

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

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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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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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Encounters of a different kind...

by
Kristin Kaschner

Imagine sitting in a very luxurious room located on an underground floor of one of the most expensive hotels in southern Italy with about 50 other people from various nations. Before being allowed to enter the room your badge has been checked carefully by serious and official looking Italians wearing sunglasses and guns and now all attention is focused on a man in a light suit sitting on a slightly raised platform in the front who is clearly in charge. You're here to discuss "strategic plans" and the chairman convenes the meeting with a

request that everybody present will need to identify themselves "by their *real* name and affiliation". When the turn comes to you, you call out your name with the same kind of slightly guilty feeling one has when being stopped by the police for no apparent reason: principally, you think you know that you haven't done anything wrong, but then again who knows for sure? ...Luckily, the chairman deems your reply acceptable and moves on, but the atmosphere in the room tenses noticeably when two other newcomers identify themselves as citizens of a nation generally perceived to be the "enemy" by the majority of all members of the assembly. The small, white-haired woman, speaking with a

strong accent, grows increasingly more nervous and uncomfortable as the chairman continues to question her and her associate. She struggles unsuccessfully to prove their dedication to the cause and everybody lets out their breath with a deep sigh of relief when,



Daniel Pauly with Kristin Kaschner (left) and with Patricia A. Forkan (right), President of Humane Society International, at the strategic NGO meeting in Sorrento, Italy. Photos by Betsy Dribben.

finally, a trustworthy witness stands up, vouching for the credibility and integrity of the newcomers and the meeting finally proceeds.

The scene I described is not part of a second-rate spy movie, but was witnessed by Daniel and myself at an NGO meeting at this year's International Whaling Commission (IWC) meeting held in Sorrento, Italy during mid-July. Similar to my own impression, I would imagine that this kind of opening ceremony would strike most attending any scientific meeting as very unusual and somewhat bizarre or even absurd. However, in my opinion, this scene is very indicative of the level of distrust and suspicion that separates the two

main factions within the IWC, one made up of member countries strongly in favour of the resumption of commercial whaling and the other emphatically opposed to it. The International Whaling Commission is an international body, founded in 1946, with the

mandate to manage global whaling operations of all member countries. As a general procedure, whaling quotas are/were set during the annual Commissioners' meeting, based on the recommendations and assessment of whale stocks through scientists during the Scientific Committee meeting which takes

place every year just prior to the Commissioners' meeting. However, despite all regulatory efforts, the mismanagement of whale stocks led to an over-exploitation that brought the majority of large whale species close to the brink of extinction during the first three quarters of the 20th century. As a consequence, a worldwide moratorium on whaling was put in place in 1985. By the early nineties, a so-called revised management procedure (RMP) was developed to allow a sustainable harvest of those whale stocks that were considered to be healthy. The IWC has endorsed the RMP already, but has not yet implemented it for any stock,

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because of some complex scientific issues – much to the chagrin of those nations who argue that at least one of the baleen whale species, the minke whale, is abundant enough to allow a sustainable harvest. As a consequence of this ongoing debate, zero commercial whaling quotas continued to be set for all member countries at the IWC meeting every year for the past twenty years, even though a relatively small number of various species are still being taken as part of aboriginal whaling operations or during the – very controversial – so-called Scientific Whaling Programme conducted by the Japanese, or by the Norwegians who are not bound by the moratorium because of their initial vote opposing the decision. The situation has resulted in an effective deadlock between the opposing factions in the last decade, only interrupted by regular attempts of either faction to produce either new arguments supporting their cause or by trying to tip the scales of the voting majority in their favour with the help of new member countries. Most recently, in an effort to justify the resumption of whaling, some of the pro-whaling nations, namely Japan and to a lesser extent Norway and Iceland, have argued in many international fora that marine mammals and specifically the large whales compete directly with fisheries for “our” limited marine resources; often implying that the culling of marine mammals would somehow help to resolve the world’s fisheries crises and may even alleviate world hunger.

To counteract these claims, the Humane Society of the United States invited Daniel and me to

come to this year’s IWC Commissioners’ meeting in Sorrento to launch a report that we had recently prepared for them, summarizing the main opposing arguments in this so-called ‘Whales-eat-fish’ debate. This report “Competition between Marine Mammals and Fisheries - Food for thought” (available at www.hsus.org/ace/21314), was largely based on the research I conducted for my PhD

and as part of the *Sea Around Us* project in collaboration with Daniel Pauly, Reg Watson, Villy Christensen and Andrew Trites. Using spatial modeling and mapping techniques (see *Sea Around Us*, Issue 22, p. 8, for description of methodology) I have assessed the extent of overlap in food resources between marine mammals and fisheries by considering not only

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Our findings indicate that overlap between [marine mammals and fisheries] is very low ...

