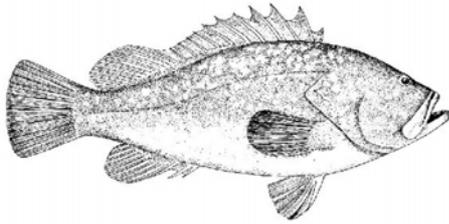


IUCN SPECIALIST GROUP OF GROUPERS AND WRASSES

***NEWSHEET No. 8
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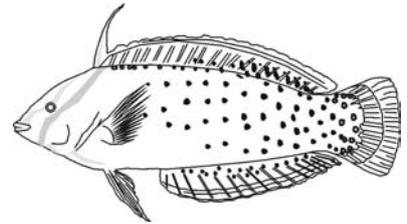
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Introduction

Welcome to newsletter number 8 of the IUCN Specialist Group on Groupers and Wrasses. There has been quite a delay since the last one for one reason or another – apologies to those of you who had sent in items some time ago. Still, this is a bumper edition and there is quite a nice mix of information. Feel welcome to raise any issues by submitting an article and asking for comment, or by sending comments yourself. Any other news is always welcome. Enjoy the festive season!

Editor: Sean Fennessy seanf@ori.org.za

Message from the Chair

Greetings to all for the Christmas holiday season!

This has been a good year for our Specialist Group and I am pleased to bring you up-to-date with what has been going on. We have completed a record number of species assessments (see the 2004 Red List, now up on the IUCN website), including a much-needed update of the Nassau grouper, *Epinephelus striatus* (still 'Endangered'). We have also made good progress with other species assessments for completion in 2005. The assessments are considered to be thorough and

solid, and should stand us in good stead when more people wake up to the fact that there are commercially valuable groupers and wrasses that need management and conservation attention. I have started a draft of a long overdue Action Plan for our SG that I will circulate to the SG next year (you have been warned!). I have just heard that a joint meeting of our SG with the Shark Specialist Group (SSG) and Project Seahorse now has the go-ahead to take place in early 2006 in Oman. This is being spearheaded by Sarah Fowler of the SSG and will be an excellent opportunity to work and learn in a part of the world where we have little experience and where reef fishery development is at a relatively early stage. Our IUCN group is also beginning to work with TRAFFIC and WWF to co-ordinate and organize marine work in Asia – more news on this when we discuss details of a proposal for funding. The next triennium promises to be busy.

The great news for us, of course, is the recent listing of the humphead (Napoleon or Maori) wrasse, *Cheilinus undulatus*, on Appendix II of CITES. This is a highly significant listing because it is the first time that a commercial marine fish that is 'fecund', i.e. produces a lot of eggs and so for many people is more truly 'fish-like' than sharks or seahorses (already listed on CITES), has been so listed. (More on the humphead wrasse below.)

For next year, I want to draw your attention to the 7th Indo-Pacific Fish Conference that will be held in Taipei, Taiwan, 16-20 May. This meeting takes place only once every four years and is now a big meeting covering all aspects of fishes in the wide Indo-Pacific region. I strongly encourage you to try to attend this meeting, both because I should very much like to have a **Specialist Group** gathering during the conference, and because I think you will find a lot of presentations to be of interest. Note that there will be mini-symposium on '**Conservation in Coral Reef Fishes**' still accepting abstracts (until the end of January) – please consider participating in this mini-symposium. We are not really looking for conservation issues to be presented but more for solutions, case studies, lessons, etc. pointing the way forward.

As you are now aware from my earlier emails, we are entering a new triennium and, as for each triennium, I am reconstituting this Specialist Group. Everybody who wishes to continue, and is able to put some time into our work, is very welcome to do so. I know that some of you cannot continue because of professional or personal constraints or circumstances. To all who have contributed variously to this SG over the past three years, however, whether you continue or not, I am most grateful for your time and shared expertise. I shall be finalizing the new GWSG in early 2005 and those who continue with us will see a lot of new fresh, young, faces, ready and keen to help this group develop.

Well, that's it for now. Please send articles along to Sean for our Newsletters: it is a good way to stay in touch and to share news from your part of the world.

