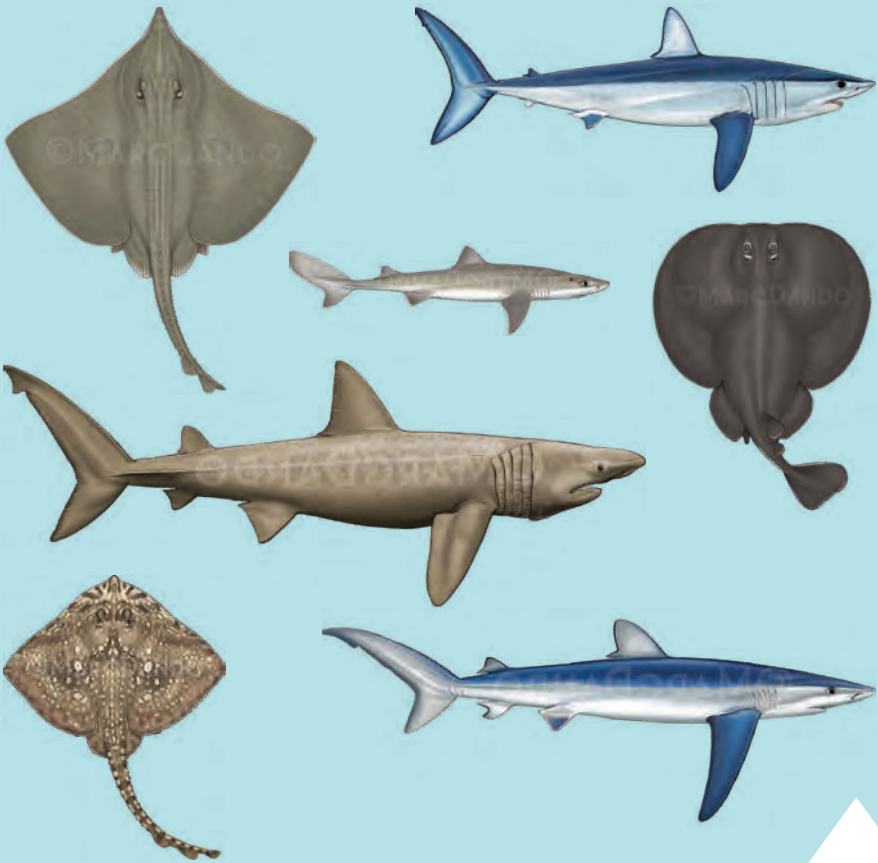
IDENTIFICATION GUIDE

SHARKS, SKATES & RAYS

British Isles & Northeast Atlantic



SHARK TRUST

INTRODUCTION

Since the publication of the Shark Trust's '*Identification guide to Sharks, Skates, Rays and Chimaeras of the British Isles and Northeast Atlantic*' (2010), an increase in interest, improved research and recording techniques have revealed a wealth of new information about these fascinating animals. Based on the most up-to-date information available, we have developed this revised identification guide. It covers 41 species of shark and 22 species of skate and ray known to occur in British waters and the Northeast Atlantic - as catalogued by the Centre for Environment, Fisheries and Aquaculture Science (Cefas). The species featured in this guide include year-round residents and seasonal visitors that may be encountered by the fishing industry.

Sharks, skates and rays (elasmobranchs) exhibit diverse life history characteristics that make them vulnerable to overfishing. Elasmobranchs are typically slow growing, late to mature, have low reproductive rates, and are long-lived. The necessity to protect vulnerable populations, whilst also managing sustainable fisheries is a crucial balancing act.

Many species of shark, skate and ray are designated as "data limited", meaning that not enough information is available to accurately provide population estimates upon which sustainable catch-limits can be based. Reducing the number of data limited species through improved identification and reporting is key to effective fisheries management.

Whilst much data is collected through scientific surveys, the fishing industry is central to contributing important species-specific information through the catch recording process.

The aim of this updated identification guide is to provide clear information that will assist the fishing industry, observers, enforcement bodies, researchers and policymakers to quickly and accurately identify and record any sharks, skates and rays encountered.

ACKNOWLEDGEMENTS

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https://ec.europa.eu/fisheries/cfp/emff_en

Our sincere thanks are extended to Dr. Jim Ellis (Cefas) for his expertise and advice in developing this guide.

We would also like to thank the volunteers who assisted in researching information within these guides.

For up-to-date management refer to the Shark Trust Commercial Fisheries Advisories **(www.sharktrust.org/fisheries-advisories)**.

For full reference lists refer to online versions.

For more detailed information on each species refer to the IUCN Red List of Threatened Species (www.iucnredlist.org).

As research evolves and conservation statuses are reassessed, we will endeavour to update online versions of this resource.

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Compiled by: John Richardson & Rebecca Gillham, with assistance from Ali Hood & Cat Gordon.

This identification guide covers 41 species of shark and 22 species of skate and ray found around the British Isles and Northeast Atlantic. Illustrations of morphology are provided to aid with the location of key external identification features used to describe each species. Handling guides outlining best practice for commercial and recreational fishing are also included. Divided into sharks and skates/rays, the species cards are listed in alphabetical order by scientific name. We encourage you to arrange the pages into an order that serves you best, for example, the species you most commonly encounter. A glossary of terminology can be found at the back of this guide.

Each species card includes annotated illustrations of a 'standard' specimen and illustrations of species dentition where available. Annotations refer to the comments in the **Identification and colour** section.

NB. *Appearance can vary between individuals and with maturity and growth.*

Each species is described under 12 headings:

SCIENTIFIC NAME: the binomial name (genus and species) and species authority.

DISTRIBUTION: a short description of the species' range and corresponding distribution map based on International Council for the Exploration of the Sea (ICES) areas. NB. *Distribution will extend or contract from these areas. Areas where species presence is uncertain have been identifed with a question mark. Vagrant sightings are not included.*

COMMON NAMES: the most widely used name is given in bold, followed by common names used around the UK and in select European countries where available.

IDENTIFICATION AND COLOUR: key external characteristics including shape, colour, thorns and distinctive features to check for when identifying the animal.

