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Effective fisheries management critical in improving sustainable fishing

Where fisheries are well managed, fish populations can recover. This is according to new international research co-authored by Dr Carryn de Moor, a senior research officer from the University of Cape Town's (UCT) Department of Mathematics and Applied Mathematics and the Marine Resource Assessment and Management Group.

The research from a collaboration of researchers from all the continents led by the University of Washington aims to understand whether management – new regulations and appropriate fishing pressure – could allow fish to recover and return to higher abundances. A database of 882 fish stocks, comprising nearly half of the world's first catch was collated and analysed.

Looking at the combined information on the South African stocks in the database, de Moor points out that the country's fish abundance is below what management says it should be. However, it also shows the country's fishing pressure is also below target, suggesting capacity to rebuild.

The oceans are a vital source of food for many people across the globe. Fish – an important component of the world food system – account for about 20% of the animal protein and almost 7% of all protein eaten by humans. This number is even higher in some developing regions.

Oceans contribute a significant share of the world's fish: almost 90% of global fish catch comes from the sea. At the same time, fishing has been recognised as having one of the most widespread human impacts in the world's oceans.

During the 1990s and 2000s, scientists raised the alarm about the sustainability of fisheries and their long-lasting effect on the oceans, and a suite of papers elevated the profile of the decline of fish and the prevalence of overfishing.

Says de Moor: "Some of South Africa's resources are doing all right; some are very well managed. However, our in-shore resources, like abalone and west coast rock lobster, are not, and illegal fishing is exacerbating the problem.

"And then some others are mainly environmentally driven, like sardine, which is currently very low."

Covering 20% of the world's fish catches, the stocks in the database, though, were not necessarily representative of the world, as they came from places with solid management: Europe, North America, Australia, New Zealand and South Africa. Many parts of the world have no such management.

Nonetheless, for the stocks in the database, the researchers found that they were – on average – small, smaller than they should be based on management recommendations. But they also found positive indications that they could recover: the levels of fishing in 2005 were low enough to allow the fish to rebound to higher levels of abundance.

That was 11 years ago. What has happened since? Are there more fish or have we sent them beyond some threshold from which they cannot rebound?

"In 2009, the authors said the fish stocks 'were poised to recover'," explains de Moor. "Now we've asked: have they?"

To do this, they needed more information, though.

Filling the gaps

De Moor co-ordinated the provision of data for South Africa, extending the timeline for the country's stocks already included in the database and adding data for a few new stocks. "But on a global scale, the expansion was huge," she comments.

Whereas before the RAM Legacy database covered 20% of the world's fish catch, now the researchers had information for 882 fish stocks representing 50% of it. The latest expansion now covers regions such South America, the Mediterranean, north-west Africa, Russia and Japan.

Having done that and by comparing the results from previous studies surveying the effectiveness of the management of the same stocks, the team was able to ask: what's the impact of management on the abundance of fish?

They found that, on average, abundance of fish is increasing and the size of fish stocks is at levels targeted by management. Although there is variability across regions and individual stocks.

Unfortunately, though, there hasn't been a parallel increase in the amount of fish being caught as a result of the increase in their abundance.

"Where fishing pressure is at appropriate levels, the resource is able to recover," says de Moor. That is good news for well-managed fisheries.

More management

"But the reality is good management has a positive impact on fish populations," adds de Moor. "We can change the way we manage fisheries, and in many cases, there can be recovery."

Armed with these findings, she hopes managers in some of the regions that are under-represented, Africa and South East Asia, for example, will be convinced to get on board.

[Read the full study.](#)

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