

Assessing the vulnerability of fish spawning aggregations in the Great Barrier Reef: A new approach for fishery managers?

Many reef fish species form large spawning aggregations at certain times of the year. These aggregations maximise spawning success for these species, but also make it easier for fishers to target and catch large numbers of fish. While fishing of spawning aggregations can provide fishers with good catches, catching too many fish and disrupting spawning can lead to the over-exploitation and potential collapse of fish stock. While these problems are well recognised, it can be difficult for fisheries managers to identify targeted fishing of spawning aggregations and to assess the risk this poses to fish stocks.

Research in the Great Barrier Reef has developed a *Tiered Analysis Approach*¹ to analyse fisheries logbook data to assess the vulnerability of fish populations to fishing during the spawning seasons. This approach was used to assess fisheries targeting coral trout (*Plectropomus* spp.), redthroat emperor (*Lethrinus minatus*) and the Spanish mackerel (*Scomberomorus commerson*). The analysis found that while the fishing during the spawning season did not increase the vulnerability of the reef dwelling species (coral trout and emperor), it did increase the vulnerability of the epipelagic Spanish mackerel. The research recommends using a tiered approach that considers multiple types of fishing vulnerability analyses and metrics. Without a tiered approach, those species most vulnerable to fishing and thus amenable to spawning season specific management of fishing may be overlooked.

Further reading

Tobin A., Currey L. and Simpfendorfer C. 2013. Informing the vulnerability of species to spawning aggregation fishing using commercial catch data. *Fisheries Research* 143:47–56.

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*The analysis found that fishing of the leopard coral trout (*Plectropomus leopardus*) during the spawning season did not significantly modify its vulnerability (image source: Great Barrier Reef Marine Park Authority).*

¹ A tiered approach refers to a process in which the exposure or risk assessment uncertainties progress systematically from relatively simple to more complex. An important feature of a tiered analysis is that the uncertainty analyses may be refined in successive iterations. (Source: <http://cfpub.epa.gov/si/>)