



Newsletter

Number 5 – June 2004

Editorial

The SCRFA fisher interview project in the western Pacific seeks to document the current status and history of exploited reef fish spawning aggregations to build a stronger case to protect them. We are also learning more from the communities and local governments about ways in which that protection could be effective.

Options for management include protection of the aggregation site itself, either temporarily or permanently, or protection of the aggregating species during its spawning season. Seasonal protection has the advantage that it is not necessary to know the precise locations of spawning sites; the disadvantage is that the habitat of the site itself is not protected. Which approach, seasonal or site protection, is most appropriate depends on the local situation such as enforcement capacity, distance of aggregation from the community, community support for management and the marketing set-up (i.e. number and location of market outlets). In many cases the best protection a site can have is to remain unknown.

Examples of seasonal protection can be found on the Great Barrier Reef and in

the Caribbean, among others. Another approach, in the western Pacific and Cuba, is to protect outer reef channels and passes, during the spawning seasons, since these appear to be a significant habitat for spawning and aggregation-fishing for some commercial species.

There is a growing commercial interest in many reef fishes and many of the more vulnerable species aggregate to spawn. If information is released prematurely on aggregation locations, we believe there is a very real risk that they will be fished, and most probably overfished before protection is implemented. Very few known spawning aggregations in the Pacific, for example, are protected and few of these are likely to be effectively protected in the near future. Therefore, it is important to consider a range of management options (see MPANews article, below).

SCRFA Activities

First and foremost I want to grab your attention to announce a **SCRFA members' meeting** at the upcoming 10th International Coral Reef Symposium in Okinawa. The meeting will take place immediately after the spawning aggregation mini-symposium session on July 1st in Room 8 of the convention centre (6.00 p.m.) I look forward to seeing some of you there.

We have now produced a number of posters and an information pamphlet (this is in English and is about to be produced in Spanish and Chinese) on spawning aggregations. These will be available in Okinawa, and are on our website, but I can also mail copies. If further translations would be useful, let me know.

The Western Pacific project of fisher interviews is now almost complete and country reports will be available on our website over the next few months. Most recently, surveys were completed in Malaysia (see below) and Indonesia, with excellent from local governments, NGOs and fishing communities. We are most grateful for all the help and kind hospitality afforded us during the visits.

The SCRFA database has been upgraded and we now have a map function and a lot more data; over 550 aggregations have now been entered. The database is available from our website and we also have a link directly from FishBase (www.fishbase.org). This is currently on the homepage, searchable by country, and will later be linked to individual species.

The SCRFA Newsletters are widely circulated and are intended to cover aggregation-related work in progress, including management, debate and implementation, new research and other items that will hopefully be of general interest, as well as news of SCRFA activities. We warmly welcome submissions of news items, information on recently published work and any other relevant material. Please submit to: scrfa@hkucc.hku.hk.

Our work is funded by the David and Lucile Packard Foundation.

News

Caribbean and Atlantic

Bahamas

A film has just been released by Friday's Films (<http://fridaysfilms.com/> then go

to projects) called 'Hanging in the Balance'. Through the words of fishers in the Bahamas the film explores the changes in reef resources that they have seen and their concerns about declines. There are good segments on spawning aggregations and this approach to raising awareness in source countries, based on the testimony of those who use and depend on the resources, is a powerful way to convey the message.

Bermuda

Following the discovery of a large aggregation of black grouper (*Mycteroperca bonaci*) near the seaward edge of the Bermuda reef platform, the Department of Environmental Protection of the Bermuda Government has recommended that the site, and a substantial buffer zone around it, be closed to all fishing on a seasonal basis (May 1st – August 31st). This will allow an initial assessment of the site to be conducted in 2004.

The black grouper site lies between two other areas that are seasonally closed to all fishing to protect red hind (*Epinephelus guttatus*) spawning aggregation sites. These areas were initially seasonally closed in the 1970s and have remained so ever since, albeit with some changes in the boundary delimitations. The designation of this new closed area will effectively create one large seasonally closed area to protect at least three known grouper spawning aggregation sites. As no fishing is permitted in this area, it will also reduce fishing pressure on many other species as well.

Despite a bag limit of one black grouper per boat per day implemented in 1996,

the increased catchability of these large groupers at aggregation sites makes them vulnerable to fishing pressure at aggregations. With a strong market demand, there is an economic incentive to fish at aggregation sites and black grouper will continue to be a prime target species for the fishery. Affording seasonal protection through closure of the site will reduce this vulnerability.

Cuba

In an important step forward, the Ministry of Fisheries in Cuba has passed a law banning the use of large nets across channels. This will protect several important species of snappers that have been long been caught while migrating through channels to spawning sites - often in very high numbers. The law is in place for several months during 2004, and will be year-round in 2005.

Indo-Pacific

Australia

Protection of the Great Barrier Reef Marine Park (GBRMP) is soon to be increased. On 1 July 2004, a new Zoning Plan will come into effect, increasing the highly protected areas where no fishing is allowed on the Great Barrier Reef from 4.5 per cent to 33 per cent. This is one of the most exciting global advances in the protection of marine biodiversity in recent decades.