SIZE AND BIOLOGY: known sizes at birth, maturity and maximum total length (unless otherwise stated) where known. Also key biological characteristics e.g. life history, reproduction, diet, identifying behaviours.

EGGCASE: description and illustration of the eggcase where applicable and known.

TEETH: description, tooth count (number of rows unless otherwise stated) and illustration of the species' dentition where available.

SIMILAR SPECIES: other species which the species in question could be confused with.

HABITAT: where species most commonly live, including the known depth range. This may also include how the species utilises its habitat e.g. movement, aggregations, migrations.

CONSERVATION STATUS: a summary of the species status and Global, European and Mediterranean classification on the IUCN Red List of Threatened Species where available.

COMMERCIAL IMPORTANCE: a summary of the species importance to commercial fisheries.

MANAGEMENT: a summary of any relevant regulation/legislation.

The Shark Trust's annually updated Commercial Fisheries Advisories are a complementary product to this identification guide. For more detailed management information visit: www.sharktrust.org/fisheries-advisories.

HOW TO USE THIS GUIDE

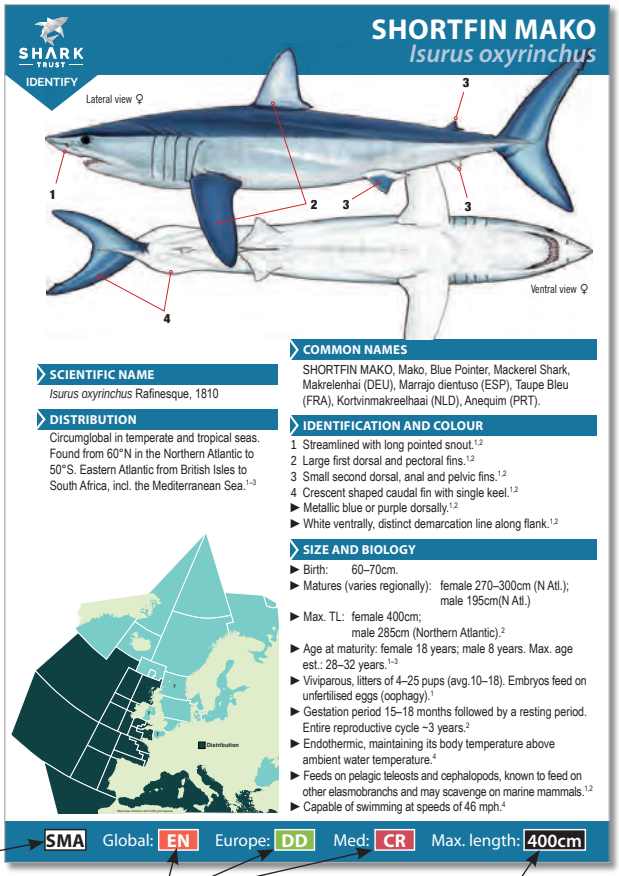
Key distinguishing features and external characteristics to pay attention to when identifying an unknown species are:

SHARKS:

- Size and shape of the dorsal, pectoral, and caudal fins.
- Relative fin placement.
- Presence or absence of anal fins.
- Shape and size of teeth.

SKATES AND RAYS:

- Size and shape of the disc and wings.
- Presence or absence of thorns, spines and spinules, and shape of thorns.
- Distinguishing markings e.g. eyespots or banding on tail.



At the bottom of each page is a banner of icons with key information specific to each species.

FAO code:

3 letter code unique to each species.

IUCN Red List status:

Global, European and Mediterranean conservation status of this species.

NE **Not Evaluated:**
not yet evaluated against IUCN Red List criteria.

DD **Data Deficient:**
inadequate information exists to make an assessment.

LC Least Concern:
low risk of extinction.

NT Near Threatened:
close to qualifying for a threatened category in the near future.

VU Vulnerable:
high risk of extinction in the wild.

EN Endangered:
very high risk of extinction in the wild.

CR Critically Endangered:
extremely high risk of extinction in the wild.

IUCN Red List statuses are subject to change.

Maximum total length/ disc width:

Measured from the tip of the snout to the tip of the tail/ from wing tip to wing tip.

INTRODUCTION TO CHONDRICHTHYANS

Sharks, skates and rays belong to the class Chondrichthyes, which contains over 1,200 species. They are distinguished from bony fish (teleosts) like tuna and cod, by their strong yet flexible cartilaginous skeletons. The class Chondrichthyes is split into two sub-classes Elasmobranchii (sharks, skates and rays) and Holocephali (chimaeras). The sub-class of Elasmobranchii is further split into two super-orders Selachii (sharks) and Batoidea (rays – including skates, sawfishes, and guitarfishes).

Chondrichthyans invest a lot of energy into producing few, well-developed young through various reproductive modes, they key ones being:

Viviparity (placental viviparity/live bearing): the embryo develops inside the mother's body, receiving all the necessary nutrients and oxygen through an umbilical cord. Once born, the young receive no further parental care and are fully independent.

Ovoviviparity (aplacental viviparity): the female carries fertilised eggs inside her body. Embryos continue to grow within a thin membrane until fully developed. They will then hatch inside the female, who will then give birth to the live young.

Oviparity (egglaying): some chondrichthyans produce tough, leathery eggcases containing a fertilised yolk. Females deposit eggcases onto the seabed or attached to substrates e.g. seaweed. The embryo develops over months to years, until fully formed, when it will hatch from an opening at the top of the eggcase.

