



## *Newsletter*

**Number 3 – August, 2003**

### **Editorial**

As SCRFA becomes more widely known we are starting to receive feedback on our work and are better able to understand where we might be of greatest benefit. The Methods Manual has now been widely distributed and has been very well received as a useful reference for a range of initiatives in the early stages of development. These include aggregation research, monitoring and management. Interest is also clearly growing in using the fisher interview approach to learn more about local aggregations and I am planning to post several items on our website on this form of information gathering, based on our own experiences and on those of others who have used this approach with similar ends. Valuable information can be gathered by interviews but how they are conducted is important and makes an enormous difference to the usefulness and accuracy of data collected.

The feedback we are getting indicates that our work is relevant to the current needs of workers and we are increasingly being asked to provide reviews or input into proposals, manuals and other products. Most recently we

have provided expert advice to The Nature Conservancy for an information package they are producing on spawning aggregations.

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](mailto:scrfa@hkucc.hku.hk).

The Manual for the Study and Conservation of Reef Fish Spawning aggregations (Colin *et al.*, 2003) can be downloaded from [www.scrfa.org](http://www.scrfa.org), or is available in book or CD form from [scrfa@hkucc.hku.hk](mailto:scrfa@hkucc.hku.hk).

*Yvonne Sadovy*

### **SCRFA activities**

*Field surveys:* As part of our Packard Foundation funded work we continue to conduct field interviews in the western Pacific to document known aggregations, their history and current status as well as attitudes and approaches to their management. We have been discovering a wealth of information. See sections on Palau and Philippines (below) for highlights of the most recent surveys. Full reports on field interview surveys will be available next year.

*New Caledonia – Heads of Fisheries meeting:* On behalf of SCRFA, Being Yeeting of the Secretariat for the Pacific Community (SPC) made a presentation

on Aug 21<sup>st</sup> at the SPC Heads of Fisheries third annual meeting (Aug 18-23, Noumea). Being reports comments of appreciation from several countries on the importance of SCRFA's work; since spawning aggregations are frequently targeted in the region for both subsistence and the live reef fish trade, our work is particularly relevant. We are most grateful to Being for representing the Society in New Caledonia at this important meeting.

*Board meeting:* the second SCRFA Board meeting was held on 15-16<sup>th</sup> May 2003 in San Diego. A summary of the Minutes is available on our website. *SCRFA Board Members:* Michael Domeier (Chairman) PIER, Pat Colin (CRRF), Yvonne Sadovy (SCRFA), Martin Russell (GBRMPA), Brian Luckhurst (BG), Ken Lindeman (ED), Terry Donaldson (UOG). *Andy Cornish (HKU) keeps the Global Database.*

## News

### CARIBBEAN & ATLANTIC

#### *Brazil*

The wreckfish, *Polyprion americanus*, is a deepwater reef fish that aggregates to spawn and has a wide geographic distribution; there is genetic evidence, however, that the stock in Brazil may be an isolated population, or even an endemic species of the genus *Polyprion*. Following a request from workers reflecting concern from local fishers in Brazil over the status of the local stock, the IUCN Grouper/Wrasse Specialist Group assessed the Brazil stock/species to be critically endangered in Brazil: a global assessment of the species was also done. Wreckfish were traditionally

caught in southern Brazil by local hand-liners, but, from the mid 1990's, fishing pressure increased significantly. The fleet grew to 35 boats, changed to horizontal long-lines and expanded the fishing areas northwards to include the species' spawning grounds. From 1998 to 2001 there was intense exploitation by four Spanish-leased long-liners that ultimately left the fishery for economic reasons. The local fishery finally collapsed in 2002, showing how fast a stock can be depleted, especially when the species is long-lived, slow-growing, has low natural mortality and seasonally forms spawning aggregations at specific sites. In addition, recruitment of southern Brazil wreckfish to the fishing grounds is slow (8 to 33 years), which means that it takes at least 8 years before the signs of overfishing can be detected. Although wreckfish are no longer targeted, some are still taken as a bycatch off southern Brazil. The species, particularly during its aggregation period, needs protection in Brazil.