My best regards to you all, Yvonne yisadovy@hkucc.hku.hk

Humphead wrasse on CITES Appendix II

After years of gathering information on the humphead wrasse, following its red listing as 'Vulnerable' in 1996, and with help from many people, a strong proposal was finally successful in gaining support for an Appendix II listing of the Convention on International Trade in Endangered species (CITES) for this species. You may recall that the first proposal, in 2002, failed to gain the necessary 2/3 majority of countries signatory to the Convention. This listing is important because, given the nature of trade and the lack of fishery management capacity or authorities in much of the range of the species, it may be the only means of preventing further declines. Even some of my colleagues who trade in the humphead wrasse for the live reef food-fish trade agreed that drastic and strong measures are needed to stop declines. Because Hong Kong is the major importer of this wrasse, our SG will collaborate with local NGOs and government to try to make the listing work. In terms of implementation at import, our major concern is that it is difficult to monitor imports by sea on Hong Kong vessels; this problem needs to be addressed.

The Appendix II listing is not just significant for *Cheilinus undulatus* but also important for two other reasons. First, the proposal was endorsed by the new FAO *ad hoc* expert review panel that met this summer to carry out scientific reviews of commercially important marine species being proposed for CITES appendices. This was the first time that this panel of fishery experts had met and the scientific review was extremely useful and very rigorous. An important part of the success of this proposal (submitted by Fiji, the USA and the EU) was in its science which was put through its paces at the FAO meeting. Secondly, the listing was accepted by a **consensus** of the country delegates at the Conference of the Parties (CoP) (CITES meeting) this past October. This is important because it implies strong general support (or at least not strong open resistance) by the CoP. The proposal was supported by Norway and Iceland (typically not in favour of commercial fish listings on CITES), Japan did not openly oppose it (Japan tends to favour FAO as the managing authority for commercial fishes rather than CITES). Only the Seychelles spoke against it on the basis of national implementation problems.



Adult humphead wrasse arriving by ship in southern China for the restaurant trade)

Now we just have to make the listing work!! In relation to this, my final piece of good news is that our SG is now arranging a contract with the CITES Secretariat to follow up on the humphead wrasse Appendix II listing which will allow field surveys to be conducted and what are known as 'non-detriment findings' to be developed (this refers to the issue of permits for export which should only occur if exports do not cause 'detriment' i.e. are sustainable). We hope to establish a model case study for this listing in a key exporting country. I am also hoping that the listing will finally bring some much-needed focus to reef-fish management and conservation in general. 'Fin'gers crossed!

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News from SCRFA

The Society for the Conservation of Reef Fish Aggregations has been active over the last year or so, particularly in producing materials for education and in raising awareness. At the 3rd IUCN World Conservation Congress in Bangkok this past November, a Recommendation was adopted by the hundreds of governments and NGOs present to better protect and conserve reef fish

spawning aggregations. If nothing else, discussion of the Recommendation at this meeting gave this issue higher visibility. It will be interesting to see if it translates in any way to action.

Now available are simple pamphlets about spawning aggregations in English, Chinese, Fijian and Spanish, posters in English and Spanish, a new Handbook in English, and we have just produced our first documentary (all available on www.scrfa.org). This latter is an 18-minute piece set in Fiji entitled: **Seeds of the Future – Fijian Spawning Aggregations** and examines the role of the cash economy in overfishing and loss of spawning aggregations. SCRFA Newsletter No. 6 is just out (www.scrfa.org).

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News from Seychelles

Compared to some other areas in the Indo-Pacific and to the Caribbean, very little is known of reef fish spawning aggregations in the Western Indian Ocean (WIO). Largely bordered by developing states, research on aggregations in the WIO region has simply not featured on national and regional agendas, with other pressing issues, such as widespread coral bleaching, driving numerous initiatives over the last decade. In the last few years, however, reef fish spawning aggregations have finally begun to receive much-warranted attention. In Seychelles, a 3-year project funded by the Seychelles Fishing Authority (SFA) and the Marine Science for Management (MASMA) Programme of the Western Indian Ocean Marine Science Association (WIOMSA) is entering its final year. An IUCN initiative, under their project 'Implementing the Jakarta Mandate in the Western Indian Ocean', conducted stakeholder interviews in Kenya, Tanzania (including Zanzibar) and Mozambique earlier in 2004 as a preliminary investigation of reef fish spawning aggregations. This article provides an overview of the progress made in Seychelles.

