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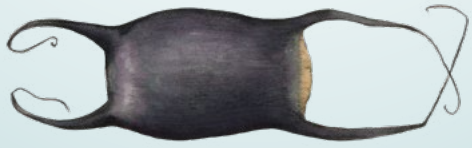

By Ruth H. Leeney

Illustrations by Alexis Aronson

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People protect what they love, they love what they understand, and they understand what they're taught. - Jacques Cousteau

For everyone committed to learning about, understanding and protecting the ocean.

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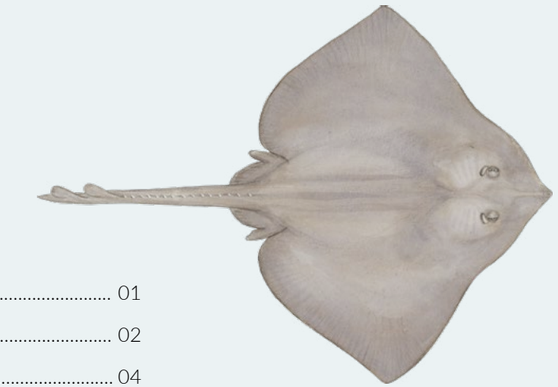

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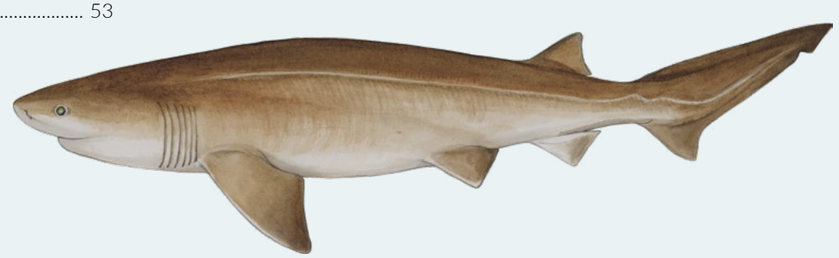

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INTRODUCTION

The Benguela Current Ecosystem, which runs along the west coast of South Africa, the entire Namibian coastline and into southern Angola, is one of the world's most productive marine ecosystems and supports a huge array of marine life, including seabirds, cetaceans (whales and dolphins), Cape fur seals and chondrichthyans (sharks, skates, rays and chimaeras). However, almost no research has focused on chondrichthyans in Namibia to date, meaning we know remarkably little about which species are found in Namibian waters, where their key habitats are, the roles they play in food webs and the threats they face.

This publication is the first ever identification guide focusing on chondrichthyans in Namibian waters. Previously published guides which included chondrichthyans have covered all marine 'resources' in Namibian waters (Bianchi et al. 1999), or have covered 'southern Africa' (e.g. Compagno et al. 1989), a large region encompassing two significantly different current systems and assemblages of species. Based on an up-to-date species list, this guide includes only species that have been confirmed (from at least one reliable record) to occur in Namibian waters.

This guide is intended for a wide readership, including any member of the public interested in learning more about Namibia's sharks, skates, rays and chimaeras. However, one of the primary drivers for producing this guide was to support researchers and students of marine life in Namibia, in research activities focusing on chondrichthyans. The purpose of this guide is therefore twofold. For the general public, we hope that this guide will serve to increase their fascination in sharks and their relatives, and deepen understanding amongst Namibians of the incredible diversity of life found just beyond the coastline. For Namibia's scientific community, including researchers, fisheries observers and students of biology and fisheries science, this guide will be an invaluable reference for identifying animals caught as bycatch (incidental catch of non-target species) in fishing gears and chondrichthyan specimens captured or recorded during scientific surveys. We hope that this resource will support students, researchers and managers to conduct high-quality research on chondrichthyans in Namibian waters, and that the resulting information contributes to management and conservation actions that ensure a healthy, productive ocean for the benefit of all Namibians.

INTRODUCTION TO CHONDRICHTHYANS

Chondrichthyan (pronounced *kon-drik-thee-yan*) is the term used to refer to any member of the class Chondrichthyes, which is a diverse group of jawed fishes with multiple gill openings and simple, flexible, cartilaginous skeletons. Sharks, skates, rays and chimaeras (pronounced *ky-mee-ra*; sometimes called holocephalans, ratfish or ghost sharks) are all chondrichthyans. The term elasmobranch (pronounced *eh-laz-moh-brank*) is sometimes used to refer to sharks, skates and rays.

Chondrichthyans inhabit every ocean around the world, from the poles to the tropics, and play a vital role in maintaining the health of marine ecosystems. Worldwide, there are at least 536 species of shark, around 670 species of skate and ray and at least 52 species of chimaera, although new species are described every year. The majority of chondrichthyans inhabit marine waters, but some also live in brackish water (estuaries) and a few live only in freshwater habitats. They inhabit a vast array of depths, from shallow coastal waters to the deepest parts of the ocean.

Once regarded by fishers as an undesirable catch, elasmobranchs are now commonly caught in many industrial and small-scale fisheries around the world. This may be in part because of the diversification of uses for various shark and ray products – there are now well-established markets for products including shark fins, the meat from many shark and ray species, and gill rakers from mobulids (manta rays and devil rays). However, the main driver for the increase in capture and retention of sharks and rays is undoubtedly the decline in populations of the fishes historically targeted by fisheries. As the fish species that humans have traditionally caught and eaten decline due to overfishing, many fisheries are turning to chondrichthyans - mainly sharks, skates and rays - as a primary commercial resource.

Why are sharks, skates, rays and chimaeras important?

Sharks, skates, rays and chimaeras are an important part of life in ocean ecosystems. An ecosystem is the biological community of interacting organisms and their physical environment. In the ocean, there are many different marine ecosystems - from tidal rock pools and coastal kelp forests, to deep, offshore waters. Each ecosystem has a particular combination of species which interact to form a food web - an interdependent network of producers (in the ocean, primary producers include seaweeds and phytoplankton), prey and predators. Some species of chondrichthyan, like great white sharks, are top predators. Other species are predators in the middle of the food web - they eat smaller animals but are themselves preyed upon by larger species. And some, including the huge basking shark, feed on some of the tiniest organisms in the ocean – plankton. Each species has a role in keeping the ecosystem in balance. Healthy marine ecosystems are those that are in balance, with just the right proportions of producers, prey and predators. They are biodiverse and productive. In contrast, if the balance is disrupted in an ecosystem – for example by overfishing of particular species, causing their populations to shrink or even disappear – this has a knock-on effect on all the other species in that ecosystem, which in turn affects the health of the ecosystem. An unbalanced marine ecosystem is one that may not function as well as it should – it may become less productive or absorb less carbon dioxide, for example.

Many chondrichthyans mature late in life and do not produce large numbers of young (unlike other fish species which can produce hundreds of thousands of eggs in a single spawning event). For this reason, many chondrichthyan species can be overfished very easily, and their populations can take a long time to recover from overfishing. Excessive mortality in unsustainable, unregulated fisheries (both those targeting sharks and their relatives, and those fisheries that catch them accidentally), is the greatest threat to chondrichthyans worldwide. Species found in shallow water, coastal and open ocean habitats are the most seriously threatened because this is where fishing pressure is highest. Habitat damage through development and pollution in coastal waters and rivers contributes to the decline of some species, and climate breakdown is likely to also pose a threat.

We need a healthy ocean because as humans, we rely on the ocean in many ways. Most obviously, it is a source of food and employment for fishers and many others who work in the fish processing and aquaculture sectors. The growing level of carbon dioxide (CO_2) in our atmosphere, produced when we burn fossil fuels (in our cars and power plants, for example), is causing our planet's climate to change. But a healthy ocean absorbs CO_2, and thus helps in the fight against climate breakdown. Thriving marine ecosystems full of marine life like whales, dolphins and sea birds support many jobs in tourism, and clean beaches and coastal areas where people can go fishing, surf, swim and relax are important for our overall well being and quality of life.

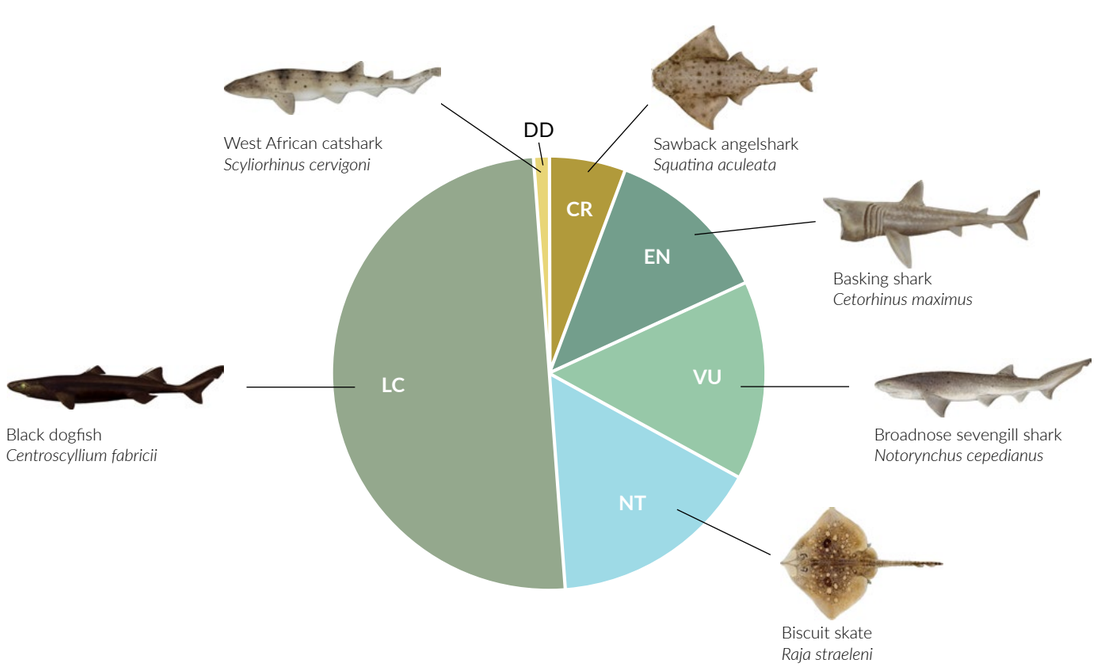
Conservation status of chondrichthyans in Namibia

Recent research suggests that over a third of all chondrichthyan species worldwide (at least 391 species) are threatened with extinction (Dulvy et al. 2021), making them amongst the most threatened of the world's vertebrates. Of the 88 species of chondrichthyan (55 sharks, 25 batoids and 8 chimaera species) recorded from Namibian waters, 5 species are listed as Critically Endangered, 11 as Endangered and 13 as Vulnerable on the IUCN Red List of Endangered Species[1]. That means that one third of all species known from Namibian waters are threatened (classified as Critically Endangered, Endangered or Vulnerable). These classifications are explained in more detail on page 5.

Why do research on chondrichthyans?

Sharks and their relatives are important components of marine and coastal ecosystems, but they have, until recently, been paid very little attention in Namibia. It is important to do research not just on commercial fish species, but on the many other species in marine ecosystems, including chondrichthyans. Research and monitoring allow us to track the status of these species over time, to understand which areas are especially sensitive (such as fish breeding grounds, or areas used by endangered species), and to assess whether certain activities, like pollution, coastal development, coastal and offshore mining, and exploration and drilling for oil and gas, negatively affect marine species or habitats. Research can also provide insight into the roles that chondrichthyans play in keeping ecosystems healthy and productive. In addition, some sharks and skates are fished commercially in Namibian waters and therefore make an important contribution to the country's economy. Research to document the size and movements of those populations, and monitoring how they change over time and the fishing pressure they can withstand, will be essential to ensure sustainable shark and skate fisheries in the long term.

Ultimately, research and monitoring are essential in developing an understanding of how to use the ocean's resources wisely and sustainably, now and in the future, for the benefit of all Namibians.



The proportions of Namibia's 88 chondrichthyan species which are listed as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC) and Data Deficient (DD) on the IUCN Red List of Endangered Species. The illlustrations show an example species from each category.

[1] The IUCN Red List is a critical indicator of the health of the world's biodiversity. www.iucnredlist.org

HOW THIS SPECIES LIST WAS CREATED

There has been almost no research focusing on chondrichthyans in Namibian waters, meaning that there has, until now, never been a comprehensive species checklist for the country. A species list was compiled by combining information from regional catalogues and guides, literature accounts, museum voucher specimens, and original data gathered by David Ebert (Compagno et al. 1989; Compagno et al. 1991; Compagno and Ebert 2007; Ebert 2015; Ebert and van Hees 2015; Ebert et al. 2021). Several species have also been added to this guide, based on data collected during research activities led by the Namibia's Rays and Sharks project (between 2022 and 2024). The resulting list of species is the first evidence-based, comprehensive species list for chondrichthyans in Namibian waters. Future research in Namibia may reveal the presence of additional species but for now, we hope that this guide serves to support researchers in launching the first exciting era of chondrichthyan research in Namibian waters.

HOW TO USE THIS GUIDE

For each species that features in this guide, rather than providing a comprehensive summary of everything that is known, key information is provided on the appearance of each species and the areas where it is found. This information, alongside the illustration, is intended to help readers to identify a chondrichthyan they may have caught, recorded on camera or otherwise encountered.

Information for each species is provided under the following headings:

Common name - Given in English and (where it exists) in Afrikaans.

Scientific name - This is the formal name used by scientists and is unique to each species. By contrast, some common names can be used for several species of shark, which can cause confusion when recording scientific information.

Description - Includes descriptions of body shape and other physical features, such as shape and position of fins, that will help distinguish this species from similar species.

Colour - Description of colouration and any patterning.

Size - Maximum total length (TL) for sharks, skates and chimaeras; maximum disc width (DW) for rays. Maximum body length (BDL) is also included for chimaeras.

Distribution - This describes the known global distribution of the species.

Habitat - A description of the type of habitat in which the species is usually found, including depth range.

Threats - This section lists documented threats to the species throughout its range, based mainly on IUCN Red List assessments. Species-specific threats in Namibian waters are also mentioned, if there is supporting research-based evidence.

IUCN Red List status - The Red List category (see below for further details) assigned to the species, as of 2023[2].

Notes - Includes guidance on how to distinguish this species from similar, sympatric species; notes on any revisions in taxonomy and previous scientific names for the species.

Eggcase - For oviparous species (those that produce eggcases, i.e. all skate and chimaera species, and some shark species), morphology and dimensions of eggcases are provided, where known. In some cases, no published information was available upon which to base a description or illustration.

The IUCN Red List

The IUCN Red List is the world's most comprehensive information source on the global conservation status of animal, fungi and plant species. It provides information about range, population size, habitat and ecology, use and/or trade, threats, and conservation actions that will help inform necessary conservation decisions. It is therefore a powerful tool that can inform and catalyse action for biodiversity conservation and policy change, which are critical to protecting the natural resources we need to survive.

Simple definition of the IUCN Red List categories:

CR	Critically Endangered, extremely high risk of imminent extinction in the wild.
EN	Endangered; very high risk of extinction in the wild.
VU	Vulnerable; high risk of extinction in the wild.
NT	Near Threatened; coming close to qualifying as a threatened category.
LC	Least Concern; lowest risk, does not qualify for an at-risk category. Species that are widespread and abundant are included in this category.
DD	Data Deficient; inadequate information at present to make an informed assessment of the species' extinction risk.
NE	Not Evaluated; as yet not assessed for extinction risk.

The IUCN Red List is not a list of species that are high priorities for conservation action. Extinction risk is an important factor to consider when determining which species to invest in, but defining conservation priorities ultimately depends on numerous other important factors, including financial, cultural, logistical, biological, ethical and social considerations, to ensure that any conservation actions are as implementable and effective as possible.

More information on the IUCN Red List, and more detailed information on the biology, distribution, life history and conservation status of individual chondrichthyan species, is available online at www.iucnredlist.org.

A note from the author and illustrator

The illustrations provided by this guide have been based on both available photographs of each species, and the detailed descriptions of their morphologies documented by taxonomists. However, for many species, especially those that inhabit deeper waters, good-quality images are very scarce. In some cases, only one photograph, of a dead animal or preserved museum specimen, may be available. We have worked together to ensure that the illustrations in this guide are as representative as possible, but in some cases they may not be entirely representative. In some species there is also considerable morphological variation between juvenile and adult life stages and between males and females. We therefore encourage users of this guide to use both the illustrations and the descriptive text to identify specimens.

The descriptions of the species provided in this guide are based largely on the descriptions published by taxonomists in several excellent identification guides and many more scientific papers (see the References section for details), as well as the Red List assessments produced by the IUCN Shark Specialist Group. We gratefully acknowledge the invaluable work of these researchers and hope that, by presenting condensed and accessible versions of those accounts in this publication, their work can reach new audiences in Namibia and can support research in this little-studied part of the Atlantic Ocean.

[2] Each assessment only has a lifespan of 10 years and therefore over time, the Red List status provided for many of the species in this guide may change. As such, the IUCN Red List category for each species in this guide should be updated in future editions or revised versions of this guide.

EXTERNAL MORPHOLOGY OF CHONDRICHTHYANS

Sharks

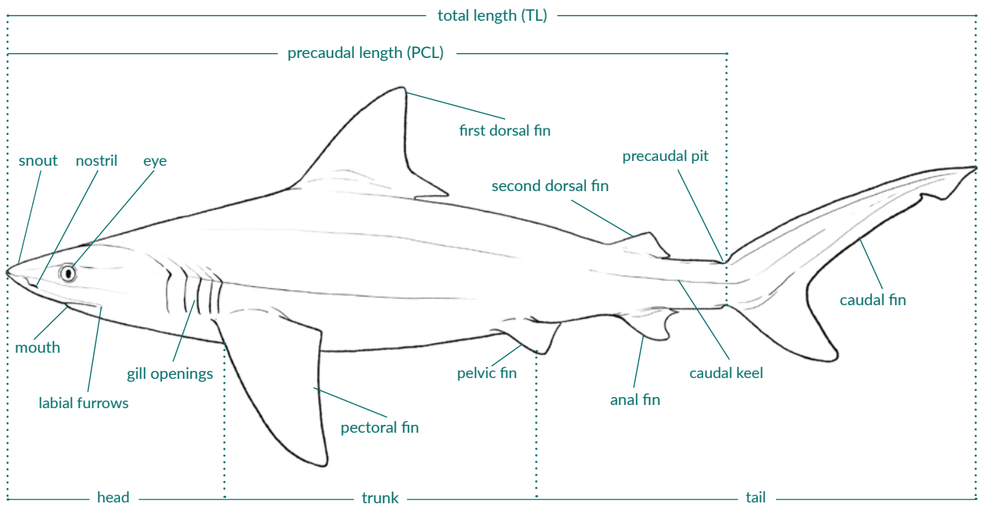


Fig. 1: External morphology of a shark (female) - lateral view.

Batoids (skates and rays)

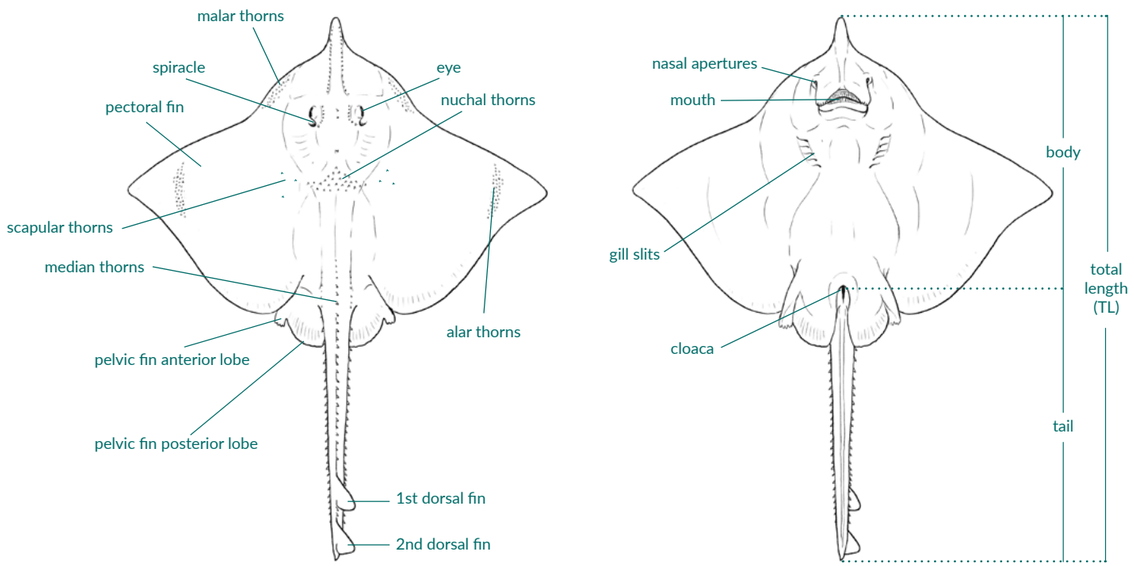


Fig. 2: External morphology of a skate (family Rajidae). (a) Dorsal surface; (b) ventral surface.

Chimaeras

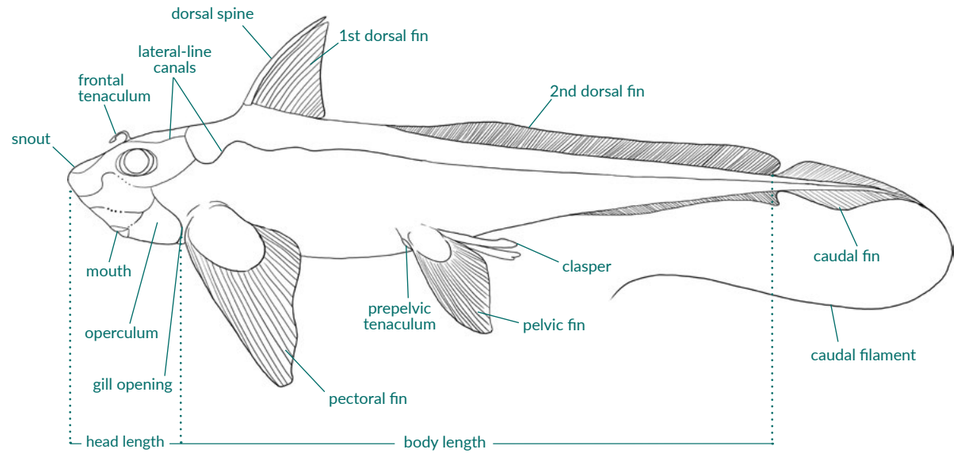


Fig. 3: External morphology of a chimaera (male).

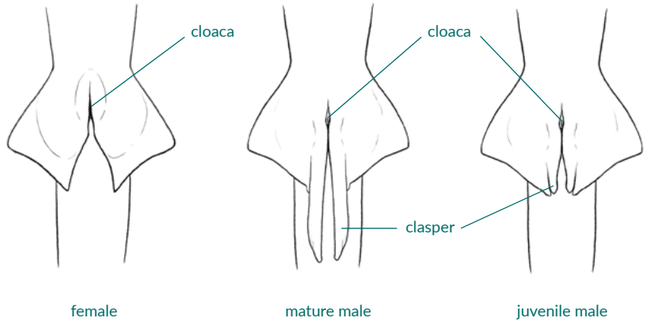


Fig. 4: Determining the sex of a chondrichthyan - ventral view of pelvic fin area.

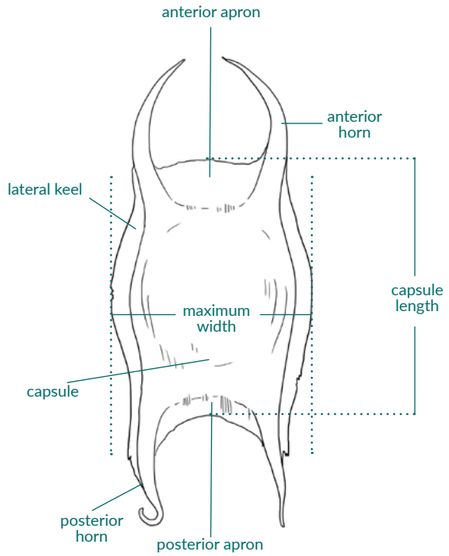
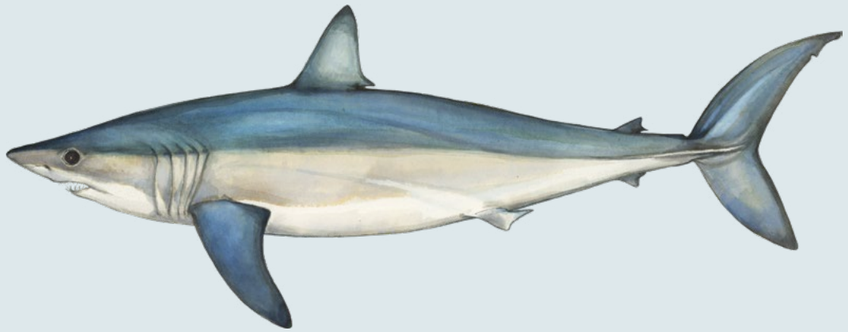
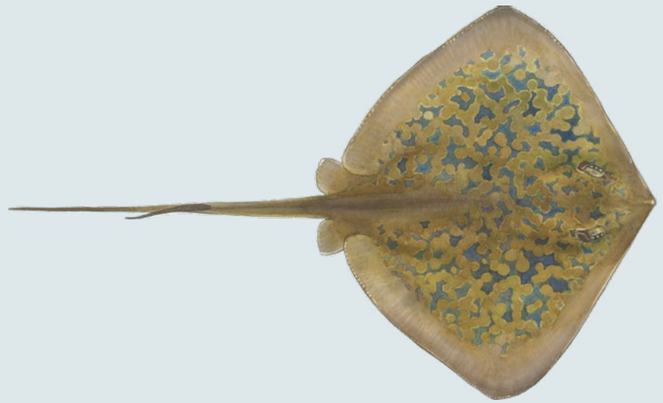


Fig. 5: Eggcase morphology.

