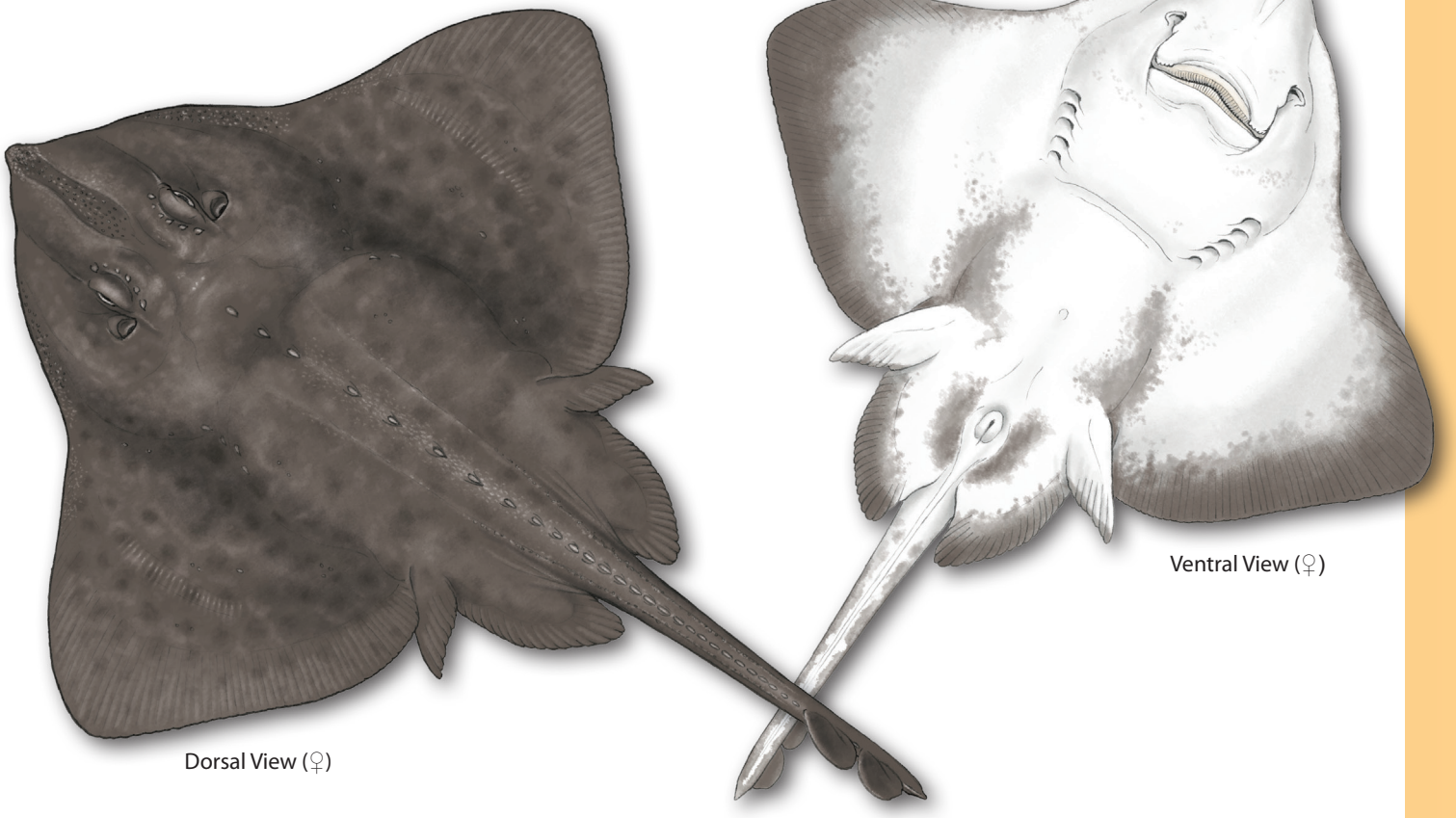
Arctic Skate

Amblyraja hyperborea



Dorsal View (♀)

Ventral View (♀)

COMMON NAMES

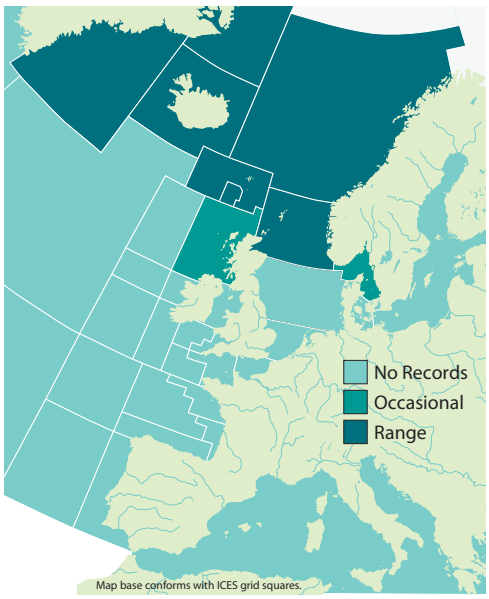
Arctic Skate, Boreal Skate, Darkbelly Skate, Northern Skate, Raie Arctique (Fr), Raie Boréale (Fr), Raya Ártica (Es).

SYNONYMS

Raja hyperborea (Günther, 1887), *Raja borea* (Garman, 1899).

DISTRIBUTION

Widespread along lower continental slopes in temperate seas. In the northeast Atlantic the Arctic Skate ranges from the southeast Barents Sea to Greenland, including the Norwegian coast as far as Spitsbergen. It is found all along the Greenland-Iceland-Faroe-Shetland Ridge and around the west coast of Ireland. In the northwest Atlantic it is found in the Davis Strait between southwest Greenland and Canada. Its range may extend as far south as the Grand Banks. It is also found in South Africa, Australia, New Zealand and a section of Pacific Central America (Costa Rica, Panama, Columbia and Ecuador). (Kulka *et al.*, 2007)



APPEARANCE

- Up to ~100cm total length.
- Dark grey/brown dorsal surface.
- Some indistinct spots and blotches.
- Ventral surface white in juveniles, darker in adults.
- Short tail.
- Row of 25-32 thorns along midline.
- Up to two thorns between dorsal fins.

The Arctic Skate has a thick body with a short tail (Agustin, 2009). The dorsal surface of the body is rough and scattered with small thorns, although mature individuals have smooth areas around the centre of their pectoral fins and along either side of its spine. There is also a regular row of 25-32 stout thorns from the nape to the first dorsal fin with up to two thorns between the dorsal fins. The ventral surface is smooth (Whitehead *et al.*, 1986).

The colouration of the dorsal surface is generally dark grey or brown with indistinct light or dark spots and occasionally large dark blotches. The ventral surface is white in juveniles only, the amount of speckling increasing with age until predominantly dark in some (Whitehead *et al.*, 1986).

The Arctic Skate is born measuring ~16-18cm long and adults can reach a maximum length of 106cm. The maximum recorded size from Canadian waters is only 63cm however (Kulka *et al.*, 2007).

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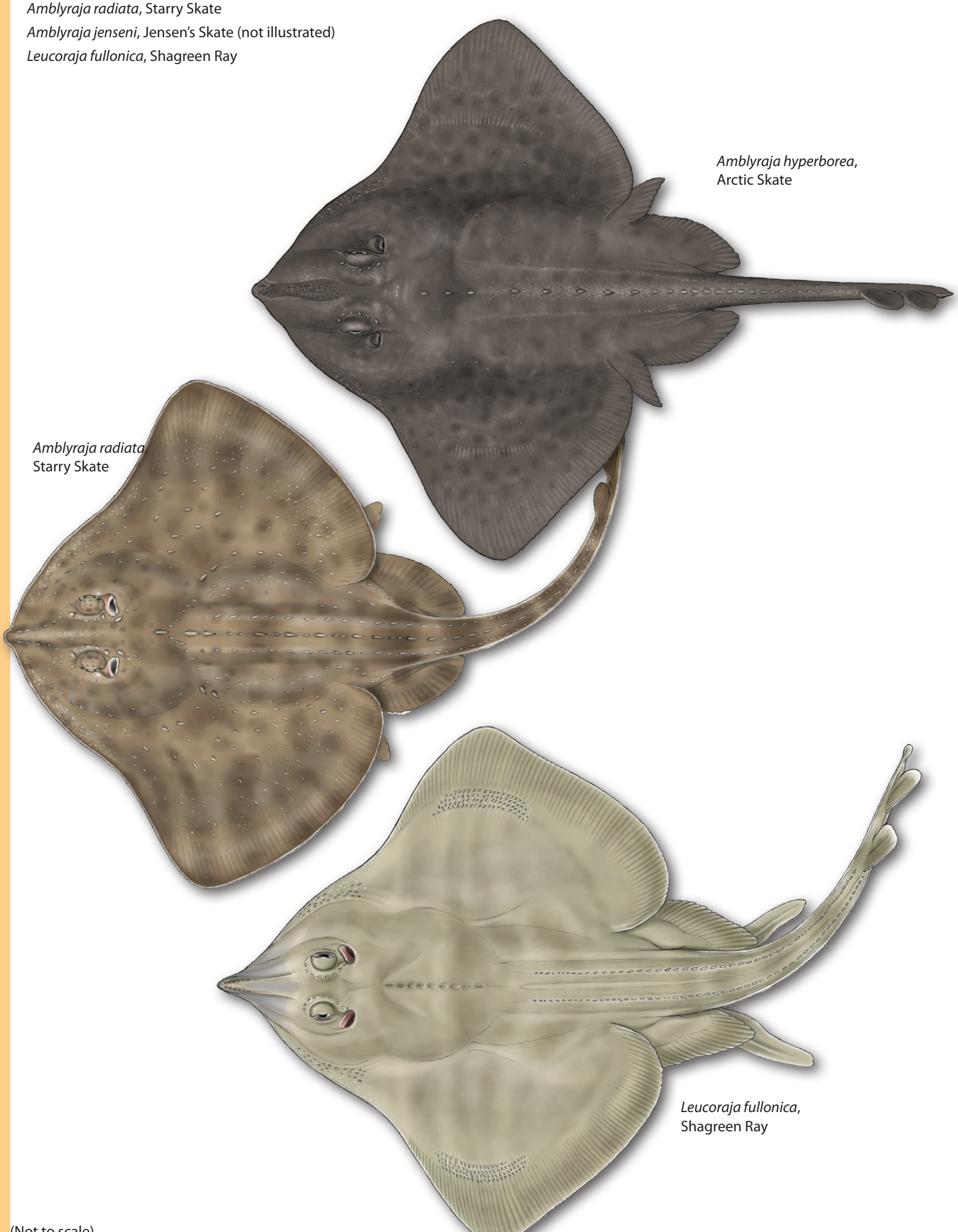
Arctic Skate

SIMILAR SPECIES

Amblyraja radiata, Starry Skate

Amblyraja jenseni, Jensen's Skate (not illustrated)

Leucoraja fullonica, Shagreen Ray



Amblyraja hyperborea, Arctic Skate

Amblyraja radiata, Starry Skate

Leucoraja fullonica, Shagreen Ray

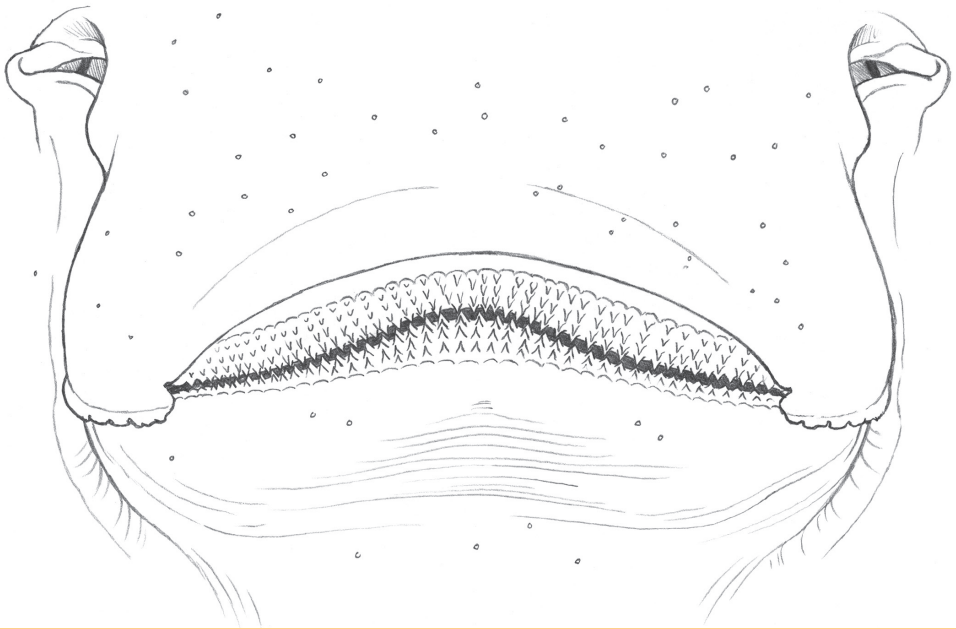
(Not to scale)

Arctic Skate

Amblyraja hyperborea

TEETH

The teeth are arranged into 35-48 rows in the upper jaw (Whitehead *et al.*, 1986).



ECOLOGY & BIOLOGY

HABITAT

The Arctic Skate is a bottom dwelling, deepwater species found from 250-2,500m (820–8,200ft) and appears to live exclusively in waters below 4ºC (39.2ºF) (Gibson *et al.*, 2006). In Canadian waters, the average observed depth for the species was 1,200m (3,940ft) and they were occurring regularly in the deepest trawls at 1,550m (5,085ft). In Norwegian waters the highest frequency of catches observed was at depths between 1,050-1,250m (3,445-4,100ft). In the deepest areas sampled, from 2,000-2,050m (6,560–6,725ft), no catches were recorded. This suggests a lower limit to the Arctic Skate's depth range in the northeast Atlantic than in the northwest Atlantic. In the Barents Sea, the Arctic Skate seems to prefer bottom temperatures around 0°C (32ºF) (Kulka *et al.*, 2007).

DIET

The Arctic Skate is a benthic predator with a diet consisting primarily of teleost fish, but also including a variety of invertebrates such as crustaceans and molluscs (Kulka *et al.*, 2007).

REPRODUCTION

Very little is known of the reproductive strategy of the Arctic Skate. A study from the Barents Sea found that in most trawls, males dominated comprising up to 90% of the fish caught. However in some areas, females dominated with the proportion of males dropping as low as 29%. This has led to speculation that Arctic Skate segregate by sex for much of their lives (Dolgov *et al.*, 2005).

The Arctic Skate is a medium to large skate which may exhibit similar characteristics to other deepwater skates with low fecundity such as the Common Skate, *Dipturus batis*, and White Skate, *Rostroraja alba* (Kulka *et al.*, 2007). Like all true skate it is oviparous. Its eggcases measure 8-12.5cm long (excluding horns) and 5-8cm wide. As these are so large it is likely that only a small number are laid each year. The eggs are deposited on the bottom in soft substrates and left to develop (Whitehead *et al.*, 1986). When the juveniles hatch they measure 16-18cm in length (Kulka *et al.*, 2007).

EGGCASE

1. 80–125mm in length (excluding horns).
2. 50–80mm in width (Whitehead *et al.*, 1986).

Similar eggcase to the Blonde Ray, *Raja brachyura*.

Arctic Skate

COMMERCIAL IMPORTANCE

The Arctic Skate is currently of no commercial interest although it is often taken as bycatch in deepwater trawl and longline fisheries. In the Barents Sea it is taken in trawl fisheries targeting Atlantic Cod, *Gadus morhua*, Haddock, *Melanogrammus aeglefinus*, redfish, *Sebastes* spp. and Greenland Halibut, *Reinhardtius hippoglossoides*. It is also occasionally caught in the Greenland Halibut and shrimp fisheries of the Davis Strait (Kulka *et al.*, 2007).

Between the Faroe and Shetland Islands the Arctic Skate is the most abundant skate caught and in Canadian waters, along with the Greenland Shark, *Somniosus microcephalus*, and Starry Skate, *Amblyraja radiata*, it is one of the most commonly taken bycatch species (Fowler *et al.*, 2004; Fisheries & Oceans, Canada, 2007). When taken, it is generally discarded (ICES, 2008b).

THREATS, CONSERVATION, LEGISLATION

The Arctic Skate is a deepwater species that is distributed largely outside the depth range of commercial fisheries, offering it some refuge from anthropogenic pressures. It also has a wide geographic range meaning that any heavy, localised fishing pressure is unlikely to seriously threaten global populations. With deepwater fisheries expanding however, the continued monitoring of catches and the collection of life history data is essential and should be a priority (Kulka *et al.*, 2007).

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
VIId	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

(Al 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. The SFC's which implement these and the details are shown in the table below.

SFC	DW (cm)	Other
Cumbria	45	Cannot land wings less than 22cm in their maximum dimension
Kent & Essex	40	Cannot land wings less than 19cm in their maximum dimension
Southern	40	Cannot land wings less than 20cm in their maximum dimension
South Wales	45	Cannot land wings less than 22cm in their maximum dimension
States of Guernsey	36	

(Cumbria SFC, Unknown; Kent & Essex SFC, Unknown; South Wales SFC, Unknown; Southern SFC, 2006; NFFO, 2004)

IUCN RED LIST ASSESSMENT

Least Concern (2007).

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Row of strong thorns on midline.
- Thorns can be present between dorsal fins.

REFERENCES

AGUSTIN, L. Q. 2009. *Amblyraja hyperborea*. Arctic Skate. Fishbase. www.fishbase.org.

CUMBRIA SFC. Unknown. Minimum Fish Sizes. www.cumbriasfc.org.uk.

DOLGOV, A. V., GREKOV, A. A., SHESTOPAL, I. P., SOKOLOV, K. M. 2005. By-catch of Skates in Trawl and Long-Line Fisheries in the Barents Sea. *Journal of Northwest Atlantic Fishery Science*, 35: 357-366.

EUROPEAN UNION. 2009. Council Regulation (EC) No. 43/2009. *Official Journal of the European Union*, L22/1.

FISHERIES & OCEANS, CANADA. 2007. National Plan of Action for the Conservation and Management of Sharks. Communications Branch. Ottawa, Ontario.

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.

GONZÁLEZ, C., ROMÁN, E., PAZ, X., CEBALLOS, E. 2006. Feeding Habits and Diet Overlap of Skates (*Amblyraja radiata, A. hyperborea, Bathyraja spinicauda, Malacoraja senta* and *Rajella fyllae*) in the North Atlantic. Northwest Atlantic Fisheries Organization.

ICES. 2008a. Demersal Elasmobranches 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.

KENT & ESSEX SFC. Unknown. Minimum Fish Sizes. www.kentandessex-sfc.co.uk.

KULKA, D. W., BARKER, A. S., PASOLINI, P., ORLOV, A. 2007. *Amblyraja hyperborea*. In: IUCN. 2008. 2008 IUCN Red List of Threatened Species. www.iucnredlist.org.

NFFO. 2004. Official Yearbook and Diary. Grimsby, UK.

SOUTH WALES SFC. Unknown. Byelaws. www.swsfc.org.uk.

SOUTHERN SFC. 2006. Minimum Landings Sizes. www.southernsfc.org.uk.

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.

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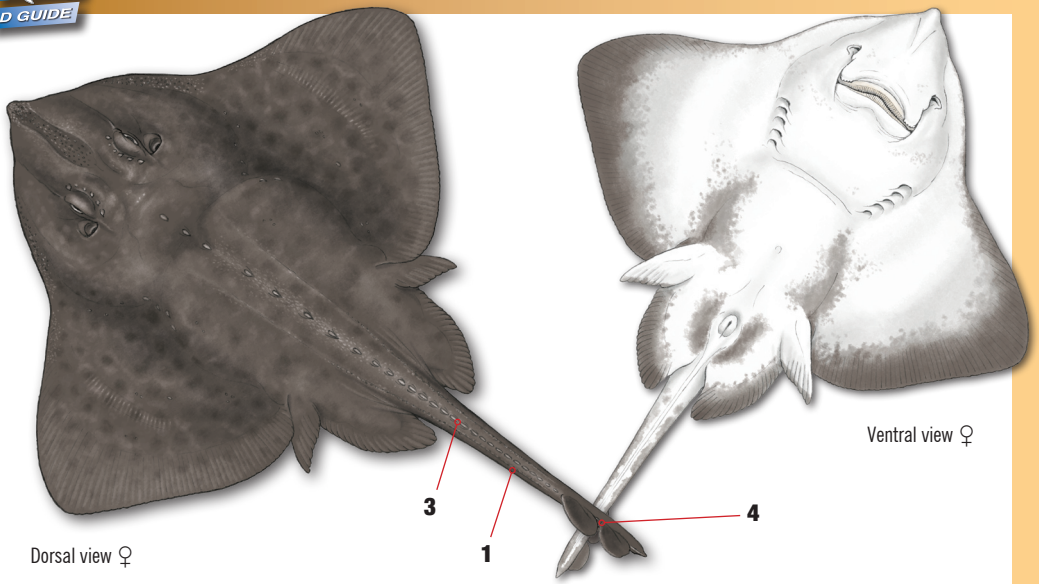
Arctic Skate

Amblyraja hyperborea



Dorsal view ♀

Ventral view ♀

SCIENTIFIC NAME

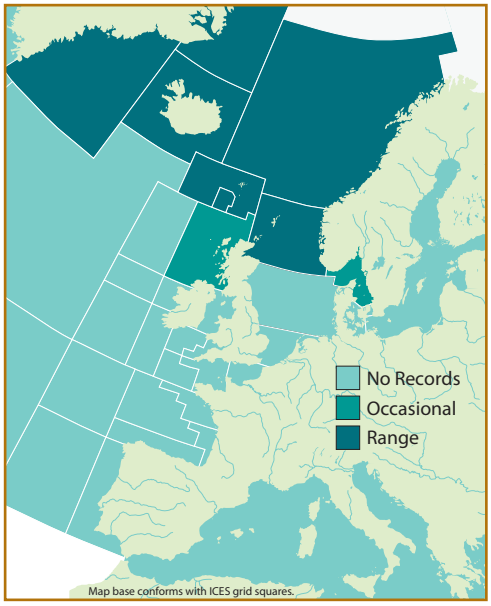
Amblyraja hyperborea (Collett, 1879).

COMMON NAME

ARCTIC SKATE, Boreal Skate, Dark Belly Skate, Northern Skate, Raie Arctique (Fr), Raie Boréale (Fr), Raya Ártica (Es).

DISTRIBUTION

Across North Atlantic from Canada to Norway and south to Ireland's west coast. Also reported from some areas of the southern hemisphere[v].



IDENTIFICATION

1 Short tail.

2 Thick body.

3 Row of 25–32 thorns along midline.

4 0–2 thorns between dorsal fins[vii].

COLOUR

- Dorsal surface dark grey/brown with indistinct light or dark spots and dark blotches.
- Ventral surface white in juveniles.
- Ventral surface with darker margins and blotches in adults[vii].

BIOLOGY AND SIZE

- Born: 16–18cm. Max TL: 85cm[v].
- Feed primarily on teleost fish but also on a wide variety of benthic crustaceans and molluscs[iii].
- Studies suggest segregation by sex[i].

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Arctic Skate

SIMILAR SPECIES

- *Amblyraja radiata,* **Starry Skate**
- *Amblyraja jenseni,* **Jensen's Skate**

HABITAT

- Demersal from 250–2,500m. Most common ~1,200m[ii].
- Continental slopes, normally over soft substrates such as sand and mud[v].
- Exclusively in water temperatures <4ºC. Prefer ~0ºC in Barents Sea[v].

CONSERVATION STATUS

- Deepwater species mostly distributed beyond the range of commercial fisheries. Wide geographic distribution so intensive local fishing pressure unlikely to seriously affect global stocks[v].
- Red List status: Least Concern (2007).

COMMERCIAL IMPORTANCE

- No current commercial interest. Taken as bycatch in deepwater trawl fisheries[v].
- Sometimes landed from the Barents Sea for sale and consumption[i] but generally discarded[iv].
- 2009 – Species currently subject to TAC in EU waters.

HANDLING AND THORN ARRANGEMENT

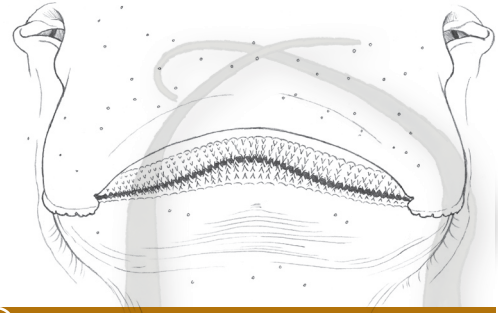
- Handle with care.
- Row of strong thorns on midline.
- Sometimes thorns between dorsal fins.

REFERENCES

i. Dolgov, A. V. *et al*; 2005. *J. Northw. Atl. Fish. Sci*. 35: 357–366.
ii. Gibson, C. *et al*; 2006. IUCN SSC Shark Specialist Group.
iii. González, C. *et al*; 2006. Northwest Atlantic Fisheries Organization.
iv. ICES; 2008.
v. Kulka, D. W. *et al*; 2007. IUCN Red List.
vi. Lacourt, A. W; 1979. *Meded*.
vii. Whitehead, P. J. P. *et al*; 1986. UNESCO.

TEETH

- Arranged into 35–48 rows[vii].



EGGCASE

1 81–125mm in length (excluding horns).

2 50–80mm in width[vi].

Similar eggcase to the Blonde Ray, *Raja brachyura.*

(Eggcase shown actual size.)

Atlantic Torpedo Ray

Torpedo nobiliana

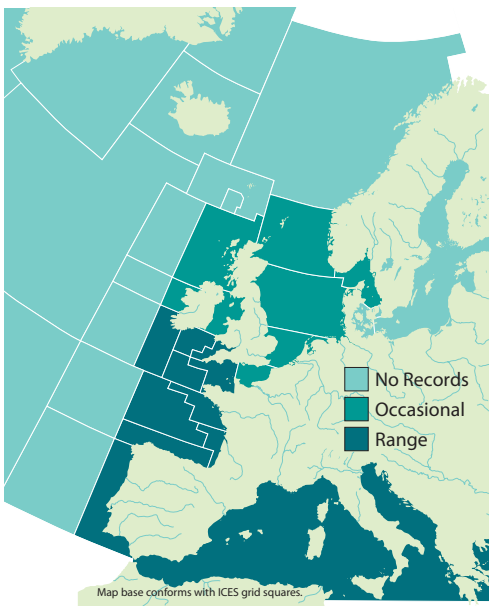
COMMON NAMES

Atlantic Torpedo Ray, Atlantic Electric Ray, Black Torpedo, Crampfish, Numbfish, Dark Electric Ray, Great Torpedo, Torpille Noire (Fr), Torpedine Nera (It), Tremolina Negra (Es), Sidderrog (Ne).

SYNONYMS

Torpedo walshii (Thompson, 1840), *Torpedo hebetans* (Lowe, 1841), *Torpedo emarginata* (McCoy, 1841), *Torpedo occidentalis* (Storer, 1843), *Torpedo nigra* (Guichenot, 1850), *Tetronarce occidentalis* (Gill, 1862), *Torpedo hebetans* (Günther, 1870), *Narcacion nobilianus* (Garman, 1913), *Tetranarce nobiliana* (De Buen, 1935).

DISTRIBUTION



The Atlantic Torpedo Ray is found along Atlantic coasts from Scotland to South Africa in the east and from Brazil to Nova Scotia in the west. Also found across the Mediterranean and in the western Baltic, but is absent from the Black Sea (Bester, Unknown).

APPEARANCE

- Rounded body with almost straight leading edge of disc.
- Short, thick tail with large caudal fin.
- Two close-set dorsal fins.
- Smooth with no thorns, spines or papillae.
- Dark grey to brown colouration on dorsal surface.
- Ventral surface creamy white with darker margins.

The Atlantic Torpedo Ray is a distinctive ray similar only to the Marbled Torpedo Ray, *Torpedo marmorata*, in UK waters. The two species can normally be distinguished by colouration and size however. Failing this, the spiracles of the two species are markedly different. On the Marbled Torpedo Ray, *Torpedo marmorata*, there are 6-8 obvious papillae on the inside edge of the spiracle. These are lacking on the Atlantic Torpedo Ray, *Torpedo nobiliana*. It is a large ray that can reach 180cm in length and weigh 90kg, although lengths of 60-150cm are more common (Bester, Unknown).

It has a thick, rounded body with an almost straight leading edge and no protruding snout. The eyes and spiracles are set far apart on the head and have no associated orbital thorns or papillae. The tail is thick with a large caudal fin and two dorsal fins, the first distinctly larger than the second. Its skin is soft and smooth (Bester, Unknown).

The colouration of the dorsal surface varies from grey blue to dark brown with no patterning. The ventral surface of the disc is creamy white with a dark margin (Barnes, 2008).

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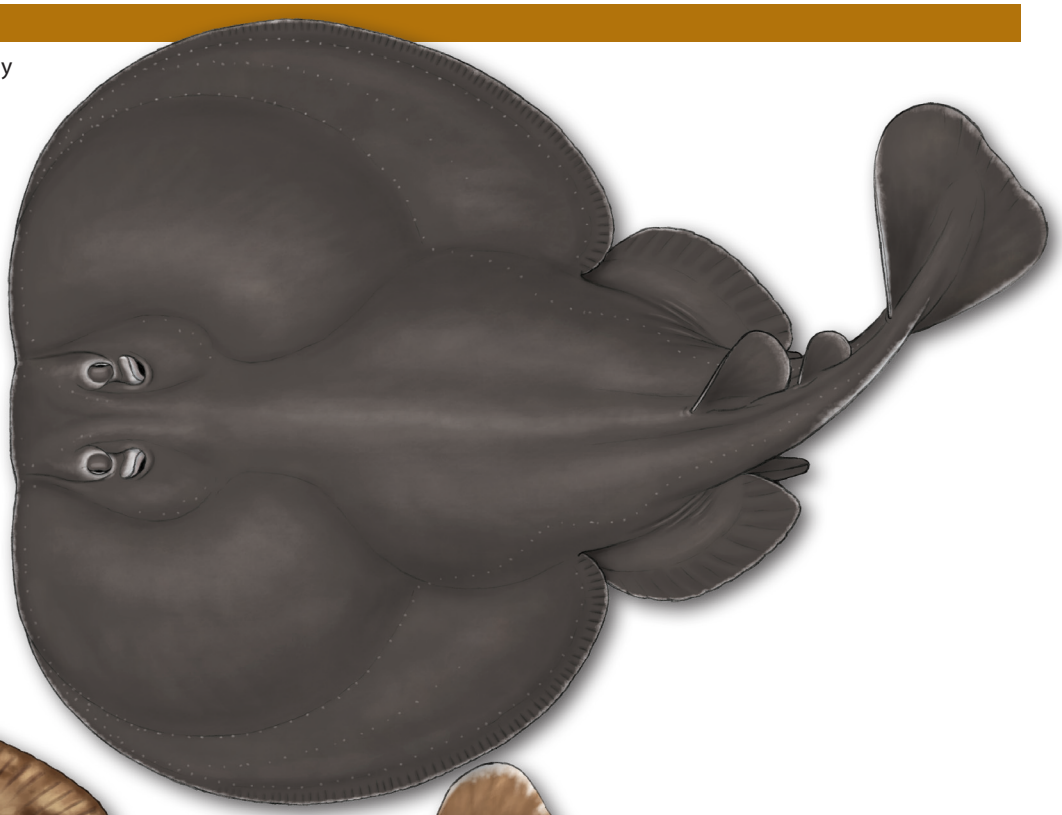
Atlantic Torpedo Ray

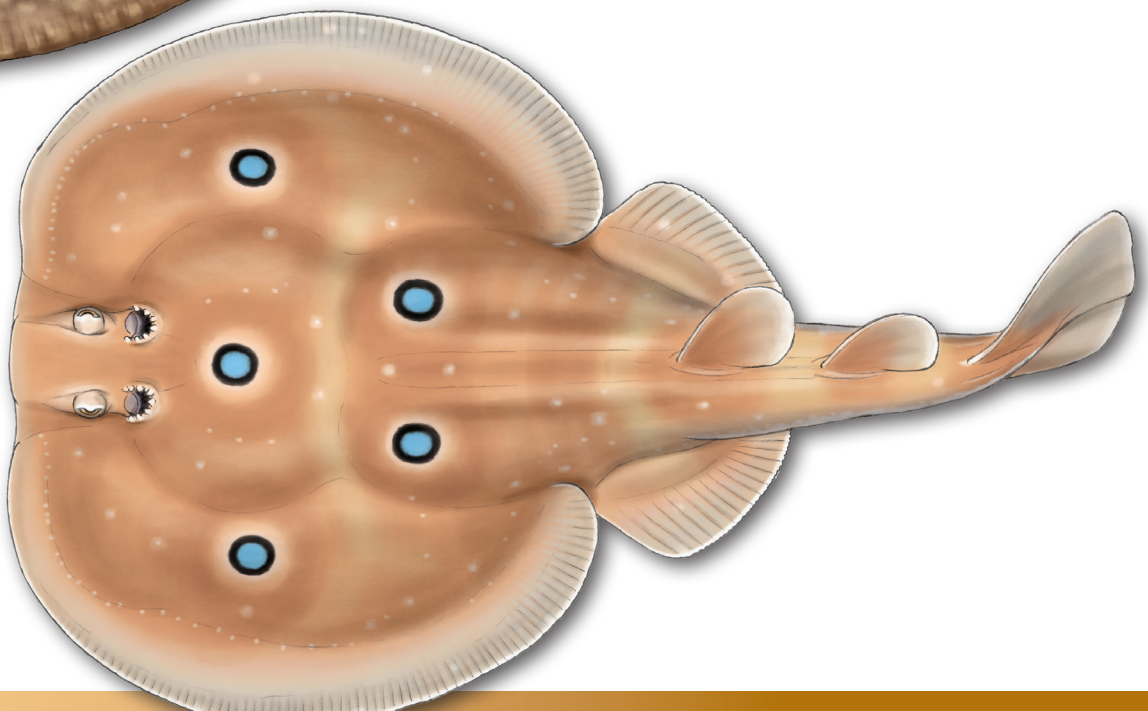
SIMILAR SPECIES

Torpedo marmorata, Marbled Torpedo Ray
Torpedo sinuspersici, Gulf Torpedo Ray
Torpedo torpedo, Common Torpedo Ray



Torpedo nobiliana,
Atlantic Torpedo Ray

Torpedo marmorata,
Marbled Torpedo Ray



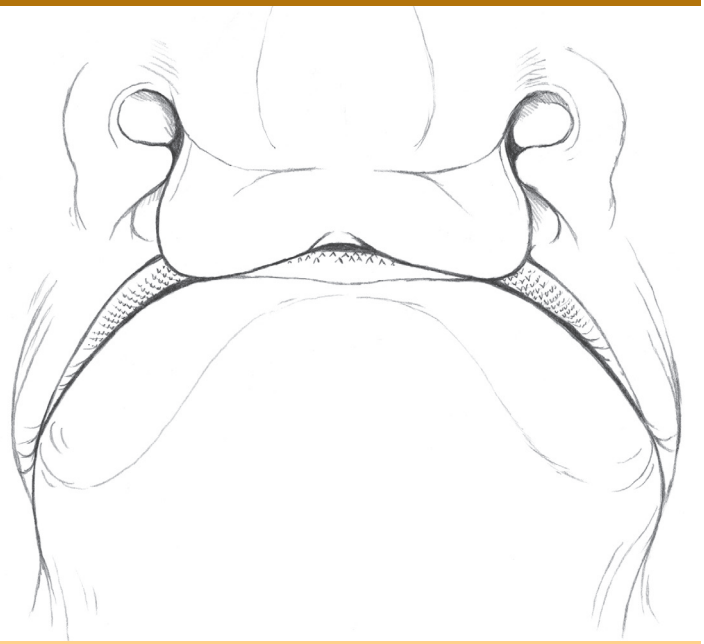
Torpedo torpedo,
Common Torpedo Ray

(Not to scale)

Atlantic Torpedo Ray *Torpedo nobiliana*

TEETH

The teeth are small, curved and single-cusped, arranged in bands or rows. Approximately 7 of these rows are exposed (Bester, Unknown).



