduce the effectiveness of that insurance coverage. Specific habitats may be particularly important for different life stages of a species. We know from research here in Newfoundland that eelgrass is really important for juvenile cod because it provides a refuge from predators until the cod grow large enough to fend for themselves. So protecting eelgrass helps to sustain cod.

This example illustrates the critical role of no-take zones, which could be nested within larger areas that could, in some case, allow some times of limited activities that are not damaging to habitats and thus not placing biodiversity at risk. But it also reminds us that we should think of egg and larval, juvenile, AND adult stages.

Slide 14 – A United Nations panel recently summarized the different benefits we obtain from natural systems and their current status. Green denotes ecosystems that provide vital benefits to humanity, whereas orange indicates less vital systems. The arrows also indicate current trajectories globally – you will not that some are stable but many are declining; none are improving. And the situation in Canada is really no better than elsewhere.

Slide 15 - Insurance also plays a role in thinking about population connectivity. Species sometimes often occur in high abundances in multiple locations, and when numbers in one location decrease (for example through fishing) it may be that offspring from one of the other locations may be able to replace those removed individuals. But some of those populations may be more important than others in contributing to future generations. We are meeting in Newfoundland, so cod again offers an excellent example. One of the explanation for the failure of cod to recover was that we badly overfished some of the key source populations, so in essence cashed in the insurance policy.

Slide 16 – The good news is that the tools we have available to provide sound scientific advice have advanced tremendously over the last decade, and will continue to advance, particularly in ocean observation and ocean sensors, imaging, genetics, computation and modeling, and means to use Traditional Ecological Knowledge. Collectively we now have a much better toolbox to inform ocean policy than we did when the Oceans Act came into being in 1997.

Slide 17 – I am not for a moment suggesting that we stop ocean industry. We simply cannot survive as a species without ocean resources. But we must figure out how to extract those benefits sustainably. We need to buy more insurance against future decline.

Slide 18 – Some people see the ocean as a source of wealth. Others see the situation as hopeless – an environment we’ve damaged beyond repair. But I see it as an environment full of wonder and opportunity, and if we treat it right it will provide benefits to humanity for as long as humanity persists as a species.

Well-designed marine protected areas can help to “pay for themselves” through enhanced fisheries, enhanced productivity, and enhanced ocean health. Even ignoring ethical issues regarding extinctions and habitat destruction, these losses often have direct impacts on human well-being.

Regarding your remaining questions:

I base my comments on the best available science and on the links between science and an ecosystem approach – the fact that these ecosystems are strongly interlinked to each other, and indeed to us as humans.

I would not say that indigenous approaches played a role in shaping my suggestions but I do think indigenous approaches could help in ASSESSING and REALIZING conservation objectives, and in doing so could help in reconciliation and in building relationships with indigenous peoples. Their knowledge and recognition of the need for such measures can help in figuring out the who, what, why, when, where of prioritizing protection.

I actually see the IUCN guidelines as pretty thoughtful and comprehensive. I realize that conservation is not the only consideration in designing marine protected areas but it must be a primary consideration if we’re going to get serious about sustainable ocean strategies. Otherwise we may as well all go home.

I think the IUCN guidelines are well thought on the many issues and there is no reason they are not perfectly suited to Canadian needs.

There are unique aspects of Canada that don’t so much challenge the IUCN guidelines but rather increase the challenge in achieving those guidelines. I point to ice cover and remoteness of many of our marine environments, which make baseline assessment and monitoring extremely difficult. I also point to the sheer volume of coastline – the longest in the world – and

a relatively small population and even smaller scientific community. So we need shortcuts that make the best of the information we collect. Thus the new tools.

We also need to make some tough decisions. We need to protect a wide range of habitats in order to protect the diversity of ocean life and processes, and a network of MPAs placed for convenience in remote locations will not provide a comprehensive insurance plan. We tend to utilize productive habitats and nearshore environments more heavily, whether for fishing or aquaculture or sewage disposal. But we also know coastal habitats support a particularly important set of processes and species. As The Guess Who once sang – we need to “share the land” or in this case the ocean, INCLUDING conservation.

Let me finish by saying that dental insurance will not be of much help if you have a house fire, and life insurance will not help offset your prescription costs. A mixed portfolio of insurance will force you to give something up – a portion of your paycheck – but when the unforeseen strikes it can avoid bankruptcy. So too can a mixed portfolio of marine protected areas avoid ecological collapse.

I thank you for your time and would be happy to answer any questions.