SPECIES IDENTIFICATION GUIDE





SHARKS

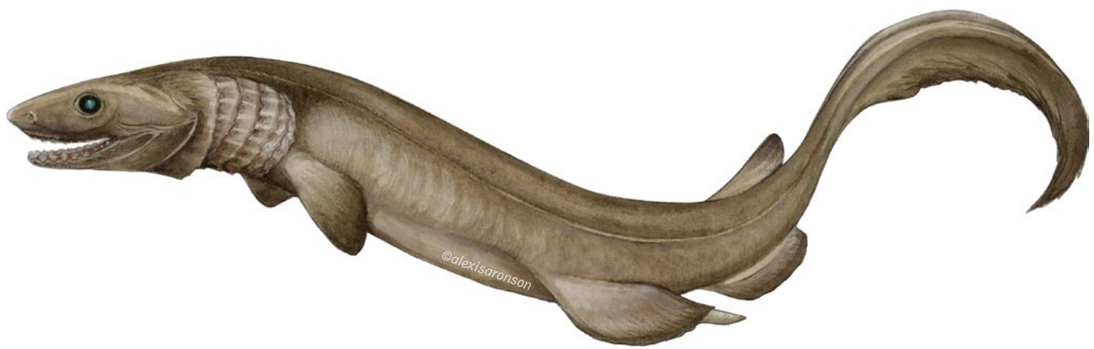
There are around 536 species of sharks worldwide, of which 55 are found in Namibian waters. They occupy a range of habitats, from rocky, sandy and muddy areas and kelp forests along the coast, to the offshore waters several hundred metres deep. They range in size from the basking shark (the second biggest fish species in the world) and the well-known great white shark, which reach around 11 m and 6 m in length respectively, to some far smaller species such as the African sawtail catshark, found in waters up to 700 m deep but measuring just 43 cm in length, and the dark shyshark, a kelp forest dweller that can reach 70 cm in length.

All sharks have 5–7 pairs of gill openings or slits. These gill slits are on the sides of their head and their pectoral fins are never fused to the head along their entire length. In contrast, the gill slits of skates and rays always lie beneath their pectoral fins, which are fused to the sides of their head. Shark species exhibit a range of body shapes, depending upon their habitat and feeding strategy, but the majority of sharks in Namibian waters have some variation on the typical fusiform body shape (rounded and tapered at both ends).

All sharks reproduce by internal fertilisation, in contrast to the external spawning behaviour of most bony fishes. Sharks produce a small number of large young with high survival rates. Some shark species produce eggs which are protected by a tough capsule (called an eggcase) and contain a large reserve of yolk to feed the developing pup. These eggcases are anchored to the seabed whilst the pups develop. Other sharks are viviparous, meaning they give birth to live young. In some viviparous species, unborn pups are attached to a yolk-sac inside the mother, with no direct maternal supply of nutrition, whilst others have a placental attachment through which they receive nutrition directly from the mother.

SOUTHERN FRILL SHARK / AFRICAN FRILL SHARK

Chlamydoselachus africana



LC

Description: Snake-like head with a large terminal mouth containing widely spaced, slender, three-cusped, needle-sharp teeth. Elongated, eel-like body. A single low dorsal fin, smaller than the anal fin and positioned close to the caudal fin; pectoral fins smaller than pelvic fins. Six gill slits on each side of the body.

Colour: Dark grey, but covered with a thin membrane that gives it a uniform dark brown colour.

Size: 117 cm.

Distribution: Angola, Namibia and South Africa.

Habitat: Benthic, epibenthic and pelagic, at depths of 300 to 1,400 m.

Threats: Taken as bycatch in deepwater demersal trawl and longline fisheries, particularly in northern Namibia. Catch data from trawl fisheries suggest very few fishery interactions with southern frill sharks in South African waters.

Notes: This species is morphologically very similar to *Chlamydoselachus anguineus*, which also occurs in the Atlantic Ocean but is generally considered not to occur off Namibia or South Africa. However, the collection of tissue samples, photographs and measurements is encouraged wherever possible when a frill shark is encountered, to allow for accurate identification. In *C. africana*, the length of the head is more than 17% of the total length of the shark.

SHARPNOSE SEVENGILL SHARK

Heptranchias perlo

NT

Description: Seven gill slits. Slender body and acutely pointed head with a narrow mouth and large eyes. Single dorsal fin.

Colour: Brownish-grey to olive above and lighter below. Juveniles have black dorsal fin apex which fades with growth.

Size: 139 cm.

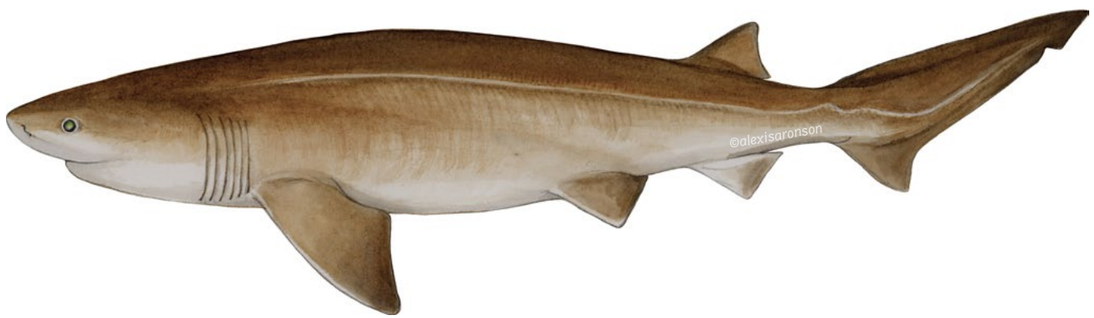
Distribution: Globally in tropical and temperate waters.

Habitat: Mainly deep waters, to a maximum depth of 1,000 m.

Threats: Bycaught in industrial and artisanal fisheries including demersal trawl, pelagic driftnet, longline and gillnet fisheries throughout its range. Commonly encountered as bycatch in bottom trawl fisheries in Namibia.

BLUNTNOSE SIXGILL SHARK

Seskiefhaai
Hexanchus griseus



NT

Description: Large, heavy body; broad head with a wide, blunt snout when viewed from above. Wide mouth; small, white-ringed eyes. Soft, flexible fins; pale lateral line and pale posterior edges to fins.

Colour: Grey or medium brown to blackish; sometimes darker spots on sides.

Size: At least 482 cm.

Distribution: A patchy worldwide distribution in tropical, temperate and boreal waters.

Habitat: A demersal species found on the slope, shelf, and occasionally inshore. Mostly at depths of 200 to 1,100 m but up to 2,490 m. It also occurs on seamounts and mid-ocean ridges and is often associated with areas of high biological productivity and upwelling.

Threats: Infrequently reported as targeted and incidental catch from industrial and artisanal demersal trawl, longline, handline, traps, and gillnet fisheries throughout its range. Encountered as bycatch in demersal trawl fisheries in Namibia.

BROADNOSE SEVENGILL SHARK

Platneus sewekiefhaai
Notorynchus cepedianus

VU

Description: Seven gill slits. Blunt, rounded, broad head, wide mouth and small eyes. Single small dorsal fin set far along the back; black dorsal fin apex on newborn sharks fades with age.

Colour: Grey to brown body; numerous small black spots (occasionally white spots or none) on body and fins.

Size: 296 cm.

Distribution: Patchy global distribution in the South Atlantic and Indo-Pacific Oceans.

Habitat: Inshore, cool, temperate waters to depths of 570 m; often found very close to shore.

Threats: Infrequently reported as target and incidental catch from industrial and artisanal demersal trawl, longline, and gillnet fisheries across its range. Regularly captured by recreational anglers in Namibia. May be susceptible to coastal development and environmental changes, given its reliance on inshore habitats.

BRAMBLE SHARK

Braamhaai
Echinorhinus brucus

EN

Description: Large-sized with heavy cylindrical body, flattened head; broad and short snout. Irregular, scattered, whitish coarse spiky denticles or enlarged tack-like denticles (which can fuse into plates) all over the body. Spiracles very small and far behind eyes. Two small, spineless, posteriorly placed dorsal fins positioned close together; first dorsal fin origin over or behind pelvic-fin origins. Pectoral fins low, broadly rounded; pelvic fins as large as or slightly larger than pectoral fins, and more than twice size of dorsal fins. No anal fin. Peduncle compressed, very short; no lateral keels or precaudal pits. Fin edges blackish.

Colour: Uniformly grey or brownish to black on back and sides; usually light below.

Size: 394 cm.

Distribution: Circumglobal but sparse, in cold-temperate to tropical seas.

Habitat: On or near the bottom, usually between 200 and 900 m but may be found closer to shore.

Threats: Taken as both targeted and incidental catch across its range in demersal trawl, longline, and setnet fisheries. The species is infrequently reported across most of its range. In Namibia, this species has been recorded as bycatch in the bottom trawl fishery for hake, and at least one bramble shark has been caught by a shore-based angler in Namibia. When caught by anglers, they should be handled carefully and released immediately.

SPINY DOGFISH / PIKED DOGFISH

Doringhaai/ Spikkel-penhaai
Squalus acanthias

VU

Description: Slender, narrow head and long, pointed snout; no barbels. First dorsal fin fairly long and low with a slender, short dorsal spine; origin usually behind pectoral fin rear tips. Second dorsal fin spine tip at the same height or higher than fin apex. No subterminal notch on caudal fin; no precaudal pit on caudal peduncle.

Colour: Greyish to blue-grey above, often has white spots on back and sides. Lighter to white below. Black dorsal fin tips in young.

Size: 200 cm (highly variable amongst populations).

Distribution: Worldwide (except North Pacific Ocean, western Indian Ocean, tropical waters and near the poles).

Habitat: Boreal to warm-temperate continental and insular shelves and sometimes slopes, between 0 and 1,978 m. Between 0 and 200 m in epipelagic cold water.

Threats: Taken as targeted and incidental catch by hand line, demersal gillnet, trawl, dredge, and longline in artisanal, industrial, and recreational fisheries throughout its range. Targeted fishing pressure in the Atlantic Ocean has declined significantly but the species is still susceptible to capture as bycatch in multi-species fisheries. Coastal development, pollution, dredging, and bottom trawling affect coastal or demersal habitat that the species' prey relies on.

BLUNTNOSE SPINY DOGFISH / BLUNTNOSE SPURDOG

Stompneus penhaai
Squalus acutipinnis

NT

Description: Small, slender shark with short, angular snout. Height of first dorsal fin is two-thirds or less of fin length, with moderately high spine; originates over pectoral fins. Second dorsal fin spine tip at the same height as fin apex. Upper precaudal pit and lateral keels present on caudal peduncle. No subterminal notch on caudal fin.

Colour: Unspotted grey-bronze back and sides; lighter below. Black tips and white posterior margins of dorsal fins, which fade in adults. Caudal fin with light dorsal margin.

Size: 77 cm.

Distribution: Namibia to the east coast of South Africa; possibly present in the western Indian Ocean.

Habitat: Inshore to upper continental slopes, to 450 m depth. Newborns pelagic; adults benthic.

Threats: Trawl fisheries operate throughout this species' range and it is captured frequently as bycatch in demersal trawl fisheries targeting hake in South Africa. It is caught at least occasionally as bycatch in the Namibian bottom trawl fishery for hake. The species is also caught occasionally by recreational anglers in Namibia, but usually released alive. There is some evidence of a southward range shift for this species in South Africa, possibly as a result of climate change. This may represent a significant loss of habitat to a species which already has a restricted southern African distribution.

Notes: This species was formerly known as *S. megalops*.

LONGNOSE AFRICAN SPINY DOGFISH / LONGSNOUTED AFRICAN SPURDOG

Squalus bassi

LC

Description: A stout-bodied, large dogfish. Long angular snout; distance from snout tip to inner nasal margin longer than distance from inner edge of nostril to front of upper labial furrows. Height of first dorsal fin is two-thirds or less of fin length. First dorsal spine shorter than fin base, lower than fin tip, originating above inner margin of pectoral fin.

Colour: Pearly-grey to brownish above; no light-coloured spots on flanks; white-edged fins. White below.

Size: 110 cm.

Distribution: Southern African endemic. Occurs in the Southeast Atlantic between southern Namibia and the Northern Cape, South Africa, on the east coast of South Africa and possibly in southern Mozambique.

Habitat: Outer continental shelf and upper slope at depths of 159 to 591 m.

Threats: Frequently bycaught in demersal trawl and longline fisheries, but usually discarded.

Notes: This species was formerly known as *S. mitsukurii*.

GULPER SHARK

Centrophorus granulosus

EN

Description: Short, thick snout and smooth skin. First dorsal fin relatively low and long; second dorsal fin shorter but nearly as high as first dorsal; both dorsal fins with grooved spines. Pectoral fin free rear tips long and acute; no anal fin.

Colour: Dark grey or greyish-brown above, lighter below. Fins without distinct markings in adults; dorsal and caudal fins of juveniles usually much darker and sometimes with a white posterior margin.

Size: 176 cm.

Distribution: Atlantic, Indian and West and Southwest Pacific Oceans.

Habitat: On or near the seafloor on continental and insular shelves and slope; 50 to 1,500 m.

Threats: Gulper sharks are an important component of commercial target and bycatch fisheries and are caught with longlines, trawls and gillnets. Their conservation status is poorly known but they have a limited reproductive capacity (small litters, long gestation periods, slow growth and late maturity) which makes them susceptible to overfishing. Unmanaged and unmonitored deepwater fisheries therefore pose a significant threat to gulper sharks. Gulper sharks are caught as bycatch in bottom trawl fisheries in Namibia and anecdotal evidence suggests that at least occasionally, fishers remove the livers of these sharks and extract the liver oil.

Notes: Small *C. granulosus* may be confused with *C. uyato*, but the shape of the first dorsal fin can be used to distinguish the two species. *C. granulosus* has a longer, lower first dorsal fin than *C. uyato*, which has a shorter and more triangular first dorsal fin.

LEAFSCALE GULPER SHARK

Gryns-hondhaai
Centrophorus squamosus

EN

Description: Rough skin; short, thick, slightly flattened snout. Large eyes, green when alive. First dorsal fin long and low; shorter and higher second dorsal, both with grooved spines. Short pectoral fin free rear tips; no anal fin. Caudal fin posterior margin slightly concave.

Colour: Uniformly dark grey, grey-brown or reddish-brown; dusky fins and no prominent markings.

Size: 166 cm.

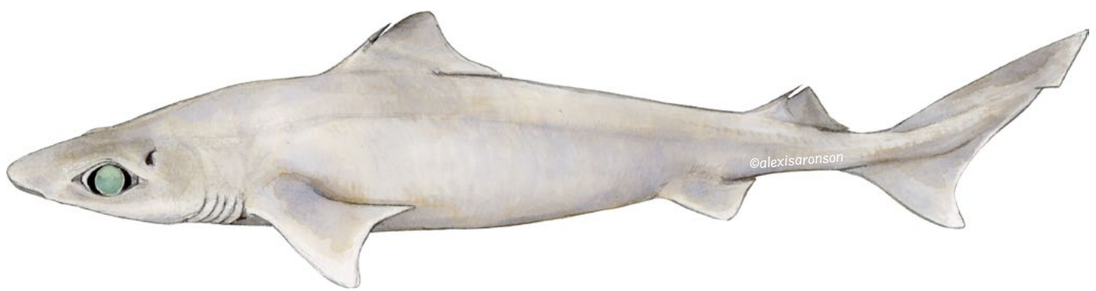
Distribution: Widespread but patchy global distribution in Atlantic and Indo-Pacific Oceans.

Habitat: Demersal on continental and insular shelves and slopes to the abyss at depths of 0 to 3,366 m, but mostly at depths greater than 200 m.

Threats: Gulper sharks are an important component of commercial target and bycatch fisheries. They are caught with longlines, trawls and gillnets. Their conservation status is poorly known but they have a limited reproductive capacity (small litters, long gestation periods, slow growth and late maturity) which makes them susceptible to overfishing. Unmanaged and unmonitored deepwater fisheries therefore pose a significant threat to all gulper sharks, including the leafscale gulper shark. This species is caught at least occasionally in bottom trawl fisheries in Namibia.

LITTLE GULPER SHARK

Centrophorus uyato



EN

Description: Slender body, moderately long head with relatively short snout. Large eyes, green when alive. First dorsal fin originates behind pectoral fin insertion and is slightly higher and longer than second dorsal fin. First dorsal fin base less than 15% of total length (TL). Both dorsal fins with grooved spines; no anal fin.

Colour: Uniform greyish-brown above; lighter below. Juveniles have dark markings on dorsal and caudal fins.

Size: At least 112 cm, possibly up to 128 cm.

Distribution: Widespread but patchy global distribution in Mediterranean Sea, Atlantic and Indo-Pacific Oceans.

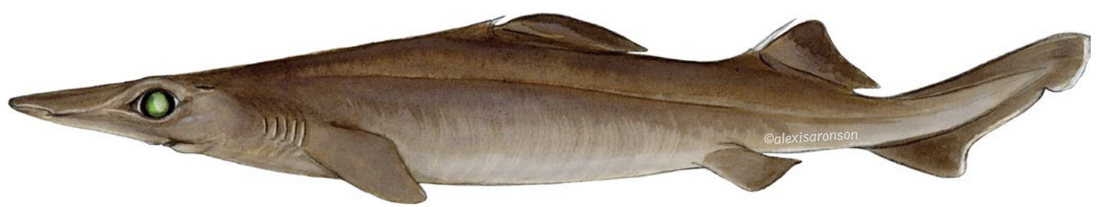
Habitat: Demersal on continental and insular shelves and slopes at depths of 115 to 745 m, possibly to 1,400 m, but mostly between 400 and 800 m.

Threats: Taken as both targeted and incidental catch across its range in mid-water and demersal trawl, surface and demersal longline, and setnet fisheries. Its conservation status is poorly understood but limited reproductive capacity (a single pup per litter) makes this species very susceptible to overfishing.

Notes: This species may be confused with small *C. granulosus* specimens. The shape of the first dorsal fin can be used to distinguish the two species; *C. granulosus* has a longer, lower first dorsal fin than *C. uyato*, which has a shorter and more triangular first dorsal fin.

BIRDBEAK DOGFISH

Deania calceus



NT

Description: Extremely long, flat snout, rough skin. First dorsal fin low and long with a short spine; originates over bases of pectoral fins. Second dorsal fin shorter and higher with a longer spine. No anal fin and no sub-caudal keel.

Colour: Uniform black-brown to grey-brown or light grey; no obvious markings. Fin webs dusky to dark grey.

Size: 162 cm.

Distribution: Widespread but patchy global distribution in Atlantic and Indo-Pacific Oceans.

Habitat: Continental and insular shelves and slopes, between 60 and 1,504 m.

Threats: Has been taken as both targeted and incidental catch across its range, in midwater and demersal trawl, demersal longline, and gillnet fisheries. Species in the genus *Deania* were historically exploited commercially. At-vessel mortality is high and post-release mortality is also likely to be high. *Deania* species are occasionally reported in logbooks in demersal inshore and offshore hake trawl fisheries in South African waters, and this species is commonly caught as bycatch in the hake bottom trawl fishery in Namibia.

Notes: References in the literature to *D. crepidalbus* and *D. hystricosa* are thought to refer to *D. calceus*. This species appears in some guides as *Deania calcea*.

ARROWHEAD DOGFISH

Deania profundorum

NT

Description: Extremely long, flat snout; smooth skin. Subcaudal keel present (distinguishes this species from other *Deania* species). First dorsal fin relatively short and high and bearing short spine, second dorsal similar but taller, with much higher spine.

Colour: Uniformly dark grey or brown.

Size: 97 cm.

Distribution: Patchily distributed in parts of the eastern Atlantic (Western Sahara to South Africa), western Atlantic and Indo-west Pacific Oceans.

Habitat: Continental and insular slopes at depths of 205 to 1,800 m.

Threats: Has been taken as both targeted catch and bycatch throughout its range in midwater and demersal trawl, demersal longline, and gillnet fisheries. Species in the genus *Deania* were historically exploited commercially. At-vessel mortality is high, and post-release mortality is also likely to be high. *Deania* species are occasionally reported in logbooks in demersal inshore and offshore hake trawl fisheries off South Africa, and *D. profondorum* is a common bycatch of the bottom trawl fishery for hake in Namibia.

LONGNOSE DOGFISH / LONGSNOUT DOGFISH

Deania quadrispinosa

VU

Description: Rough skin; extremely long, flat snout. No subcaudal keel. First dorsal fin high, angular and short; second dorsal fin higher with longer spine.

Colour: Grey, grey-brown or blackish. Fins sometimes have white edges.

Size: 118 cm.

Distribution: Southeast Atlantic, western Pacific and Indian Oceans.

Habitat: Demersal on continental and insular shelves and slopes at depths of 150 to 1,360 m, usually at depths greater than 400 m.

Threats: Has been taken as both targeted and incidental catch across its range in midwater and demersal trawl, demersal longline, and gillnet fisheries. It is likely to be misreported with similar looking *Deania* species. May be one of the deep-water shark species reported as bycatch from Namibian hake fisheries, alongside *D. calceus* and *D. profondorum*.

Notes: Not as well documented from Namibia as *D. calceus* and *D. profondorum*.

BLACK DOGFISH

Centroscyllium fabricii

LC

Description: Fairly stout body; long, compressed abdomen. First dorsal fin somewhat low. First dorsal spine short and second dorsal spine moderately high. Short caudal peduncle; no anal fin. Arched mouth and large, oval, reflective green eyes.

Colour: Uniformly blackish-brown.

Size: 107 cm.

Distribution: Widespread throughout the temperate Atlantic Ocean. In the eastern Atlantic it occurs between Europe and South Africa.

Habitat: Demersal on the outer continental shelf and slope, at depths of 130 to 2,250 m.

Threats: Occasionally taken as a bycatch off southern Africa, but generally occurs in deep waters beyond the hake fishery zone. Not considered to currently be threatened by fisheries in the Southeast Atlantic and likely to have refuge at depth. However, catch rates should be closely monitored, should fisheries expand into deeper waters.

BLURRED SMOOTH LANTERNSHARK

Etmopterus bigelowi

LC

Description: Slender body, broad head with long, thick, flat snout. Smooth skin; long caudal fin. First dorsal fin smaller than second dorsal fin. Faint flank markings which are often barely or not visible on bycaught individuals.

Colour: Dark brown or blackish, and darker ventrally. White spot centred on the top of the head and pale edges to fins.

Size: At least 73 cm.

Distribution: Widespread but patchy global distribution in the Atlantic and Indo-Pacific Oceans.

Habitat: Continental and insular shelves and slopes, from the surface to 1,000 m depth.

Threats: Likely to be taken as bycatch and discarded in demersal and pelagic fisheries throughout much of its range. Captured regularly as bycatch in the Namibian bottom trawl fishery for hake.

Notes: Lanternsharks in the genus *Etmopterus* often have photophores - bioluminescent organs that light up their fins and other parts of their bodies - on their flanks and undersides. The markings that indicate the location of these photophores (also called photomarks) can be helpful when discerning amongst the lanternshark species. Lanternsharks can be in poor condition when observed on fishing vessels, due to damage by fishing gear.

BROWN LANTERNSHARK

Etmopterus compagnoi

LC

Description: Moderately stout body. Short caudal fin. Inconspicuous black flank markings (photomarks) above and behind pelvic fins.

Colour: Brown above; rather abruptly transitioning to black below.

Size: 67 cm.

Distribution: Southeast Atlantic and western Indian Oceans, from Namibia to Mozambique.

Habitat: Benthic or benthopelagic on continental slope at depths of 383 to 1300 m, but most individuals are found deeper than 600 m.

Threats: No known threats (occurs at depths below current fishing activities).

Notes: Sometimes referred to as *E. gracilispinus*.

SOUTHERN LANTERNSHARK

Etmopterus granulosus

LC

Description: Heavy-bodied with large, flattened head and very short gill slits. Second dorsal fin much higher than first dorsal; caudal fin short and broad. Conspicuous lines of large rough denticles on body. If visible, anterior branch of flank photophore is long, slender and tapering posteriorly; posterior branch broad and much shorter.

