

Wildlife spectacle and fishery source urgently need protection

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Wildlife spectacles are marvels of nature. They can involve brief gatherings of tens of thousands of individuals for feeding, mating or giving birth. Examples include large nesting seabird colonies, enormous gatherings of monarch butterflies, seasonal mass movements of wildebeest, snake congregations, turtles on nesting beaches, shark birthing areas, and bird migrations. For many species, these are key life history events that are crucial for population regeneration. Today the importance of these massive biological gatherings is widely recognised, and many land-based events receive some protection. Indeed, many wildlife spectacles are now important generators of tourism dollars.

Today few large wildlife gatherings are exploited for food, but the spawning aggregations of many reef fish species are a notable exception in the marine ecosystem. These are exceptional in that they are still widely

exploited and are rarely managed; as a result, many are disappearing. Once they stop forming, the fisheries that depend on these aggregations collapse, as has been witnessed in parts of the Caribbean and Southeast Asia. There is a rapidly growing recognition of the importance of protecting spawning aggregations and allowing adult fish to produce young for the future, but this is proving to be a surprisingly difficult challenge.¹

Reef fish spawning aggregations are found in many species of commercial importance, including prime food fish (e.g. many snappers, larger groupers, jacks, emperors, mullets and rabbitfish). Each year, aggregations of these species typically occur at specific times and locations and may only form for a few days or weeks (a couple of months at most). Some are associated with extensive migrations of large groups of fish that move from their home reefs to assemble with others of the same species to mate. For many of these species the aggregation time and location is the only opportunity to reproduce, making it important for scientists and fishery managers to understand and appropriately protect or manage these gatherings. Of particular concern is the speed with which aggregations can be overfished once they are discovered; globally about two-thirds of all exploited aggregations are yielding declining landings and some have even stopped forming altogether. This situation represents a considerable challenge, both for management and for conducting the research that would help us to better understand these remarkable life history events. Such research is best conducted on unfished aggregations, before they have been reduced or otherwise altered by exploitation, but these are remarkably difficult to find or access.

A small international group of scientists was recently afforded a wonderful opportunity to visit what appears to be a pristine aggregation site and witnessed a massive gathering of reproductive camouflage grouper,



*Yvonne Sadovy records data prior to a camouflage grouper (*Epinephelus polyphekadion*) spawning event. Image: Éric Clua*



As the spawning event approaches, the number of groupers in the area increases. Image: Éric Clua.

Epinephelus polyphekadion. (The location is undisclosed to protect it from possible exploitation.) Aggregation is known to occur during one or two months of the year. This year, the aggregation first began to develop over about a week in June, the initially empty reef slowly became busy as more and more groupers assembled over about a hectare. We think that the fish were mostly males because there were many aggressive interactions as males faced off to each other, angrily jockeying for prime space on the reef; places that are presumably attractive to the ladies! As the number of fish climbed into the thousands, the divers eagerly visited the site each day in the hope of seeing spawning. But, other than for a few very ripe-looking females, their massive bellies full of hydrated eggs — a clear sign of imminent egg release — we saw no spawning. Despite all the excitement of seeing so many active fish, we had to pack up and leave the area without witnessing any mating. We had selected the wrong month!

Several lucky biologists did, however, manage to return the following month and for just two days witnessed incredible spawning events. Tens of thousands of camouflaged grouper had gathered this time and intense mating occurred over just two days, accompanied by considerable fighting, colour changes, and many large-bellied hydrated females desperate to release their eggs. Sharks came into the site and as the groupers jostled for spawning partners and rushed up into the water above

the reef in small groups to rapidly release their packages of sperm and eggs, sharks used the opportunity to snatch up distracted individuals; a feeding and breeding frenzy of incredible proportions and intensity. And then, by day three, suddenly all the fish had gone — migrating into the lagoon in large groups. This species has just a few days each year for reproduction — a very brief window, but critical for the population to renew itself.

Aggregations such as the one described are, not surprisingly, highly susceptible to overfishing if unmanaged and can disappear within just a couple of years if overfished. One of the biggest challenges to management is that there are so many fish together at one time that it is hard for a fisherman or a manager to believe that any management is necessary. This “illusion of plenty” hides the highly vulnerable nature of these fantastic and important events. Indeed, in many places, aggregations are a seasonal target of fishing. What we are learning, however, is that they really need to be a seasonal target for protection. Let the fish spawn undisturbed and the eggs produced will maintain a healthy fishery for the rest of the year. Lack of action will eliminate these incredible natural wonders and destroy the fisheries they support.

For more information
on spawning aggregations, see:
<http://www.SCRFA.org>

¹ The sustainable management of spawning aggregations in the Pacific Islands region is a major focus of the Secretariat of the Pacific Community, which addresses this challenge in close partnerships with the University of Hong-Kong (SCRFA) and the Insular Research Center and Environment Observatory (CRIOBE) in Moorea (French Polynesia) under funding provided by the French Ministry of Sustainable Development in the framework of the International Coral Reef Initiative (ICRI). The David and Lucile Packard Foundation provides funding for SCRFA.