#### *Mexico*

The Centro de Investigacion y Estudios Avanzados del Instituto Politecnico Nacional (CINVESTAV-IPN) in Merida, Yucatan, Mexico, has been studying the biology of groupers from the continental slope of the Yucatan Peninsula (Campeche Bank) for the past decade. Because grouper landings and catch-per-unit-effort have decreased over this period (with constant fishing effort), the Mexican government proposed, for the first time, a closed season as a new management measure to protect the grouper resource. This fishing regulation has been official since February 13, 2003 (Federation Official Diary of Mexico) and includes a

seasonal closure, during the reproductive period, for all grouper species from February 15 to March 15. This applies to all waters of the Exclusive Economic Zone from Campeche and Yucatan States (Gulf of Mexico) and Quintana Roo State (Caribbean Sea), as well as from Rio San Pedro, between Tabasco and Campeche States, to the Belize border. Additionally, there are restrictions in the use of long-line fishing gear during the closure in these areas.

The seasonal closure is based on studies of the reproductive biology of the three more important grouper species from the Campeche Bank (red grouper, *E. morio*, black grouper, *Mycteroperca bonaci* and gag, *M. microlepis*). These studies have shown that these fishes all show peak spawning activity between January and March in the Southern Gulf of Mexico. Future studies will indicate if this fishing measure will be appropriate and adequate for the management of the southern Gulf of Mexico grouper resource. Both *Mycteroperca bonaci* and *M. microlepis* aggregate to spawn so these closures cover part of their spawning aggregation period.

The above two articles were extracted from Newsletter No. 6 of the IUCN Specialist Group of Groupers and Wrasses, which has additional information on serranids and labrids <http://www.hku.hk/ecology/GroupersWrasses/iucnsg/index.html>

#### *Gulf of Mexico - USA*

It was reported in the last SCRFA newsletter that regulators were proposing to end the current one-month long (Feb 15-March 15) spawning season closures for three species of grouper in the US Gulf of Mexico. The groupers involved are the black (*M.*

*bonaci*), gag (*M. microlepis*) and red (*E. morio*) groupers; the black and gag groupers aggregate during the spawning season. This regulation reversal was apparently in response to industry concerns that such closures result in lost local markets to foreign imports. However, the closure remained in effect during the 2003 closed season (<http://www.gulfcouncil.org>). The existing one-month closure is for the commercial fishery only and does nothing to reduce recreational fishing. Recreational fishers catch many more gag grouper than the commercial fishery. There is a real need, therefore, to address the impacts of the recreational fishery and work is now being conducted to examine the recreational versus commercial impacts of fishing during these spawning period closures, an consideration applicable not only to the Gulf of Mexico fishery.

#### *Cuba*

"Primero, gracias. Segundo, muchisimo gracias!" SCRFA heard in June from Angel Quiros, a well-known Cuban biologist, in referring to our new spawning aggregation Methods Manual, at a recent Marine Protected Area workshop in Cuba. As Chief Biologist of the Ministry of Environment's provincial office designing and implementing MPAs in Villa Clara Province in north-central Cuba, Quiros has been working with fishermen to identify spawning aggregations for increased protection. He has found the manual to be of 'extraordinary' value for his team's work, in terms of both in-water research and fisher outreach. Hard copies of the Manual have been distributed to 8 major libraries and

research groups around Cuba by Environmental Defense.