Colour: Grey-brown above, abruptly black below. Black marks above pelvic fin and caudal fin base.

Size: 102 cm.

Distribution: Widespread but patchy distribution throughout the Southern Hemisphere. Known from the Southwest and Southeast Atlantic Ocean, western and eastern Indian Ocean and Southwest and Southeast Pacific Ocean.

Habitat: Upper continental and insular slopes, and seamounts at depths of 220 to 1,500 m, but more common below 600 m.

Threats: Taken incidentally in benthic trawl and longline fisheries throughout its range. Caught as bycatch in trawl fisheries for hake off the west coast of South Africa, and possibly also in Namibia.

SMOOTH LANTERNSHARK

Etmopterus pusillus

LC

Description: Fairly slender body; head flattened, relatively short snout. First dorsal fin located around mid-back between pectoral and pelvic fins (whereas it is more anterior in *E. bigelowi*). First dorsal spine stout, short and usually lower than first dorsal fin apex. Second dorsal fin nearly twice area of first dorsal. Fairly short, broad caudal fin. Dermal denticles give body a velvety texture. Anterior branch of flank photomark much longer than posterior branch, but may be faint or obscure. Posterior branch of caudal photomark elongated and blunt-tipped.

Colour: Blackish brown body with obscure black ventral markings.

Size: 50 cm.

Distribution: Widespread but patchy global distribution in Atlantic and Indo-Pacific Oceans.

Habitat: Continental and insular slopes, between 0 and 1,120 m and possibly as deep as 1,998 m. Also recorded as epipelagic and mesopelagic in deep waters.

Threats: Occasionally taken as bycatch in demersal and midwater trawl, demersal longline, and trammel net fisheries across much of its range. This species is most abundant in waters of around 400 m depth, thus within the current depth range of deep-water fishing activities.

Notes: This species is more commonly encountered than *E. bigelowi*. In *E. bigelowi*, dorsal fin is closer to head; distance from pectoral fin insertion to first dorsal fin base is three or more times length of interdorsal space.

SCULPTED LANTERNSHARK

Etmopterus sculptus

LC

Description: Moderately large. Denticles in linear rows on head and extending to flanks and caudal fin base give body a sculpted, textured appearance. Lateral flank photomark with anterior branch about equal to or slightly longer than posterior branch.

Colour: Dark grey-brown above, black below with well-defined, narrow, elongated flank markings extending to anterior and posterior of pelvic fins.

Size: 59 cm.

Distribution: Southern Africa and seamounts south of Madagascar.

Habitat: Near bottom; 240 to 1,023 m.

Threats: Occasionally caught in demersal trawl fisheries. The majority of the population inhabits waters deeper than where most fisheries are active, and may thus have some refuge there. Caught at least occasionally as bycatch in the Namibian bottom trawl fishery for hake.

Notes: Sometimes listed in the literature as *E. brachyurus* or *E. lucifer*.

PORTUGUESE DOGFISH

Centroscymnus coelolepis

NT

Description: Short snout, body stocky; not strongly tapering back from pectoral fin area. Dorsal fins about equal in height and size; dorsal fin spines both very small, with tips just protruding from fins. Second dorsal fin close to caudal fin. No anal fin. Pre-oral length (from tip of snout to mouth) much shorter than distance from mouth to line joining points at which first gill slit on each side starts (distinguishes this species from *C. owstonii*).

Colour: Uniformly golden brown to blackish-brown.

Size: 130 cm.

Distribution: Atlantic, Indian and West Pacific Oceans.

Habitat: Continental slopes, upper and middle abyssal plain rises, on or near seafloor; 128 to 3,675m.

Threats: Taken as both targeted catch and bycatch throughout its range in demersal trawl, demersal longline, and gillnet fisheries. Somniosid sharks (*Centroscymnus* spp.) are occasionally reported in demersal offshore trawl fisheries off South Africa. However, most records of this species are from depths greater than 900 m, which provides the species with some refuge from existing fisheries.

Notes: Easily confused with *Centroscymnus owstonii*, but the latter has a distinct ridge at the base of each side of the body, and a longer pre-oral length relative to distance from mouth to first gill slit. Short dorsal spines can distinguish this species from *Centroscyllium fabricii*.

ROUGHSKIN DOGFISH

Centroscymnus owstonii

VU

Description: Similar to *Centroscymnus coelolepis* but longer snout; longer, lower first dorsal fin and taller, triangular second dorsal fin. No anal fin. Dorsal spines barely exposed. When body is placed on its side, skin on belly typically forms ridge between pectoral and pelvic fins, which is diagnostic for this species. Pre-oral length (from tip of snout to mouth) about as long as distance from mouth to line joining points at which first gill slit starts, on each side of body.

Colour: Uniformly dark brownish or black, with no conspicuous markings.

Size: 120 cm.

Distribution: Atlantic, Indian and Pacific Oceans.

Habitat: Upper continental slopes and submarine ridges, on or near seafloor; 150 to 1,459m. Strongly associated with seamounts.

Threats: Taken incidentally in benthic trawl and longline (surface and benthic) fisheries throughout its range. Regularly taken as bycatch in the Namibian bottom trawl fishery for hake.

Notes: Easily confused with *Centroscymnus coelolepis*. The latter does not have a distinct ridge at the base of each side of the body, when placed on its side.

LONGNOSE VELVET DOGFISH

Centroselachus crepidater

NT

Description: Slender body; very long, somewhat flattened snout, small mouth with very long labial furrows that extend up and over the mouth. Preoral length about equal to distance between mouth and pectoral fin origin. Dorsal fins about the same size; first dorsal fin extends forward in prominent ridge with origin over pectoral bases; second dorsal free rear tip nearly reaches upper caudal origin. Dorsal spines very small. Soft, velvety skin.

Colour: Deep black to dark brown. Narrow light posterior fin margins.

Size: 105 cm.

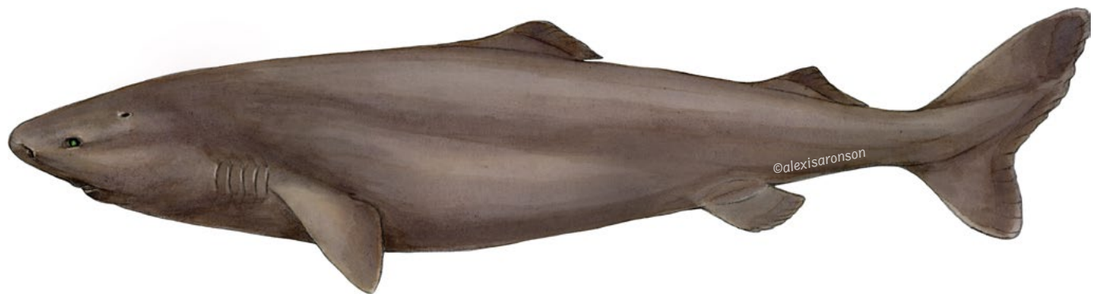
Distribution: East Atlantic, Indian and Pacific Oceans, except for Northeast Pacific.

Habitat: Upper continental and insular slopes, on or near bottom; 200 to 2,080 m but mostly at depths greater than 500 m.

Threats: Taken as both targeted and incidental catch across its range in midwater and demersal trawl, surface and demersal longline and gillnet fisheries. The species is likely to have refuge at depths where industrial fisheries currently do not operate. Has been recorded at least occasionally as a bycatch in the Namibian bottom trawl fishery for hake.

SOUTHERN SLEEPER SHARK

Somniosus antarcticus



LC

Description: Gigantic, heavy cylindrical body and short, rounded snout. Rough skin. Very low, equally sized dorsal fins; no dorsal spines. First dorsal fin closer to pelvic fins than pectoral fins; distance between dorsal fin bases c. 80% of distance between snout and first gill slit. Pectoral fins with rounded tips. Short caudal peduncle, keels on base of caudal fin. Caudal fin with long lower lobe, short upper lobe.

Colour: Uniform grey to blackish.

Size: About 600 cm.

Distribution: Widespread but patchy distribution in the southern Atlantic and Indo-Pacific Oceans and in Antarctic waters.

Habitat: Upper continental slopes, insular shelves, oceanic ridges and seamounts; 245 to 1,540 m.

Threats: Taken infrequently as incidental bycatch in benthic trawl, set net, and longline fisheries throughout most of its range.

VELVET DOGFISH

Zameus squamulosus

LC

Description: Slender body and low, flat head; fairly long, narrow snout. Short, narrow mouth and nasoral grooves much longer than upper labial furrows. Dorsal fin spines small. Second dorsal fin larger than first dorsal and about same size as pelvic fins; fin base of first dorsal fin is shorter than that of second dorsal fin base. No anal fin. Caudal fin with strong terminal notch and short lower lobe.

Colour: Uniformly black to dark brownish-black.

Size: 109 cm.

Distribution: Widespread but patchy global distribution in Atlantic and Indo-Pacific Oceans.

Habitat: Continental slope and oceanic ridges, and epipelagic over deep water, from the surface to 1,511 m depth.

Threats: Infrequently reported from surface longline fisheries targeting pelagic fishes, such as tunas and swordfish, and as demersal longline and trawl fisheries, in some regions. May have some refuge from fisheries at depth. Has been recorded as incidental bycatch in Namibian bottom trawl fishery for hake.

ANGULAR ROUGHSHARK

Strykysterhaai
Oxynotus centrina

EN

Description: Distinctively stocky body, triangular in cross section, with a broad and flattened head and short, blunt snout. Two large, sail-like dorsal fins, both preceded by a short spine; no anal fin. Spiracle large and vertically elongated. Light horizontal line below eye.

Colour: Grey or grey-brown above. Dark blotches on head and flanks but may be obscure, particularly in adults.

Size: 150 cm.

Distribution: Northeast and East Atlantic Ocean, between Norway and South Africa, and the Mediterranean Sea.

Habitat: Coral, algal and muddy bottoms, on continental shelf and upper slopes, at depths of 35 to 805 m.

Threats: Infrequently reported as bycatch in demersal trawl and longline fisheries throughout its range. Suspected to be declining in parts of its distribution where historic and current fishing pressure is high and previous declines in deep-water sharks have been documented. However, there are few records of this species in the southern Atlantic and species-specific population trend data are not available.

COOKIECUTTER SHARK

Isistius brasiliensis

LC

Description: Cigar-shaped body with moderately short snout, relatively large eyes close to tip of snout. Pectoral, dorsal and pelvic fins all very small relative to body size. Both dorsal fins set far back along body; first dorsal fin insertion over area of pelvic fin origin. No anal fin. Luminous organs (photophores) on entire ventral surface except on prominent dark collar and light-edged fins.

Colour: Mid-grey to grey-brown above with conspicuous dark collar-like marking around gill area; lighter below. Fins dark brown but with pale or translucent edges.

Size: 56 cm.

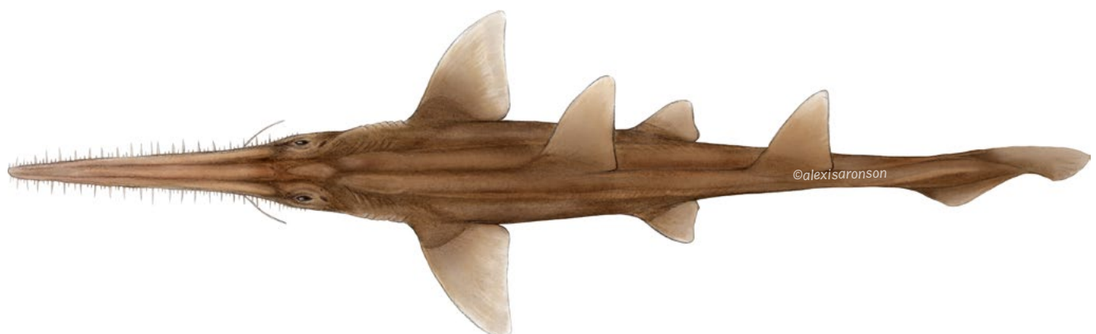
Distribution: Likely to be cosmopolitan in oceanic waters of temperate and tropical regions.

Habitat: Tropical oceanic, epipelagic to bathypelagic, between the surface and 3,500 m.

Threats: Occasionally bycaught in oceanic trawl and longline fisheries, including mid-water trawls, but the small size, habitat and behaviour of this species may limit the level of bycatch.

WARREN'S SIXGILL SAWSHARK

Seskief-saaghaai/ saagbek
Pliotrema warreni



LC

Description: Slender sawshark. Long, toothed rostrum extends from head, bearing rostral teeth of varying lengths; larger rostral teeth have serrated edges. Two barbels extend from the ventral surface of the rostrum; barbel origins about two-thirds of the distance between rostrum tip and mouth (i.e. closer to the mouth than in other species of sawshark documented from western Indian Ocean). Six pairs of gill slits.

Colour: Dark grey to olive brown above with yellowish longitudinal stripe; uniformly lighter below.

Size: At least 136 cm (possibly up to 170 cm).

Distribution: Southeast Atlantic and southwestern Indian Ocean, between False Bay, South Africa and southern Mozambique. Only recorded twice in Namibia.

Habitat: Offshore continental shelf and upper continental and insular slope at depths of 10 to 915 m (but usually between 60 and 430 m), on or near the seabed. Adults typically occur deeper than juveniles.

Threats: Inherently susceptible to capture in trawl fisheries as their rostra (saws) are easily entangled in nets. They are caught as bycatch of demersal trawlers. This species may be rare in Namibian waters but at least one specimen has been recorded as bycatch on a bottom trawl vessel in Namibia.

SAWBACK ANGELSHARK

Engelhaai
Squatina aculeata

CR

Description: Distinctly broad, flattened body. Short snout with large mouth and nostrils; eyes on top of head close to and level with large spiracles. Large thorns on head (spines on the snout and above the eyes). Heavily fringed nasal barbels and anterior nasal flaps. One row of dorsal spines along the back (distinguishes this species from other angelsharks with overlapping ranges). Very large pectoral fins. Pelvic fin tips extend to, or beyond, origin of first dorsal fin.

Colour: Light grey or brown mottled with darker brown; may have irregular small white spots and regular dark brown spots. Large dark blotches may be present on dorsal surface and tail.

Size: 188 cm.

Distribution: Eastern Atlantic from Senegal at least as far south as Sierra Leone and Mediterranean Sea.

Habitat: Coastal and shelf areas of warm-temperate and tropical Eastern Atlantic, on or near seabed on soft substrates, at depths of 30 to 500 m.

Threats: Highly susceptible to bycatch in trawls and dredges due to its bottom-dwelling behaviour. Taken as bycatch in major industrial bottom trawl fisheries and inshore bottom-set gillnets, and in trammel nets and bottom-set longlines throughout its range.

Notes: There have only been three records of sawback angelsharks in Namibian waters since 1975. Two were recorded in northern Namibian waters, close to Angolan waters, and the third was an extra-limital record from an area south of Lüderitz, which may be a misidentification. It is at present unclear whether both *Squatina aculeata* and *S. oculata* occur in Namibian waters, or whether records of one of these species may have resulted from a misidentification. Any angelshark observed in Namibian waters should be documented in detail with photographs and measurements.

SMOOTHBACK ANGELSHARK

Engelhaai
Squatina oculata

CR

Description: Distinctly broad, flattened body. Short snout with large mouth and nostrils; eyes on top of head close to and level with large spiracles. Anterior nasal flaps weakly fringed. Thorns present above the eyes and around the snout. Very large pectoral fins. Pelvic fin tips do not reach origin of base of first dorsal fin.

Colour: Grey-brown with small white and dark spots; sometimes symmetrical brown ocelli surrounded by white spots on pectoral fins, tail, and body. Large dark blotches on base and rear tips of pectoral fins, base of tail and under dorsal fins. White dorsal and caudal fin margins.

Size: 160 cm.

Distribution: Mediterranean Sea and along the West African coast, between Senegal and Ghana (possibly further south as far as Angola and northern Namibia).

Habitat: Warm-temperate and tropical continental shelves and upper slopes between 20 and 560 m; sandy and muddy habitats.

Threats: Highly susceptible to bycatch in trawls and dredges due to its bottom-dwelling behaviour. Angelsharks are taken as bycatch in major industrial bottom trawl fisheries and inshore bottom-set gillnets throughout their range.

Notes: Very rare, with only one record from Namibia since 1975, recorded by a research vessel just south of Namibia's border with Angola. Most likely at the edge of its range in northern Namibian waters. Any angelshark observed in Namibian waters should be documented in detail with photographs and measurements.

SAND TIGER SHARK / RAGGED-TOOTH SHARK / GREY NURSE SHARK

Spikkel-skeurtandhaai
Carcharius taurus

CR

Description: Flattened conical snout; large, slender, pointed teeth that protrude slightly from the mouth. Large dorsal fins and anal fin of similar sizes. First dorsal fin is closer to pelvic fins than pectoral fins. Caudal fin has short ventral lobe.

Colour: Light brown-grey above, often with scattered dark spots, and white below.

Size: Up to 325 cm, possibly longer.

Distribution: Circumglobal distribution, in all oceans except for the East Pacific.

Habitat: Demersal and pelagic in tropical and temperate seas on the continental shelf from the surf zone to a depth of 232 m. Occurs mainly in shallow waters of 15 to 25 m and aggregates in or near underwater caves, gullies, and rocky and coral reefs. Undertakes complex migrations associated with seasonal and reproductive events, habitually returning to the same breeding area.

Threats: Subject to fishing pressure throughout its range. Captured as target and bycatch in artisanal, recreational and industrial fisheries with gears including longline, line, gillnet and trawl. Mostly retained for its meat and fins, except in areas where retention is prohibited by law. The coastal habitat preferences of this species means it is also threatened by habitat loss and degradation, including pollution and clearing for aquaculture and development. In South Africa, this species is captured by recreational shore-based anglers, but in Namibia it is encountered only rarely. Catches by anglers should not pose a threat to the species, if the sharks are handled carefully and released immediately.

CROCODILE SHARK

Krokodilhaai
Pseudocarcharias kamoharai

LC

Description: Distinctive, slender, cylindrical body. Conical head with very large eyes; large mouth with prominent long, slender teeth and highly protrusible jaws. Very small spiracles. Small pectoral fins; two spineless dorsal fins, small anal fin, long dorsal caudal fin lobe.

Colour: Grey or grey-brown above and light below. Some individuals have a white cheek area (between mouth and first gill slit).

Size: 122 cm.

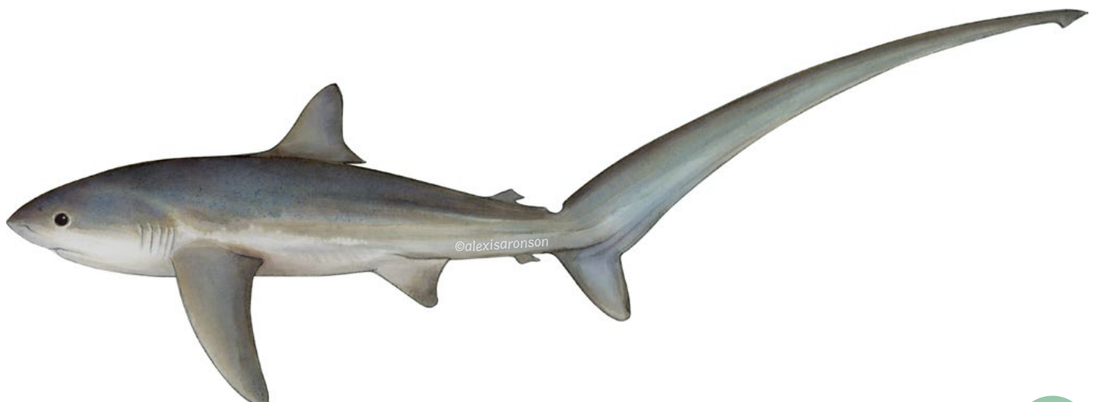
Distribution: Circumglobal in oceanic waters of the Indo-Pacific and Atlantic Oceans.

Habitat: Epi- and mesopelagic, recorded from the surface to depths of at least 590 m.

Threats: Regularly bycaught in pelagic swordfish and tuna longline fisheries. Their high susceptibility to capture and low biological productivity may make them susceptible to population declines.

THRESHER SHARK

Fynstert-sambokhaai
Alopias vulpinus



VU

Description: A distinctive shark - caudal fin upper lobe is nearly as long as the rest of the body. Long, curved, pointed pectoral fins. Fairly large eyes; labial furrows present.

Colour: Blue-grey or dark grey above, silvery or bronze on sides. White below, extending to a patch above the pectoral fins. White spot on pectoral fin tips.

Size: Up to at least 575 cm, possibly longer.

Distribution: Worldwide, tropical to cold temperate seas.

Habitat: Nearshore to oceanic, to depths of 650 m.

Threats: Caught globally as both target and bycatch in commercial and small-scale pelagic longline, purse seine, and gillnet fisheries. Bycatch in industrial pelagic fleets in offshore and high-seas waters accounts for much of the catch of this species. Also captured in coastal longlines, gillnets, trammel nets and sometimes trawls, particularly in areas with narrow continental shelves. When retained, both fins and meat are used. Has been recorded as a bycatch of the mid-water trawl fishery in Namibia.

Notes: Distinguishable from other thresher shark species by the white flanks that extend over the pectoral and pelvic fins in *Alopias vulpinus*.

BIGEYE THRESHER SHARK

Grootoog-sambokhaai
Alopias superciliosus

VU

Description: Distinctive shark with long caudal fin upper lobe; huge eyes extend onto flat-topped head. Deep groove runs horizontally above gill slits. Very long, narrow pectoral fins.

Colour: Purplish grey or grey-brown above. Light grey to white ventrally; does not extend above pectoral fin bases (distinguishes this species from *Alopias vulpinus*)

Size: At least 484 cm.

Distribution: Worldwide in tropical and temperate seas.

Habitat: Close inshore to open ocean; surface to 955 m.

Threats: Caught globally as target and bycatch in commercial and small-scale pelagic longline, purse seine, and gillnet fisheries. The majority of animals are taken as bycatch by commercial pelagic fleets in offshore and high-seas waters. Also captured in coastal longlines, gillnets, trammel nets and occasionally trawls, particularly in areas with narrow continental shelves. Often retained for their meat and fins. Bigeye thresher sharks spend time near the surface at night where they are exposed to fisheries capture, but have some refuge at depth during the day. In Namibia, this species has been recorded as bycatch in the bottom trawl fishery for hake.

BASKING SHARK

Koesterhaai
Cetorhinus maximus

EN

Description: Second largest shark in the world (after the whale shark, *Rhincodon typus*). Very large cylindrical body and conical head with pointed snout. Huge mouth with tiny teeth; huge gill slits that almost encircle the head. Very small spiracles well behind eyes. Two spineless dorsal fins; strong lateral keels on caudal peduncle.

Colour: Variable colour but usually dark or light grey above, often with mottled pattern on back and sides, and white blotches under head. Skin has a lined or wrinkled appearance.

Size: At least 1,097 cm but more commonly 700 cm.

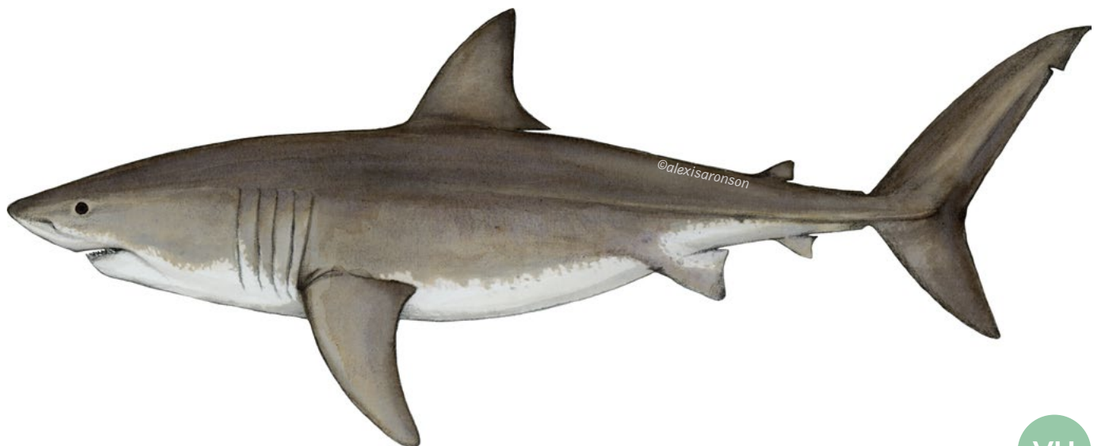
Distribution: Worldwide, frequent in cold to warm temperate waters where it is present near the surface, and in tropical and equatorial waters where it occurs deeper, below the thermocline. Undertakes large-scale migrations.

Habitat: Coastal and pelagic, often associated with coastal and oceanic fronts. Can undertake vertical movements from the surface to depths of 1,264 m.