The Republic of Seychelles comprises 115 islands scattered across the central WIO, with a land area totalling 455 km² and an EEZ of 1.3 million km². In an attempt to narrow down the search for spawning aggregations over such a huge area, the first stage of the project was to conduct semi-structured interviews with artisanal fishers on the location and other key aspects of these phenomena. It was with great interest that we learnt that nearly all fishers interviewed were aware that certain reef fishes aggregate to spawn, and that many target aggregations regularly. From 44 fisher interviews, a total of 89 aggregations were reported, belonging to around 26 species. Spawning aggregations of *Epinephelus fuscoguttatus* and *E. polyphkadion* at the atolls to the south of Seychelles were particularly well known, some of which have been fished commercially over the last decade or so by a parastatal company managing several islands. Spawning aggregations of the siganid, *Siganus sutor*, were reported to occur in at least 5 locations around the main granitic islands of Mahé, Praslin and La Digue, and these are the basis of an important fishery.

The distribution of spawning aggregations as reported by fishers revealed family level spatial patterns that were consistent with the distribution of fishing effort for target species, which is influenced by species distribution/abundance and operational costs. Lutjanid and siganid aggregations were generally known from the Seychelles Bank, on which the main granitic islands lie, whilst reports of serranid aggregations were largely confined to the atolls in the south of the archipelago. Temporal patterns in spawning and aggregation formation also differed at the family level. Lutjanids and siganids tended towards a prolonged spawning season with separate peaks in activity generally corresponding with the inter-tropical monsoons. By contrast, the spawning periodicity for the larger serranids, such as *E. fuscoguttatus*, tended to be compact and limited to a few consecutive months, an expected result given what is known about the reproductive strategies of those species.

Interviewing fishers was found to be an effective approach to finding spawning aggregations unknown to scientists - as will be discussed later, the locations of several sites reported by fishers

have now been confirmed through field studies. Moreover, fisher reports of spawning periodicity also proved reliable, as confirmed by existing and new data generated by this project. Regular samples from commercial catches of *E. multinotatus*, *E. polyphkadion*, *E. fuscoguttatus*, *Variola louti* and *S. sutor* have been collected since April 2003, with histological analyses yielding information on spawning periodicity and other important reproductive parameters.

Based on stakeholder reports, field studies have been undertaken to the atolls and islands of Cosmoledo, Farquhar and Praslin, where aggregations of *E. fuscoguttatus*, *E. polyphkadion*, *Plectropomus punctatus* and *S. sutor* were documented. At Farquhar, *E. fuscoguttatus* and *E. polyphkadion* were found to spawn at the same reef pass site during consecutive months (December and January). It was estimated that approximately 7 800 *E. polyphkadion* and between 2 600 and 5 300 *E. fuscoguttatus* were present at the Farquhar aggregation site during the new moon in January 2004. Similar to *P. leopardus* on the Great Barrier Reef, *P. punctatus* aggregations at Cosmoledo Atoll comprised around 50 individuals and formed on the edge of the outer reef slope. There is some evidence to suggest that Cosmoledo is host to numerous, small aggregations of this species. Whether or not this reproductive strategy makes *P. punctatus* less vulnerable to overfishing than *E. fuscoguttatus* and *E. polyphkadion*, which appear to form only a few large aggregations, needs to be assessed.

The 2004/2005 spawning season is now underway and the team is frantically travelling around the archipelago conducting field studies. Due to the fact that many aggregations follow the same seasonal and lunar periodicity at disparate locations, we are attempting to focus our attention on those considered most vulnerable for the duration of the MASMA project, after which time we will seek funding to study others.

