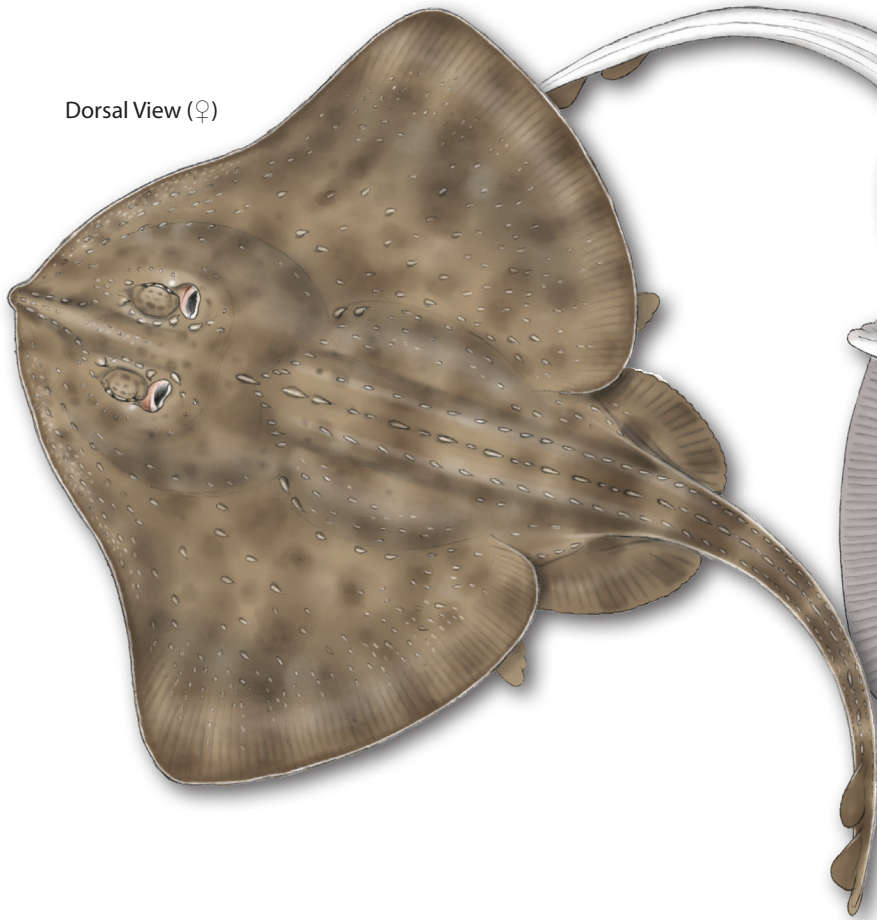
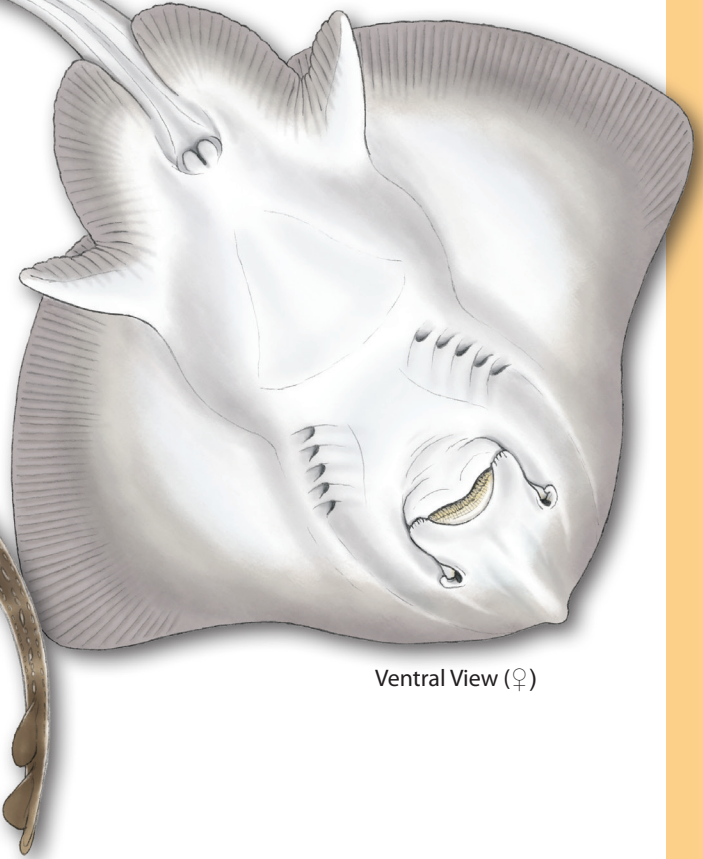