Threats: A highly migratory species, its movements through the waters of many nations likely brings it into contact with many different threats. Basking sharks were historically hunted to extinction in some parts of the world; their low productivity places them at high risk of extirpation due to overfishing. The species is still taken as bycatch by trawl, trammel nets, and set-net fisheries, and becomes entangled in pot lines. The species' habit of spending time swimming at or just below the surface puts it at risk of strikes by recreational and commercial vessels. In Namibia, it has been recorded as bycatch in the bottom trawl fishery.

GREAT WHITE SHARK

Witdoodshaai
Carcharodon carcharias



VU

Description: Large, heavy, torpedo-shaped body and long gill slits. Relatively long snout and black eyes. Large first dorsal fin. Wide keels on caudal peduncle.

Colour: Grey above and sharp demarcation to white below. Dark free rear tip on first dorsal fin; black tips on underside of pectoral fins and usually dark spot at pectoral fin insertion. Older adults often become paler grey above.

Size: 640 cm.

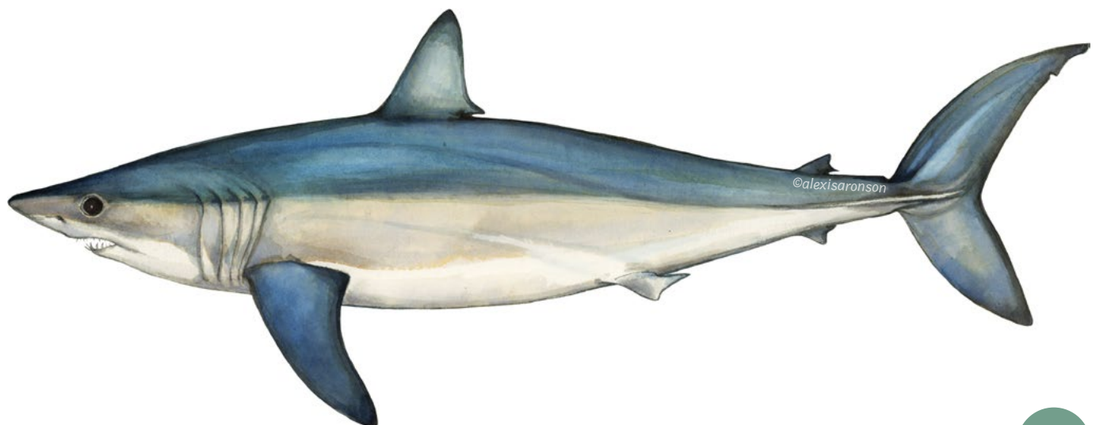
Distribution: Worldwide except polar seas.

Habitat: From shallow inshore waters to continental shelf and remote oceanic islands, at depths of 0 to 1,280 m. Undertakes long migrations during which it spends long periods in pelagic waters.

Threats: Caught as bycatch mostly in inshore fisheries in a range of gears, such as longlines, setlines, gillnets, trawls, hand-held rod and reel, and fish-traps. Rarely caught in offshore pelagic fisheries. Also vulnerable to drum-lines and gillnets used in bather protection programmes, such as those used in parts of South Africa.

SHORTFIN MAKO

Kortvin-mako
Isurus oxyrinchus



EN

Description: Pointed snout; U-shaped mouth, black eyes. Long gill slits. Wide keels on caudal peduncle.

Colour: Bright blue or purple above, paler and silvery on sides, white below. Underside of snout and mouth white in adults. Anterior dorsal surface of pelvic fins dark in colour; posterior half and underside of pelvic fins white.

Size: 445 cm.

Distribution: Worldwide in tropical and warm-temperate seas.

Habitat: Coastal and oceanic, between 0 and 888 m depth.

Threats: Caught globally as target and bycatch in industrial and small-scale pelagic longline, purse seine, and gillnet fisheries. The majority of the catch occurs in offshore and high-seas waters, as bycatch of industrial pelagic fleets, but the species is also captured in coastal longlines, gillnets, trammel nets, and sometimes trawls. In Namibia it is purportedly a bycatch of the tuna and swordfish fishery, but is retained for the meat and fins.

FLESHYNOSE CATSHARK

Apristurus melanoasper

LC

Description: Slender, elongated body and two small, spineless dorsal fins of equal size. Slender, fleshy snout; long, arched mouth reaches past front end of the cat-like eyes. Long, deep, angular anal fin, separated from caudal fin by a small notch.

Colour: Dark brown body with irregular scattering of pale flecks on most individuals (may be absent); black naked fin tips.

Size: At least 79 cm.

Distribution: North and East Atlantic, southern Australia, New Zealand and off Madagascar Ridge.

Habitat: Continental mid-slopes and seamounts at depths of 512 to 1,683 m, but mostly in waters deeper than 1,000 m.

Threats: Uncommon bycatch of commercial deepwater trawlers. Generally recorded deeper than 1,000 m and the depth range may extend deeper than currently known, offering some refuge from fishing pressure. A poorly studied species, it may share the limiting life history characteristics of other deepwater sharks that make them vulnerable to rapid depletion. Future expansion of fishing into deeper waters could therefore negatively affect this species.

Notes: *Apristurus melanoasper* can be distinguished from *A. microps* by the fact that it has a slender body and its upper labial furrows are longer than the lower ones.

Eggcase: Opaque and yellowish to brownish, probably darker after exposure to sea water; tendrils blackish brown. Measures 52 - 67 mm in length and 23.5 - 27 mm in width (based on examination of 3 eggcases). Capsule anterior margin slightly concave, with short, inwardly curving horn of about 3 mm length at each corner. Posterior end with two long, tightly coiled tendrils set close to each other at base. Eggcase is constricted at about one third of the length from anterior end. Surface entirely covered by fine, weak longitudinal fibres; lateral edge with keel-like ridges.

SMALLEYED CATSHARK

Apristurus microps

LC

Description: Stout body; extremely small eyes. Long, arched mouth reaches past front end of the cat-like eyes. Two small, spineless dorsal fins, of similar size and both located far along the back, close to caudal fin. Very large, long, rounded-angular anal fin separated from caudal fin by small notch. Caudal fin with loose crest of enlarged dermal denticles on dorsal margin.

Colour: Can range from uniformly blackish or purplish-black to greyish and variations in between; no conspicuous markings on fins.

Size: 61 cm.

Distribution: North and Southeast Atlantic and southwestern Indian Ocean.

Habitat: Bottom-dwelling species that inhabits the continental slope at depths of 700 to 2,200 m. Migrates off the seabed to feed on midwater prey items.

Threats: May be caught and discarded as bycatch by deepwater trawl fisheries, but most of its range is deeper than the waters targeted by commercial fisheries. However, any expansion of deepwater fisheries may pose a threat to this species in the future.

Notes: Similar to *Apristurus melanoasper* and *A. saldanha*. See the descriptions of these species for notes on distinguishing features.

Eggcase: Measures c. 47-52 mm in length (excluding horns). Fairly thick eggcase with fine, straight, smooth longitudinal striations (ridges) on the dorsal and ventral surfaces. Eggcase has a 'waist' (constriction) along its length unless the capsule is empty. Lateral flanges of cases are narrow (about 1 mm wide) and flat, extending the length of the egg case. Anterior border of the case nearly straight with very short (1 mm) anterior horns that are straight, pointed anteriorly and without tendrils. Posterior border narrow and concave; posterior horns very short, stout, and curved towards each other. Posterior tendrils very short, curled, slender and filamentous. Uniform dark green in colour (when removed from preserved catsharks).

SALDANHA CATSHARK

Apristurus saldanha

LC

Description: Elongated body and two small, spineless dorsal fins. Long, arched mouth reaches past front end of cat-like eyes. Upper labial furrows longer than lower labial furrows. First dorsal fin slightly smaller than or equal in size to second dorsal fin. Small notch separates long angular anal fin from caudal fin.

Colour: Uniformly dark slate-grey or grey-brown.

Size: 89 cm.

Distribution: Southeast Atlantic from Namibia to the Eastern Cape, South Africa.

Habitat: A demersal species, inhabiting the continental slope at depths of 344 to 1,009 m.

Threats: Taken as incidental bycatch and discarded in the deep-water hake bottom trawl fishery off South Africa, and likely also in Namibia; several *Apristurus* catsharks have been recorded as bycatch in the Namibian bottom trawl fishery for hake. However, the majority of the population is found in waters deeper than this fishery operates.

Notes: *Apristurus saldanha* can be distinguished from *A. microps* by the fact that it has a slender body and the upper labial furrows are longer than the lower ones.

Eggcase: No confirmed records have been documented of eggcases produced by this species.

AFRICAN SAWTAIL CATSHARK

Galeus polli

VU

Description: Large pectoral fins; small, spineless, equally sized dorsal fins; long, low anal fin. Dermal denticle crest along upper margin of tail. Cat-like eyes.

Colour: Dorsally, sometimes pale grey with distinct, dark saddle blotches, usually 11 or less, and large dark spots over the gill area. Some individuals are darker grey or brownish-bronze dorsally, with saddles and spots indistinct or not visible. Cream or white ventrally, and sometimes laterally on posterior half of body.

Size: 43 cm.

Distribution: Eastern Atlantic (southern Morocco to South Africa).

Habitat: Demersal on the continental shelf and upper continental slope at depths of 159 to 720 m.

Threats: May inhabit depths beyond the reach of some regional fishing activities, but is reported as bycatch in demersal trawl fisheries in the northern (Guinea) and southern (Namibia and South Africa) parts of its range. Large quantities of this species are regularly caught as bycatch in the Namibian bottom trawl fishery for hake, and the majority are already badly injured or dead by the time they reach the vessel.

DARK SHYSHARK

Donker skaamoog
Haploblepharus pictus

LC

Description: Slender body when juvenile, stocky when mature. Broad, slightly flattened head. Very large nostrils with greatly expanded nasal flaps which reach the mouth.

Colour: Light brown to dark brown or blackish above; dorsal saddles and sparsely scattered white spots; white below. Colour and patterning can vary considerably.

Size: 70 cm.

Distribution: Found only in Namibian and South African waters.

Habitat: An inshore, bottom-dwelling shark, found in kelp, sandy and rocky habitats, close inshore to a maximum depth of 35 m.

Threats: Caught as bycatch in demersal trawl fisheries, commercial line fisheries, demersal longline fisheries targeting sharks, and in beach seines, gillnets, and rock lobster traps. In Namibia, this species is largely only caught by recreational anglers and released alive, and is thus not likely to be under considerable pressure. However, any pollution or degradation of shallow coastal habitats may have negative impacts on this species.

Eggcase: Rectangular in shape, with long, thin, curly tendrils extending from all four corners. Black, dark brown, reddish or amber in colour (when found on the beach). Measures c. 55 mm long and 25 mm across when rehydrated. Dark shyshark eggcases are often washed up on beaches in Namibia.

IZAK CATSHARK

Izak
Holohalaelurus regani

LC

Description: Very broad head, short snout and long mouth. Broad pectoral fins; dorsal fins short and angular. Slender tail.

Colour: Yellowish to pale brown, covered with distinctive darker reticulations, bars and blotches with pale centres; no white spots. White below. Younger animals are dark and slender with line of white spots on sides and black bars on tail and fins.

Size: 69 cm.

Distribution: Found only in Namibia and South Africa.

Habitat: Continental shelf and upper slopes between 10 and 1,075 m, but mainly between 100 and 300 m.

Threats: Caught as bycatch in substantial numbers in bottom trawl fisheries for hake in South Africa and Namibia. Individuals are discarded and post-release mortality may be low, although evidence is lacking. This species may have some refuge in deeper waters.

Eggcase: Light brown; velvety covering with longitudinal striations and long tendrils from each corner. Eggcases are 36 to 43 mm long and 12 to 15 mm across. Mature females bear only one cased egg per oviduct.

YELLOWSPOTTED CATSHARK

Geelspikkel-kathaai
Scyliorhinus capensis

NT

Description: Fairly large, slender catshark. Head slender but deep; anterior nasal flaps small and do not reach mouth; no nasoral grooves; lower labial furrows only. First dorsal fin much larger than second.

Colour: Light brown or grey above with eight to nine irregular, dark brown saddles; numerous small bright yellow spots on dorsal surface, pectoral and pelvic fins. No dark spots. Pale below.

Size: 122 cm.

Distribution: Found only in Namibian and South African waters.

Habitat: Bottom-dwelling on continental shelf and upper slope, 26 to 695 m.

Eggcase: Broad and flat eggcase; measures 80 to 84 mm in length (excluding horns). Thick, smooth walls with longitudinal striations and poorly defined or no ridges. Broad (c. 2 mm) lateral flanges. Anterior border almost straight and broad, with long anterior horns that extend into strong tendrils (longer than the eggcase). Posterior border broad and concave with long, stout posterior horns that extend into initially stout, then slender strongly curled posterior tendrils that extend below the eggcase. Tendrils tend to catch onto each other, those of other eggcases and the substrate. Eggcases removed from preserved specimens were uniform pale green to dark green.

WEST AFRICAN CATSHARK

Scyliorhinus cervigoni

DD

Description: Moderately large, stout catshark. Head flattened in profile, triangular with pointed snout when viewed from above. Anterior nasal flaps just reach mouth; lower labial furrows only. First dorsal fin much larger than second; interdorsal space slightly less than anal fin base.

Colour: Greyish or brownish above with seven to nine dark saddles centred on midline dark spots; few, relatively large dark spots. No white spots. White below.

Size: 106 cm.

Distribution: West Africa, between Mauritania and Namibia.

Habitat: Continental shelf and upper slope, rocky to mud bottom; 45 to 500 m.

Threats: Likely to be caught in demersal net and line fisheries, and has occasionally been reported from gillnet fisheries off the Congo. However, little is known of fisheries interactions and the species has been absent or very infrequently reported in surveys in the West Africa region. Several individuals of this species have been recorded as bycatch in the Namibian bottom trawl fishery for hake.

Eggcase: Eggcases of this species have not yet been documented.

FALSE CATSHARK

Pseudotriakis microdon

LC

Description: Large shark with soft, stocky body. Short, bell-shaped snout; nictitating eyelids; anterior nasal flaps short. Huge angular mouth and short labial furrows; very large spiracles. Long, low, keel-like first dorsal fin; second dorsal fin much higher.

Colour: Uniform dark brown to blackish.

Size: 296 cm.

Distribution: Patchy worldwide, except East Pacific.

Habitat: Benthic on continental and insular slopes; 100 to 2,430 m. Occasionally recorded on the continental shelves including in shallow water.

Threats: Taken as sporadic bycatch on deep-set longlines or in deepwater bottom trawls. No information is currently available on whether this species is impacted by fisheries in Namibian waters.

TOPE SHARK / SCHOOL SHARK / SOUPFIN SHARK

Vaalhaai
Galeorhinus galeus

CR

Description: Large, slender shark with a long, conical snout and large arched mouth. Small anterior nasal flaps. First dorsal fin much larger than second dorsal fin; second dorsal is same size as anal fin.

Colour: Grey above with short blaze of white originating in front of the pelvic fin, extending from the lower flank forwards onto the upper flank. White below. Juveniles have black fin markings and sometimes a few dusky spots.

Size: 195 cm.

Distribution: Worldwide in cold to warm-temperate waters.

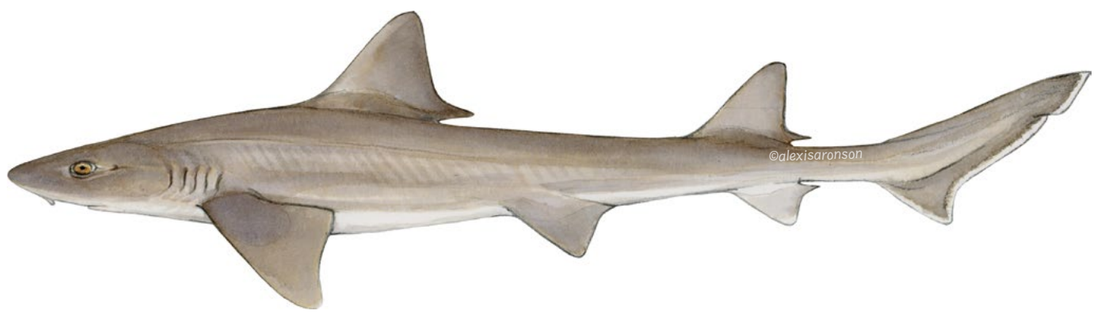
Habitat: On or near the seabed, on continental and insular shelves. Can be found from shallow inshore waters to offshore waters up to 800 m deep, but commonly shallower than 200 m.

Threats: Tope has been caught, historically and currently, globally as both a target species and as bycatch in industrial, small-scale, and recreational demersal and pelagic gillnet and longline fisheries, as well in trawl and hook-and-line fisheries, troll lines, trammel nets and traps. It is usually retained for the meat, fins, and liver oil. In South Africa, tope is both targeted and a retained bycatch species and is caught in significant quantities in the demersal and pelagic line, trawl, gillnet, and recreational fisheries. In Namibia, it is occasionally caught by shore-based recreational anglers.

Notes: This species can be distinguished from *Mustelus mustelus* and *M. palumbes* by the fact that tope have sharp, blade-like teeth whereas smoothhounds have low, molariform teeth (for crushing rather than cutting).

SMOOTHHOUND SHARK

Hondhaai
Mustelus mustelus



EN

Description: Large, fairly slender houndshark. Short head and snout; large, close-set eyes. Nostrils widely spaced. High dorsal fins; first dorsal fin origin over pectoral fin inner margins; first dorsal slightly larger than second dorsal.

Colour: Grey to grey-brown above, usually no spots but occasional dark spots; white below.

Size: 176 cm.

Distribution: Temperate East Atlantic Ocean, including the Mediterranean Sea, between Portugal and the east coast of South Africa.

Habitat: Sandy and muddy substrates on the continental shelf and slope at depths of 0 to 800 m, but more commonly encountered in shallow waters to depths of 50 m.

Threats: Targeted and taken as bycatch in multiple industrial and artisanal fisheries including demersal trawl, line gear, gillnet, set nets, tangle nets, and trammel nets, and is retained for human consumption. In the southeast Atlantic, smoothhounds are also targeted or captured as bycatch. In South Africa, this species is one of the top five most valuable commercial species in the demersal shark longline fishery, commercial line fishery, and inshore trawl fishery. In Namibia, this species is often caught by shore-based recreational anglers, and lower fishing pressure in coastal waters along the Namibian coastline may offer this species some refuge. However, smoothhounds have been used by some anglers as bait for catching larger sharks such as bronze whalers. The impact of this activity on Namibia's smoothhound population is unknown but given this species' conservation status, it should not continue.

Notes: This species and *M. palumbes* can be distinguished from tope (*Galeorhinus galeus*) by the fact that both smoothhound species have low, molariform teeth (for crushing rather than cutting), whereas tope have sharp, blade-like teeth. In addition, the lower caudal lobe is longer in tope than in smoothhounds.

WHITESPOTTED SMOOTHHOUND

Witkol-hondhaai
Mustelus palumbes

LC

Description: Fairly large houndshark, short head and snout with nostrils widely spaced. Moderately high dorsal fins; first dorsal origin over pectoral fin inner margins. First dorsal fin slightly larger than second dorsal, large pectoral fins (larger than *M. mustelus*).

Colour: Grey to grey-brown above, usually with small white spots on upper body. White below. This is the only southern African smoothhound with white spots.

Size: 113 cm.

Distribution: Southeast Atlantic and southwestern Indian Ocean (Namibia, South Africa and southern Mozambique).

Habitat: Continental shelf and upper slope, nearshore to depths of 443 m but most often below 70 m. Found on or near sandy and gravel seabeds.

Threats: Caught as bycatch in demersal trawl, line, and gillnet fisheries, and is retained for the meat and fins or discarded. Post-release mortality for *Mustelus* species tends to be very low in line fisheries but is moderate in trawl and gillnet fisheries. In Namibia, this species is caught by recreational anglers and smoothhounds have been used by some as bait for catching larger sharks such as bronze whalers, a practice now strongly discouraged.

Notes: This species and *M. mustelus* can be distinguished from tope (*Galeorhinus galeus*) by the fact that both smoothhound species have low, molariform teeth (for crushing rather than cutting), whereas tope have sharp, blade-like teeth. In addition, the lower caudal lobe is much longer in tope than in smoothhounds.

SPOTTED GULLY SHARK

Gespikkelde sloothaai
Triakis megalopterus

LC

Description: Broad, blunt snout. Broad, large pectoral fins, falcate with concave posterior margins. First dorsal fin almost vertical.

Colour: Grey or bronze-grey above, with few or many scattered small black spots; white below.

Size: 208 cm.

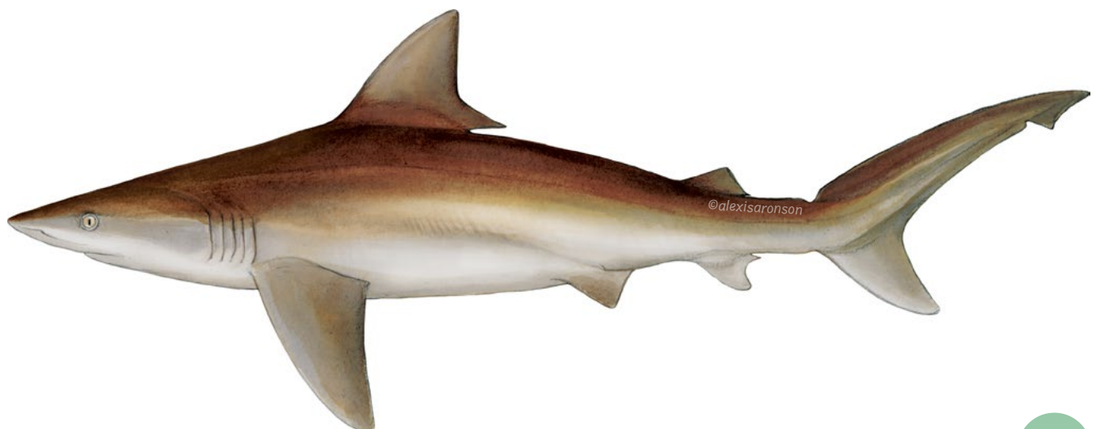
Distribution: Southern Angola to South Africa.

Habitat: In the surfline and shallow inshore waters, to a depth of about 50 m.

Threats: Occasionally taken as bycatch in beach seine, commercial line, longline, and trawl fisheries. Targeted in recreational line fisheries and commonly caught by shore-based recreational anglers in Namibia. Smaller spotted gully sharks have sometimes been used by anglers as bait for catching larger sharks; the scale and impact of this activity on Namibia's spotted gully shark population is unknown and it is now strongly discouraged.

BRONZE WHALER / COPPER SHARK

Koperhaai
Carcharhinus brachyurus



VU

Description: Moderately large shark. Bluntly pointed, broad snout. Labial furrows small and inconspicuous. Long pectoral fins. Dorsal fins with short rear tips; first dorsal moderately large; second dorsal small. No interdorsal ridge.

Colour: Olive grey to bronze above; most fins with inconspicuous darker margins and dusky tips. Light colour on ventral posterior flanks extends upwards and anteriorly from pelvic fin area in fairly prominent white blaze. White below.

Size: 325 cm.

Distribution: Most warm, temperate waters in Atlantic, Mediterranean and Indo-Pacific.

Habitat: Close inshore to at least 145 m offshore.

Threats: Caught globally, both as target and as retained bycatch of industrial, small-scale, and recreational fisheries using a range of gears including demersal longlines and gillnets, pelagic longlines and demersal trawls. Commonly caught by shore-based recreational anglers in Namibia.

BULL SHARK

Bulhaai/ Zambesihaai
Carcharhinus leucas

VU

Description: Large shark with stocky body. Large, broad head and very broad, short, bluntly rounded snout. Small eyes; upper labial furrows very short. No spiracles. Large, broad pectoral fins with concave inner margins. Broad, triangular first dorsal fin, much bigger than second dorsal; both dorsal fins with short free rear tips. No interdorsal ridge. Weak caudal keels.

Colour: Grey or grey-brown above; dusky fin tips. Juveniles have black tips on some fins and black patches on caudal peduncle. White below.

Size: At least 366 cm.

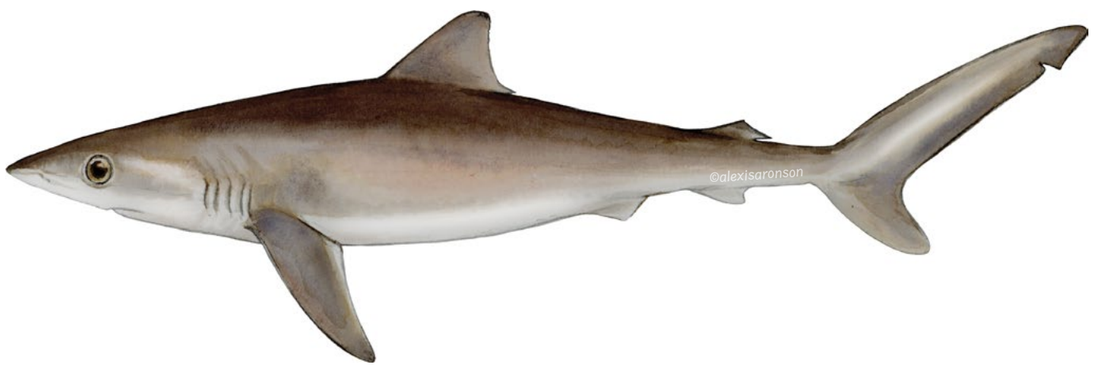
Distribution: Worldwide subtropical and tropical seas.

