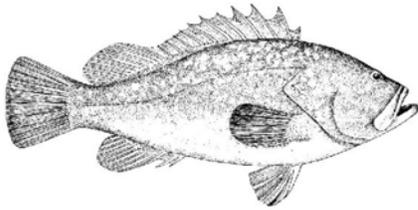


IUCN SPECIALIST GROUP OF GROUPERS AND WRASSES

***NEWSHEET No. 7
(December 2003)***



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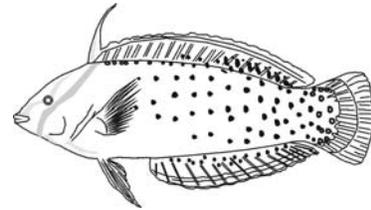
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Introduction

Welcome to newsletter number 7 of the IUCN Specialist Group on Groupers and Wrasses. Quite a mixed bag of items for this edition again – I hope you find them interesting. I have specifically asked for reader's comments on Chris Koenig's item on seasonally closed marine protected areas – maybe to be included in the next edition in a Comments section. Feel welcome to raise any issues by submitting an article and asking for comment. Any other news is always welcome. Enjoy the festive season – if you have one!

Editor: Sean Fennessy seanf@ori.org.za

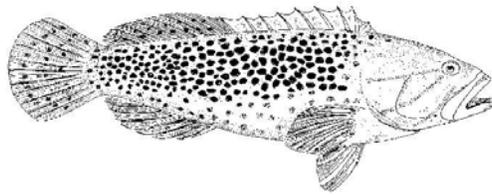
Message from the Chair

Greetings to all! When thinking back over the last 6 months, since our last newsletter, a number of items and thoughts come to mind. Importantly for this Specialist Group, draft species assessments have now been completed for 42 species (see list at end of Newsletter) and will soon be circulated to specialist group members (that means you!) for review. It will be good to have so many species under our collective 'belt' – the great majority of remaining groupers and wrasses have little or no information available and, as a result, will be considerably quicker, though less satisfying of course, to assess.

The work on spawning aggregations, many of which are formed by groupers, being carried out by the Society for the Conservation of Reef Fish Aggregations (SCRFA) is producing new information on the current status and history of exploited aggregations in the western Pacific. The information will hopefully be of use in the development of marine protected areas and fishery management in reef fish fisheries and further underlines the urgency with which aggregations must be protected. An update of the work is included in this Newsletter.

The live reef food fish trade, centred in Hong Kong and southern China, continues to trade in large numbers of groupers. Because of considerable concerns that catch rates for key species in the trade may be unsustainable in some locations, several countries in the western Pacific (such as Papua New Guinea and Fiji) are treading carefully and beginning their involvement with a few trial businesses, while monitoring the outcomes. Given the general interest in this trade (largely because of the perceived but not often realized, higher value of live compared to dead fish) many other countries are interested. To guide them in their decisions, the Asian Development Bank has recently completed a book that will be available shortly. It's message is simple; proceed with extreme care, there is a very real risk of rapid overfishing and financial promise is not always realized. Please contact me directly if you would like a copy of the book.

Yvonne yjsadovy@hkucc.hku.hk



Update on Humphead wrasse, *Cheilinus undulatus*

Juvenile humphead wrasse (< 40cm) for sale outside restaurants in southern mainland China (December 2003)

We continue our work on the humphead wrasse, which is now being considered by several NGOs for further action. There is concern for this species wherever it is commercially exploited, with the major problems being export for the live reef food fish trade and night fishing with spears. Another concern is that many of the fish on sale alive as food are in the juvenile size range, the size most valued by diners in parts of southern mainland China. These fish are either taken directly from the wild, or caught at a small size and grown-out in floating cages to market size. Despite regulations to



protect this species, including an export ban that went into effect on December 1st in Australia, there continues illegal, unregulated and undocumented trade. It is possible that this species will again be the subject of a listing proposal for the next CITES conference of the parties (in Bangkok, November 2004). Our awareness campaign progresses with a poster being developed for release early next year. We also have a little funding to prepare a trade summary on the species, being done in collaboration with the TRAFFIC office here in Hong Kong. A synopsis on the biology, fishery and trade in this species will be printed shortly (see below).

