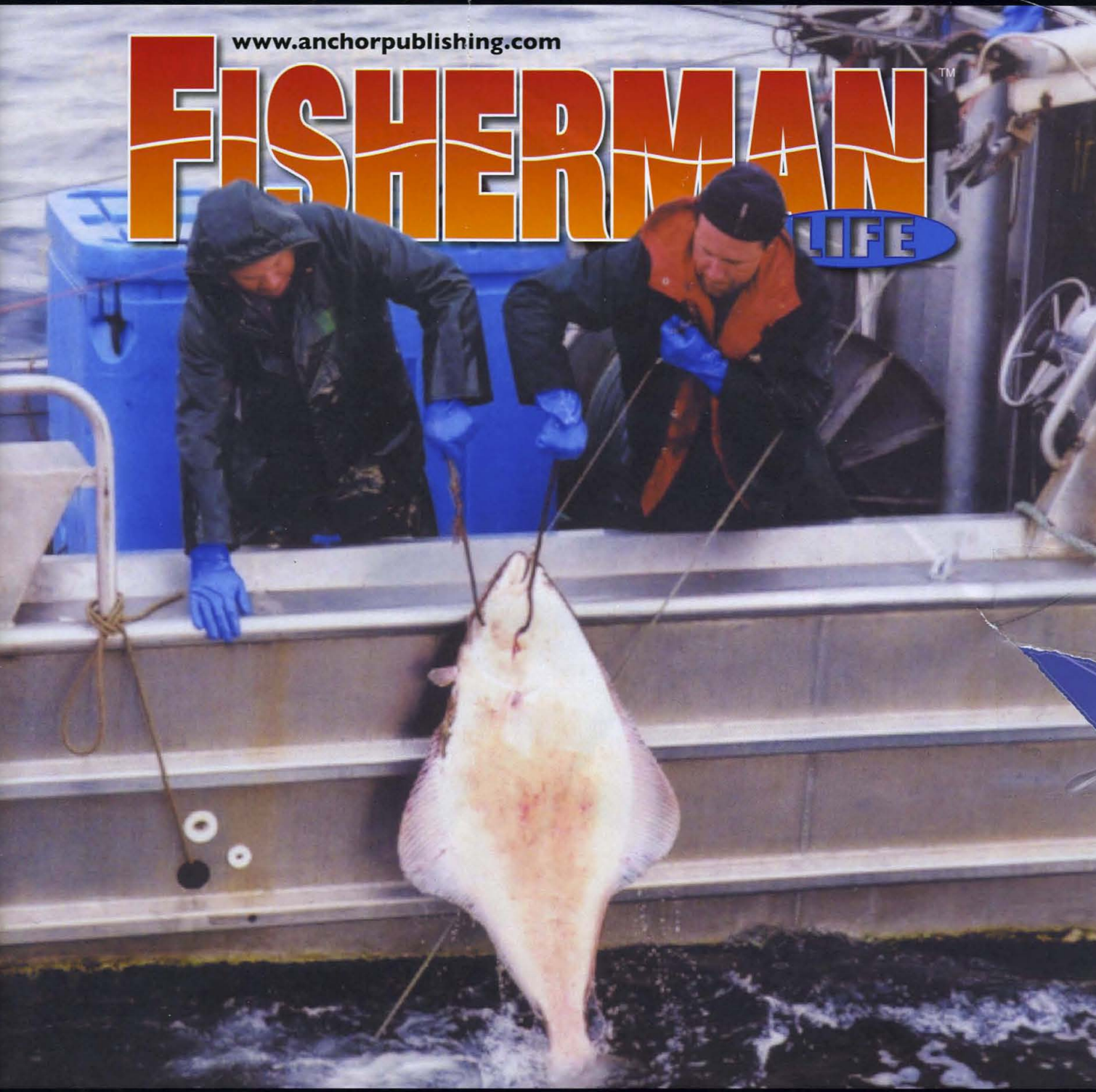


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An Interview With DANIEL PAULY, PhD

Overfishing, driven by annual subsidies of billions of dollars per year, has depleted fish populations worldwide. Dr. Pauly's work is to identify policies that can reverse harmful trends and retain the social and economic benefits of sustainable fisheries.

BY MARGARET BOYES

Dr. Daniel Pauly is a French-born biologist who studies global fisheries impacts on marine ecosystems. He is a Professor and Director of the Fisheries Centre at the University of British Columbia (www.fisheries.ubc.ca). He is famous for initiating the online encyclopedia of fishes called FishBase (www.fishbase.org), for contributing to Ecopath, an ecosystem modeling software (www.ecopath.org) and leading the Sea Around Us Project, dedicated to the mapping of global fisheries trends (www.searoundus.org). Pauly has authored or co-authored over 500 scientific articles and reports, as well as 30 books. He is a fellow of the Royal Society of Canada and has won numerous awards, including the 2005 International Cosmos Prize from the Expo '90 Foundation of Japan, and the Volvo Prize in 2006. In 2003, Scientific American magazine named him one of the "Scientific American 50," recognizing outstanding acts of leadership in science and technology in that year.

Fisherman Life: You're known for expressing opinions about public policy. Specifically you argue that governments should abolish subsidies to fishing fleets and establish marine reserves. Could you elaborate on these please?

Dr. Daniel Pauly: Nowadays, it is understood that scientists, particularly those working in universities, must inform the public of their findings. Two important findings of contemporary fisheries science are that subsidies to the fisheries sector generally encourage overfishing, and that marine protected areas can lessen fisheries impacts on ecosystems. Hence, I speak up on these issues along with a number of my colleagues.