Habitat: Usually found close inshore, in hypersaline lagoons and river mouths but can also be found as deep as 164 m and hundreds of kilometres up warm rivers and in freshwater lakes. In Namibia, bull sharks are only known from the Kunene River and the coastal zone close to the Kunene River mouth.

Threats: Caught as target and bycatch in artisanal, industrial, and recreational fisheries throughout its range, with multiple fishing gears including gillnet, longline, and trawl. Mostly retained for its meat and fins. Habitat loss and degradation (in coastal, estuarine and riverine habitats) also impact this species, because of its preference for those habitats, as do the effects of climate change. Bull sharks are caught (but usually released alive) by recreational anglers in northern Namibia; the status of this local population is unknown.

NIGHT SHARK

Carcharhinus signatus



EN

Description: Moderately large, slim shark with a long, pointed snout. Large green eyes; short, inconspicuous upper labial furrow. Small first dorsal fin with moderately long free rear tip; first dorsal fin origin situated over or behind the free tips of the pectoral fins. Interdorsal ridge is present; second dorsal fin low with long free rear tip.

Colour: Grey-brown above with no obvious fin markings. White below.

Size: Up to 280 cm.

Distribution: Tropical and warm temperate Atlantic. May be rare in Namibian waters.

Habitat: Deepwater coastal and semi-oceanic; along outer continental and insular shelves and off upper slopes, in depths of up to 600 m.

Threats: Captured primarily in pelagic longline fisheries. Unlikely to be a targeted catch, but high value and demand for shark fins, and possibly the misidentification of this species, has historically resulted in some bycaught animals being retained.

BLUE SHARK

Blouhaai
Prionace glauca

NT

Description: Large, slim shark with narrow head and long conical snout. Large eyes, small mouth; small labial furrows confined to corners of mouth. No spiracles. Long, narrow, scythe-shaped pectoral fins. First dorsal fin originates well behind pectoral fins; second dorsal fin much smaller (less than one third of first dorsal fin size). Weak caudal keels; no interdorsal ridge.

Colour: Usually dark blue back with brighter blue flanks, grading to silvery blue. White below.

Size: 384 cm.

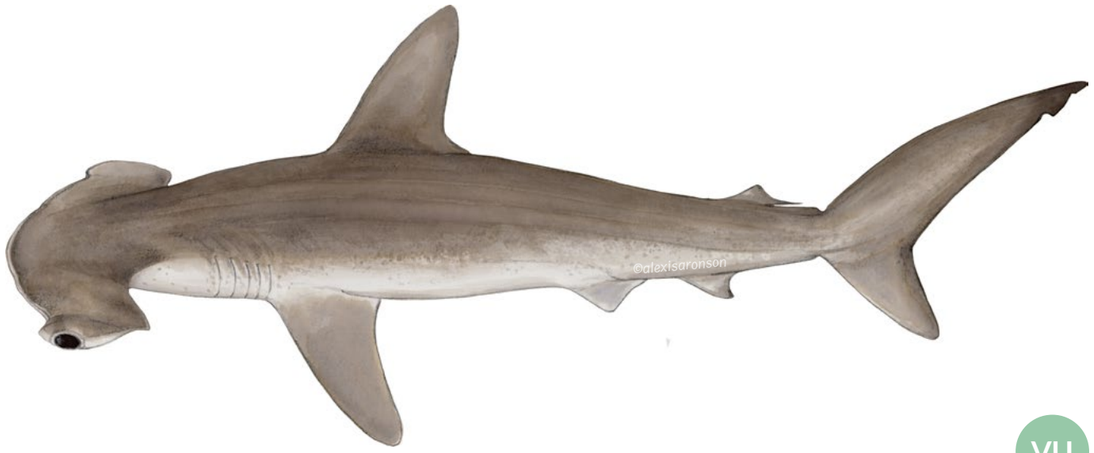
Distribution: Worldwide in temperate and tropical seas.

Habitat: Oceanic and epipelagic, usually off the edge of continental shelves. Found between the surface and 1,000 m depth.

Threats: Caught globally as target and bycatch in commercial and small-scale pelagic longline, purse seine and gillnet fisheries. Bycatch in industrial pelagic fleets, in offshore and high-seas waters, accounts for the majority of catches. It is also captured in coastal longlines, gillnets, trammel nets, and sometimes trawls. The species is generally retained for the meat and fins, unless retention is prohibited and enforced. In Namibia, blue sharks are a target catch of the longline fishery for swordfish and tuna, and one of its major exports.

SMOOTH HAMMERHEAD SHARK

Gladde hamerkop
Sphyrna zygaena



VU

Description: Large shark. Hammer-shaped head comprising long, narrow blade with broadly arched anterior margin, no median indentation but obvious lateral indentations. Short snout and broadly arched mouth. First dorsal fin moderately high; second dorsal and pectoral fins low. Upper pre-caudal pit.

Colour: Olive-grey or dark grey-brown above; dusky undersides of pectoral fin tips. White below.

Size: 400 cm.

Distribution: Worldwide in warm temperate and tropical seas. In Namibia, more likely to be encountered in the far north and in summer months.

Habitat: Continental and insular shelves, found both in inshore and offshore waters to 200 m depth and possibly deeper.

Threats: Caught globally as target and bycatch in commercial and small-scale pelagic longline, purse seine, and gillnet fisheries. Also captured in coastal longlines, gillnets, trammel nets, and sometimes trawls. Often retained for its fins. Post-release mortality is thought to be very high. Occasionally caught by recreational anglers in Namibia; responsible handling and immediate release are especially recommended for this species.

RAYS AND SKATES

There are at least 670 valid, named skate and ray species worldwide, of which at least 25 occur in Namibian waters. Some stingray species can live occasionally or permanently in freshwater habitats, but all of the skate and ray species that occur in Namibia are exclusively marine. In Namibia, skates and rays are found in a wide diversity of habitats including shallow coastal areas on sandy and muddy bottoms, in kelp forests and far offshore, in waters hundreds of metres deep. They do not range as much in size as sharks, but several species reach considerable sizes, including the spearnose skate which reaches a total length of 240 cm, and the Norwegian skate which can reach 250 cm.

Rays and skates are distinguished from sharks by their dorso-ventrally flattened, disc-like bodies, with their gill slits and mouth usually located on the underside and the eyes situated on the dorsal surface. Their greatly enlarged, wing-like pectoral fins are completely (e.g. stingrays and skates) or partly (e.g. guitarfishes[3]) fused with the head and trunk. All skates and rays lack an anal fin, and the caudal and dorsal fin(s), which are developed to varying extents across the group, are also sometimes absent.

The main difference between rays and skates is in their reproductive strategies. Rays give birth to live young, whilst skates produce eggs (in hard eggcases, sometimes called mermaids' purses) in which the young skates develop for some time, before hatching. Skates typically have prominent dorsal fins, while rays have a very small dorsal fin or none at all. Most rays are kite-shaped with whip-like tails possessing one or two stinging spines, while skates have fleshier tails and lack spines. Many rays protect themselves with these stings or barbs, while skates rely on thorny projections on their backs and tails for protection from predators.

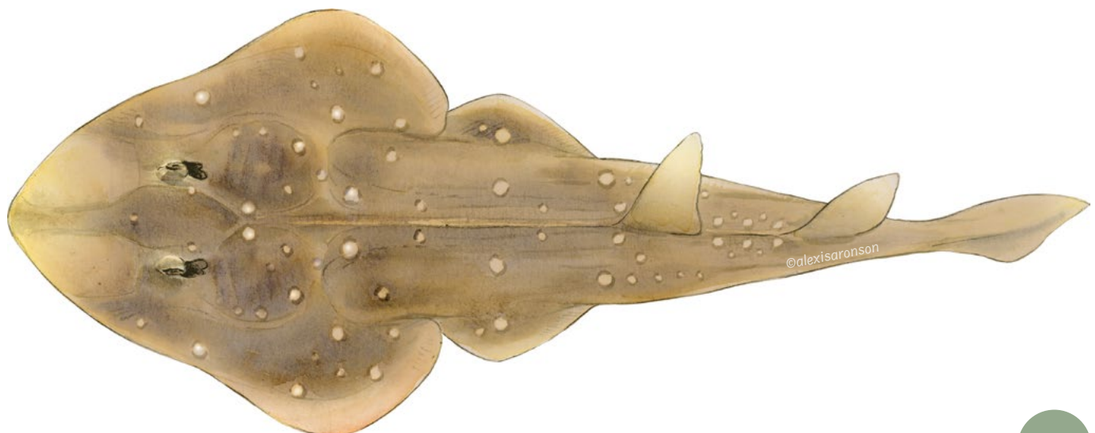
Identifying skates can be challenging. There are five species in the genus *Rajella* present in Namibian waters, and most of them can appear very similar or identical. This is further complicated by the fact that the shape of a skate's disc and its thorn patterns vary with maturity and between sexes. Anyone attempting to identify a *Rajella* skate is encouraged to measure the tail length and precloacal length, and to take photographs and detailed notes on the disc shape and the number and pattern of thorns on each part of the body. However, in some cases, genetic sequencing may be the only way to identify many of these skates reliably to species level.

The lack of research to date on many deepwater skate species means that, for some species, there are no confirmed images or descriptions of their eggcases, on which we could base eggcase illustrations or information in this guide. This presents an opportunity for future research in Namibian waters.

[3] Rays in the Order Rhinopristiformes, which includes sawfishes, wedgefishes, giant guitarfishes, guitarfishes and banjo rays, have a long, shark-like trunk and tail but largely share the other characteristics of rays.

BLUNTNOSE GUITARFISH

Sandfis/ Stompneus-sandkruiper
Acroteriobatus blochii



LC

Description: Medium-sized guitarfish with shovel-shaped/ heart-shaped disc; disc anterior margins slightly convex. Short, bluntly pointed snout. Anterior nasal flaps extending across internasal space and close together. Disc length 1.1 times disc width. Rostral ridges broadly separated. Spiracle with a single fleshy fold.

Colour: Dorsal surface uniformly brownish in adults. Young have a pattern of symmetrical light spots with cloudy outlines, which gradually disappear with growth. Ventral surface uniformly white.

Size: 96 cm (TL).

Distribution: Southeast Atlantic, between Cape Province (South Africa) and Namibia.

Habitat: Benthic in shallow, sandy bays.

Threats: Caught in gillnet, beach seine, commercial and recreational line fisheries in South Africa. Caught by recreational anglers and occasionally in bottom trawls in Namibia. Most are released alive by anglers but post-release mortality rates are unknown. The restricted range of this species and its preference for shallow, coastal habitats makes it susceptible to fishing activities. Potential habitat degradation from diamond mining and coastal development activities on the Namibian coast may also pose a threat.

Notes: This species is commonly referred to as 'sandshark' in Namibia. Has previously been referred to as 'lesser guitarfish', but that is the common name of another species, *Acroteriobatus annulatus*, which is found in South African waters but is not believed to be present in Namibia. Two fleshy folds in each spiracle and a dorsal pattern of numerous dark spots surrounded by a pale ring with a dark edge, distinguishes *A. annulatus* from *A. blochii*.

CAPE NUMBFISH / CAPE SLEEPER RAY

Eenvin-drilvis
Narke capensis

LC

Description: Small to medium-sized sleeper ray with broadly rounded to oval disc. Eyes small and close to front edge of disc; near to spiracles. One low, rounded dorsal fin originates over the pelvic fin rear tips. Tail broad and slightly flat. Caudal fin elongate, close to and larger than dorsal fin. Can deliver a powerful shock if touched.

Colour: Almost uniformly yellowish or greenish-brown dorsal colouration, slightly darker outer disc margin. Sometimes with a few poorly defined darker brown blotches or streaks on central disc, or small dark spots. Ventral surface creamy white or yellowish, with dusky outer disc margin.

Size: May reach 38 cm (TL).

Distribution: Namibia and South Africa.

Habitat: Benthic species on soft and rocky substrates over the continental shelf; depths of 3 to 115 m.

Threats: Caught in demersal trawl fisheries and inshore beach seines. Caught in low numbers and not retained as they produce electric shocks.

COWLEY'S TORPEDO RAY / SOUTH AFRICAN TORPEDO

Tetronarce cowleyi

LC

Description: Large torpedo ray with smooth surface. Eyes and spiracles small. Mouth strongly arched; teeth small and sharp. Disc thick; oval shaped; clearly wider than long. Dorsal fins rounded to oval at apex; second dorsal fin much smaller than first. Caudal fin large (relative to other sleeper rays); upper and lower lobes of roughly equal size.

Colour: Uniformly shiny black or dark grey dorsal colouration, with no distinctive spots or dorsal markings. Ventral surface creamy white.

Size: 113 cm (TL).

Distribution: Southeast Atlantic and southwestern Indian Ocean; Namibia to Algoa Bay, South Africa.

Habitat: Demersal on the outer continental shelf and upper slopes, at depths of 110 to 455 m.

Threats: May be caught in some demersal trawl fisheries, but their semi-pelagic behaviour limits their catchability and electricity production likely limits their retention - electric rays are usually discarded. This species has been frequently recorded as a bycatch of the Namibian bottom trawl fishery for hake.

Notes: Formerly called *Tetronarce nobiliana*.

AFRICAN SOFTNOSED SKATE

Bathyraja smithii

LC

Description: Large skate with broad rhombic disc and broadly triangular, bluntly pointed snout. Pelvic fins deeply notched. No thorns on rostrum, around eyes or on dorsal surface of disc in adults; juveniles have orbital, nuchal, scapular and mid-back thorns. Upper surface has a velvety to rough texture, apart from posterior and central disc. Tail slender, tapering to apex, shorter than disc length; bears 14 to 19 sharp, evenly spaced thorns in a single row.

Colour: Uniformly slate grey to greyish-brown disc above. Ventral surface white, sometimes with grey blotches on the disc; ventral disc margins and area around cloaca grey to black.

Size: 120 cm (TL).

Distribution: Southeast Atlantic from Walvis Bay, Namibia to Agulhas Bank, South Africa.

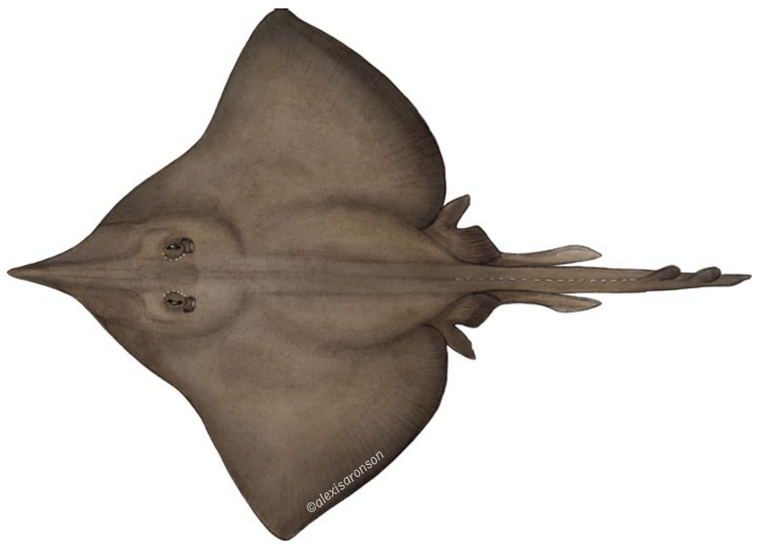
Habitat: Demersal on the continental shelf and slope at depths of 250 to 1,040 m.

Threats: Incidental bycatch of demersal deepwater trawl fisheries. Although these fisheries operate throughout this species' geographic range, it has some refuge at depths beyond the reach of fisheries. Has been documented as bycatch in the Namibian bottom trawl fishery for hake.

Eggcase: Egg cases are quite large, around 150 mm long (excluding horns). Striated surface; broad lateral keels. A distinctive window is present in the apron on one end, and runs across almost the width of the capsule. Anterior horns are very long, thin and taper to a filamentous tip. Posterior horns are shorter and thicker, with blunt tips.

JAVELIN SKATE

Dipturus doutrei



LC

Description: Large skate with a long, pointed rostrum (snout) with firm rostral cartilage. Disc anterior margin strongly concave (especially in adults). Disc width is 1.1 to 1.2 times disc length at all sizes. Pelvic fin anterior lobes only slightly shorter than posterior lobes. Weak rosette of thorns around orbital rim in adults. Tail short (about 0.6 times precloacal length), very thick and bulging beyond its base, with 13 – 26 thorns in single median row in males and juveniles; additional lateral row of close-packed thorns on each side in adult females. Dorsal fins rounded, close together, located well forward of tail tip.

Colour: Dorsal surface greyish-brown or dark brown with scattered darker blotches; posterior margins of disc and pelvic fins may have dark edges. Ventral surface dark brown, with or without paler blotches; dark-edged sensory pores.

Size: 115 cm (TL).

Distribution: Eastern Central and Southeast Atlantic Ocean, between Senegal and Cape Province, South Africa.

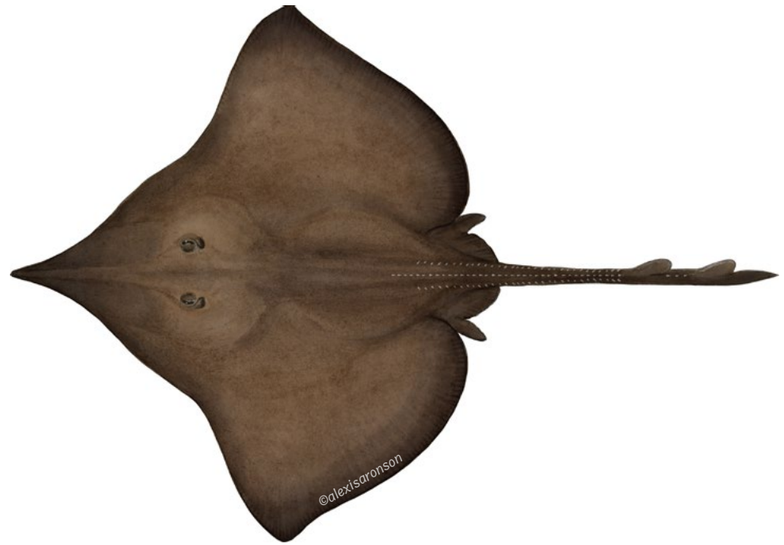
Habitat: Demersal on outer continental shelf and upper and mid-slopes at depths of 165 to 1,200 m, but commonly between 450 and 600 m.

Threats: Occasionally reported as bycatch in demersal trawl fisheries for hake around southern Africa, including in Namibian waters. May be misreported as other, similar-looking *Dipturus* species. Much of the species' range lies in waters outside the range of fisheries at present and thus it may have some refuge from fishing pressure, but expansion of fisheries into deeper waters would likely impact this species.

Eggcase: No images or description of this species' eggcases are available.

NORWEGIAN SKATE

Dipturus nidarosiensis



NT

Description: Very large skate with rhombic disc (width c. 1.2 times length), very long and narrowly pointed snout with firm rostral cartilage. Small eyes with rosette of small thorns around orbital rim. Deeply concave anterior margin to disc; strongly convex posterior margin. Pelvic fin anterior lobe barely shorter than posterior lobe in juveniles, but much shorter in adults. Dorsal disc smooth in young, denticles developing on head and along anterior disc margin in adults. Dorsally, no thorns on mid-disc before tail, but ventral surface densely covered with coarse denticles. Tail short (length c. 0.8 times precloacal length in adults) and thick (but not as thick as *D. doutrei*), with 40–50 small median predorsal thorns in single row in males; one additional lateral row on each side in larger females. Dorsal fins rounded, separated slightly.

Colour: Uniformly dark greyish brown dorsally. Dorsal and caudal fins darker than adjacent tail (more apparent in young). Ventral surface of disc usually darker than dorsal surface, brownish and may be covered with black mucus; sensory pores dark-edged.

Size: 250 cm (TL).

Distribution: East Atlantic, between Iceland and South Africa, including Mid-Atlantic Ridge.

Habitat: On or near the seabed, on continental and insular shelves and slopes at depths of 125 to 1,420 m but probably most common on the mid-slope.

Threats: Not targeted by commercial fisheries, but occasionally taken as bycatch in deepwater trawl and longline fisheries and usually discarded. Deepwater fisheries, including trawl fisheries, are known to operate within this species' range. As for all large skates with low productivity and high catchability, even moderate levels of bycatch are likely to negatively impact populations. Levels of bycatch should thus be closely monitored.

Notes: May have been called *Dipturus springeri* in the past; *D. springeri* may only occur on Africa's east coast.

Eggcase: Posterior horns tapered and curved towards midline; anterior horns possibly shorter and filamentous at tips (based on a single image of one eggcase). The only eggcase for this species for which measurement data are available measured 106 x 85 mm (excluding horns), but was likely not fully developed.

SLIME SKATE

Dipturus pullopunctatus

LC

Description: Large skate with a broad disc (width 1.2–1.4 times length) and distinct pair of blotches on upper disc. Moderately long, bluntly triangular snout with firm rostral cartilage, large nuchal thorn, 3–8 spiny thorns around orbital rim. Disc anterior margin undulate in young, much more so in adults. Skin of females and young smooth. Pelvic fins large, anterior lobe much shorter than posterior lobe. Narrow tail (length less than precloacal length) with up to 27 tail thorns between area over cloaca and dorsal fins, in adults. Dorsal fins close to tail tip; broadly rounded, separated by space about half the length of first dorsal fin base.

Colour: Yellow to brownish, with prominent large dark brown irregular blotch on dorsal surface of each pectoral fin. Juveniles covered with numerous black spots, becoming inconspicuous or lost in adults; adults occasionally with pale blotches and small white spots. Ventral surface greyish white; sensory pores grey or black.

Size: 130 cm (TL).

Distribution: Southeast Atlantic and southwestern Indian Ocean; between Namibia and Eastern Cape (South Africa).

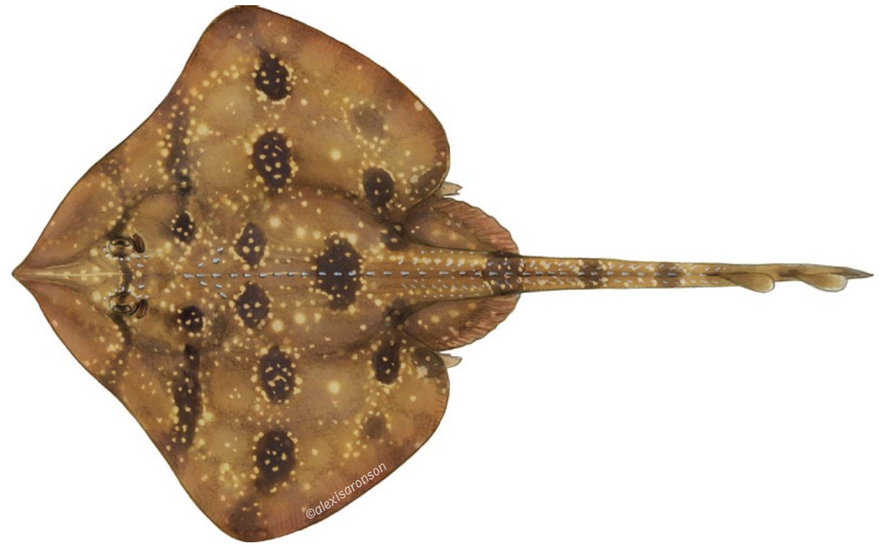
Habitat: Demersal on continental shelf and upper slope at depths of 30 to 385 m.

Threats: Caught in trawl and longline fisheries targeting hake throughout its range, and retained at least in South Africa. This species has shown evidence of a range shift to the southwest and a loss of habitat area over three decades (1981–2016) in South Africa, possibly caused by climate change. This may represent a significant loss of habitat to this species that has a restricted southern African distribution.

Eggcase: A striated eggcase covered in dense fibres, over 130 mm in length (excluding horns), with broad lateral keels c. 19% of maximum eggcase width. Anterior horns hook-like and tapered. Posterior horns taper and curve inwards, but are not hook-like; slightly shorter than anterior horns.

YELLOWSPOTTED SKATE

Leucoraja wallacei



VU

Description: Medium-sized skate with a rounded to heart-shaped disc (width 1.2–1.3 times length); short snout with firm rostral cartilage. Disc anterior margin undulate (concave in adult males). Anterior pelvic fin lobe much shorter than posterior lobe. Upper disc very rough; largely smooth ventrally, anterior margins of disc prickly. Rosette of 7–10 orbital thorns; small triangular area of sparse thorns around nape and shoulder. Thorns in single row along central disc; young usually have 5 rows of tail thorns, median row reduces with growth. Tail 1.1-1.3 times precloacal length. Stiffened tail tapers strongly; dorsal fins about half as high as long and separated by short space; caudal fin short and low.