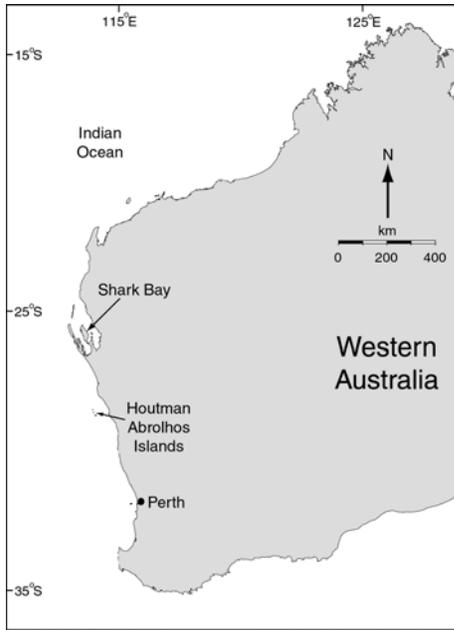


Figure 1. Map of Western Australia, showing main sampling areas of Shark Bay and the Houtman Abrolhos Islands.

News from Australia

Over the last four years, research into the biology of four commercially and/or recreationally important tuskfish species (*Choerodon*: Labridae) in the Shark Bay World Heritage Area, Western Australia, has been conducted by David Fairclough, at Murdoch University's Centre for Fish and Fisheries Research in Perth (Fig. 1). The work was funded by the Australian Fisheries Research and Development Corporation and supervised by Professor Ian Potter at Murdoch University. The four species include the baldchin groper *Choerodon rubescens* and the bluespotted tuskfish *C. cauteroma*, which are endemic to Western Australia, and the blackspot tuskfish *C. schoenleinii* and blue tuskfish *C. cyanodus*, which are found throughout the Indo-West Pacific (Allen, 1999).

Shark Bay, although remote, is an important area for recreational fishers, with *ca* 40,000 fishers visiting the area every year. Increasing fishing pressure and the improvement of fish finding technology, *e.g.* Global

Positioning Systems, has led to a reduction in the numbers of pink snapper *Pagrus auratus*, which is the most important commercial and recreational fish species in Shark Bay (Penn, 2002). The Western Australian Department of Fisheries thus introduced fishing bans in certain areas and tightened size and catch limits for this species in Shark Bay. However, this has resulted in fishing pressure reverting to other sought-after reef species, *i.e.* lethrinids, labrids and serranids.

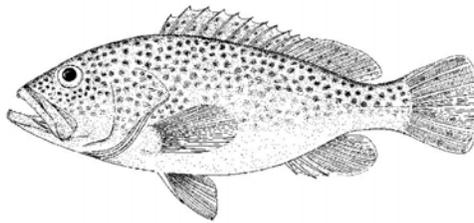
Until this project, little was known of the biology of the above four *Choerodon* species, other than the work of Ebisawa *et al.* (1995) on *C. schoenleinii* in Japan and that of Nardi (1999) on *C. rubescens* in the Houtman Abrolhos Islands, 350 km to the south of Shark Bay (Fig. 1). In Western Australia, the lack of biological knowledge on these species is reflected by the fact that, although *C. rubescens*, *C. schoenleinii* and *C. cyanodus* grow to different maximum sizes, *i.e.* 65, 80 and 60 cm, respectively, they each have the same minimum legal size limit (MLL) for retention of 40 cm. If MLLs are to be a useful tool in the management of commercially and recreationally important species, then it is essential to acquire biological information on these species.

Despite the fact that individuals of all of the life cycle stages of *C. cyanodus* in Shark Bay were caught during this study, few were above 35 cm in length, which is only about half of the maximum size reported for this species and thus also less than its MLL of 40 cm. Furthermore, there is often confusion in the identification by fishers of individual species of *Choerodon* in Western Australia. If fisheries management is to be conducted on a species by species basis, the onus is on fishers to be able to identify the species that they are catching and on the Department of Fisheries to educate the public. During this study, I found that even regular fishers and charter operators couldn't always tell the difference between the tuskfish species, let alone occasional fishers. For example, the four species of *Choerodon* in this study are often just called baldies, the colloquial name given to the baldchin groper (*C. rubescens*), or bluebone, the name given to the blackspot tuskfish (*C. schoenleinii*). This is fortunate for the bluespotted tuskfish (*C. cauteroma*). While there is no MLL for this species and it only grows to *ca* 42 cm, individuals of this species are frequently misidentified as baldies or bluebone and are returned to the water, since they are assumed to be below the MLL. For this species, fisher ignorance is bliss!