FL: You are also on the board of Oceana, a marine conservation group, is that correct?

DP: Yes, my role on this board is helping Oceana remain

science-based. Marine conservation must be science-based if it is going to be credible and effective.

FL: Please tell us about FishBase.

DP: FishBase is a database of fish which I initiated in the 1980s when I was working in the Philippines. It was originally intended to help people who were managing tropical fisheries by providing fishery biologists information on growth and other aspects of the biology of fish as needed for fisheries management. However, the database grew and now includes key features of the biology of the over 30,000 fish species in the world. The program is accessible in several languages and scripts.

FishBase grew in the early 1990s from a small, part-time activity involving two scientists and two research assistants, into a big project funded by the European Union. We went

online in 1996, and it took off like gangbusters. Now, FishBase is run by an international consortium of nine research institutions, and it employs 10 staff in the Philippines and is supported by a dozen scientists in Europe, China, Brazil and Canada, all working in institutions as diverse as the Fisheries Centre at the University of British Columbia (UBC), the National Museum in Stockholm, the National Museum of Natural History in Paris, the Chinese Academy of Fisheries Science, a university in Greece and the Food and Agriculture Organization of the United Nations (FAO). We meet once a year to evaluate what we have done, and plan what we'll do in the next year. For example, we may choose a group of fish or a big country to emphasize for a year. We all use the same format for entering data, so they are compatible. The huge success of FishBase is illustrated by 25 million hits and 2 million visitors a month. Indeed, FishBase just won a Conservation Award from the International Game Fisheries Association, which I accepted on behalf of the FishBase Consortium in Palm Beach, Florida in early January this year.

FL: Please tell us about Ecopath and its software.

DP: The approach known as Ecopath was initiated by a US scientist working for NOAA in the early 1980s as a method to account, in ecosystems, for fish feeding on other fishes at the same time as you account for the effect of fishing. I took over the methodology, which had been abandoned, and tweaked it such that it could be used widely, and I taught its use in courses throughout the world.

It may have helped in the transition from single species studies to ecosystem studies, which many colleagues throughout the world are now doing. In 1994 when I came to UBC, I brought Ecopath with me, and my new colleagues are the ones who made Ecopath the success it is now. Thousands of contemporaries have downloaded one of its successive versions, and hundred of publications cite from it. In fact, NOAA lists Ecopath on its website as one of its 10 biggest achievements ever.

FL: Please tell us about your Sea Around Us Project.

DP: The Sea Around Us Project, based since 1999 at the UBC Fisheries Centre is a partnership with Philadelphia's Pew Charitable Trusts. The aims of the project, of which I am the principal investigator, are to study how fisheries affect marine ecosystems, and to identify policies that can reverse harmful trends while maintaining the social and economic benefits of sustainable fisheries.

Overfishing, driven by annual subsidies of US \$30 billion to \$34 billion per year, has depleted fish populations worldwide and is disturbing the ecosystems that support fisheries. The damage this causes is becoming increasingly unacceptable. For example, the collapse of Atlantic cod fishery on Canada's east coast cost over US \$4 billion in compensation to displaced fishermen, to say nothing of lost revenue, loss of jobs, lifestyles and culture, and loss of biodiversity.

Reversing these trends will require huge changes in policy

and management, and this requires public involvement. This is the reason why we use maps and other visuals to show the impact of fisheries. We have made maps of global catches, of the distribution of commercial marine species, of marine protected areas, etc. Also, we have databases of international fishing access agreements, of fish prices and other data all freely available on our website. This information enabled us to show, for example, that over-reporting of fish catches until the year 2000 masked a global decline in landings, which created a false optimism about the state of global fisheries. We have also shown disturbing reductions in the average size and trophic level of global catches, a process now known as 'fishing down the food web.' This happens when fisheries first deplete the more vulnerable fish at the top of food chains, then target smaller and smaller fish, and finally invertebrates. In some parts of the world, the fisheries have gone all the way down and the only ones left are jellyfish fisheries.

FL: Why has the Department of Fisheries (DFO) shut the market down for fish like halibut, rockfish and black cod, but fishermen complain there are too many of them? Where do you think those markets are headed?

DP: There's always disagreement between fishermen and government scientists about these issues, because fishermen and scientists operate differently. Imagine an overfished area

of the sea in the shape of a hockey field with nets at either end. The few fish left therein would gather around the goals because fish like structured habitat. Scientists would survey the entire field, make lots of unsuccessful hauls, and conclude that it contains few fish. The fishermen would make a beeline to the goals, catch the fish around them, and say the scientists do not know what they are talking about.

The subjective impression the fishermen get is always that there's lots of fish - because they only go to places that still have them. DFO and other fisheries scientists survey and compare entire areas, not only the productive fishing spots. Such spots are often enough for a few fishermen to make a living, but this doesn't tell you if a stock is depleted or not.

On the second part of the question: I can't say where markets are headed; I have the impression that the halibut and black cod fisheries are well managed, however.

FL: How do you think climate change will affect fisheries?

DP: We will have to change the way we do things. Not just fishing, but our whole economy. If we don't, we will have major problems with food production on land, and there'll be a huge wave of extinction of plant and animal species, both on land and in the oceans. Canada will have to play a positive role there, and cap our monstrous emissions of greenhouse gases. If Canada, a rich country, cannot do it, who should? 