



## Exhibit message

There are some more unusual species of shark that have evolved interesting body shapes to attract and capture prey.

## Quick fact

There are more than 350 species of shark in the world, ranging in size from a few centimetres to several metres long.

The swellshark (*Cephaloscyllium ventriosum*) has an unusual technique to avoid being eaten by larger sharks. It wedges itself between rocks with its back facing out and holds its tail in its mouth. It swells up by swallowing lots of seawater, so it is wedged like a tough balloon between rocks, making it difficult for other sharks to bite or remove it.

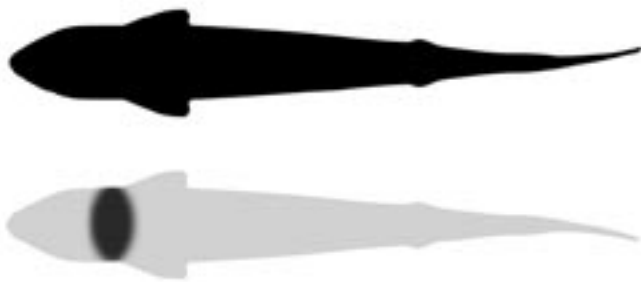
## Graphic panel text

### Cookie cutter shark (*Isistius brasiliensis*)

These small sharks carve out plugs of flesh from marlin, tuna, dolphins, elephant seals and whales.

Their lips attach to flesh by suction. They then twist their bodies around to leave a crater-like scar.

Cookie cutter sharks use countershading, and have dark coloured backs, with a light bioluminescent underbelly.



Their dark fish-shaped collar may act like a lure. When fish beneath the cookie cutter shark look up, they may see the fish shaped collar, and think it is a fish.

If they swim up towards the cookie cutter shark to catch it, the cookie cutter shark can then bite into the unsuspecting predator.

### Common sawshark (*Pristiophorus cirratus*)

Saw sharks have flattened snouts, which are lined with sharp teeth, like a saw.

As they swim through a school of fish, they swing their 'saw' from side to side, stunning and cutting through small prey such as fish, crustaceans, and squid.

They then swim along eating up the stunned prey with their mouth

Long, thin barbels are used to detect electrical impulses of prey.

## Want to know more about cookie cutter sharks and saw sharks?

### Cookie cutter sharks

The cookie cutter shark earned its name from the way it removes a plug of flesh from prey, leaving them scarred, but alive—similar to cutting out biscuit shapes from a sheet of pastry.

Cookie cutters feed on large, fast-swimming prey, such as tuna, swordfish and porpoises. They're both parasites and predators, because they can remove plugs of flesh from prey, but they also swallow small squid whole.

Cookie cutters press their lips against prey and create an oral vacuum against the prey's flesh. (In laboratory conditions, a live cookie cutter shark created an oral vacuum strong enough to lift another fish in mid-air).

The shark then bites into the prey's flesh. The cookie cutter's upper teeth are small and thorn-like, while their lower teeth are larger, flattened and triangular. Their lower teeth are lost and replaced as one whole unit, rather than lost and replaced individually.

After biting into the prey's flesh, the cookie cutter twists its own body and removes a plug of flesh out of the prey.

Many predators hunt for prey by searching the waters above for a dark silhouette. To avoid being detected by predators, some fish have evolved a glowing, bioluminescent body so their silhouette is broken up and they blend with light streaming down from the water's surface. This bioluminescent belly adaptation is called counter illumination.



The cookie cutter's stomach and chin glow with a greenish bioluminescence. The glow is produced by thousands of tiny photophores (0.03-0.05 millimetres in diameter) packed together very closely.

Parts of the cookie cutter's body remain dark and do not glow, such as their back (dorsal side), and a dark strip or 'dog collar' around their neck. This 'dog collar' may be used by cookie cutters as a lure to tempt faster, larger fish swimming beneath them.

As these larger prey look upwards, they may see the cookie cutter's 'dog collar' and think it is a smaller fish. The larger prey then swims up to the cookie cutter without observing the rest of the cookie cutter's silhouette, which is concealed by its glowing belly. As the large prey moves near the cookie cutter's chin, the cookie cutter latches onto the prey and removes a plug of flesh.

### Sawsharks

Very little is known about sawsharks. They have an elongated blade-like snout that is studded with teeth around its edge. Scientists think that sawsharks use their snout to stun and kill small fish or perhaps they sweep it through sediment on the sea bed in search of prey.

Two long tentacles called barbels usually extend from underneath the sawshark's snout. The barbels may be used to detect the presence of prey by sensing electrical nerve impulses given off by prey or by tasting the surrounding water.

Sawsharks are often confused with sawfishes (which look very similar), but they differ in the following ways.

Sawsharks:

- are sharks
- have five gill slits on the side of their head and neck (except one species which has six gills)
- reach lengths between 0.75 to 1.2 metres
- have long, thin barbels extending from their snout
- live only in marine environments (saltwater), usually on the sea bed.

However, sawfishes:

- are rays
- have five gill slits on the underside of their head
- grow larger (up to 6 metres long)
- do not have barbels and
- enter brackish and fresh water.

The long-nose or common sawshark (*Pristiophorus cirratus*) is an abundant species of sawshark that can swim in large groups or schools. Many of these sawsharks are caught by trawl fishing boats, as their flesh is eaten by humans.

### Further information

*Sharks in Question*. The Smithsonian Institution. 1989. Victor G. Springer, Joy P. Gold.

A predatory use of counterillumination by the squaloid shark, *Isistius brasiliensis*. *Environmental Biology of Fishes*. Edith A. Widder. 1998. Vol 53: 267–273.

ReefQuest

<http://www.elasmo-research.org/index.html>

### Cookie cutter shark

[http://www.amonline.net.au/wild\\_kids/sharks/cookie\\_cutter.htm](http://www.amonline.net.au/wild_kids/sharks/cookie_cutter.htm)

<http://www.fishbase.org/Summary/SpeciesSummary.cfm?genusname=Isistius&speciesname=brasiliensis>

<http://www.austmus.gov.au/fishes/fishfacts/fish/ibrasil.htm>

[http://www.ncf.carleton.ca/~bz050/HomePage.giant\\_cookiecutter.html](http://www.ncf.carleton.ca/~bz050/HomePage.giant_cookiecutter.html)

### Sawshark

[http://elasmo-research.org/education/shark\\_profiles/pristiophoriformes.htm](http://elasmo-research.org/education/shark_profiles/pristiophoriformes.htm)

<http://www.marinethemes.com/indexFrame.html>

Eastern sawshark

<http://www.amonline.net.au/fishes/fishfacts/fish/pristioph.htm>