Histological studies of the gonads of the above four *Choerodon* species demonstrated that they are all monandric protogynous hermaphrodites, which requires consideration when drawing up management plans. Since fishers target large fish preferentially and, for some species in Western Australia, the fishers are restricted by minimum size limits, then they often catch only the larger

size classes of a particular species. Thus, in the case of protogynous species, they may be removing a large proportion of the male fish. For example, during this project, *C. rubescens* was also studied in the Houtman Abrolhos Islands, where it is an important commercial target, and the sex ratio of commercially (line) caught *C. rubescens* in this region was about 1♀:1♂. However, the sex ratio of adult *C. rubescens*, i.e. \geq the length at which 50% of individuals reach maturity, was closer to 10♀:1♂. This clearly demonstrates that a large proportion of *C. rubescens* in commercial catches are males. If fishing pressure is sufficiently high, this type of fishing bias may cause a drastic decline in the size of stocks of this species and/or a reduction in the size at which a species changes sex and its overall maximum size. The latter two effects occurred with *Choerodon venustus* in heavily fished areas in Queensland, Australia (Platten *et al.*, 2002).

A recent change to fishing regulations in Western Australia has seen the reduction of the catch limit for recreational fishers to four tuskfish (of all species) per person per day above their minimum size limit. This will reduce the catches of these sought-after species in the recreational sector, but does not limit the catches of legal size fish by commercial fishers. Thus, *C. rubescens*, the most important commercial species, may be at high risk. At the moment, the range of management tools in place for other targeted *Choerodon* species in Western Australia may be adequate, but the example given for *C. venustus* demonstrates how high fishing pressure may have an undesirable impact on a species.



News from SCRFA

Progress is being made in both the underwater monitoring of spawning aggregations as well as documenting reef fish aggregations in the western Pacific. There is also some excellent news on recent management initiatives from the Cayman Is., Bahamas (also see below), and from Australia - see Newsletters 3 and 4 on www.scrfa.org

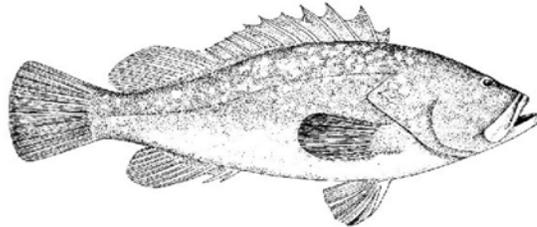
Pat Colin (crff@palaunet.com) and Terry Donaldson have been developing a methodology for more quickly, easily and accurately monitoring fish numbers underwater. A logging GPS receiver, recording the latitude/longitude every 15 seconds, is towed on the surface by a diver who is counting the number of groupers (in this case there are three species being recorded) 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. The work is supported by The Nature Conservancy and the Coral Reef Research Foundation.

Field interviews by the Society continue, the most recent being in Fiji. In all over 150 fisher interviews have been conducted in the western Pacific with more than 50 previously undocumented aggregations recorded. In Fiji, interviews were conducted with 52 fishermen in 12 coastal communities around Fiji in October and November, 2003.

All significant passes and channels of outer reefs, especially where currents are strong, and which are fished by interviewed fishermen, were reportedly used by several species of grouper (especially *Epinephelus polyphekadion*, *Plectropomus areolatus*, and variously by *E. fuscoguttatus* and several other *Epinephelus* species). At least two of these three species have consistently been reported as occurring at the same spawning sites in all of the countries surveyed to date. 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.

In future planned work, Terry Donaldson (IMA-Integrative Biological Research Program and the University of Guam Marine Laboratory - donaldsn@uog9.uog.edu) was awarded a grant from the National Oceanographic and Atmospheric Administration's (NOAA – USA) International Programs Division to conduct assessments of potential reef fish spawning aggregation sites in northern Vietnam and northern Palawan, Philippines.



Feedback requested

Chris Koenig (koenig@bio.fsu.edu) of the Institute for Fishery Resource Ecology in Florida (USA) sent me this item on seasonally closed marine protected areas, and I have included it to provoke comment from readers. First, here is the background :

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. Also significant is the support that commercial and recreational fishermen are providing to the council for continuing the closure. This is a complete reversal from their original position in 1999 when closure of the spawning aggregation areas was opposed. However, the Gulf council is proposing to close limited spawning areas only seasonally, which Chris thinks is a bad idea. He outlines his (six) reasons below.

A derby-like fishery would result when the seasonally closed area is opened; the smaller the area and the longer the closure, the more intense the fishing. It is well known that fishers tend to skirt closed areas, and this can be seen daily around Madison Swanson. This is because fishers believe that the fish population has built up within the confines of that area and some fish will spill over to bordering areas. Imagine now that a closed area is periodically opened to fishing. Boats would be running over each other on the day of opening to get in there. Soon the best sites would be known and fishers would swamp them.

