SCRFA
SOCIETY FOR THE CONSERVATION OF REEF FISH AGGREGATIONS

Newsletter

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Editorial

Great news just in, to finish the year, is that significant protection of reef fish spawning aggregations has recently been announced from the Cayman Is., the Bahamas and Australia. Such measures are an excellent indication that the need for aggregation conservation has not only been acknowledged, but that protection is finally being implemented. Please see details on pages 2, 3 and 4.

The core of SCRFA's work at the moment is the field survey, which involve interviewing experienced fishers about the current status and history of their local fishery, with emphasis, of course, on those fish species that aggregate to spawn. Not only are these interviews (more than 150 conducted to date) revealing many undocumented aggregations, they also suggest that where declines in general fishery catches have occurred, these are often most marked in species that aggregate to spawn. If such impressions are correct, they may well reflect the all-important links between aggregations and the fisheries that they support, illustrating more clearly to communities and fishery departments, alike, the importance of aggregation protection.

It is also becoming clear that the aggregation sites of certain species have quite specific characteristics. For example, our western Pacific survey results have consistently suggested that *Plectropomus areolatus, Epinephelus polyphekadion* and *E. fuscoguttatus*, in various species combinations, predictably spawn in outer reef passes and channels where currents are strong. What it is about such sites that is important for these, and often other, species, is not known but if they are critical as habitats for spawning (see also the *United States* and *Australia* articles below), then efforts to protect them find important support in Article 6.8 of the FAO Code of Conduct for Responsible Fisheries: "All critical fisheries habitats in marine and fresh water ecosystems, such as wetlands, mangroves, reefs, lagoons, nursery and spawning areas, should be protected and rehabilitated as far as possible and where necessary. Particular effort should be made to protect such habitats from destruction, degradation, pollution and other significant impacts resulting from human activities that threaten the health and viability of the fishery resources."

SCRFA Activities

Field surveys in the western Pacific, involving interviews with experienced fishers, continue, with results from Fiji presented below. Surveys in eastern Malaysia are set to begin the end of December, and for Indonesia in February and March. To date, these surveys have revealed over 50 previously undocumented spawning aggregation sites, many of which show evidence of recent declines, almost certainly due to fishing pressure.

We continue to support management and conservation initiatives where and whenever we can. Recently, supportive letters have been sent to the Bahamas (Minister V. Alfred Gray), Cayman Islands (The Hon. W.

McKeeva Bush) and Fiji (Fisheries Department, the Tagiuba Initiative, and Mali Island).

SCRFA participated in the recent annual 56th meeting of the Gulf and Caribbean Fisheries Institute in Tortola, British Virgin Islands. The message from this meeting is that interest in spawning aggregation management and conservation remains strong. SCRFA is organizing a mini-symposium focusing on spawning aggregations at the International Coral Reef Symposium, to be held in Japan in June/July, 2004. There is just time to submit an abstract for this meeting – the deadline is December 25th.

The global database of spawning aggregations has taken a considerable amount of time and effort to develop but, finally, we aim to launch it on our website at the end of January, 2004. With over 500 records (aggregations) and information on a range of parameters (see www.scrfa.org), we hope that the database will be a useful resource for aggregation-related research, conservation and management.

The SCRFA Newsletters are widely circulated and are intended to cover 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. The newsletters will soon be circulated more widely, as an insert to the Live Reef Fish Bulletin, one of the many excellent publications of the Secretariat for the Pacific Community. 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 currently funded by the Packard Foundation.

News

Caribbean and Atlantic

Bahamas

The government of the Bahamas has just announced a seasonal closure of fishing at High Cay, Andros, as well as a closure of Nassau grouper, *Epinephelus striatus*, fishing throughout The Bahamas. The following press release was released: "The Department of Fisheries advises the public that the waters surrounding High Cay, off the coast of Andros, will be designated as a "Protected Area" during the period of 18th December 2003 to 31st March 2004. During this period all forms of fishing will be prohibited in……..the designated "Protected Area" bounded in the north by latitude 24°40′N, in the South by Latitude 24° 37.8'N, in the east by Longitude 77° 40.8'W and in the west by Longitude 77° 44'W, and encompassing an area of approximately seven (7) square miles.

The Department of Fisheries wishes to further advise the public that the taking, landing, processing, selling and offering for sale of fresh Nassau Grouper will be prohibited during the periods from 1st January 2004 to 31st January 2004 and from 16th December 2004 to 16th February 2005 throughout The Bahamas.

The above measures are a part of efforts being made to ensure that the commercial fishery for the Nassau Grouper in The Bahamas will be sustained for the benefit of present and future generations of Bahamian fishermen and consumers."

Bermuda

Brian Luckhurst has documented two previously unknown fish aggregation sites in Bermuda. The first was discovered with the help of a fisherman friend and is a putative spawning aggregation site of black grouper, *Mycteroperca bonaci,* on the Bermuda reef platform. The site was discovered 4 days after the full moon in July during a dive at 1500 hrs, and at about 33 m depth. The fish were slowly milling around close to the substrate, with few interactions between them. Several individuals were seen undergoing colour changes, and, because of good visibility, Brian was able to make 4 separate point counts from a dive position hanging in the water column above the possible centre of the aggregation site. He estimated that there were 250-300 fish. One and three days later the aggregation was still present but with reduced numbers.