ABOUT SHARKS

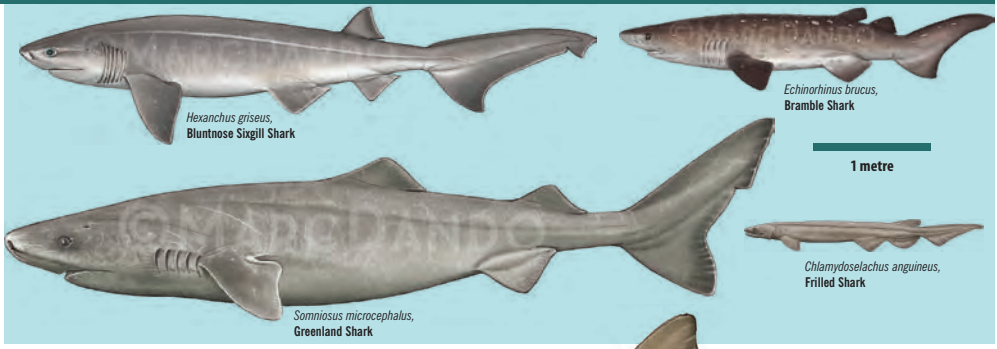
Of the >500 species of shark found globally, ~40 species inhabit British waters with ~21 of these resident year-round and the rest seasonal visitors. Sharks can be characterised by their typically torpedo shaped body (although some have a flattened torso e.g. angel sharks) and 5–7 uncovered gill slits located on each side of the head. Males can be distinguished from females by the presence of a pair of elongated claspers positioned beneath the pelvic fins; these may be difficult to see in juvenile males.

As predators, sharks play a key role in maintaining healthy, balanced marine ecosystems through predation on sick, diseased animals. Their removal from ecosystems can lead to complex ecological consequences that are still not yet fully understood. Their slow life history characteristics are similar to that of mammals (slow growth, late to mature, produce few young, long-lived), meaning they have a low resilience to human impact. Some species of shark could be considered biologically sustainable if sufficient science-based management plans based on species-specific data were in place. However, as a result of unregulated historical and ongoing fishing pressure, many species of shark are now highly threatened.

Many shark species are subject to management in the British Isles and Northeast Atlantic under the Common Fisheries Policy (CFP), Regional Fisheries Management Organisations (RFMO) regulation and national legislation e.g. the Wildlife and Countryside Act 1981 in England and Wales, and the Scottish Elasmobranch Protection Order. All sharks caught by UK and EU fishing vessels are subject to Regulation (EU) 605/2013 which requires that fins remain naturally attached to the body until first point of landing, easing enforcement and aiding identification.

LARGE NORTHEAST ATLANTIC SHARKS

SQUALOMORPHII



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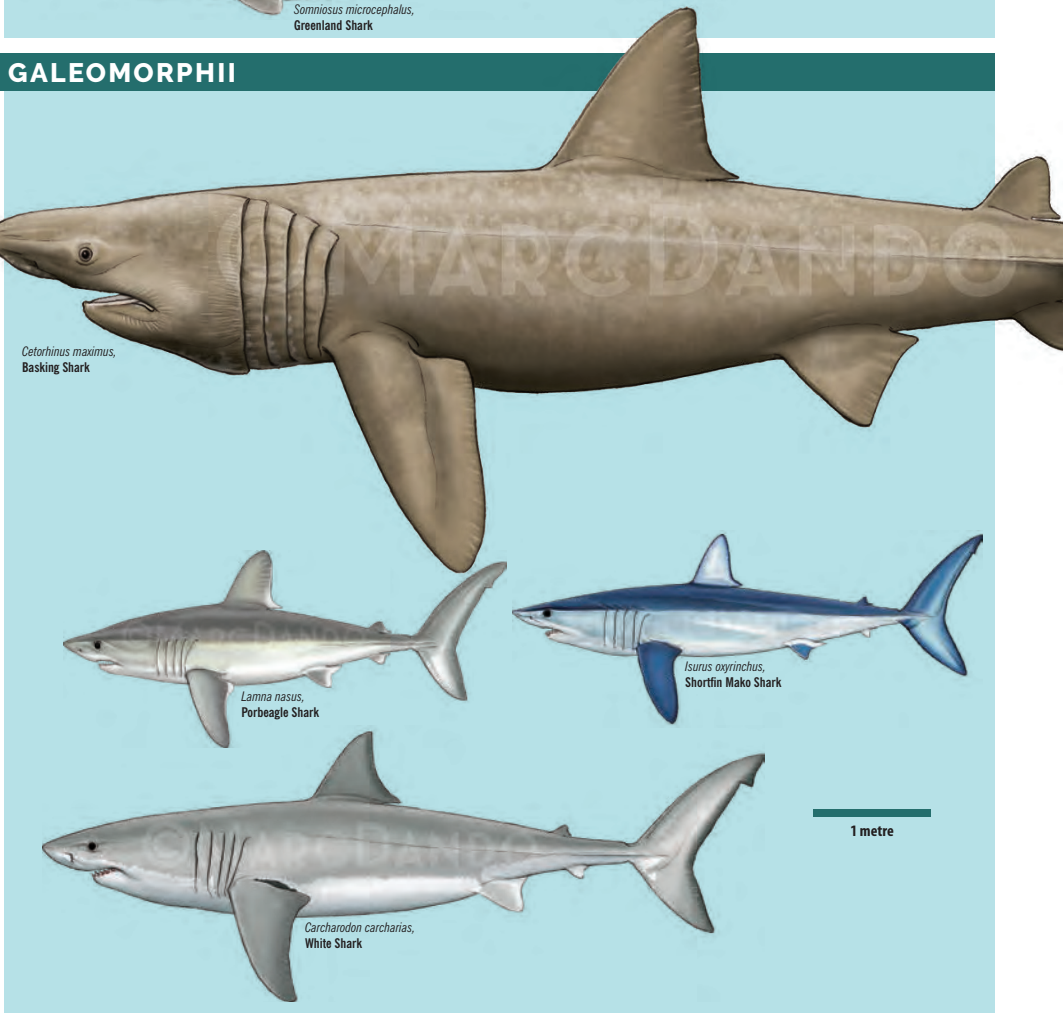