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 a resident population all year round. We have seen this with gag, goliath grouper, scamp, and most intensely in red grouper. These fish would be subjected to heavy fishing pressure when the seasonally closed area opens to fishing. Red grouper is a special case because they construct and maintain their own habitat by digging into the sea floor and exposing rugose rock from beneath a sand veneer. The exposed rock provides not only shelter for the grouper, but also for many other fish species, including young red snapper and vermilion snapper. If fishing were allowed in the closed area not only would the red grouper be depleted, but habitat would be lost to those juveniles that depend on the habitat the groupers maintain.

Demographics of the grouper spawning populations would not be protected in seasonally closed areas. We find that the resident population is composed mostly of large fish and, in the case of gag, a large proportion are males. Fishing in the closed area would tend to deplete the large, old

fish and thereby decrease the reproductive output. The decline in the gag male:female sex ratio over the last two decades appears now to be the result of fishing spawning sites in non-spawning seasons, when males are more abundant on the spawning sites (i.e., because newly transformed males are also there and many females moved back into shallow water). For these fish the opportunity to change sex only comes during the aggregation period, so males produced during this period would be lost to fishing when the seasonally closed area is opened to fishing. Thus, size, age and sexratio would not be protected.

It would be difficult to evaluate the effectiveness of a seasonally closed area because results would depend on fishing intensity and localization during the open season. In the open season of a seasonally closed area, the most productive spawning sites would be fished first and most intensely. Even though a closed area may be relatively large, the sites used for spawning are relatively few. For example, in Madison Swanson, gag spawning sites are located along the southern carbonate ridges which extend in an arc from the southwest portion up to the central eastern portion. So far, we have located, with the help of commercial grouper fishermen, 18 gag spawning sites within the 100 + square mile area. We believe that these sites are extremely productive, but imagine if fishing were allowed after the spawning season. All known gag spawning sites within Madison Swanson could be targeted by only 18 vessels!

Our scientific understanding of the ecology and behavior of the groupers and other economically important reef species would be stifled. One of the primary reasons why we requested the Gulf and South Atlantic Councils to establish experimentally closed areas was to study the impacts of fishing on grouper reproduction in general and specifically on demographics. In the south Atlantic region we have the Oculina Banks reserve and in the Gulf we have Madison Swanson and Steamboat Lumps. If these reserves were only closed seasonally, we would not be able to evaluate movement patterns, site fidelity, effects of fishing on demographics, ecological interactions, natural mortality and many more aspects of their biology because each year the resident population (which includes all males for gag) would be removed from our study areas by fishing. We must continue to develop an understanding of the biology of these species, especially those that are threatened such as speckled hind and Warsaw grouper.

Other species which use the same sites for spawning at other times of the year would be heavily fished at their time of spawning. Many species use the same sites at the same or different times of the year for spawning; an open season for a closed area would likely impact some other species during their spawning season. For example, gag, scamp, and red grouper spawn in Madison Swanson from about February through May, but red snapper are spawning in there during the summer months through early fall. Why would we want to impact the red snapper spawning? Why not just allow the populations to increase and the individual size and age increase of all reef fish within the confines of the reserves so that reproductive output can be maximized?

Chris requested details on which positive aspects were cited by the Council for closing designated areas only seasonally. He notes that Madison Swanson and Steamboat Lumps represent a very small percentage of the shelf-edge habitat, of the order of 1%, so this couldn't possibly be a hardship issue for fishermen. He suggests that several more year-round closed areas strategically placed in important spawning habitat for the various economically important reef species would go a long way to protecting reproductive output. The results from the Madison Swanson year-round closures to date are very encouraging - many commercial and recreational fishermen have completely reversed their opinions about the value of reserves and now support them. Chris is surprised that such a small investment of a few percent of spawning habitat area closed to fishing to ensure sustainability is so contentious. The council has not provided good reasons for proposing seasonal closures - what do you think ?

Miscellaneous

Fishy tale

A single giant grouper, *Epinephelus lanceolatus*, was purchased for HK\$32,800 (about US\$ 4,250) in Hong Kong recently by a wealthy tycoon from a local fish retailer/restaurant owner. And then the fish was released ! This extravagant behaviour is part of a pattern whereby buyers are encouraged by the restaurant owner to release one or two 'weird' fishes each year to bring him good luck by offsetting all the fish he has to kill in his fish trading business. A release also brings good luck to the buyer. The balance of the purchase, after paying for the fish, is donated to charity. It was not explained why this species was considered to be 'weird'. South China Morning Post newspaper, 17 August, 2003.

