

## 4.6 Sharks, Rays and Chimaeras

**KZN is blessed with a wide diversity of sharks, rays and chimaeras, a group of fishes that have in common a skeleton made of cartilage. In general, these fishes are vulnerable to over-exploitation because of their life history characteristics; hence, careful attention needs to be paid to their conservation and management.**

The warm water of KZN provides suitable habitat for many tropical species of sharks, rays and chimaeras. Of the approximately 185 species of cartilaginous fish that have been recorded in South African waters, approximately 137 include the waters of KZN in their range.<sup>1;2</sup> These are broadly divided into sharks (85 species), rays (49 species) and chimaeras (3 species). Some species that are more typically associated with temperate waters are found off KZN, particularly in the winter months. Some species are found in the relatively shallow waters of the KZN continental shelf, where the depth ranges from the water's edge to about 150 m. Others are found at the shelf edge, which slopes from about 150 m to over 1000 m deep. A third group is typically associated with oceanic waters, beyond the shelf edge, but limited to the top few hundred meters. These species sometimes venture into the surface waters over the shelf. The animals range from very large filter feeders such as the

whale shark, which may reach 12-14 m in total length, and the giant manta with a disk width of up to 6.7 m, to the African ribbontail catshark, which reaches only 37 cm. Amongst the most well-known species are large predators such as the great white shark, which is protected in South African waters, and the distinctively striped tiger shark, which is known for its cosmopolitan diet and is the prime attraction for the shark diving industry based in the Aliwal Shoal MPA (MPA's are discussed in *Section 10.4*). Another large predator is the Zambezi or bull shark, which is able to penetrate into fresh water and uses some of KZN's estuaries as nurseries for its young. The dusky shark is often caught both by the line-fishery and by the shark safety gear deployed to protect bathers, as explained in *Section 7.4*. Other species popular with divers include the spotted ragged-tooth shark, a seasonal visitor from the cooler waters of the Cape that undertakes a breeding migration into KZN; and the blacktip shark, which is unpopular with the ski-boat angling community as it has a habit of taking hooked fish.

Some of the smaller sharks are colourful, such as the zebra shark and the leopard catshark. Others have distinctive shapes, including the three species of thresher, which have tails as long as their bodies, and the three locally-occurring

Shark engulfing sardines.



Photo: Jean Tersfon

species of hammerhead, with their characteristically shaped heads. Within the ray family, shapes vary from the typical disk of the blue stingray, through the guitar-like shape of the giant guitarfish to the distinctive sawfish species, which may now be locally extinct.

### Spatial distribution

Amongst the coastal species of shark are those with a largely tropical or sub-tropical distribution, which tend to be found in larger numbers on the KZN north coast than on the south coast. These include the sandbar shark, the Zambezi shark, the similar-looking Java shark and the increasingly rare great hammerhead shark. Those with a more temperate distribution tend to be found along the south coast, and include the bronze whaler or copper shark, the houndshark and the flapnose houndshark, a species that is endemic to South Africa's east coast. The spotted ragged-tooth shark breaks this pattern, in that it is a temperate species that occurs over the entire KZN coast.

The productive Thukela Bank region of the north coast appears to be a nursery ground for certain species, including the scalloped hammerhead. In addition to young hammerheads, various other shark and ray species are common as by-catch in shallow-water prawn trawls on the Thukela Bank, including the diamond ray, the sharpnose or brown stingray, the blue stingray, the hard-nosed smoothhound and the banded catshark.<sup>3</sup> Catches of pregnant sharks (of several species) in KZN's bather-protecting shark nets are highest at the northernmost netted beaches of Richards Bay and Zinkwazi, and these include the sandbar, spotted ragged-tooth, spinner, dusky and scalloped hammerhead sharks. However, the ragged-tooth shark does not pup in these waters, but rather returns to the Cape to do so.

### Importance of sharks and rays

Sharks are a valuable resource. Well-managed shark fisheries based on the more productive species can sustain livelihoods, as can shark-based marine ecotourism, including recreational diving with species such as tiger, blacktip and ragged-tooth sharks. They also have an important ecological role to play in the coastal waters of KZN.

Research into the ecological importance of sharks and rays is still at an early stage but, as predators, it is thought that they

have influenced the structure of marine communities over geological time.<sup>4</sup> The mechanisms through which they are likely to have had this effect include direct predation effects, risk effects (behavioural changes in prey) and cascading effects of predator-prey interactions.<sup>4</sup>

Hence, the unsustainable exploitation of sharks would not only affect the populations of the exploited species themselves, but may also affect marine ecosystems more generally.