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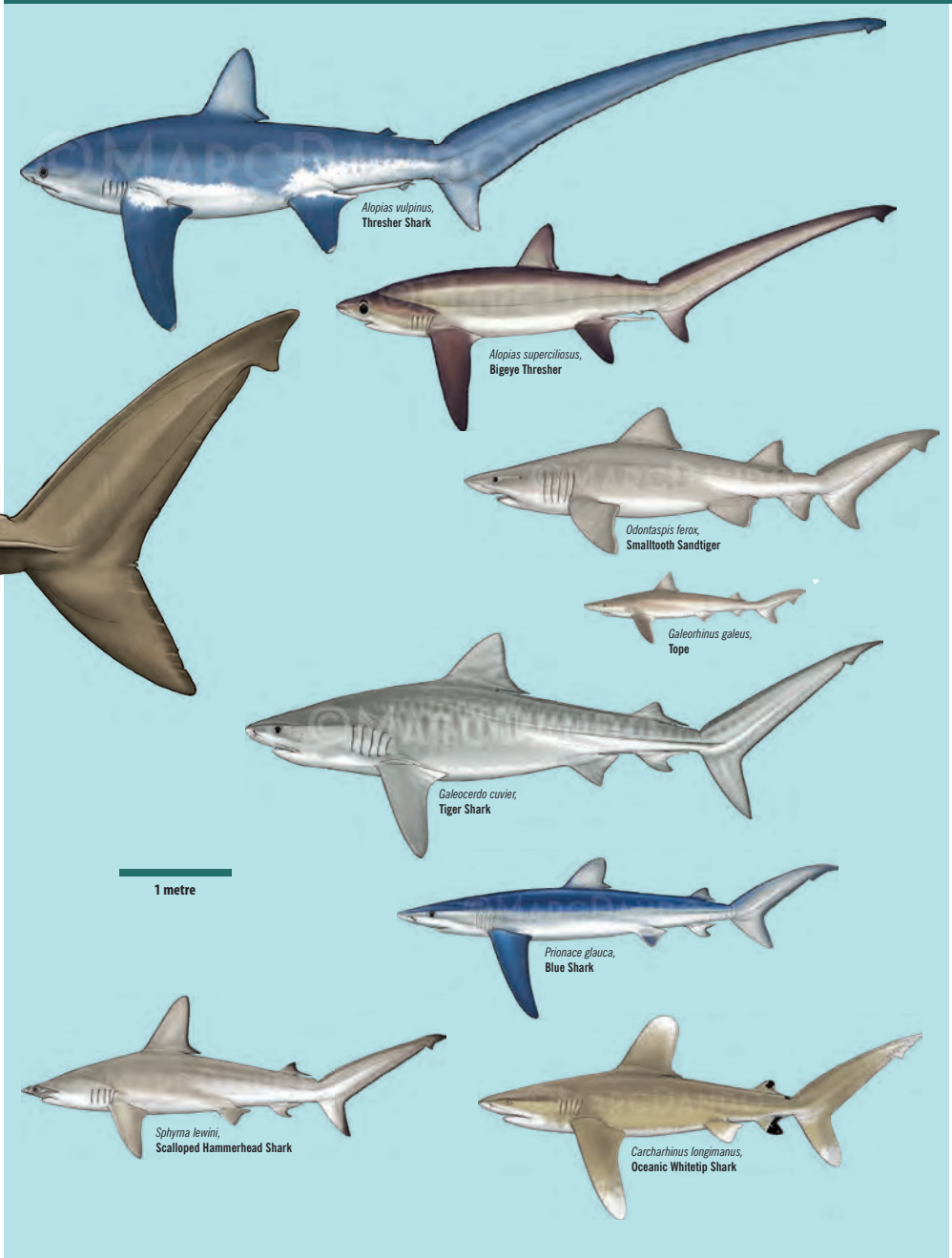

SMALL NORTHEAST ATLANTIC SHARKS

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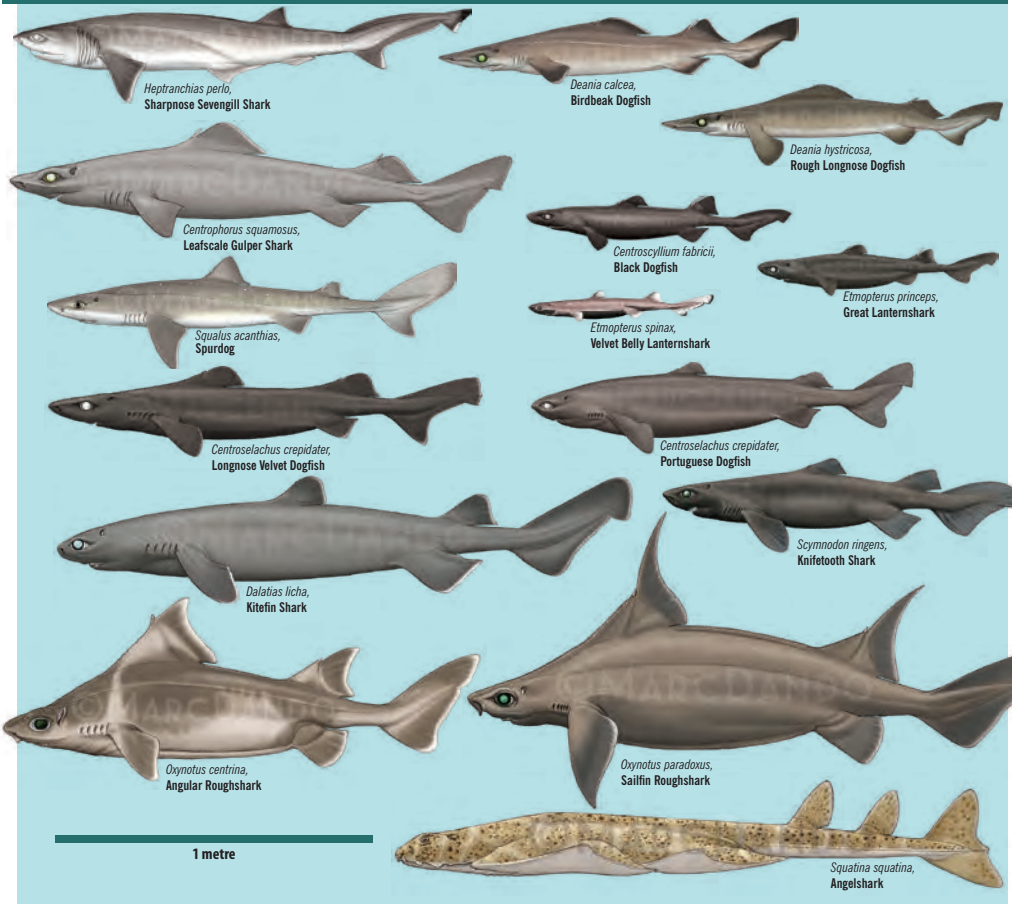

