Decade of benefits for the Great Barrier Reef

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With this week marking the tenth anniversary of the rezoning of the Great Barrier Reef Marine Park, prominent marine scientists from around the world have gathered in Canberra to discuss its successes - both expected and unexpected.

"At the time, the rezoning of the Great Barrier Reef Marine Park was the largest marine conservation measure in the world," says Professor Garry Russ from the ARC Centre of Excellence for Coral Reef Studies (Coral CoE). "The Reef went from being five percent protected to about 30 percent. So now, a third of it is green, or no-take, zones."

Designed to conserve biodiversity, the plan identified and recognised 70 bioregions across the Reef for protection. So, not only are corals being protected, but seagrasses and other habitats across the area are too. And with no fishing allowed in the green zones, the fish and sharks in these reserves are bigger and more plentiful than they are in the fished areas.

Professor Hugh Possingham, from The University of Queensland, co-developed Marxan - the software that was instrumental in the rezoning of the reef. He says the plan represents, globally, the first large-scale systematic zoning to be fully implemented. And now it is a model being copied around the world.

"Remarkably, almost every habitat feature and bioregion met its 20 percent conservation target," he says. "And furthermore this was all achieved whilst minimising impacts on other users."

However, this achievement was not met without some controversy. Prior to 2004, protected areas were a lot further away from the coast. But with the rezoning, protected areas were brought in closer to shore and to cities such as Townsville, Cairns, Mackay and Rockhampton.

"Though the objective of the rezoning was to protect biodiversity, the political issue very rapidly became focused on fishing," says Russ.

Scientists were challenged for many years to prove that marine reserves were benefitting fishing areas through connectivity. But they weren't able to do so until a study published in 2012 linked parent fish in the green zones to baby fish in the fishing areas through DNA tracking.

"About 80 percent of the babies of big coral trout from these green zones are being dispersed via ocean currents to settle in the fished areas," explains Russ. "So marine reserves don't lock up fish resources. In fact, it is a pure bonus through conserving biodiversity that we see reserves exporting fish recruits to fishing areas."

In the Keppel Islands, ocean currents on average disperse coral trout larvae about eight to nine kilometres (kms) away from their parents.

"Currents can carry larvae as little as one km away," says Russ. "But the maximum distance recorded so far is an astounding 250 kms."

"From these figures, we can see that the reserves are likely connecting to each other, which is great for the conservation objectives and great for the fisheries too."

But, Russ warns, even with the successes of marine reserves, it doesn't mean we can get too comfortable.

"The Great Barrier Reef has been hit by a lot of major environmental

disturbances, such as cyclones, crown-of-thorns outbreaks and bleaching events," he explains. "Live coral cover has declined by 50 percent in the past 27 years, and we see both no-take zones and fishing zones hit equally as hard."

"What this shows is that protected areas are not necessarily protected from everything. But how they recover will depend on the number of other stressors they have to contend with."

A management plan for an extension of Australia's current marine reserves network is currently under review by the Australian Government. Possingham says he hopes "that the review process for the entire nation will have the same level of scientific and economic rigour that underpinned the rezoning of the Great Barrier Reef."

Provided by ARC Centre of Excellence in Coral Reef Studies