Dorsal View (♀)



Ventral View (♀)



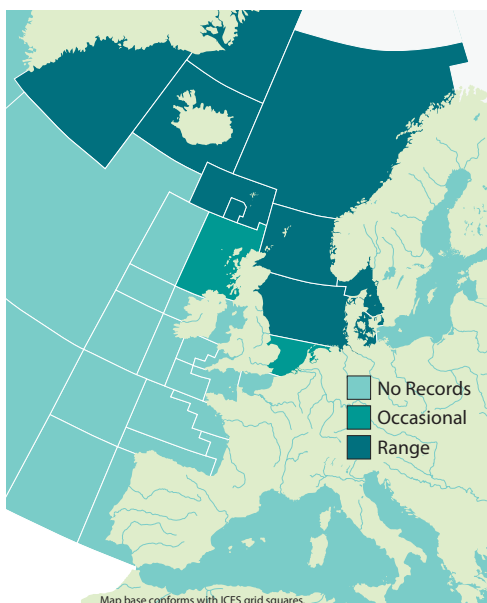
COMMON NAMES

Starry Skate, Starry Ray, Thorny Skate, Maiden Ray, Miller Ray, Raie Radiee (Fr), Raya Radiante (Es).

SYNONYMS

Raia americana (DeKay, 1842), *Raia scabrata* (Garman, 1913), *Raja radiata* (Müller & Henle, 1841), *Deltaraja radiata* (Leigh-Sharpe, 1924).

DISTRIBUTION



Found in the east Atlantic from the English Channel as far north as Svalbard and across to Iceland. In the west Atlantic it is found from South Carolina as far north as Canada and Greenland (Kittle, Unknown). There are some reports of the species in deepwater off South Africa (Whitehead *et al.*, 1986).

APPEARANCE

- Maximum total length ~90cm.
- Dorsal surface brown and covered in dark spots.
- Sometimes one white spot beside each eye.
- Ventral surface white, occasionally with dark blotches.
- Row of 13-17 thorns along midline to first dorsal fin.
- Maximum of 10 of these on tail (measured from cloaca).
- Thorns have star shaped bases.

The Starry Skate has a short, blunt snout and rounded pectoral fin tips. The dorsal fins can be joined at the bases or slightly separate. There is occasionally a single thorn between them if separate (Whitehead *et al.*, 1986). The leading edge of the disc is concave in females and juveniles, more undulate in males (Stehmann and Bürkel, 2000).

There is a row of 13-17 large thorns along the midline of the back from the head to the first dorsal fin and smaller thornlets scattered all over the upper surface of the disc and tail. These thorns have star shaped bases giving the species its common name. The ventral surface of the disc is smooth except for some prickles on the snout (Whitehead *et al.*, 1986).

The dorsal surface of the disc is generally brown and can be covered in darker spots organised into rosettes. These are more distinctive in younger animals (Whitehead *et al.*, 1986). There is sometimes a white spot beside each eye, one on each side. Single white spots can sometimes be found on each side of the rear of the disc. The ventral surface is white, sometimes with dark blotches (Kittle, Unknown). Rarely there are dark and light crossbars on the



tail, making confusion with the Thornback Ray, *Raja clavata*, possible (Stehmann and Bürkel, 2000). The Starry Skate can reach a maximum total length of 90cm in deep water and higher latitudes. This is reduced to around 60cm in shallower water and lower latitudes. In the latter case it matures at around 40cm but in the deeper, more northerly populations it may still be immature at 80cm (Whitehead *et al.*, 1986). Mature males have extremely large claspers with thickened, club-like ends and a single, stiff spine on the upper lobe of each (Stehmann and Bürkel, 2000).

