

What is a mermaid’s purse?

Although most sharks and rays give birth to live pups, some species actually lay eggs that are surrounded by a tough protective case. These eggcases can often be seen washed up on beaches and are sometimes referred to as mermaids’ purses. The purses are initially laid by the adult female in a suitable habitat on the seafloor, with the young embryo developing within the eggcase for up to 15 months. The baby shark, skate or ray then hatches out of the purse and swims away, leaving the discarded eggcase behind it. Observations of mermaids’ purses on the seashore (and underwater) can provide valuable information on the location of shark and ray nursery areas.



A purse containing a developing dogfish embryo © (Alice Wiegand)

Getting involved in shark and ray conservation.

There are a number of shark and ray conservation programmes that depend on public participation in Ireland. Some of these projects are listed below:

Purse Search Ireland, Marine Dimensions.

This project encourages the Irish beach going public to report their sightings of shark, skate and ray eggcases (aka mermaids’ purses). Resulting observations are then used by scientists to map nursery areas, improving information necessary for fisheries conservation and management. For more information, go to www.marinedimensions.ie or call Marine Dimensions at 01 2828876.



Shark and ray eggcases are regularly washed up on beaches around Ireland’s coastline. © (Sarah Varian).

The Basking Shark Sightings Scheme, Irish Whale and Dolphin Group.

This sightings scheme encourages the Irish seafaring public to report their observations of basking sharks. A tagging programme for the sharks has also been set up and observations of sharks, with or without tags, may be submitted to the IWDG at Merchants Quay, Kilrush, Co. Clare or online at www.iwdg.ie.

The Marine Sportfish Tagging Programme, The Central Fisheries Board.

Anglers can make a valuable contribution to shark and ray research and conservation by participating in the Central Fisheries Board’s tagging programme. For more information, go to www.cfb.ie or call 01 8842672.



A rare White Skate (Rostoraja alba) eggcase found by a beachcomber in Tralee Bay. © (Sarah Varian)

Other useful websites

www.sharkalliance.org

The Shark Alliance is a global coalition of non governmental organisations dedicated to the conservation of sharks and rays.

www.heritagecouncil.ie

The Heritage Council is a statutory body concerned with the identification, protection, preservation and enhancement of the national heritage.

www.marine.ie

The Marine Institute is the national agency responsible for marine research, technology development and innovation.

www.bim.ie

Bord Iascaigh Mhara is the Irish State agency with responsibility for developing the Irish sea fishing and aquaculture industries.

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Thanks to Beatrice Kelly, Cliona O’Brien, Kylie Corcoran, Declan Quigley and Gary Hannon for comments on the manuscript.

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Cover photo: Ireland’s largest fish, the Basking Shark.
© (Andy Murch)

Ireland’s sharks and rays



Sharks and rays have existed for millions of years

Sharks and rays have been swimming the world’s oceans for over four hundred million years. That’s one hundred million years before the first dinosaurs appeared on land! In evolutionary terms, they are one of the most successful families of animals, managing to survive mass extinction events with their diversity relatively in tact. Sharks and rays inhabit every ocean and play a vital role in maintaining the health of marine ecosystems.

Worldwide, there are at least 453 species of sharks and over 500 species of skates and rays. A wide variety of sharks and rays inhabit Irish waters, including 39 species of sharks and 28 species of skates and rays. Members of this diverse group can be found in all our seas, ranging from shallow estuaries down to depths of 2000m or more in the Atlantic.

Most sharks are harmless to humans

Most shark species are small and harmless to humans. About half of them reach less than 1m in length and 80% are smaller than an adult human. There is always a lot of media attention when sharks bite people, but in reality, the vast majority of shark species pose no threat to humans and the chance of a shark attack is very small. In fact, recent studies have shown that more people are killed each year worldwide by defective toasters than by sharks!



Fishing for sharks, skates and rays is very popular during the summer months in Ireland.
© (Mark Gannon)

In Ireland, one of our most common shark species, the Lesser Spotted Dogfish (Scyliorhinus canalicula), measures less than 1m in length.
© (Nigel Motyer)



Ireland’s largest fish, the Basking Shark (Cetorhinus maximus), can grow up to 12m in length. It feeds only on minute plankton and tiny fish. © (Padraig Whooley, IWDG)