ECOLOGY & BIOLOGY

HABITAT

Juveniles are bottom dwelling, found over soft substrates such as sand and mud from 10 to 150m (32–490ft) (Whitehead *et al*., 1986). They are often buried during the day and hunt at night (Barnes, 2008). Adults are semi-pelagic living in the water column from 2-800m (7–2,625ft) (Bester, Unknown).

DIET

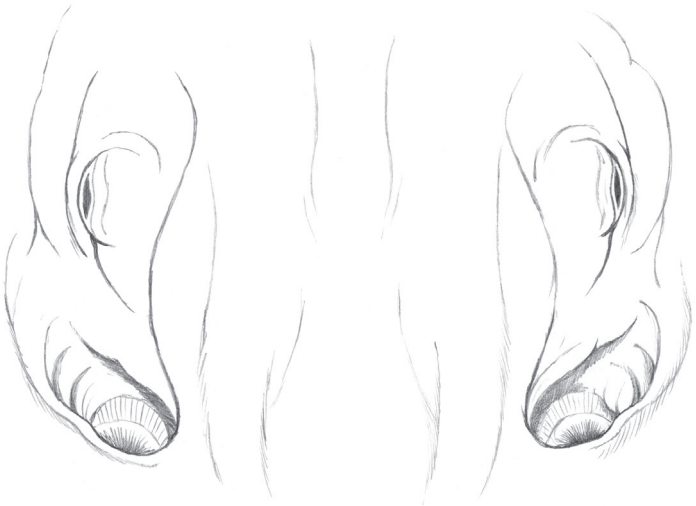
The Atlantic Torpedo Ray feeds predominantly on fish. As it can extend its jaws, it can feed on surprisingly large prey such as small sharks, flounder, mullet and mackerel (Bester, Unknown). It is an ambush predator, 'jumping' on intended prey whilst emitting a series of electrical shocks to stun it (Belbenoit, 1986). These shocks are generated by highly specialised electrogenic organs which are composed of stacks of striated muscle. When contracted, these produce an electrical current up to 220 volts and 600 Hz (Barnes, 2008).

REPRODUCTION

Like other Torpediniformes, the Atlantic Torpedo Ray is ovoviviparous. Ovoviviparity, or leicithotrophic viviparity, is means of reproduction whereby the embryos develop entirely within the mother. They are encased in a thin membrane which is retained in the uterus (Martin, Unknown). The means of nourishment varies considerably amongst elasmobranchs. In Torpediniformes, the embryo feeds initially on an external yolk sac. When this is depleted, they receive additional nourishment from the mother through the indirect absorption of 'uterine milk', a fat and protein rich histotroph (Bester, Unknown).

Little is known of the reproduction of the Atlantic Torpedo Ray. It is thought that the gestation period is approximately a year and each female gives birth to around 60 young. At birth, these measure around 20cm in length and can already use their electric organs for hunting and defence (Bester, Unknown).

SPIRACLES



Torpedo nobiliana, Atlantic Torpedo Ray

Torpedo marmorata, Marbled Torpedo Ray

Atlantic Torpedo Ray

COMMERCIAL IMPORTANCE

The Atlantic Torpedo Ray was once sought for its liver oil, considered of high quality for illumination purposes. It is currently of no commercial importance (Bester, Unknown).

IUCN RED LIST ASSESSMENT

Data Deficient (2008).

THREATS, CONSERVATION, LEGISLATION

Very little data is available on population or catch trends for the Atlantic Torpedo Ray. When taken as bycatch in trawl and line fisheries, it is usually discarded at sea. It is possible that destructive bottom trawling is damaging nursery areas and it appears to be rare in the Mediterranean Sea (Gibson *et al.*, 2006).

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Can produce an electrical current of 170-220v.

REFERENCES

BARNES, M. K. S. 2008. *Torpedo nobiliana*. Electric ray. Marine Life Information Network: Biology and Sensitivity Key Information Sub-programme. Plymouth: Marine Biological Association of the United Kingdom. www.marlin.ac.uk.

BELBENOIT, P. 1986. Fine Analysis of Predatory and Defensive Motor Events in *Torpedo Marmorata* (Pisces). *Journal of Experimental Biology*, 121, 197–226.

BESTER, C. Unknown. Atlantic Torpedo. Florida Museum of Natural History. www.flmnh.ufl.edu/fish/.

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.

MARTIN, R. Unknown. Elasmobranch Reproductive Modes. ReefQuest Centre for Shark Research. www.elasmo-research.org.

RAINER, F. 2009. *Torpedo nobiliana*: Atlantic Torpedo. Fishbase. www.fishbase.org.

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.

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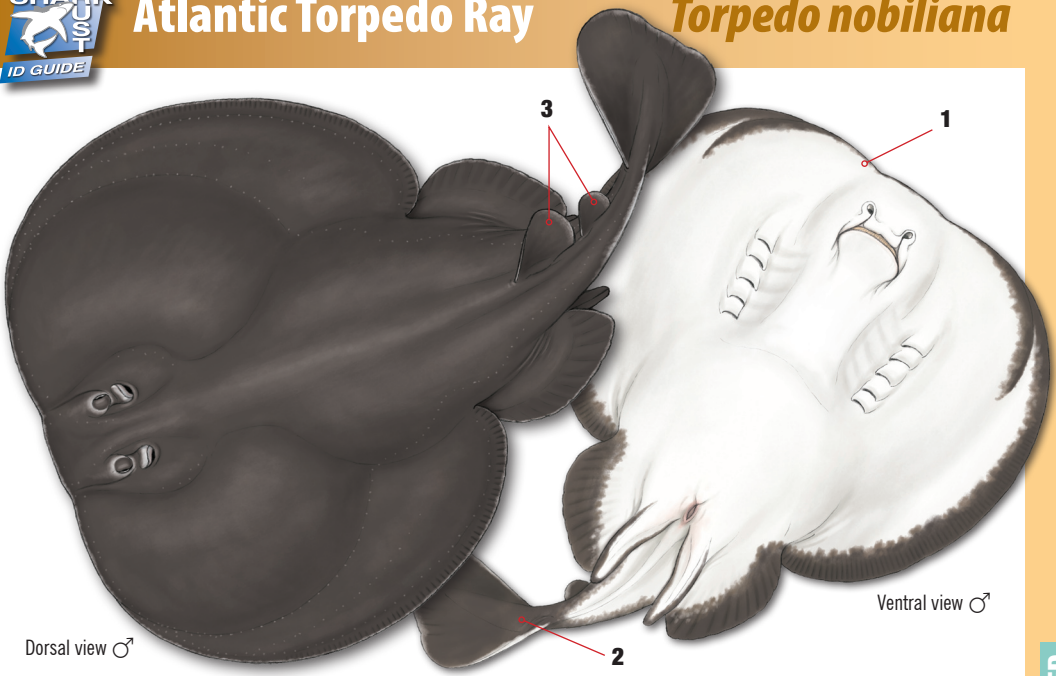
Atlantic Torpedo Ray *Torpedo nobiliana*

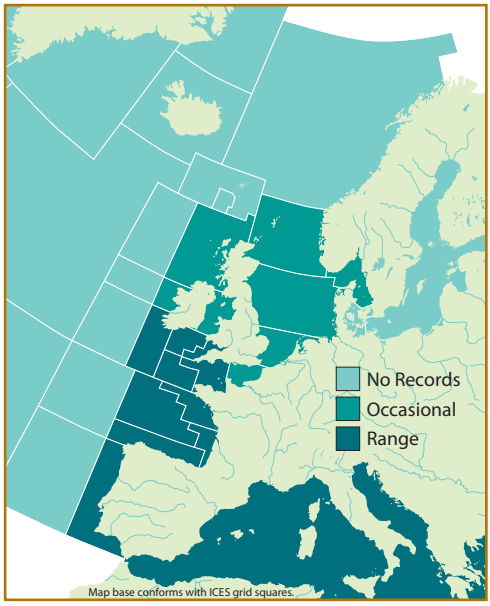


SCIENTIFIC NAME

Torpedo nobiliana (Bonaparte, 1835).

DISTRIBUTION

East Atlantic: South Africa to Scotland, including Mediterranean. Absent from Black Sea.
West Atlantic: Brazil to Nova Scotia[ii].



COMMON NAME

ATLANTIC TORPEDO RAY, Atlantic Electric Ray, Black Torpedo, Crampfish, Numbfish, Dark Electric Ray, Great Torpedo, Torpille Noire (Fr), Torpedine Nera (It), Tremolina Negra (Es) Sidderrog (Ne).

IDENTIFICATION

1 Round body with straight leading edge of disc.

2 Short, thick tail with large caudal fin.

3 2 close-set dorsal fins.

4 No papillae around spiracles[ii].

COLOUR

- Dorsal surface dark grey to brown.
- No patterning.
- Ventral surface creamy white with dark margins[i].

BIOLOGY AND SIZE

- Born: 20cm. Max TL: 180cm[i].
- Long gestation period ~12 months. ~60 young in each litter[ii].
- Nocturnal, remain hidden during the day and actively hunt at night[i].

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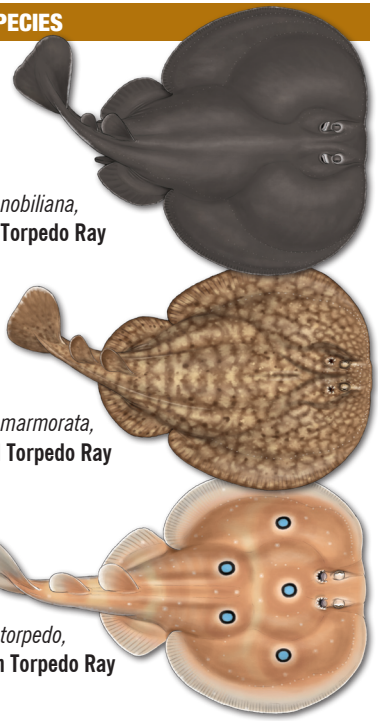
Atlantic Torpedo Ray

SIMILAR SPECIES



- *Torpedo nobiliana*, **Atlantic Torpedo Ray**
- *Torpedo marmorata*, **Marbled Torpedo Ray**
- *Torpedo torpedo*, **Common Torpedo Ray**
- *Torpedo sinuspersici*, **Gulf Torpedo Ray**, not illustrated

HABITAT

- Juveniles 10–150m, adults to 800m.
- Found over soft substrates such as sand and mud[ii].

CONSERVATION STATUS

- Very little is known of population trends. Possibly vulnerable to trawl fisheries damaging nursery grounds. Appears to be rare in the Mediterranean[iii].
- Red List status: Data Deficient (2008).

COMMERCIAL IMPORTANCE

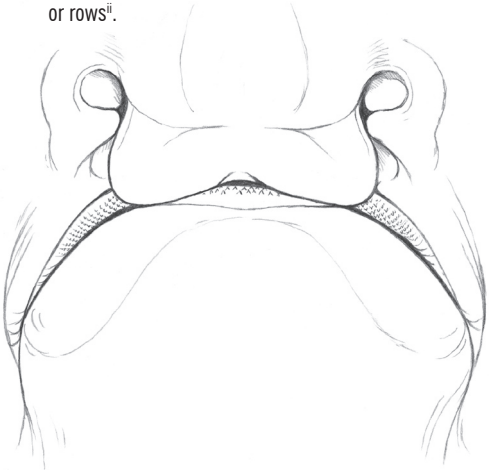
- Currently of no fisheries interest, although previously hunted for its liver oil[ii].
- Taken as bycatch in trawl fisheries throughout its range.
- When caught, usually discarded at sea[iii].

HANDLING AND THORN ARRANGEMENT

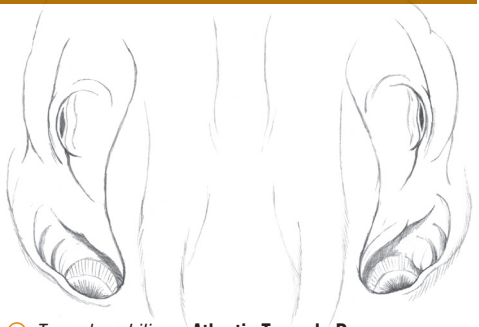
- Handle with care.
- Can produce an electrical current of 170–220V[i].

TEETH

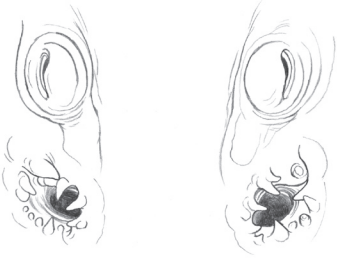
- Small, curved, single-cusped teeth arranged in bands or rows[ii].



SPIRACLES



- *Torpedo nobiliana*, **Atlantic Torpedo Ray**



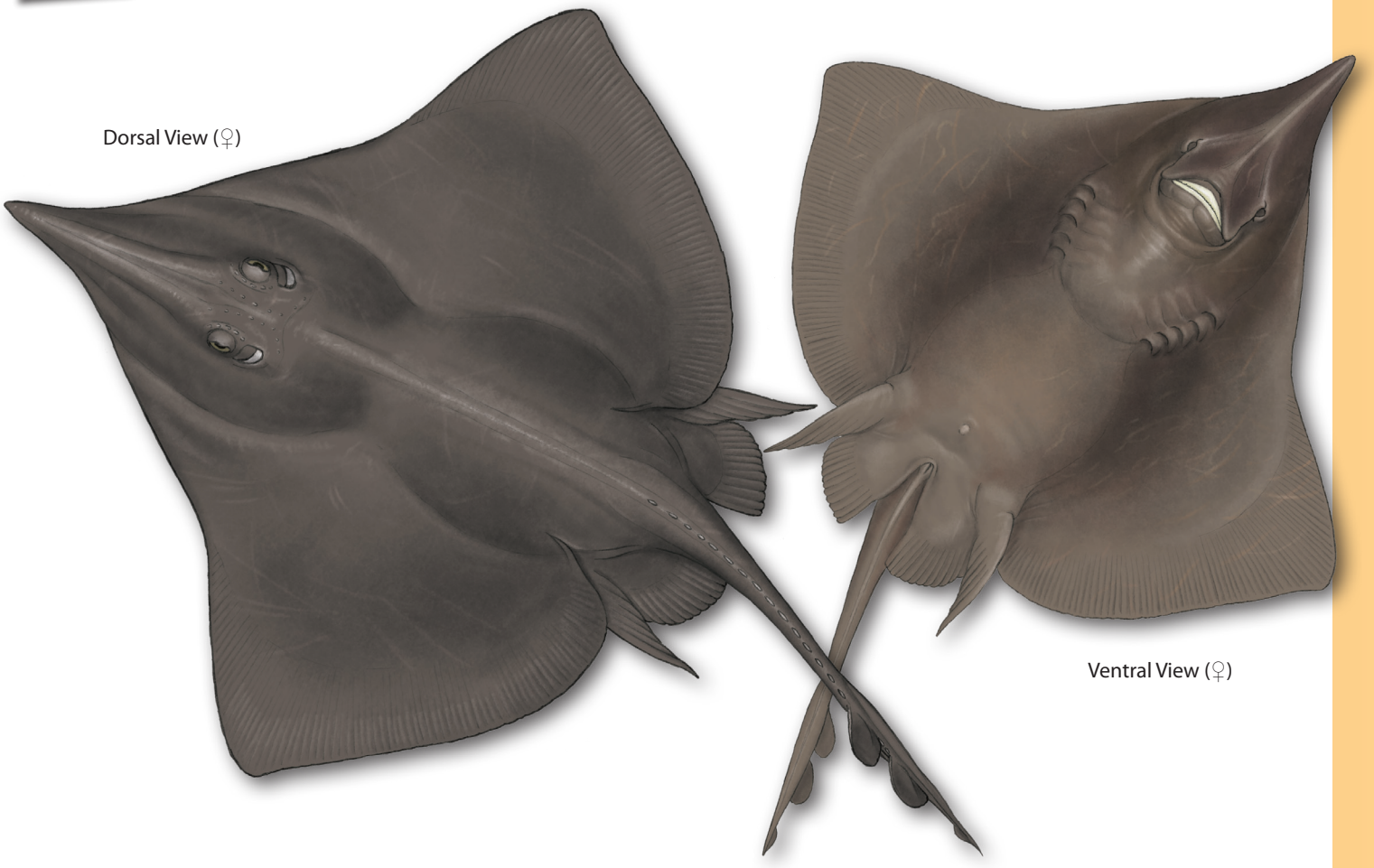
- *Torpedo marmorata*, **Marbled Torpedo Ray**

REFERENCES

i. Barnes, M.K.S; 2008. Marine Biological Association.
ii Bester, C; Unknown. Florida Museum of Natural History.
iii. Gibson, C et al; 2006. IUCN SSC Shark Specialist Group.

Black Skate

Dipturus nidarosiensis



COMMON NAMES

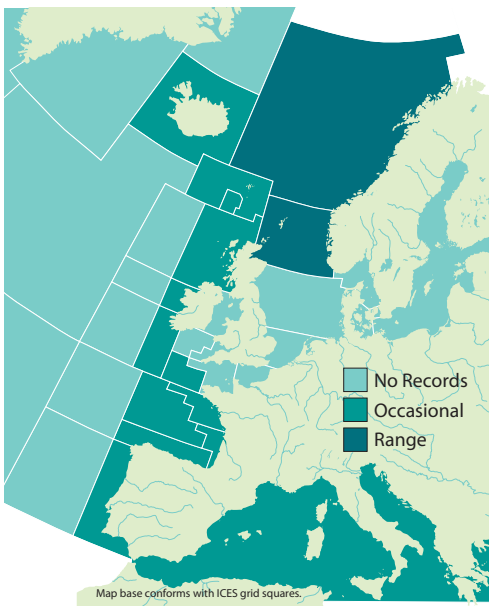
Black Skate, Norwegian Skate, Pocheteau de Norvege (Fr), Raya Noruega (Es).

SYNONYMS

Raja nidarosiensis (Storm, 1881), *Gammaraia nidrosiensis* (Leigh-Sharpe, 1924).

DISTRIBUTION

The Black Skate is endemic to deep-water in the northeast Atlantic, particularly around Norway, Sweden, Iceland, Scotland and Ireland (Gibson *et al*., 2006). It is no longer found across the southern and central North Sea and only a few specimens have been reported from the very north in recent years. It is extremely scarce in British coastal waters and is no longer common across any of its range (JNCC, 2002; Tangen, 2008). Recent genetic work has revealed that the Black Skate can be found in the Mediterranean (Serena, 2009).



APPEARANCE

- Large, up to 200cm total length.
- Grey/brown dorsal surface.
- Very dark ventral surface.
- Thin tail, particularly at the base.

The Black Skate is a large species, reaching 200cm in length with a very long, gradually pointing snout. The dorsal surface of the disc is greyish brown with black vermicular spots marking the mucous pores. The ventral surface is darker brown, almost black in some specimens with no spots or blotches (Shark Trust, 2007). The disc is usually covered with a layer of thick black mucus which can mask the real colour of the animal (Whitehead *et al*., 1986).

The dorsal surface of the disc is predominantly smooth, rough only on the snout and upper margin of the eye. In some older specimens this roughness extends along the front margin of the disc. The ventral surface of the disc is thickly covered with minute spines. There are no larger spines than these on the disc (Clark, 1926). Males have a median series of about 40–52 spines on their tails (measured from the cloaca), but none on the sides (Shark Trust, 2003). Mature females have three series of spines, some of which are irregularly crowded together. Between the dorsal fins there are generally 1-3 spines (Whitehead *et al*., 1986).

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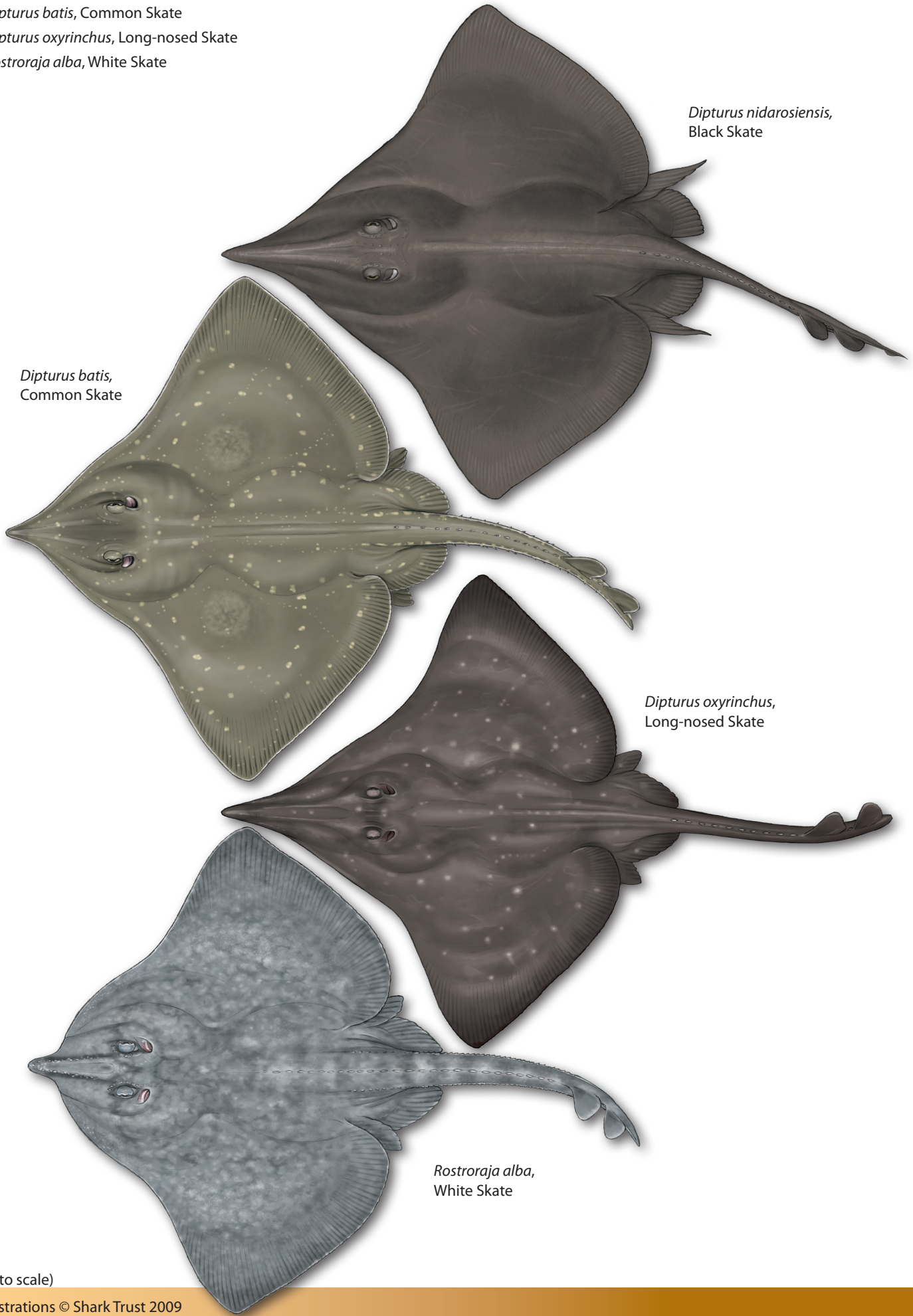
Black Skate

SIMILAR SPECIES

Dipturus batis, Common Skate
Dipturus oxyrinchus, Long-nosed Skate
Rostroraja alba, White Skate



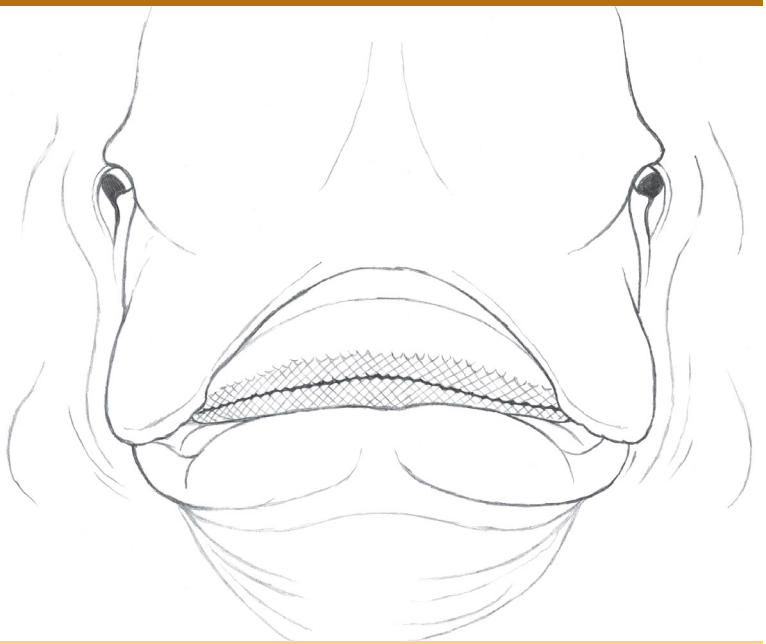
(Not to scale)

Black Skate

Dipturus nidarosiensis

TEETH

There are 41–44 rows of teeth in the upper jaw, 41–43 rows in the lower jaw (Clark, 1926).



ECOLOGY & BIOLOGY

HABITAT

The Black Skate is a deepwater species normally found at around 200m (660ft). It has been recorded as shallow as 124m (400ft) and as deep as 1312m (4,300ft) in the Celtic Sea around Ireland (Ellis *et al*., 2005; Massutí *et al*., 2004). Like most skates and rays it is found on sandy and muddy substrates. Research in Norway has discovered that tagged Black Skate have low mobility and that most are re-caught in roughly the same place as they were tagged, although this may only indicate areas which are regularly fished (Tangen, 2008).

DIET

Little is known of the diet of the Black Skate but it is thought that it preys on bottom dwelling teleost fish and invertebrates (JNCC, 2002).

REPRODUCTION

Little is known about the reproductive processes of Black Skate, though it is likely it matures at around 8-10 years old and lays approximately 50 eggs a year (JNCC, 2002). The eggcases of the Black Skate resemble the eggcases of the Long-nosed Skate, *Dipturus oxyrinchus*, but are much larger, measuring 182-260mm long (excluding horns) by 92-113mm wide (Binohlan, 2009; Clark, 1926). The horns of the eggcases are short and the outer walls are covered with a felty mass, making them appear longitudinally striated (Clark, 1926). They are deposited in sandy or muddy substrates and are left to develop (Binohlan, 2009).

EGGCASE

1. 182– 260mm in length (excluding horns) (Binohlan, 2009; Clark, 1926).

2. 92–113mm in width (Binohlan, 2009).

3. Horns are short (Clark, 1926).

Similar eggcase to the Common Skate, *Dipturus batis*.

Black Skate

COMMERCIAL IMPORTANCE

The Black Skate is of little commercial importance but is taken as bycatch where it is encountered. Species specific information is generally not available regarding the landings of deepwater skates, although FAO statistics report landings of 19–393t for *Dipturus nidarosiensis* between 1982 and 1993 throughout its range (Gibson *et al*., 2006). Between 2001 and 2007, Black Skate accounted for 1% of all skates landed in Irish ports (ICES, 2008b).

THREATS, CONSERVATION, LEGISLATION

Although little is known about the stock status or biology of the Black Skate, it is likely to be highly vulnerable to overexploitation given its large body size, slow growth, time taken to mature, and low intrinsic rate of population increase (Gibson *et al*., 2006). In 2002, a proposal to include the Black Skate on Schedule 5 of the Wildlife and Countryside Act (1981) was not adopted (JNCC, 2002).

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
VIId	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. The SFC's which implement these and the details are shown in the table below.

SFC	DW (cm)	Other
Cumbria	45	Cannot land wings less than 22cm in their maximum dimension
Kent & Essex	40	Cannot land wings less than 19cm in their maximum dimension
Southern	40	Cannot land wings less than 20cm in their maximum dimension
South Wales	45	Cannot land wings less than 22cm in their maximum dimension
States of Guernsey	36	

(Cumbria SFC, Unknown; Kent & Essex SFC, Unknown; South Wales SFC, Unknown; Southern SFC, 2006; NFFO, 2004)

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

THREATS, CONSERVATION, LEGISLATION

In 2009 the Black Skate received protection from the European Council in ICES areas VIa-b, VIIa-c and VIIe-k, meaning that it cannot be retained by commercial fishers if captured. However, most of these areas are not within the main range of the Black Skate and as such, a mandatory release order is unlikely to have a significant impact on populations.

As deepwater fishing effort in the northeast Atlantic increases, encompassing wider geographical and depth ranges, the effect on the Black Skate could be serious and must be very carefully monitored (Gibson *et al*., 2006).

IUCN RED LIST ASSESSMENT

Near Threatened (2008).

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large, powerful skate.
- Covered in small spines.

REFERENCES

BINOHLAN, C. B. 2009. *Dipturus batis*. Blue Skate. Fishbase. www.fishbase.org.

CLARK, R. S. 1926. Rays and Skates. A Revision of the European Species. Fishery Board for Scotland. HM Stationary Office. Edinburgh, UK.

CUMBRIA SFC. Unknown. Minimum Fish Sizes. www.cumbriasfc.org.uk.

ELLIS, J. R., CRUZ-MARTÍNEZ, A., RACKHAM, B. D., ROGERS, S. I. 2005. The Distribution of Chondrichthyan Fishes around the British Isles and Implications for Conservation. *Journal of Northwest Atlantic Fishery Science,* Vol. 35: 195-213.

EUROPEAN UNION. 2009. Council Regulation (EC) No. 43/2009. *Official Journal of the European Union*, L22/1. www.mfa.gov.uk.

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 elasmobranches 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.

JNCC. 2002. Fourth Quinquennial Review of Schedules 5 and 8 of the Wildlife and Countryside Act, 1981: Report and Recommendations from the Joint Nature Conservation Committee. www.jncc.gov.uk.