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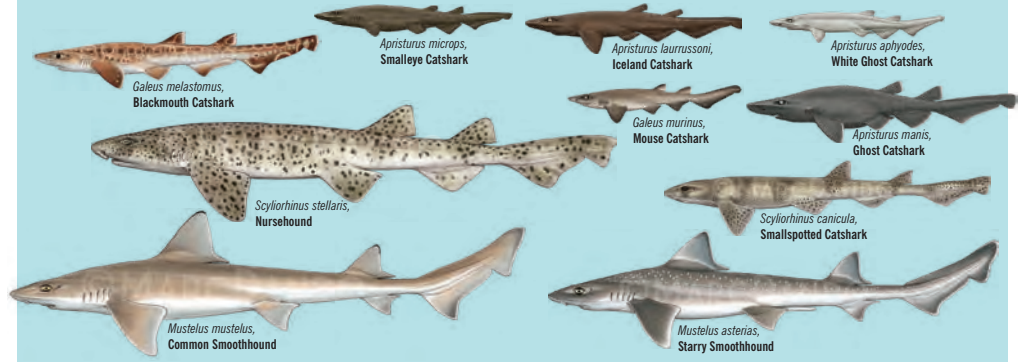
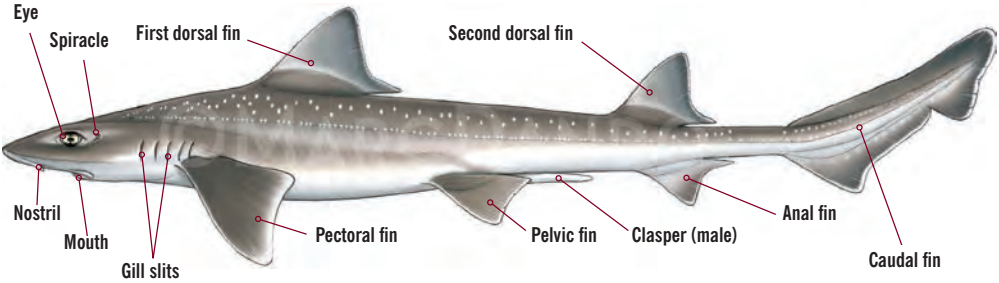
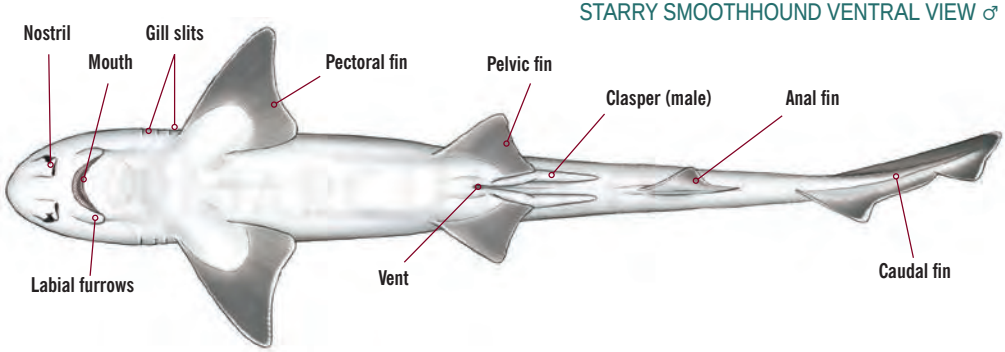
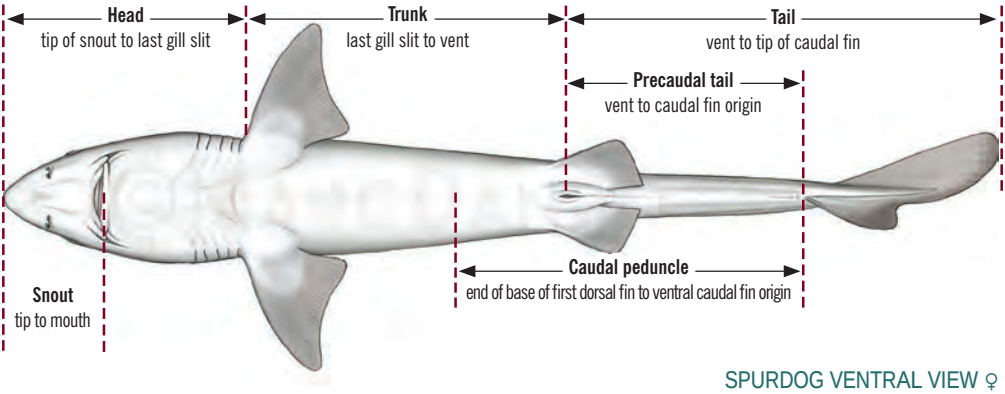