New Publications

Sea Around Us members have produced several new publications in the past few months. Notably, Villy Christensen, in collaboration with John L. Maclean, was guest editor for a special issue of *Ecological Modelling* (March 1 2004, Vol 172 (2-4): Placing Fisheries in their Ecosystem Context). The special issue contains 19 papers reporting the latest applications and advances in ecosystem modelling using the *Ecopath* with *Ecosim* suite of modelling tools. Papers by *Sea Around Us* members include:

- Christensen, V. and D. Pauly. 2004. Placing fisheries in their ecosystem context, an introduction. *Ecological Modelling* 172, 103-107.
- Christensen, V. and C. J. Walters. 2004. *Ecopath* with *Ecosim*: methods, capabilities and limitations. *Ecological Modelling* 172, 109-139.
- Kavanagh, P., N. Newlands, V. Christensen and D. Pauly. 2004. Automated parameter optimization for *Ecopath* ecosystem models. *Ecological Modelling* 172, 141-149.
- Zeller, D. and J. Reinert. 2004. Modelling spatial closures and fishing effort restrictions in the Faroe Islands marine ecosystem. *Ecological Modelling* 172, 403-420.

Other recent publications by *Sea Around Us* members include:

- Alder, J. and U.R. Sumaila. 2004. Western Africa: a fish basket of Europe past and present. *Journal of Environment and Development*, 13(2), 156-178.
- Atta-Mills, J., J. Alder and U.R. Sumaila. 2004. The decline of a regional fishing nation: The case of Ghana in West Africa. *Natural Resources Forum*, 28:13-21.
- Christensen, V. and C. J. Walters. 2004. Trade-offs in ecosystem-scale optimization of fisheries management policies. *Bulletin of Marine Science* 74(3), 549-562.
- Salas, S., U.R. Sumaila and T.J. Pitcher. 2004. Short-term decisions of small scale fishers selecting alternative target species: a choice model. *Canadian Journal of Fisheries and Aquatic Science*, 374-383.
- Zeller, D. and D. Pauly. 2004. The future of fisheries: from ‘exclusive’ resource policy to ‘inclusive’ public policy. *Marine Ecology Progress Series* 274, 295-303.

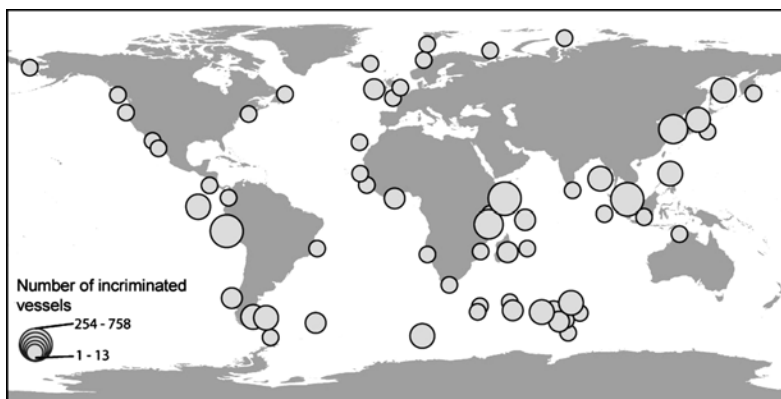
IUU fishing, international fisheries organizations and the Sea Around Us

by

Ussif Rashid Sumaila and Jackie Alder

The *I* in IUU fishing stands for illegal fishing; the *U* denotes unreported fishing; and the last *U* is unregulated fishing. When fishers catch fish where they are not supposed to, they are engaging in illegal fishing. When a fisher catches fish, whether legally or illegally, and fails to report the catch to the relevant authorities, that is unreported fishing. Unregulated fishing is conducted by vessels flying the flag of countries that are not parties of or participants in relevant fisheries organizations, and therefore consider themselves not bound by their rules (e.g. countries fishing for tuna in the Atlantic by those who are not members of ICCAT).

IUU fishing has recently attained rock star status among international fisheries organizations - both intergovernmental and non-governmental. The FAO, Coalition of Legal Toothfish Operators (COLTO), the OECD, WWF and UNEP are all very active in this area, trying to help tackle this burning problem. In fact, the FAO is currently working with its member countries to develop International Plans of Actions (IPOAs) for tackling IUU fishing. Also, the OECD organized a workshop in April 2004 where a group of invited speakers, including R. Sumaila, gave papers on the economic and social drivers of IUU fishing



Map showing distribution of incidences of illegal fishing for the period 1980 -2003.

Map produced by Jordan Beblow, Sea Around Us project.

Sources: IntraFish and other online news services.

(see www.feru.org/publications/Cost_of_IUU.pdf).