KENT & ESSEX SFC. Unknown. Minimum Fish Sizes. www.kentandessex-sfc.co.uk.

MASSUTÍ, E., GORDON, J. D. M., MORANTA, J., SWAN, S. C., STEFANESCU, C., MERRETT, N. R. 2004. Mediterranean and Atlantic Deep-Sea Fish Assemblages: Differences in Biomass Composition and Size Related Structure. *Scientia Marina,* 68 (Suppl. 3): 101–115.

NFFO. 2004. Official Yearbook and Diary. Grimsby, UK.

SERENA, F. 2009. Personal Communication.

SHARK TRUST. 2003. Key to Skates, Rays and Ray-Like Fishes in UK Inshore Waters. www.eggcase.org.

SHARK TRUST. 2007. British Skates and Rays Identification Guide. www.sharktrust.org.

SOUTH WALES SFC. Unknown. Byelaws. www.swsfc.org.uk.

SOUTHERN SFC. 2006. Minimum Landings Sizes. www.southernsfc.org.uk.

TANGEN, M. 2008. A Rare and Vulnerable Ray – The Norwegian Skate. http://afishblog.com.

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.

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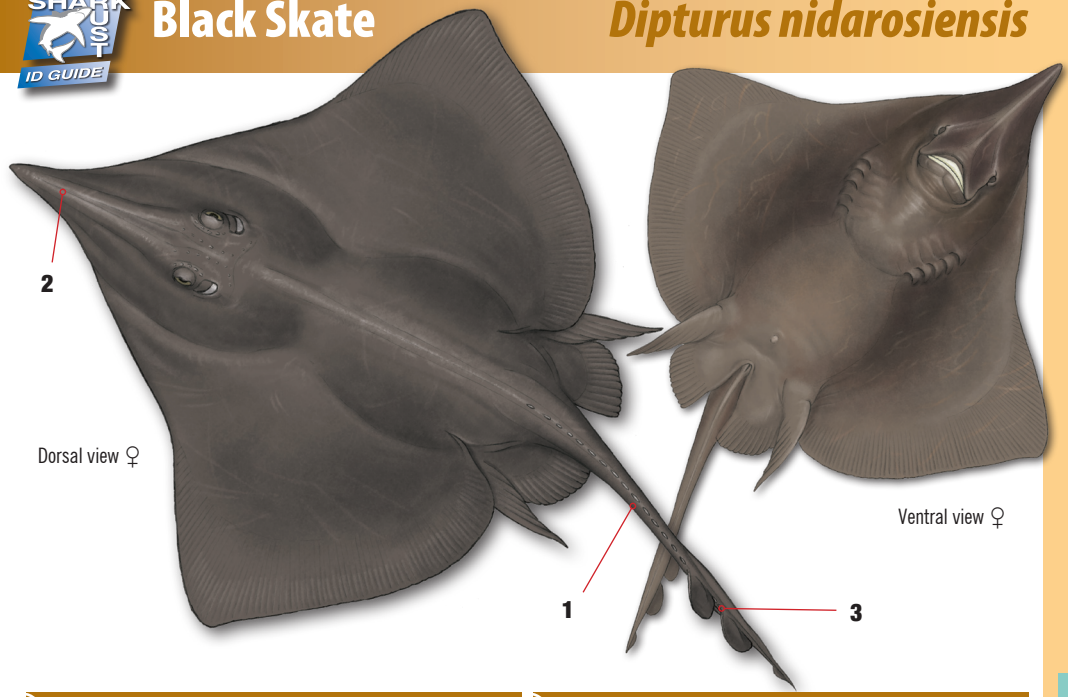
Black Skate

Dipturus nidarosiensis

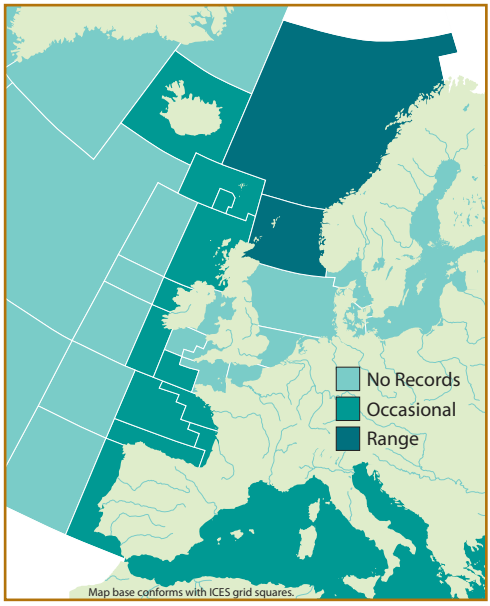


SCIENTIFIC NAME

Dipturus nidarosiensis (Collett, 1880).

DISTRIBUTION

Endemic to the northeast Atlantic[iv] between Norway, Iceland and Ireland[i], occasionally to northern Spain. May also be present in the Mediterranean[x].



COMMON NAME

BLACK SKATE, Norwegian Skate, Pocheteau de Norvege (Fr), Raya Noruega (Es).

IDENTIFICATION

1 Distinctly thin tail, particularly at base[ii].

2 Long, pointed snout[viii].

3 40–52 thorns along midline of tail, 1–3 thorns between dorsal fins[xi].

COLOUR

- Ventral surface solid dark brown/black[viii].
- Dorsal surface grey/brown with black spots marking pores.
- Usually covered in black mucus when caught[xi].

BIOLOGY AND SIZE

- Max TL: 200cm[xi].
- Feed on benthic fish and invertebrates[v].
- Most tagged specimens re-caught very close to release site, suggesting site fidelity or an artifact of regular fishing grounds[x].

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Black Skate

SIMILAR SPECIES

- *Dipturus batis,* **Common Skate**
- *Dipturus oxyrinchus,* **Long-nosed Skate**
- *Rostroraja alba,* **White Skate**

HABITAT

- Demersal, 120[iii]–1,300m[v].
- Most common >200m[iii].
- Prefers sandy and muddy substrates[x].

CONSERVATION STATUS

- Large body size, slow growth and low intrinsic rate of population increase make it vulnerable to overfishing[viii].
- Red List status: Near Threatened (2008).

COMMERCIAL IMPORTANCE

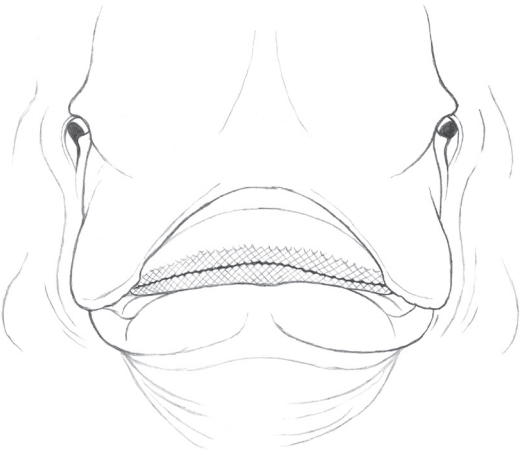
- Little commercial importance but targeted previously and still taken as bycatch[iv].
- Popular with recreational anglers if found. This has lead researchers to keep common locations secret[x].
- 2009 – Prohibition on commercial fishers retaining this species in ICES areas VI, VIIa-c & VIIe-k.

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large, powerful skate.
- Covered in small spines.

TEETH

- 41–44 rows in the upper jaw.
- 41–43 rows in the lower jaw[ii].



EGGCASE

1 182[i]–260mm[ii] in length (excluding horns).

2 92–113mm in width[i].

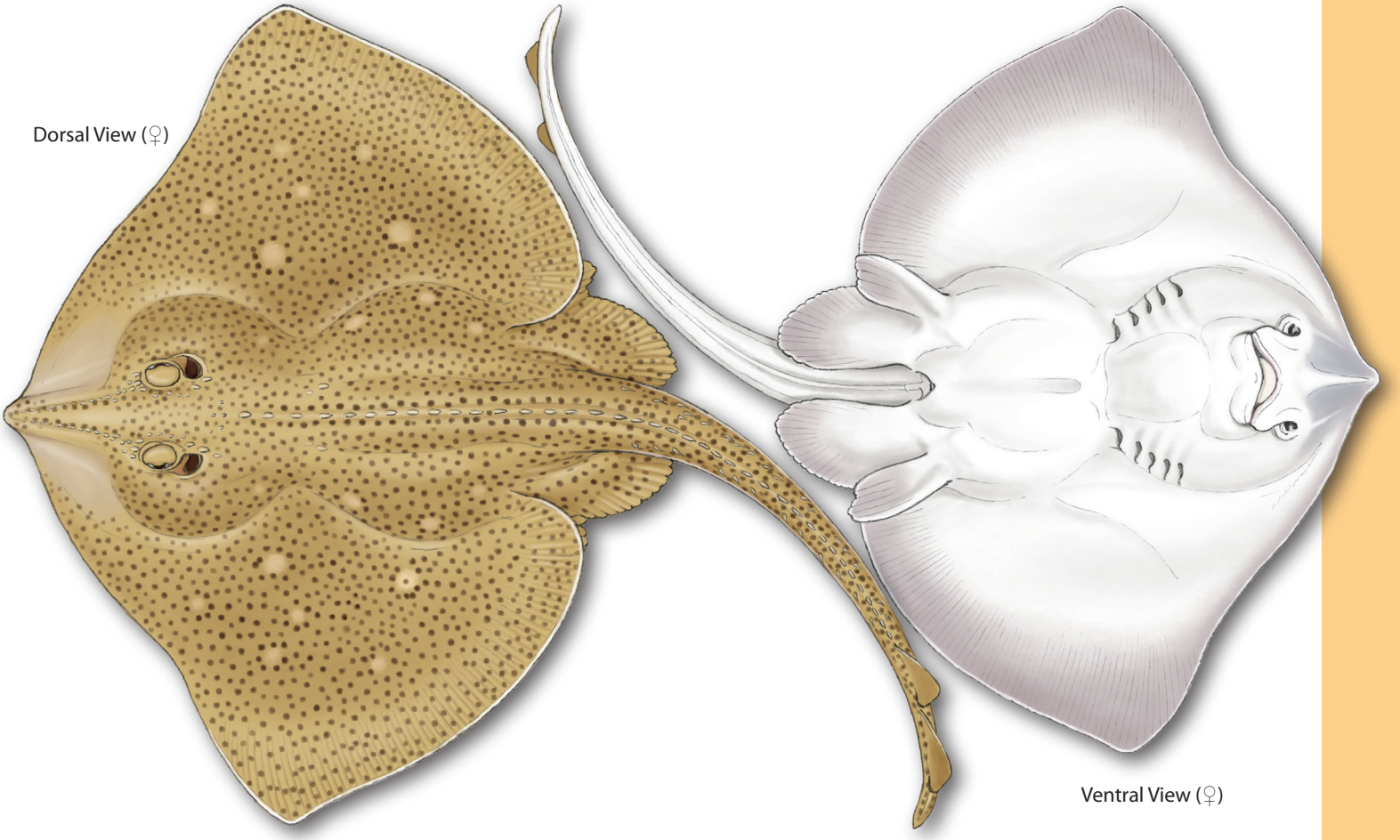
3 Horns are short[ii].

REFERENCES

i. Binohlan, C. B; 2009. Fishbase.
ii. Clark, R. S; 1926. Fishery Board for Scotland.
iii. Ellis, J. R. *et al*; 2005. *J. Northw. Atl. Fish. Sci*. 35: 195-213.
iv. Gibson, C. *et al*; 2006. IUCN SSC Shark Specialist Group.
v. Joint Nature Conservation Commitee; 2002.
vi. Massutí, E. *et al*; 2004. *Scientia Marina,* 68 (Suppl. 3): 101 – 115.
vii. Marine Conservation Society; Unknown.
viii. Shark Trust; 2007.
ix. Serena, F; 2005. FAO.
x. Tangen, M; 2008.
xi. Whitehead, P. J. P. *et al*; 1986. UNESCO.

Blonde Ray

Raja brachyura



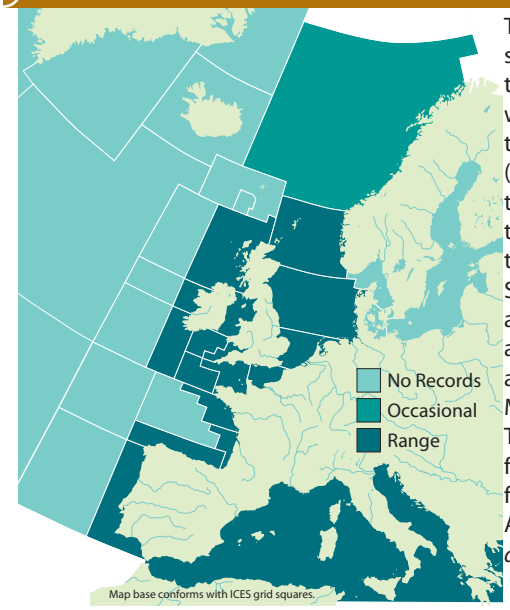
COMMON NAMES

Blonde Ray, Blonde Skate, Raie Lisse (Fr), Raie à Queue Courte (Fr), Razza a Coda Corta (It), Raia Pontuada (Pr), Raya Boca de Rosa (Es), Blonde Rog (Ne).

SYNONYMS

Raja asterias (Günther, 1870), *Raja blanda* (Holt & Calderwood, 1895), *Betaraia blanda* (Leigh-Sharpe, 1924), *Raja oculata* (Fowler, 1936).

DISTRIBUTION



The Blonde Ray is spread throughout the temperate waters of Europe and the Mediterranean (Luna, S, M; 2009). In the eastern Atlantic they are found from the western Isles of Scotland to Morocco and can be found all along the northern and western Mediterranean. There have been a few doubtful records from the northern Aegean Sea (Ellis *et al*., 2005).

APPEARANCE

- Up to 120cm total length.
- Median row of 31–45 thorns.
- Light brown on dorsal surface.
- White on ventral surface.
- Covered in small, dark spots which extend to the **very edge** of the pectoral fins.
- Larger, lighter spots often present.

The disc of the Blonde Ray is quadrangular and brownish in colour (CFB Ireland, 2003). The leading edge of the disc is slightly undulate in females, more so in males (Stehmann and Bürkel, 2000). The back is covered in small, dark spots that extend to the very edge of the wings, distinguishing it from the Spotted Ray, *Raja montagui*, on which the spots stop short of the very margins of the fins. The Blonde Ray commonly has larger, much lighter spots on its back, also absent from the Spotted Ray. The ventral surface is white. The snout is short with an arched mouth containing 60-90 rows of teeth (Clark, 1926).

On mature individuals the entire dorsal surface is prickly and there are spines along the front margins of the disc on the ventral surface. Along the back of juveniles and adult females there is an uninterrupted central row of 31-45 thorns (Bottaro *et al*., 2007). This row is present on males but is interrupted (Whitehead *et al*., 1986). Behind the pelvic fins the tail is very slender with lateral folds (Bester, Unknown). Between the dorsal fins, there are 1–2 thorns (Stehmann and Bürkel, 2000).

Both male and female Blonde Rays grow to a maximum total length of approximately 120cm and mature at approximately 80-90cm. It is thought that the Blonde Ray reaches a maximum age of around 15 years (Gallagher *et al*., 2005).

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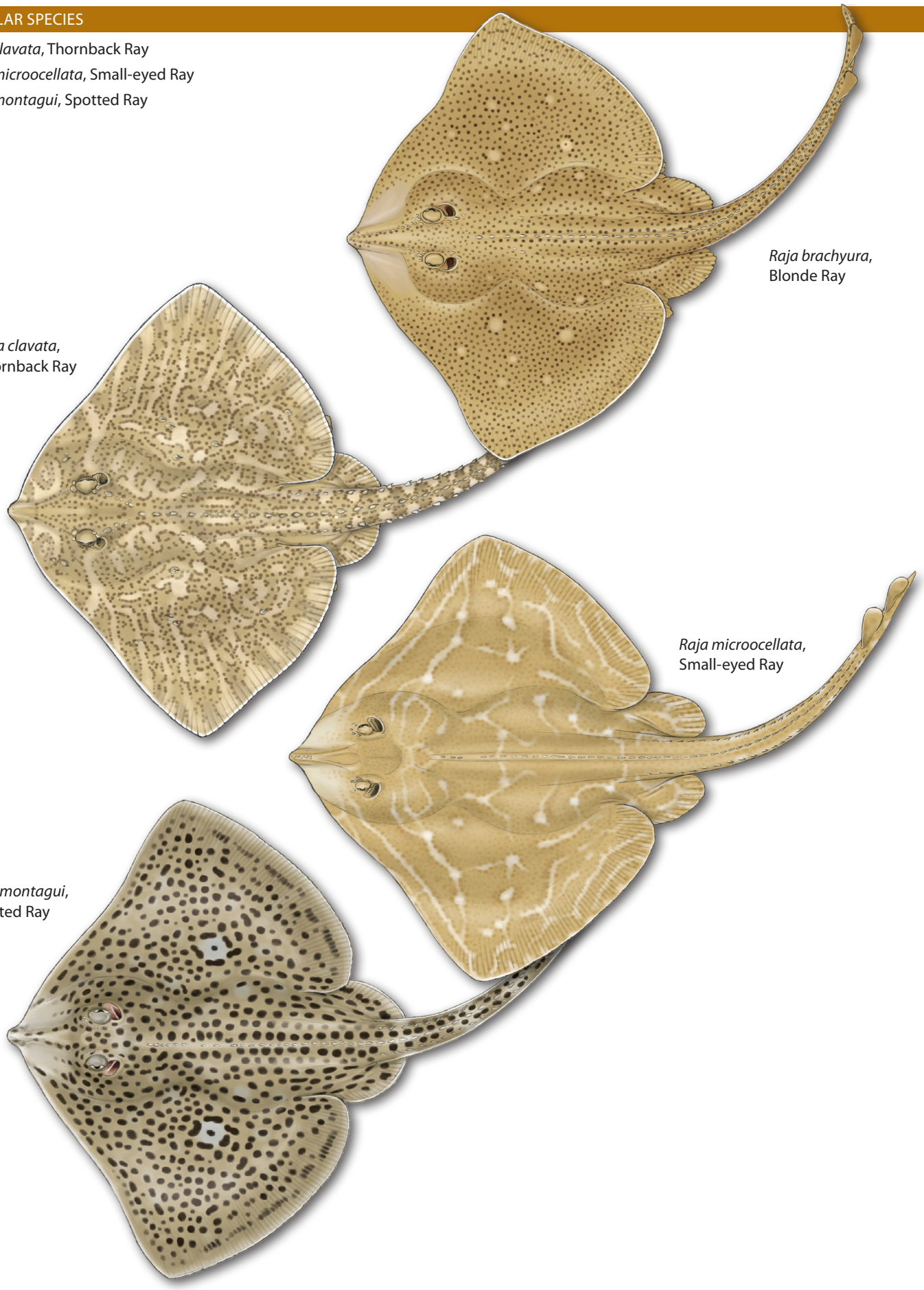
Blonde Ray

SIMILAR SPECIES

Raja clavata, Thornback Ray

Raja microocellata, Small-eyed Ray

Raja montagui, Spotted Ray



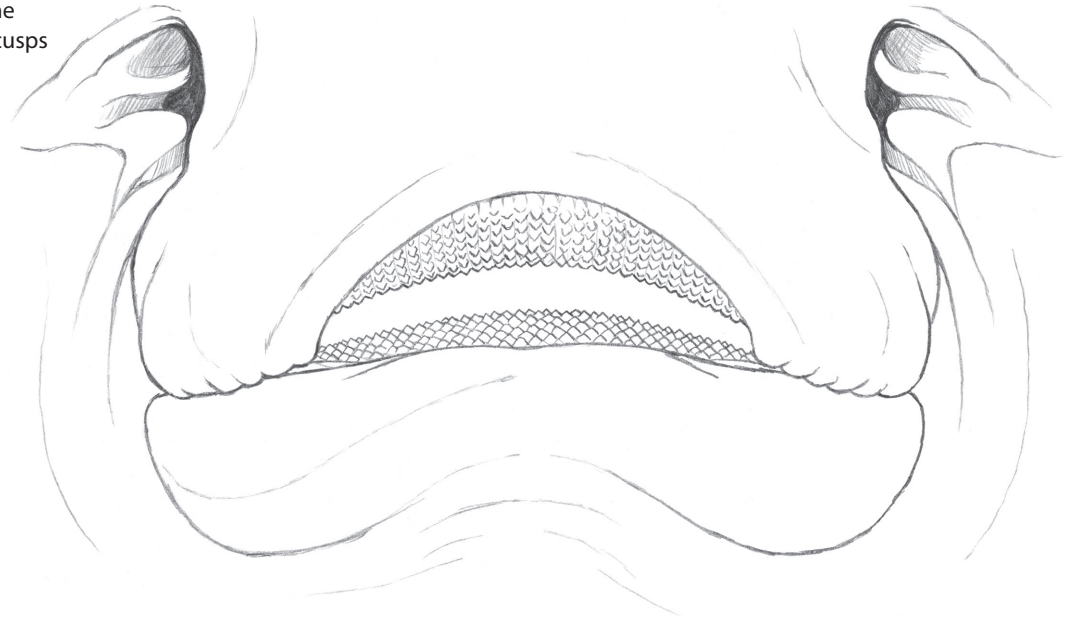
(Not to scale)

Blonde Ray

Raja brachyura

TEETH

There are 60–90 rows of teeth in the upper jaw. Both sexes have sharp cusps (Clark, 1926).



ECOLOGY & BIOLOGY

HABITAT

The Blonde Ray is a bottom dwelling species that prefers sandy and muddy areas. It has been recorded down to 900m and can most commonly be found at depths around 350m. As with many elasmobranch species, shallower coastal waters are used as nursery areas leading to a greater number of rays found near shore being juveniles (Farias *et al*., 2005).

DIET

Studies from the Portuguese continental shelf have shown that the majority of the diet of larger Blonde Rays consists of cephalopods, small bony fish, in particular the sandeel, *Gymnammodytes semisquamatus*, and the shrimp *Processa canaliculata*. These are absent from the diet of rays smaller than 45-55cm in length as they cannot tackle such large prey. For these animals the small shrimp *Crangon crangon* was the dominant prey item. Both juvenile and adult rays feed on indiscriminate shrimps, prawns and crustaceans (Farias *et al*., 2005).

REPRODUCTION

The Blonde Ray reaches sexual maturity at 85–92cm in length, which corresponds to ~8–10 years of age (Gallagher *et al*., 2005; Walker *et al*., 1998; Shark Trust, 2008). Females lay between 40 and 140 eggs a year between February and August (Shark Trust, 2008; Walker and Hislop, 1998). These eggcases are approximately 90mm long with obvious keels down each side and larger upper horns than lower. They can be mistaken for Thornback Ray, *Raja clavata*, eggcases although these are smaller at around 65mm in length. The incubation period is approximately 7 months (depending on sea temperatures) and the newly hatched skate measure around 20cm in length (Hoff, 2008).

EGGCASE

1. ~90mm in length (excluding horns).
2. Obvious keels.
3. Upper horns longer than lower horns (Shark Trust, 2008).

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

Blonde Ray

COMMERCIAL IMPORTANCE

The Blonde Ray is commercially important and is caught and landed across its range (Catchpole *et al*., 2007). It is sometimes targeted in areas where it is locally abundant but is normally taken as bycatch in mixed demersal fisheries using trawl, gill nets and longlines elsewhere in its range. (Gibson *et al*., 2006)

THREATS, CONSERVATION, LEGISLATION

The status of the Blonde Ray in the UK is uncertain. It is potentially vulnerable to exploitation because it matures at a large size and produces relatively few young. As a result, juveniles can be fished before they have had a chance to breed (Gibson *et al*., 2006). The species is of commercial importance and is targeted across much of its range by long-line fisheries. It is regularly taken as by-catch in trawl fisheries. It is also considered a game fish and is sought by recreational anglers (Catchpole *et al*., 2007).

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.

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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
VIId	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, 2008).

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. The SFC's which implement these and the details are shown in the table below.

SFC	DW (cm)	Other
Cumbria	45	Cannot land wings less than22 cm in their maximum dimension
Kent & Essex	40	Cannot land wings less than 19cm in their maximum dimension
Southern	40	Cannot land wings less than 20cm in their maximum dimension
South Wales	45	Cannot land wings less than 22cm in their maximum dimension
States of Guernsey	36	

(Cumbria SFC, Unknown; Kent & Essex SFC, Unknown; South Wales SFC, Unknown; Southern SFC, 2006; NFFO, 2004)

THREATS, CONSERVATION, LEGISLATION

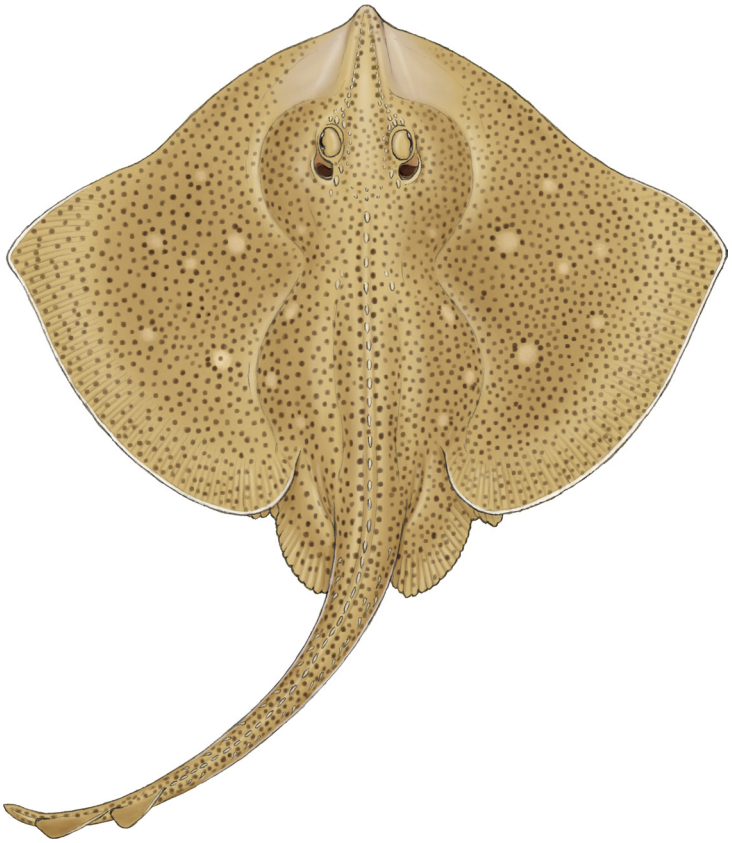
However, such localised management strategies are unlikely to be significant for the conservation of wider populations (Fowler *et al*., 2005). Many recreational anglers return any sharks, skates and rays they catch alive and some angling clubs have begun tag and release programmes (Holt, 2005). As with most European skate and ray species, there is very little effective management in place to protect the Blonde Ray.

IUCN RED LIST ASSESSMENT

Near Threatened (2008).

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Row of strong midline thorns.
- Parallel thorns sometimes present on lateral back of tail.



REFERENCES

BESTER, C. Unknown. Ray and Skate Biology. Florida Museum of Natural History. www.flmnh.ufl.edu/fish/.

BOTTARO, M., CONSALVO, I., FERRANDO, S., GALLUS, L., GIROSI, L., PSOMADAKIS, P. N., ATKINSON, C. J. L., VACCHI, M. 2007. New Records of Blonde Ray (*Raja brachyura*) from the Ligurian Sea. *Journal of the Marine Biological Association*. 76: 89–106.

CATCHPOLE, T. L., ENEVER, R., DORAN, S. 2007. Programme 21: Bristol Channel Ray Survival. CEFAS. Lowestoft, UK.

CENTRAL FISHERIES BOARD IRELAND. 2003. Irish Sport Fishes: A guide to their identification. www.cfb.ie.

CLARK, R. S. 1926. Rays and Skates: A Revision of the European Species. Fishery Board for Scotland, HM Stationary Office. Edinburgh, UK.

CUMBRIA SFC. Unknown. Minimum Fish Sizes. www.cumbriasfc.org.uk.

ELLIS, J. R., CRUZ-MARTÍNEZ, A., RACKHAM, B. D., ROGERS, S. I., 2005. The Distribution of Chondrichthyan Fishes around the British Isles and Implications for Conservation. *J. Northw. Atl. Fish. Sci.,* 35: 195-213.

EUROPEAN UNION. 2009. Council Regulation (EC) No. 43/2009. *Official Journal of the European Union*, L22/1. www.mfa.gov.uk .

FARIAS, I., FIGUEIREDO, I., SERRA-PEREIRA, B., BORDALO-MACHADO, P., MOURA, T., SERRANO GORDO, L. 2005. Diet comparison of four ray species [*Raja clavata* Linnaeus, 1758; *Raja brachyura* Lafont, 1873; *Leucoraja naevus* (Müller & Henle, 1841) and *Raja montagui* Fowler, 1910] caught along the Portuguese continental coast. ICES CM 2005/N:28 *Elasmobranch Fisheries Science.*

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.

GALLAGHER, M. J., NOLAN, C. P., JEAL, F. 2005. Age, Growth and Maturity of the Commercial Ray Species from the Irish Sea. *Journal of Northwest Atlantic Fishery Science*, 35: 47-66.

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.

HOFF, G. R. 2008, A Nursery Site of the Alaska Skate (*Bathyraja parmifera*) in the Eastern Bering Sea. *Fish. Bull.* 106: 233–244.

HOLT, D. 2005 Common Skate Tagging Programme. The Scottish Angling Homepage: www.catchalot.co.uk.

ICES. 2008. Demersal elasmobranchs in the North Sea (Subarea IV), Skagerrak (Division IIIa), and eastern English Channel (Division VIId). ICES advice 2008, Book 6.

KENT & ESSEX SFC. Unknown. Minimum Fish Sizes. www.kentandessex-sfc.co.uk.

LUNA, S. M. 2009. *Raja brachyura*: Blonde Ray. Fishbase. www.fishbase.org.

NFFO. 2004. Official Yearbook and Diary. Grimsby, UK.

SHARK TRUST. 2008. Identify Your Eggcase. www.eggcase.org.

SOUTH WALES SFC. Unknown. Byelaws. www.swsfc.org.uk.

SOUTHERN SFC. 2006. Minimum Landings Sizes. www.southernsfc.org.uk.

STEHMANN, M., BÜRKEL, L. 2000. Field Key to Common skate Species (Raja spp.) in Northern EC Shelf Waters. Grafik Design Studio GmbH. Hamburg, Germany.

WALKER, P. A., HISLOP, J. R. G. 1998. Sensitive Skates or Resilient Rays? Spatial and Temporal Shifts in Ray Species Composition in the Central and North-western North Sea Between 1930 and the Present Day. *ICES Journal of Marine Science*, 55: 392-402.

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
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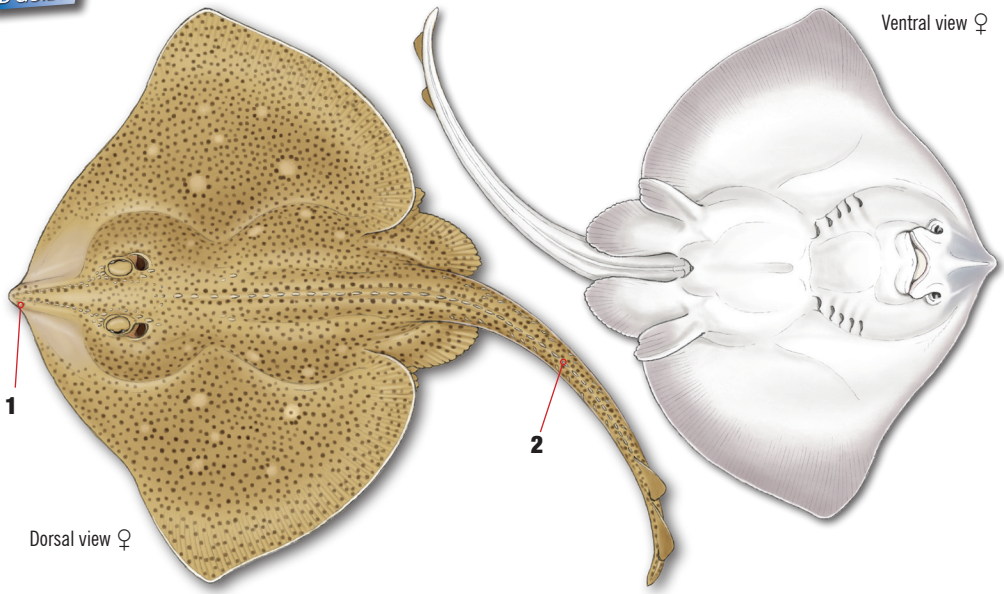
Blonde Ray

Raja brachyura

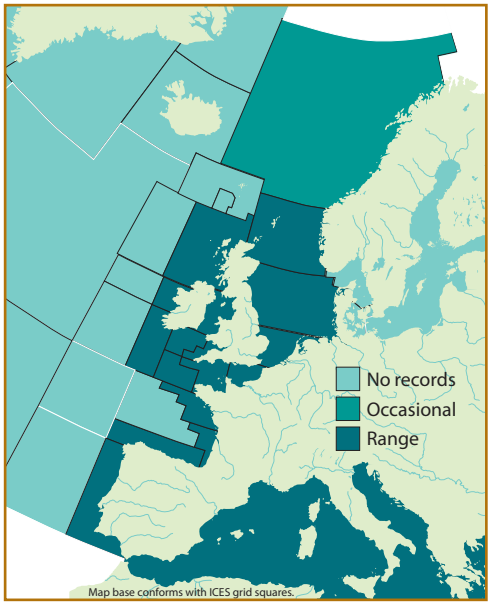


SCIENTIFIC NAME

Raja brachyura (Lafont, 1873).