This major initiative for the long-term protection of the Great Barrier Reef means that a significant proportion of reef fish spawning aggregation sites will be protected. Combined with recently introduced recreational bag and size limits, a reduction in commercial fishing

effort and catch and the introduction of seasonal closures, this new measure will help ensure the coral reef fish fisheries on the Great Barrier Reef are ecologically sustainable. (Information on re-zoning GBRMP can be found at: www.gbrmpa.gov.au.)

Malaysia

In January 2004 surveys were conducted for SCRFA in the E. Malaysian state of Sabah on Northern Borneo. Reef fish catches have been declining for several years in the area due to heavy and destructive fishing pressure and there was virtually no information available on the existence of spawning aggregations, or whether they are exploited. Ninety-two interviews were made with a variety of stakeholders (largely fishers) from around the state to investigate the existence, status and use of reef fish spawning aggregations.

Data were compiled into a field database and consolidated into a list of 57 reported individual-species aggregations (see SCRFA database). Most aggregations were of serranids including *Plectropomus* and *Epinephelus* species, and several siganids were mentioned. Many of the aggregations had been exploited for generations but trends of catch per unit effort (CPUE) from the memories of fishers indicated that most had declined substantially. Several had either ceased to exist or had declined to such an extent that fishers no longer bothered to exploit them. Lyang Lyang atoll in the Spratley Islands and Sipadan Island were exceptions, presumably due to the strict prohibition of fishery activities (disputed waters and tourist area).

Other than these two sites and one other protected area, there is currently no management of reef fisheries and no specific provisions for the management of spawning aggregations. Although fishers typically associated the decline of reef fisheries with increasing levels of effort, there was little evidence of a consensus for curtailing fishing activities. Some fishers were unconcerned with declines, citing that increased prices and alternative target species compensated for other losses, while others viewed declines as inevitable, or the result of outsiders. Thus the conservation of many of these aggregations in remote locations, although urgent from a conservation perspective, will be difficult without extensive collaborative and education efforts with the local communities affected.

Maldives

The Maldivian environmental NGO Blue Peace has stepped up its efforts to persuade authorities in the Maldives to conserve dwindling grouper stocks. Annual *per capita* consumption of fish in the Maldives is amongst the highest in the world, at around 125 kgs, but most of this is tuna and other pelagic species. Groupers are not valued as food fishes and were reportedly so common a decade ago that they were considered a nuisance by hook and line fishers targeting other reef fishes. All this changed about 10 years ago when middlemen and foreign buyers started buying large quantities for the South East Asian market. Even though prices paid to fishers were not particularly high, the income generated enough to pay for schools and mosques on some of the islands.

Concern about overfishing of serranids in the Maldives led to Blue Peace launching a campaign in the early 1990s to conserve stocks while the government Marine Research Center noted the number of frozen groupers exported from Maldives showed a 73 percent decline from 1997 to 1998. Fishers reported average lengths were decreasing, as were numbers of baitfish such as damselfishes used to catch the groupers. However, demand remains high and the price paid to fishers today is 10 times that when the fishery began. This demand has led to the discovery and exploitation of spawning aggregations. According to the Maldives Customs Service, Maldives exported Rf15 million (around USD\$ 1,18 million) worth of groupers last year

Blue Peace is calling for restrictions on fishing groupers in the Maldives saying that there is ample evidence of the need for action with fishermen and divers reporting fewer and fewer groupers on the reefs. Blue Peace would like to see a ban on fishing spawning aggregations during the spawning season and a quota on grouper exports to reduce demand. Ali Rilwan, executive director of Blue Peace, said “we need to stock our groupers just like fixed deposits in a bank. Only then can we ensure that we have a comfortable reserve.”

Compiled from a report by Hilath Rasheed and Hassan Amir entitled “Groupers overfished in Maldives waters, warns NGO Blue Peace” in the Haveeru Daily online newspaper, 18 June 2004 and the Blue Peace website <http://bluepeacemaldives.org/>

Palau

In the Micronesian island nation of Palau, fishers and traditional leaders have long known where aggregations are located and did their best to manage them. Now a new generation of resource managers has emerged. Since 1996, the Palau Conservation Society (PCS) has worked with the Ngarchelong State Community, resource owners of the Ebiil Channel aggregation site in western Palau, a reef channel, to protect the aggregation. In 2000, a traditional *bul* was declared. A *bul* is a prohibition from the traditional leadership on a resource, whether a species or a place, for a certain period of time. In this case, the *bul* prohibited entry to the channel and declared the area a no-take zone for 3 years. The *bul* was formalized and supported through state legislation. In 2003, at the end of the 3 years, the local leadership and community extended the *bul* indefinitely and are now developing a management plan. PCS is working with the Ebiil community to study the frequency and status of the aggregation. To protect the Ebiil aggregation and other coastal resources, the Ebiil Society was formed in January 2004, and has been developing activities including documentation of local and traditional knowledge of all local marine and terrestrial resources, and educating their children about their rich heritage. In addition, they are tackling solid waste management, community clean ups, expansion of MPAs and building local capacity for enforcement. The Ebiil Society has begun to meet with neighbouring communities to discuss ways of jointly managing other valuable coral reef and fish resources.

