

Export Trade in Aggregating Species: Telling Patterns and Opportunities

Comercio de Exportación de Peces Tropicales de Agregar: Retos y Oportunidades

Commerce d'Exportation de Poissons Agrégative Tropical : Défis et Opportunités

YVONNE SADOVY

University of Hong Kong, Society for the Conservation of Reef Fish Aggregations, School of Biological Sciences,
Pok Fu Lam Road, Hong Kong, 0000 China. yjsadovy@hku.hk.

ABSTRACT

Increasing demand for reef fishes, both domestically and internationally, is putting intense pressure on many reef fish populations which receive little management or adequate conservation attention. Many of these are aggregating species and an increasing number is being exported. It is time to carefully examine and better understand the value, economic, cultural and nutritional of these species to source countries and to ensure not only their sustainability and seek ways to improve the value that they bring to the sectors of society that use and depend on them most. In this article, I highlight the problems being faced to preserve important reef fishes, and identify key challenges and opportunities for doing so.

KEY WORDS: international trade, reef fishes, sustainable management

INTRODUCTION

Globally, many important and valuable reef fishes aggregate predictably at the same times and places each year, to spawn. For most species it is their only known means of reproduction. Many of their populations are now being overfished and are under decline; in some locations their spawning aggregations are also decreasing, and some species are now considered to be threatened (according to IUCN Red List categories and criteria), some largely due to aggregation-fishing (Sadovy de Mitcheson et al. 2006, 2013, Russell et al. 2014). Examples of the latter include the Nassau grouper, *Epinephelus striatus*, dusky grouper, *E. marginatus*, and squaretailed coral grouper, *Plectropomus areolatus*. On the other hand, pressure to exploit reef fishes is growing to meet domestic food and trade needs as well as to respond to growing international demand. The latter is particularly marked for species considered to be of high economic value, especially many groupers and snappers, as well as some emperors, sparids, labrids, etc. This list includes many species that aggregate to spawn (Sadovy de Mitcheson and Yin 2014).

Spawning aggregations are particularly attractive fishing targets. Their oftentimes large numbers and predictability can define a major fishing season when catching fish is particularly efficient. For some species, the majority of annual landings come from spawning aggregations. Examples range from Nassau grouper and brown-marbled grouper, *E. fuscoguttatus*, to the camouflage grouper, *E. polyphkadion*. For large commercial operations, the high numbers of fish available at these times are advantageous for their economies of scale, facilitating pulses of large export shipments, whether by sea or air, live or dead. Just a few of the many examples, either currently or in the recent past, range from exports of live and/or chilled groupers from Honduras, Palau, Solomon Islands and Fiji to chilled snappers (shallow and deepwater reef species) exported from Honduras, Nicaragua, Fiji, etc. (Sadovy de Mitcheson and Yin 2015, unpublished). The focus on spawning aggregations as major sources of these export fisheries is poorly documented overall, but a few case studies and examination of export and import data clearly implicate intensive fishing during the reproductive season (e.g. Box and Cauty 2010, Fox et al. 2012, Sadovy de Mitcheson and Yin 2015).

Most reef fishes are exported from developing countries, which account for over 50% of the economic value of global seafood trade. In general, international trade is widely assumed to be an important contributor to the economic development and food security of developing countries but can both positively and negatively impact on their socio-economics and environment (e.g. Kurien 2005, World Bank 2013, FAO 2014). However, positive benefits often accrue to relatively few people (e.g. traders), with exports only advantageous in the long term when natural resources are managed for sustainability; negative impacts from export trade, on the other hand, can come from increased fishing pressure, reduction in locally available food fish, and from damaged reefs (Kurien 2005). Unfortunately, few developing countries effectively monitor and manage their marine resources for biological sustainability many are in poor condition (Sadovy 2005, Costello et al. 2012), and the extent to which the poorer segments of society that produce the seafood in these countries actually benefit from international trade is far from clear; few studies have been conducted despite growing pressure to export. Moreover, surprisingly few countries tax the export of their reef fishes.

Overall, patterns of international trade in most tropical coastal fisheries are difficult to understand because the monitoring and documentation of exports of reef fish species is generally very poor. Nonetheless, despite the paucity of trade data, there are clearly both opportunities and challenges associated with international trade in reef fishes from both socio-economic and biological perspectives. These should be considered and addressed to ensure that economic benefits trickle down to those who produce or depend on traded resources, and that resources are not degraded, or can no longer adequately meet local needs. Aggregating fishes are a particularly vulnerable aspect of this trade and merit close attention. Finally, while interest in reef fishes is often focused on extractive use, their economic value for tourism and cultural and aesthetic values should not be ignored and can be considerable.