Colour: Dorsal surface yellowish brown with striking patterning of bright yellow spots, often forming whorls and rosettes (sometimes greyish brown with white spots); markings cover most of disc. Ventral surface uniformly pale or white.

Size: 96 cm (TL).

Distribution: Southeast Atlantic and southwestern Indian Ocean, between Namibia and southern Mozambique.

Habitat: On or near seabed on soft bottoms of outer continental shelf and upper slope, between depths of 75 and 515 m.

Threats: Captured mainly by deep-water trawl fisheries targeting hake in South Africa and crustaceans in Mozambique, and sometimes retained. May also be caught in commercial line fisheries in South Africa. Trawl fisheries operate throughout most of its range and it has been recorded as bycatch in the Namibian bottom trawl fishery for hake. In South Africa, this species has also exhibited a loss of habitat and clear shift in range over over three decades (between 1981 and 2016), possibly due to climate change.

Eggcase: Very fine striations on smooth surface, with no fibres. Measures 80 to 83 mm in length (excluding horns). Horns taper to filamentous tips; posterior horns nearly twice length of anterior horns. Posterior apron c. 50% wider than anterior apron. No lateral keel.

ROUGHSKIN SKATE / PRICKLE SKATE

Malacoraja spinacidermis

LC

Description: Medium-sized skate with broad, heart-shaped disc (width 1.2–1.3 times length), moderately elongate and pointed snout with firm rostral cartilage. Disc anterior margin almost straight (slightly undulated in mature males). Pelvic fin anterior lobe slightly shorter than posterior lobe. Dorsal surface velvet-like; ventral surface smooth except for tail and prickly anterior margins of disc. No thorns on snout and body posterior to shoulder, except for alar and malar thorns of adult males. Juveniles bear thorns beside eyes, on nape and shoulders. Tail about 1.3 times precloacal length; gradually tapers to tip. Dorsal fins strongly tilted, bases joined; caudal fin small.

Colour: Dorsal surface plain, pale grey-brown (in juveniles) to dark grey (in adults); semi-translucent near rostrum. Ventral surface white in young with scattered grey speckles; becomes darker on disc and pelvic fins in adults; tail entirely dark grey.

Size: 64 cm (TL).

Distribution: North and East Atlantic; Maine (USA) to Rockall Trough, and off northwestern Africa, Namibia and South Africa.

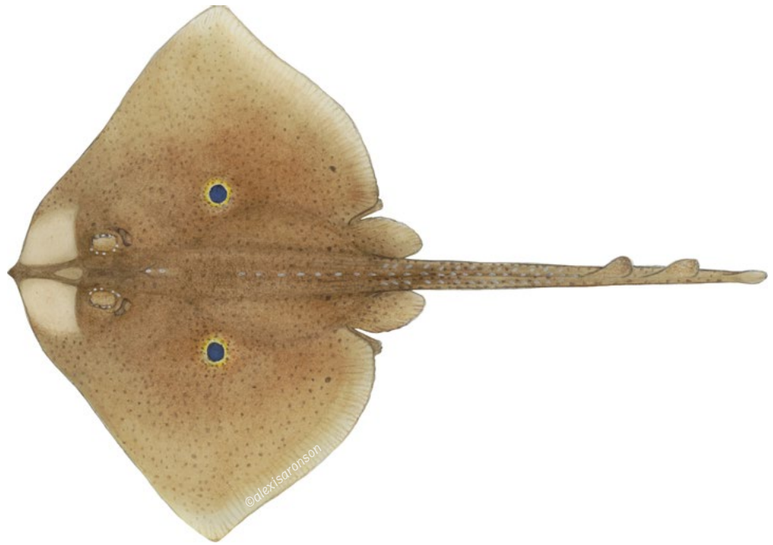
Habitat: Demersal on continental and insular slopes at depths of 450 to 1,570 m.

Threats: Most records occur deeper than 800 m, thus this species likely occurs at depths greater than those currently fished. Any future expansion of fisheries operating in this species' range into deeper waters may pose a threat.

Eggcase: Length is likely less than 100 mm (described from two partially developed eggcases *in utero*). Smooth surface with very fine striations. Anterior and posterior horns taper to tips; lateral keel broad (c. 11% of maximum width). No images of fully developed eggcases from this species were available.

TWINEYED SKATE

Raja ocellifera



EN

Description: Medium-sized skate with a broad rhombic disc (width c. 1.3 times length) and short snout. Disc anterior margin weakly undulate (similar in adult males). Pelvic fins moderately large and deeply incised. Dorsal disc smooth in adults and young. Ventral surface smooth, apart from snout tip. 2 to 3 preorbital and usually 2 postorbital thorns; 2 to 3 thorns on nape, several thorns on shoulders in young, reducing with growth; median row of 20 to 23 thorns on tail from posterior disc to first dorsal fin, 2 widely spaced lateral rows of strong thorns along each side of tail in females. Tail long and slender (53–54% TL). Dorsal fins low with rounded margins, well separated at bases with 0 to 2 interdorsal thorns.

Colour: Dorsal surface medium brown, usually covered with many small, closely set, dark brown spots and large ocellus on each pectoral fin consisting of broad blue spot, encircled by narrow, dark central ring and pale yellow outer ring. Ventral surface white, edges of disc slightly darker.

Size: 49 cm (TL).

Distribution: Endemic to South Africa but possibly also southern Namibia.

Habitat: Demersal on continental shelf, at depths of 15 to 105 m, possibly deeper.

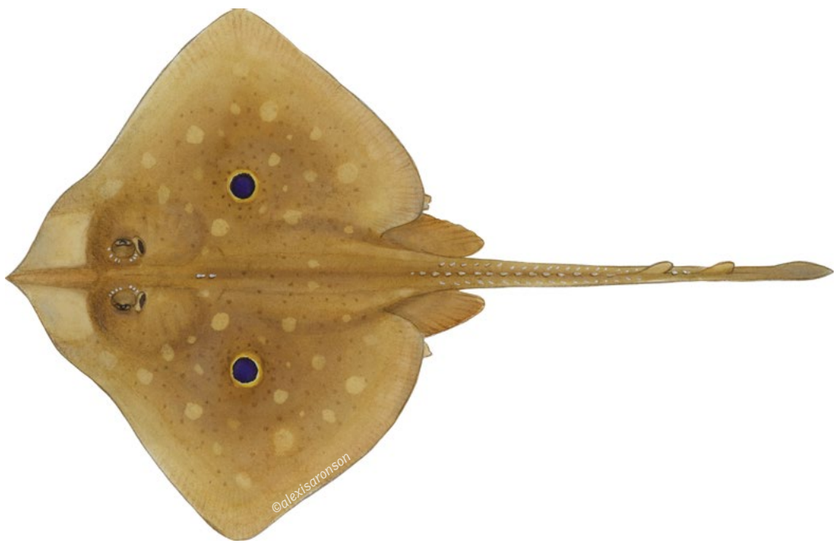
Threats: Bycaught in a range of fisheries including trawl, commercial and recreational line, beach seine and gillnet. When captured incidentally, the species is often retained due to its value and is thus considered a byproduct. Given its restricted depth range and distribution, this species has very little refuge from fisheries.

Notes: Formerly identified as *Raja miraletus* but now known to be a separate species. Belongs to recently recognised species complex that includes the African brown skate (*Raja parva*). These two species look very similar but the African brown skate has larger eyes and more widely spaced dorsal fins. The range of these two species appears not to overlap, but it is currently not known whether both species occur in Namibian waters.

Eggcase: Small eggcases, less than 50 mm in length (excluding horns). Horns relatively equal in length and slightly less than length of capsule; robust and taper to a point. Dark brown or black in colour.

AFRICAN BROWN SKATE

Raja parva



NT

Description: Small to medium-sized skate with a rhombic disc (width c. 1.1 times length), moderately long snout with firm rostral cartilage and its tip slightly pronounced. Disc thick, anterior margin weakly undulate (also in adult males). Pelvic fins not deeply incised. Dorsal disc prickly in juveniles, largely smooth in adults. Ventral surface smooth, snout prickly in mature males. 3–5 preorbital and usually 3 postorbital thorns, 2–3 thorns on nape, large malar patch beside eyes in adult males; thorn present on shoulders in juveniles but often absent in adults. Tail thorns in single row extending from tail base area to first dorsal fin; additional 1–2 lateral rows of strong thorns along each side. Tail long and slender (about 55% TL); dorsal fins small with narrowly rounded margins, bases very widely separated and 2–3 interdorsal thorns.

Colour: Dorsal disc plain yellow-brown (sometimes faintly spotted) with large, conspicuous pectoral ocellus consisting of large blue spot encircled by dark blue-black central ring and yellowish outer ring. Ventral surface white with slightly darker disc edges; no dark-edged pores.

Size: At least 63 cm (TL).

Distribution: Eastern Central Atlantic, between Mauritania and Namibia.

Habitat: Demersal on continental shelf and upper slope at depths of 10 to 300 m; but mainly occurs inshore.

Threats: Probably caught as bycatch in industrial and artisanal fisheries throughout its range, and retained for human consumption in some areas. Bottom trawl fisheries likely have the biggest impact on this species.

Notes: Formerly identified as *Raja miraletus*. Belongs to recently recognised species complex that includes the twineye skate (*Raja ocellifera*). These two species look very similar but the African brown skate has larger eyes and more widely spaced dorsal fins. The range of these two species appears not to overlap, but it is currently not known whether both species occur in Namibian waters, or only one of the two species.

Eggcase: No images or description of this species' eggcases are available. However, they likely look very similar to the eggcases of *Raja ocellifera*.

BISCUIT SKATE

Vals doringrug-rog
Raja straeleni

NT

Description: Medium to large skate with a rhombic disc (width 1.2–1.4 times length). Very small orbital thorns, tail moderately long and slender (51–58% TL). Pelvic fins not deeply incised. Dorsal disc usually prickly; ventral surface mostly smooth, except anterior disc margins in adults. Small nuchal and shoulder thorns occasionally present; median row of thorns extending along trunk and tail in males, additional lateral row in females, 0–2 interdorsal thorns. Dorsal fins with rounded margins, well separated at bases.

Colour: Upper surface of beige or greyish brown, with numerous pale circular blotches and darker greyish bands encircled with small, dark grey or dark brown spots and flecks; pattern more or less symmetrically arranged. Dark pectoral markings sometimes present. Occasionally sooty markings on dorsal surface of rostrum. Disc margins darker purplish-brown. Undersurface whitish, sooty grey along disc margins; often with dark blotches around cloaca and on belly. Tail marbled with dark blotches or entirely dark.

Size: 91 cm (TL).

Distribution: East Atlantic and southwest Indian Ocean, Mauritania to South Africa; possibly Madagascar and Mauritius.

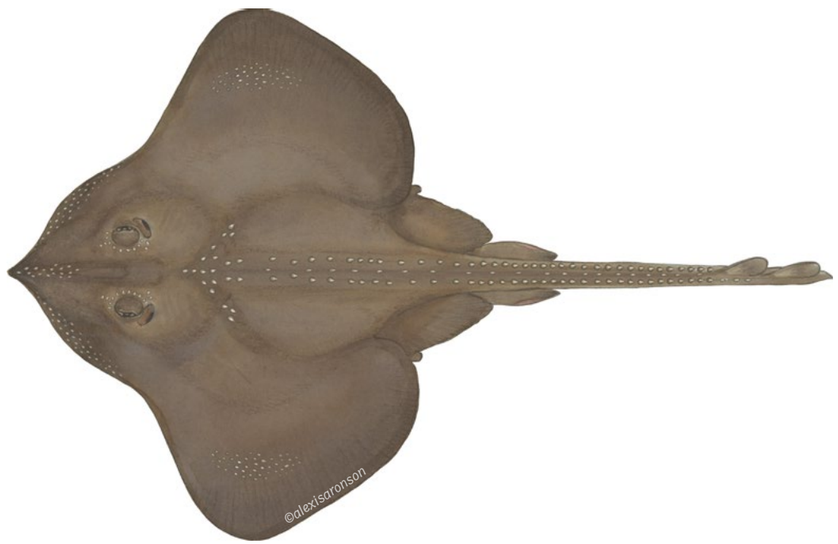
Habitat: Benthic, inshore on continental and insular shelves and slopes, from inshore to depths of 690 m. Often encountered in shallow coastal waters in southern Namibia.

Threats: May be taken as bycatch in industrial and artisanal fisheries throughout its range and likely retained for human consumption in some areas. Information on discards and associated mortality is not available. In Namibia, has been recorded as bycatch in the bottom trawl fishery for hake, and has been used by some shore-based anglers as bait for large sharks, a practice which is strongly discouraged.

Eggcase: Medium-sized eggcase, slightly convex long edges. About 75 mm in length, excluding horns. Horns tapered and become filamentous at their tips; posterior horns about 1.2 times length of anterior horns. Surface densely covered in fibres, but the surface is smooth beneath these fibres. Broad lateral keel c. 8% of maximum egg case width, and posterior apron c. 1.3 times length of anterior apron. Common on beaches in southern Namibia.

BIGTHORN SKATE

Rajella barnardi



LC

Description: Medium-sized skate with a heart-shaped disc (width c. 1.1 to 1.2 times length). Disc anterior margins undulate. Dorsal disc mostly smooth, spinulose on anterior margins; ventral surface largely smooth, except along anterior disc margins. Pelvic fins not deeply incised. 2–15 small thorns on snout and rostrum, few orbital thorns in young but forming rosette in adults, triangular patch of thorns on nape and shoulder, developing with growth. Malar thorns in males. Median row of 18–24 thorns on trunk and tail (reducing in adults) and few parallel rows of thorns in young, increasing in number (35–40) and in size with growth, becoming larger than those of the median row. Tail slender (c. 55% TL); dorsal fins with rounded margins, usually confluent at bases, no interdorsal thorns.

Colour: Upper surface of disc plain dusky brown, mostly dark. Ventral surface variable, from almost uniformly dark with areas only around nostrils and gills pale, to whitish with broad dark margins and dark blotches. Ventral surface of tail white or variably dark.

Size: At least 75 cm TL.

Distribution: East Atlantic and southwestern Indian Ocean, between Canary Islands and South Africa.

Habitat: Benthic on continental shelf and slope at depths of around 100 to 1,700 m.

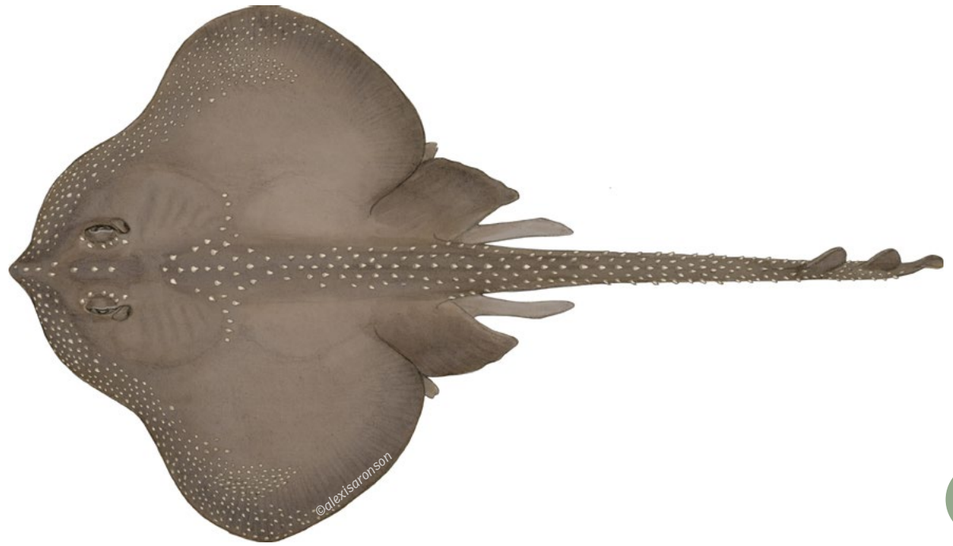
Threats: Taken as bycatch in inshore and offshore demersal trawl and hake longline fisheries in South Africa. In Namibia, *Rajella* skates (possibly includling bigthorn skates) are a frequent bycatch of the bottom trawl fishery for hake. This species may have some refuge at depth from the impact of fishing activities.

Notes: Many of the *Rajella* skate species in Namibian waters can be difficult to tell apart. This species can be distinguished from the leopard skate by its thicker disc, plain dark dorsal coloration, and strong, pale thorns.

Eggcase: Small eggcase, c. 55 mm in length; smooth surface with very fine striations. Anterior horns robust, tapered with attachment fibres near tips; posterior horns robust, tapered, c. 1.7 times length of anterior horns. Posterior apron 1.5 times that of anterior apron width. Lateral keel broad (c. 18% of maximum eggcase width) and feathery, extending along whole eggcase length, between tips of horns.

MUNCHKIN SKATE

Rajella caudaspinosa



LC

Description: Medium-sized skate with a thick, heart-shaped disc (width 1.2–1.4 times length). Snout very short with firm rostral cartilage and small triangular tip. Disc anterior margins undulate. Pelvic fins not deeply incised. Dorsal disc very prickly and rough with strong thornlets along anterior margins of disc; ventral surface smooth. Few rostral thorns, rosette of 5–9 orbital thorns, small triangular patch of 4-5 thorns on nape and 3-4 on each shoulder. Dense band of large thorns and smaller thornlets along trunk and tail. Tail longer than body (59–63% TL); with central row of 22–33 large-based thorns, smallest near rear of tail; central thorns flanked by irregular parallel row on trunk and 2 rows on each side on tail. Dorsal fins with rounded margins, confluent at bases; no interdorsal thorns.

Colour: Uniform light greyish to brownish dorsally, sometimes with scattered darker spots; young usually with white-barred pattern. Ventral surface white.

Size: 65 cm (TL).

Distribution: Namibia and South Africa.

Habitat: Benthic on outer continental shelf and upper slope, at depths of 100 to 1,100 m.

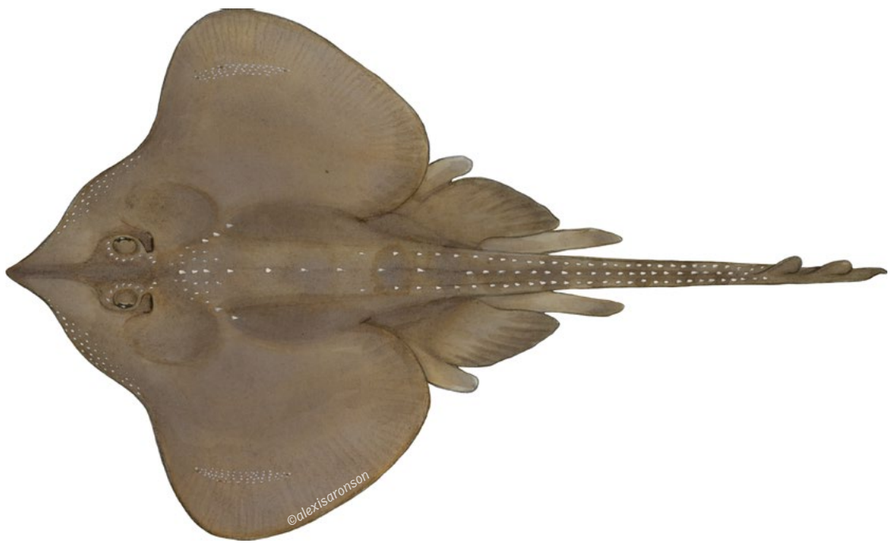
Threats: Caught in demersal trawl fisheries. Large numbers of *Rajella* sp. skates are caught as bycatch in the Namibian bottom trawl fishery for hake.

Notes: Many of the *Rajella* skate species in Namibian waters can be difficult to tell apart. The tail of this species is longer than the precloacal length, a feature which should allow this species to be distinguished from other *Rajella* species.

Eggcase: Smooth, finely striated surface under fibrous covering. Narrow lateral keel, c. 6.3% of maximum egg case width. Posterior horns taper to acute tip. (Described from 2 partially developed eggcases from a single animal). Dimensions of this species' eggcases are unknown and no images or descriptions of completely developed eggcases were available.

GHOST SKATE

Rajella dissimilis



LC

Description: Medium-sized skate with heart-shaped disc in juveniles and more angular disc in adults (width c. 1.2 times length); anterior margins undulate. Dorsal disc prickly; ventral surface smooth. Pelvic fins not deeply incised. Few small rostral thorns, rosette of orbital thorns, triangular patch of c. 16 thorns on nape and shoulder, malar thorns present. Central row of 20–32 thorns on trunk and tail, reduced with growth; parallel rows of 50–60 thorns on tail in juveniles, extending onto trunk in larger individuals. Tail slender and about as long as body. Dorsal fins with rounded margins, confluent at bases; no interdorsal thorns.

Colour: Dorsal surface of disc plain greyish brown in juveniles; becomes paler in adults. Subtle banding or blotches may be present dorsally. Ventral surface white with broad dark margins. Ventral surface of tail mottled with white tip.

Size: 82 cm (TL).

Distribution: East Atlantic and southwestern Indian Ocean; Rockall Trough (British Isles) to South Africa.

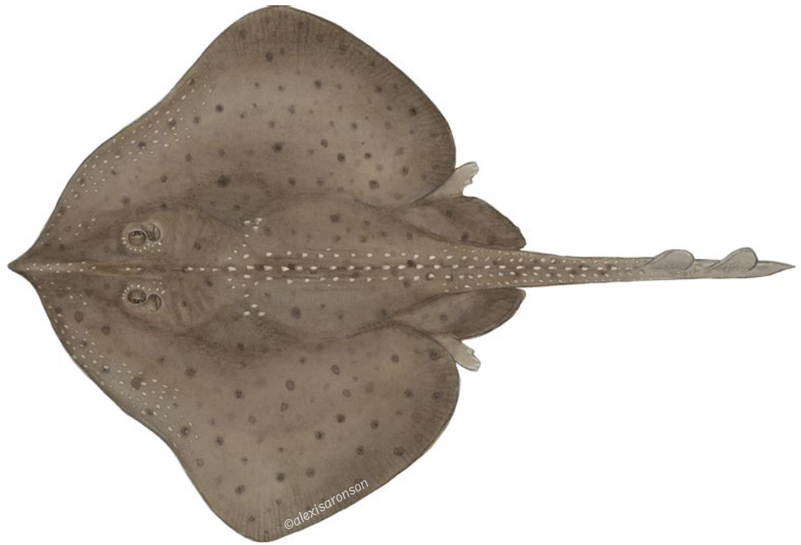
Habitat: Demersal on continental slope at depths of 400 to 1,640 m.

Threats: Occurs at depths beyond most fishing activities, but is likely captured at least occasionally in deep-water bottom trawl fisheries in Namibia, and any expansion of such fisheries would likely result in increased bycatch of this species.

Eggcase: Rectangular capsule with straight long edges and straight-edged posterior apron. Measures at least 80 mm (excluding horns; described from two eggcases, *in utero* in a single skate). Smooth surface with no striations, anterior and posterior aprons similar in size; very narrow lateral keel. Horns taper to filamentous tips; posterior horns almost twice length of anterior horns.

LEOPARD SKATE

Rajella leoparda



LC

Description: Medium-sized skate. Small, close-set eyes. Disc flat and rather thin, anterior margins undulate. Dorsal disc largely smooth, prickly on anterior margins; ventral surface prickly in young, smooth in adults. Pelvic fins not deeply incised. Few small rostral thorns, rosette of 5–13 orbital thorns (1–2 over spiracles), triangular patch of thorns on nape and shoulders; central row of 19–29 widely spaced thorns on trunk and tail, flanked by parallel row on each side on trunk and 2–3 rows on tail. Tail about as long as precloacal length and slender. Dorsal fins with rounded margin, separated at base; interdorsal thorn sometimes present.

Colour: Dorsal disc uniformly medium grey to brownish above, with black scattered spots (especially in juveniles). Ventral surface pale or mottled with dusky patches and blotches.

Size: 95 cm (TL).

Distribution: Eastern Central Atlantic and southwestern Indian Ocean, between Mauritania and South Africa.

Habitat: Demersal on outer shelf and continental slope at depths of 130 to 1,920 m.