STARRY SMOOTHHOUND LATERAL VIEW ♂



STARRY SMOOTHHOUND VENTRAL VIEW ♂

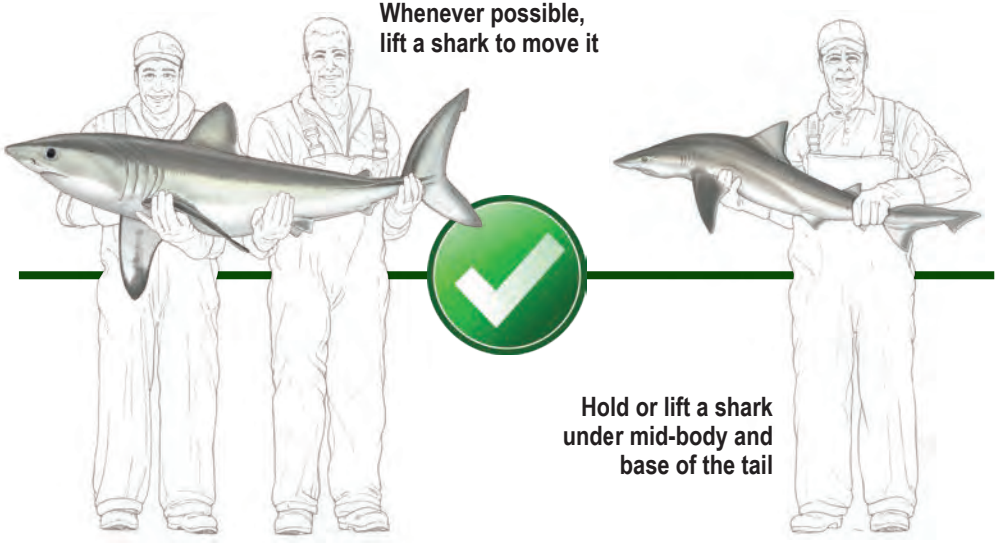




SPURDOG VENTRAL VIEW ♀

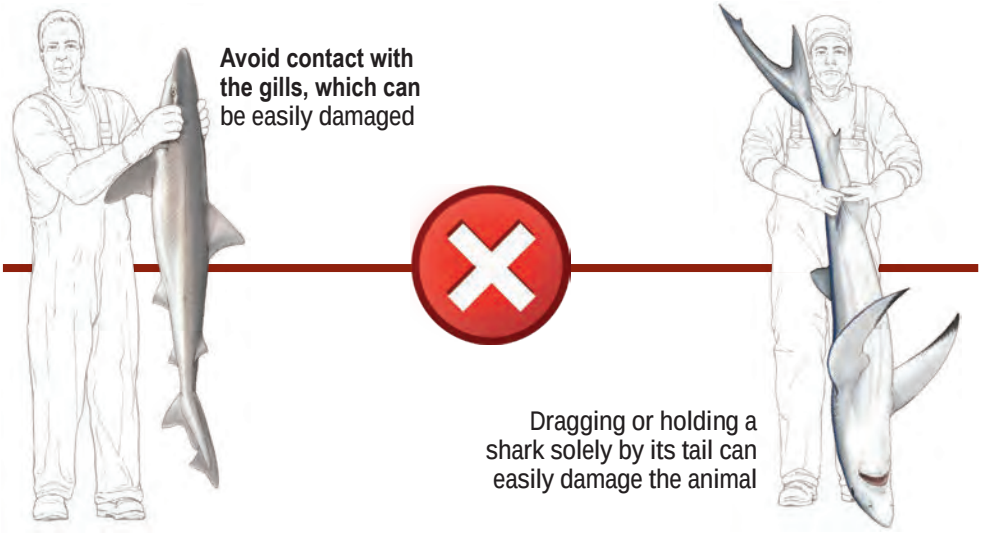
SHARK HANDLING GUIDE

Whenever possible, lift a shark to move it



Hold or lift a shark under mid-body and base of the tail

Avoid contact with the gills, which can be easily damaged



Dragging or holding a shark solely by its tail can easily damage the animal

Skates and rays are flat bodied cartilaginous fish belonging to the class Chondrichthyes. They are part of the sub-class Elasmobranchii (sharks, skates and rays) and super-order Batoidea (skates, rays, sawfishes and guitarfishes). Over 650 species of batoid exist across four orders: Rajiformes (skates), Torpediniformes (electric rays), Rhinopristiformes (guitarfishes and sawfishes), and Myliobatiformes (stingrays). Of which >30 can be found in British waters.

Unlike sharks, the mouth, nostrils and gill slits of skates and rays are located on the ventral side of the body, whilst the eyes and spiracles are located on the dorsal side. As with sharks, males can be distinguished by the presence of a pair of elongated claspers positioned beneath the pelvic fins; these may be difficult to see in juvenile males.

Skate and rays can be notoriously difficult to identify, due in part to the numerous colour morphs some species exhibit. This poses a challenge when identifying to species level and has led to taxonomic confusion in the past and even species reclassification. Since the publication of the first Shark Trust ID guide, Common Skate has been recognised as two distinct species and reclassified as the Flapper Skate *Dipturus intermedius* and the Blue Skate *D. batis*.

The shape, size and demersal nature of many species of skate and ray make them particularly vulnerable to capture by a variety of fishing gears. Like most chondrichthyans, the life history of skates and rays (slow growth, late maturity, low fecundity, longevity) makes them slow to recover from overexploitation. As a result, many of the larger species of skate that were once common are now assessed as Critically Endangered e.g. Flapper Skate.

The nomenclature for skates and rays are often confused. In the UK and Europe, species with long snouts (e.g. White Skate) are known as skates whilst those with shorter snouts are misnamed as rays (e.g. Spotted Ray), when in fact all species of the family Rajidae are skates. The key difference is that true skates produce eggcases (oviparity) whereas true rays give birth to live young (viviparity).

In addition:

Skates:

- Pelvic fins have two lobes.
- Relatively broad tail, typically with two small dorsal fins located near the tip of the tail
- Typically have large thorns along midline or tail.

Rays:

- Pelvic fins have single lobe.
- Slender, whip-like tail (if complete) with spine. Dorsal fin located at base of tail if present.
- No thorns present along midline.

RAYS

Myliobatis aquila,
Common Eagle Ray

Mobula mobula,
Giant Devil Ray

Dasyatis pastinaca,
Common Stingray

Pteroplatytrygon violacea,
Pelagic Stingray

TORPEDO RAYS

Tetronarce nobiliana,
Atlantic Torpedo Ray

Torpedo marmorata,
Marbled Torpedo Ray

SKATES


Leucoraja naevus, **Cuckoo Ray**
Leucoraja fullonica, **Shagreen Ray**
Leucoraja circularis, **Sandy Ray**
Rajella fyllae, **Round Ray**
Raja clavata, **Thornback Ray**
Raja microocellata, **Small-eyed Ray**
Raja undulata, **Undulate Ray**
Raja brachyura, **Blonde Ray**
Raja montagui, **Spotted Ray**
Dipturus nidarosiensis, **Norwegian Skate**
Amblyraja radiata, **Starry Skate**
Amblyraja hyperborea, **Arctic Skate**
Dipturus intermedius, **Flapper Skate**
Dipturus oxyrinchus, **Longnosed Skate**
Dipturus batis, **Blue Skate**
Rostroraja alba, **White Skate**
1 metre

