

Marine biodiversity vs economy, security and health

by
Daniel Pauly

As readers of this newsletter know, fisheries have huge, but long neglected impacts on the structure of marine ecosystems. Fisheries have begun to endanger marine biodiversity as well, and especially the large, long-lived species that have sustained fisheries for centuries. Indeed, the prevailing trends in fisheries are so frustrating to those who try to document and reverse them that hearing about the similar travails of colleagues working, e.g. on forestry, can give one a perverse sense of *schadenfreude*.

I recently had the opportunity to such guilty pleasure at a workshop held in London, July 19-20, on the premises of the Royal Society, and devoted to us looking "Beyond extinction rates: monitoring wild nature for the 2010 target". A number of entities, foremost the Convention on Biological Diversity (CBD), have set themselves the goal "to achieve, by 2010, a significant reduction of the current rate of

biodiversity loss". The participants, drawn from Academia and a number of national and international GOs and NGOs, were supposed to exchange their experience in how to reverse what is still an accelerating trend of biodiversity loss. However, while we all had horror stories to tell on disappearing forests and the birds and mammals therein, and on decaying coral reefs and disappearing ocean predators, it became also clear that none of us knew how these trends are going to be turned around. How could we? Most of us don't even get to speak with our local Member of Parliament. But this is not because the science is not there: the workshop clearly established how good we now are at quantifying biodiversity trends through international collaborative programmes, analyses of remote sensing data, and meta-analyses of scattered, otherwise un-interpretable observations, and at presenting our results in an attractive fashion, with error bars and all.

Thus, I was particularly interested in the final presentation, by Bob Watson, who, as former coordinator of the Intergovernmental Panel on Climate Change (IPCC), would surely share with us how the IPCC was able to reach our elusive saviours: real politicians. His key message was that politicians are concerned with three issues: the economy, security, and health. These are the three issues that get them votes. Hence, unless we can relate the loss of biodiversity in various natural systems to impacts on the economy or security or health, the issue will continue to be neglected. It hit me how unfair it is that, as biologists, we not only have the inherent tasks of rigorously documenting changes in the abundance of the organisms we study, but also of convincing people around us that it matters. And we must do it even though the food we eat is biodiversity, and the medicine we take is

Continued on page 2 - biodiversity

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Biodiversity - Continued from page 1

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biodiversity, and the fibers we use are biodiversity, and even though it is biodiversity that naturally filters the water we drink, and cleans up the air we breathe.

Let's get back to the example provided by fisheries, still widely perceived as local activities, pertaining to one commercial fish species and perhaps a few other species caught along with it. In the five last years, the team members of the *Sea Around Us* project developed an approach to mapping fisheries catches globally, from 1950, the first year for which global data exist, to the present. These catches are then used as a backbone of procedures to map the biomass of fish over that same period for an entire ocean basin. This generates 'before vs. after' maps

illustrating rather convincingly how fisheries are impacting marine ecosystems in increasingly deeper waters. Moreover, these maps can be used to document the geographic expansion of fisheries, which, starting from Europe and Northeastern North America in the North Atlantic, spread to cover the world's oceans, e.g., to Western Africa, South America and Antarctica, and similarly from Japan and Taiwan via Southeast Asia towards the South Pacific. This shows that fisheries have become a planet-wide force, impacting all of marine life, notably by eliminating the upper level of food webs, and simplifying the lower levels, now increasingly affected by outbursts of jellyfish and other short-lived invertebrates. These large-scale ecological experiments were done without control, i.e., there is no chunk of the ocean that we have deliberately set aside as reserve or to hedge our bets. Also, most of the income extracted in the process was plowed back into acquiring more and larger boats, whose very existence now forces our hand. However, the near insatiable demand for fish that has been unleashed in the last decades can not be met anymore by the stocks that are left, and coastal aquaculture, which increasingly uses fish meal as input, and which pollutes, will likely aggravate the

problems faced by capture fisheries.

Now apply Bob Watson's formula to this: what are the links to the economy, to security, and human health? One major economic link is subsidies, of which many billions are paid by governments every year, reportedly to protect jobs. These subsidies, however, have the main effect of keeping afloat the large-scale, and distant-water fleets which undermine otherwise competitive small-scale fisheries in both developed and developing countries. Unfortunately, these subsidies are neglected in the grand scheme of things, as are the increasing number of vessels involved in illegal fisheries – a security issue – and, owing to exports of fish to the developed world, the undermining of protein food supply in developing countries – a health issue.

Overall, it is thus very difficult to remain optimistic about the future of biodiversity on this planet, whether we think of its terrestrial or marine components. Perhaps dealing with the menace that rapid global climate change represents to our economy, to our security and to our health will make us realise how urgent it is that we change the way we interact with our planet. We will be in deep trouble if this is not enough.

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Our mailing address is: UBC Fisheries Centre, Lower Mall Research Station, 2259 Lower Mall, Vancouver, British Columbia, Canada, V6T 1Z4. Our fax number is (604) 822-8934, and our email address is SeaNotes@fisheries.ubc.ca. All queries (including reprint requests), subscription requests, and address changes should be addressed to Robyn Forrest, *Sea Around Us* Newsletter Editor.

The *Sea Around Us* website may be found at saup.fisheries.ubc.ca and contains up-to-date information on the project.



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