The second aggregation site was discovered by Judie Clee and is a resident spawning aggregation site for the scarid *Sparisoma rubripinne* off the south shore of Bermuda. The site was found in May of this year, close to a protected dive spot (a wreck), with dives subsequently conducted through to the end of July. Spawning took place in the morning; all spawns were group spawns. Of interest, observations were made of predation attempts by black grouper on spawning parrotfish.

Cayman Islands

The Cayman Islands has banned fishing in grouper spawning areas for 8 years, citing a sharp decline in populations of Nassau grouper, according to a recent Associated Press article from Georgetown, Cayman Is.

Thursday's decision by the British Caribbean territory's Marine Conservation Board takes effect Dec. 29, 2003. It will close fisheries in six spawning areas known as "grouper holes" for eight years, the amount of time before a newly hatched fish begins reproducing, to enable populations of this species to recover.

Cayman officials said three of the six areas off the islands are fished-out, with two in serious decline. "We have to ensure the sustainability of the grouper population for generations to come," Marine Con-servation Board chairman Don Foster said. "We acknowledge that not everyone will support this decision." But, he said, most islanders "agree that tighter restrictions are necessary to prevent us from losing our grouper permanently, as has happened in other areas of the Caribbean."

United States – Gulf of Mexico

The Gulf of Mexico Fishery Management Council has recently voted to extend the closed period for Madison Swanson and Steamboat Lumps experimental marine fishery reserves for another 6 years. These areas contain a number of grouper and snapper spawning sites. Commercial and recreational fishermen are supporting the Council for continuing the closure, a complete reversal from their original position in 1999 when closure of the spawning aggregation areas was opposed. However, the Gulf Council is only proposing to close certain spawning areas seasonally, rather than year-round. Chris Koenig (koenig@bio.fsu.edu) of the Institute for Fishery Resource Ecology in Florida, USA, is concerned about this seasonal approach to protected spawning areas in lieu of year-round protection. He outlines six reasons in a more extensive article to be found in the recent IUCN (World Conservation Union) Groupers & Wrasses Specialist Group Newsletter 7 at:

www.hku.hk/ecology/GroupersWrasses/iucnsg/index.html.

Briefly, Chris' points are: 1. A derby-like fishery would result when the seasonally closed area is opened. 2. Fishing in a seasonally closed area would depress the populations of many spawners and thereby decrease reproductive output; many grouper spawning sites appear to hold resident populations all year round. 3. Demographics of the grouper spawning populations would not be protected in seasonally closed areas. 4. Scientific understanding of the ecology and behaviour of the groupers and other economically important reef species would be stifled. 5. Other species using the same sites for spawning at other times of the year would be heavily fished at their time of spawning. 6. It would be difficult to evaluate the effectiveness of a seasonally closed area because results would also be affected by fishing in the open season.

Editor's comment. The question of seasonal versus year-round protection for fish species that aggregate to spawn in what may be critical spawning areas, in different management and cultural contexts, needs further discussion. I invite feedback from readers on these issues.

Indo-Pacific

Australia

Queensland Fisheries Management - the Queensland Government has introduced the *Fisheries (Coral Reef Fin Fish Fishery) Management Plan 2003* to provide for the long-term sustainability of coral reef fin fish stocks on the Great Barrier Reef. A suite of management measures will be phased in from December 2003. Key initiatives that will protect spawning fish include size limits, no-take species and spawning season closures. The Coral Reef Fin Fish Fishery comprises demersal species of cods (grouper species, including coral trout), tropical snappers, wrasses and sweetlips.

An important progression for the increasing global awareness of the need to protect fish spawning aggregations is the introduction of 'Spawning Season Closures' on the Great Barrier Reef. The Spawning Season Closures**,** taking effect in October 2004, involve three, nine-day, closed seasons for the taking of all coral reef fish in October, November and December each year around the "new moon" period. The closures start six days before the new moon and finish 2 days after. The first closure will start on 8 October 2004.

The Queensland Fisheries Service advise that "the closures are designed to protect the spawning aggregations of most coral reef fish species. During spawning periods, mature fish congregate in certain locations on the reef to spawn, generally corresponding with a particular moon phase. This behaviour, during the spawning period, makes these species more vulnerable to fishing through fishers targeting spawning aggregations and increased catchability of the fish..."

Minister for Primary Industries Henry Palaszczuk said: "We heard a range of views about closing the fishery during the spawning season, following a suggestion of a three month closure in a Great Barrier Reef Marine Park Authority (GBRMPA) Report. The scientifically sound outcome is three nine-day closures during the sensitive spawning season."

Great Barrier Reef Marine Park (GBRMP) - the Minister for Environment and Heritage Dr David Kemp has tabled in Parliament the Great Barrier Reef Marine Park Zoning Plan 2003.