Publications and Articles

- Alonzo, S. H. and Mangel, M. (2004). The effects of size-selective fisheries on the stock dynamics of and sperm limitation in sex-changing fish. *Fishery Bulletin* 102(1):1-13
- Cornish, A. S. and Sadovy, Y. (2004). Diminishing Returns. Spawning Aggregations are at Risk in the Indo-Pacific. April/May 2004 Issue. P. 28
- Domeier, M.L. (2004) A potential larval recruitment pathway originating from a Florida marine protected area. *Fish. Ocean.* 13:in press
- Sala E, Aburto-Oropeza O, Paredes G, Thompson G (2003) Spawning aggregations and reproductive behaviour of reef fishes in the Gulf of California. *Bull. Mar. Sci.* 72:103—121
- Sala et al. (2004) Fishing down coastal food webs in the Gulf of California. *Fisheries.* 29(3):19-25.
- MPANews: The Science and Policy of Protecting Spawning Aggregations- Interview with Yvonne Sadovy - [http://depts.washington.edu/mpanews/issues.html#Jun 2004](http://depts.washington.edu/mpanews/issues.html#Jun%202004) (see below for extracts).

Acknowledgements

Many thanks to the following for information and help with this Newsletter: Julie Barr (Palau); Elizabeth Matthews (Palau); Ken Lindeman (Cuba); Brian Luckhurst (Bermuda); Perry Pickert (Friday's Films); Martin Russell (Australia); Andy Cornish (Maldives); John Davies, MPANews, and Tim Daw (Malaysia).

MPANews Interview in full:

John B. Davis, Editor MPA News

E-mail: mpanews@u.washington.edu

Website: www.mpanews.org

* **MPA NEWS:** Should all spawning aggregations of commercially valuable reef fish be incorporated in no-take reserves?

* **SADOVY:** No. Not all reef fish spawning aggregations need to, or should, be incorporated in no-take reserves, nor do they all need to be protected. There are some circumstances when low levels of subsistence fishing on spawning aggregations can probably be sustained, and not all aggregating species are equally vulnerable to fishing.

In cases where protection is necessary, the appropriate measures depend on the biology of the species, the nature of the fishery, and the local management and social contexts. In many places, a seasonal sales ban during the spawning season might be easier to implement than a no-take reserve. One specific example is in Palau, which has a seasonal sales ban on three species of aggregating groupers. Although the aggregation sites are also temporarily protected during the reproductive season, their distance from land and the limited enforcement capacity mean that they cannot be easily observed. Therefore, no one is allowed to catch or sell fish during the aggregation period. Moreover, the reef channels where the aggregations occur are important fishing areas for a range of species outside of the reproductive season, so closing them permanently as part of a no-take reserve would be unacceptable to many local communities.

In addition, aggregation locations can shift from year to year. If the protected area is too restricted, or if fish migrate along predictable pathways to aggregations, as the Nassau grouper seems to do in the Caribbean, then a no-take reserve may not protect the aggregations or migration routes effectively unless it is very big, which may be difficult to implement in practice.

Finally, in many places the actual spawning locations are not widely known. Protection of fish during spawning seasons, which are relatively easy to determine, can effectively protect such species without any need to know the physical location of aggregation sites.

Several such sites are protected largely because they are not yet known.

* **MPA NEWS:** Could the process of trying to protect such aggregations actually have the effect of publicizing their location, potentially exposing them to greater fishing pressure?

* **SADOVY:** This is an important point and is true only if the aggregation site itself is to be protected, rather than using some other form of management such as seasonal protection. This is why different management options need to be considered and applied according to local circumstances.

For example, in the Indo-Pacific over the last decade, there has been a growing commercial interest in many reef fishes for the international trade in live reef fish for food. Several of the key species in this trade aggregate to spawn, and traders and businessmen - looking for good sources of live fish - search for potential aggregation sites using the same kinds of information as biologists do. If biologists release information prematurely on aggregation locations, or reveal techniques that would make aggregations easier to find, there is a very real risk that the aggregations will be fished, even overfished, before protection is implemented.

The reality is that very few known spawning aggregations, anywhere, are currently protected and few of these are protected effectively. SCRFA therefore believes that there is a need for discretion in not widely revealing aggregation site locations identified by our work, other than in the immediate context of management with local communities, conservation groups, and government, and then only on a strictly need-to-know basis.

Almost all the sites that we have come to learn about in our Western Pacific work are already known by fishers, but often only by a few small communities. Again, one way to protect species without widely revealing their aggregation sites, or without knowing all the sites, is through seasonal protection. Another approach, in the Pacific, is to protect outer reef channels and passes during the spawning seasons since such areas are already known to be a significant habitat for spawning aggregations for several valuable fish species. In some places, such habitats could be included in the planning of no-take marine reserves.