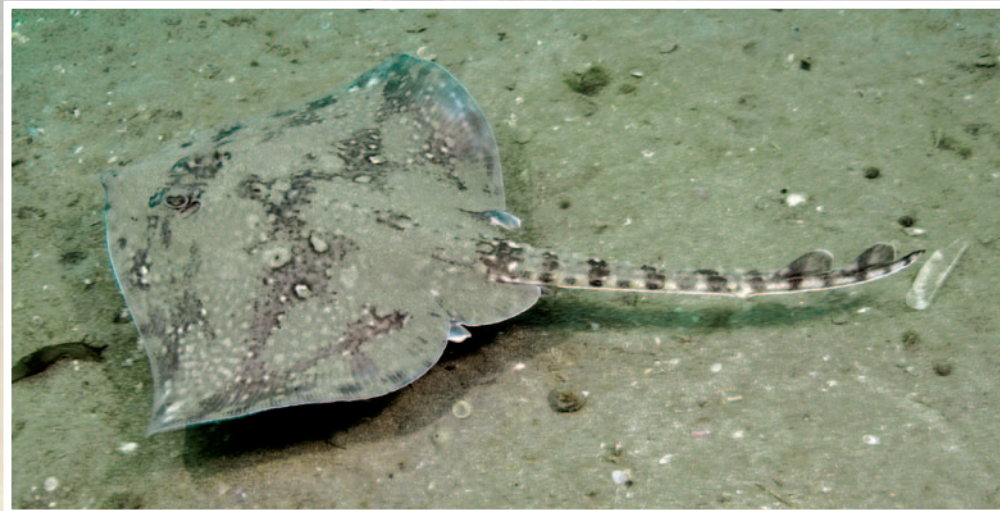
Sharks as a resource

Sharks and rays are fished commercially throughout Europe for their meat, livers, cartilage and fins. There is a particularly strong demand in Asia for shark fins, which are used to make shark fin soup, a traditional Chinese delicacy which has become popular in recent years. In Ireland, ray wings and dogfish meat (aka rock salmon or huss) are sold in fish shops, whereas the livers and fins of oceanic sharks are exported to other countries. There used to be a fishery for basking sharks in the west of Ireland, but this was closed in the 1970’s when the local stock collapsed (most likely as a result of overfishing). A number of other European shark fisheries are now also seriously depleted and there is a growing concern for the status of stocks. There is also an important recreational fishery in Ireland and sea angling is very popular during the summer months. Shark and ray related tourism (including SCUBA diving) is becoming an increasingly valuable revenue source for coastal communities around the world.

How sharks and rays differ from other fishes

They have gill slits rather than gill covers like bony fishes. Most sharks need to keep moving in order to move water across their gills so that they can breathe, whilst rays have an organ called a spiracle which allows them to breathe whilst resting on the seafloor. Sharks and rays are sometimes called elasmobranchs by scientists. This is a Latin word that literally means strap gill, referring to the way in which the gills are structured.

They have skeletons that are composed of cartilage rather than bone. This is the same as the cartilage that humans have in their noses and ears. The cartilage is lighter than bone and it helps the fish to stay buoyant, although most sharks have to keep swimming in order to avoid sinking to the bottom. The more highly evolved bony fishes have an organ called a swim bladder that they can fill with air in order to move up and down in the water. This is similar to the buoyancy device used by a SCUBA diver.



Skates and rays have very large pectoral fins that act a bit like wings. They help to prevent the fish from sinking. They also use their wings to trap their prey against the seabed. © (Andy Murch)



Sharks are generally very well streamlined, enabling them to move quickly through the water. The Shortfin Mako (*Isurus oxyrinchus*) can move at speeds of up to 31 miles per hour. © (Andy Murch)

They don't have overlapping scales like most fishes. Instead, their skin is covered with tiny tooth-like projections called denticles which channel water over the shark's body to reduce friction. The hydrodynamics of shark skin has even inspired the swimwear industry in Australia, where the skin structure has been replicated in order to increase swimming speeds.

They have seven senses, including the same five senses as humans, ie. hearing, sight, touch, taste and they have a particularly good sense of smell. Indeed, sharks have been shown to be able to detect one part of blood to a million parts of water. That's the equivalent of one teaspoon in an average swimming pool! Their sixth electrical sense also allows them to detect very small electrical signals made by other animals, whilst the seventh sense - the lateral line system - is designed to detect small differences in pressure between one point and another. This helps them to locate predators and prey.

The role of sharks and rays in the marine environment



The Blue Shark (*Prionace glauca*) is known to migrate vast distances. © (Andy Murch)

Sharks and rays play an important role in the marine ecosystem. Most serve as top predators, with the larger species likely to significantly affect the size and structure of prey populations. The role of some shark species is similar to the role of the great cats (lions, tigers and cougars) on land. They eat the slower fish in a school of mackerel or herring in the same way as cats eliminate the weak or slow animals in a herd of wildebeests or deer. Loss of these important predators can disrupt the balance of an ecosystem.

