

Shark conservation and blanket bans in the eastern Pacific Ocean

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Abstract

Sharks are one of the most threatened marine animals, with fishing identified as the prime human activity responsible for population declines. The tropical eastern Pacific, a biogeographic region spanning the coastal areas from Mexico to Peru including the Colombian Pacific coast and the Galapagos archipelago, forms critical habitat and migratory routes for sharks and other marine megafauna. The Colombian government recently announced a total (blanket) ban on all forms of shark fishing in the country, including artisanal and industrial. Prohibiting shark fisheries in Colombia could drive fishing and trade underground, fueling criminality, and marginalization. This will not only undermine recent efforts of local communities and researchers to manage small-scale fisheries, but will criminalize a key source of income for a historically marginalized part of Colombian society. To be effective and ethical, this government decision needs to be rethought incorporating a more holistic management strategy consented among different stakeholder groups.

KEYWORDS

Colombian Pacific coast, conservation intervention, holistic fisheries management, marine social-ecological systems, shark fisheries

Sharks are one of the most threatened marine animals, with fishing identified as the prime human activity responsible for population declines (Dulvy et al., 2017; Queiroz et al., 2019). The tropical eastern Pacific (TEP), a biogeographic region spanning the coastal areas from Mexico to Peru including the Galapagos archipelago and four other oceanic islands, forms critical habitat and migratory routes for sharks and other marine megafauna. The TEP is a rich small-scale and industrial fishing area for large and medium pelagic fishes suffering from illegal, unreported and unregulated (IUU) fishing. For a few decades, a network of marine protected areas in the TEP

has aimed at protecting shark's migratory routes, but ongoing fishing pressure continues to cause targeted and by-catch shark mortality on coastal and oceanic areas of the region (Alava & Paladines, 2017).

The Colombian government recently announced a total (blanket) ban on all forms of shark fishing (sharks, rays, and chimeras) in the country, including artisanal and industrial, in a bid to “[take] care of natural resources and ecosystem[s]”. The decree stipulates that shark, rays, and chimeras will be no longer considered fisheries resources but hydro-biological resources, and, therefore, cannot be commercialized, not even in local

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markets. This change also implies that the national fisheries authority will not be in charge of managing these resources and that the Ministry of Environment will take over those functions. This decision is well meaning, and has been celebrated by some conservation organizations. However, blanket bans on wildlife use are known to have perverse consequences for wildlife and people. For example, if regulations are not perceived as legitimate amongst resource users, they can drive trade under-ground (Conrad, 2012), undermine monitoring efforts, remove incentives for sustainable use, cause socio-economic shocks, and fail to address underlying drivers and market forces of conservation problems (Booth, Squires, & Milner-Gulland, 2019). In the case of sharks, bans can be ecologically ineffective, especially in mixed-species tropical fisheries like the ones in Colombia (Herrón, Kluger, Castellanos-Galindo, Wolff, & Glaser, 2020), where sharks are caught incidentally (Collins, Letessier, Broderick, Wijesundara, & Nuno, 2020).

Prohibiting shark fisheries in Colombia could drive fishing and trade under-ground, fueling criminality, and marginalization. A compelling example of a similar failed measure is the prohibition on the use of artisanal shrimp trawls in the Colombian Pacific established in 2004 (Puentes et al., 2014). Artisanal shrimp trawls never stopped operating and they are currently active in several towns along the coast with little to no enforcement of this regulation. Mainly due to the prohibition, data on the