In line with the fundamental aim of the MASMA programme, we will be utilising the research data to evaluate management options for spawning aggregations. That process is already underway, with SFA securing cabinet approval for a dynamic management system for the outer islands, the Fisheries Reserves Management Areas (FRMAs). Through consultation with stakeholders, the FRMAs will allow managers to implement regulatory measures, such as closed seasons and areas, to protect spawning aggregations (notably serranids) and other ecologically sensitive areas. Enforcement of regulatory measures will be facilitated by the newly acquired vessel monitoring system (VMS). Socio-economic surveys of fishers engaged in aggregation fishing have shown that there is already a high level of support (c. 50 %) for protective measures, and we aim to further that support through outreach and awareness activities.

The preliminary findings of this 3-year programme suggest that management of spawning aggregations must be evaluated on a case-by-case basis. Although many of the life-history parameters of *E. fuscoguttatus* and *E. polyphkadion* render these species vulnerable to overfishing, aggregations in Seychelles are targeted only sporadically by artisanal fishers. Nevertheless, the remoteness of the atolls on which these aggregations occur, a factor that increases the risk of IUU (illegal, undocumented, unregulated) fishing by foreign fleets, and the fact that spawning aggregations can be decimated by a single period of intense effort, underpin the need for pro-active management and effective enforcement of regulatory measures. By contrast, the management of siganid spawning aggregations must be approached from a different perspective. On the Seychelles Bank, spawning aggregations of *Siganus sutor* have been targeted since at least the 1920s. Although catch rates are observed to decline in certain years, stocks recover rapidly. Given the rapid growth rate and early age at maturity for this species, it is possible that aggregations can sustain small-scale trap fisheries. Certainly, the history of the fishery appears to support this contention. In addition to closures, we must therefore consider other strategies to enhance the resilience of the siganid populations.

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Grouper and wrasse biodiversity along the west coast of India

Observations were made using SCUBA on rocky substrata between Vizhinjam, Kerala state and Midalam Point, Tamil Nadu state January - March, 2002 (n = seven sites and 30 hours sampling) to document fish species composition by using underwater visual census. Similar habitat was examined at Natrani Island, offshore of Murdeshwar, Karnataka state and Grand Island offshore of Panaji, Goa state in September-October, 2002 (n = eight and 13 hours, respectively, for each of these two sites). The habitat surveyed in south India (depth range 3-30 m) was rocky with low coral cover (<1%). The most abundant benthic colonizers were fine turfing algae, encrusting sponges, barnacles, and mussels. The habitat in central India (depth range 2-12 m) was also rocky, but with higher coral cover (15% - 31%). Other abundant benthic colonizers at these two sites were fine turfing algae, encrusting sponges, and polychaetes. Species lists were developed and then checked for prior occurrences in India using Fishbase last checked on December 30, 2003. Other literature was also examined for occurrence records, including synonyms.

Within the family Serranidae, eighteen grouper species, two soapfish species and one anthias were observed (Table 1). Among Labrids, eighteen species were observed, including the humphead wrasse (*Cheilinus undulatus*). This species was rare on the west coast of India, as we only sighted five individuals during 26 hrs 38 min of underwater observation time spent specifically searching for this species (Sluka and Lazarus unpublished ms). Three wrasse species appear to be new records for India: *Bodianus axillaris*, *B. diana* and *Halichoeres nigrescens*. See table at end of newsletter.

Bob Sluka bobsluka@hotmail.com and S. Lazarus

News from Australia

Current research projects at the Centre for Fish and Fisheries Research (Murdoch University) include studies of the biology of two labrids in south-western Australia. The western blue groper *Achoerodus gouldii* (max. length 1.6 m) and the western foxfish *Bodianus frenchii* (max. length 49 cm) are commercially and recreationally important species, respectively. These two species are protogynous hermaphrodites. Initial investigations of the numbers of opaque zones in sectioned otoliths have found up to 60 annuli in those of *A. gouldii* and up to 50 in those of *B. frenchii*. Students at Murdoch are currently validating the frequency of annulus formation. If they are found to be annually formed, these fish are obviously very long-lived. This is in contrast to the maximum ages recorded by Fairclough (2004) for two other large labrids, the subtropical *Choerodon rubescens* (max. length 70 cm, max. age recorded of 22 years) and the tropical *Choerodon schoenleinii* (max. length 90 cm, max. age recorded of 16 years), in Western Australia. Data on the reproductive biology of *A. gouldii* and *B. frenchii* is also being collected to provide lengths and ages at sexual maturity and thus information on the generation time of each species.