DISTRIBUTION

Northeast Atlantic from Norway to Morocco and the western Mediterranean Sea[iii].



COMMON NAME

BLONDE RAY, Blonde Skate, Roker, Raie Lisse (Fr), Raie à Queue Courte (Fr), Razza a Coda Corta (It), Raia Pontuada (Pr), Raya Boca de Rosa (Es), Blonde Rog (Ne).

IDENTIFICATION

1. Large skate with short snout[vii].
2. Row of 40–45 midline thorns on juveniles and adult females.
3. Row present but interrupted on males[x].

COLOUR

- Pale brown dorsal surface covered in dark spots.
- Spots reach to **very edge** of pectoral fins.
- Larger, paler spots often scattered on disc.
- Ventral surface white[viii].

BIOLOGY AND SIZE

- Born: 16–18cm. Mature: 80–90cm. Max TL: 120cm[v].
- Juveniles feed on small crustaceans (amphipods, shrimp, crabs), adults feed more on cephalopods and small fish (sandeels)[iv].
- Juveniles are more likely to be found around inshore (<100m) nursery areas[iv].

NE ATL MED

NT

RJH

Blonde Ray

SIMILAR SPECIES

- *Raja clavata,* **Thornback Ray**
- *Raja microocellata,* **Small-eyed Ray**
- *Raja montagui,* **Spotted Ray**

HABITAT

- Demersal to 900m.
- Most common <100m.
- Prefer soft substrates such as sand and mud[iv].

CONSERVATION STATUS

- It matures late, has a long incubation period and a low fecundity. It is also concentrated on specific grounds. Consequently it is vulnerable to localised over-exploitation[viii].
- Red List status: Near Threatened (2008).

COMMERCIAL IMPORTANCE

- An important species, it is targeted where it is locally abundant in multispecies trawl, longline and gillnet fisheries[vi].
- Popular game species targeted by recreational anglers.
- 2009 – Species currently subject to TAC in EU waters.

HANDLING AND THORN ARRANGEMENT

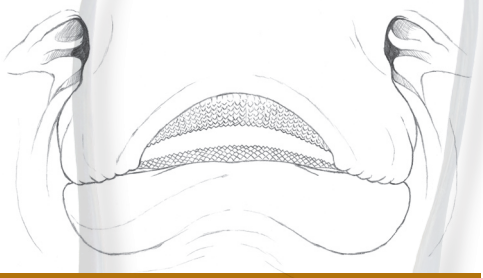
- Handle with care.
- Row of strong midline thorns.
- Parallel thorns sometimes present on sides of tail[vii].

REFERENCES

i. Catchpole, T. L; 2007 CEFAS.
ii. Clark, R; S; 1926. Fishery Board for Scotland.
iii. Ellis, J. *et al*; 2005. *J. Northw. Atl. Fish. Sci*. 35: 195-213.
iv. Farias, I. *et al*; 2005. ICES.
v. Gallagher, M. J; 2005. *J. Northw. Atl. Fish. Sci.* 35: 47-66.
vi. Gibson, C; 2006. IUCN SSC Shark Specialist Group.
vii. Luna, S. M; 2009. Fishbase.
viii. Marine Conservation Society; Unknown.
ix. Shark Trust; 2008.
x. Whitehead, P. J. P. *et al*; 1986. UNESCO.

TEETH

- 60–90 rows in upper jaw. Sharp cusps in both sexes[ii].



EGGCASE

1 ~90mm in length (excluding horns).
2 Obvious keels.
3 Upper horns longer than lower horns[ix].

Similar eggcase to the Thornback Ray, *Raja clavata*, although significantly larger. (Eggcase shown actual size.)

Common Eagle Ray

Myliobatis aquila

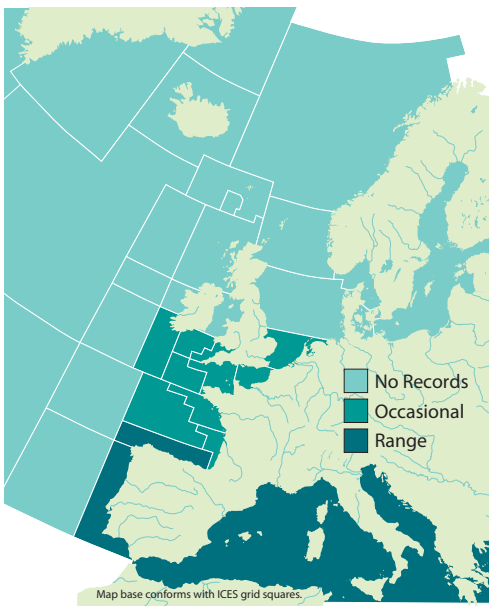
COMMON NAMES

Common Eagle Ray, Bull Ray, Sea Eagle, Whip-ray, Toad-fish, Aigle Commun (Fr), Aigle de Mer (Fr), Aguila Marina (Es), Adlerroche (De), Aquila di Mare (It), Ratão (Pr).

SYNONYMS

Raja aquila (Linnaeus 1758), *Myliobatis noctula* (Bonaparte 1833), *Pastinaca aquilai* (Gray 1854), *Raja rhombus* (Larrañaga 1923), *Myliobatis cervus* (Smith 1935), *Holorhinus aquila* (Fowler 1941).

DISTRIBUTION



Eastern Atlantic from the southern North Sea and Ireland to Morocco and the Canary Islands. Found throughout the Mediterranean but not present in the Black Sea. Also found around the coasts of South Africa and into the Indian Ocean as far north as Kenya (Luna, 2009).

APPEARANCE

- Disc width (DW) up to 83cm.
- Total length (TL) up to 260cm (including tail).
- Tail 2–2.5 times longer than body.
- One or more venomous spines near to the base of the tail 45mm (♀)-60mm (♂) in length.
- Average of 66 ♀-72 ♂ serrations on spine.
- Colour varies from dusky bronze to blackish on dorsal surface.
- Ventral surface white with brownish margin.

The body of the Common Eagle Ray is considerably wider than it is long. The head is moderately short and rounded with the pectoral fins joining underneath to form a subrostral lobe. The mouth is situated on the underside of the head and contains 1–7 series of teeth fused into dental plates. On the floor of the mouth there are several papillae (Bester, Unknown).

The tail is extremely long and whip-like, 2–2.5 times the length of the body (Bester, Unknown). At the base of the tail a single, venomous spine is normally found, although there are reports of fish with two or more (Wölfl, 1994). This spine is normally between 45–60mm in length depending on the sex and size of the ray. Adult males normally have around 72 serrations along the spine, adult females around 66 (Schwartz, 2007).

Colouration varies from dusky bronze/brown to almost black on the dorsal surface of the ray. The ventral surface is always white, sometimes with a brownish margin (Bester, Unknown). The maximum recorded size is 83cm DW and 260cm TL, including the tail (Serena, 2005).

NE ATL MED

MED: NT DD MYL

Common Eagle Ray

SIMILAR SPECIES

Mobula mobular, Giant Devil Ray

Pteromylaeus bovinus, Bull Ray

Rhinoptera marginata, Lusitanian Cownose Ray

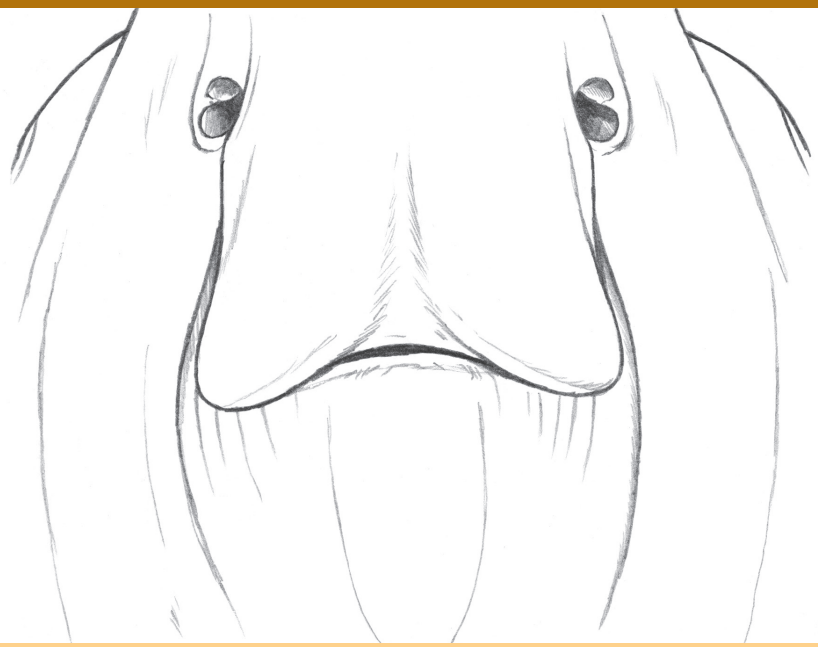
(Not to scale)

Common Eagle Ray

Myliobatis aquila

TEETH

There are 1–7 series of teeth fused into dental plates in each jaw (Bester, Unknown).



ECOLOGY & BIOLOGY

HABITAT

The Common Eagle Ray is semi-pelagic to depths of 300m (985ft), preferring shallow coastal areas such as lagoons and estuaries (Bester, Unknown). It is most common over sand flats on which it forages (Murch, Unknown).

DIET

A study from the eastern Adriatic showed that the Common Eagle Ray is an opportunistic predator feeding on a wide variety of species from the nematode, mollusc, polychaete, sipuncula, decapod crustacean and teleost groups. The most common prey items were *Aspidosiphon muelleri*, *Pteria hirundo* and *Cardium* spp. (Ivan *et al*., 2004).

REPRODUCTION

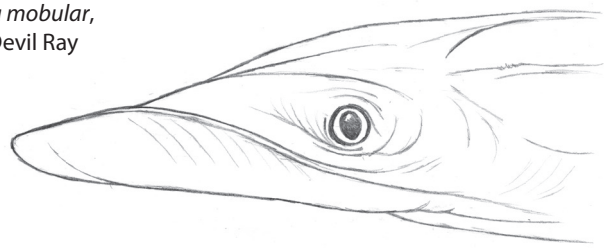
The Common Eagle Ray is an ovoviviparous species. Ovoviviparity, or leicithotrophic viviparity, is means of reproduction whereby the embryos develop within the female (Martin, Unknown). They are encased in a thin membrane which is retained in the uterus and nourished by the mother. In the Myliobatidae, Dasyatidae and Gymnuridae families, this nourishment is given through thousands of long threads called trophonemata which feed 'uterine milk' (protein-rich histotroph) directly into the embryos oesophagus through the spiracles (Martin, 1994).

Males reach sexual maturity at a total length of 40–50cm, females slightly larger at 60–70cm in length. The gestation period is approximately 6-8 months and 3–7 young are produced. The breeding period is probably between August and September and females most likely breed every other year (Capacé *et al*., 2007).

LATERAL VIEW OF HEAD

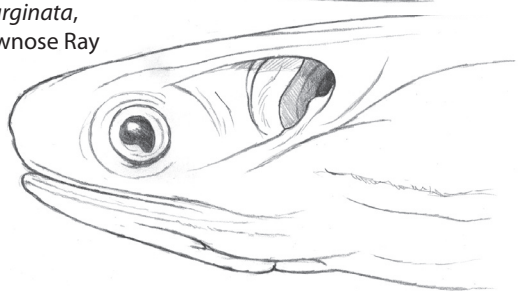
Myliobatis aquila,
Common Eagle Ray

Mobula mobular,
Giant Devil Ray



Pteromylaeus bovinus,
Bull Ray

Rhinoptera marginata,
Lusitanian Cownose Ray



Supported by:

Common Eagle Ray

COMMERCIAL IMPORTANCE

The Common Eagle Ray is of minor commercial importance, taken as bycatch by bottom trawls, trammel nets, purse seines and longlines throughout its range. The flesh is eaten dried and salted and is utilized for fishmeal and oil. It is also considered a game fish and sought by recreational anglers, although the majority of those caught are released (Bester, Unknown).

IUCN RED LIST ASSESSMENT

Data Deficient (2008).

Near Threatened in Mediterranean.

THREATS, CONSERVATION, LEGISLATION

Regional populations are known to have declined in the northern Mediterranean but little data is currently available for the rest of the Mediterranean and the eastern Atlantic (Bester, Unknown).

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- At least 1 large, venomous spine at base of tail.

REFERENCES

BESTER, C. Unknown. Common Eagle Ray. Florida Museum of Natural History. www.flmnh.ufl.edu/fish/.

CAPACÉ, C., GUÉLORGET, O., VERGNE, Y., QUIGNARD, J. P. 2007. Reproductive Biology of the Common Eagle Ray, *Myliobatis aquila*, from the Coast of Languedoc. *Vie et Milieu*, Vol. 57 (3): 125-130.

IVAN, J., SANTIC, M., PALLAORO, A. 2004. Diet Composition of the Eagle Ray, *Myliobatis aquila*, in the Eastern Adriatic Sea. *International Journal of Ichthyology*, Vol. 28 (4).

Luna, S. M. 2009. *Myliobatis aquila*. Common Eagle Ray. Fishbase. www.fishbase.org.

MARTIN, R. 1994. From Here to Maternity. ReefQuest Centre for Shark Research. www.elasmo-research.org.

MARTIN, R. Unknown. Elasmobranch Reproductive Modes. ReefQuest Centre for Shark Research. www.elasmo-research.org.

MURCH, A. Unknown. Common Eagle Ray. Elasmodiver. www.elasmodiver.com.

SCHWARTZ, F. J. 2007. A Survey of Tail Spine Characteristics of Stingrays Frequenting African, Arabian to Chagos-Maldive Archipelago Waters. *Smithiana*, Publications in Aquatic Biodiversity, Bulletin 8: 41-52.

SERENA, F. 2005. Field Identification Guide to the Sharks and Rays of the Mediterranean and Black Sea. FAO. Rome, Italy.

WÖLFL, D.; 1994. The Poisonous Fishes of the Croatian Adriatic. Draga.

Text: Richard Hurst.
Illustrations: Marc Dando.

Citation
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Common Eagle Ray

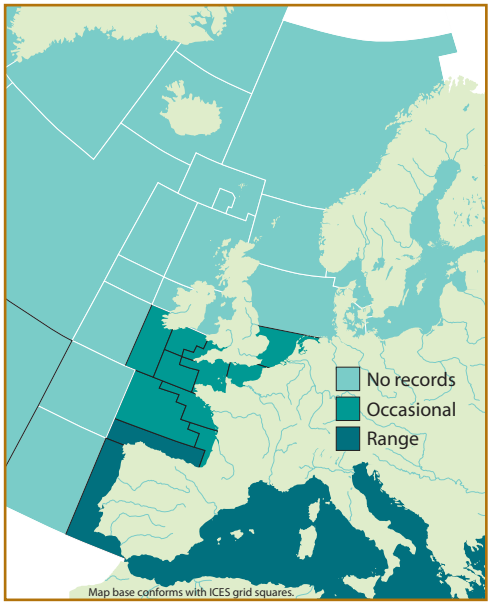
Myliobatis aquila

SCIENTIFIC NAME

Myliobatis aquila (Linnaeus 1758).

DISTRIBUTION

Southern North Sea to Morocco including Mediterranean Sea. Absent from the Black Sea. In Indian Ocean, Kenya to South Africa[v].



COMMON NAME

COMMON EAGLE RAY, Bull Ray, Sea Eagle, Whip-ray, Toad-fish, Aigle Commun (Fr), Aigle de Mer (Fr), Aguila Marina (Es), Adlerroche (De), Aquila di Mare (It), Ratão (Pr).

IDENTIFICATION

1 Wide body with sharply angled wings.

2 Tail 2–2.5 times length of body[i].

3 ~66 ♀–72 ♂ serrations on venomous spine[vi].

COLOUR

- Dorsal surface from dusky bronze to almost black.
- Ventral surface white with darker margin[i].

BIOLOGY AND SIZE

- Mature: 40–50cm ♀, 60–70cm ♂ [ii].
  Max TL: 260cm, DW 183cm[vii].
- Feed predominantly on worms, molluscs and crustaceans[iv].
- Give birth to 3–7 young each year[ii].

NE ATL MED

MED: NT

DD

MYL

Common Eagle Ray

SIMILAR SPECIES

- *Mobula mobular,* **Giant Devil Ray**
- *Pteromylaeus bovinus,* **Bull Ray**
- *Rhinoptera marginata,* **Lusitanian Cownose Ray**

HABITAT

- 0–300m.
- Prefer shallow lagoons, bays and estuaries.
- Most common over sand flats on which it forages[i].

CONSERVATION STATUS

- Very little data but known to be decreasing in northern Mediterranean. Unknown across the rest of its range[iii].
- Red List status: Data Deficient (2008). Near Threatened in Mediterranean.

COMMERCIAL IMPORTANCE

- Regularly taken as bycatch in mixed species fisheries[iii].
- Sought by recreational anglers.
- Flesh utilised for human consumption, liver for oil and carcass for fishmeal[i].

HANDLING AND THORN ARRANGEMENT

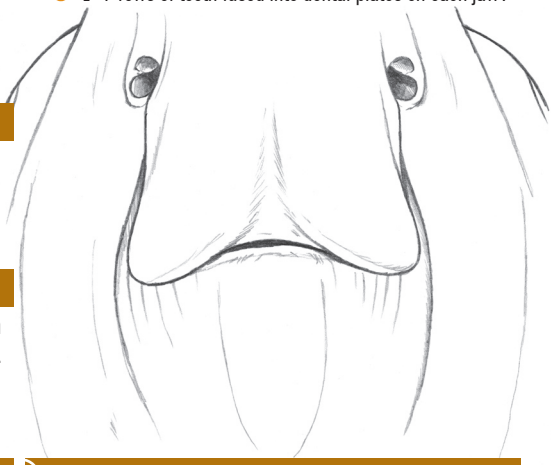
- Handle with care.
- At least one large, venomous spine at base of tail.

REFERENCES

i. Bester, C; Unknown. Florida Museum of Natural History.
ii. Capace, C; 2007. *Vie et Milieu*, Vol. 57 (3): 125-130.
iii. Gibson, C; 2006 Red List Workshop.
iv. Ivan, J; 2004. *International Journal of Ichthyology*, Vol. 28 (4).
v. Luna, S. M; 2008. Fishbase.
vi. Schwartz, F. J; 2007. Smithiana, *Publications in Aquatic Biodiversity*, Bulletin 8: 41-52.
vii. Serena, F; 2005. FAO.

TEETH

- 1–7 rows of teeth fused into dental plates on each jaw[i].



LATERAL VIEW OF HEADS

- *Myliobatis aquila*, **Common Eagle Ray**

- *Pteromylaeus bovinus,* **Bull Ray**

- *Rhinoptera marginata,* **Lusitanian Cownose Ray**

Common Skate

Dipturus batis

COMMON NAMES

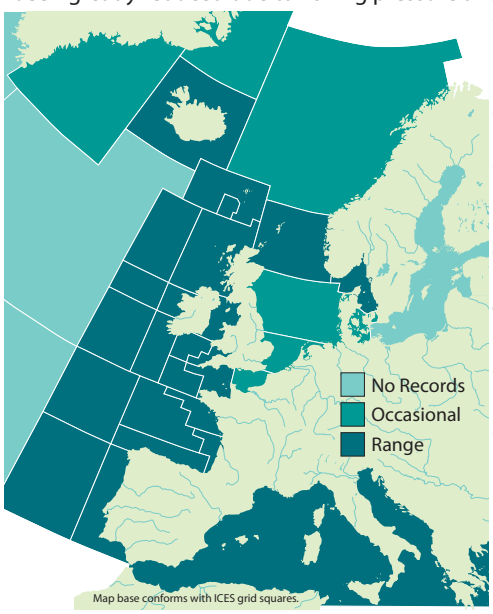
Common Skate, Blue Skate, Grey Skate, Pocheteau Gris (Fr), Noriega (Es).

SYNONYMS

Raja batis (Linnaeus, 1758), *Raja macrorhynchus* (Rafinesque, 1810), *Raja flossada* (Risso, 1826), *Raja intermedia* (Parnell, 1837), *Laeviraja macrorhynchus* (Bonaparte, 1839).

DISTRIBUTION

The Common Skate was historically found across much of the northeast Atlantic and Mediterranean (Luna, 2009). Its range has been greatly reduced due to fishing pressure and it is now almost extinct in the Mediterranean (Abdulla, 2004). Around the UK, individuals are occasionally reported from the Irish Sea, Bristol Channel and central North Sea but it would appear that its range is now effectively limited to northwest Scotland and the Celtic Sea. (Dulvy *et al*., 2006).



APPEARANCE

- Large, up to 285cm total length.
- Long, pointed snout.
- Upper surface olive-grey to brown.
- Variable pattern of light spots and dark blotches.
- Lower surface black in juveniles, fading with age.
- Juveniles have large orbital thorns.

The Common Skate has a long and pointed snout giving the disc a broadly rhombic shape with the front margins distinctly concave. The dorsal surface of the disc is olive-grey or brown with a variable pattern of light spots and dusky blotches. In sub-adults there is often a marking on each pectoral fin resembling an eye spot (Whitehead *et al.,* 1986). The ventral surface of the disc is black in juveniles and fades to grey as the animal matures (Neal *et al.,* 2008). The mucus pores on both sides of the disc are marked with black spots and short streaks which are particularly numerous on the lower surface (Whitehead *et al*., 1986).

Juveniles are smooth on both surfaces of the disc but often have large orbital thorns. Adults are partly prickly on both the upper and lower surfaces but have no thorns on the disc. There are two rows of 12-18 thorns along the tail (measured from the cloaca) and normally one or two thorns between the dorsal fins. Often there are thorns along the lower edges of the tail, particularly so in females (Luna, 2009).

They are the largest skate found in European waters with females reaching a maximum total length of 285cm. They have between 40 and 56 rows of teeth and may live for 50-100 years (Luna, 2009; Dulvy *et al.,* 2006; Neal *et al.,* 2008).

NE ATL MED

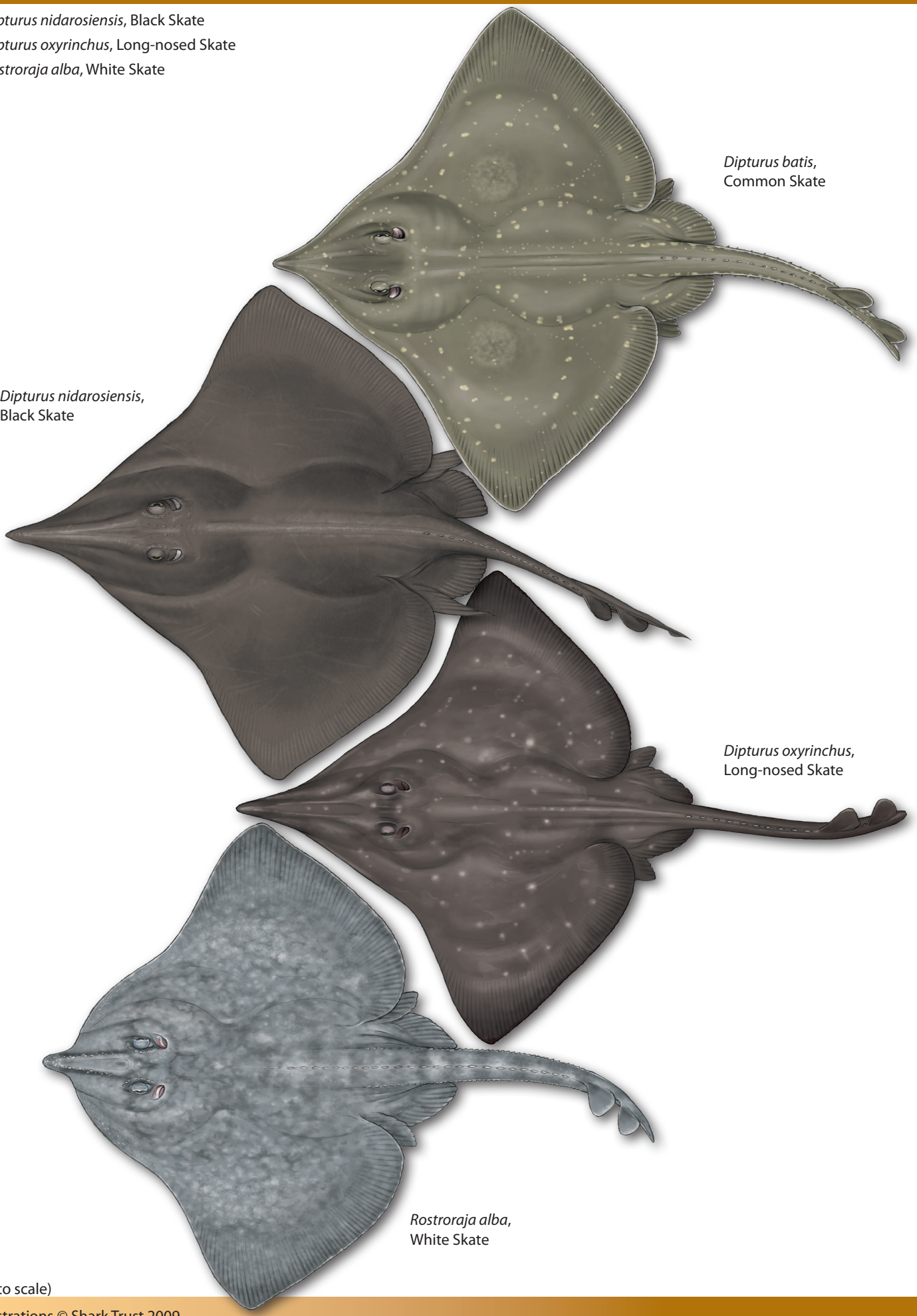
CR

RJB

Common Skate

SIMILAR SPECIES

Dipturus nidarosiensis, Black Skate
Dipturus oxyrinchus, Long-nosed Skate
Rostroraja alba, White Skate



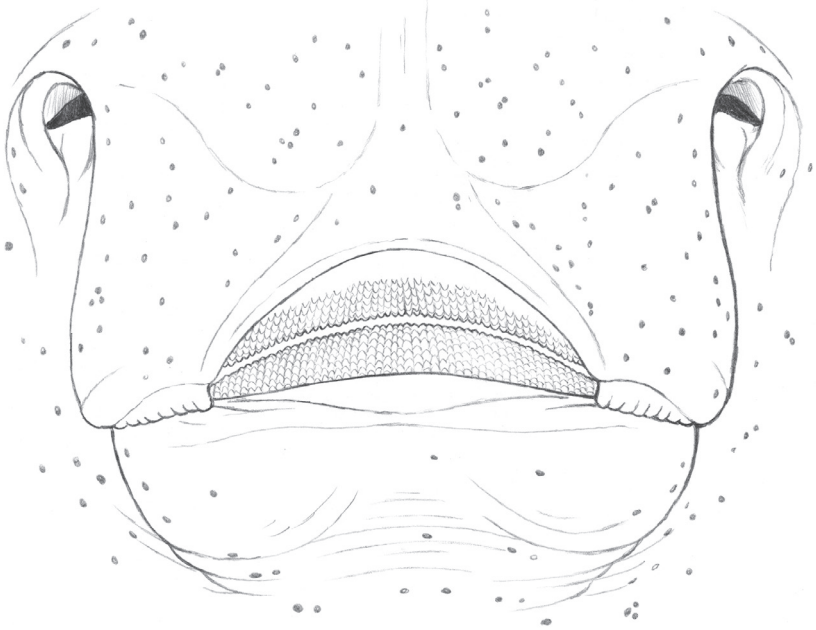
(Not to scale)

Common Skate

Dipturus batis

TEETH

There are between 40–56 rows of teeth (Luna, 2009).



ECOLOGY & BIOLOGY

HABITAT

Like most skates and rays, the Common Skate is a bottom dwelling species that is found from coastal waters to a depth of approximately 600m (1,970ft), although it is most commonly found around 200m (670ft) (Dulvy *et al.,* 2006). Unlike most other skate, it is active both day and night (Luna, 2009).

DIET

The Common Skate has been recorded as feeding on several species of skate (*Raja* spp.), dogfish (*Squalus* spp.), catshark (*Scyliorhinus* spp.), anglerfish (*Lophius* spp.), gurnards (*Dactyloptena* spp.), flatfishes, pilchards, herring (*Clupea* spp.) and scad (*Trachurus* spp.). Lobsters, crabs and cephalopods (particular *Eledone* spp.) are also important (Wheeler, 1969). It hunts actively, enveloping prey before consuming it (Dulvy *et al.,* 2006). Mid-water species are captured by the skate propelling itself rapidly upward, enveloping and gripping the fish before returning to the seabed to consume it (Wheeler, 1969).

REPRODUCTION

The Common Skate takes around 11 years to reach sexual maturity at a length of around 150cm for males and 180cm for females. Females only breed every other year, mating in spring and laying up to 40 eggcases during summer which are deposited in sandy or muddy flats (Neal *et al.,* 2008). These eggcases are large, measuring up to 25cm long (excluding the horns) and 15cm wide and are covered with close-felted fibres (Neal *et al.,* 2008; Dulvy *et al.,* 2006). They have been reported as being loose on the seabed and occasionally secured between rocks. The embryos take between 2–5 months to develop depending on temperature and the juveniles are born measuring 21-22cm long (Neal *et al.,* 2008; Clark, 1926).

EGGCASE

1. Very large, 120–250mm in length (Neal *et al.,* 2008).
2. Distinct lateral keels.
3. Very deep anterior fields (Luna, 2009).

Similar eggcase to the Long-nosed Skate, *Dipturus oxyrinchus.*

(Eggcase shown half actual size)

Supported by:
SEAFISH
Cyngor Cefn Gwlad Cymru Countryside Council for Wales
defra Department for Environment Food and Rural Affairs
marine and fisheries agency

Common Skate

COMMERCIAL IMPORTANCE

Historically important, the Common Skate has been targeted across its range wherever and whenever it has been abundant. This has lead to serious declines in stocks making it a financially unsound species to target commercially. Until recently it was still caught and landed by multispecies trawl fisheries operating over the vast majority of its habitat (Dulvy *et al.,* 2006). From January 2009 there has been a prohibition on commercial fishers retaining this species in ICES areas IIa, IIIa, IV, VI, VII, VIII & IX.

The Common Skate is a popular species with recreational anglers due to its large size but if these fish are returned alive there is a good chance of them surviving (Catchpole *et al.,* 2007). A catch and release scheme involving recreational anglers in the Sound of Mull, Scotland, generates an estimated £1,000,000 a year from a stock of around 500 fish (Holt, 2005).

THREATS, CONSERVATION, LEGISLATION

The large size of the Common Skate allows it to be caught by most fishing gear from birth, giving individuals little or no chance to reach maturity in heavily fished areas (UK Biodiversity Action Plan; 1999). Combined with relatively late maturity and low population increase rates, the Common Skate is extremely vulnerable to fishing pressure. This has been seen in a drastic decline in populations during the 20th century, particularly around the UK. It has been extirpated from the majority of British coastal waters and is now only regularly found in northwest Scotland, the Shetlands and the Celtic Sea. French landings appear to be stable but this is likely to be due to a redirection of the fishing effort from the continental shelf into deeper water where the population may currently be stable (Dulvy *et al.,* 2006).

In 1999, the Common Skate was included on the UK Biodiversity Action Plan (BAP) list. Though this does not provide any legal protection for the species in itself, it includes provisions to work towards European conservation legislation. Its main targets included plans to stabilise populations in refuge areas by 2004 and to facilitate the migration of animals from refuge populations to areas where they are scarce or extinct (UK Biodiversity Action Plan; 1999).

In 2009, the Common Skate received protection from the European Council in ICES areas IIa, IIIa, IV, VIIa-k, VIII and IX, meaning that it cannot be retained by commercial fishers if captured. As elasmobranchs have no swim bladder that can overinflate or rupture, they are more likely to survive capture and release than teleost fish (DEFRA; 2008). The mandatory release order is therefore likely to significantly reduce the level of fishing mortality.

The vast majority of recreational anglers in the UK return any Common Skate they catch alive. Some angling clubs and the majority of charter boats tag and release Common Skate when caught, an activity which provides a sustainable source of income for many communities (Holt, 2005).