EGGCASES

Oviparity (egglaying) occurs in five orders and 13 families across chondrichthyan taxa:

- Horn Sharks (Heterodontiformes)
- Carpet & Zebra Sharks (Orectolobiformes)
- Catsharks (Carcharhiniformes)
- Skate (Rajiformes)
- Rabbitfish (Chimaeriformes)

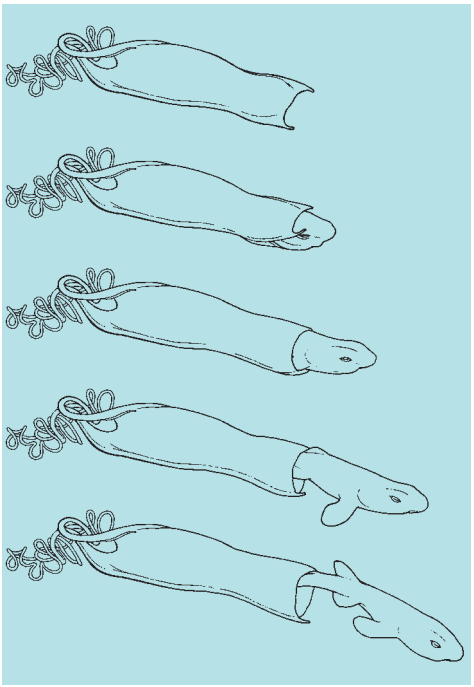
In the British Isles and Northeast Atlantic, egglaying elasmobranchs most often encountered are found in the skate (Rajidae) and catshark (Scyliorhinidae) families.

Made of keratin and collagen, tough leathery eggcases house a large yolk that provides the necessary nutrients for the embryo to develop. As the embryo grows it absorbs the nutrients from the yolk, which shrinks until fully absorbed. Whilst relatively impermeable, small slits along the horns or margins allow oxygenated water to enter, which is then pumped around the capsule when the embryo moves around or beats its tail.

Mature females produce eggcases in pairs, one from each ovary. The eggcases are deposited onto the sea floor or attached to a substrate e.g. seaweed and reefs. Features including curled tendrils, horns or sticky mucus filaments (depending on the species) help to anchor them and protect from wave and tidal force. Once deposited, they receive no further parental care.

After a lengthy incubation period (which varies between species, and is affected by water temperature), of more than a year for some, the young will emerge from an opening between the horns or tendrils and is fully independent.

Once empty, eggcases, also known as mermaid's purses, are much lighter and can drift ashore where they can be found washed up on beaches. Different sizes, shapes, and features can help determine which species it once belonged to. By reporting spent eggcases, important information can be gathered about diversity and broad distribution of oviparous elasmobranchs, as well as potentially indicating the location of egglaying sites and filling in knowledge gaps in the biology of skates and egglaying sharks.



Hatching sequence of a catshark.

SPOTTED RAY

Raja montagui

Capsule length: 5–6cm

Capsule lengths are for soaked eggcases and exclude horns.

SMALL-EYED RAY

Raja microocellata

Capsule length: 7–8cm

THORNBACK RAY

Raja clavata

Capsule length: 6–7cm

STARRY SKATE

Amblyraja radiata

Capsule length: 3.5–4.5cm

UNDULATE RAY

Raja undulata

Capsule length: 7–8cm

BLONDE RAY

Raja brachyura

Capsule length: 10–12cm

CUCKOO RAY

Leucoraja naevus

Capsule length: 5–6cm

Eggcases can be reported to the Shark Trust's Great Eggcase Hunt via the online recording form at www.sharktrust.org/recordyoureggcase or by downloading the iPhone or Android smartphone app.

WHITE SKATE

Rostroraja alba

Capsule length: 13–15cm

Limited range

FLAPPER SKATE

Dipturus intermedius

Capsule length: 15–20cm

Previously known as Common Skate. Limited range.

BLUE SKATE

Dipturus batis

Capsule length: 13–15cm

Eggcases rarely reported to the Great Eggcase Hunt.

CATSHARKS

You may know these species as dogfish, but they are in truth catsharks, as true dogfish give birth to live young.