SIMILAR SPECIES

Amblyraja hyperborea, Arctic Skate

Leucoraja fullonica, Shagreen Ray

Raja asterias, Starry Ray (not illustrated)

Raja clavata, Thornback Ray

Amblyraja radiata,
Starry Skate

Amblyraja hyperborea,
Arctic Skate

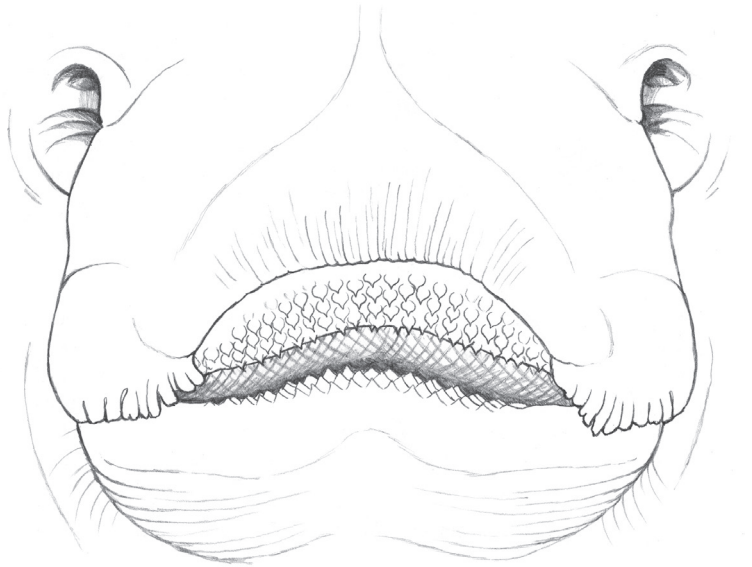
Leucoraja fullonica,
Shagreen Ray

Raja clavata,
Thornback Ray

(Not to scale)

TEETH

The dentition consists of 36-46 rows of teeth with round bases on each jaw plate. Females and juveniles have low cusps which are worn almost smooth in the older rows. Mature males have sharper, more widely spaced teeth which are used to hold the female during copulation (Kittle, Unknown). They may also be indicative of a difference in diet between the sexes, although this has not been observed (Packer *et al.*, 2003).



ECOLOGY & BIOLOGY

HABITAT

The Starry Skate is found in marine and brackish waters in depths ranging from 18 to 1,200m (60–3,940ft) and temperatures of -1.3–14°C (29.7–57.2°F), although it is predominantly encountered from 50–100m (164–328ft) in temperatures of 2–5°C (35.6–41°F). It can tolerate salinity levels of 31.2–35.3 parts per thousand. A bottom dwelling species in coastal seas and on continental shelves, It is found over a variety of substrates such as sand, gravel and soft mud (Kittle, Unknown).

DIET

Studies from across the North Atlantic have shown that the Starry Skate is an opportunistic feeder, feeding on the most abundant and available prey species in an area (Skjæraasen and Bergstad, 2000). In the northwest Atlantic, polychaetes and decapods are the major prey items followed by amphipods and euphausiids. Fishes and mysids are present but constitute a small part of the diet (McEachran *et al.*, 1976). It is apparently not uncommon for the Starry Skate to feed on trawler discards (Berestovskii, 1989).

REPRODUCTION

The Starry Skate is oviparous and, in the Gulf of Maine at least, reproductively active all year round (Kittle, Unknown). As with most elasmobranchs it matures relatively late. In North American and Canadian waters it reaches a maximum recorded age of 16 years and does not reach sexual maturity until 11 years of age at a length of 88cm for males and 86.5cm for females (Kittle, Unknown).

The females lay up to 88 eggcases (usually with more in the right ovary than the left) per year (Whitehead *et al.*, 1986) which are deposited on sand or mud substrates (Kittle, Unknown). These eggcases measure 42–66mm long (excluding horns) and 25–53mm wide (Whitehead *et al.*, 1986). Laboratory studies have shown the incubation period for these eggcases can be as long as 2–2.5 years in water temperatures of -0.3–9.5°C. When the young finally emerge they are fully formed and measure 10.4–11.4cm in length (Berestovskii, 1994).

It is thought that Starry Skate eggcases are eaten by a variety of fish such as Atlantic Halibut, *Hippoglossus hippoglossus*, and the Greenland Shark, *Somniosus microcephalus* (Kittle, Unknown).

EGGCASE

1. Small, 34–89mm in length (excluding horns).
2. 23–68mm in width.
3. Obvious keels (Shark Trust, 2008).

Similar eggcase to the Thornback Ray, *Raja clavata*.



COMMERCIAL IMPORTANCE

Historically, the Starry Skate has not been commercially important due to its small size. However, it is regularly taken and sold in multispecies trawls across its range. As populations of other species of skate decline it is likely that it will be targeted, a process that has already begun in the western Atlantic (Kittle, Unknown).