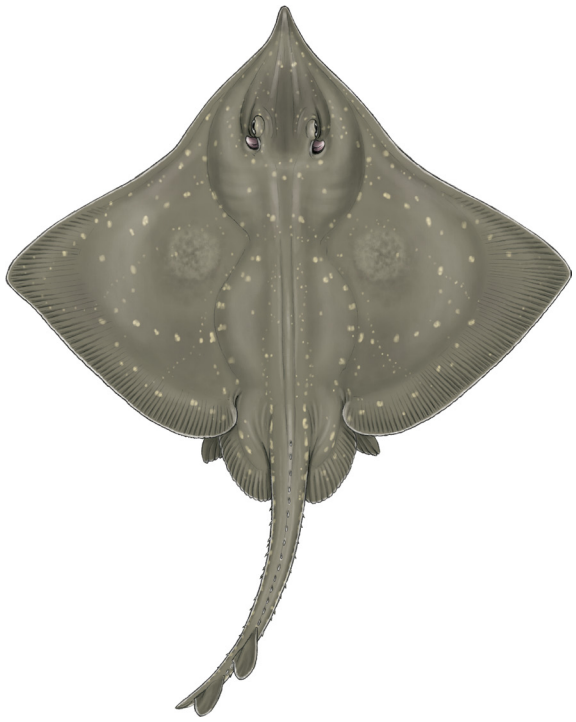
IUCN RED LIST ASSESSMENT

Critically Endangered (2006).

Critically Endangered in northeast Atlantic.

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Strong rows of thorns on midline.
- Thorns between dorsal fins.



TAXONOMIC NOTE

Since this factsheet was produced, genetic research has revealed that the Common Skate, *Dipturus batis*, is in fact two distinct species. These have been named *D. intermedia* and *D. flossada*. Common names already in use for these species are the Flapper Skate and Blue Skate respectively, although it remains to be seen if these become widely accepted.

The two species appear to have different distributions and biological characteristics. Of the two, *D. intermedia* is slower growing and reaches a larger size. The first data published suggests a size at 50% maturity of 197.5cm (♀) and 185.5cm (♂) for *D. intermedia*, compared to 122.9cm (♀) and 115cm (♂) for *D. flossada*. The largest positively identified specimen of *D. flossada* was 143.2cm in length. It seems the maximum total length of 285cm previously attributed to *D. batis* must be *D. intermedia*.

While the ranges of the species overlap it appears that *D. intermedia* is limited to west Scotland and west Ireland, with *D. flossada* limted to the southern Irish and Celtic Seas and the Rockall Trough. This appears to be closely related to temperature.

The most reliable means of distinguishing these species seems to be the colour of the iris. In *D. intermedia* it is dark green/olive, in *D. flossada* it is pale yellow. Other morphometric features to check are the malar thorns, lateral tail thorns, interdorsal space and tooth bases. Colouration can differ on the ventral surface and on the centre of the wings. For a full discussion of these differences see Iglésias *et al*., 2009, available online.

REFERENCES

ABDULLA, A. 2004. Status and Conservation of Sharks in the Mediterranean Sea. IUCN Global Marine Programme.

CATCHPOLE, T. L., ENEVER, R., DORAN, S. 2007. Programme 21: Bristol Channel Ray Survival. CEFAS. Lowestoft, UK.

CLARK, R. S. 1926. Rays and Skates. A Revision of the European Species. Fishery Board for Scotland. HM Stationary Office. Edinburgh, UK.

DEFRA. 2008. Impact Assessment of Tope Shark Protection Measures. www.defra.gov.uk.

DULVY, N. K., NOTOBARTOLO DI SCIARA, G., SERENA, F., TINTI, F., UNGARO, N., MANCUSI, C., ELLIS, J. 2006. Dipturus batis. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. www.iucnredlist.org.

HOLT, D. 2005 Common Skate Tagging Programme. The Scottish Angling Homepage: www.catchalot.co.uk.

IGLÉSIAS, S. P., TOULHOAT, L., SELLOS, D. Y. 2009. Taxonomic confusion and market mislabelling of threatened skates: important consequences for their conservation status. *Aquatic Conserv: Mar. Freshw. Ecosyst.* Published Online 2009.

LUNA, S. M. 2009. *Dipturus batis*. Blue Skate. Fishbase. www.fishbase.org.

NEAL, K. J., PIZZOLLA, P. F., WILDING, C. M. 2008. *Dipturus batis*. Common Skate. Marine Life Information Network: Biology and Sensitivity Key Information Sub-programme [on-line]. Plymouth: Marine Biological Association of the United Kingdom. www.marlin.ac.uk.

UK BIODIVERSITY ACTION PLAN. 1999. Species Action Plan: Common Skate (*Dipturus batis*). www.ukbap.org.uk.

WHEELER, A. 1969. The Fishes of the British Isles and North-West Europe. Macmillan and Co Ltd. London, UK.

WHITEHEAD, P. J. P., BAUCHOT, M. L., HUREAU, J. C., NIELSEN, J.,

Text: Richard Hurst.
Illustrations: Marc Dando.

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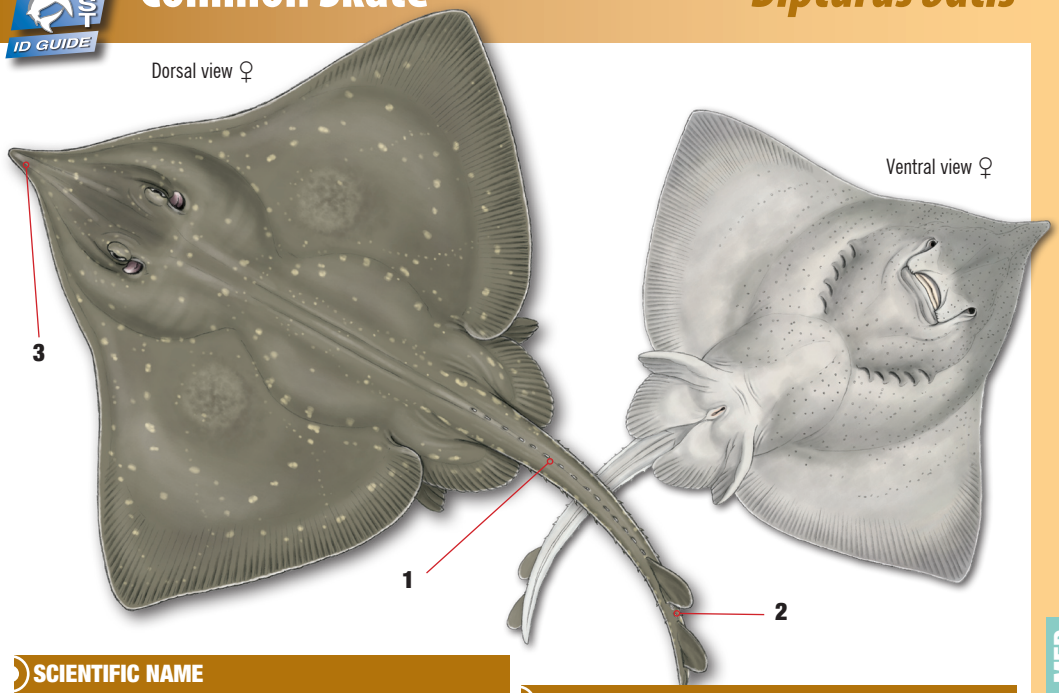
Common Skate

Dipturus batis

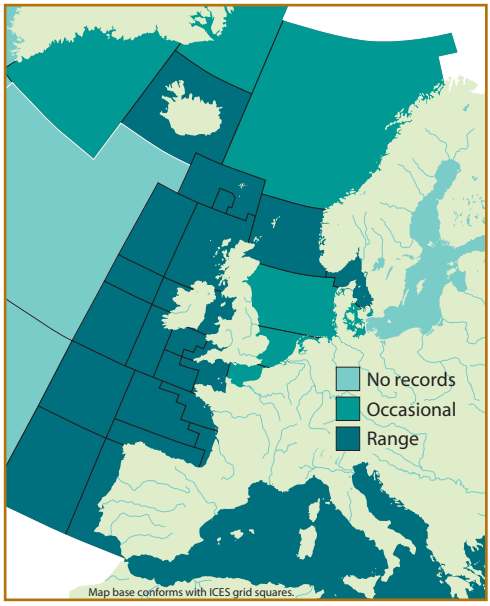


SCIENTIFIC NAME

Dipturus batis (Linnaeus, 1758).

DISTRIBUTION

Formerly widespread in European seas. Range reduced to northwest Scotland, Celtic Sea, northern North Sea and rarely the western Mediterranean Sea[iii].



COMMON NAME

COMMON SKATE, Blue Skate, Grey Skate, Flapper Skate, Glattroche (De), Pocheteau Gris (Fr), Razza Bavosa (It), Raia Oirega (Pr), Noriega (Es), Vleet (Ne).

IDENTIFICATION

1 Row of 12–18 thorns on tail.

2 1–2 thorns between dorsal fins.

3 Long, pointed snout[v].

COLOUR

- Dorsal surface olive grey/brown.
- Variable pattern of light spots and dark blotches.
- Ventral surface black in juveniles, grey in adults[v].

BIOLOGY AND SIZE

- Born: 21[ii]–29cm[i]. Mature: ~150cm[iii]. Max TL: 285cm[v].
- Feed on a variety of crustaceans, teleosts and other skates[v].
- Longevity of 20–100 years[v].

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Common Skate

SIMILAR SPECIES

- *Dipturus nidarosiensis*, **Black Skate**
- *Dipturus oxyrinchus*, **Long-nosed Skate**
- *Rostroraja alba*, **White Skate**

HABITAT

- Demersal from coastal waters to 600m. Most common ~200m[iii].
- Unlike many skate, it is active both day and night[iv].
- Prefer soft substrates but can be found over gravel and rock beds[iii].

CONSERVATION STATUS

- Large size, late maturity and low fecundity combine to make Common Skate extremely vulnerable to fishing pressure[viii].
- Red List status: Critically Endangered (2006).

COMMERCIAL IMPORTANCE

- 2009 – Prohibition on commercial fishers retaining this species in ICES areas IIa, IIIa, IV, VI, VII, VIII & IX.
- Extremely popular with recreational anglers, catch-and-release fisheries are a sustainable source of income where it is common[vii].
- Rod and line caught fish are regularly tagged to monitor populations[vii].

HANDLING AND THORN ARRANGEMENT

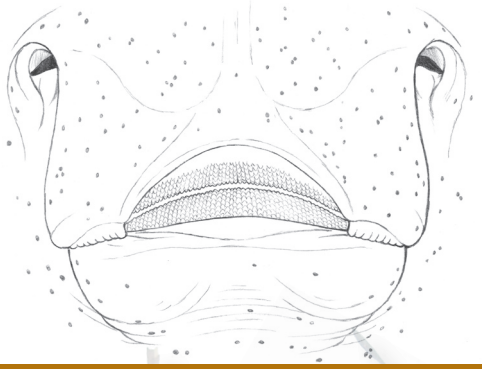
- Handle with care.
- Large, powerful skate.
- Strong row of thorns on midline.
- Thorns between dorsal fins.

REFERENCES

i. Clark, R. S; 1922. *JMBA* Vol. XI (4): 577–643.
ii. Clark, R. S; 1926. Fishery Board for Scotland.
iii. Dulvy, N. K *et al*; 2006. IUCN Red List.
iv. Luna, S. M; 2009. Fishbase.
v. Neal, K.. J. *et al*; 2008. Marine Biological Association.
vi. Shark Trust; 2008.
vii. The Scottish Angling Homepage; 2005.
viii. UK Biodiversity Action Plan; 1999.

TEETH

- 40–56 rows of teeth[iv].



EGGCASE

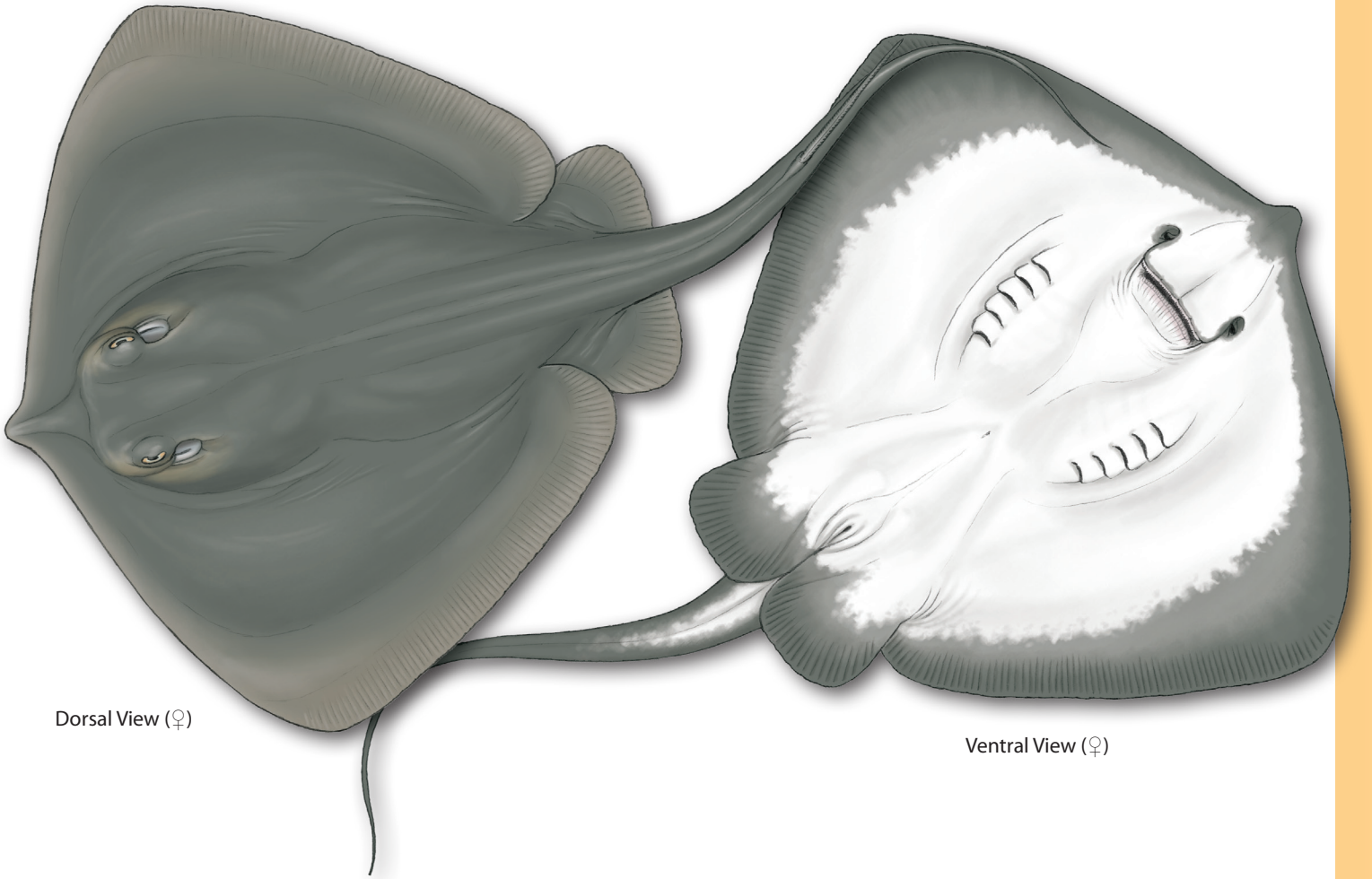
1 Very large, 120–180mm in length (excluding horns).
2 Distinct lateral keels.
3 Very deep proximal fields[vi].

Similar eggcase to the Long-nosed Skate, *Dipturus oxyrinchus*.

(NB Shown at half size in comparison to an adult's hand.)

Common Stingray

Dasyatis pastinaca



Dorsal View (♀)

Ventral View (♀)

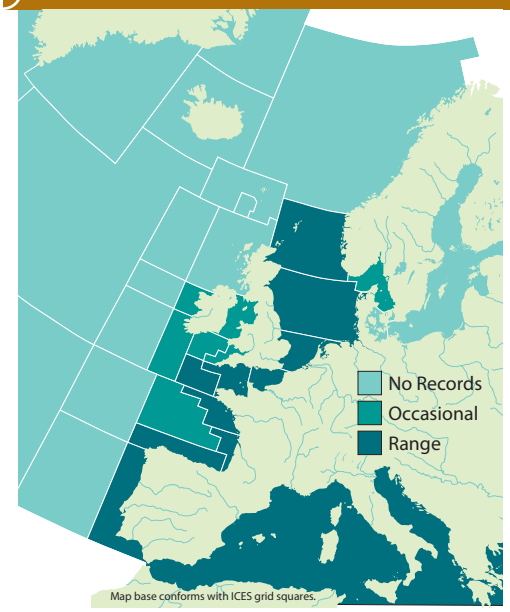
COMMON NAMES

Common Stingray, Blue Stingray, Fire Flaire, Pastenague Commune (Fr), Raya Latigo Comun (Es).

SYNONYMS

Raja pastinaca (Linnaeus, 1758), *Trygon pastinaca* (Cuvier, 1817), *Trygon vulgaris* (Risso, 1826), *Pastinaca laevis* (Gray, 1854), *Dasybatus (Dasybatus) pastinacus* (Garman, 1913).

DISTRIBUTION



The Common Stingray is found along east Atlantic coasts from southern Norway to the Canary Islands and the Azores, rarely including the Baltic Sea (Greenberg, 2008; Whitehead *et al.*, 1986). Also found throughout the Mediterranean and Black Seas (Whitehead *et al.*, 1986).

It has been suggested that records from South

DISTRIBUTION CONTINUED

Africa, Namibia and Angola are not *D. pastinaca* but a subspecies, *D. chrysonota chrysonota*. Likewise, it has been suggested that the Blue Stingray from Senegal is not *D. pastinaca* but a subspecies, *D. chrysonota marmorata*. The range of this subspecies could stretch from the Congo as far into the southern Mediterranean as Tunisia (Cowley and Compagno, 1993). *D. chrysonota* has now been accepted as a distinct species containing the two subspecies *D. c. chrysonota* and *D. c. marmorata*, effectively limiting the range of the Common Stingray from the northern Mediterranean to southern Norway (ITIS, Unknown).

APPEARANCE

- Short snout with almost straight leading edges of disc.
- Long thin tail, 1.3–1.5 times the length of the body.
- Up to 12cm long spine ~1/3 of the way along the tail.
- Spine with maximum 74 (♀)–98 (♂) serrations.
- Dorsal surface uniform grey-brown to olive.
- Ventral surface white with a wide, dark margin.
- Up to 60cm disc width (DW) and 250cm total length (TL).

The Common Stingray is the only true stingray species regularly encountered in UK waters, easily distinguishable from the Rajiformes (skates) and Torpediniformes (torpedo rays) by its long, whip-like tail, lack of dorsal fins and large, stinging spine. The tail has relatively short and deep membranous folds along the upper and lower surface, which originate at around the level of the spine (Whitehead *et al.*, 1986). It has a short snout which barely protrudes from the almost straight leading edge of the pectoral fins, the corners of which are obtuse and rounded. Inside the mouth there are 5 bulbous papillae on the lower surface (Whitehead *et al.*, 1986).

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Common Stingray

The colouration of the dorsal surface is generally solid brown but varies from grey to olive green. The ventral surface is white with a wide brown or grey margin along the edges (Whitehead *et al*., 1986). The maximum observed disc width is 60cm and the maximum total length is 250cm, although this is unusual (IBSS, Unknown; Ferretti *et al.,* 2005). The maximum recorded age from the Mediterranean is 10 years, but captive animals of up to 21 years old have been reported (Ismen, 2003; AnAge, Unknown).

SIMILAR SPECIES

Dasyatis centroura, Roughtail Stingray

Pteroplatytrygon tortonesi, Tortonese's Stingray (not illustrated)

Pteroplatytrygon violacea, Pelagic Stingray

Dasyatis pastinaca, Common Stingray

Dasyatis centroura, Roughtail Stingray

Pteroplatytrygon violacea, Pelagic Stingray dorsal

Pteroplatytrygon violacea, Pelagic Stingray ventral

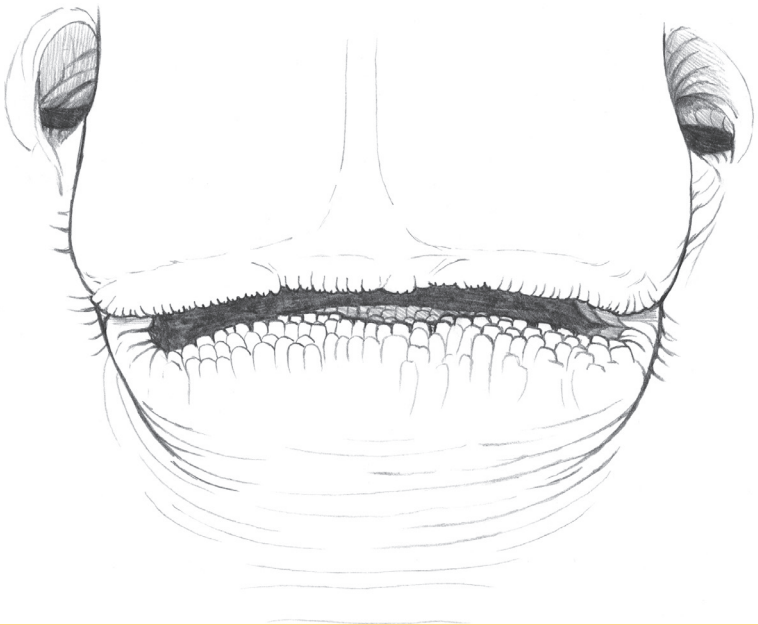
(Not to scale)

Common Stingray

Dasyatis pastinaca

TEETH

The teeth are arranged into 28–43 rows (Van der Elst and Borchert, 1997).



ECOLOGY & BIOLOGY

HABITAT

A benthic species, the Common Stingray is encountered over sandy substrates in marine and estuarine habitats. It is found from the shallows to around 200m (650ft), but is most common to 60m (200ft) (Serena, 2005).

EGGCASE

N/A

DIET

The Common Stingray preys on a variety of bottom dwelling invertebrates, predominantly crustaceans but also small fish and molluscs (Ismen, 2003; Luna, 2009). Anglers seeking the species generally use worms, crustaceans and squid and fish strips as bait (Go Fishing, 2009).

REPRODUCTION

The Common Stingray is an ovoviviparous species. Oviviparity, or leicithotrophic viviparity, is a means of reproduction whereby the embryos develop within the female (Martin, Unknown). They are encased in a thin membrane which is retained in the uterus and nourished by the mother. In the Dasyatidae, Gymnuridae and Myliobatidae families, this nourishment is given through thousands of long threads called trophonemata which feed 'uterine milk' (protein-rich histotroph) straight into the embryos oesophagus through the spiracles (Martin, 1994).

In the Mediterranean, male Common Stingrays mature at a total length of around 43cm with a disc width of around 22cm. Females mature slightly larger around 46cm in length and 24cm wide (Ismen, 2003). The gestation period is around 4 months and 4-7 young are born (IBSS, Unknown). In the Balearics, large numbers of Common Stingray come inshore to warm, sheltered areas where they give birth during May. In other parts of the Mediterranean, parturition is reported to occur between May and September (Ismen, 2003).

Common Stingray

COMMERCIAL IMPORTANCE

The shallow depth distribution of the Common Stingray makes it particularly vulnerable to small-scale inshore fisheries such as the Balearic Islands trammel net fishery, where it can constitute up to 40% of the elasmobranch biomass caught (Gibson *et al.,* 2006). It can also be taken by bottom trawls, bottom-set longlines and hook-and-line fishing (Serena, 2005). Its wings are marketed smoked and dried-salted for human consumption and it is also used for fishmeal and oil (Luna, 2009).

THREATS, CONSERVATION, LEGISLATION

Little is known of the status of the Common Stingray, though its shallow depth range makes it particularly vulnerable to inshore fisheries. Populations appear to be fairly stable in the Mediterranean, although comparative trawl data from the Adriatic Sea shows a decrease in abundance. In the northeast Atlantic, populations appear to be low and it may have been extirpated from the Bay of Biscay (Gibson *et al*., 2006).

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. The SFC's which implement these and the details are shown in the table below.

SFC	DW (cm)	Other
Cumbria	45	Cannot land wings less than 22cm in their maximum dimension
Kent & Essex	40	Cannot land wings less than 19cm in their maximum dimension
Southern	40	Cannot land wings less than 20cm in their maximum dimension
South Wales	45	Cannot land wings less than 22cm in their maximum dimension
States of Guernsey	36	

(Cumbria SFC, Unknown; Kent & Essex SFC, Unknown; South Wales SFC, Unknown; Southern SFC, 2006; NFFO, 2004)

Due to the relative rarity of their capture in UK waters however, such localised management strategies are unlikely to be significant for the conservation of wider populations (Fowler *et al.,* 2005).

IUCN RED LIST ASSESSMENT

Data Deficient (2008).

Near Threatened in northeast Atlantic.

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large venomous spine on tail.
- In extreme cases can cause temporary paralysis (Wölfl, 1994).

REFERENCES

ANAGE. Unknown. *Dasyatis pastinaca*. The Animal Ageing & Longevity Database. http://genomics.senescence.info/species/.

COWLEY, P. D., COMPAGNO, L. J. V. 1993. A Taxonomic Re-evaluation of the Blue Stingray from Southern Africa (Myliobatiformes: Dasyatidae). *South African Journal of Marine Science*, Vol. 13 (1): 135-149 (15).

CUMBRIA SFC. Unknown. Minimum Fish Sizes. www.cumbriasfc.org.uk.

FERRETTI, F., MYERS, R. A., SARTOR, P., SERENA, F. 2005. Long Term Dynamics of the Chondrichthyan Fish Community in the Upper Tyrrhenian Sea. ICES. Copenhagen, Denmark.

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.

GO FISHING. 2009. Sting Ray – *Dasyatis pastinaca*. www.gofishing.co.uk.

GREENBERG, R. 2008. Guide to European Elasmobranches. Oceana. Madrid, Spain.

IBSS, Unknown. Mediterranean Fishes: *Dasyatis pastinaca* (Linnaeus, 1758). http://atlases.ibss.org.ua.

ISMEN, A. 2003. Age, Growth, Reproduction and Food of Common Stingray (*Dasyatis pastinaca* L., 1758) in Iskenderun Bay, the Eastern Mediterranean. *Fisheries Research*, Vol. 60 (1): 169-176.

ITIS. Unknown. ITIS Standard Report Page: *Dasyatis chrysonota*. www.itis.gov.

KENT & ESSEX SFC. Unknown. Minimum Fish Sizes. www.kentandessex-sfc.co.uk.

LUNA, S. M. 2009. *Dasyatis pastinaca*: Common Stingray. Fishbase. www.fishbase.org.

MARTIN, R. 1994. From Here to Maternity. ReefQuest Centre for Shark Research. www.elasmo-research.org.

MARTIN, R. Unknown. Elasmobranch Reproductive Modes. ReefQuest Centre for Shark Research. www.elasmo-research.org.

NFFO. 2004. Official Yearbook and Diary. Grimsby, UK.

SCHWARTZ, F. J. 2007. A survey of tail spine characteristics of stingrays frequenting African, Arabian to Chagos-Maldive Archipelago waters. *Smithiana*, Publications in Aquatic Biodiversity, Bulletin 8: 41-52.

SERENA, F. 2005. Field Identification Guide to the Sharks and Rays of the Mediterranean and Black Sea. FAO. Rome, Italy.

SOUTH WALES SFC. 2008. Skate and Ray – Minimum Size. www.swsfc.org.uk.

SOUTHERN SFC. 2008. Minimum Landing Size. www.southernsfc.org.uk.

VAN DER ELST, R., BORCHERT, P. 1997. A Guide to the Common Sea Fishes of Southern Africa. Random House Struik. Cape Town, South Africa.

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.

WÖLFL, D. 1994. The poisonous fishes of the Croatian Adriatic. *Draga*.

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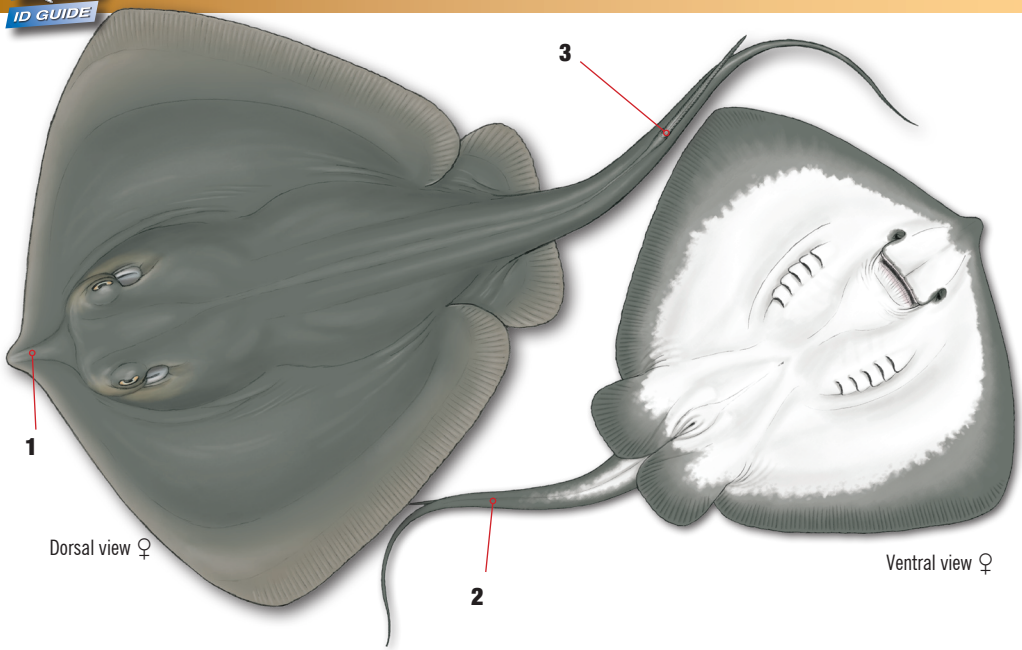
Common Stingray

Dasyatis pastinaca

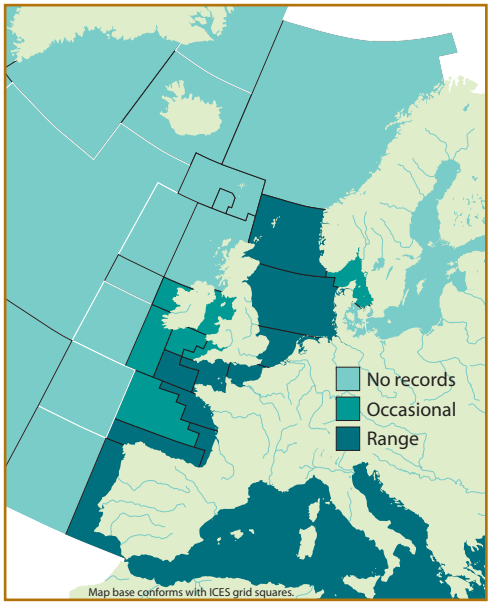


SCIENTIFIC NAME

Dasyatis pastinaca (Linnaeus 1758).

DISTRIBUTION

Southern Norway to the northern Mediterranean[vii] including the western Baltic[iii] and the Black Sea[x].



COMMON NAME

COMMON STINGRAY, Blue Stingray, Fire Flaire, Pastenague Commune (Fr), Raya Latigo Comun (Es), Stechroche (De), Pastinaca (It), Uge (Pr), Pijlstaartrog (Ne).

IDENTIFICATION

1. Short snout with straight leading edges of disc.
2. Long, thin tail up to 1.5 times the length of the body[vi].
3. Spine on tail up to 12cm long with 74 ♀–98 ♂ serrations[vi].

COLOUR

- Dorsal surface uniform dark brown to olive.
- Ventral surface white with dark margins[vii].

BIOLOGY AND SIZE

- Mature: 46cm ♀, 43cm ♂[v]. Max TL: 250cm, DW: 60cm[i].
- Give birth in shallow waters to 4–7 young[iv].
- Feed predominantly on crustaceans[v] with some small fish and molluscs[vi].

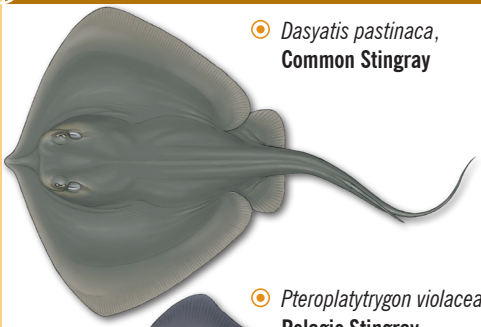
NE ATL MED BLK

NE ATL: NT DD

JDP

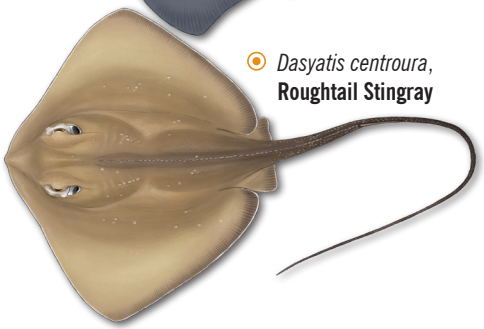
Common Stingray

SIMILAR SPECIES



- *Dasyatis pastinaca*, **Common Stingray**

- *Pteroplatytrygon violacea*, **Pelagic Stingray**



- *Dasyatis centroura*, **Roughtail Stingray**
- *Dasyatis tortonesi*, **Tortonese's Stingray** (not illustrated).

