



Short communication

Banning is not enough: The complexities of oceanic shark management by tuna regional fisheries management organizations



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ABSTRACT

Recently, declining populations of several pelagic shark species have led to global conservation concerns surrounding this group. As a result, a series of species-specific banning measures have been implemented by Regional Fishery Management Organizations (RFMOs) in charge of tuna fisheries, which include retention bans, finning bans and trading bans. There are both positive and negative aspects to most management measures, but generally, the positive aspects outweigh the negatives, ensuring the measure is beneficial to the resource and its users in the long term. Banning measures are a good first step towards the conservation of pelagic shark species, especially since they improve conservation awareness among fishers, managers and the public. Measures that impose total bans, however, can lead to negative impacts that may jeopardize the populations they were intended to protect. The majority of pelagic shark catches are incidental and most sharks die before they reach the vessel or after they are released. The legislation set out by RFMOs only prevents retention but not the actual capture or the mortality that may occur as a result. Managers should be fully aware that the development and implementation of mitigation measures are critical for a more effective conservation strategy.

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1. Introduction

As populations of highly migratory species decline due to over-exploitation or other human induced causes, management measures are often implemented to aid their conservation and restore populations to pre-existing levels (Hoffmann et al., 2010). Such measures have a variety of forms, typically linked to the level of concern surrounding the population in question. Generally, as concerns become increasingly severe, management measures follow suit and often conclude with total bans

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on harvesting and global trade of a species. While these measures are generally believed to aid in species conservation, they can, at times, lead to increased pressure on the population at risk (Rivalan et al., 2007).

Recently, declining populations of several pelagic shark species have led to global conservation concerns surrounding this group (Fowler et al., 2005; Dulvy et al., 2008; Aires-da-Silva and Gallucci, 2008; Cortés et al., 2010). These sharks are both targeted and taken incidentally as bycatch by a range of fleets from coastal artisanal to industrial vessels operating in distant waters (Bonfil, 1994; Worm et al., 2013). An inherent issue with exploitation of elasmobranch species, as compared to their teleost counterparts, is their low rebound capacity resulting directly from their characteristic life history traits of slow growth, late maturation and low fecundity (Cortés, 2000). As such, this group is generally far more vulnerable to overfishing than teleost fish species (Musick et al., 2002; Compagno et al., 2005).

With the increasing conservation concern over this sensitive group, a series of species-specific banning measures have recently been established by Regional Fishery Management Organizations (RFMOs) responsible for the management of tuna fisheries. These measures include retention bans, finning bans and trading bans. There are both positive and negative aspects to most management measures, but generally, the positive aspects outweigh the negatives ensuring the measure is beneficial to the resource and its users in the long term. Management measures based on retention, finning or trading bans are no different. Here we highlight both the benefits and drawbacks of such measures, in order to assess their overall efficacy and long-term benefit to populations.

2. Banning measures

Fisheries that target widely distributed and highly migratory species are managed by international commissions, of which cooperating countries/parties are members. There are five such commissions (RFMOs) that regulate the world's tuna fisheries, each with jurisdiction over an ocean/ocean region or target species: the International Commission for the Conservation of Atlantic tuna (ICCAT), the Indian Ocean Tuna Commission (IOTC), the Western and Central Pacific Fisheries Commission (WCPFC), the Inter-American Tropical Tuna Commission (IATTC), overseeing fishery activity in the eastern Pacific Ocean, and the Commission for the Conservation of Southern Bluefin Tuna (CCSBT), overseeing all fisheries targeting southern bluefin tuna (*Thunnus macoyii*). Aside from tuna species, these RFMOs are also usually responsible for the management of any other species caught in association with tuna fisheries. Management measures generally stem from the results of annual stock assessments and the advice from scientific committees linked to RFMOs. These measures are set out in the form of recommendations or resolutions, which contracting parties are then required to implement and report upon.

To date, several species-specific management measures have been developed under the tuna RFMOs that pertain to the incidental capture of pelagic sharks. These measures are hereafter referred to as banning measures. Generally, they stipulate that all contracting parties shall prohibit retention, transshipment, landing or storing any part, or whole carcass, of the species in question. Additionally, some of these measures require captured sharks to be promptly released unharmed and/or further state that trading, selling or offering for sale is also prohibited (Table 1). As a result, oceanic whitetip (*Carcharhinus longimanus*), silky (*C. falciformis*), thresher (*Alopias spp.*) and hammerhead (*Sphyrna spp.*) sharks fall under such resolutions in at least one ocean (Table 1). These measures were all developed fairly recently by tuna RFMOs (2010–2013). The oceanic whitetip shark is the only species covered by such measures across all oceans.

In addition to RFMO management measures, international treaties also regulate the trade of certain marine species. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is one such treaty and plays an important role in managing wildlife. CITES represents an international agreement among governments that aims to ensure that international trade of wild fauna and flora does not threaten their survival. In accordance with this convention, the international trade of specified species can either be closely controlled (species listed on appendix II) or completely banned (appendix I), depending on its population status or vulnerability. During the most recent meeting of CITES (March 2013), the oceanic whitetip and hammerhead sharks were included in appendix II (CoP16 Prop. 42 and 43), requiring their international trade to be closely controlled.

3. In what scenario can banning measures be effective?

Banning the retention and trade of pelagic sharks can drastically decrease their fishing mortality in fisheries where they are directly targeted. Essentially, the aim of these measures is to give the stocks the opportunity to recover to pre-exploitation levels. It is well known, however, that the great majority of pelagic shark mortality results from their incidental capture in high-seas pelagic longlines, gillnets and purse seine fisheries that primarily target tuna and tuna-like species (Gilman et al., 2008; Bonfil, 1994). Nevertheless, sharks are undeniably considered a valuable bycatch in many fleets and are increasingly becoming a target as well (Hareide et al., 2007). The implementation of banning measures in these fisheries not only encourages fishers to modify their current practices, but also prevents these species from shifting from an incidental catch to a specific target.

An increasing number of marine populations are showing signs of recovery after an advance on conservation efforts, especially through measures that ban trade or any exploitation activity (Lotze et al., 2011). Marine mammals represent the group with the greatest results in terms of conservation success for this ecosystem. A recent study has shown that 42% of 92 spatially non-overlapping marine mammal populations are significantly increasing as a result of measures that ban their

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