



- Elasmobranchs are widely targeted for their meat & caught as bycatch in diverse artisanal fisheries.
- A lack of regulation and landings data is preventing full understanding of their involvement.
- Recent growth in fishing effort in coastal nursery areas may be significantly affecting recruitment.
- Endangered hammerheads (*Sphyrna* spp.) are most at risk despite protected status.

## 1. Introduction

The fishing sector in Cabo Verde is dominated by traditional small-scale fisheries (Carneiro, 2012), which have an important socio-economic and cultural role. Yellowfin tuna (*Thunnus albacares*) and African hind (*Cephalopholis taeniops*) are amongst the most widely sought species. In comparison to the rest of West Africa, targeted shark fisheries are speculated to be 'under-developed' (Diop & Dossa, 2011) and elasmobranch catches in artisanal fisheries are considered negligible (Gominho et al. 2005). Nonetheless, a widespread lack of comprehensive landings data and insufficient regulation, in conjunction with high levels of industrial IUU within the EEZ (Carneiro, 2011), has led to increasing uncertainty. Recent growth in artisanal fisheries driven by the expansion of tourism, has underlined the need to understand current trends. In this regard, Traditional Ecological Knowledge (TEK) can provide a historical and contemporary overview of marine species, distribution and fisheries, which can supplement scientific monitoring and inform management.



Fig. 1. Fishers drag a traditional artisanal boat, known as a 'boca aberta', up a beach.

## 2. Methods

- 250 structured standardised interviews (n=250) were conducted with artisanal fishers in the archipelago of Cabo Verde (16N,-22W) in the Eastern Central Atlantic (ECA).
- Including the islands of Boavista<sup>1</sup>, Sal<sup>2</sup>, São Vicente<sup>3</sup>, Maio<sup>4</sup> and Santiago<sup>5</sup>
- Interviews were conducted by trained local technicians and comprised of 56 formulated questions.
- Participation was on a voluntary basis and all responses were anonymous.
- Respondents were randomly selected, between the ages of 18 - 85.



Fig. 2. Location of the archipelago of Cabo Verde relative to continental Africa.

### Objectives:

- Characterise historical and contemporary artisanal fisheries and elasmobranch captures.
- Establish cultural drivers behind fisheries.
- Identify target species and important sites.
- Quantify fishing effort and identify recent trends.



Fig. 4. Dried shark meat known as cação being prepared.



Fig. 5. A coastal nursery area where fishing effort increasingly impacts shark populations.



Fig. 6. A neonate scalloped hammerhead (*Sphyrna lewini*) & numerous milk sharks (*Rhizoprionodon acutus*) caught as bycatch in a nursery area.

## 3. Results

- >88% of interviewed fishers acknowledged having caught sharks though only 3.2% admitted to ever directly targeting them.
- Nonetheless, nearly 60% declared selling elasmobranchs (Fig. 7), 27% denied selling elasmobranchs; 13% did not answer.
- Endangered *Sphyrna* spp. cited as most frequently captured species.
- >95% of fishers noted a decline in marine resources and 70% a significant decrease in the number of sharks captured in the last 10 years.

Fig. 7. The sale of elasmobranchs.



## 4. Discussion

- Historically, shark meat had little value, however, cultural and religious linkages have seen dried shark meat (known as cação) replace imported cod from Portugal, and resulted in increased targeted fisheries.
- The common smoothhound (*Mustelus mustelus*) is directly targeted as 'cação', though fishery also targets Hemigaleidae and juvenile Carcharhinidae & Sphyrnidae - the latter being nationally protected.
- Easily identifiable species more frequently cited.
- Legislation passed in 2005 (*Resolução* n° 56/2014 of 31 July, BO n° 18-Serie I) has reduced levels of finning occurring at sea.
- Both sharks and rays are frequently taken as bycatch in divergent fisheries either to be consumed or used as bait in more valuable finfish fisheries.
- The existence of coastal nursery areas and growth in fishing effort (and use of unlicensed gillnets), has led to increased levels of bycatch of neonate and juvenile sharks, particularly endangered *Sphyrna* spp.

Fig. 8. Blacktips (*Carcharhinus limbatus*) are targeted for their meat & fins and juveniles caught as bycatch.

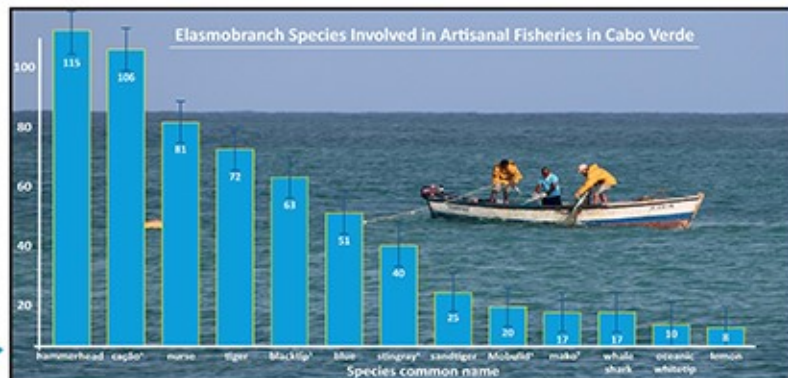


Fig. 9. The most frequently caught species according to surveys. \* indicates groups of multiple species unlikely to be distinguished - 'blacktip' is composed of *C. limbatus*, *C. brevipinna*, *C. obscurus* & *C. altimus*. 'Mobulid' includes *Mobula* and *Monta* spp., 'cação' *M. mustelus*, *Paragaleus pectoralis*, *Rhizoprionodon acutus* and *Leptocharias smithii*. Fig. 10. Fishers remove a gillnet set over night in a nursery area in order to catch juvenile sharks.

## 5. Conclusion

- Artisanal fisheries are affecting a wide range of elasmobranch species to a greater extent than previously thought.
- Increased fishing effort, and the use of gillnets, in coastal nursery areas, is resulting in higher levels of direct involvement and bycatch.
- Populations have declined substantially in last 20 years, ex. *Sphyrna* spp.
- In combination with industrial fisheries, ensures large impact across stages of development & highlights lack of effective protective measures (MPAs).
- A lack of regulation of fisheries and widespread underreporting is obscuring true level of involvement/species. Results are considered conservative.
- Results highlight i). the need for greater involvement at a community level to understand drivers and, ii). increased scientific monitoring to underpin management, if populations are to persist in the long-term.



Fig. 11