Book Review

GLOBAL ATLAS OF MARINE FISHERIES: A CRITICAL APPRAISAL OF CATCHES AND ECOSYSTEM IMPACTS.

Edited by D. Pauly & D. Zeller. 497 pp. Published by Island Press, Washington, DC, U.S.A., 2016. Price $80.00. ISBN: 9781610917698.

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This book presents the key results from the first 15 years of the "Sea Around Us", a research initiative funded by the Pew Charitable Trusts. The goal of this project, as stated in the Foreward by the funder, was "…to provide a portrait of the major changes that have taken place in populations of fish over time, primarily as a result of fishing…" and to understand the ecological consequences of these changes. This was an ambitious endeavour, and the mountain of results can only partly be reported in this, a book of almost 500 pages. There is, therefore, much to be gained from inspecting the resources gathered at the associated website (www.seaaroundus.org). Fisheries scientists will likely have seen many of the results before, as just about every one of the Chapters (1-14) have appeared in the scientific literature: these encompass half the volume (Part 1, "Global Accounts"). The other half of the book provides summaries of the fisheries of 273 countries (and/or parts thereof) from 1950 to 2010, with new estimates of their catches.

The emphasis on catches is significant, as the entire endeavour was based on correcting, or rather "reconstructing", estimates of the global fish landings that are assembled and disseminated annually by the Food and Agriculture Organisation (FAO) of the United Nations. Such corrections are required because FAO's estimates take little to no account of small scale fisheries (artisanal, recreational and subsistence) and do not include discards for the industrial fisheries. Overall, the reconstructed catches were 50% higher than the reported data. Moreover, since 1996, the reconstructed data exhibit a significant decline in global catch, whereas the FAO estimates indicate a period of stability. The decline is caused by the reduction in catches from industrial fisheries, since there is a steady increase in the reconstructed catch from small scale fisheries throughout the entire time period. These are the essential headlines from the final chapter (14) of Part 1. Preceding that is an account of the "rationale for their [catches] reconstruction", followed by the methods used, and some of the ensuing products: a focus on pelagic fish in the high seas and an evaluation of their management; example maps of the distribution of the catches of exploited fish and shellfish (exploited marine biodiversity); the economics of global fisheries; the response of fish to climate change; mariculture; and some matters relating to ecological consequences, such as ecosystem modelling (with the particular model Ecopath), jellyfish fisheries, seabirds, and chemical pollutants. Many of these subjects make for interesting reading, so Part I is useful as a one-stop shop for the publications it summarises.

At first sight, the individual country accounts in Part 2 are an astonishing global collation. It is certainly fascinating to find out, for any country with a coastline, the constituent fisheries, the magnitude of catches, and the main species fished. The attention to detail in including so many of the world's minor islands is particularly impressive. On closer inspection, however, it is questionable how accurate the reconstructed catches are and the narrative can be misleading. I had cause to scrutinise the accounts for a couple of the countries I am familiar with, as I suspect [and hope] many others might. The Portuguese account, for example, states that the reconstructed catches "…were 2 times the amount reported…", yet according to a peer reviewed account - curiously by the same first author - the reconstructed catch

was 36% higher. I may be nitpicking, but I think it would be helpful if fisheries scientists with suitable experience contributed to this initiative, as per the authors request (via the website). The Taiwanese would point out that their catches are not like Syria's (an obvious printing error); Nordic scientists might then correct the [online] maps which show mackerel absent from the Norwegian Sea; and Scots may help to put the prawns back into Europe's biggest fishing ground for prawns, the Fladen ground, from which they too are absent. Indeed, many of the country accounts do not feature appropriate national expertise, as non-cooperation was acknowledged by the authors as one of their major challenges. The entry for the UK, a case in point in relation to the lack of expertise involved, is more telling. It has a rather negative account and concludes that the *biomass* (my emphasis) of fish has declined (in line with catches) throughout the time period, even though the plots it refers to are of catch, not biomass.

Therein lies the rub. A fundamental problem with this book lies in the interpretation of the time series of reconstructed catches, particularly when one considers the aforementioned goal as stated by the funder. What is being considered here is the fishery, "defined by the amount and kind of fish caught and their monetary value" not the "population of fish". However, the book deliberately conflates the two, with reference to *stocks* being "collapsed" "…meaning that *catches* [my emphasis] were less than 10% of their historic maximum." Such conflation leads to the acknowledged "debate…recently raging about whether to use catch data to infer the status of fisheries". I do not wish revisit that grand debate (see e.g. Pauly et al., 2013), however, trends in catch simply do not always reflect trends in biomass, particularly where there have been significant successful management interventions (such as e.g. in Northern Europe, USA and parts of Australasia). The reason why the UK's, and indeed most of Northern Europe's catches have declined since the early 2000's, is because catches have been deliberately and painstakingly *reduced* to sustainable levels, set according to good scientific advice and enforced by effective compliance. Contrary to what, for example, the UK account provides here, this has resulted in many stocks exhibiting *increases* in population, and recoveries to what are considered sustainable levels. But this, the good news story that fish stocks in many places will *not* be collapsing any time soon, is one that is seldom told. Sadly, it doesn't seem to have made it into this book either. Fish populations in the poorer countries of the world are under pressure, but there is hope in the example of good stewardship applied elsewhere: we need to acknowledge that we can make a positive difference, and provide assistance to those countries for them to do likewise. However, part of good stewardship is knowing how much a fishery removes from a population and this book summarises a commendable initiative to improve such knowledge.

Reference

Pauly, D., Hilborn, R., and Branch, T.A. (2013). Fisheries: Does catch reflect abundance? Nature, **494**: 303-306.