CHALLENGES AND OPPORTUNITIES

Challenges

The major challenge is the lack of management of small-scale coastal fisheries for sustainability. Due to limited or absent monitoring/reporting, catch and trade volumes, economic value and overall importance of these for coastal communities are not fully understood and certainly not properly appreciated. Few government resources are dedicated to ensuring their long-term persistence and insufficient attention is given to threatened species and declining fisheries. Moreover, fisheries development projects largely ignore the underlying resource base and can further exacerbate overfishing; a good example is the establishment of fish storage and consolidation facilities (ice plants) that encourage and enable increased fishing pressure with no prior knowledge of, or reference to, the capacity for increased exploitation of the affect resources.

Large numbers of seasonally available fish when they aggregate to spawn are particularly attractive to target and export because they produce high volumes quickly and this can satisfy economies of scale for commerce, including for export. However, this situation can also produce market gluts and lower prices per fish paid to fishers (Sadovy de Mitcheson and Erisman 2012, Kuridrani 2008). The many fish seen in aggregations, even as catches decline, can create *illusions of plenty* that make it difficult to attract management attention. Yet aggregations can decline quickly and collapse suddenly without protection, and with loss of the associated fishery. A proactive approach to their management is needed. On the other hand, the extensive application of marine protected areas (MPAs) for conservation, cannot adequately address the protection of species that aggregate since many are migratory and MPAs are typically too small to address all aspects of their annual distribution. Loss of coastal fisheries over the long term will translate to loss of jobs and economic options

Opportunities

Given the growing demand for reef fishes, live and chilled, wherever valued reef fish populations are still in fair to good condition, there is excellent opportunity for source countries to benefit more from them economically. In addition to ongoing contribution to domestic food security and trade, well-handled and well-marketed reef fishes can gain good income. Export taxes can benefit source countries and could provide income for management and enforcement. If some of the fisheries could be certified as sustainable, this might improve revenues if buyers are prepared to pay more for such fish.

In some countries, economic income from tourism derives directly from the spawning aggregations of larger reef fishes and their spawning aggregations. For example, in Belize, an economic analysis indicated that the value of an aggregation of Nassau grouper was 20 times higher for non-extractive (tourism) than extractive use (Sala et al. 2001). In Palau, western Pacific, diving and seafood are major attractions. The spectacular aggregations of several snappers and of the bumphead parrotfish, *Bolbometopon*

muricatum, are popular with divers (personal observation). Tourists from mainland China now flock to the country in large numbers with a huge appetite for seafood, and reef species are a particular target, especially many of the groupers and larger species (Survival 2014). The country no longer exports reef fishes commercially, keeping them for local traditional and tourism uses. Fortunately, Palau has long protected its grouper spawning aggregations, and with a recent improvement in enforcement and resulting start in recovery (Russell et al. 2014).

There are many opportunities to improve management of coastal fisheries. National fisheries legislation can be updated, and species conservation status identified. The IUCN Red List is now used to assess the conservation status of marine fishes and many tropical reef species have been assessed, both globally and regionally; those species highlighted as threatened could be a focus of conservation attention or further study. For species listed on the Convention on International Trade in Endangered Species of Flora and Fauna (CITES), control of exports would help to reduce threats to the species. For monitoring and assessing coastal fisheries, there are a number of simple methods that can be used in data-poor situations that allow for the tracking of catches, species, and sizes – all necessary information to understand fishery condition and trends and to make management decisions. A better understanding of the overall and various values associated with reef fishes and their trade could provide incentive to manage.

To raise understanding about fisheries and the need to manage and better utilize these, there is ample scope for local and international NGOs amongst which there is a growing understanding of fisheries issues, and appreciation of the need to manage. It is important for those organizations that have focused on conservation of biodiversity and habitat to also embrace the wider issues of sustainable use and move beyond a single focus on protected areas. There are many opportunities for major campaigns to raise awareness about the plight of local resources, and some good examples to follow. In Belize, for example, a consortium of local NGOs has effectively raised public and government awareness and succeeded in protecting and monitoring Nassau grouper aggregations:

(<http://collaborations.wcs.org/Default.aspx?alias=collaborations.wcs.org/spag&>).

A good outreach example is a popular campaign that highlights the importance of aggregating species to local communities, and engages the local public through pledges to avoid eating groupers during the aggregation season as a way to help protect culture heritage and food sources (<http://www.4fj.org.fj/>).

SUMMARY

There are opportunities for many developing countries to gain considerably more benefit from valuable species, many of which aggregate to spawn, in their reef ecosystems by better managing their extraction, use and trade, both domestic and international. As competition for marine resources, including highly regarded reef-associated species, intensifies globally, scenarios of elite capture (e.g., luxury live reef fishes), or inequitable benefit distribution, will almost certainly become more common (Fabinyi et al.

2010, Cabral and Alino 2011), particularly impacting on poor marginal groups. Source countries can protect themselves from these trends by better managing their coastal resources in general and their export trade in coastal species in particular. They could also prioritize the interests of their own people and local economies, whether as food, for trade, or to meet tourism interests. Spawning aggregations are important components of coastal ecosystems and fisheries, and include some of the greatest wildlife events of our oceans – it will take commitment to preserve them and the benefits they generate, and much will be lost if we fail.

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