## INDO-PACIFIC

### *Marshall Islands*

At least two grouper spawning aggregation sites are targeted each year between November and April by a live reef fish operation at specific sites off Enewetak Island. Moreover foreign fishermen employ long-lining in Enewetak lagoon to catch the fish needed to feed the thousands of caged groupers held for months and destined for export in the live reef fish trade. According to the Marshall Islands Marine Resources Authority (MIMRA), long-lining in the Marshall Islands lagoons is illegal and fishing of spawning sites would not be allowed under a management plan that is currently under discussion. One possible component of this plan will be to ensure a competent observer programme for live reef fish fishery operations <http://www.marine.org/Philippines/emarineline/emarineline.html#Goodnews#Goo>

### *Palau*

Thirty in-depth interviews were conducted throughout Palau in July, 2003. Significant new data were collected on approximately 10 previously undocumented spawning sites, many of which involved three grouper species noted to aggregate together elsewhere in the Pacific: *E. fuscoguttatus*, *E. polyphkadion* (=microdon) and *Plectropomus areolatus*. Presentations made on the results of the work were well received. Palau is distinguished as one of the first places in the Pacific to formally protect

spawning fishes using a combination of seasonal and spatial closures. Although many aggregations appear to be still viable, it was clear that declines continue to occur despite protective legislation. Recommendations were provided to extend the protection season to include August, currently unprotected but which interviews consistently revealed to be a spawning month. The biggest problem identified was a need for greater enforcement of current laws for aggregations away from the population centre of Koror. We also recorded marked declines in rabbitfish aggregations. Many fishermen recognized the need for stronger aggregation protection and were concerned about recent declines perceived to be occurring in aggregations remote from the capital, where fishing activity is intensifying.

We are extremely grateful for the assistance of the Palau Conservation Society while conducting fisher interviews in Palau.

### *Philippines*

Few fish aggregations have ever been reported in the literature from the Philippines, other than rabbitfish and milkfish. Forty in-depth interviews were conducted in the central Visayas and around Palawan. Clear evidence for spawning concentrations of several grouper species, including *Plectropomus leopardus*, was recorded; in many cases these had been relatively recently discovered, largely as a result of fishers moving offshore, as inshore stocks depleted, and in association with fishing activities (including the use of hookah) seeking live grouper for the live reef food fish trade centred in Hong Kong.

We are extremely grateful to WWF-Philippines, and especially Dr. Jose Ingles, for assistance in conducting fisher interviews in the Philippines.

## Research

SCRFA Board member Patrick L. Colin of the Coral Reef Research Foundation (CRRF) is carrying out a project on Palau's reefs looking at the connection between spawning aggregations, local water circulation and recruitment habitat. The work is designed to put into practice a number of the ideas presented in the SCRFA "Methods Manual" (SCRFA Special Publication 1) and to refine methods of making repeatable and accurate quantitative surveys of spawning aggregations. Working with Terry Donaldson (another SCRFA Board member) of the University of Guam, they have been doing quantitative surveys of the Ulong Channel (Ngermakool) grouper spawning aggregation during the spawning season of April to August 2003. A logging GPS receiver, recording the latitude/longitude every 15 seconds, is towed on the surface by a diver who is counting the number of groupers (three species) seen in a 20 m wide swath (10 m each side of the track) every minute. At the end of the day the positions in the GPS are downloaded and the distance covered during each minute can be calculated. Given the 20 m wide swath, the distance travelled in each minute produces an area that also includes the counts of the number of fish in that area. This gives you a density of aggregating fish at specific points in the overall aggregation area. It is then an easy step to plot the overall distribution of fishes through bubble plots or contour maps and arrive

at an estimate of total number of fishes in the aggregations.

Every known and suspected grouper aggregation site in Palau is being bathymetrically mapped using the techniques described in the SCRFA Manual. Vertical aerial photographs of each site are used as base images on which bathymetry is applied, and ground-truthed habitat mapping is conducted for each area. The location and size of aggregations can be plotted on the same images resulting in an increased ability to visualize the relationships between habitat, bathymetry and aggregation occurrence.

Work on the dispersal of eggs by current from spawning sites is being started using GPS tracked lagrangian drifters. Drifters are started where and when eggs are released and allowed to run several hours before recovery, tracking the initial dispersal of eggs from aggregations. Later, drifters with radio beacons will be run for a day or two before recovery to a longer time frame. Modelling of the circulation within the Palau reef system and the offshore waters will be occurring over the next year which should provide estimates of dispersal of fish propagules from aggregations as well as possible recruitment areas. The work in Palau is being supported by The Nature Conservancy and the Coral Reef Research Foundation.