HABITAT

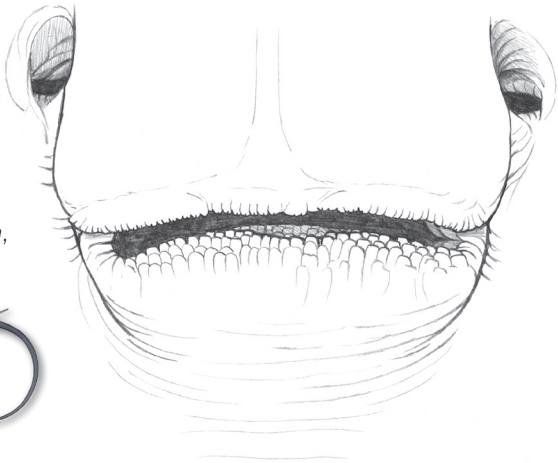
- From shallows to 200m.
- Most common to 60m.
- Found over soft substrates such as sand and mud[viii].

CONSERVATION STATUS

- Very few data. Appears to be rare in northeast Atlantic and has declined in the Bay of Biscay. Stable in the Mediterranean[ii].
- Red List status: Data Deficient (2008). Near Threatened in northeast Atlantic.

TEETH

- 28–43 rows[ix].



COMMERCIAL IMPORTANCE

- No targeted fishery but taken as bycatch in trawl, longline, trammel net and rod and line fisheries. Often discarded[ii].
- Wings are sold smoked and dried-salted for human consumption, liver for oil and carcass for fishmeal[vi].

HANDLING AND THORN ARRANGEMENT

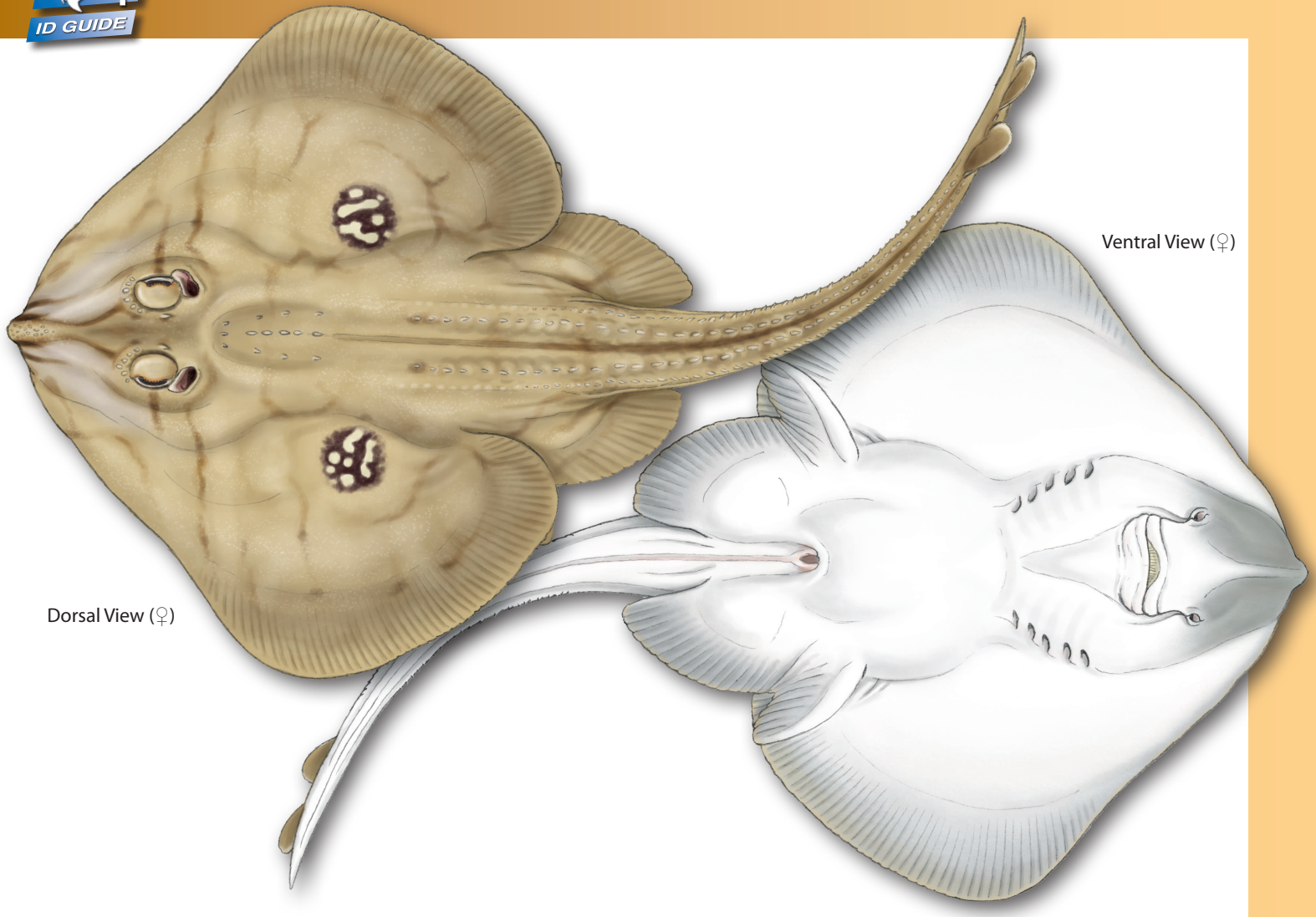
- Handle with care.
- Large venomous spine on tail.
- In extreme cases can cause paralysis[xi].

REFERENCES

i. Ferretti, F. *et al*; 2005. ICES.
ii. Gibson, C. *et al*; 2006. IUCN SSC Shark Specialist Group.
iii. Greenberg, R; 2008. Oceana.
iv. IBSS; Unknown.
v. Ismen, A; 2003. *Fisheries Research*, Vol. 60 (1): 169–176.
vi. Luna, S. M; 2008. Fishbase.
vii. Schwartz, F. J; 2007. Smithiana, *Publications in Aquatic Biodiversity*, Bulletin 8: 41–52
viii. Serena, F; 2005. FAO.
ix. Van der Elst, R. *et al*; 1997. Random House Struik.
x. Whitehead, P. J. P. *et al*; 1986. UNESCO.
xi. Wölfl, D; 1994. Draga.

Cuckoo Ray

Leucoraja naevus



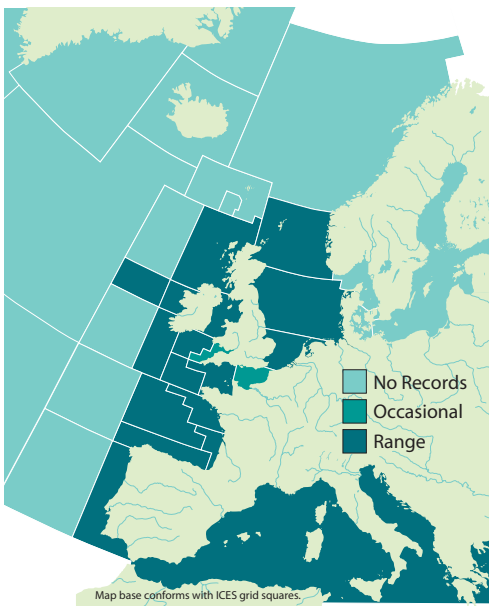
COMMON NAMES

Cuckoo Ray, Cuckoo Skate, Pudding, Stars, Crownback, Butterfly Skate, Sandy Ray, Grootoogrog (Ne), Raie Fleurie (Fr), Kuckucksroche (De), Razza Cucolo (It), Raya Santiguesa (Es).

SYNONYMS

Raja naevus (Duméril, 1865), *Raja circularis* (Couch, 1838) *Deltaraia naevus* (Leigh-Sharpe, 1924) *Raja quadrimaculata* (Risso, 1826).

DISTRIBUTION



Found along coastlines throughout much of the northeast Atlantic and Mediterranean including northern Morocco, the British Isles and southern Norway (Gibson *et al.*, 2006). In the Mediterranean its range extends as far as Tunisia and western Greece (Whitehead *et al.*, 1986).

APPEARANCE

- Up to 75cm total length.
- Light grey/brown dorsal surface.
- Large yellow and black eyespot on each pectoral fin.
- Ventral surface white.
- Four rows of thorns on tail, inner two continue onto back.

The Cuckoo Ray is easily identified by the black eye-spot that is present on each pectoral fin. These are large and marbled with yellow stripes making them extremely distinctive. The rest of the dorsal surface of the disc is light grey to brown and the ventral surface is white. There are rarely smaller, less distinct eyespots in addition (Whitehead *et al.*, 1986).

The dorsal surface of the disc is covered in small spines with the exception of the centre of the pectoral fins which are bare in adults. The ventral surface is smooth except for the prickly leading edges of the wings (Luna, 2009). Generally there are 9-13 thorns in a row around the inner margin of the eyes and a large triangle of thorns on the shoulder. Along the tail there are two rows of thorns on each side of the midline, the inner of which continues onto the back in adults (Whitehead *et al.*, 1986). The snout is short with the leading edges of the pectoral fins slightly concave (Serena, 2005). Males reach a maximum total length of 71cm and females 68cm (Luna, 2009).

NE ATL MED

MED: NT

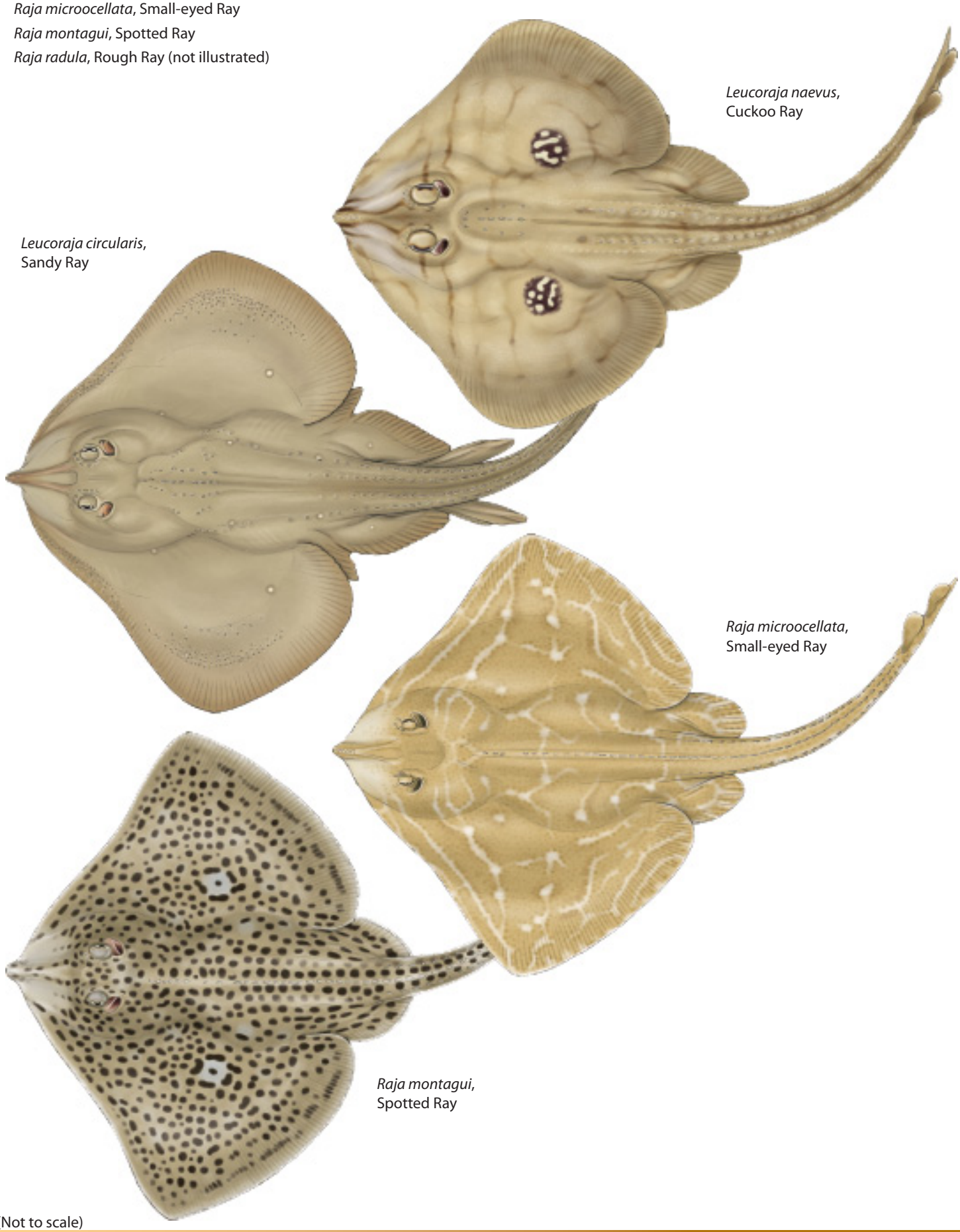
LC

RJN

Cuckoo Ray

SIMILAR SPECIES

Leucoraja circularis, Sandy Ray
Leucoraja melitensis, Maltese Ray (not illustrated)
Raja microocellata, Small-eyed Ray
Raja montagui, Spotted Ray
Raja radula, Rough Ray (not illustrated)



Leucoraja naevus, Cuckoo Ray

Leucoraja circularis, Sandy Ray

Raja microocellata, Small-eyed Ray

Raja montagui, Spotted Ray

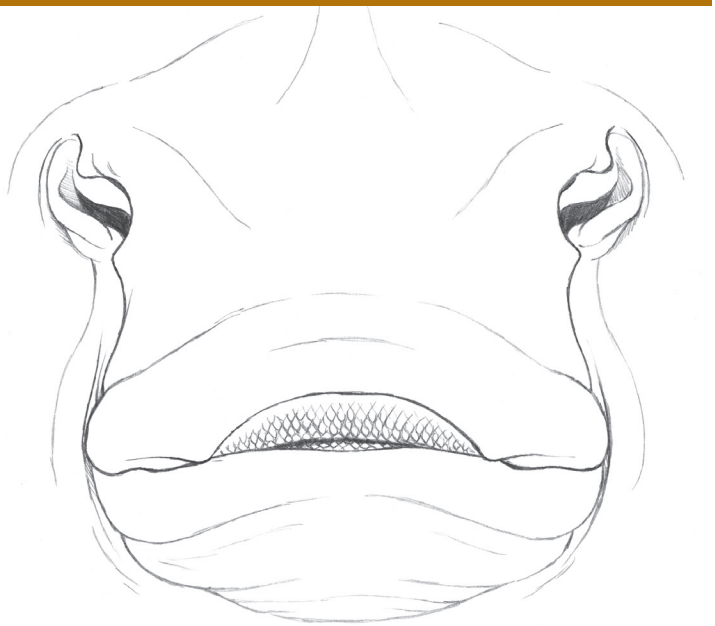
(Not to scale)

Cuckoo Ray

Leucoraja naevus

TEETH

The teeth are sharp cusped with 54–60 rows in the upper jaw (Farias *et al*., 2005; Clark, 1926).



ECOLOGY & BIOLOGY

HABITAT

The Cuckoo Ray is a bottom dwelling species that is most commonly encountered around 200m (655ft), but can be found as shallow as 12m (40ft) or as deep as 290m (950ft) (Gibson *et al.,* 2006; Ellis *et al*., 2005).

DIET

Juvenile Cuckoo Rays feed mainly on small crustaceans such as *Lophogaster typicus* and Atlantic Mud Shrimps, *Solenocera membranacea*. Adults also feed on polychaetes and bony fish such as Smooth Sandeels, *Gymnammodytes semisquamatus* (Farias *et al*., 2005). Studies using trawl discards have shown that Cuckoo Rays will scavenge when the opportunity arises (Olaso *et al*., 2002).

REPRODUCTION

The Cuckoo Ray reaches maturity at a length of around 60cm and an age of 4 to 5 years, and is know to mate throughout the year (Vaz *et al*., 2006; Gallagher *et al*., 2005; Whitehead *et al*., 1986). It lays between 70 and 150 eggs a year which are deposited in sandy or muddy substrates (Luna, 2009). These eggcases measure 50-70mm long (excluding horns) and 31-39mm wide. The horns are extremely long with the anterior pair longer than the case (Whitehead *et al*., 1986). The embryos take approximately eight months to develop and the hatchlings measure around 12cm in length (Serena, 2005). Juveniles congregate further offshore than most skate and ray young and are particularly abundant in the western Irish Sea and northern St. Georges Channel (Ellis *et al*., 2005).

EGGCASE

1. 50-70mm in length (excluding horns).
2. 30–50mm in width.
3. Delicate and rounded.
4. If unbroken, very long horns at top (Whitehead *et al*., 1986).

Similar eggcase to the Spotted Ray, *Raja montagui*.

Cuckoo Ray

COMMERCIAL IMPORTANCE

There is no targeted fishery for the Cuckoo Ray although it is an important bycatch species in mixed demersal fisheries throughout its range (Gibson *et al*., 2006). Estimates from the French otter and twin trawl fleet in the Celtic Sea are that 50% of all Cuckoo Rays caught are discarded at sea (Pastors, 2002).

THREATS, CONSERVATION, LEGISLATION

Due to its small size and higher reproduction rates, the Cuckoo Ray may be able to withstand fishing pressure better than the larger bodied species such as the Common Skate, *Dipturus batis*, and White Skate, *Rostroraja alba*. It is possible that increases in populations of small bodied species such as the Cuckoo Ray have masked the decline of the larger species in fisheries landing statistics (Gibson *et al*., 2006).

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
VIId	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, 2008). 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. The SFC's which implement these and the details are shown in the table below.

SFC	DW (cm)	Other
Cumbria	45	Cannot land wings less than 22cm in their maximum dimension
Kent & Essex	40	Cannot land wings less than 19cm in their maximum dimension
Southern	40	Cannot land wings less than 20cm in their maximum dimension
South Wales	45	Cannot land wings less than 22cm in their maximum dimension
States of Guernsey	36	

(Cumbria SFC, Unknown; Kent & Essex SFC, Unknown; South Wales SFC, Unknown; Southern SFC, 2006; NFFO, 2004)

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

IUCN RED LIST ASSESSMENT

Least Concern (2008).

Near Threatened in Mediterranean.

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Multiple rows of thorns on tail.
- 2 rows of thorns on body.
- Orbital thorns.

REFERENCES

CUMBRIA SFC. Unknown. Minimum Fish Sizes. www.cumbriasfc.org.uk.

ELLIS, J. R., CRUZ-MARTÍNEZ, A., RACKHAM, B. D., ROGERS, S. I. 2005. The Distribution of Chondrichthyan Fishes around the British Isles and Implications for Conservation. *J. Northw. Atl. Fish. Sci.*Vol. 35: 195-213.

EUROPEAN UNION. 2009. Council Regulation (EC) No. 43/2009. *Official Journal of the European Union*, L22/1. www.mfa.gov.uk.

FARIAS, I., FIGUEIREDO, I., SERRA-PEREIRA, B., BORDALO-MACHADO, P., MOURA, T., SERRANO GORDO, L. 2005. Diet comparison of four ray species [*Raja clavata* Linnaeus, 1758; *Raja brachyura* Lafont, 1873; *Leucoraja naevus* (Müller & Henle, 1841) and *Raja montagui* Fowler, 1910] caught along the Portuguese continental coast. ICES CM 2005/N:28 Elasmobranch Fisheries Science.

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.

GALLAGHER, M. J., NOLAN, C. P., JEAL, F. 2005. Age, Growth and Maturity of Commercial Ray Species from the Irish Sea. J. Northw. Atl. Fish. Sci. Vol. 35: 47-66.

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. 2008. Demersal elasmobranchs in the North Sea (Subarea IV), Skagerrak (Division IIIa), and eastern English Channel (Division VIId). ICES advice 2008, Book 6.

KENT & ESSEX SFC. Unknown. Minimum Fish Sizes. www.kentandessex-sfc.co.uk.

LUNA, S. M. 2009. *Leucoraja naevus*. Cuckoo Ray. Fishbase. www.fishbase.org.

NFFO. 2004. Official Yearbook and Diary. Grimsby, UK.

OLASO, I., SÁNCHEZ, F., RODRÍGUEZ-CABELLO, C., VELASCO, F. 2002. The Feeding Behaviour of Some Demersal Fish Species in Response to Artificial Discarding. *Scientia Marina*, 66 (3): 301-311.

PASTOORS, M. A. 2002. Stock Assessments of Elasmobranchs in the Northeast Atlantic: Making the Most of the Data. Northwest Atlantic Fisheries Organisation.

SERENA, F. 2005. Field Identification Guide to the Sharks and Rays of the Mediterranean and Black Sea. FAO. Rome, Italy.

SOUTH WALES SFC. Unknown. Byelaws. www.swsfc.org.uk.

SOUTHERN SFC. 2006. Minimum Landings Sizes. www.southernsfc.org.uk.

VAZ, S., CARPENTIER, A., COPPIN, F. 2006. Eastern English Channel Fish Assemblages: measuring the structuring effect of habitats on distinct sub-communities. *ICES Journal of Marine Science*, 64.

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.

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Tel: 01752 672008/672020
Email: enquiries@sharktrust.org

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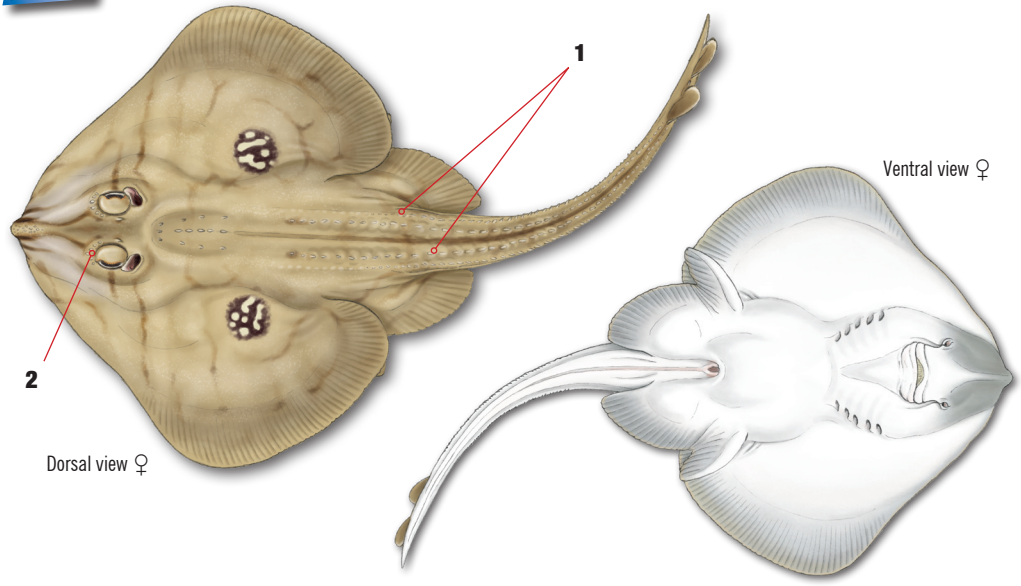
Cuckoo Ray

Leucoraja naevus

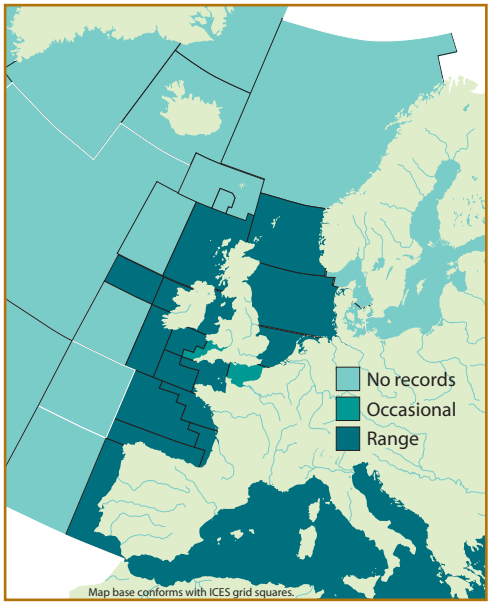


SCIENTIFIC NAME

Leucoraja naevus (Müller and Henle, 1841).

DISTRIBUTION

Northeast Atlantic from Norway to Morocco[v]. Western Mediterranean as far as Tunisia and Greece[x].



COMMON NAME

Cuckoo Ray, Cuckoo Skate, Pudding, Stars, Crownback, Butterfly Skate, Sandy Ray, Grootoogrog (Ne), Raie Fleurie (Fr), Kuckucksroche (De), Razza Cucolo (It), Raya Santiguesa (Es).

IDENTIFICATION

1 4 rows of thorns along tail. Inner 2 continue onto back.

2 9–13 orbital thorns.

3 Spinulose skin dorsally[x].

COLOUR

- Large black and yellow eyespot on each pectoral fin.
- Light grey to brown dorsal surface.
- Ventral surface white with dark margin[x].

BIOLOGY AND SIZE

- Born: 9–10cm[iii]. Mature: 60cm[ix].
  Max TL: 75cm ♀, 68cm ♂[vi].
- Juveniles feed predominantly on small crustaceans and polychaetes. Adults prey on bony fish[iv].
- Juveniles are found further offshore (southern Irish Sea, St. George's Channel) than the young of other *Raja* species[ii].

NE ATL MED

MED: NT

LC

RJN

Cuckoo Ray

SIMILAR SPECIES

- *Leucoraja circularis*, **Sandy Ray**
- *Leucoraja melitensis*, **Maltese Ray**
- *Raja microocellata*, **Small-eyed Ray**
- *Raja montagui*, **Spotted Ray**
- *Raja radula*, **Rough Ray**

HABITAT

- Demersal from 250–290m[i].
- Most common ~200m[v].
- Prefer soft substrates such as sand and mud[ii].

CONSERVATION STATUS

- Compared to most skates, Cuckoo Rays are small with high fecundity making them less vulnerable to fishing pressure[v].
- Red List status: Least Concern (2008).
  Near Threatened in Mediterranean.

COMMERCIAL IMPORTANCE

- No targeted fishery but it is an important bycatch for some multispecies trawl fisheries, particularly in the Celtic Sea and Bay of Biscay[v].
- Estimates for the French fleet are that ~50% are discarded at sea[vii].
- Popular with recreational anglers.
- 2009 – Subject to a TAC in European waters.

HANDLING AND THORN ARRANGEMENT

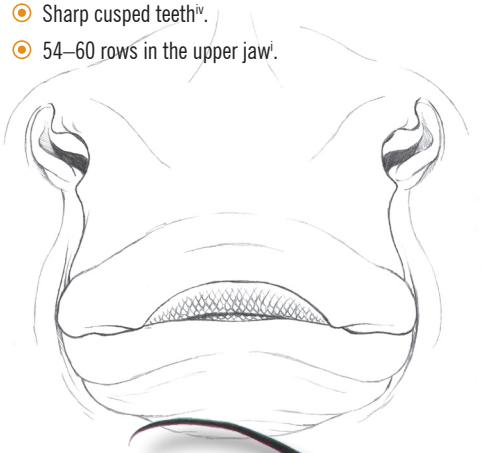
- Handle with care.
- Multiple rows of thorns on tail.
- 2 rows of thorns on body.
- Orbital thorns.

REFERENCES

i. Clark, R. S; 1926. Fishery Board for Scotland.
ii. Ellis, J. R. *et al*; 2005. *J. Northw. Atl. Fish. Sci*. 35: 195–213.
iii. FAO. 2005.
iv. Farias, I. *et al*; 2005. ICES.
v. Gibson, C. *et al*; 2006. IUCN SSC Shark Specialist Group.
vi. Luna, S. M; 2009. Fishbase.
vii. Pastoors, M. A; 2002. Northwest Atlantic Fisheries Organisation.
viii. Shark Trust; 2008.
ix. Vaz, S. *et al*; 2006. ICES. *Journal of Marine Science*, Vol. 64.
x. Whitehead, P. J. P. *et al* 1986. UNESCO.

TEETH

- Sharp cusped teeth[iv].
- 54–60 rows in the upper jaw[i].



EGGCASE

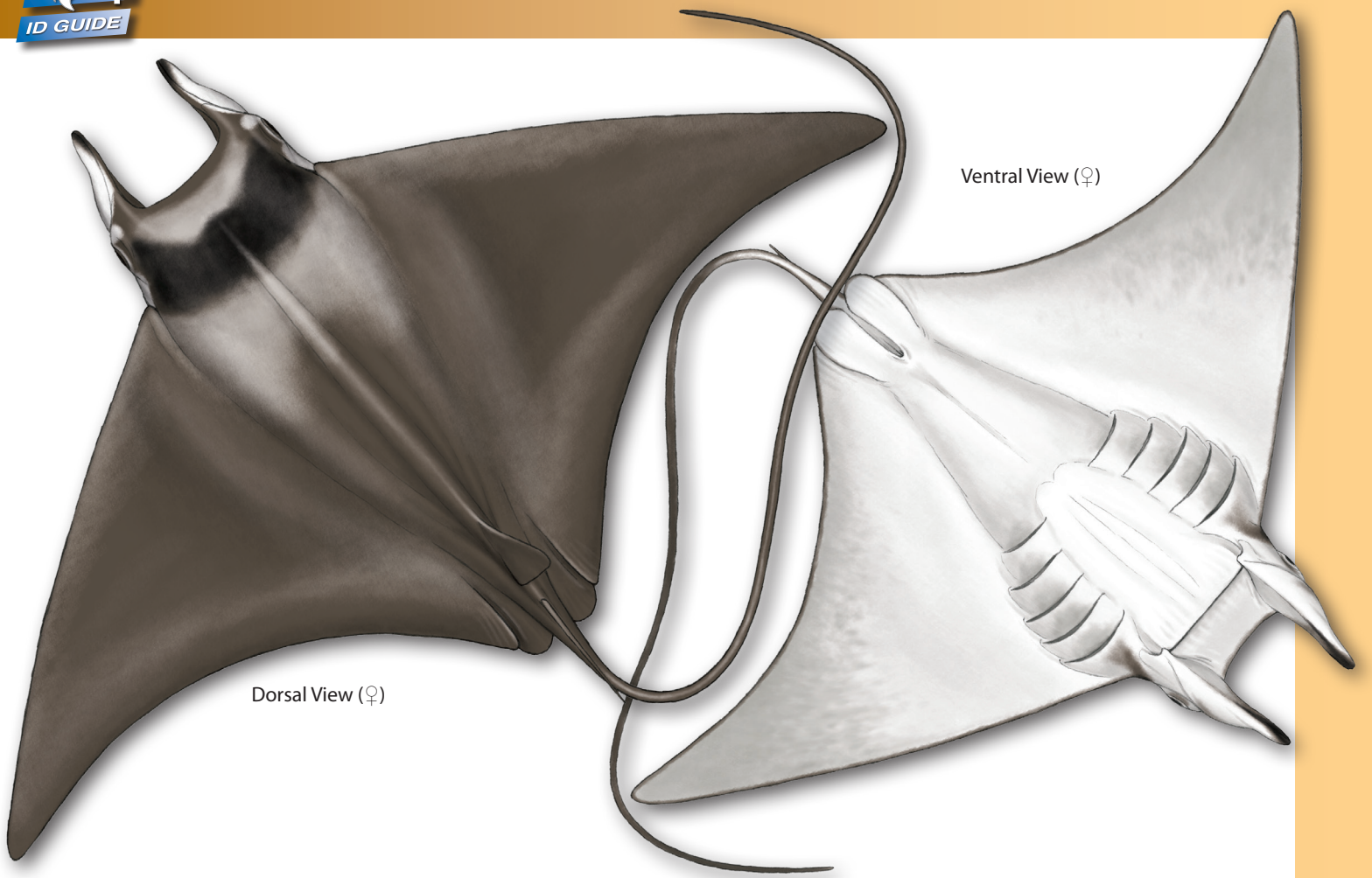
1. 50–70mm in length (excluding horns).
2. 30–50mm in width.
3. Rounded body.
4. If unbroken, very long horns at top[viii].

Similar eggcase to the Spotted Ray, *Raja montagui*.

(Eggcase shown actual size.)