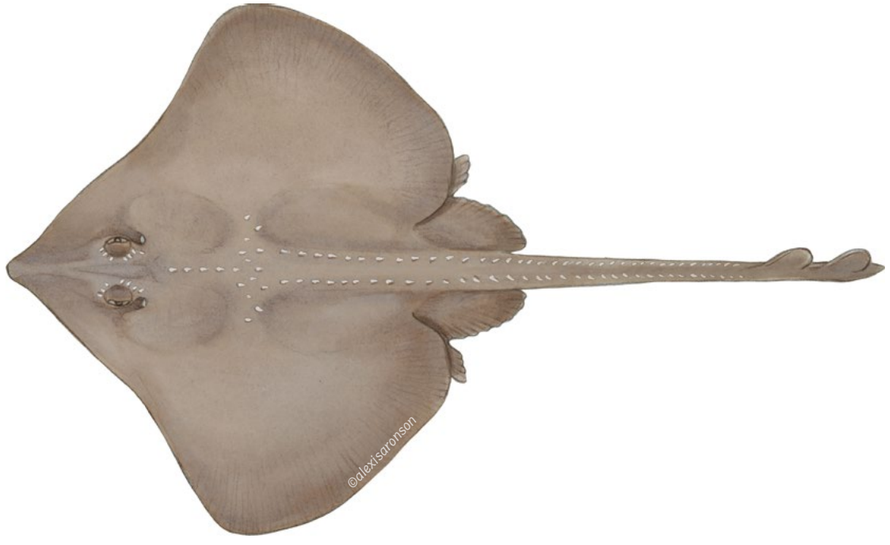
Threats: Has been recorded as a bycatch of inshore and offshore demersal trawl and hake longline fisheries off South Africa, and as a bycatch of the demersal trawl fishery for hake in Namibia. Has some refuge from current fishing activities in the deeper parts of its range.

Notes: This species reaches a larger size than other *Rajella* species found in Namibian waters, has a subtly more flattened disc and a darker dorsal colouration.

Eggcase: Measures c. 55 mm in length (excluding horns). Smooth surface. Distinctive broad, frilled lateral keel extending length of whole eggcase from horn tip to tip. Anterior horns have fibrous tendril attachment; posterior horns c. 1.2 times length of anterior horns.

SMOOTHBACK SKATE

Rajella ravidula



LC

Description: Medium-sized skate; disc width 1.1–1.2 times length; snout moderately long with firm rostral cartilage and pronounced tip. Disc anterior margin weakly undulate. Pelvic fins not deeply incised. Dorsal disc covered with widely spaced denticles, tail sides spiny; ventral surface entirely smooth. 6–8 orbital thorns, well-developed triangular patch of up to 15 thorns on nape and shoulder; no median thorn row, 2 parallel rows on trunk and tail. Tail about as long as body and slender; dorsal fins with rounded margins, confluent at bases; no interdorsal thorns.

Colour: Dorsal surface of disc medium grey, with darker posterior disc margins and darker pelvic fins. Dorsal fins dark grey to black. Ventral surface pale yellow to white with dusky posterior margins. Tail mostly dark or mottled grey and white, base largely white.

Size: 79 cm (TL).

Distribution: Patchy distribution in East Atlantic, between Morocco and South Africa.

Habitat: Benthic on upper and mid-continental slopes at depths of 495 to 1,475 m.

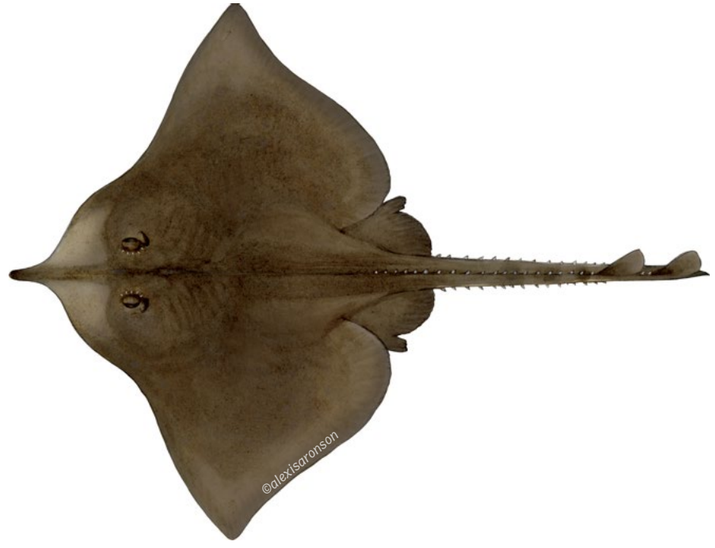
Threats: Currently has some refuge at depth from the majority of fisheries, but may be threatened by any future expansion of demersal trawl fisheries into deeper waters.

Notes: Many of the *Rajella* skate species in Namibian waters can be difficult to tell apart. This species is distinguishable from congenerics in the East Atlantic by its plain, pale grey dorsal disc, black dorsal fins, double parallel rows of thorns on the trunk and tail and the absence of a median row of thorns.

Eggcase: Moderately large, finely striated eggcase, rough to the touch. Measures c. 90 mm in length (excluding horns). Posterior horns more than twice the length of anterior horns. Posterior and anterior apron widths similar. Broad lateral keel, c. 13% of maximum length of eggcase. (Based on description of eggcases *in utero* from a single female).

SPEARNOSE SKATE / WHITE SKATE

Spiesneus
Rostroraja alba



EN

Description: Huge skate with broad, rhombic disc (width c. 1.5 times length). Snout long with pointed tip and firm rostral cartilage. Anterior disc margin strongly undulate to biconcave; posterior margin strongly convex. Pelvic fins not deeply incised. Dorsal disc in young largely smooth, prickly on snout and along anterior margins, skin rougher with growth; ventral surface almost entirely smooth in young, becoming more spinulose in adults. Small juveniles have thorns on rostrum which disappear with growth. 10–16 median row thorns in young, and up to 30 in adults, on posterior trunk and tail; lateral row of 7–17 thorns in young, and 17–39 in adults along lower edges of tail. Young have only preorbital and postorbital thorns which form orbital rosette of small thorns with growth. Tail slightly shorter than body (c. 48% TL), broad and depressed at base, tapering distally. Small dorsal fins with rounded margins, bases separated slightly; 0–2 interdorsal thorns.

Colour: Dorsal surface reddish-brown in young, greyish-blue in adults with a pattern of pale spots which may be more or less apparent. Ventral surface white with dark disc margins. Dusky tail.

Size: 240 cm (TL).

Distribution: East Atlantic and southwestern Indian Oceans, between the British Isles and Mozambique, including Mediterranean Sea.

Habitat: Benthic on sandy and detrital seabeds, from coastal waters to upper slope at depths of 10 to 750 m.

Threats: Targeted fisheries for this species have existed in certain areas, but have ceased after localised depletion. May still be caught as bycatch in some demersal fisheries. Anecdotal information suggests that this species has declined severely in many parts of its range, but its prevalence in Namibia is unknown. Caught by shore-based recreational anglers in Namibia, the majority of whom practice catch-and-release.

Eggcase: Large, almost square capsule with thick walls and coarse striations (ridges) on both sides. About 100-138 mm across and 125-183 mm long (excluding horns) when rehydrated, possibly larger. The horns on one end are short, tapered and strongly hooked. At the other end of the eggcase, the horns are long, tapered, flattened towards the tip and almost as long as the capsule. Lateral keels up to 20 mm wide.

ROUGHNOSE LEGSKATE

Cruriraja hulleyi

LC

Description: Small skate with a broad rhombic disc (width 1.2 times length); anterior margins weakly undulate. Separate anterior and posterior pelvic-fin lobes. Dorsal surface largely without dermal denticles. 4–5 small rostral thorns, a rosette of c. 9 regularly spaced, large thorns on each orbital rim and no other thorns between eyes. 1–5 rows of large thorns on trunk. Tail long and slender, gradually tapering to tip; length c. 1.4–1.7 times precloacal length. Tail bears median row of 39–47 thorns and 4 parallel thorn rows. Two separate dorsal fins with 3–6 interdorsal thorns. Claspers long (post-cloacal length c. 23% of TL) and thick in adult male.

Colour: Dorsal surface usually brownish-yellow, with poorly defined, dark brown patches in adults. Juveniles mottled with circular brown spots and brown tail bands. Ventral surface uniform yellowish white.

Size: 59 cm (TL).

Distribution: Southeast Atlantic and southwestern Indian Ocean, between Namibia and Eastern Cape (South Africa).

Habitat: Demersal on continental shelf and upper slope between depths of 40 and 545 m.

Threats: Caught in demersal trawl fisheries.

Notes: Formerly *Cruriraja parcomaculata*

Eggcase: A small, vase-shaped eggcase, less than 50 mm in length (excluding horns). Length of main capsule is more than twice as long as its width. Anterior horns are hook-shaped; posterior horns are 45% longer than anterior horns, taper to thin tips and curve inwards with fine attachment fibres. Narrow lateral keels (<1% of maximum eggcase width).

SHORTTAIL STINGRAY / SMOOTH STINGRAY

Bathytoshia brevicaudata

LC

Description: Very large, plain-coloured stingray with broad rhombic disc and short snout. Oblique row of white spots at base of each pectoral fin on dorsal surface. Skin lacks dermal denticles, smooth at all stages of growth. Pelvic fins small. Transverse groove on belly. Short tail that tapers strongly before caudal sting; very broad and depressed at base, usually shorter than disc width; usually with 1 long caudal sting. Specimens exceeding c. 45 cm DW with a row of spear-shaped or star-shape-based thorns and tubercles on midline of tail before caudal sting; tail beyond sting covered with sharp thornlets.

Colour: Uniform greyish-brown to charcoal above; darkest on tail tip and above eye. Inside of spiracles, diagonal row of pores on each side of disc and pores around side of head are white. Ventral surface white; margin of disc may be grey or mottled; undersurface of tail usually dusky.

Size: At least 210 cm (DW).

Distribution: Anti-tropical, disjunct distribution in the Indo-Pacific, southern Africa (Cape Town, South Africa to Zambezi River, Mozambique), southern Australia (southern Queensland to Shark Bay, Western Australia), New Zealand (including the Kermadec and Chatham Islands), and Japan to eastern Russia. Probably also present in Namibia.

Habitat: Demersal and epipelagic on the continental shelf and slope in a wide variety of habitats. Can be found in shallower waters but more commonly between 180 and 480 m.

Threats: Taken as bycatch in trawl, Danish seine, longline, and purse seine fisheries, and is most often discarded.

BROWN STINGRAY

Bruinrog
Bathytoshia lata

VU

Description: Large, plain-coloured stingray with broad, rhombic disc. Disc width 1.2 to 1.3 times disc length; very thick trunk. Nasal curtain broadly skirt-shaped. Thorn pattern changes with growth. Juveniles (<60 cm DW) have smooth skin; may have stellate thorns on midline of disc, more pointed and upright thorns on back and snout, and some enlarged, broad-based thorns on tail. Larger individuals have denser coverage of large thorns centrally; tail beyond sting very thorny. Moderately long, gently tapering tail, broad and depressed at base, length about 2 times disc width. Usually 1 caudal sting.

Colour: Uniformly greyish-brown to blackish. May have irregular white flecks where skin is damaged. Ventral surface white. Dorsal surface of tail is dark to black; ventral surface is white at base and black posterior to sting.

Size: 260 cm (DW).

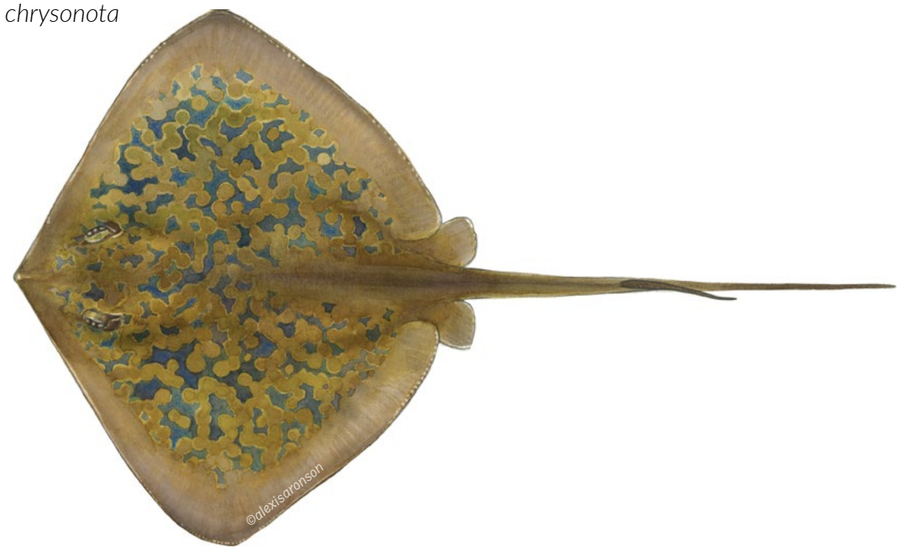
Distribution: East Atlantic Ocean (southern France to northern Namibia), including Mediterranean Sea, and Indo-Pacific Ocean. In Namibia, appears to be present only in far north, close to the Kunene River mouth.

Habitat: Largely demersal on sandy and muddy substrates, on continental and insular shelves, and on upper slope, at depths of 0 to 800 m.

Threats: Taken as bycatch in artisanal and industrial fishing gears including trawl, gillnet, set nets, trammel nets and tangle nets, and is retained for human consumption in parts of its range. Occasionally caught by recreational anglers in northern Namibia, most of whom practise catch-and-release.

BLUE STINGRAY

Blou pylstert
Dasyatis chrysonota



NT

Description: Broad rhombic disc; large, protruding eyes. Pelvic fins broad with broadly rounded tips. Small, skirt-shaped nasal curtain with strongly fringed margin. Tail short (less than twice disc width) and gradually tapered before caudal sting.

Colour: Dorsal disc golden brown with distinctive, complex blue marbling pattern. Edge of disc and tail greyish-blue. Uniformly white ventral surface.

Size: 75 cm (DW).

Distribution: Southeast Atlantic and southwestern Indian Ocean, between Angola and South Africa.

Habitat: Benthic mainly in shallow coastal and estuarine habitats in summer, moving to offshore waters (to depths of 110 m) in winter.

Threats: Captured by trawl, commercial and recreational line, beach seine, and gill net fisheries in parts of southern Africa. Regularly caught by recreational anglers in Namibia. Climate change and warming of coastal waters may result in habitat loss or a shift in range for this species.

PELAGIC STINGRAY / VIOLET STINGRAY

Pteroplatytrygon violacea

LC

Description: Medium-sized stingray. Rounded, blunt snout. Distinctive disc shape – curved anteriorly as far as pectoral fin tips, then relatively straight posterior disc margins. Disc broad, width 1.3 to 1.4 times length. Pelvic fins rounded, usually barely extended beyond disc. Tail broad-based, tapering strongly, becoming whip-like beyond caudal sting; 2.5 to 3 times disc length (when undamaged), with 1 or 2 very long, serrated stings and and a long, distinct, membranous ridge on ventral surface of tail. Larger individuals have scattered dermal denticles on dorsal disc and a median row of small thorns from nape to tail sting origin.

Colour: Dorsal surface uniformly dark purplish-black, including whip-like portion of tail. Ventral surface and tail dark brownish or black. Cloaca, thorns and sting(s) mostly pale.

Size: 80 cm, but usually less than 60 cm (DW).

Distribution: Circumglobal in all tropical and temperate oceans.

Habitat: Pelagic, usually between the surface and 100 m, but has been reported as deep as 381 m.

Threats: Frequently caught by pelagic longline fisheries for tunas, billfishes, and pelagic sharks and to a lesser extent other gear, including pelagic gillnets and trawls. Mostly discarded, but retained and utilised in some areas. Rates of capture in Namibia's longline fisheries are unknown.

BACKWATER BUTTERFLY RAY / DIAMOND RAY

Rem-vinderrog
Gymnura natalensis

LC

Description: Very large butterfly ray with a rudimentary tentacle on inner posterior margin of spiracle. Very short tail with 3 to 5 black bands (often poorly demarcated), one or more caudal stings and without a dorsal fin. Very broad disc, 1.8 to 2.2 times disc length.

Colour: Dorsal surface greyish or brown; sometimes with small dark spots or irregular pale spots or blotches, often in a marbled pattern. Ventral surface white or brownish.

Size: 250 cm (DW).

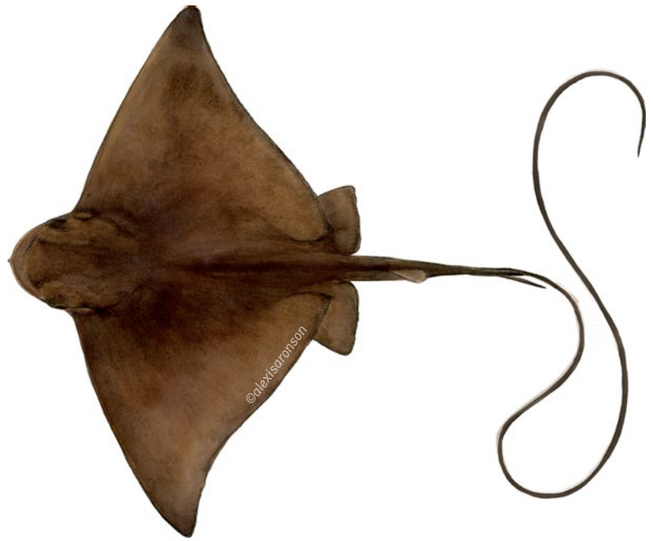
Distribution: Southeast Atlantic and southwestern Indian Oceans, between Namibia and southern Mozambique.

Habitat: Benthic inshore, mainly on muddy and sandy seabeds, to 75 m.

Threats: In South Africa, frequently caught by prawn trawlers and possibly in commercial line fisheries. Occasionally caught (and usually released alive) by recreational anglers in Namibia, but levels of post-release mortality are unknown and depend on handling practices. May also be susceptible to habitat degradation, especially in estuarine habitats.

COMMON EAGLERAY

Arendrog
Myliobatis aquila



CR

Description: Medium to large-sized eagle ray with even colouration on dorsal surface. Disc diamond- or rhombus-shaped, width about twice its length. Short, fleshy, rounded snout is joined to pectoral fins by a ridge below eyes. Long tail (2 to 2.5 times length of disc) with single small dorsal fin and 1 or 2 large caudal stings behind it.

Colour: Dorsal surface uniformly dusky bronze to chocolate brown or black; no markings. Ventral surface mostly white with brownish pectoral fin tips and posterior margin of disc.

Size: Up to 150 cm, but mostly less than 83 cm (DW).

Distribution: East Atlantic Ocean, Mediterranean and southwestern Indian Ocean, between Scotland and Kenya.

Habitat: Largely coastal demersal, preferring shallow bays, estuaries and lagoons with muddy or sandy seabeds, but can be found to depths of 510 m.

Threats: Taken as bycatch in industrial and artisanal fishing gears including trawl, gillnet, set net, tangle net, and trammel net, and is retained for human consumption in some parts of its range. The schooling behaviour of this species means that large numbers can be fished out in one haul. Regularly caught by recreational anglers in Namibia and South Africa; usually released alive but rates of post-release mortality are unknown. In Namibia, habitat destruction in coastal waters may pose a threat to this species.

CHIMAERAS

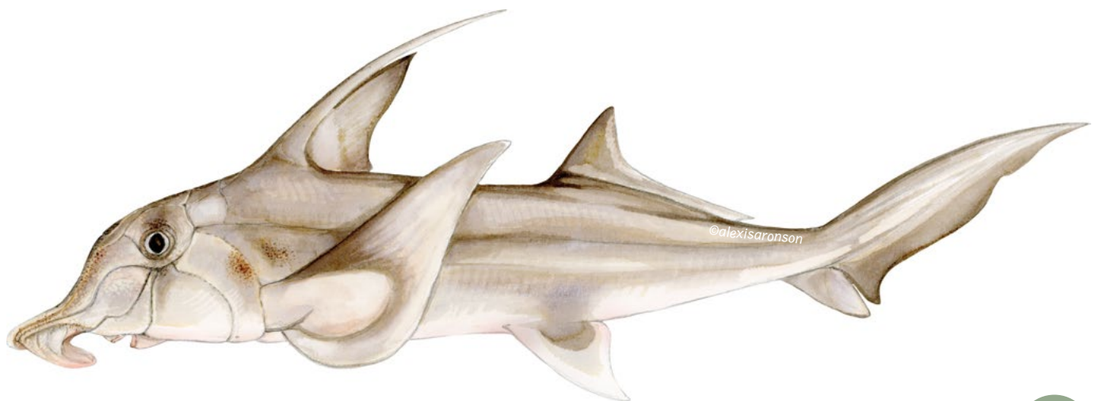
Chimaeras are cartilaginous fish in the order Chimaeriformes, sometimes referred to as ratfish, rabbitfish or ghost sharks. There are about 47 species of chimaeras worldwide, ranging in length from about 60 to 200 cm. There are thought to be eight species present in Namibian waters. Found in temperate to cold waters of all oceans, most chimaeras inhabit the deep sea, to depths of 2,500 m or more; just one species in Namibia is encountered in the coastal zone. They are weak swimmers and are delicate when caught, dying quickly out of water. Their food consists of small fishes and invertebrates. Females lay large, elongated eggs protected by tough eggcases.

Chimaeras' closest living relatives are sharks and rays, but they are very different to both these groups in several ways. Chimaeras mostly have a tapered body form, with large pectoral and pelvic fins, large eyes and two dorsal fins, the first preceded by a sharp spine. Unlike sharks and rays, chimaeras have a single external gill opening, covered by a flap called an operculum (as the bony fishes have), on each side of the body. The upper jaw is fused with the skull in chimaeras, in contrast to the elasmobranchs which have an upper jaw that articulates with the skull. Chimaeras have scaleless skin, lacking the rough denticles characteristic of most sharks, skates and rays, and they are smooth and almost slimy to the touch. Like sharks and rays, male chimaeras possess external reproductive organs (claspers) derived from the pelvic fins and used to introduce sperm into the body of the female. However, male chimaeras, unique amongst fishes, also have a pair of denticle-studded grasping organs, the prepelvic tenaculae, just in front of the pelvic fin bases, and a denticle-covered frontal tenaculum on the forehead. These structures are believed to help the male in grasping the female during mating.

Because chimaeras inhabit mostly deep waters and are of little commercial value, there has been remarkably little research done on them and very little is known about the lifecycles or the conservation status of most of the species described here. The eggcases of some chimaera species have never been documented and thus, for several species in this guide, we have been unable to include eggcase illustrations or descriptions.

ST JOSEPH SHARK / ELEPHANTFISH

Josef
Callorhinchus capensis



LC

Description: Smooth body, slimy to the touch. Trunk-like lobe projecting downwards from snout. Venomous spine protruding from front of dorsal fin. Large, broad pectoral fins; long, pointed upper caudal lobe.

Colour: Silver or bronze, with brown markings on flanks and head, but the body can flash with various colours when the animal is captured and handled.

Size: 120 cm TL.

Distribution: Mainly along the southern and western Cape of South Africa but extending into Eastern Cape waters and Namibia.

Habitat: Shallow coastal waters (the only chimaera in Namibia found in coastal waters).

Threats: Caught as targeted and incidental catch by line, beach seine, surface and demersal gillnet, and demersal trawl and longline commercial fisheries in South Africa, and suspected to be captured in the hake longline fishery but not reported. There

is also a fishery targeting St. Joseph sharks in South Africa. In Namibia, shore-based recreational anglers catch St. Joseph sharks, but usually release them alive. Fishing pressure on this species is considered high, but its effects on the species are unknown.

Eggcase: A hairy, brown, spindle-shaped eggcase with a broad frill around each edge; 130 - 180 mm in length. Convex shape on one side and a flatter surface on the other. Pale yellow to dark brown in colour, turning black when they have dried out. These eggcases are laid directly on the seabed and take around 9 to 12 months to hatch.

CAPE CHIMAERA

Chimaera notafricana

LC

Description: Body elongate, slender, tapering from head to whip–like tail filament. Snout short, conical, and bluntly pointed; lateral line canals on head appear as open grooves. Large, triangular pectoral fin reaching to pelvic fin origin when laid back. Distal edge of pelvic fins slightly rounded. Pelvic claspers short, not extending past distal tip of pelvic fins. First dorsal fin high, triangular, preceded by a keeled spine, strongly serrated along posterior edge of tip. When depressed, spine tip reaches beyond origin of second dorsal fin. Second dorsal fin long, slightly higher along posterior one-third of fin length, but margin not undulating. Small, low anal fin with pointed tip. Caudal filament length about 44–57% total body length.

Colour: A uniform blackish brown colouration with dark blue streaking and longitudinal light and dark stripes along flanks. Pectoral, pelvic and dorsal fins medium to dark brown, with a blueish colour near the edges of the fins and lighter along posterior edges. Dorsal fin spine light brown. Caudal fin lobes brown, darker near fin base and lighter near tip.

Size: 93 cm TL (53 cm BDL).

Distribution: Known only from off Lüderitz, Namibia, to the Cape of Good Hope and eastwards to Algoa Bay, Eastern Cape Province, South Africa.

Habitat: Upper continental slope from 680 to at least 1,016 m.

Threats: Taken as bycatch in demersal trawl and longline fisheries targeting hake in South Africa, and potentially also in Namibia. Not utilised; the effect of fisheries-related mortality, if any, is unknown. May have some refuge at depth since much of the species' range is beyond current fishing activity.

