Sharks and rays of Belize: preliminary results from the field and fishers interviews


Introduction

Populations of sharks and rays worldwide are under increasing pressure from unsustainable fisheries with dramatic declines and extinctions in many populations of coastal and pelagic species documented over relatively short time scales (Bann et al. 2003). As the food chain's open predators with K-selected life history traits and low population recovery rates, sharks and rays may be potent indicators of fishing pressure (DeFoe et al. 2006) and in coral reef habitats, of high fish biomass and a functional ecosystem (Newman et al. 2006).

No broad assessments of coastal elasmobranch diversity, distribution and fishery exist in Belize due primarily to the lack of importance of the associated fishery. The need for information on the country’s top marine predators and desired completion of a National Plan of Action for Sharks (NPSA) prompted our study of elasmobranch diversity, relative abundance and critical habitats throughout Southern Belize, a key transboundary area hosting the majority of the fishery. Preliminary results have been disseminated in local communities and are being used to raise the profile of sharks and rays in Belize. We envisage that this study’s final results will provide the basis for the development of regulations for the fishery.

Materials and methods

We are conducting the elasmobranch assessment between January and December 2006 in Southern Belize (Figure 1). Sampling gears used to date included set lines deployed in mangrove creeks and estuaries (n = 3,840), longlines in coastal estuaries, reef patches and outer reef areas (n = 275) and drumlines in reef passes (n = 164). Circle 160 hooks were used on wire and mono leaders. Soak times for drumlines and longlines were 3 hrs or less. All animals were brought alongside the boat (Fig. 2 and 3), restrained to induce tonic immobility (Fig. 6) and measured for pre-cordal, total and clasper lengths. Fin clips were taken for future population analysis and animals were conventionally tagged before the base of the dorsal fin (Halfpoint marker tags).

Local fishers provided traditional knowledge on historical abundance, diversity and critical habitats of elasmobranchs during interviews and ec community meetings held for consultative purposes as well as return of study results. A socio-economic survey was administered to 55 local fishers from Punta Gorda, Placencia, Hopkins, Dangriga, Belize City and Sarteneja (Northeastern fishing community in Belize) to assess the importance of shark capture to their livelihood.

Results

259 elasmobranchs were captured over 92 survey days. A total of 15,489 hooks were deployed, resulting in a mean of 1 elasmobranch caught per 60 hooks deployed. The ease shark, Carcharhinus perezii and blacktip, C. limbatus (Fig. 3). Captures were distributed throughout the study area with the exception of sampling sites south of Punta Gorda Town (Fig. 4a). Species habitat partitioning specifics are of e.g., C. perezii only caught on the barrier reef and C. limbatus primarily caught in mid-channel and coastal areas (Fig. 4b-e).

Shark fisher survey results

Of the 49 socio-economic surveys of coastal fishers conducted, 26 fishers surveyed regularly fish sharks. Sharks are not targeted in Belize.

Shark fisher profiles

- 2 females, 24 male fishers.
- Age range 16-57.
- Fishing for 1-40 years with an average of 21.4 years fishing.
- 44% did not complete primary school.
- 56% captains working with 2-14 fishers during each trip.

Fishing methods and landings

- 74% fish with nets, the gear of choice for shark capture.
- Coastal reefs and channel areas are preferred set locations.
- 12% catch shark specifically for the Lenten season with other fishers catching shark occasionally or all year.
- Species targeted and frequently caught (Fig. 5) include blacktip (C. limbatus), nurse (G. cirrhosus), hammerhead (U. glauca spp), tiger (G. brevipinna), and bull (C. leucas).
- Deepwater sharks captured include dusky smoothhound (A. stearnsii), porbeagle, blue shark (A. prionace), bigeye sawfish and dusky smoothhound.

Distribution of captures for all elasmobranch species

- Belize
guatemala
honduras
- Caribbean Sea

Markets and prices

- 64% engage in transboundary sales to Mexico, Honduras and Guatemala, mostly within Lent.
- Shark meat sells USD40-43/kg.
- Oil sells for USD5/L.
- Shark fins fetch up to USD22.73/kg.
- Preferred species include blacktip and hammerhead spp.
- Avoided species include nurse sharks and tiger sharks.

Perceptions of the resource

- 55% note a decline in the abundance of sharks.
- 52% have to travel farther to find sharks.

Summary

- Elasmobranchs were captured throughout Southern Belize except for the heavily fished area south of Punta Gorda Town.
- Catches were dominated by nurse sharks.
- Shark is rarely consumed in country relative to finfish; consumption is not purchased by the Belizean’s cooperatives and is primarily destined for international markets.
- Nets are the favored shark fishing gear.
- Belize’s shark fishery is currently unregulated.

Conclusions

Low catch rates of historically abundant species during our Southern Belize field assessment support fisher accounts of declines in both abundance and diversity of elasmobranch species throughout the country. Although Belize’s shark fishery is small (with an estimated 75 fishers), it is almost entirely geared towards supplying the growing populations of three neighboring countries (Mexico, Honduras and Guatemala) with canned fish, particularly during the religious Lenten season. Additionally, pressures on remaining shark populations are increasing due to rising interest in supplying Asian’s lucrative fish market. According to fishers interviewed, there is an increasing shift towards the capture of previously avoided species such as nurse sharks and rays as preferred species decline. Preliminary study results suggest that elasmobranchs require specific regulations to foster the recovery of populations and that such regulations need to include provisions for curbing or eliminating the use of nets and longlines.

Literature cited

Bennett, J. K., Myers, R. A., Kehler, D., Worm, B., Harley, S. J. and P. A. Doherty. 2000. Collapse and conservation geared towards supplying the growing populations of three neighboring countries (Mexico, Honduras and Guatemala) with canned fish, particularly during the religious Lenten season. Additional pressures on remaining shark populations are increasing due to rising interest in supplying Asian’s lucrative fish market. According to fishers interviewed, there is an increasing shift towards the capture of previously avoided species such as nurse sharks and rays as preferred species decline. Preliminary study results suggest that elasmobranchs require specific regulations to foster the recovery of populations and that such regulations need to include provisions for curbing or eliminating the use of nets and longlines.

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For further information

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