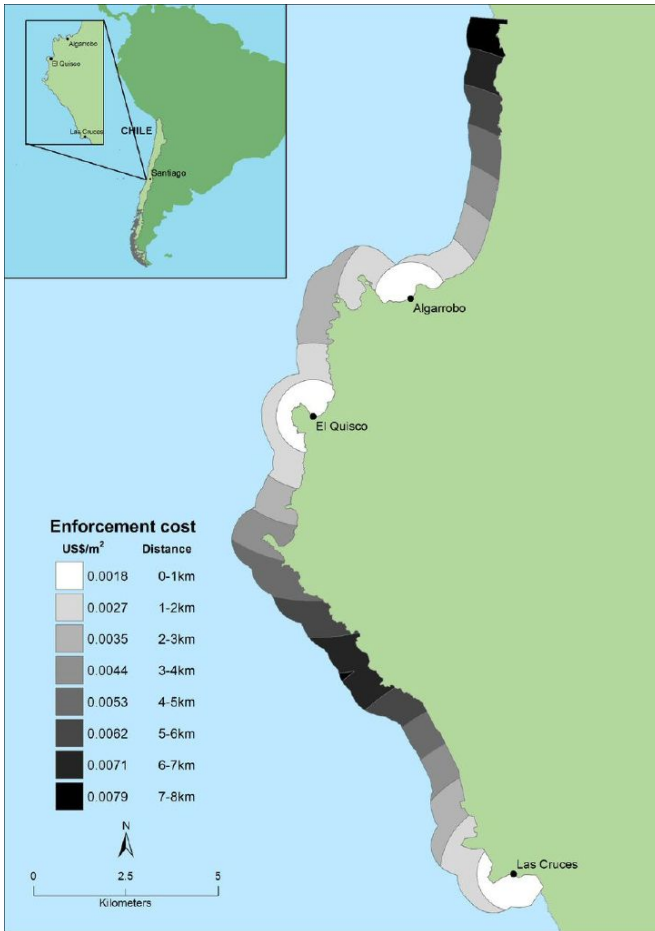


New way to save fish—and fishers

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Credit: Katrina Davis

An end to poaching will benefit ocean conservation and fishing communities worldwide, an Australian-led scientific study shows.

Researchers at the ARC Centre of Excellence for Environmental Decisions (CEED) have found that well-enforced fishing areas can boost the incomes of [fishers](#) by up to 50 per cent through catching more [fish](#), compared with those fishing in unregulated 'anything-goes' areas.

Protecting both the world's ocean life and the livelihoods of fishers creates a win-win situation for

both fishing communities and conservation, says lead author Ms Katrina Davis of CEED and The University of Western Australia (UWA).

"And as Australia considers increasing its marine reserves and regulated fishing zones, it's encouraging to find that the cost of managing these areas can be offset by larger profits for our fishers as well as tourism in places such as the Great Barrier Reef or Ningaloo Coast," she says.

Ms Davis explains that uncontrolled industrial and consumer demands are driving over-fishing in the world's oceans, threatening the survival of reefs in places such as the Coral Triangle. To manage this threat, governments are setting up reserves and regulating fishing in certain locations – all of which allow fish stocks and fisheries to recover.

However, the effectiveness of these systems depends on support from coastal fishing communities, whose livelihoods may be affected by no-take or regulated fishing zones where catch is restricted, she says. "Around one billion people rely on fish for protein, and tens of millions fish for their income. Apart from the potential loss of earnings and food, some communities even have to pay the cost of the enforcement themselves.

"This can deter them from supporting wise marine management – and some fishers may even be driven to poach, which leads to a spiral of decline in the oceans."



Credit: Katrina Davis

The researchers used Chile – one of the world's top 10 exporters of fish and fishery products – as a case study to identify how fishing incomes can be protected while anti-poaching rules are enforced.

"Marine species in Chile, such as the Chilean abalone, are managed through a program called Territorial User Rights for Fisheries (TURF)," Ms Davis says. "Under TURFs, artisanal fishers can fish over a defined coastal area under certain conditions."

This includes limiting the catch, surveying the population of key fish species each year, and paying for all management costs used to monitor and stop poachers.

The study shows that fishers earned more in enforced-TURF zones than they did in open-access areas, with every (US) dollar spent on enforcement yielding an increase of between US\$4-9 in fishing revenue, Ms Davis says.

"This is a massive return. It shows that the benefits are significantly higher than the cost of preventing poaching. And this means that, as well as furthering conservation, enforcement of regulated [fishing areas](#) is justified by higher incomes for fishers."

The increase in revenue stems directly from the

increase in fish numbers which occurs when poaching is eliminated. "In TURF areas, fishers are only allowed to take 30 per cent of the available fish stock, leaving enough fish in the ocean to reproduce. The Chilean abalone, for example, can now reproduce at the maximum rate."



Credit: Katrina Davis

On the other hand, fishers operating in open-access areas are much more likely to exceed safe catch limits – and drive down fish abundance. "Even if an individual fisher wishes to leave some fish in the sea, he can't guarantee that his neighbour will do the same," Ms Davis says.

"So everyone takes as much as they can from the common resource, and this ends up depleting the fish stock. As a result, fishers spend more time fishing for fewer fish than they would in TURF zones."

The researchers interviewed fishers and divers in the area, who were aware of the benefits of fishing sustainably, Ms Davis adds. "They are aware they spend less time fishing and have a lower risk of running out of catch compared to open-access areas." Local tourism is also boosted when there are more and bigger fishes for visitors to admire.



Credit: Katrina Davis

"Our finding on the substantial benefits of well-enforced marine areas applies to oceans and fisheries worldwide, and we recommend that governments everywhere provide subsidies and training programs to support programs similar to TURF."

The study "Accounting for enforcement costs in the spatial allocation of marine zones" by Katrina Davis, Marit Kragt, Stefan Gelcich, Steven Schilizzi and David Pannell is published in *Conservation Biology*.

More information: "Accounting for enforcement costs in the spatial allocation of marine zones." *Conserv Biol.* 2015 Feb; 29(1):226-37. [DOI: 10.1111/cobi](https://doi.org/10.1111/cobi)

Provided by CEED

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