NURSEHOUND

Scyliorhinus stellaris

Capsule length: 8–10cm

SMALLSPOTTED

Scyliorhinus canicula

Capsule length: 5–7cm

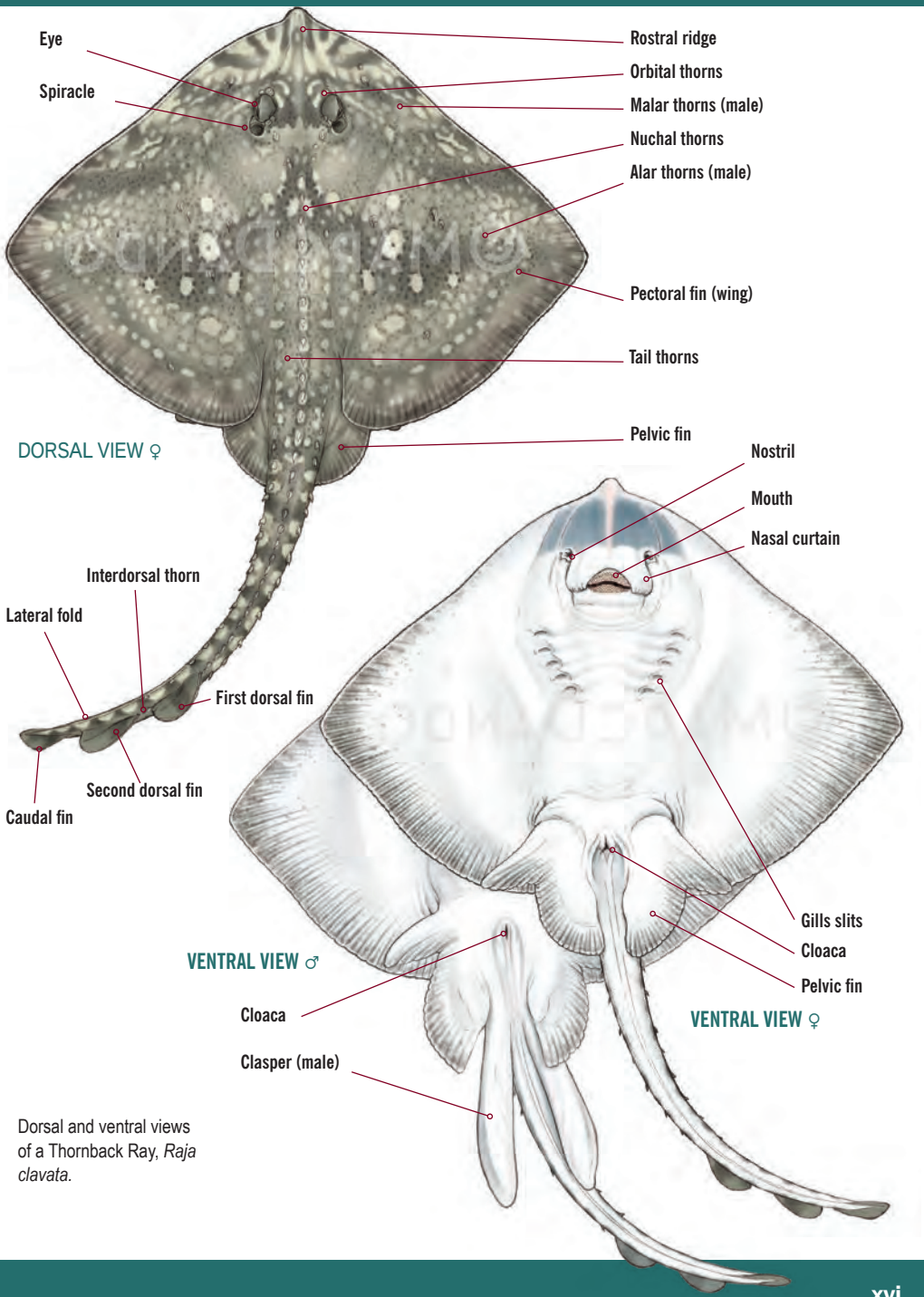
5–7cm

BLACKMOUTH

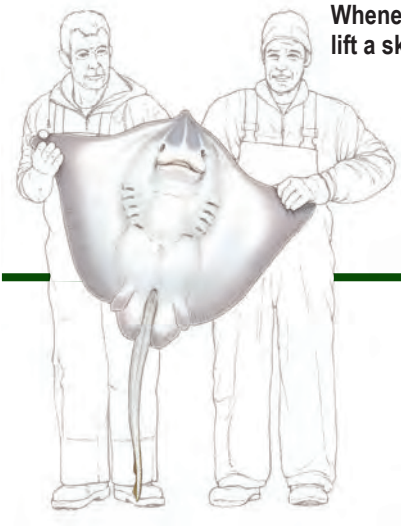
Galeus melastomus

Capsule length: 4.5–6.5cm

Deepwater species, eggcases rarely reported.



Dorsal and ventral views of a Thornback Ray, *Raja clavata*.



Whenever possible, lift a skate or ray to move it

Hold or lift a skate or ray under mid-body and base of the tail

Avoid contact with the gills and spiracles, which can be easily damaged

Dragging or holding a skate or ray solely by its tail can easily damage the animal

Benthic or Demersal Bottom-dwelling organisms that live on or near the substrate.

Boreal Cold climatic northern regions.

Buckler thorn Large thorns with swollen bases and sharp, curved tips.

Carrion An already dead/decaying animal.

Cephalic lobe/fins Paddle-like projections located on either side of the head that help to guide food into the mouth.

Cephalopod Invertebrate animal group including squids, octopuses, cuttlefishes.

Continental shelf The gently sloping seafloor that extends from the shoreline to the top of the continental slope to a depth of ~200m.

Continental slope The steeply sloping seafloor that extends from the edge of the continental shelf.

Crustacean Animal group with hard exoskeletons e.g. lobsters, crabs, prawns.

Cusp A projection on a tooth.

Cusplet A smaller projection on a tooth.

Dermal denticle A small tooth-like scale, usually very small and close-set.

Diurnal During the day.

Dorsal The upper side of the animal.

Endothermic An organism that is capable of the internal generation of heat.

Epipelagic An organism that lives in the uppermost layer of the ocean, usually depths 0-200m.

Fecundity The reproductive output of an organism i.e. number of young produced.

FNA Fins Naturally Attached.

Fusiform Elongated body tapering at both ends.

Insular shelf The sloping area around an island or continent that descends to about 200m.

Intertidal Area of the shoreline between high and low tide.

Nocturnal Active at night.

Oceanic The open ocean beyond the continental shelf.

Oophagy Egg eating; embryos in the uterus feed on unfertilised eggs.

Orbital thorns Row of thorns around the eyes.

Oviparous Mode of reproduction where eggs are produced in toughened capsules and left to develop independently.

Ovoviviparous or Aplacental Viviparity Mode of reproduction where eggs develop and hatch within the body of the female before being born as fully developed live young.

Papillae Small, fleshy projections.

Pelagic Referring to an organism that lives in the water column or fisheries in open water.

Seamount A large undersea mountain rising to at least 1,000m above the sea floor.

Spinulose Covering of small spines, giving a prickly feel.

Submarine canyon A steep-sided valley in the sea floor of the continental slope.

Substrate The surface on which an organism lives.

Symphysial teeth Distinctive teeth on or either side of the midline of the upper and lower jaw.

Teleosts Fish with bony skeletons.

Temperate Climates characterised by relatively moderate mean annual temperatures.

Terminal mouth Mouth is located at very front of the head, with equal upper and lower jaws.

Thermocline Transition layer between warmer upper layer at the ocean's surface and cooler layer of water below.

TL Total Length.

Ventral The underside of the animal.

Vestigial No longer has a function.

Viviparous Live-bearing mode of reproduction, as with mammals.

SHARK TRUST

Safeguarding the future of sharks, skates and rays through positive change. We achieve this through science, education, influence and action.

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