The Perth metropolitan recreational fishery is seeing a gradual change in the species being taken home by fishers (Harvey, 2004). Reduced numbers of legal-sized target species, such as the West Australian dhufish *Glaucosoma hebraicum* and probably also the breaksea cod *Epinephelides armatus* (few recreational catch and effort data are available), have led to fishers retaining previously discarded species, such as western king wrasse *Coris auricularis* and brown-spotted wrasse *Notolabrus parilus*. Studies of the biology of *E. armatus*, *C. auricularis*, *N. parilus* and some other labrids are currently underway at Murdoch. Histology of the testes of adult male *E. armatus* has revealed a "gonochoristic" structure, contrasting with previous suggestions that this species is protogynous (Steven Moore, pers. comm., Murdoch University). Further histology of the gonads of small fish is required to confirm the sexual pattern of *E. armatus*. Visual census studies inside and outside a no-take area at Rottneest Island (Dr. Russ Babcock, CSIRO, pers. comm.) have demonstrated a positive response to protection for *E. armatus*, with larger fish being recorded in the protected area.

The bluethroat wrasse *Notolabrus tetricus* has become an important target in Victorian waters (southern Australia) for a live fish trade to restaurants in Sydney. Live fish attract a higher price than gilled and gutted fish. The fishery developed during the 1990's, with annual catches increasing over that period from less than 10 tonnes to a maximum of 90 tonnes in 1998, coupled with an increase in effort (Smith *et al.*, 2003). The Marine and Freshwater Resources Institute in Victoria, in conjunction with Seafood Industry Victoria and commercial fishers, conducted a comprehensive biological study of this protogynous species in response to the increasing demand and in order to assist with the development of appropriate management plans.

A PhD project is about to begin at the Houtman Abrolhos Islands (mid-west coast of Australia) studying the bar-cheeked coral trout *Plectropomus maculatus*. Previous work by Nardi *et al.* (2004) demonstrated significant increases in the abundance of the congeneric coral trout *P. leopardus* in no-take zones at the islands. The PhD, being conducted at Edith Cowan University, will focus on the general biology of *P. maculatus* and also determine the usefulness of protected areas for increasing the size/age composition of this species and the resultant potential to increase overall fecundity and export of eggs and larvae.

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Reproductive biology of groupers in Borneo

We know very little of the biology of groupers, and for that matter, of coral reef fishes in Southeast Asia. As such, biological regulations for reef fisheries cannot readily be developed into management policies. On a shoe-string budget, Dr. Annadel S. Cabanban, began collecting, in April 2004, information on the size, reproductive stages, and age of groupers in Kudat district in the state of Sabah (North Borneo), Malaysia. Samples are taken from fish markets on a weekly basis by volunteers of Greenforce, a United Kingdom-based non-governmental organisation. Specimens are measured, weighed, sexed and staged for reproductive activity, and otoliths are taken for estimating age (see picture below). Gonads are preserved for histological examination. The data will provide base-line information on reproductive biology as well as data for testing the hypothesis that species of groupers change sex at 80 % of their maximum body size and 2.5 times their age-at-maturity (see Allsop and West, 2003). A further hypothesis that may be tested is whether fishing pressure has exerted pressure on groupers' timing of maturation (Olsen *et al.*, 2004).

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A Greenforce volunteer removing otoliths from a grouper at fish market in Sabah

A farewell to *Epinephelus*?

After more than 200 years as one of the largest serranid genera, it finally appears as if we are approaching a monophyletic definition of Bloch's *Epinephelus*. With 99 described species (the most recent, *E. clippertonensis*, described only 5 years ago), *Epinephelus* has lacked a phylogenetic definition, perhaps due in large part to their conservative morphology and apparent dependence on life color patterns to differentiate many species. These two reasons work synergistically to hinder the study of the numerous museum specimens that have lost these colors, and thus appear quite similar.

