

Small cities, big business: The finning in Alagoas State, Northeast Brazil.

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Finning is an illegal activity in many countries, but due to fins high prices on the international market, it continues to be carried out, especially in developing countries. The State of Alagoas is a small fish producer in the Northeast of Brazil and until now its participation in finning and commercialization of shark fins was unknown. In February 2018, a federal action of fiscalization confiscate 42 shark's fins being commercialized in a small artisanal fisherman village. All fins were sent to the Laboratório de Ictiologia e Conservação, Universidade Federal de Alagoas, being photographed, measured and species were determined through literature. Tissues were collected for future genetic analysis. Information on finning and on the fin black market was obtained from local fishermen through free interviews. A total of 22 pectoral and 20 dorsal fins were analyzed from 26 adult sharks of 6 species belonging to 2 families: Carcharhinidae (9 individuals of *Carcharhinus limbatus*, 5 of *C. falciformes*, 1 of *C. signatus* and 1 of *C. leucas*) and Sphyrnidae (7 specimens of *Sphyrna lewini* and 3 of *S. mokarran*). Of these, we highlight *C. signatus*, *S. lewini* and *S. mokarran*, which are in the national red list of endangered species, classified as vulnerable (VU), critically endangered (CR) and endangered (EN), respectively. The others, *C. leucas*, *C. falciformes* and *C. limbatus* are considered EN in the IUCN international list. According to the free interview results, finning and the clandestine commercialization, occur in Alagoas State to a decade, being considered important and lucrative activities. These fins would be sold for an average of US \$ 63.00/kg, send to the state's capital, Maceió, and possibly exported to Asia. These results show that in addition to illegal trade, endangered species are also targeting fisheries. The implementation of management measures and fishing monitoring programs, as well as the promotion of control finning and black-market fin trade in Alagoas, are fundamental for the conservation of sharks and other endangered species by fishing.

Keywords: fishing, endangered species, illegal trade

Sharks and stingrays landed in the largest fishing port of Alagoas, Northeast Brazil.

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Sharks and stingrays are sensitive to intense and unmanaged fishing. Characteristics such as late sexual maturity, low fecundity and longevity make them the most threatened group of marine fish in Brazil. The city of Piaçabuçu, located near the estuary of the São Francisco river, is the largest fish producer in Alagoas, Northeastern Brazil. Aiming to evaluate and characterize the fishery production of sharks and stingrays of Piaçabuçu, landings were monitored from 2014 to 2017, with the collaboration of the local fishermen (colony Z - 19). Eight Families and 21 species of elasmobranchs, commercially classified as "sharks" and "stingrays", were identified. Of the registered species, 67% are threatened nationally or internationally: *Ginglymostoma cirratum*, *Carcharhinus porosus*, *C. obscurus*, *C. signatus*, *C. perezii*, *C. falciformis*, *C. leucas*, *C. limbatus*, *Isurus oxynrinchus*, *Sphyrna lewini*, *S. mokarran*, *Manta birostris* and *Mobula tarapacana*. From the amount of fish landed during this period, sharks comprised 79,320 kg (average / year = 1,652.5 kg, SD = 1,027.8) stingray 67,650 kg (mean / year = 1,409.3 kg, SD= 607 kg, 4 kg), representing 3.64% of the local fishery production. An increase in elasmobranch production during this period was observed, from 13,869 kg and 11,443 kg in 2014, to 24,958 kg and 20,013 kg in 2017, for sharks and stingrays respectively. It represents an increase of 80% in the landing of sharks and 75% of stingrays, with significant differences among the years (Anova, $F=3,85$ $p=0,015$). Despite this value, local fishermen report that most of the catches of elasmobranch occurs accidentally in gillnet, trawl fisheries, small longlines and handlines directed to other groups more valuable commercially (Penaeidae, Scombridae, Carangidae, Centropomidae, Sciaenidae, Coryphaenidae, Lutjanidae and Epinephelidae). However, there is register that large sharks are targeted on longline fisheries, with 150-300 hooks on average, by a small fleet of about ten vessels. Due to this increasing in landings which include endangered species, there is a need to implement alternatives to prevent such incidental catches in the region in addition to continued monitoring and an strategy of spread of information on fisheries legislation.

Keywords: Fishing, fishery monitoring, fishery production.

Sharks and stingrays in the street market: Out of the sea, on the dish.

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Street markets are traditional places for selling fish. In Brazil, there is a lot of this kind of market where trade is carried out daily, although there are no estimated numbers of volume or species involved. At the city of Penedo, Alagoas, Northeast Brazil, placed 48 km distant from the littoral, the main target on trade at the street markets has been historically freshwater fish from the São Francisco river, probably due to its location at the margins of the river. Nowadays, fish both cultivated and from marine origin are more important on markets due to their diversity and volume traded. Among the marine ones, the Elasmobranchs are present in relevant numbers. We have been monitoring points of sale at the main street market in Penedo, from 2014 to 2017, aiming to elucidate which elasmobranchs species are commercialized, their numbers, age group and how the fish are processed before the trade. The individuals were identified, photographed, weighed, the total length measured (TL). The sex was determined, and muscle tissue was removed for subsequent genetic analysis. During this period, 41 visits were made to 8 points of sale. Five families, 7 genera and 10 species were recorded among the 373 specimens, namely: Sphyrnidae (76 *Sphyrna lewini*, TL 37-100 cm and 1 *S. mokaran*, TL 80 cm); Carcharhinidae (200 *Rhizoprionodon porosus*, TL 28-120cm; 4 *R. cf. lalandii*, TL 41.4 cm; 44 *Carcharhinus limbatus*, TL 50-2500 cm; 3 *Galeocerdo cuvieri*, CT 1500-2500cm); Myliobatidae (2 *Rhinoptera bonasus*, CT 24-51cm); Aetobatidae (4 *Aetobatus narinari*, TL 30-73cm) and Dasyatidae (1 *Hypanus americanus*, TL 54 cm; 38 *H. guttatus*, TL 29-69 cm). Two species, *Sphyrna lewini* and *S. mokarran*, are listed as critically endangered (CR) and endangered (EN) in Brazil. Neonates and juveniles are sold entire or only eviscerated and adult specimens are sold sliced. These numbers are underestimated, due to the commercialization of carcasses, which have no identification conditions (2.9%). We emphasize that sharks and stingrays' neonates correspond to 70.5%, juveniles 23% and adults 6.5%. We confirm that small markets, placed far from the littoral, can be important consumers of the sharks and stingrays' meat, including neonates, juveniles and endangered species, and that there is a need for changes in traditional conservation strategies. We suggest the implementation of adequate management measures, as well as the monitoring of fishing activities, since all catches

occur in the southern coast of the State, adjacent to the São Francisco river estuarine region and 93.5% of the individuals sold in Penedo city are neonates and juveniles, including endangered species, indicating a possible nursery area.

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Keywords: Trade, monitoring, neonates