Community power 'can rescue failing fish stocks'

1 April 2013

Traditional community-run marine reserves and fisheries can play a big role in helping to restore and maintain fish numbers in stressed developing nations' coral reef fisheries.

Using genetic 'fin-printing', an international team of scientists has gathered the first clear proof that small traditional fishing grounds that are effectively managed by local communities can help re-stock both themselves and surrounding marine areas. The finding has big implications for hundreds of millions of people around the world who depend on coral reefs for food and livelihood.

In an article in *Current Biology* the researchers report finding the offspring of protected coral trout breeding in community-managed areas in Papua New Guinea were plentiful both in the managed area and in surrounding fishery tenures.

"This is a really important finding, because it shows that small community-run fisheries can preserve their fish stocks – and can boost fish stocks in a surrounding radius of 30 kilometres or more," says lead author Dr Glenn Almany of the ARC Centre of Excellence for Coral Reef Studies and James Cook University.

"It's proof that traditional local fishery management pays off – and that is particularly critical in countries around the world where government fisheries schemes are lacking or poorly enforced. Some of this traditional marine management has operated for centuries. We're providing the hard scientific evidence that it works," says Dr Richard Hamilton from The Nature Conservancy.

Local fisheries in countries such as Indonesia, Philippines, Malaysia, Papua New Guinea, Solomon Islands and East Timor (the six countries forming the Coral Triangle, the world epicentre of marine biodiversity) feed hundreds of millions of people and are under growing stress from development, overfishing and climate change.

However the principles also extend to coral reefs in countries such as Australia.

Local marine reserves and traditional fishing tenures have been widely posed as a solution – but so far there has been a lack of proof, and public confidence, that they benefit local fishers and communities, Dr Almany says.

Working with local fishers on Manus Island, PNG, the team took fin samples from a spawning aggregation of coral trout in a tiny marine reserve, then collected similar samples from juvenile fish up to 33 kms away to see how many were the offspring of the parent group, using DNA parentage analysis.

"We wanted to see where the young fish went, and what was the effect of the marine reserve on both its surrounding fishery and others nearby," Dr Almany explains

They found 17-25 per cent of all juveniles collected in the managed area were from this particular group of parent fish, as were 6-17 per cent of all juvenile groupers caught in four neighbouring fishery areas.

"It is a really exciting result. It's the most compelling evidence yet that traditional community management of fisheries really works," they say.

Dr Almany says the researchers project from their findings that the offspring of this one bunch of coral trout could be spreading as far as 80kms from the breeding site of the parents.

"This gives us a really great handle on how different fishery areas interconnect, and can support one another. It shows that the community which bears the cost of operating a marine reserve, also derives the greatest benefit," he adds.

"We didn't have to explain our results to the local

fishers – they got it at once" says Dr Hamilton. "It gives them the confidence they need to get behind traditional fisheries management or government-introduced marine parks – because more fish will be caught locally.

"Importantly too, the same management principles can work in places like Australia's Great Barrier Reef, where many of our favourite species like snappers, emperors and coral trout form spawning aggregations."

More information: Almany, G. et al. Larval dispersal from a grouper spawning aggregation and the spatial scale of fisheries replenishment, *Current Biology*.

Provided by ARC Centre of Excellence in Coral Reef Studies