Giant Devil Ray

Mobula mobular



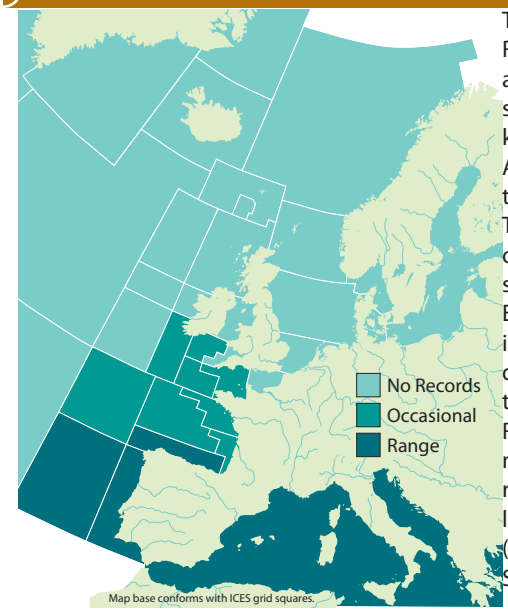
COMMON NAMES

Giant Devil Ray, Mediterranean Devil Ray, Devil Fish, Horny Ray, Mante (Fr), Kleiner Teufelsroche (De), Manta (Es), Diavolo di Mare (It).

SYNONYMS

Raia mobular (Bonnaterre, 1788), *Raja fabronia* (Lacepède, 1800), *Raja cephaloptera* (Schneider, 1801), *Raja giorna* (Lacepède, 1803), *Mobula auriculata* (Rafinesque, 1810), *Apterurus fabroni* (Rafinesque, 1810), *Cephalopterus massena* (Risso, 1810), *Cephaloptera giorna* (Lacepede, 1803), *Dicerobatis giornae* (Günther, 1870), *Cephaloptera (Dicerobatis) rochebrunei* (Vaillant, 1879), *Cephaloptera edentula* (Griffini, 1903), *Mobula giorna* (Went, 1957).

DISTRIBUTION



The Giant Devil Ray is primarily a Mediterranean species although it is known in the North Atlantic from Senegal to northern Spain. There is a record of a vagrant from southwest Ireland. Expert examination is required to distinguish it from the Spinetail Devil Ray, *Mobula japanica*, meaning its Atlantic range may be more limited than thought (Notarbartolo di Sciara *et al*., 2006).

APPEARANCE

- Dorsoventrally flattened with broad head and subterminal mouth.
- Pectoral fins extend past head, forming distinct cephalic fins.
- Dorsal fin small and at base of tail.
- Long, thin tail with prickly spines.
- Dark brown to bluish black dorsally.
- White ventrally .
- Teeth in 150–160 vertical series.
- To 520cm disc width (DW) and 650cm total length (TL).

A massive species growing to more than 5m DW, the Giant Devil Ray is the only member of the *Mobula* genus found in the northeast Atlantic and Mediterranean. It can be distinguished from similar species in these regions by the cephalic fins projecting beyond the head. There are one or more serrated spines at the base of the tail. Adults have thornlets on both surfaces and tail, although they are more densely covered ventrally (Whitehead *et al*., 1986).

Dorsally it is brown to bluish black with no distinct white patterning. Ventrally it is white. The teeth in adults form 15–160 vertical series. The flanges on the outer margins of adjacent gill plates are not fused together, forming branchial filter plates (Whitehead *et al*., 1986). The maximum recorded size is from a specimen captured off Algeria which measured 520cm DW and 650cm TL. However, they are normally encountered around 300cm DW (Serena, 2005).

NE ATL MED

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Giant Devil Ray

SIMILAR SPECIES

Myliobatis aquila, Common Eagle Ray

Pteromylaeus bovinus, Bull Ray

Rhinoptera marginata, Lusitanian Cownose Ray

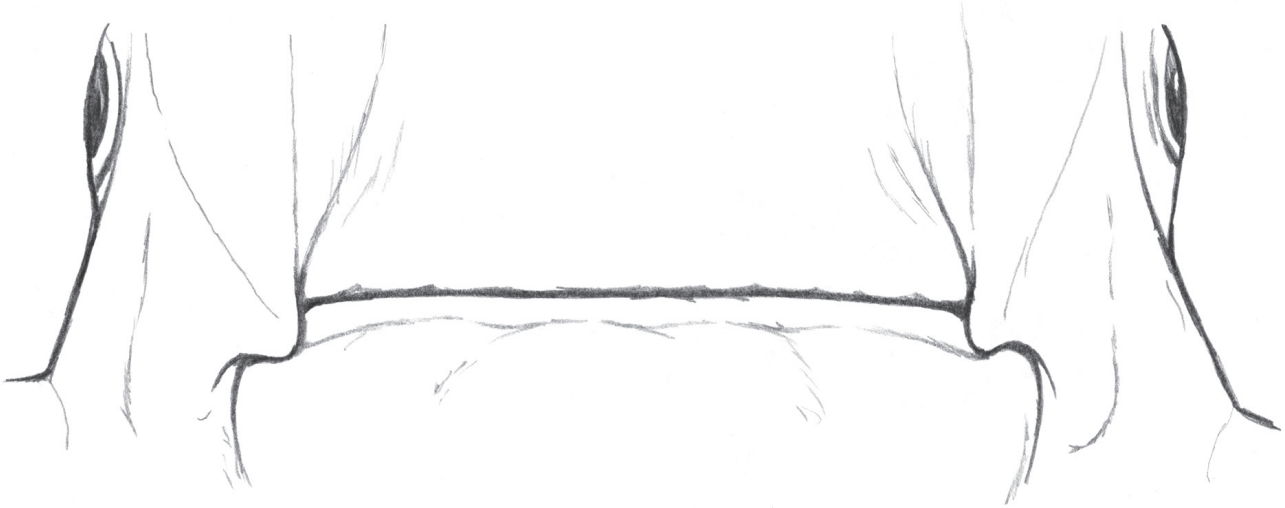
(Not to scale)

Giant Devil Ray

Mobula mobular

TEETH

Sharp cusped teeth, 54–60 rows in the upper jaw (Farias *et al*., 2005. Clark, 1926).



ECOLOGY & BIOLOGY

HABITAT

The Giant Devil Ray is an epipelagic species primarily found in offshore deepwater over continental shelves. It can be found from the surface to a depth of several thousand metres (Notarbartolo di Sciara *et al*., 2006). Often seen in groups of two or more. It may make long migrations across its range, the reasons for which are as yet unknown (Serena, 2005).

DIET

The Giant Devil Ray is adapted to feed on planktonic crustaceans and small schooling fishes with the gills forming branchial filter plates. In the Mediterranean Sea, the most important prey item is the euphasiid shrimp, *Meganyctiphanes norveggica* (Notarbartolo di Sciara *et al*., 2006).

REPRODUCTION

An aplacental viviparous species, Giant Devil Ray embryos receive nourishment from uterine milk (histotroph) secretions. The females give birth to a single pup after a gestation period of 25 months. The largest term embryo yet recorded had a disc width of 165.9cm and weighed 35kg (Notarbartolo di Sciara *et al*., 1988).

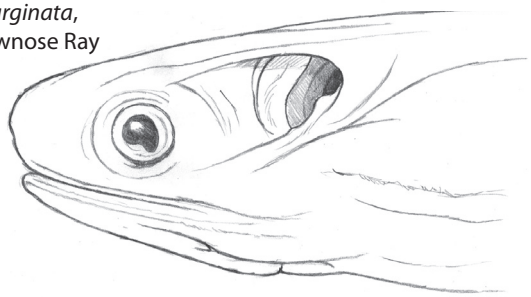
LATERAL VIEW OF HEAD

Mobula mobular, Giant Devil Ray

Myliobatis aquila, Common Eagle Ray

Pteromylaeus bovinus, Bull Ray

Rhinoptera marginata, Lusitanian Cownose Ray



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defra Department for Environment Food and Rural Affairs
marine and fisheries agency

Giant Devil Ray

COMMERCIAL IMPORTANCE

The Giant Devil Ray is not targeted but is taken by longlines, pelagic driftnets, purse seines, trawls and fixed tuna traps. This bycatch is generally discarded (Notarbartolo di Sciara *et al*., 2006).

IUCN RED LIST ASSESSMENT

Endangered (2006).

THREATS, CONSERVATION, LEGISLATION

Although there is no directed fishery for the Giant Devil Ray, incidental catch and mortality rates are high. It was regularly captured by pelagic driftnets targeting swordfish in the Mediterranean but the use of these was banned by the EU in 2002 (Notarbartolo di Sciara *et al*., 2006). Illegal driftnet fishing is still a serious problem however (EJF, 2007). It is also taken by longlines, purse seines, trawls and fixed tuna traps. It is generally discarded when caught. Due to its relatively limited geographic range, habitat destruction could also be a significant threat to the species, particularly considering the poor state of many Mediterranean ecosystems. Its epipelagic habitat makes it particularly vulnerable to oil spills and heavy maritime traffic (Notarbartolo di Sciara *et al*., 2006).

The Giant Devil Ray is included in the Annex II list of endangered or threatened species to the Protocol concerning Special Protected Areas and Biological Diversity in the Mediterranean of the Barcelona Convention, which came into force in 2001 (Notarbartolo di Sciara *et al*., 2006). The Mediterranean wide ban on the use of pelagic driftnets should have removed one of the most significant threats to the species but it has proved difficult to enforce and unregulated fishing has continued on a large scale (EJF, 2007).

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Extremely large with venomous spine at base of tail.

REFERENCES

EJF. 2007. Illegal Driftnetting in the Mediterranean. Environmental Justice Foundation. London, UK.

MCAULIFFE, J. A., ITANO, D. G., ARCENEAUX, S. 2007. Photographic Identification Guide for Billfish, Sharks, Rays, Tuna-like and Non Tuna Finfish Taken in WCPO Pelagic Longline Fisheries (V1). Western and Central Pacific Fisheries Commission. Honolulu, USA.

NOTARBARTOLO DI SCIARA, G., SERENA, F., MANCUSI, C. 2006. *Mobula mobular*. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. www.iucnredlist.org.

NOTARBARTOLO DI SCIARA, G., SERENA, F. 1988. Term Embryo of *Mobula mobular* (Bonnaterre, 1788) from the Northern Tyrrhenian Sea. *Atti Soc. ital. Sci. nat. Museo civ. Stor. nat.* Milano, 129 (4): 396–400.

SERENA, F. 2005. Field Identification Guide to the Sharks and Rays of the Mediterranean and Black Sea. FAO. Rome, Italy.

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.

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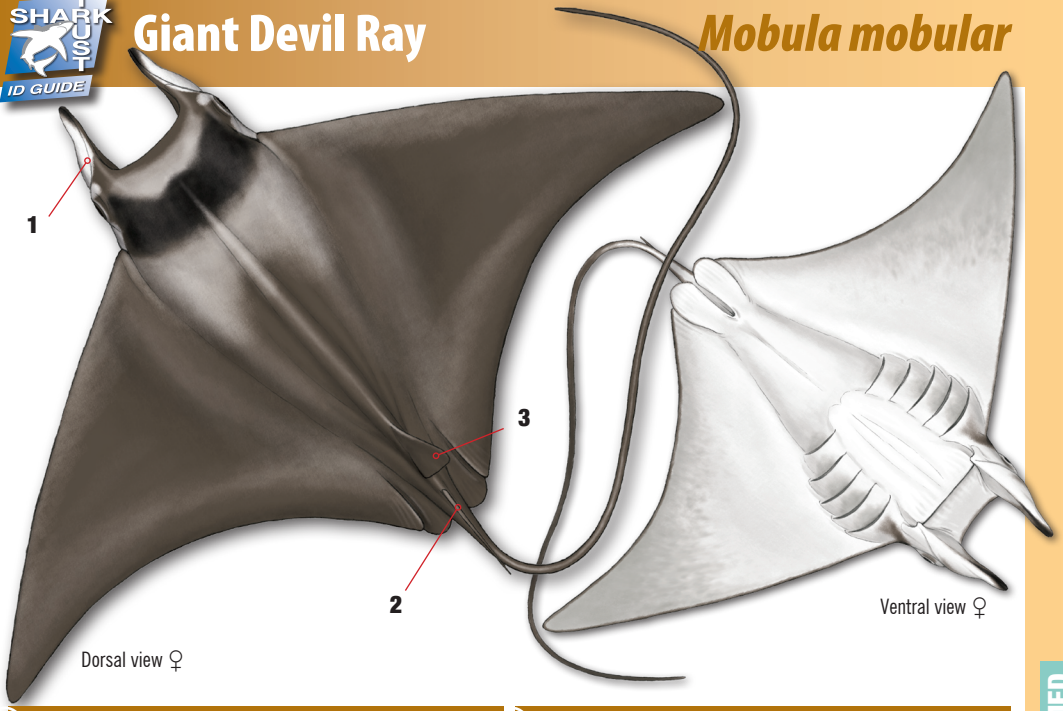
Giant Devil Ray

Mobula mobular

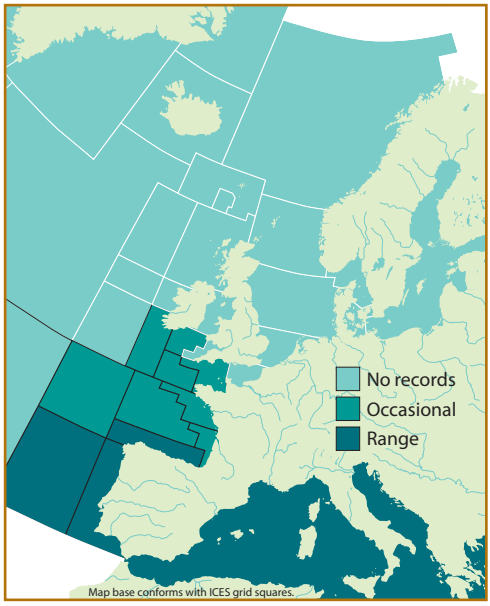


SCIENTIFIC NAME

Mobula mobular (Bonnaterre, 1788).

DISTRIBUTION

Throughout Mediterranean and northeast Atlantic from Senegal to northern Spain. Recorded as a rare vagrant from the southern British Isles[i].



COMMON NAME

GIANT DEVIL RAY, Mediterranean Devil Ray, Devil Fish, Horny Ray, Mante (Fr), Kleiner Teufelsroche (De), Manta (Es), Diavolo di Mare (It), Jamanta (Pr).

IDENTIFICATION

1 Cephalic fins present.

2 1 or more spines at base of tail.

3 Small dorsal fin present before spine.

4 Adults entirely spinulose[iii].

COLOUR

- Dark brown to bluish black dorsally[iii].
- Dark collar across head sometimes present.
- White with dark spots and blotches ventrally.

BIOLOGY AND SIZE

- Born DW: 166cm[i]. Max DW: 520cm[ii].
- Extremely long gestation period up to 25 months. Gives birth to only 1 large pup.
- Feed on planktonic crustaceans and small schooling fish. Euphausiids are an important prey in the Mediterranean[i].

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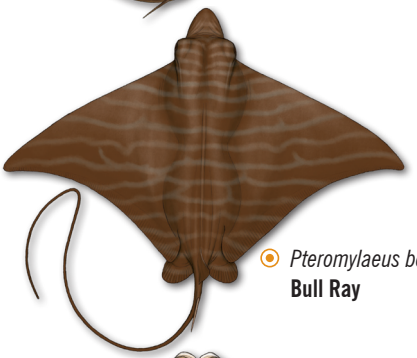
Giant Devil Ray

SIMILAR SPECIES

Mobula mobular, **Giant Devil Ray**

Myliobatis aquila, **Common Eagle Ray**



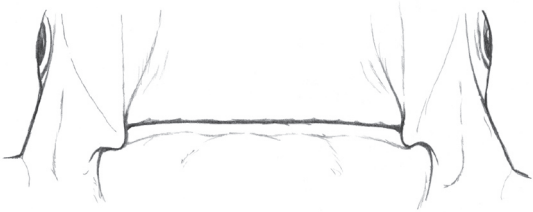
Pteromylaeus bovinus, **Bull Ray**

Rhinoptera marginata, **Lusitanian Cownose Ray**

LATERAL VIEW OF HEAD

TEETH

- 150–160 vertical rows in adults[iii].



HABITAT

- From the surface to offshore deepwater over continental shelves[i].
- Gregarious, often seen in pairs or small groups[ii].
- Makes long migrations near to the surface of the sea[ii].

CONSERVATION STATUS

- Vulnerable to overexploitation due to life history traits and relatively restricted range. Mediterranean ban on pelagic driftnet use should ease fishing pressure[i].
- Red List status: Endangered (2006).

COMMERCIAL IMPORTANCE

- Little fisheries interest. Not targeted and generally discarded when caught.
- Taken as bycatch by driftnets, longlines, purse seines, trawls and fixed tuna traps[i].

HANDLING AND THORN ARRANGEMENT

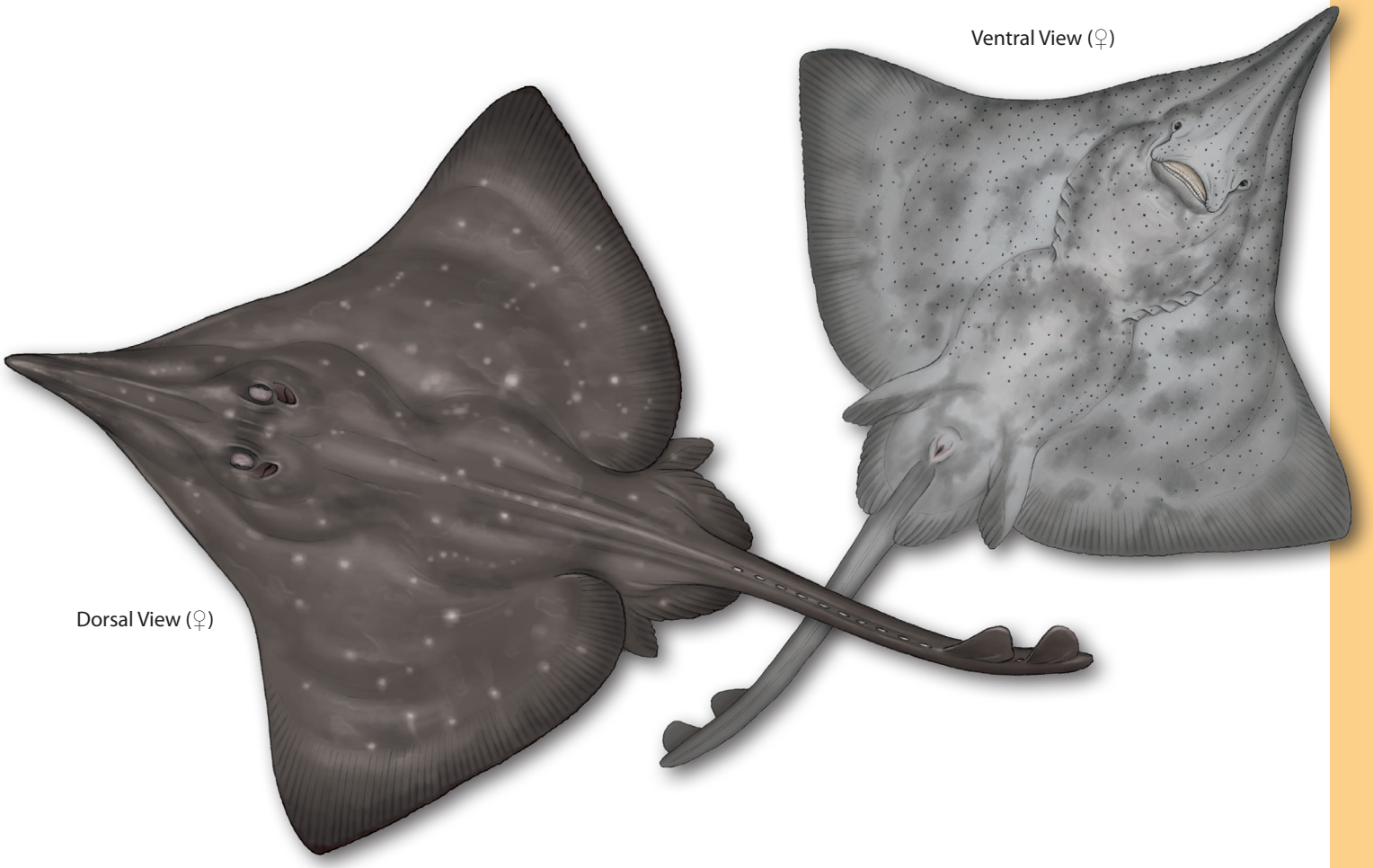
- Handle with care.
- Extremely large animal with venomous spine at base of tail.

REFERENCES

i. Notarbartolo di Sciara, G. *et al*; 2006. IUCN Red List.
ii Serena, F; 2005. FAO.
iii. Whitehead, P. J. P. *et al;* 1986. UNESCO.

Long-nosed Skate

Dipturus oxyrinchus



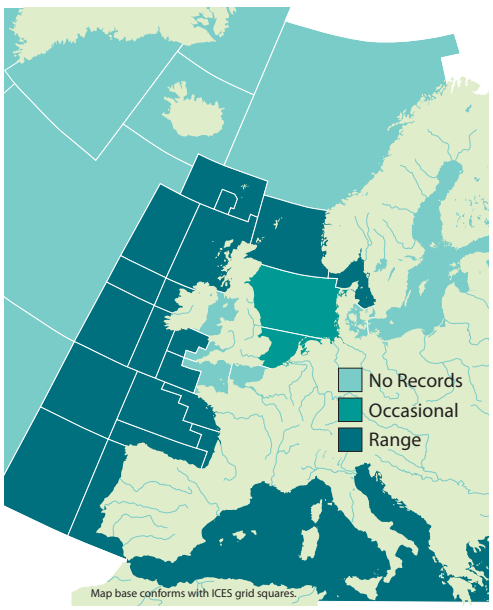
COMMON NAMES

Long-nosed Skate, Sniper's Skate, Sharp-nosed Skate, Long-nosed Burton Skate, Langsnuitrog (Ne), Raja Dlugonosa (Pr), Raya Narigona (Es).

SYNONYMS

Raja oxyrinchus (Linnaeus, 1758), *Raja acus* (Lacepède, 1803), *Raja rostrata* (Risso, 1810).

DISTRIBUTION



Found in the east Atlantic and Mediterranean. Historically known from central Norway south to Morocco and all through the Mediterranean, its range has reduced and it may have disappeared from the Irish Sea and the Gulf of Lions in the eastern Mediterranean (Ungaro *et al*., 2007).

APPEARANCE

- Large, up to 150cm total length.
- Both surfaces light brown in juveniles.
- Adults darker to grey on both surfaces.
- Very long, pointed snout.
- Smooth patches on each pectoral fin.

The Long-nosed Skate has a very long and pointed snout giving the disc a broadly rhombic shape with the front margins distinctly concave. In younger individuals both surfaces of the disc are almost completely smooth, becoming almost entirely spiny in adults. There are always bare patches on the dorsal side of each pectoral fin (Whitehead *et al*., 1986). There are generally no thorns on the disc itself but a row of 4-11 are present on the tail (measured from the cloaca) and a single thorn is sometimes found between the dorsal fins in juveniles. These are generally absent from mature specimens which develop 2 lateral rows of thorns and largely lose the median row and interdorsal thorns (Wheeler, 1969).

The dorsal surface of the disc is light brown in juveniles becoming darker as the animal matures. Adults can be dark brown or grey with a pattern of light and dark spots. Like the dorsal surface, the ventral surface of the disc is lighter in juveniles and gradually gets darker as the skate grows, eventually becoming dark brown or grey. On both sides of the disc the mucous pores are marked with black dots and streaks which are most numerous on the front two-thirds of the underside (Whitehead *et al*., 1986).

Long-nosed Skate can reach a maximum length of 150cm (Hiscock *et al*., 2004). However they are most usually found around 120–130cm (f) and 110–120cm (m) (Wheeler, 1969).

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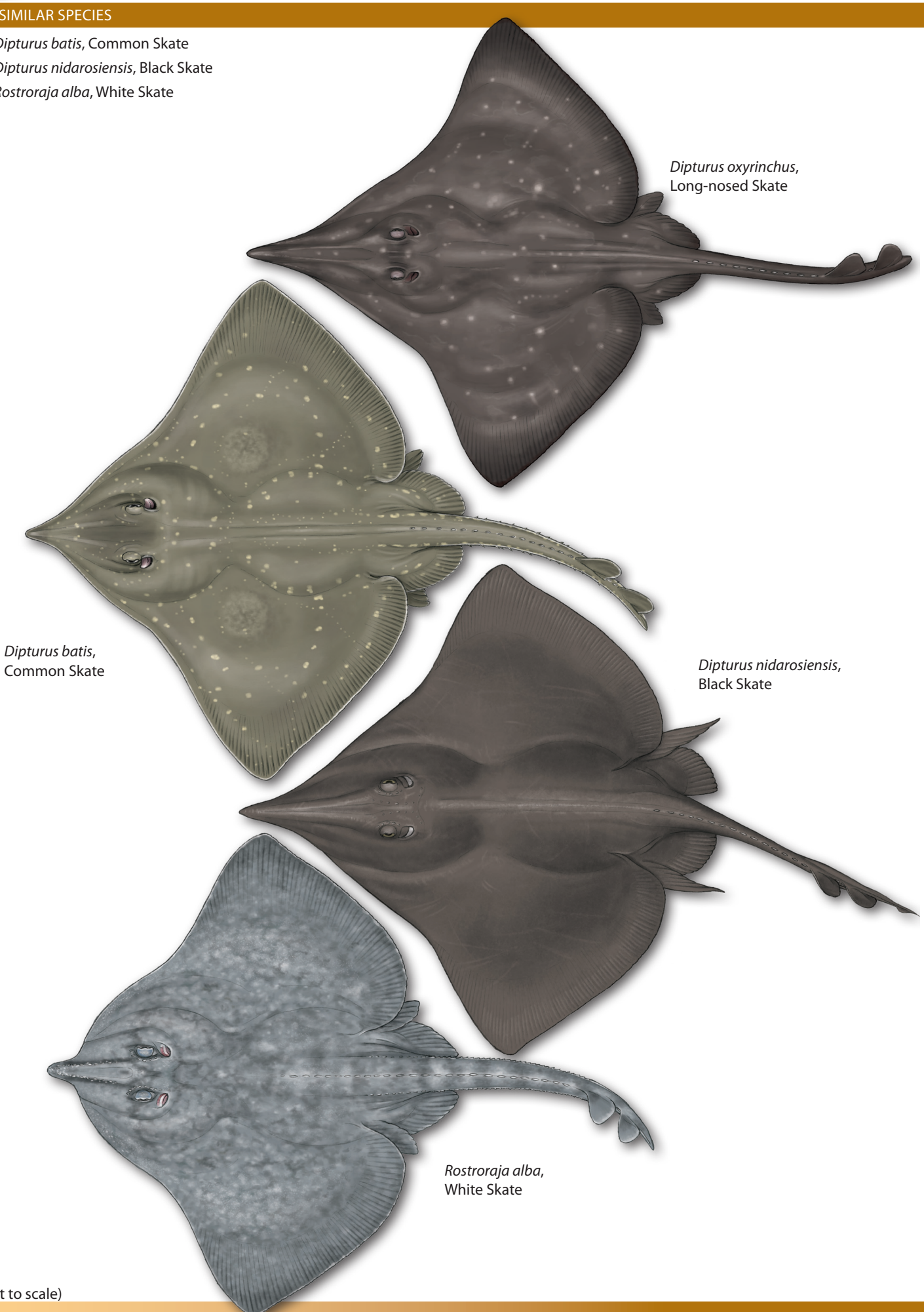
Long-nosed Skate

SIMILAR SPECIES

Dipturus batis, Common Skate
Dipturus nidarosiensis, Black Skate
Rostroraja alba, White Skate



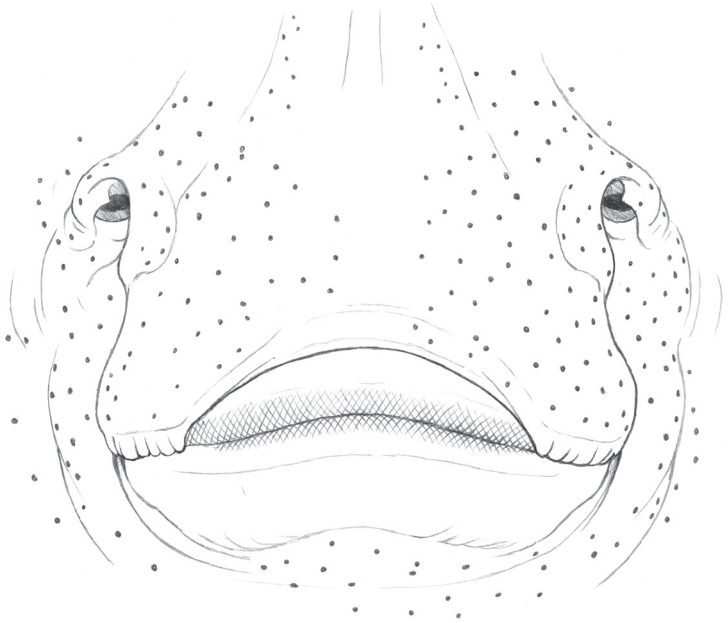
(Not to scale)

Long-nosed Skate

Dipturus oxyrinchus

TEETH

The teeth are plate-like with very small cusps, arranged in diagonal rows. There are 34–38 rows in the upper jaw (Clark, 1926).



ECOLOGY & BIOLOGY

HABITAT

The Long-nosed Skate is a bottom dwelling species that is found on sandy or muddy substrates at depths of 90-900m (295–2,950ft). It is most commonly encountered at depths around 200m (650ft) and research trawls in the Mediterranean captured the species most frequently around 200-50 m (650–1,640ft) (Ungaro *et al*., 2007).

DIET

It feeds mostly on crustaceans and cephalopods, in particular *Cephalopoda decapoda*. The crustaceans in its diet include Amphida, Euphasiacea, Isopoda, Mysidiacea, and Decapoda orders (Ungaro *et al*., 2007). It also eat bony fish such as red-fish, gurnards and dragonets (Wheeler, 1969). It has been observed in the south Ligurian and north Thyrrenian Seas that females seem to prefer cephalopods while males prefer crustaceans, particularly *Lophogaster typicus*. It is not known if this is true across the species' range (Ungaro *et al.,* 2007).

REPRODUCTION

Very little is known of the life-history of the Long-nosed Skate and there is currently no reliable information on size at birth, age at maturity or longevity. It is estimated that females mature at just over 90cm in length and males between 70 and 80cm in length. The eggcases are laid from spring to early summer and measure 14-23.5cm long and 11-12cm wide (excluding horns). As they are so large it is likely that these eggs are produced in small numbers (Whitehead *et al*., 1986; Hiscock *et al*., 2004). These eggs are deposited in sandy or muddy substrates and then left to develop. It is not known how long this incubation period takes (Agustin, 2009). The smallest recorded specimen was 17cm in length so the size at birth is likely to be slightly less (Ungaro *et al*., 2007).

EGGCASE

1. 140–235mm in length (excluding horns) (Lacourt, 1979).
2. 110–120mm in width (Lythgoe and Lythgoe, 1976)).
3. Laid from spring to early summer (Whitehead *et al*., 1986).

Similar eggcase to the Common Skate, *Dipturus batis*.

Long-nosed Skate

COMMERCIAL IMPORTANCE

The Long-nosed Skate is taken as bycatch by trawl nets and offshore bottom longlines throughout its Atlantic range. Catches are occasional and specimens are sometimes discarded at sea. Very little data is available for the Mediterranean but the situation is probably similar with the Long-nosed Skate being caught by multispecies trawl fisheries (Ungaro *et al.,* 2007).

Wheeler (1969) reported that "the Long-Nose Skate is relatively common in appropriate depths, and makes a significant contribution to the fishery statistics for rays and skates" (Wheeler, 1969). This is no longer the case.

THREATS, CONSERVATION, LEGISLATION

As with other large bodied skate species, the Long-nosed Skate is particularly vulnerable to fishing pressures due to its size and low rate of population increase. It is now very rare on continental shelves and has disappeared altogether from the Irish Sea. CEFAS survey trawls around the British Isles have found only 4 individuals since 1990 (Hiscock *et al*., 2004) and nothing is known of its status around Norway, Iceland, the Faroes, France or the Iberian Peninsula (Ungaro *et al*., 2007). In 2002, a proposal to include the Long-nosed Skate on Schedule 5 of the Wildlife and Countryside Act (1981) was not adopted (JNCC, Unknown).

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
VIId	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, 2008).

Many recreational anglers return any sharks, skates and rays they catch alive and some angling clubs have begun tag and release programmes (Holt, 2005). As with most European skate and ray species, there is very little effective management in place to protect the Long-nosed Skate.

IUCN RED LIST ASSESSMENT

Near Threatened (2007).

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Row of strong thorns on tail.
- Large, powerful skate.

REFERENCES

AGUSTIN, L. Q. 2009. *Dipturus oxyrinchus*. Longnosed Skate. Fishbase. www.fishbase.org.

EUROPEAN UNION. 2009. Council Regulation (EC) No. 43/2009. *Official Journal of the European Union*, L22/1. www.mfa.gov.uk.

HISCOCK, J., JONES, H. 2004. Testing Criteria for Assessing 'National Importance' of Marine Species, Biotopes (Habitats) and Landscapes: Report to the Joint Nature Conservation Committee. Marine Biological Association. Marine Life Information Network.

HOLT, D. 2005 Common Skate Tagging Programme. The Scottish Angling Homepage: www.catchalot.co.uk.

