

# Reef sharks threatened by overfishing

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A study by Australian scientists has warned that coral reef shark populations on the Great Barrier Reef are in the midst of a catastrophic collapse.

The research by William Robbins and colleagues, based at James Cook University and the ARC Centre of Excellence for Coral Reef Studies, found that grey reef shark numbers had already declined to around 3% of unfished levels, and are currently declining so fast that they could collapse to one thousandth of their unfished levels within 20 years if current conditions continue.

Whitetip reef sharks fared little better: they are currently at 20% of unfished levels, and are headed towards 5% within two decades.

The study is the first of its kind to combine direct underwater counts of shark abundance with mathematical models that project future population trends based on information about reef sharks' current survival, growth and reproductive rates.

“Our research indicates that current reef shark abundances and levels of fishing pressure are simply not sustainable. Reef sharks are effectively on a fast track to ‘ecological extinction’ – becoming so rare that they will no longer play their part in the ecology and food web of the reef,” says Robbins, the study’s lead author.

“It also suggests that immediate and substantial reductions in fishing pressure will be needed to give threatened populations any chance of

recovery,” he added.

The researchers also compared shark abundances in reefs that had been zoned for different levels of fishing in the decades preceding the study. They found that some types of no-take zones had worked very effectively for reef sharks, but that others had not. In particular, reef shark abundances in “pink zones”, which are strictly policed no-take zones that require special permits to enter, were as large as on oceanic reefs with virtually no shark fishing. In contrast, shark abundances in “green zones”, where illegal fishing is much harder to prevent, were similar to abundances in legally fishable areas.

“Reef sharks mature late in life, and, like many whales and dolphins, produce very few offspring,” notes Mizue Hisano, a co-author of the study. “This makes it hard for them to bounce back from even low levels of fishing, such as poaching in green zones.

The study highlights the importance of ensuring high compliance with no-take regulations. “The recent re-zoning of the Great Barrier Reef, with its increased emphasis on building support for no-take zones among reef users, is an important step to increase the effectiveness of no-take areas,” says Dr Sean Connolly, another of the study’s authors.

“However, these efforts need to be combined with realistic limits on shark fishing for the ecosystem as a whole. Because shark fishing is intensifying, the population collapses that we have identified are likely to accelerate if we do not take action now.”

It was especially disturbing that a collapse in shark populations had occurred on Australia’s Great Barrier Reef, says Hisano. “The Great Barrier Reef is widely regarded as one of the world’s best-managed reef ecosystems. This means the situation may well be even more serious on reefs elsewhere in the world.”

The team's report "Ongoing collapse of coral reef shark populations" appears in this week's issue of *Current Biology*.

Source: James Cook University

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