## Miscellany

*Not reef fish but interesting anyway*

Much has been published on squid spawning aggregations, both in terms of mating systems and the effects of

exploitation. While biologically, squid have little in common with reef fishes, the impacts of fishing on aggregations are of interest because of obvious parallels to reef fish aggregation exploitation. They are also relevant because the short life-spans of squid mean that the effects of fishing and management can be assessed far more quickly than for longer lived fishes. Work on the outcome of short-term closures to protect spawning populations in Tasmania of *Sepioteuthis australis* is of particular interest because it suggested that the closures are of value in protecting spawning aggregations and improving egg production (see paper by Moltschaniwskyj *et al*, cited below).

#### *Possible spawning aggregation of Threadfin in Hong Kong*

On 28/3/03 Mr. Patrick Chan was invited to go fishing in the western waters of Hong Kong. He wrote to us saying “the Fourfinger Threadfin (*Eleutheronema tetradactylum*) (Polynemidae) has just arrived in the Pearl River Delta. I hired a fishing sampan and the boat owner took us to Chih Chou Island which is located on the south of Soko Island, in Chinese waters. According to the boat owner the Fourfinger Threadfin was first caught on 27<sup>th</sup> March 2003 and about 40 fish were landed. On that day about 20 fishing boats were fishing in the area. We caught four fish, the smallest one weighing 4 kg and the biggest weighing 7 kg. I believe there was a total of about 70 fish caught on that day by all fishermen with the biggest weighing about 20 kg. According to the fishermen present, this kind of fish comes to the same area 2 weeks before the Ching Ming Festival (*early March – editor*) and leaves after the festival.....many of

the fish were full of eggs”. This could be a spawning aggregation of this threadfin.

## **Publications and Articles**

- Andrade, A. B., L. F. Machado, M. H. Silva, and J. P. Barreiros. 2003. Reproductive biology of the dusky grouper (*Epinephelus marginatus*, Lowe, 1834) Perciformes: Serranidae, Epinephelinae) in Santa Catarina, Brazil. TECPAR vol. 46(3): in press
- Luckhurst BE (2003) Development of a Caribbean Regional Conservation Strategy for Reef Fish Spawning Aggregations. Gulf and Caribbean Fisheries Institute 54: 668-679
- Mapstone, B.D., C. R. Davies, S. J. Slade, A. Jones, K. J. Kane, and A. J. Williams. 2001. Effects of live fish trading and targeting spawning aggregations on fleet dynamics, catch characteristics, and resource exploitation by the Queensland demersal reef line fishery. Report to Fisheries Research and Development Corporation. Project No. 96/138, 72. [www.reef.crc.org.au/publications/scientific/ - scroll down to Mapstone et al. under Technical Reports for downloadable file]
- Moltschaniwskyj, N., G. Pecl, and J. Lyle. 2002. An assessment of the use of short-term closures to protect spawning southern calamari aggregations from fishing pressure in Tasmania, Australia. Bull. Mar. Sci. 71(1):501-514.
- Russell M (2003) Reducing the impacts of fishing and tourism on fish spawning aggregations in the Great Barrier Reef Marine Park. Gulf and Caribbean Fisheries Institute 54: 681-688
- Sadovy Y. and W. L. Cheung. 2003. Near extinction of a highly fecund fish: trouble among the croakers. Fish and Fisheries 4:65-85. [An aggregating sciaenid; fisher interviews.]

## **Acknowledgements**

Many thanks to the following for their contributions to this Newsletter, Beatrice Ferreira, Monica Peres, Being Yeeting, Patrick Chan, Terry Donaldson, Pat Colin, Ken Lindeman, Felicia Coleman, Andy Cornish and Thierry Brule.