

Live reef-fishery species feature prominently in first marine fish IUCN Red List

by Yvonne Sadovy

The protection of marine fishes, particularly those exploited commercially, has historically fallen within the general purview of fisheries management. Even under extremes of exploitation, the likelihood that marine fishes could be threatened with extinction, has not, at least not until recently, been viewed as worthy of serious consideration. Should commercial exploitation prove excessive, or management ineffective, for certain species, then (the logic goes) fish numbers become too low for fishing to be commercially viable and fishing will cease. Exploited species, therefore, are protected by a 'safety valve' of economics and numbers which operates well before species, or populations, become seriously threatened. Or so many believe.

This long-held view is rapidly changing. Serious management failures far exceed any successes, with some spectacular collapses in recent years that few people would have believed possible not long ago; Atlantic cod is just one example. For a number of reasons, fishery management has not been as effective as we once hoped and, especially for species that appear to be particularly susceptible to even light levels of exploitation, conservation measures may be necessary to maintain a healthy fishery. Moreover, the safety valve may not always work. Some fishes are so highly prized that it is still worth fishing for them even at very low population levels. Indeed, in some cases, rarity itself is valued thereby maintaining or even enhancing 'cash' per unit of effort despite (or rather because of!) increasing scarcity. Examples of such species in the Indo-Pacific region, unfortunately, include many fish traded alive, either for the marine aquarium trade (MAT), for food in the live reef-fish trade (LRFT), or valued in traditional Chinese medicine (TCM).

In response to growing concerns over the status of marine fishes in general and the apparent failures of fishery management in particular, as well as recognising that marine species have long been under-represented on conservation lists, a meeting was held in April 1996 in London. This meeting was organised by the Institute of Zoology (Zoological Society of London) and the International Union for the Conservation of Nature (IUCN), which produces the internationally recognised and influential Red List of threatened species; additional funding came from the World Wide Fund's Endangered Seas Programme. The principal aims of the meeting were to discuss the applicability of various IUCN criteria, used to assess different levels of threat or endangerment in animals in general, to marine fishes and to develop a first listing of candidate marine fish species for inclusion in the 1996 Red List.

Using IUCN criteria, 148 marine fishes were included on the 1996 Red List. This list numbered 40 different families and 18 orders, with many commercially important species among them. Tropical species ranged from sharks, tunas and billfishes, to groupers, seahorses, snappers, chaetodontids and a wrasse. The criteria used to list these species, or specific populations, were mostly centred on inferred, estimated, observed, suspected or potential declining populations and/or dependence of a critical phase in life history on a small, or limited, area or habitat. Particular concerns arose from actual or likely severe overexploitation in traditional fisheries and from activities linked to a growing number of rapidly expanding 'new' fisheries especially those for the LRFT, MAT, and for TCM.

Major tropical groups included in the red-listing were the groupers (at least 14 species of serranid), the humphead wrasse (Napoleon fish or Maori wrasse), *Cheilinus undulatus*, and the seahorses, *Hippocampus* spp. For these animals, serious concerns were raised because of known, or strongly implicated, heavy declines in many exploited populations throughout the tropics as a direct result of their high value and trade. A rapidly growing demand is anticipated in many areas of the western Indo-Pacific because of the high value of species for the LRFT (e.g. groupers and humphead wrasse) and trade in seahorses for the MAT and for traditional medicines. Indeed, it is exclusively because of the apparent impact of the LRFT on the humphead in some areas that this species was red-listed.

In the live food-fish trade, groupers and humphheads are important species and fetch extremely high prices in gourmet restaurants in Southeast Asia. The humphead can retail at over US\$ 100/kg. Because of its high value, this species is being heavily fished in some places, sometimes using sodium cyanide, and severe depletions are suspected in many areas as a result of increasing demand for and trade in this wrasse. Another extreme example of the value of certain species in the live food-fish trade was a recent US\$ 10,000 price tag for a giant grouper, *Epinephelus lanceolatus*. As far as we know, this animal is not common anywhere in its range, yet its value makes it a highly desirable target and extremely susceptible to excessive trade.

Species of grouper, seahorse and the humphead are generally recognised as particularly vulnerable to exploitation because of certain of their life-history traits. Aside from their generally long lives (many decades in some cases) and slow growth rates which

generally accompany low replacement capacity, many groupers spawn for extremely limited periods each year, at spawning sites often well known in time and place. These aggregations are frequently heavily exploited and several have completely ceased to form, almost certainly as a result of fishing; they represent important areas on which these species depend for reproduction. In specific examples in the Caribbean, it is likely that much of the population or sub-population dependent on lost aggregations has also disappeared as a result of excessive aggregation fishing.

A different suite of biological characteristics renders seahorses susceptible to fishing. Loss of critical habitat (such as seagrass beds) combined with low natural seahorse densities and the reproductive habits of many species (such as faithful monogamy and low rates of production of young) mean that recovery from anything other than light fishing levels may be very slow.

The red-listing produced in April was a first draft and represents a warning flag alerting us to species exhibiting symptoms of, or potential for, endangerment at the population or species level. Debates will doubtless continue over the true vulnerability of marine species to extinction. However, populations at severely reduced numbers are clearly at risk of extinction through randomly determined environmental events; in the absence of any management at all, such risks may be particularly acute. The species listed that are currently traded alive appear to be particularly vulnerable because of their high value and the rapidly growing demand.

While red-listing has no legal muscle, it is useful as a guideline by policy makers and as a warning. Fisheries biologists and managers should heed this warning and look carefully at fishery developments in their region. The seas are not as bountiful as we once thought. Certain species, such as some of the groupers and seahorses and the humphead wrasse, will not live up to high economic hopes for them in the long term unless we resist the greed that serves nothing but short-term gain and invites the scrutinising eye of the conservationists.

While there is concern for the status of stocks, there is still very little information on the biology or trade of the humphead wrasse and the giant grouper. If anybody is carrying out any studies, or has any information on humphead wrasse or giant grouper populations, such as numbers being caught or exported, sizes of individuals observed in the field or being fished, or any confirmed cases of ciguatera poisoning from either species, I should be most interested to hear about it. This information could help us to understand better the conservation status of these species.

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Exploitation of reef resources, grouper and other food fishes in the Maldives

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The following is extracted from a paper presented at the Workshop on Integrated Reef Resources Management, 16–20 March 1996, Maldives.

Abstract

Exploitation of reef resources in the Maldives has become an important component of the country's fisheries sector. Two forms of reef-fish fisheries are recognised: the general fisheries, targeting a large number of different commercial species; and the grouper fishery, targeting commercial grouper species. Both these fisheries are expanding today.

The developing new fisheries pose two main threats: over-exploitation of resources and conflicts among resource users. To address the consequences of fisheries diversification, intensification and interactions

with other resource users, fisheries management has become a necessity.

In order to come up with recommendations for developing and managing reef fish fisheries, the available qualitative and quantitative information has been analysed in the present scenario of expanding reef-fish fisheries and increasing competition for reef resources among different interest groups. For the grouper fishery a minimum commercial size limit of 12 inches has been recommended (16 inches for the medium and large size-groups of fish). Other recommendations include maintaining the fishery below the maximum sustainable yield, keeping some areas temporarily

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