### Management concerns

Sharks and rays, through life history characteristics such as slow growth, late age at maturity and small litter sizes, are not particularly productive and are vulnerable to overexploitation. A number of shark and ray species are under threat in many parts of the world. In terms of their global conservation status, 47 (or 25%) of the approximately 185 species of cartilaginous fish that occur in South African waters are regarded as threatened in terms of the IUCN Red List of Threatened Species.<sup>5</sup>

Although the diversity of cartilaginous fish in South African waters is high, population sizes are relatively small, because the various habitats are limited in extent.<sup>1</sup> Together with their inherently low productivity, their low abundance increases their vulnerability to overexploitation. Fortunately, relatively little shark-directed fishing occurs off the KZN coast, other than the use of shark nets and drum-lines for purposes of bather protection. These protective measures catch about 14 species of large sharks that, other than the shortfin mako shark, have a coastal distribution. Some of these species are showing a decline in catch rate, in some cases probably as a direct result of the nets themselves (e.g. the Zambezi shark) and in other cases likely as a result of fishing activities elsewhere in the South West Indian Ocean (e.g. the great hammerhead).<sup>6</sup> Incidental catches of a number of species of ray also occur in the nets, but more than half are found alive and are released. The KZN Sharks Board has implemented various measures to reduce the catch of sharks, rays and other species,<sup>7</sup> as discussed in *Section 7.4*.

Another fishery that targets sharks in KZN waters is the recreational line-fishery (detailed in *Section 7.4*), much of which operates on a tag and release basis. There is a recreational bag limit of one specimen per species of cartilaginous fish per day and the catch may not be sold. Species targeted include the dusky shark, milk shark, lesser guitarfish, giant guitarfish, diamond ray and sharpnose ray.<sup>8</sup> The commercial line-fishery



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also targets primarily young dusky sharks and effort appears to vary in intensity according to demand. Concerningly, there is no limit to the number of sharks that may be caught by commercial line-fishers. However, a small number of shark species, including the spotted ragged-tooth shark and certain catsharks, may not be sold by commercial line-fishers.

No sharks caught in South African waters may be finned, meaning that it is illegal to catch a shark, remove the fins at sea and discard the carcass. Sharks must be landed whole, although they may be headed or gutted. Illegal, unreported and unregulated (IUU) fishing in international waters and in the waters of neighbouring states, where species such as hammerhead sharks and giant guitarfish are targeted for their fins, is a concern because the stocks of some of these species are shared with South Africa.

Certain cartilaginous species are protected, either nationally or in terms of international agreements. The great white shark, whale shark, basking shark (a rare visitor to KZN), and all sawfishes (family Pristidae) may not be caught in South African waters. It may, however, be too late for sawfish, which appear to be locally extinct. Internationally, these three shark species and the sawfish family are listed either in Appendix I or Appendix II of the *Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)*, meaning that trade is strictly controlled. A number of countries, including South Africa, have signed a Shark agreement in

terms of the *Convention on the Conservation of Migratory Species of Wild Animals (CMS)*, the objective of which is to ensure the conservation and management of migratory sharks and their long-term sustainable use.

A number of shark species are listed under CMS; those that occur in KZN waters include the great white shark, whale shark, the locally rare basking shark (for which species trade is banned) and the shortfin mako shark. The giant manta ray was added in November 2011. The effectiveness of agreements such as CMS is limited, if neighbouring states, with which stocks are shared, are not signatories.

### Tourism and sharks

Recreational shark diving has become an important form of ecotourism in KZN waters over the past two decades. In the 1990s diving with ragged-tooth sharks in Aliwal and Sodwana as a tourist attraction was popularised. In the early 2000s, a new activity developed in the Aliwal Shoal MPA (*Section 10.4*), involving the use of bait and chum to attract tiger and blacktip sharks. The advantage of this type of commercial activity is that it is non-consumptive, meaning that the sharks are not caught, but there are concerns about possible conditioning, in which the sharks may learn and expect to receive food. Conditioning may not only have a direct effect on the sharks themselves but also, if they cease to fulfil their ecological role as predators, on the local ecosystem.

In recent years there have been increasing numbers of anecdotal reports from the ski-boat line-fishery about loss of hooked fish to sharks. While shark predation on hooked fish is not a recent phenomenon in itself, the marked increase in reports is a new development and there is currently no explanation for it. The loss of fish represents financial loss to commercial fishers and there is the risk of frustrated fishers attempting to address the problem by killing the sharks that are taking their fish.

**Interactions between the people of KZN and the diverse cartilaginous fish fauna have been both positive and negative, from the perspectives of the people and of the fauna. These interactions require careful management, such that the diversity and ecological functionality of the fauna are conserved, while at the same time negative interactions are minimised and the economic value of the resource is utilised optimally. ■**

Blue spotted ribbontail ray.



Photo: Jade Maggs