Cleaner wrasse

From Wabnitz et al. 2003 (see citation below): The cleaner fish, *Labroides dimidiatus*. removes parasites from reef organisms and is caught and marketed for the marine aquarium trade in large numbers (at least several hundred thousand a year from a range of countries). There has been some debate about whether or not the removal of this species could negatively affect reef fish health from collected areas. One experimental study, from Egypt, involving both removals and additions of cleaner wrasse, established a positive and causal link between reef fish diversity and number of cleaner fish (Bshary, 2003). This species does not survive well in aquaria and it is advised that aquarists should not purchase it (Wabnitz et al. 2003).

Good news for Nassau grouper

Anne-Marie Eklund (Anne.Marie.Eklund@noaa.gov) in Florida has forwarded a recent press release from the Department of Fisheries, Bahamas. 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 this area. Furthermore, 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.

Recent publications + websites of interest

Gascoigne. J (2002). Nassau grouper and Queen conch in the Bahamas; status and management options. Bahamas Reef Environment Educational Foundation (BREEF) Report. (<http://www.breef.org/grouperfull.pdf>)

Andrade, A.B., Machado, L. F., HostimSilva, M. and Barreiros, J.P. 2003. Reproductive biology of the dusky grouper *Epinephelus marginatus* (Lowe, 1834). Brazilian Archives of Biology and Technology 46(3): 373-381.

Bshary, R. 2003. The cleaner wrasse, *Labroides dimidiatus*, is a key organism for reef fish diversity at Ras Mohammed National Park, Egypt. Journal of Animal Ecology 72:169-176

Sabetian, A., 2003. The association of physical and environmental factors with abundance and distribution patterns of groupers around Kolombangara Island, Solomon Islands. Environmental Biology of Fishes 68: 93-99.

Sadovy, Y, Kulbicki M., Labrosse P, Letourneur Y., Lokani, P., and Donaldson, T. J. (2003). The humphead wrasse, *Cheilinus undulatus*: synopsis of a threatened and poorly known giant coral reef fish. Reviews in Fish Biology and Fisheries (in press).

Sadovy, Y.J., Donaldson, T.J., Graham, T.R., McGilvray, F., Muldoon, G.J., Philips, M.J., Rimmer, M.A., Smith, A., and Yeeting, B. (2003) *While Stocks Last: The Live Reef Food Fish Trade*. Manila: Asian Development Bank, 147 pp.

Wabnitz, C., Taylor, M., Green, E. and Razak, T. 2003. *From ocean to aquarium. The global trade in marine ornamental species*. UNEP World Conservation Monitoring Centre, UNEP-WCMC Biodiversity Series No. 17. Cambridge, UK. pp. 64

"Tasting the No-take tonic". An article by Parker Neils on work by Chris Koenig and Felicia Coleman on MPAs and reef fish fisheries at Florida State University.
www.research.fsu.edu/rinr/rinr.html

Species assessed to date

<p>GROUPERS and WRASSE <i>Anchichoerops natalensis</i> <i>Anyperodon leucogrammicus</i> <i>Cephalopholis argus</i> <i>C. fulva</i> <i>Dermatolepis striatus</i> <i>Epinephelides armatus</i> <i>Epinephelus aeneus</i> <i>E. awoara</i> <i>E. bruneus</i> <i>E. chabaudi</i> <i>E. cifuentesi</i> <i>E. coiodes</i> <i>E. fuscoguttatus</i> <i>E. guttatus</i> <i>E. irroratus</i> <i>E. labriformis</i> <i>E. magniscuttis</i> <i>E. malabaricus</i> <i>E. marginatus</i> <i>E. morio</i> <i>E. mystacinus</i> <i>E. polyphemadion</i> <i>E. quernus</i> <i>E. tukula</i> <i>E. undulatostratus</i></p>	<p><i>Lachnolaimus maximus</i> <i>M. fusca</i> <i>M. microlepis</i> <i>M. phenax</i> <i>M. tigris</i> <i>M. venenosa</i> <i>M. xenarcha</i> <i>Paralabrax albomaculatus</i> <i>Plectropomus areolatus</i> <i>P. laevis</i> <i>P. leopardus</i> <i>P. pessuliferus</i> <i>P. punctatus</i> <i>Semicossyphus reticulatus</i> <i>Variola louti</i></p> <p>OTHER <i>Polyprion americanus</i> <i>Stereolepis gigas</i></p>
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