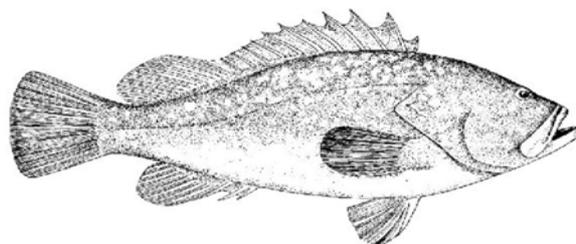
The development of molecular techniques and the relative ease with which we can now obtain DNA sequence data has allowed us to more carefully evaluate the interspecific relationships between these economically and ecologically important species. While excellent revisions of the alpha taxonomy for *Epinephelus* exist (e.g., Heemstra and Randall, 1993, FAO Catalog 16), no comprehensive phylogenetic hypothesis has been presented. Our work has continued to focus on collecting sequence data from as many species as is logistically possible, given the constraints of funding and time.

Based on our preliminary analysis of two mitochondrial (16S and 12S rDNA) and two nuclear (TMO4C4 and Histone III) genes from 68 species of *Epinephelus* in a 125 taxa dataset, it is readily apparent that *Epinephelus sensu lato* is by no means a monophyletic genus. As indicated in earlier studies (Craig, et al., 2001), this genus is divided into several monophyletic clades, with other well know genera (e.g., *Mycteroperca*) occupying positions in the tree which indicate relatively deep divergences within these groups. In addition to the molecular sequence data, some osteological features, such as the structure of the pectoral girdle, support the deeper clade structure within *Epinephelus*.

The implications of these results are interesting from a variety of standpoints. The hypothesized relationships will lead to a more robust and stable taxonomy, with the probable erection of a new genus for several members now included in *Epinephelus*. On a more broad scale, these newly hypothesized relationships will give us the unique ability to evaluate the biogeography of a circum-globally distributed reef fish lineage with high economic importance. Additionally, this phylogeny will give us the opportunity to evaluate the evolution of reproductive behavior and morphology of reproductive organs, as hermaphroditism is common in this group.

While this study is ongoing, we hope to have a published report by year's end. Additionally, if anyone is willing to help out and fill in some of the gaps in our list of taxa; any help would be appreciated. Please contact Matthew Craig.

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Table 1: Fish species observed in nearshore rocky/coral habitats of western India. Species with an asterisk after the name indicate new records for India (n=3) as judged by the Fishbase database (www.fishbase.org) and available literature distribution records.

Species	S. India	Natrani	Goa
Serranidae			
<i>Aethaloperca roгаа</i>	X	X	
<i>Cephalopholis argus</i>	X	X	
<i>C. formosa</i>	X	X	X
<i>C. miniata</i>	X		
<i>C. sonnerati</i>	X	X	
<i>Diploprion bifasciatum</i>	X		
<i>Epinephelus areolatus</i>		X	
<i>E. caeruleopunctatus</i>	X		
<i>E. coioides</i>	X	X	X
<i>E. diacanthus</i>	X	X	X
<i>E. erythrurus</i>	X	X	X
<i>E. fasciatus</i>	X		
<i>E. faveatus</i>	X		
<i>E. flavocaeruleus</i>	X		
<i>E. lanceolatus</i>		X	
<i>E. longispinis</i>	X	X	
<i>E. malabaricus</i>	X	X	
<i>E. tukula</i>	X		X
<i>Grammistes sexlineatus</i>	X		
<i>Plectropomus areolatus</i>	X		
<i>Pseudanthias squamipinnis</i>	X		
Labridae			
<i>Anampses caeruleopunctatus</i>	X		
<i>Bodianus axillaris*</i>	X		
<i>B. diana*</i>	X		
<i>B. neilli</i>	X	X	
<i>Cheilinus undulatus</i>	X	X	
<i>Coris frerei</i>	X	X	
<i>Gomphosus caeruleus</i>	X		
<i>Halichoeres hortulanus</i>	X		
<i>H. marginatus</i>	X		
<i>H. nigrescens*</i>	X	X	X
<i>H. nebulosua</i>	X		
<i>H. zeylonicus</i>	X		
<i>Labroides dimidiatus</i>	X	X	X
<i>Stethojulis strigiventer</i>		X	
<i>S. trilineata</i>	X		
<i>Thalassoma hardwicke</i>	X		
<i>T. janseni</i>	X		
<i>T. lunare</i>	X	X	X