

**Marine Mammal Commission
Advisory Committee on Acoustic Impacts on Marine Mammals
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Thank you for this opportunity to speak here at the Marine Mammal Commission Advisory Committee on Ocean Noise. I am speaking today under the assumption that all of us have some concern about the impacts of ocean noise on marine mammals, and particularly whales and dolphins. I am also assuming that most of us here are opposed, at least in principal, to killing them.

Last week I participated in another conference here in New Orleans. Perhaps one of the most revealing conversations I had was with Helvard Johansen, the Norwegian delegate to the International Whaling Commission (IWC). We spoke about some of the basic assumptions various stakeholders make when discussing commercial whaling. We also spoke about the culinary imperialism of Americans.

What became clear to me from our conversation was how last August, the IWC – a group that cannot agree on what time lunch should be, was able to unequivocally endorse the IWC scientific committee findings about the dangers of ocean noise.

Most folks in the conservation community that I spoke with about this found the IWC endorsement puzzling because they typically believe that anyone who kills whales and eats them probably has a low regard for living creatures. Helvard proves this belief wrong. The fact is that Helvard does value life. He sees a contradiction in his nation being accused of 'reckless killing' of a few whales by those who have a global disregard for the habitat that they live in. Why quibble over the death of a few animals while you are contributing to the demise of all of them?

In light of this, what is the real impact we are trying to determine here at this advisory meeting on ocean noise? There are many ways we can measure the environmental impacts of human civilization. Probably the easiest metric is to point at other people's practices and view them as encroachments on our sensible ways of living.

This habit seems almost universal. When I speak with ocean geophysicists about the contribution of seismic airgun blasting on the ocean noise budget, they point to the shipping industry and say that compared to ship traffic, airguns contribute very little noise. When I speak with navy folks about the possibility that fish populations may also be damaged by mid frequency sonar, they point to the drag trawlers and say that this reckless practice is what is causing the catastrophic crashes of fish populations.

Of course these people are correct, but this does not diminish the facts that the noise of seismic airguns and military sonars are also compromising the marine environment. It does not diminish the fact that the marine environment is seriously compromised, and all of our practices need to

be reviewed and overhauled. We can't wait for others, whose "most egregious practices constitute the real problem." If we do this, every culpable party will avoid changing their practices, because they each believe that other stakeholders are the "real problem."

There are many ways we all find to avoid changing our beliefs and practices. Condemning others is just one of them. But I am finding what I believe is a systematic problem that challenges our ability to even frame the discussion. This involves what appears to be a perversion of "scientific inquiry" which is preventing us from really examining the scope of the problem.

The tools of science were formalized centuries ago to establish a repeatable methodology to our inquiry. Beginning with what we knew, we looked out to what we didn't and devised methods of exploring the unknown in ways that others could repeat. If the exploration was successful, we would then know something new that was irrefutable, and that we could share with others.

I believe that this process has been corrupted, at least in terms of the science that we are bringing to bear on the impacts of noise on ocean animals. Rather than science being driven by a fundamental human inquisitiveness and a "need to know, it is being driven by external priorities. Funding agencies – who are not scientists – begin with a hypothesis, and then try to find the science to prove it. As a result, the work funded by various stakeholders manages to avoid unpredictable and annoying results. In this manner they come up with "good science" that conforms to a set of predetermined priorities.

The symptoms of this paradigm include narrowly focused studies that tell us something, but do little to clear up some of the fundamental ambiguities of the field of inquiry. For example, there are many respectable and learned people working on studies like the "threshold levels for temporary threshold shift" in marine mammals, or the "effects of background noise on animal vocalizations."

Of course it would be useful to know how much noise is "too much" for particular animals. It is also useful to know if specific animals are more susceptible to increased noise levels in certain frequency regimes at various times in their natural history. Useful data is derived from these studies. These data might help determine some biological risks of various practices under various sets of circumstances. We can use the information to model some behavioral possibilities. We can even construct virtual "animats" by fusing these studies with other studies in computer modeled environments to derive informed speculation about how animals might behave under a predetermined set of stimuli in a modeled environment. Tools like this could help mitigate damage to particular species under a prescribed set of conditions.

We may be able to better understand the whole by looking at the constituent parts – to a degree; but there is also a "six blind men and the elephant" component to this paradigm. The problem with this manner of inquiry relative to anthropogenic noise is that it reveals very little about the impact that anthropogenic noise has on the living habitat of marine animals. What ends up happening is that very qualified scientists are coming up with "good science," but with no clear way of applying it to solving the real problem. From outside the academies this approach appears disingenuous. It is clear that non-scientific priorities are driving science, and it looks as though reason and common sense are being substituted with fragmented and narrowly focused studies.

Unfortunately, we have a real, and well defined problem here. The oceans are in precarious shape. Fisheries are collapsing. Marine animals are showing clear signs of stress. "Protected" animal populations are not recovering at predicted rates. And it is clear that human interaction with the sea is at cause for all of this mess. Unfortunately, all ocean stakeholders are girding themselves for their own survival, and disregarding these larger facts. The blame is on bad fisheries management, global warming, depletion of the ozone layer, disappearance of coastal wetlands, chemical pollution, and whatever else is "out there."

The Marine Mammal Commission ocean noise advisory panel cannot solve all of these problems. But you can help solve one. You can come to terms with the fact that ocean noise is contributing to the precarious state of the oceans. You can recommend that all ocean enterprises find ways of mitigating their noise. The priority should not be "how much noise is to much" but rather "how can human enterprises make as little noise as possible."

This may seem naïve. How can anything be more important than National Security? How can a civilization whose very life blood is petroleum impede the flow of this precious resource? How can we limit the harvest and extraction of ocean resources in a world economy that is growing and needy? While there is expressed concern for preserving ocean life by all stakeholders (and a concern for the preservation of marine mammals by this body) it seems that the one organism to which all other life must be sacrificed is the American Economy.

I'd like to suggest that we step back a moment, and try to expand our framing beyond the scope of our individual or agency priorities. Not just in terms of the welfare of marine mammals, or oil extraction or national security, or global trade. I'd like to expand it to include the cocolithophores that create ocean weather, and the krill and plankton that feed the great mysticetes, and the fish stocks that feed the odontocetes and many humans. I'd like to expand our frame to even include Helvard Johansen, whose wife cooks him a whale stake every Sunday. I'd like to ask that we look at the whole ocean and all of the life that resides in it. Then I'd like to ask what each of us can do to nurture the ocean back to health. I'd like to ask how can we advise our industries and our policy makers to help with this task.

If we expand our framing, we could set an example that other stakeholders can follow; encouraging the paradigm shift we need to preserve the oceans. But if we only look at the problem of ocean noise from our narrow set of priorities, blaming others for their reckless practices and denying our role in the compromised ocean environment, we will be participating in a slow global suicide.

-Michael Stocker
New Orleans, 2004