The GBRMPA is rezoning the GBRMP, increasing the area closed to fishing from about 4% to over 30%. The objective of the rezoning is to help protect biodiversity within the GBRMP. This will be done by protecting 'representative' examples of all the different habitats and communities in the GBRMP and building upon the existing network of Green Zones (no-take areas).

Particular consideration has been given in the Zoning Plan to the protection of representative examples of the habitats and biological communities (bioregions) in the Marine Park. Including non-reef (e.g. sea grass meadows) and reef habitats. As part of this package of key environmental considerations, known primary fish spawning aggregation sites have been included for protection in the rezoning.

For more information on the new management plan, refer to the Queensland Department of Primary Industries website: www.dpi.qld.gov.au/fishweb/11379.html and on the Zoning Plan, visit the GBRMPA web site: www.gbrmpa.gov.au or contact Martin Russell by email: m.russell@gbrmpa.gov.au.

Fiji

Detailed interviews were conducted with 52 fishermen in 12 coastal communities around Fiji in October and November, 2003. Three communities in each of Vanuabalavu, northeast Vanua Levu, Naviti of the Yasawas, and Viti Levu were selected to represent different levels of fishing effort and fishing activity, and to provide a preliminary indication of current status and history (within living memory) of exploited fish spawning aggregations.

All significant passes and channels of outer reefs, especially where currents are strong, fished by interviewed fishermen were reportedly used by one or several species of grouper (especially *Epinephelus polyphekadion, Plectropomus areolatus*, and variously by *E. fuscoguttatus* and several other *Epinephelus* species) and sometimes by other reef fish (*Lethrinus harak, L. mahsena*), for reproduction on a regular and highly predictable basis. In most interviews, fisherman either still fished, or used to fish (but the aggregation is now depleted), spawning aggregations, either close to their community or within a day's travel. It is therefore probable that all or most significant passes in Fiji, either currently, or in the past, support or supported spawning aggregations. Many previously undocumented aggregations were described. Significantly, many fishermen observed that declines in their overall catches had been greatest for those species that aggregate to spawn.

Other aggregating species that are also particularly vulnerable to fishing and occur predictably inshore, or inside outer reef areas, when they have eggs, are several species of snapper, rabbitfish, and sweetlips (*Plectorhinchus chaetodonoides*). In most areas, these species have been depleted, sometimes severely. The coral trout, *Plectropomus leopardus*, was reported to be generally less predictable in both time and place of spawning compared to the other larger groupers. This mirrors the published literature on this species which appears to aggregate in smaller groups than some of the other large grouper species.
Seasonality of spawning varied substantially for the same species around Fiji. Management initiatives that involve seasonal fishing controls or sales bans, must take this into account.

Comments and concerns expressed by interviewed fishermen included: illegal

fishing (unpermitted fishermen and dynamite); night, and compressor diving, both of which are increasing in some areas and considered to be too efficient, and fishing on spawning aggregations. A need for provincial and government support and assistance for local community management initiatives was also identified.

The SCRFA interview project was carried out in close association with the Fiji Fisheries Department and the Wildlife Conservation Society, with assistance from WWF and the Fiji Locally Managed Marine Area Office (FLMMA). Summaries of the results were presented to the Fishery Department and to local NGOs. We are extremely grateful for the assistance received in Fiji, without which surveys would not have been possible.

Southeast Asia

Terry Donaldson (IMA-Integrative Biological Research Programme and the University of Guam Marine Laboratory - donaldsn@uog9.uog.edu) was awarded a grant from the National Oceanographic and Atmospheric Administration's (NOAA – United States) International Programmes Division to conduct assessments of potential reef fish spawning aggregation sites in association with marine protected areas in northern Vietnam and northern Palawan, Philippines. The project will be conducted in conjunction with Inter-national Marinelife Alliance (IMA) programmes in Vietnam and the Philippines with local staff and communities involved in training, interviews and assessments.

The Vietnam portion of the study will focus upon potential sites on reefs of the Ha Long World Heritage area. Ms. Nguyen Thu Hue, Country Coordinator of IMA-Vietnam, and scientists from the Haiphong Institute of Oceanography will be involved. SCRFA's interview protocol will be translated into Vietnamese.

Field work is scheduled to begin in northern Vietnam in April, 2004, and in the Philippines (Palawan) thereafter. Assessment methods will follow those used recently in Palau by Patrick Colin (Coral Reef Research Foundation) and Terry Donaldson. These include the use of GPS-linked bathymetry to characterize sites, repetitive timed transects by divers towing GPS units in water-proof floating housings, with photographic and video records made, whenever possible (see SCRFA newsletter No. 3 for more details).

Publications and Articles

Tuz-Sulub A., Cervera-Cervera K., Colon-Marrufo T., and Brule, T. (2003) Primeros Indicios sobre la Formacion de Agregaciones de Reproduccion de Meros (Epinephelinae; Epinephelini) en el Banco de Campeche, Mexico 'First Evidences on the Formation of Spawning Aggregations of Groupers (Epinephelinae; Epinephelini) from the Campeche Bank, Mexico.' Proc. Gulf and Caribbean Fisheries Institute 54: 652-667.

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