THREATS, CONSERVATION, LEGISLATION

The Starry Skate is the most abundant skate in the North Sea and it is possible that its population has increased to fill the niche left by falling populations of larger species such as the Common Skate, *Dipturus batis* and the Long-nosed Skate, *Dipturus oxyrinchus*. In the central North Sea, a marked increase in numbers was observed between 1970 and 1983 with similar increases being observed between 1982 and 1991 across English waters. A recent survey indicated a decline but this is believed to be a result of a change in survey gear (Gibson *et al.*, 2006).

It is common throughout the northeast Atlantic but is not so abundant in the northwest. The government of the USA has recently banned commercial targeting of the species in response to reports of falling populations along the coast of North America (Kittle, Unknown). In the Black Sea, it can regularly constitute as much as 96% of the elasmobranchs caught in survey trawls or as bycatch (ICES, 2008b).

All rajids are managed under a Total Allowable Catch (TAC) system in EU waters. Between 1999 and 2005 the 6,060t TAC was reduced by 47% and by a further ~50% from 2005 to 2008 (ICES, 2008). Originally the TAC applied only to areas IIa and IV, however in January 2009 the TAC was extended to include ICES divisions IIa, IIIa, IV, VIa-b, VIIa-k, VII and IX.

The table below gives a summary of the TAC's for the years 2004 to 2009.

ICES Division	2004	2005	2006	2007	2009	2009
IIa, IV	3,503	3,220	2,737	2,190	1,643	1,643
IIIa	N/A	N/A	N/A	N/A	N/A	68
VIa-b, VIIa-c, VIIe-k	N/A	N/A	N/A	N/A	N/A	15,748
VIIId	N/A	N/A	N/A	N/A	N/A	1,044
VIII, IX	N/A	N/A	N/A	N/A	N/A	6,423

(All figures in tons. European Union, 2009)

Since 2008, European countries have been required to record most skate and ray landings by species to give a clearer picture of the status of populations in EU waters (ICES, 2008a).

Some Sea Fisheries Committees (SFC) around the UK have byelaws which stipulate a minimum disc width (DW) for landed skates and rays, measured from the extreme tips of the pectoral fins. These range from 36 to 45cm depending on the area (NFFO, 2004).

Many recreational anglers return any sharks, skates and rays they catch alive and some angling clubs have begun tag and release programmes (Holt, 2005). However, such localised management strategies are unlikely to be significant for the conservation of wider populations (Fowler *et al.*, 2005).

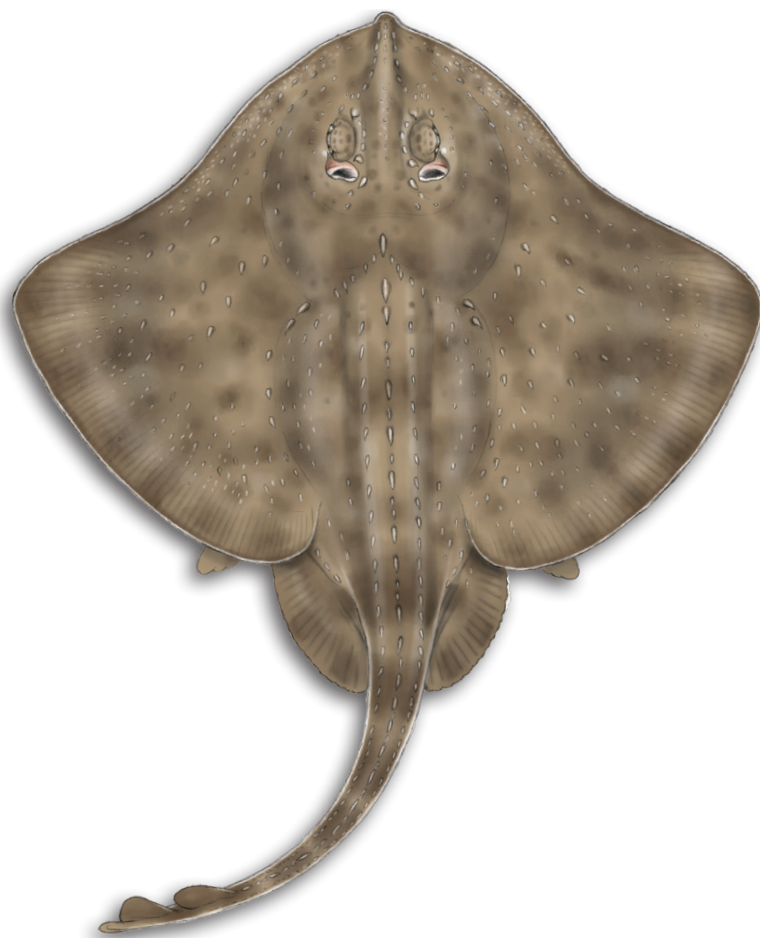
IUCN RED LIST ASSESSMENT

Vulnerable (2008).