Notes: This is the only species of the genus *Chimaera* known to occur in the southeastern Atlantic Ocean. Three other shortnosed chimaera species are present, belonging to the genus *Hydrolagus*. They can be separated from this species by the fact that all *Hydrolagus* species lack an anal fin. This species was previously referred to as *Chimaera monstrosa*, which is common in European waters. Studies have since revealed that the southern African 'form' is in fact a different species.

Eggcase: No images or description of this species' eggcases are available.

SMALL-EYED CHIMAERA / SMALL-EYED RABBITFISH

Hydrolagus affinis

LC

Description: Very large chimaera; body very stout, tapering from large head to relatively short, filamentous tail. Snout bluntly pointed. Eyes large, 16–25% head length. First dorsal fin high and triangular, with short fin-base; fin preceded by stout spine, smooth along its anterior edge with two rows of serrations along posterior edge for distal one-third to half of spine length. First dorsal fin spine does not exceed fin height, second dorsal fin height relatively even along entire fin length. Pectoral fins broadly triangular, reaching to pelvic fin base when laid back. Caudal fin dorsal and ventral lobes rounded, upper lobe height slightly greater than lower lobe height. Caudal filament ends in blunt tip. Skin rubbery, not deciduous, usually remains mostly intact.

Colour: Uniformly dark brown to purplish-black; fins with purplish tinge. Some individuals may be slightly mottled, but most do not have any distinct patterning or blotches.

Size: 147 cm TL (96 cm BDL).

Distribution: Widespread but patchy distribution in the North and East Atlantic Ocean. May be more widespread off the west coast of Africa than presently reported.

Habitat: Found on continental slope, ridges, seamounts and abyssal plains, from depths of 300 m to at least 2,410 m, but is most common below 1,000 m.

Threats: Not targeted commercially, but is occasionally recorded as bycatch in deepwater trawl and longline fisheries targeting deep-sea species. Its occurrence in very deep habitats may offer the species considerable refuge from current fishing activities.

Notes: Also called Atlantic chimaera.

Eggcase: No images or description of this species' eggcases are available.

AFRICAN CHIMAERA

Hydrolagus africanus

LC

Description: Small chimaera with blunt, rounded snout. Second dorsal fin slightly indented in centre; long, curved dorsal fin spine, equal to or exceeding first dorsal fin height. Adult males with lateral patch of 1–3 denticles on each prepelvic tenaculum.

Colour: Light brown, head often darker than the trunk; dark brown fins that lighten near the body margin. Ventral surface pale greyish-brown.

Size: At least 98 cm TL (47 cm BDL).

Distribution: Southeast Atlantic Ocean (Angola to South Africa) and western Indian Ocean (South Africa to Kenya).

Habitat: Bathydemersal, found between 300 and 1,030 m, but most common between 300 and 500 m.

Threats: Taken as bycatch in South African demersal trawl and longline fisheries targeting hake, and likely caught in other deepwater trawl and longline fisheries throughout its range. The effect of fishing, if any, is currently unknown.

Eggcase: Narrow, spindle-shaped eggcase. No good-quality images, description or measurements were available for this species' eggcases.

LARGE-EYED CHIMAERA

Hydrolagus mirabilis

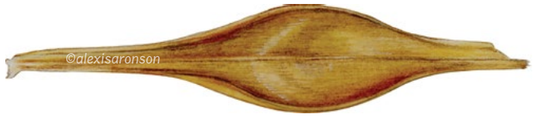
LC

Description: Very small chimaera with short, stout body; rapidly tapering behind pelvic fins to very long, narrow, whip-like filamentous tail. Snout short, conical, and bluntly pointed. Large, oval shaped eyes (about 35% of head length). First dorsal fin high and triangular, with short fin base. Slender dorsal fin spine reaches to or slightly beyond first dorsal fin tip when depressed; posterior spine edges not strongly serrated. Interdorsal fin space small; first and second dorsal fins joined by fleshy ridge of skin. Second dorsal fin long with distinct concave dorsal margin nearly separating fin into anterior and posterior portions, about mid-distance along fin. Second dorsal fin height less than one-third first dorsal fin height. Pectoral fins broadly rounded, reaching beyond pelvic fin origins when laid back. Pelvic fins stoutly rounded along base. No anal fin. Caudal filament length about 75% of body length. Skin deciduous, smooth.

Colour: Uniform light to dark brown or greyish, with darker fin edges. Second dorsal fin with light coloured band at base and dark distal edge.

Size: At least 80 cm TL (35 cm BDL).

Distribution: Thought to have widespread distribution across North, Central, and Southeast Atlantic Ocean, and Mediterranean Sea.



Habitat: Continental slope at depths of 450 to 1,933 m, but mostly below 800 m.

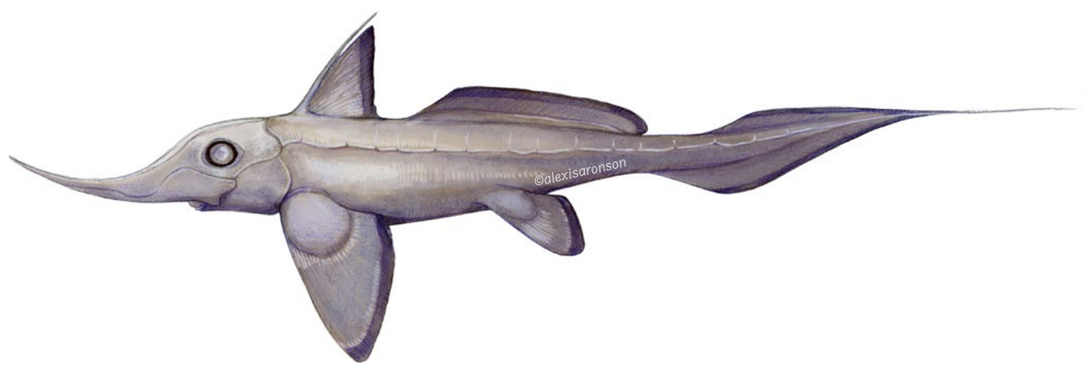
Threats: Has been recorded as minor bycatch in deep-water trawl, longline, and gillnet fisheries.

Notes: This species can be distinguished from *Hydrolagus affinis* by the concave second dorsal fin and by the eyes, which measure over one-third of the head length.

Eggcase: Spindle-shaped eggcase, convex dorsal and ventral surfaces. Long, narrow posterior portion (which contains the elongated tail of the chimaera) with a narrow lateral keel. Measures at least 11.5 cm from tip to tip, possibly more (based on photographs of a single museum specimen).

NARROWNOSE CHIMAERA

Harriotta raleighana



LC

Description: Forehead slopes to long, pointed and flattened rostrum, which sometimes curves slightly upwards; snout tip bears protuberances. First dorsal fin relatively small. Slightly curved dorsal fin spine equal to or longer than first dorsal height, reaching second dorsal fin origin when depressed; spine keeled and weakly serrated along distal half of length. Interdorsal space small; second dorsal fin somewhat convex but relatively even in height. Pectoral fins broad and long, tips reaching pelvic fin origin when folded back. Caudal fin lower lobe is about twice as deep as the upper lobe; no tubercles on upper edge; caudal filament short. No anal fin.

Colour: Uniformly light grey or brown to dark brown. Darker fin edges, pelvic fins blackish.

Size: 120 cm TL.

Distribution: Widespread but patchy distribution worldwide except for Indian Ocean.

Habitat: Inhabits depths from 200 to 3,100 m, but mostly deeper than 500 m. Has been observed at depth by remote operated vehicles, over soft mud and gravel seabeds.

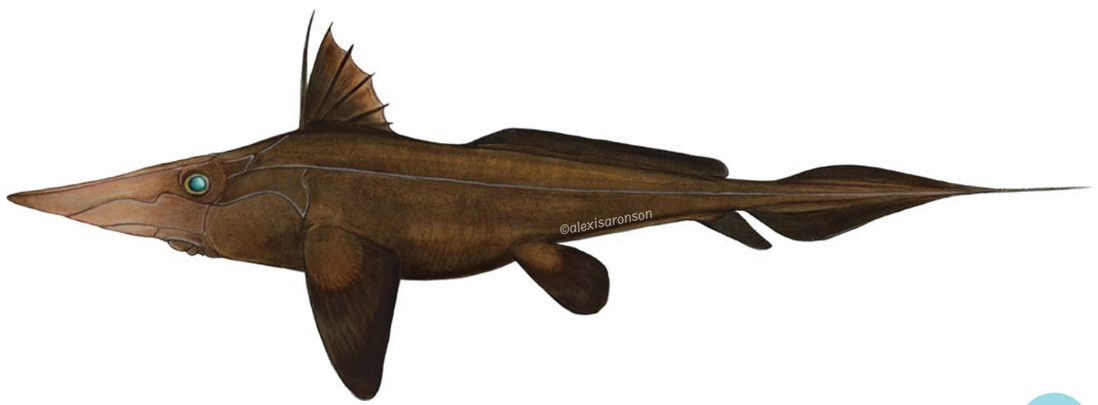
Threats: Not known to be targeted by commercial fisheries, but is caught as bycatch in commercial deepwater bottom trawl fisheries.

Notes: The smallspine spookfish (*Harriotta haeckeli*) is similar in appearance to *H. raleighana*. It has not yet been confirmed from the southeast Atlantic.

Eggcase: A spindle-shaped eggcase with a broad frill around each edge, in which closely spaced ribs run perpendicular to the edge of the eggcase cavity (ribs are far more numerous than in the similarly shaped eggcase of *C. capensis*). The central capsule is convex on one side, flatter on the other and tapers at each end, with the posterior taper, which contains the elongated tail of the chimaera, longer and narrower. Dimensions unknown.

SICKLEFIN CHIMAERA

Neoharriotta pinnata



NT

Description: Longnose chimaera with narrow, slightly flattened snout and blunt edged, ridged tooth plates. First dorsal fin spine height greater than fin height. Second dorsal fin uniform in height. Pectoral fins short and broad. Anal fin present, located close to lower caudal fin. Caudal fin with short terminal filament; no tubercles on upper edge.

Colour: Body uniformly mid-brown to dark brown, with no distinctive blotches or markings. Pectoral, pelvic, dorsal and caudal fins blackish-brown.

Size: 150 cm TL (58 cm BDL).

Distribution: West coast of Africa (Western Sahara to Namibia), and northern Indian Ocean.

Habitat: Upper continental slope at depths of 200 to 622 m.

Threats: Bycaught in large numbers in deep-water trawl, longline, and gillnet fisheries off India. Likely also a bycatch of demersal trawl fisheries in other parts of its range, and has been recorded frequently as bycatch in the Namibian bottom trawl fishery for hake.

Notes: This and *Chimaera notafricana* are the only known chimaera species with an anal fin, found in the southeast Atlantic region.

Eggcase: No images or description of this species' eggcases are available.

ATLANTIC LONGNOSE CHIMAERA

Rhinochimaera atlantica

LC

Description: Longnose chimaera with long, straight snout, fleshy at base and tapering to pointed tip without protuberances. Smooth, sharp-edged tooth plates; mouth anterior to eye. First dorsal fin triangular in shape, with long fleshy base. Dorsal spine taller than height of first dorsal fin; when depressed, dorsal spine reaches halfway to origin of second dorsal fin. Spine keeled anteriorly with small serrations on distal portion of the posterior edge (may be reduced in large adults). Long, slightly convex second dorsal fin, well separated from both first dorsal and dorsal caudal fins. Dorsal caudal fin very narrow, appears as thick fleshy ridge on dorsal surface of tail. Paired caudal tubercles present along the distal edge of the dorsal caudal fin in adults (more pronounced in males). Ventral caudal fin deepest anteriorly. Tail ends in a firm, whip-like caudal filament, sometimes broken but if intact, can be 4–32% body length. Pectoral fins narrow and long (rather than triangular, broad shape in other chimaera species). No anal fin.

Colour: Uniformly pale to light brown or greyish-brown with darker fins, darker dorsally and lighter ventrally. Whitish on ventral surface of snout.

Size: 147 cm TL (90 cm BDL).

Distribution: Widespread but patchy distribution in East and West Atlantic Ocean, and in western Indian Ocean off South Africa and Mozambique.

Habitat: Benthic on upper and mid-continental slopes at depths of 400 to 1,800 m, but generally deeper than 1,000 m.

Threats: Taken as occasional bycatch in deep-water trawl fisheries throughout its range.

Notes: Previously called straightnose rabbitfish. Can be distinguished from the other chimaera in this region with a long and broad nose, *Neoharriotta pinnata*, by the fact that *R. atlantica* does not have an anal fin.

Eggcase: Hollow, central, spindle-shaped capsule surrounded by fan-like lateral web. Lateral flange fairly narrow; central capsule tapers to a long, narrow space which contains the elongated tail of the chimaera. Measures c. 180 mm long. (Description and dimensions based on an image of a single eggcase)

GLOSSARY

Anterior - To the front (of the body or of a particular body part).

Barbel - A slender, whisker-like sensory organ near the mouth.

Batoid - An elasmobranch with a flattened body, with the pectoral fins fused to the sides of the head and the gill openings on the ventral surface (i.e. a skate or ray).

BCLME - See Benguela Current.

Benguela Current - The broad, northward flowing ocean current which extends from roughly Cape Point (South Africa) in the south, along the length of the Namibian coastline, to the position of the Angola-Benguela front in the north, at around 16°S. The upwelling system inshore of the Benguela Current sustains the productive Benguela Current Large Marine Ecosystem (BCLME).

Benthic - Referring to organisms that live on the seabed.

Boreal - The cold temperate region south of the Arctic.

Bycatch - The part of a fishery's catch taken accidentally, usually in addition to the target species. Broadly this refers to all non-target catch including organisms which are either discarded or landed.

Carbon dioxide (CO_2) - A colourless, odourless gas which is naturally present in air (about 0.03 % of the earth's atmosphere). It is added to the atmosphere naturally when organisms respire or decompose (decay), and through other natural processes, but is added to the atmosphere in excessive quantities through human activities, such as the burning of fossil fuels.

c. - Abbreviation of the Latin *circa*, meaning 'about'. Used to indicate that a number is a rough or estimated value, rather than an exact amount.

Cartilaginous fish - Fishes with skeletons composed mostly of cartilage; includes all sharks, skates, rays and chimaeras. In contrast, bony fish have a skeleton composed mostly of bone.

Caudal - Referring to the tail or posterior end of the body.

Caudal keel - A dermal keel on the caudal peduncle which may be present ventrally and extends onto the base of the caudal fin, or may be present on each side of the peduncle (lateral keels).

Caudal peduncle - The part of the pre-caudal tail which extends from the insertions of the dorsal and anal fins to the front of the caudal fin. A highly modified, rigid structure that facilitates the side-to-side movements of the caudal fin.

Chondrichthyan - A member of the class Chondrichthyes, which includes all sharks, skates, rays and chimaeras.

Chondrichthyes - The taxonomic class containing aquatic, gill-breathing, jawed, finned vertebrates with primarily cartilaginous skeletons, one to seven external gill openings, oral teeth in transverse rows on their jaws and mostly small, toothlike scales (dermal denticles). Sometimes broadly referred to as 'sharks'. The term chondrichthyes is from the Greek chondros (cartilage) and ichthos (fish).

Claspers - Paired copulatory organs present on the pelvic fins of male chondrichthyans, which facilitate the internal fertilisation of eggs.

Climate breakdown - The term which has replaced 'global warming' or 'climate change', to describe the unprecedented changes in the global climate, caused by human activities.

Cloaca - A common opening for digestive, urinary, and reproductive tracts in many fishes.

Demersal - see benthic.

Dermal denticle - A small, tooth-like scale found in cartilaginous fishes. Usually small, close-set and covering the whole body, but many batoids, chimaeras and some sharks have enlarged dermal denticles in reduced numbers.

Dorsal - On the top (upper side) of the body.

Dorso-ventrally flattened - A horizontally flattened body, like a pancake.

Disc width (DW) - The standard measurement for skates and rays; a straight-line measurement from the tip of one pectoral fin to the other (from wingtip to wingtip; see Figure 2).

Ecosystem - A living community of different species together with their non-living environment.

Eggcase - Hard casing deposited by a female shark, skate or chimaera, which contains a fertilised egg that will develop into a shark, skate or chimaera pup, and a yolk sac that will nourish the embryo during its development. Eggcases are made from a type of collagen and feel tough and leathery when wet, but brittle when they have dried out. They are often called mermaids' purses. Eggcases often have pairs of tendrils or horn-like structures extending from their corners, or flat flanges on their sides or a flange that spirals around the eggcase, which can anchor it to the seabed or to a structure (e.g. kelp) near the sea floor. See Figure 5 for the terms used to describe the parts of an eggcase.

Elasmobranch - A collective term for sharks, skates and rays.

Endemic - A species only found in a specific area. These species can be national endemics, found only in one ecosystem or along part or the whole of a country's coastline, or regional endemics, found off the coast of or in adjacent countries with similar habitat, but not elsewhere.

Epipelagic zone - The part of the ocean beyond the continental and insular shelves, in oceanic waters, from the surface to the limits of sunlight penetration (about 200 m depth). Also known as the sunlit sea or 'blue water'.

Falcate - Sickle-shaped or recurved.

Food web - The natural interconnection of food chains, or a representation of what eats what in an ecosystem.

Fossil fuels - Fuels such as coal, oil and natural gas, found in the Earth's crust and formed in the geological past from the remains of living organisms. They contain carbon and hydrogen, and can be burned for energy.

Free rear tips - A moveable rear corner or flap of the pectoral, pelvic, dorsal and anal fins, which is separated from the trunk or tail by a notch and an inner margin. In some sharks the rear tips of some fins are very elongated.

Habitat - The area(s) where an animal lives.

Insertion - The posterior or rear end of the fin base in all fins except the caudal fin.

IUCN - International Union for the Conservation of Nature. An international organisation working in the field of nature conservation and sustainable use of natural resources. It is involved in data gathering and analysis, research, field projects, advocacy, and education. The IUCN's mission is to 'influence, encourage and assist societies throughout the world to conserve nature and to ensure that any use of natural resources is equitable and ecologically sustainable'.

Labial furrows/ grooves - a fold or groove in the flesh either anterior to (upper labial furrow) or posterior to (lower labial fold) the mouth.

Lateral - On the side of the body or part of the body.

Mermaid's purse - See Eggcase.

Mesopelagic zone - The intermediate depths of the ocean, between about 200 and 1,000 metres deep.

Nasal flaps - One of a set of dermal flaps associated with the nostrils, and serving to direct water into and out of them.

Nasoral grooves - Shallow or deep grooves on the ventral surface of the snout between the nostrils and the mouth, seen in many bottom-dwelling, relatively inactive chondrichthyan species. These grooves are covered by expanded anterior nasal flaps that reach the mouth, and form water channels that allow the respiratory current to pull water into and out of the nostrils and into the mouth. This allows the animal to actively irrigate its nasal cavities while sitting still or moving slowly.

Nuchal - Nape of neck. Usually refers to area just behind head, where some skate species have one or more thorns.

Origin - The anterior or front end of the fin base in all fins. The caudal fin has upper and lower origins, but no insertion.

Peduncle - See Caudal peduncle.

Pelagic - Referring to organisms that live or spend time in the water column (as opposed to on the seafloor).

Photomark - Marking on the body of a shark, indicating where photophores are located.

Photophores - Small bioluminescent organs that produce light, found on lanternsharks and kitefin sharks.

Plankton - The small and microscopic organisms drifting or floating in the sea or freshwater, consisting chiefly of diatoms, protozoans, small crustaceans, and the eggs and larval stages of larger animals.

Posterior - Rearwards, i.e. towards the tail.

Precaudal pit - A notch in the caudal peduncle, where it joins the caudal fin.

Precloacal length - The length between the tip of the rostrum and the anterior edge of the cloaca.

Producers - Organisms that make their own food, using energy from the sun (or in the case of deep-sea environments, chemicals in the water), and convert it into usable energy in the form of sugar, or food. In aquatic environments, the most common producers are algae, including phytoplankton (microscopic marine algae) and seaweeds.

Saddle - Darker dorsal marking that extends downwards either side of the shark's body but does not form a band around the whole body.

Snout - The part of a chondrichthyan in front of its eyes or mouth, including the nostrils.

Spiracle - An opening between the eye and first gill opening of most sharks, skates and rays, representing the modified gill opening between the jaws and hyoid (tongue) arch. Water is taken in through the spiracles in order to ventilate the gills, and is expelled through the gill slits. Spiracles have been lost in chimaeras and some sharks.

Temperate - The part of the earth's surface lying between the tropic of Cancer and the Arctic Circle in the Northern Hemisphere or between the tropic of Capricorn and the Antarctic Circle in the Southern Hemisphere. Characterised by mild temperatures.

Tendrils - The long, curly fibres that extend from the corners of some skate and shark eggcases, and are used to attach the eggcase to structures on the seabed.

Total length (TL) - The standard measurement for sharks, chimaeras and some batoids, from the tip of the snout or rostrum to the end of the upper lobe of the caudal fin (see Figures 1 and 2).

Tropics - The part of the earth's surface surrounding the equator, between the Tropic of Cancer in the Northern Hemisphere and the Tropic of Capricorn in the Southern Hemisphere. 'Tropical' waters are warmer than those at higher latitudes, but not all ocean waters within this zone are tropical.

Ventral - On the underside of the body.

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REFERENCES AND ADDITIONAL RESOURCES

Bianchi G, Carpenter KE, Roux J-P, Molloy FJ, Boyer D, Boyer HJ. 1999. Field guide to the living marine resources of Namibia. FAO, Rome, Italy. 265 p.

Compagno LJV, Ebert DA. 2007. Southern African biodiversity and distribution. Environmental Biology of Fishes 80: 125-145.

Compagno LJV, Ebert DA, Cowley PD. 1991. The distribution of offshore chondrichthyan fishes off the west coast of southern Africa. South African Journal of Marine Science 11: 43-139.

Compagno LJV, Ebert DA, Smale MJ. 1989. Guide to the sharks and rays of southern Africa. Struik Publishers, Cape Town. 160 p.

Dulvy NK, Pacoureau N, Rigby CL, Pollom RA, Jabado RW, Ebert DA, Finucci B, Pollock CM, Cheok J, Derrick DH, Herman KB, Sherman CS, VanderWright WJ, Lawson JM, Walls RHL, Carlson JK, Charvet P, Bineesh KK, Fernando D, Ralph GM, Simpfendorfer CA. 2021. Overfishing drives over one-third of all sharks and rays toward a global extinction crisis. Current Biology 31: 4773-4787.e8

Ebert DA. 2015. Deep-sea Cartilaginous Fishes of the Southeastern Atlantic Ocean. FAO Species Catalogue for Fishery Purposes. No. 9. Rome. FAO. 251 p.

Ebert DA, Compagno LJV, Cowley PD. 2006. Reproductive biology of catsharks (Chondrichthyes: Scyliorhinidae) off the west coast of southern Africa. ICES Journal of Marine Science 63: 1053-1065.

Ebert DA, Compagno LJV, Cowley PD. 2008. Aspects of the reproductive biology of skates (Chondrichthyes: Rajiformes: Rajoidei) from southern Africa. ICES Journal of Marine Science 65 (1): 81–102.

Ebert DA, Dando M. 2021. Sharks, rays and chimaeras of Europe and the Mediterranean. Princeton University Press, Princeton, New Jersey. 383 p.

Ebert DA, Dando M, Fowler S. 2021. Sharks of the World. Second edition. Princeton University Press, Princeton, New Jersey. 607 p.

Ebert D, van Hees KE. 2015. Beyond Jaws: rediscovering the 'Lost Sharks' of southern Africa. African Journal of Marine Science 37(2): 141-156.

Ebert DA. 2015. Deep–sea cartilaginous fishes of the Southeastern Atlantic Ocean. FAO Species Catalogue for Fishery Purposes. No. 9. FAO, Rome. 251 p.

Iglésias SP. 2012. Chondrichthyans from the North-eastern Atlantic and the Mediterranean (A natural classification based on collection specimens, with DNA barcodes and standardized photographs), Volume I (plates), provisional version 06, 01 April 2012. 83 p.

Last P, Naylor G, Séret B, White W, Stehmann M, de Carvalho M (eds). 2016. Rays of the World. CSIRO Publishing, Clayton South, Australia. 790 p.

Leeney RH, Ebert DA, Grobler K. 2023. First record of Warren's sixgill sawshark *Pliotrema warreni* (Pristiophoriformes: Pristiophoridae) and the West African catshark *Scyliorhinus cervigoni* (Carcharhiniformes: Scyliorhinidae) in Namibia, and notes on the habitat of the bull shark *Carcharhinus leucas* (Carcharhiniformes: Carcharhinidae). Journal of the Marine Biological Association of the United Kingdom 103: e97.

The **Namibia's Rays and Sharks** (NaRaS) project is the first research and education project of its kind in Namibia. The project aims to generate baseline data on sharks, skates, rays and chimaeras, by documenting which species live in Namibian waters, the ocean habitats they use and the threats they face. The project also aims to share information on the incredible diversity of sharks, skates, rays and chimaeras living off our coastline with the Namibian public, and encourage more people to take an interest in these animals.

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