Some sharks and rays migrate vast distances to find food or to reproduce. In Ireland, the Central Fisheries Board's Marine Sportfish Tagging Programme was set up in 1970 in order to find out more about the migratory patterns of various species captured by sea anglers around our coasts. The fish are tagged on the boat by the skipper and then carefully released back into the sea. Anyone can then report their observation of a tagged fish that has been recaptured. Over 70 chartered angling boats are now involved in this voluntary programme.

The Spurdog

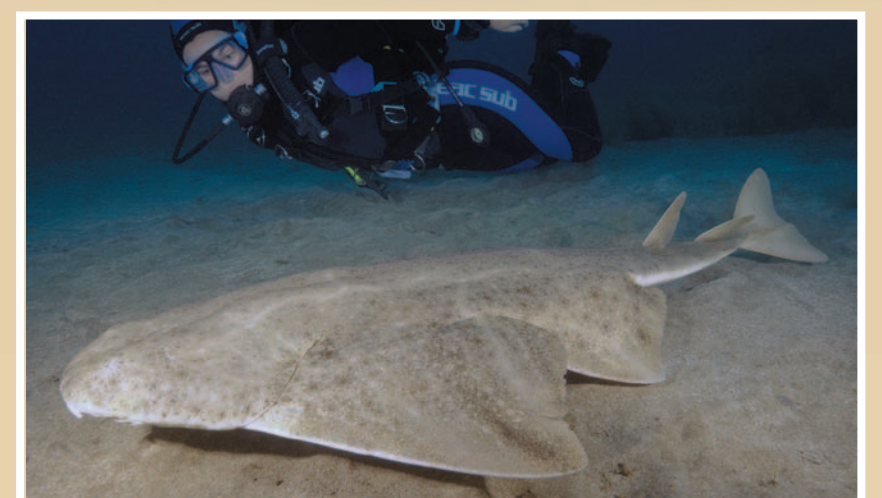
The Spurdog or Spiny Dogfish, *Squalus acanthias*, is one of Europe's most commercially important species. Sought for its liver oil in the first half of the 1900s, this species is now valuable for its meat; it is frequently sold as rock salmon or huss in fish and chips shops. However, populations have been declining in recent years and the spurdog is now classified as critically endangered in the north east Atlantic by the World Conservation Union (2008). Its reproductive biology makes it particularly vulnerable, with female fish carrying their pups for two years.



The Spurdog is classified as critically endangered by the IUCN. © (Andy Murch)

The Angel Shark

The angel shark *Squatina squatina*, sometimes called the monkfish, used to be a fish that was frequently caught by anglers on the west coast of Ireland. However, in recent years its numbers have seriously declined and it is now classified as critically endangered by the World Conservation Union. Little is known about its reproductive biology, although we do know that it has moderate sized litters, producing between 7 and 25 pups.



The Angel Shark is classified as critically endangered by the IUCN. © (Andy Murch)

Sharks and rays are vulnerable

Assessment of the status of European sharks and rays by the World Conservation Union (ie. IUCN 2008) has led to the classification of roughly one quarter (26%) of evaluated species as threatened (either critically endangered, endangered or vulnerable), with another 20 percent at risk of becoming so in the near future. This is related to the biology of many species of sharks and rays making them more vulnerable and susceptible to overfishing. Sharks and rays are generally slow growing and long lived, with females tending to reproduce later in life, often producing very few offspring. All these factors make it more difficult for a population to recover quickly from periods of intensive fishing. Many sharks and rays are also caught as unwanted bycatch in fisheries that mean to target other fish species, thus further complicating the issue. The resulting need for conservation management has resulted in the development of an Action Plan for the Conservation and Management of Sharks by the EU.

Threatened species in Ireland include the Common Skate *Dipturus batis*, White Skate *Rostroraja alba*, Spurdog or Spiny Dogfish *Squalus acanthias*, Angel Shark *Squatina squatina*, Porbeagle Shark *Lamna nasus* (all classified as critically endangered by the IUCN), Gulper Shark *Centrophorus granulosus*, Leafscale Gulper Shark *Centrophorus squamosus* and Basking Shark *Cetorhinus maximus* (classified as vulnerable).



An angler holding a Common Skate. © (Mark Gannon).

The Common Skate

Although a previously common fish species (hence the name) in the North East Atlantic, the Common Skate *Dipturus batis* is now, rather ironically, absent from the Southern and Central North Sea, the Irish Sea and most of the British coastline. Only small localised populations remain in Ireland and Scotland. The male Common Skate does not reproduce until it is over 10 years old and its large size (up to 2.9m in length) makes it particularly vulnerable to fishing. In an

effort to protect the animals in Ireland, the Irish Specimen Fish Committee has removed the species from listings, encouraging recreational fishers to return specimens to sea. However, there are currently no legal protection measures in place for this species. The Common Skate is classified as critically endangered by the World Conservation Union (2008).

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