status of the main target resources of this fishery and its bycatch are commonly not available or difficult to obtain. Fishers operating these gears are commonly marginalized in their communities with a few sparse efforts dedicated to convince those fishers to change their fishing gears but no actual understanding of the motivations and social components of that specific fishery (Castellanos-Galindo & Zapata, 2019). A blanket ban on shark fisheries will not only undermine recent efforts of environmental and fisheries authorities, local communities, and researchers to manage and monitor small-scale fisheries (SSF) (e.g., concerted design of integrated management areas in recent years; Ramírez-Luna & Chuenpagdee, 2019), but will criminalize a key source of income for a historically marginalized part of the Colombian society (i.e., Afro-Colombians; Oslender, 2008). Most SSF in Colombia do not target sharks, but those sharks that are incidentally caught represent an important source of income and food security (Herrón et al., 2020). Avoiding the capture of shark species in the SSF of the Colombian Pacific could be an unachievable task. The prohibition will be difficult to enforce due to the historical weak institutional presence in this coast, including that of the Ministry of the Environment and its regional bodies. Sharks will most likely continue to be targeted, but monitoring will become difficult with fishers reluctant to contribute data to assess the conservation status of already data-poor species. More than 50% of the 67 species of

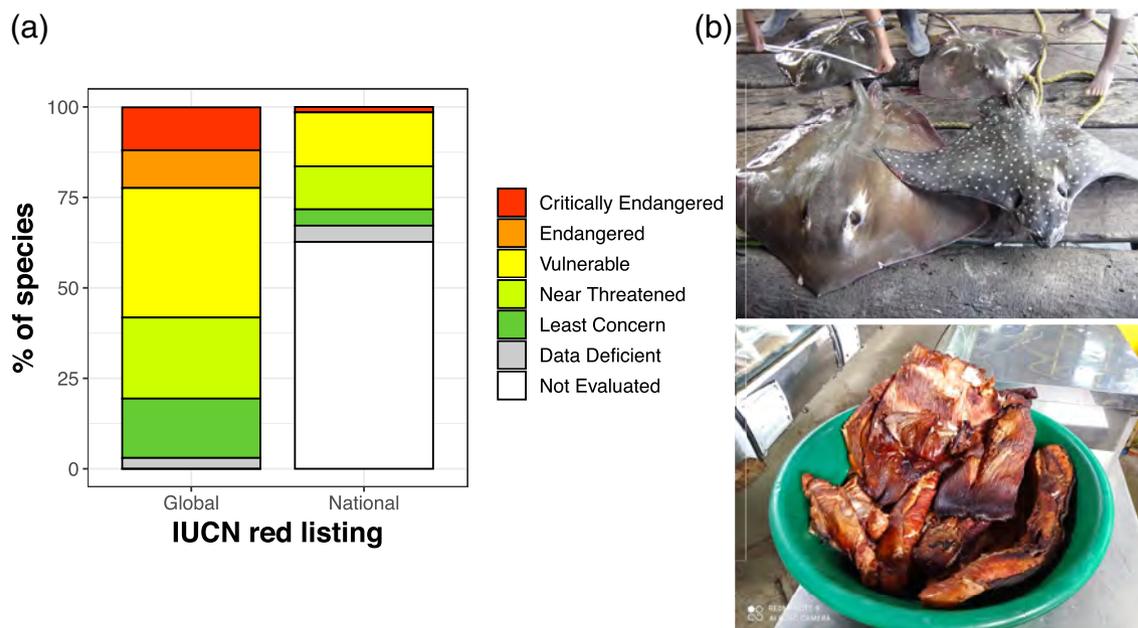


FIGURE 1 (a) IUCN threatened status of the 67 shark and ray species present in the Colombian Pacific (Mejía-Falla & Navia, 2019) according to global (IUCN, 2020) and national (Chasqui et al., 2017) lists; (b) Some of the targeted and processed (smoked) sharks and rays commonly sold by Afro-Colombian women at the principal fish market in the Colombian Pacific coast (Tumaco and Pueblo Nuevo market in Buenaventura). Photo Credits: Rodrigo Baos and Stella Gomez

TABLE 1 Main commercially exploited shark and ray species in the Colombian Pacific coast, their uses and their national and global conservation status according to the IUCN criteria

