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Battling scientists reach consensus on health of global fish stocks

Many depleted fisheries are making good progress to recovery.

Lizzie Buchen



fishOverexploitation has left many fisheries drastically depleted. Rudy Kloser, CSIRO

Fisheries scientists and conservation ecologists have put aside their differences to collaborate in a study of overexploited commercial fisheries. They say that such ecosystems can be revived and managed sustainably with existing techniques, but that these measures are being patchily applied around the world.

The study marks a rare consensus between the two fields. Both recognize that overfishing is a serious problem, but have disagreed strongly on how bad the situation is and what the most effective remedies might be.^{1,2}

Now, researchers from both sides of the debate have come together in a

collaboration led by ecologist Boris Worm of Dalhousie University in Halifax, Nova Scotia, Canada, and fisheries scientist Ray Hilborn of the University of Washington, Seattle. They conclude that efforts to rein in overfishing are beginning to show success in several ecosystems, but they haven't yet reversed the global trend of depletion for individual fish stocks³.

"It was quite surprising that the exploitation rate was decreasing in a number of ecosystems," says Worm. "This shows that we don't need to wait for someone to come up with a magical cure for exploitation. We already have the tools."

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Daniel Pauly of the University of British Columbia in Vancouver, Canada, says that it was "very daring for [Hilborn and Worm] to come together. There were many, including me, who thought nothing would come out of this because of the animosity between the two of them."

"Of course there should never have been a conflict there in the first place," he adds. "When a stock is exploited, it's as bad for ecology as for fisheries."

Reaching consensus

The conflict had climaxed in 2006, when Worm suggested that all fisheries could collapse by 2048⁴. Hilborn and others argued against the apocalyptic prophecy by highlighting fishery success stories⁵.

"The controversy highlighted that there were two very different views," says Worm. "We're both motivated about improving the state of fisheries, so we wanted to find some consensus of where we are and where we're heading."

The 21 authors of the new paper, published in *Science*, came together in a working group supported by the National Center for Ecological Analysis and Synthesis, based at the University of California, Santa Barbara. They built comprehensive datasets, compiling three types of fish assessments: fisheries catches, research surveys and individual stock assessments.

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Ray Hilborn
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They then ran the data through ecosystem models to calculate the proportion of fish that could be caught while achieving the greatest yield for species across the ecosystem — known as the multi-species maximum sustainable yield (MMSY).

The authors focused on ten well-characterized ecosystems. In five overfished ecosystems, they found that fishing rates had declined since the 1990s to a level at

or below the MMSY, which had allowed some depleted stocks to recover. The five rebounding ecosystems (Iceland, Newfoundland–Labrador, the northeast US shelf, southeast Australian shelf and California current) all used different combinations of traditional management practices, including gear restrictions, closed areas and quota reductions.

No room for complacency

"The biggest surprise was how much progress had been made in the regions viewed as the 'bad boys' of fisheries," says Hilborn. "This shows that we have the tools to manage fisheries, and they work quite well."

But the picture wasn't entirely rosy: about two-thirds of the world's stocks are being fished beyond their maximum sustainable yield. Hilborn believes that this ongoing decline is "not for lack of scientific understanding", but a result of competing economic pressures and poor management enforcement.

"The findings demonstrate that the gap between what we could do and what we actually do is enormous in most of the world," Pauly says. "Here are some fisheries that work. Why aren't they all like that? Particularly for Europe and Japan, where all the conditions are there for reasonable fisheries."

Worm says he has more hope than he did in 2006, but "there are still enormous problems in much of the world, where there's less management and less reinforcement," he adds. "We can't be complacent."

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