Least Concern in northeast Atlantic.

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Row of strong thorns on midline.
- Large thorns on shoulder and nape.



REFERENCES

- BERESTOVSKII, E. G. 1989. Feeding in the skates, *Raja radiata* and *Raja fyllae*, in the Barents and Norwegian Seas. *J. Ichthyol.* 29: 88-96.
- BERESTOVSKII, E. G. 1994. Reproductive biology of skates of the family Rajidae in the seas of the far north. *J. Ichthyol.* 34: 26-37.
- EUROPEAN UNION. 2009. Council Regulation (EC) No. 43/2009. *Official Journal of the European Union*, L22/1.
- FOWLER, S. L., CAVANAGH, R. D., CAMHI, M., BURGESS, G. H., CAILLIET, G. M., FORDHAM, S. V., SIMPFENDORFER, C. A., MUSICK, J. A. 2005. Sharks, Rays and Chimaeras: The Status of the Chondrichthyan Fishes. IUCN SSC Shark Specialist Group. IUCN Publications. Cambridge, UK.
- GIBSON, C., VALENTI, S. V., FOWLER, S. L., FORDHAM, S. V., 2006. The Conservation Status of Northeast Atlantic Chondrichthyans; Report of the IUCN Shark Specialist Group Northeast Atlantic Regional Red List Workshop. VIII + 76pp. IUCN SSC Shark Specialist Group.
- HOLT, D. 2005. Common Skate tagging programme. The Scottish Angling Homepage. www.catchalot.co.uk.
- ICES. 2008a. Demersal elasmobranchs in the North Sea (Sub-area IV), Skagerrak (Division IIIa), and eastern English Channel (Division VIId). ICES advice 2008, Book 6.
- ICES. 2008b. Report of the Working Group Elasmobranch Fishes. Copenhagen, Denmark.
- KITTLE, K. Unknown. Thorny Skate. Florida Museum of Natural History. www.flmnh.ufl.edu/fish/.
- MCEACHRAN, J. D., BOESCH, D. F., MUSICK, J. A. 1976. Food division within two sympatric species-pairs of skates (Pisces: Rajidae). *Mar. Biol.* 35: 301-317.
- NFFO. 2004. Official Yearbook and Diary. Grimsby, UK.
- PACKER, D. B., ZETLIN, C. A., VITALIANO, J. J. 2003. Thorny Skate, *Amblyraja radiata*, Life History and Habitat Characteristics. NOAA Technical Memorandum NMFS-NE-178.
- SHARK TRUST. 2008. Identify Your Eggcase. www.sharktrust.org.
- SKJÆRAASEN, J. E. BERGSTAD, O. A. 2000. Distribution and feeding ecology of *Raja radiata* in the North-eastern North Sea and Skagerrak (Norwegian Deep). *ICES J. Mar. Sci.* 57: 1249-1260.
- STEHMANN, M., BÜRKEL, L. 2000. Field key to Common Skate Species (*Raja* spp.) in Northern EC Shelf Waters. Grafik Design Studio GmbH. Hamburg, Germany.
- WHITEHEAD, P. J. P., BAUCHOT, M. L., HUREAU, J. C., NIELSEN, J., TORTONESE, E. (Eds.). 1986. Fishes of the Northeast Atlantic and Mediterranean. UNESCO. Paris, France.
- Text: Richard Hurst.
Illustrations: Marc Dando.
- Citation
Shark Trust; 2009. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles. Part 1: Skates and Rays.
- Any amendments or corrections, please contact:
The Shark Trust
4 Creykes Court, The Millfields
Plymouth, Devon PL1 3JB
Tel: 01752 672008/672020
Email: enquiries@sharktrust.org
- For more ID materials visit www.sharktrust.org/ID.
- Registered Company No. 3396164.
Registered Charity No. 1064185