Species	Common name (English)	Uses	National IUCN status	Global IUCN status
Industrial fisheries				
<i>Alopias pelagicus</i>	Pelagic thresher	RMC	VUA2d + 4d	EN A2bd
<i>Alopias superciliosus</i>	Bigeye thresher	RMC	NT	VU A2bd
<i>Sphyrna lewini</i>	Hammerhead	RMC	VUA2a + 4d	CR A2bd
<i>Carcharhinus falciformis</i>	Silky	RMC, H	VUA2ad + 4d	NT
Small-scale fisheries				
<i>Carcharhinus cerdale</i>	Pacific Smalltail shark	LMC, LO	DD	CR A2bcd
<i>Carcharhinus leucas</i>	Bull shark	LMC, LO, H	Not evaluated	NT
<i>Rhizoprionodon longurio</i>	Pacific Sharpnose shark	LMC, LO, H	Not evaluated	VU A2cd
<i>Sphyrna tiburo</i>	Bonnethead	LMC, LO, H	Not evaluated	EN A2bcd
<i>Sphyrna media</i>	Scoophead	LMC, LO, H	Not evaluated	CR A2bcd
<i>Sphyrna corona</i>	Crown shark	LMC, LO, H	NT	CR A2bcd
<i>Sphyrna lewini</i>	Hammerhead	LMC, LO, H	VUA2a + 4d	CR A2bd
<i>Mustelus lunulatus</i>	Sicklefin smooth-hound	LMC, LO	VU A4d	LC
<i>Mustelus henlei</i>	Brown smooth-hound	LMC, LO	VU A4d	LC
<i>Hypanus longus</i>	Longtail stingray	LMC, LO	VU A4d	VU A2d
<i>Pseudobatos leucorhynchus</i>	Whitesnout guitarfish	LMC, LO	VU A4d	VU A2d
<i>Styracura pacifica</i>	Pacific Chupare	LMC, LO	Not evaluated	VU A2cd
<i>Aetobatus laticeps</i>	Spotted eagle ray	LMC, LO	Not evaluated	NT

Note: Species in bold are those mainly caught.

Abbreviations: H, handicrafts; LMC, local meat consumption; LO, liver oil; SM, regional meat consumption (inland cities).

sharks and rays in the Colombian Pacific (Mejía-Falla & Navia, 2019) have not been assessed at the national level under the International Union for the Conservation of Nature (IUCN) red list criteria (Figure 1). This is primarily due to the lack of data available to determine either the conservation status of these species or the stock condition of exploited populations. At least 15 species of these 67 species have documented local and regional uses (Table 1) and they are in need of management actions that warrant their sustainable use (Navia & Mejía-Falla, 2016). In a scenario of total prohibition on shark fisheries, in which landings data no longer include information on these group, collecting scientific information will become even more difficult and determining the real conservation status of sharks and rays in the country would face a bleak future.

Sustainable shark fisheries are possible, and there are examples of well-managed shark fishing (Shiffman & Hammerschlag, 2016; Simpfendorfer & Dulvy, 2017). Shark conservation in the TEP is needed and should be prioritized in the Decade of Ocean Science for Sustainable Development. However, conservation interventions that are not supported by resource users, are logistically

difficult to implement and ignore the wider socio-economic drivers of shark fishing impacting vulnerable sectors of society, can lead to undesired outcomes. Replicating this measure in other countries of the TEP region will likely have similar societal negative effects. These may accentuate inequality and hamper the achievement of several interrelated Sustainable Development Goals. Instead, holistic management strategies (Booth, Squires, & Milner-Gulland, 2020), consented among different stakeholder groups, and incorporating different social, economic and cultural perspectives, are likely to produce better conservation outcomes for sharks (Mejía-Falla et al., 2019), and better social outcomes for small-scale fishers in the TEP. To be effective and ethical, this government decision needs to be rethought incorporating exemptions for artisanal fishers, training and rewards for live-release protocols, and novel socio-economic instruments that can help to compensate for financial and social losses.

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