Why is IUU fishing so topical today? First, governments and stakeholders recently realized that this is indeed a significant problem for fisheries management, with global estimates of the quantity of fish removals due to IUU fishing of up to 30% of official reported global catches (Pauly *et al.* 2002). Second, the fact that so much of the removals are not reported makes stock assessments that underpin most fisheries management arrangements, less reliable. Third, IUU fishing aggravates the well-known negative effects of overcapacity in fisheries. Fourth, it makes buyback schemes less likely to achieve their goals of reducing fishing capacity, since the capacity so removed simply moves on into IUU fishing. Fifth, IUU fishing makes the management of shared stocks and high seas fisheries even more difficult.

Finally, IUU fishing puts legal fishers at a disadvantage since, in effect, the IUU fishers enjoy a *de facto* subsidy and therefore can supply fish at a lower cost than legal fishers.

All of these reasons make the tackling of IUU fishing a very important task if the goal is to stop the current overfishing of global fish stocks. To do so implies that we need data and analyses to support policy makers. The *Sea Around Us* project (SAUP) has been (i) compiling a detailed global database of illegal IUU fishing, and (ii) developing country case studies of IUU fishing, which will later be scaled-up to the global level (Pitcher *et al.* 2002). In fact an active database has already been established, which is continually being updated through access to fishing news services. The SAUP, working together with the Fisheries

IUU fishing has recently attained rock star status among international fisheries organizations

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Economics Research Unit (FERU) has used this database to develop a global map of IUU fishing incidences, and undertake a study for the OECD on the economics and risks associated with being apprehended while engaging in IUU fishing (Sumaila et al. 2004). Our goal at the SAUP is to establish the most comprehensive global database, which will underpin different

analysis of IUU fishing activities to provide vital scientific information to support actions to eliminate the harmful activity.

References

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Pitcher, T.J., Watson, R., Forrest, R., Valtysson, H., Guénette, S.

2002. Estimating illegal and unreported catches from marine ecosystems: a basis for change. *Fish and Fisheries* 3: 317-339.

Sumaila, U.R., J. Alder and H. Keith 2004. The cost of being apprehended fishing illegally: Empirical evidence and policy implications. In OECD Workshop Proceedings on Illegal, Unreported and Unregulated (IUU) Fishing Activities, April 19-20, Paris.

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what type of food either group targets but also where this food is consumed or caught. Our findings indicate that, from a global perspective, resource overlap between the two is very low, because the vast majority of food consumed by marine mammals is taken in areas where fisheries don't operate and/or consists of food types that are not exploited by fisheries. Consequently, even given all the associated uncertainties, potential competition is also likely low, except in the case of a few hotspots of high resource overlap, which warrant further investigation. However, we found no evidence that fisheries catches would likely increase due to a reduction of any marine mammal population.

The actual report was launched at a press conference, and during the days prior to this event Daniel and I met with many IWC Commissioners, reporters and – during the closed strategic NGO meeting described in the opening paragraph – representatives of the various international conservation or animal welfare organisations that hold observer status at the IWC. Although not introduced as an official agenda item of the Commission's meeting this year, we have been told that the

findings of our report may become the main focus of a special session during the IWC's Scientific Committee meeting next year. Since it was launched, the report has been covered widely in the media including articles in *Nature News* and *New Scientist* (www.nature.com/news/2004/040719/full/040719-7.html; and www.newscientist.com/news/print.jsp?id=ns99994983).

Overall, the feedback we received was very positive and I have been contacted by several colleagues, politicians and conservationists, praising us for the work we've done and for the "reality-check," as someone called it, our report has provided in the context of the on-going marine mammal-fisheries competition debate. In one sense, this article therefore describes a success story and I am obviously very pleased with the recognition of our work. Nevertheless, I wonder if somehow we have been preaching mainly to the converted. Without exception, everybody we spoke to at the IWC or who has since approached us was on "our side" in the first place (i.e., people that are opposed to whaling), while members of the Japanese delegation and other pro-whaling nations made no attempt to engage in any kind of

discussion. In my opinion, this lack of constructive interaction – similar to the deeply embedded suspicion that was so apparent at the NGO meeting and that seems to dictate and determine the interactions between most IWC member countries – is symptomatic of the unyielding, cemented positions in the whaling debate that have resulted in the organization's current deadlock.

I believe that our report is a useful attempt to provide some badly needed perspective on the extent of the problem of potential competition between marine mammals and fisheries. However, based on my observations, I tend to agree with many others that, in the context of the whaling debate, maybe the actual problem lies elsewhere and is unlikely to be solved by any scientific research. It may therefore be time to refocus our efforts to resolve this issue, shifting the emphasis to much more basic questions of how to deal with problems arising due to vastly different viewpoints when nations from very different cultural backgrounds are thrown together in the ongoing globalization process. But don't ask me how – fortunately, that's not my job as a scientist – or is it?



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