ICES. 2008. Demersal elasmobranches in the North Sea (Sub-area IV), Skagerrak (Division IIIa), and eastern English Channel (Division VIId). ICES advice 2008, Book 6.

JNCC. Unknown. The Wildlife and Countryside Act 1981. www.jncc.gov.uk.

LACOURT, A. W. 1979. Eikapsels van de kraakbeenvissen, roggen, haaien, draakvissen (Chondrichthyes) van Noord-en West Europa. *Wetenschap. Meded.* (135):1-27 p.

LYTHGOE, J., LYTHGOE, G. 1976. Vissen van de Europese kutswateren en de Middlellandse Zee. 335 p.

UNGARO, N., SERENA, F., DULVY, N. K. D., TINTI, F., BERTOZZI, M., MANCUSI, C., NOTARBARTOLO DI SCIARA, G., ELLIS, J. E. 2007. *Dipturus oxyrinchus*. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. www.iucnredlist.org.

WHEELER, A. 1969. The Fishes of the British Isles and North-West Europe. Macmillan and Co Ltd. London, UK.

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.

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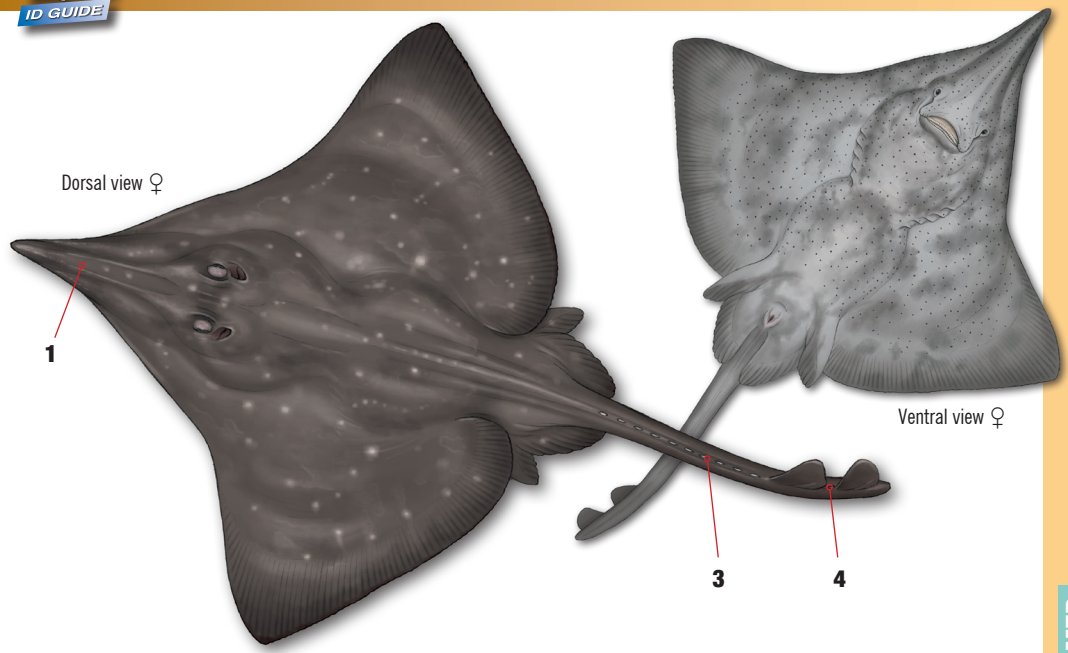
Long-nosed Skate

Dipturus oxyrinchus

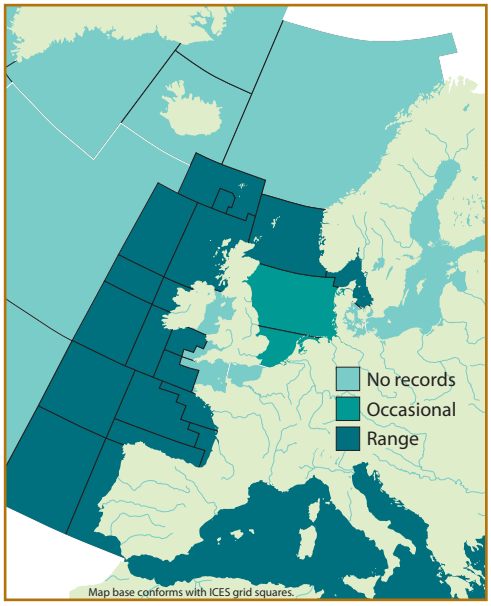


SCIENTIFIC NAME

Dipturus oxyrinchus (Linnaeus, 1758).

DISTRIBUTION

Northeast Atlantic from Norway to Morocco including the Mediterranean Sea[iii].



COMMON NAME

LONG-NOSED SKATE, Spear-nosed Skate, Snipers Skate, Long-nosed Burton Skate, Langsnuitrog (Ne), Raja Dlugonosa (Pr), Raya Narigona (Es).

IDENTIFICATION

1 Conspicuously long, pointed snout.

2 No thorns on body.

3 Row of 4–11 thorns on tail.

4 0–1 thorns between dorsal fins[iv].

COLOUR

- Both surfaces light brown in juveniles.
- Adults darker to grey on both surfaces.
- Pattern of light and dark spots dorsally.
- Mucous pores marked with black dots and streaks[iv].

BIOLOGY AND SIZE

- Born: <17cm[iii]. Mature: >90cm ♀, 70–80cm ♂[iv]. Max TL: 150cm[iv].
- Prey mostly on cephalopods, crustaceans and fish.
- Females appear to prefer cephalopods, males crustaceans[iii].

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Long-nosed Skate

SIMILAR SPECIES

- *Dipturus batis*, **Common Skate**
- *Dipturus nidarosiensis*, **Black Skate**
- *Rostroraja alba*, **White Skate**

HABITAT

- Demersal from 90–900m.
- Most common >200m.
- Prefer soft substrate such as sand and soft mud but can be found on loose rock and gravel beds[iii].

CONSERVATION STATUS

- Very vulnerable to fishing pressure due to its large size, late maturity and low fecundity[ii].
- Red List status: Near Threatened (2007).

COMMERCIAL IMPORTANCE

- It is occasionally caught by deepwater trawl and longline fisheries in the Northeast Atlantic.
- When taken as bycatch, it is often discarded.
- Catches in the Mediterranean Sea are poorly understood but are likely to be similar[iii].
- 2009 – Species currently subject to TAC in EU waters.

HANDLING AND THORN ARRANGEMENT

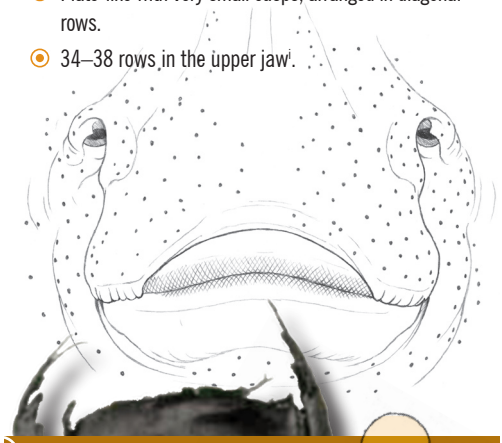
- Handle with care.
- Large, powerful skate.
- Row of strong thorns on tail.

REFERENCES

i. Clark, R. S; 1926. Fishery Board for Scotland.
ii. Hiscock, J; 2004. Marine Biological Association.
iii. Ungaro, N; 2007. IUCN Red List.
iv. Whitehead, P. J. P. *et al*; 1986. UNESCO.

TEETH

- Plate-like with very small cusps, arranged in diagonal rows.
- 34–38 rows in the upper jaw[i].



EGGCASE

1 140–235mm in length (excluding horns).

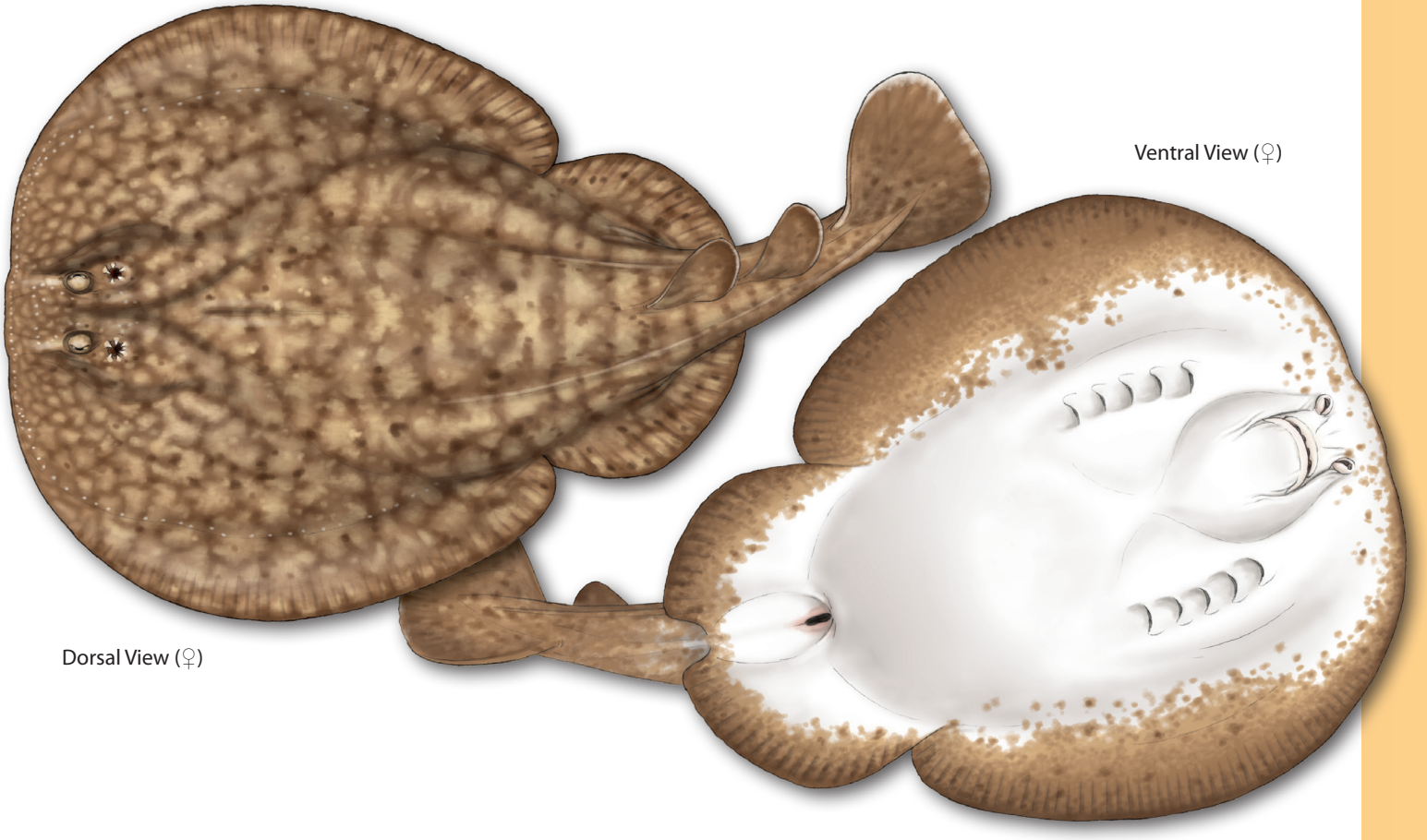
2 110–120mm in width[ii].

3 Laid from spring to early summer[iv].

Similar eggcase to the Common Skate, *Dipturus batis*.

(NB Shown at half size in comparison to an adult's hand.)

Marbled Torpedo Ray *Torpedo marmorata*



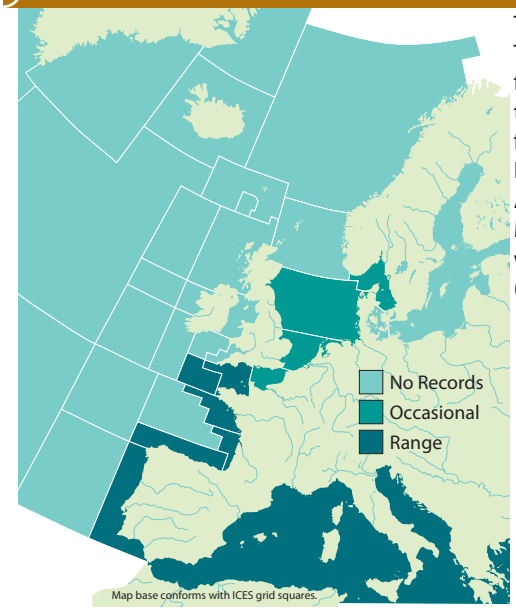
COMMON NAMES

Marbled Torpedo Ray, Marbled Electric Ray, Spotted Torpedo Ray, Common Crampfish, Numbfish, Torpille Marbrée (Fr), Tremolina Marmol (Es), Gemarmerde Sidderrog (Ne), Torpedine Marezzata (It).

SYNONYMS

Narcacion marmoratus (Risso, 1810), *Narcobatus marmoratus* (Risso, 1810), *Torpedo diversicolor* (Davy, 1834), *Torpedo galvani* (Risso, 1810), *Torpedo immaculata* (Rafinesque, 1810), *Torpedo picta* (Lowe, 1843), *Torpedo punctata* (Rafinesque, 1810), *Torpedo trepidans* (Valenciennes, 1843), *Torpedo vulgaris* (Fleming, 1828), *Raja torpedo* (Linnaeus, 1758), *Torpedo torpedo* (Fowler, 1936).

DISTRIBUTION



The Marbled Torpedo Ray is found throughout the east Atlantic from the southern British Isles to South Africa, including the Mediterranean and western Baltic Seas (Bester, Unknown).

APPEARANCE

- Rounded disc with almost straight leading edge.
- Short, thick tail with large caudal fin.
- Two dorsal fins positioned close together on tail.
- Marbled pale and dark brown colouration on dorsal surface.
- Creamy white ventral surface with dark margin.

The Marbled Torpedo Ray is a distinctive ray similar only to the Atlantic Torpedo Ray, *Torpedo nobiliana*, in UK waters. The two species can normally be distinguished by colouration and size however. Failing this, the spiracles of the Marbled Torpedo Ray, *Torpedo marmorata*, have papillae around the inner edge which are lacking in the Atlantic Torpedo Ray, *Torpedo nobiliana*.

It is a small ray which reaches a maximum of 100cm total length, but is rarely found over 80cm (Bester, Unknown). The disc is thick, flabby and rounded with the leading edge being almost straight, although median indentation is seen. The tail is short and thick with a large caudal fin and two close-set dorsal fins. The skin is soft to touch and seems almost loose fitting. There are seven papillae-like protuberances around each spiracle which are absent on the Atlantic Torpedo Ray, *Torpedo nobiliana* (Barnes, 2008).

The Marbled Torpedo Ray gets its common name from the light and dark brown marbled colouration on the dorsal surface of the disc. The ventral surface is creamy white (Barnes, 2008). The small mouth contains single cusped teeth arranged in bands on both jaws (Bester, Unknown).

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Supported by:

Marbled Torpedo Ray

SIMILAR SPECIES

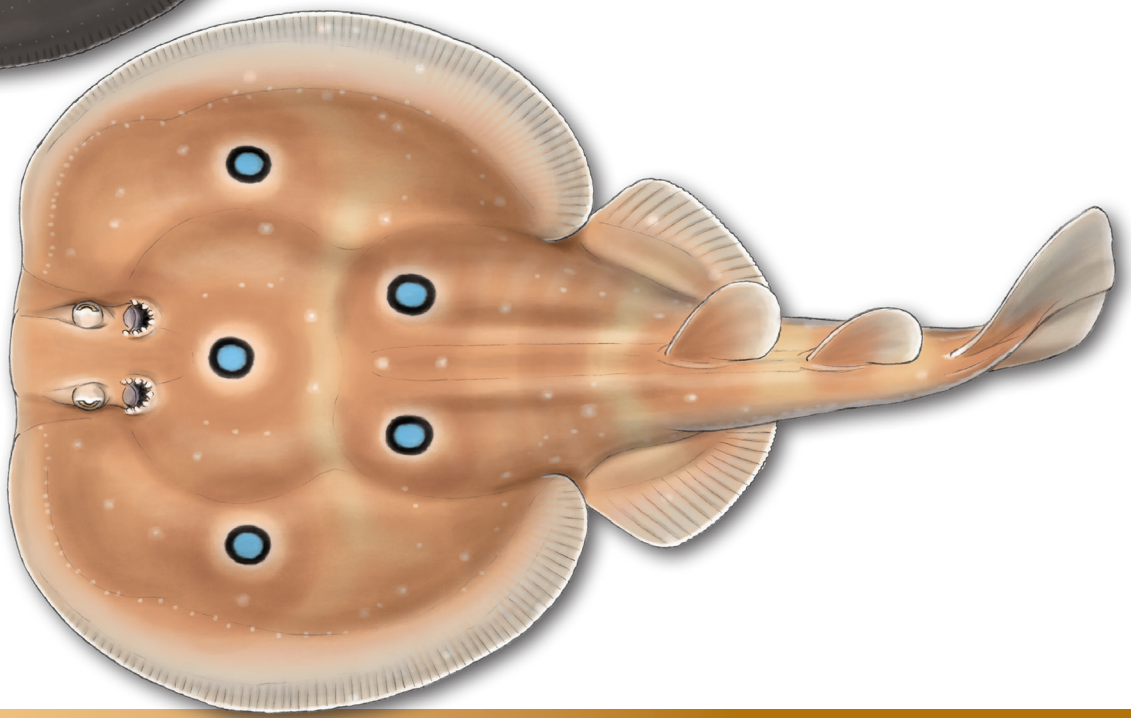
Torpedo nobiliana, Atlantic Torpedo Ray

Torpedo sinuspersici, Gulf Torpedo Ray
(not illustrated)

Torpedo torpedo, Common Torpedo Ray

Torpedo marmorata,
Marbled Torpedo Ray

Torpedo nobiliana,
Atlantic Torpedo Ray



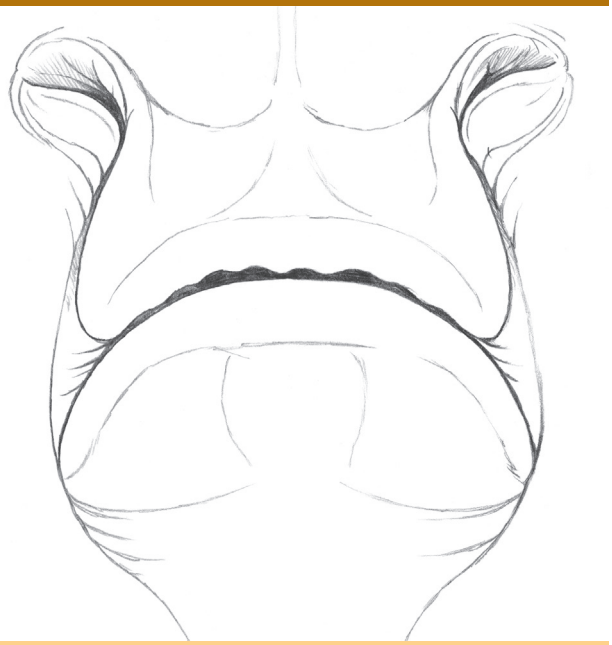
Torpedo torpedo,
Common Torpedo Ray

(Not to scale)

Marbled Torpedo Ray *Torpedo marmorata*

TEETH

Small, single cusped teeth arranged in bands (Bester, Unknown).



ECOLOGY & BIOLOGY

HABITAT

Although it has been reported as deep as 100m (330ft) in the Mediterranean, the Marbled Torpedo Ray is generally found between 10 and 30m (32–98ft) in waters temperatures of less than 20°C (68°F). It is encountered in a variety of habitats such as sand and mud bottoms, rocky reefs and sea grass beds. It is active nocturnally, burying itself during the day with only its eyes and spiracles visible (Bester, Unknown).

DIET

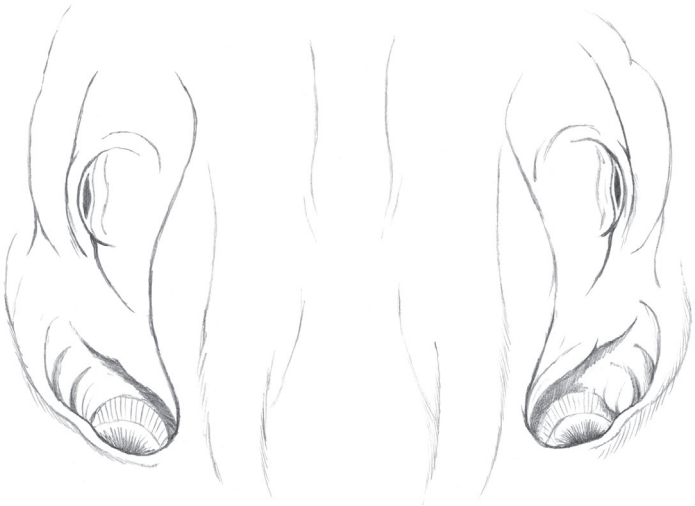
The Marbled Torpedo Ray is an ambush predator, 'jumping' on intended prey whilst emitting a series of electrical shocks to stun it (Belbenoit, 1986). These shocks are generated by highly specialised electrogenic organs which are composed of stacks of striated muscle (Barnes, 2008). When contracted, these produce an electrical current up to 200 Volts and 600 Hz. It can distend its jaws allowing it to catch and consume all sizes of prey including gobies, mullet, mackerel, bogue, pandora, damselfish and crustaceans (Bester, Unknown).

REPRODUCTION

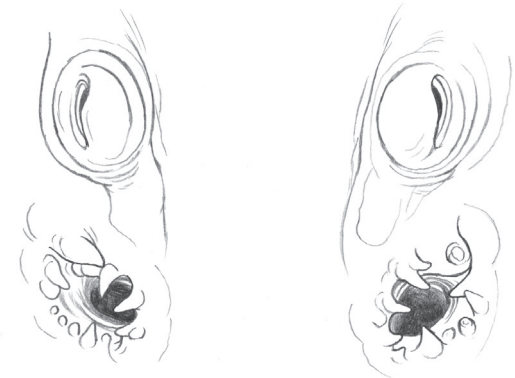
Males mature at around 25cm in length, females larger at around 31cm in length. The gestation period is between 9 and 10 months (Consalvo *et al*., 2007). Like other Torpediniformes, it is ovoviviparous. Ovoviviparity, or leicithotrophic viviparity, is a means of reproduction whereby the embryos develop entirely within the mother. They are encased in a thin membrane which is retained in the uterus (Martin, Unknown). The means of nourishment varies considerably amongst elasmobranchs. In Torpediniformes, the embryo feeds initially on an external yolk sac. When this is depleted, they receive additional nourishment from the mother through the indirect absorption of 'uterine milk', a fat and protein rich histotroph (Bester, Unknown).

The females give birth in November and December and litter sizes can vary between 5 and 32. These young rays measure 10-14cm in length and have fully functioning electrical organs which they can use for defence and hunting (Bester, Unknown). The inter-birth interval is at least 2 years and has been reported as 3 (AnAge, Unknown).

SPIRACLES



Torpedo nobiliana, Atlantic Torpedo Ray



Torpedo marmorata, Marbled Torpedo Ray

Supported by:

Marbled Torpedo Ray

COMMERCIAL IMPORTANCE

The Marbled Torpedo Ray is currently of no commercial interest, although it is taken as bycatch in trawl fisheries throughout its range. These individuals are usually discarded (Bester, Unknown).

IUCN RED LIST ASSESSMENT

Data Deficient (2008).

THREATS, CONSERVATION, LEGISLATION

Very little is known of the population status of the Marbled Torpedo Ray, although it appears to be more common than other Torpediniformes in the northern Mediterranean and may even be increasing around Italy. As the majority of caught individuals are discarded at sea, catch rates and populations trends are extremely difficult to assess across the majority of its range (Gibson *et al*., 2006).

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Can produce electrical current up to 200v.

REFERENCES

ANAGE. Unknown. *Torpedo marmorata*. The Animal Ageing and Longevity Database. www.genomics.senescence.info/species/index.html.

BARNES, M. K. S. 2008. *Torpedo marmorata*. Marbled electric ray. Marine Life Information Network: Biology and Sensitivity Key Information Sub-programme [on-line]. Plymouth: Marine Biological Association of the United Kingdom. www.marlin.ac.uk.

BELBENOIT, P. 1986. Fine Analysis of Predatory and Defensive Motor Events in *Torpedo Marmorata* (Pisces). *Journal of Experimental Biology*, 121, 197–226.

BESTER, C. Unknown. Marbled Electric Ray. Florida Museum of Natural History www.flmnh.ufl.edu/fish/.

CONSALVO, I., SCACCO, U., ROMANELLI, M., VACCHI, M. 2007. Comparative study on the reproductive biology of *Torpedo torpedo* (Linnaeus, 1758) and *T. Marmorata* (Risso, 1810) in the central Mediterranean Sea. *Scientia Marina*, 71 (2): 213-222.

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.

LUNA, S. M. 2009. *Torpedo marmorata*: Spotted Torpedo. Fishbase. www.fishbase.org.

MARTIN, R. Unknown. Elasmobranch Reproductive Modes. ReefQuest Centre for Shark Research. www.elasmo-research.org.

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.

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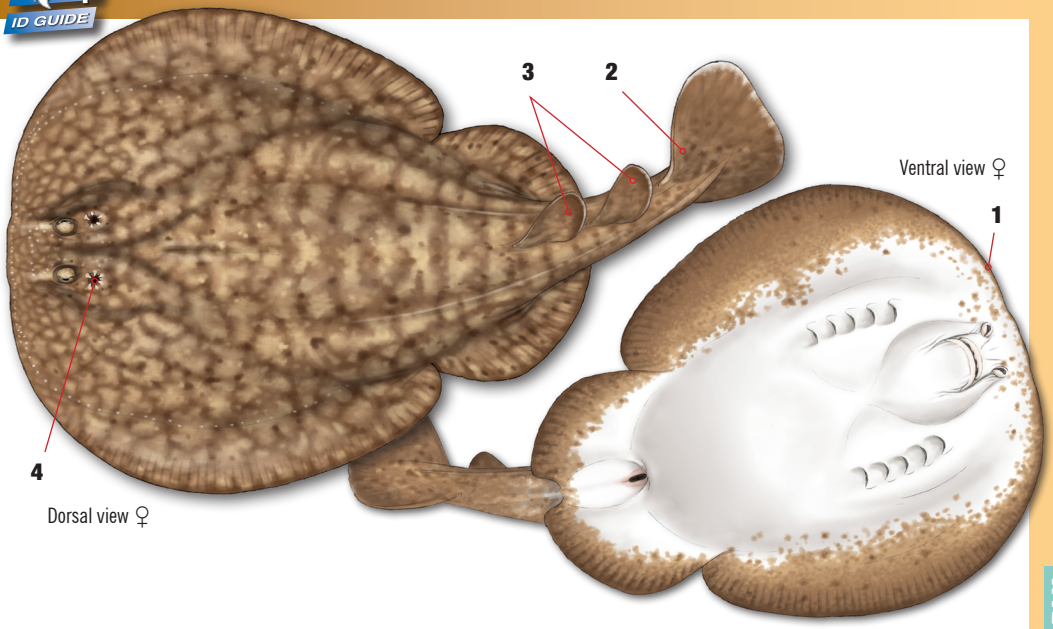
Marbled Torpedo Ray

Torpedo marmorata

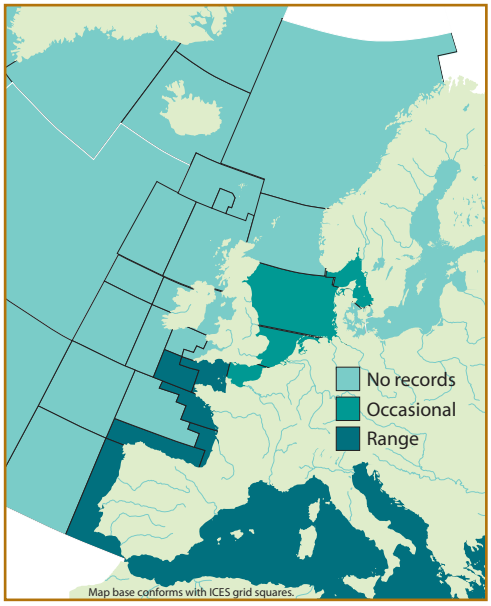


SCIENTIFIC NAME

Torpedo marmorata (Risso, 1810).

DISTRIBUTION

Eastern Atlantic from western Baltic Sea to South Africa, including the Mediterranean and Black Seas[ii].



COMMON NAME

MARBLED TORPEDO RAY, Marbled Electric Ray, Spotted Torpedo Ray, Common Crampfish, Numbfish, Torpille Marbrée (Fr), Tremolina Marmol (Es), Gemarmerde Sidderrog (Ne), Torpedine Marezzata (It).

IDENTIFICATION

1 Thick, rounded body with straight leading edge.

2 Short, thick tail with large caudal fin.

3 2 well developed, close-set dorsal fins.

4 6–8 papillae around each spiracle[ii].

COLOUR

- Dorsal surface pale and dark brown.
- Marbled pattern.
- Ventral surface creamy white with darker margin[i].

BIOLOGY AND SIZE

- Born: 10–14cm. Mature: 31cm ♀, 25cm ♂[ii]. Max TL: 80cm[i].
- 9–10 month gestation period[iii].
- Up to 32 pups in each litter.
- Nocturnal, remain hidden during the day and actively hunt at night[ii].

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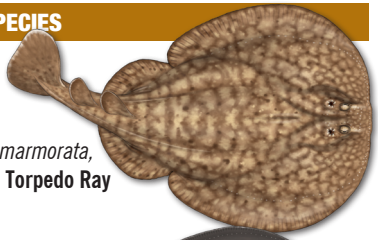
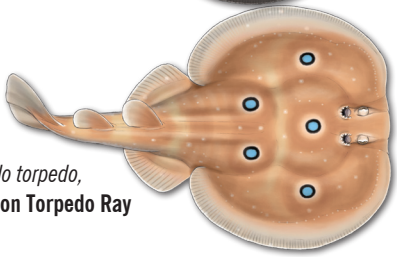
Marbled Torpedo Ray

SIMILAR SPECIES



- *Torpedo marmorata,* **Marbled Torpedo Ray**

- *Torpedo nobiliana,* **Atlantic Torpedo Ray**



- *Torpedo torpedo,* **Common Torpedo Ray**
- *Torpedo sinuspersici,* **Gulf Torpedo Ray**, not illustrated

HABITAT

- Demersal to 100m, most common 10–30m[i].
- Can be found over sandy and muddy substrates as well as in seagrass and rocky reef habitats[i].

CONSERVATION STATUS

- Very little is known of population trends. Appears to be common in the northern Mediterranean and may be increasing around Italy[iv].
- Red List status: Data Deficient (2008).

COMMERCIAL IMPORTANCE

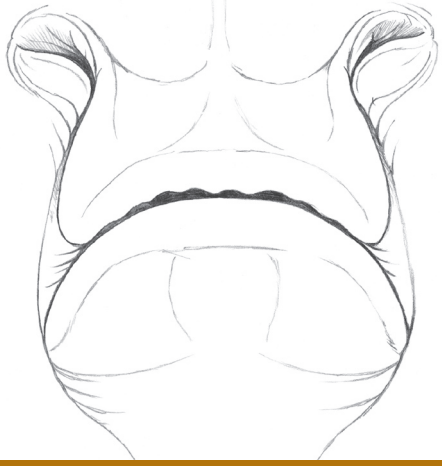
- Currently of no fisheries interest[v].
- Bycatch in shallow trawl fisheries across its range.
- When caught, usually discarded at sea[iv].

HANDLING AND THORN ARRANGEMENT

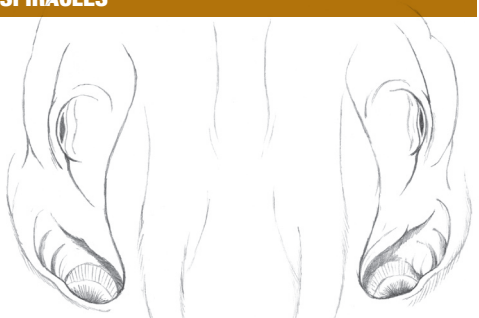
- Handle with care.
- Can produce an electrical current up to 200V[ii].

TEETH

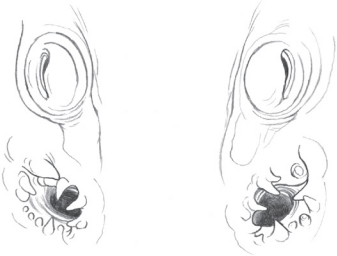
- Small, single cusped teeth arranged in bands[ii].



SPIRACLES



- *Torpedo nobiliana,* **Atlantic Torpedo Ray**



- *Torpedo marmorata,* **Marbled Torpedo Ray**

REFERENCES

i. Barnes, M. K. S; 2008. Marine Biological Association.

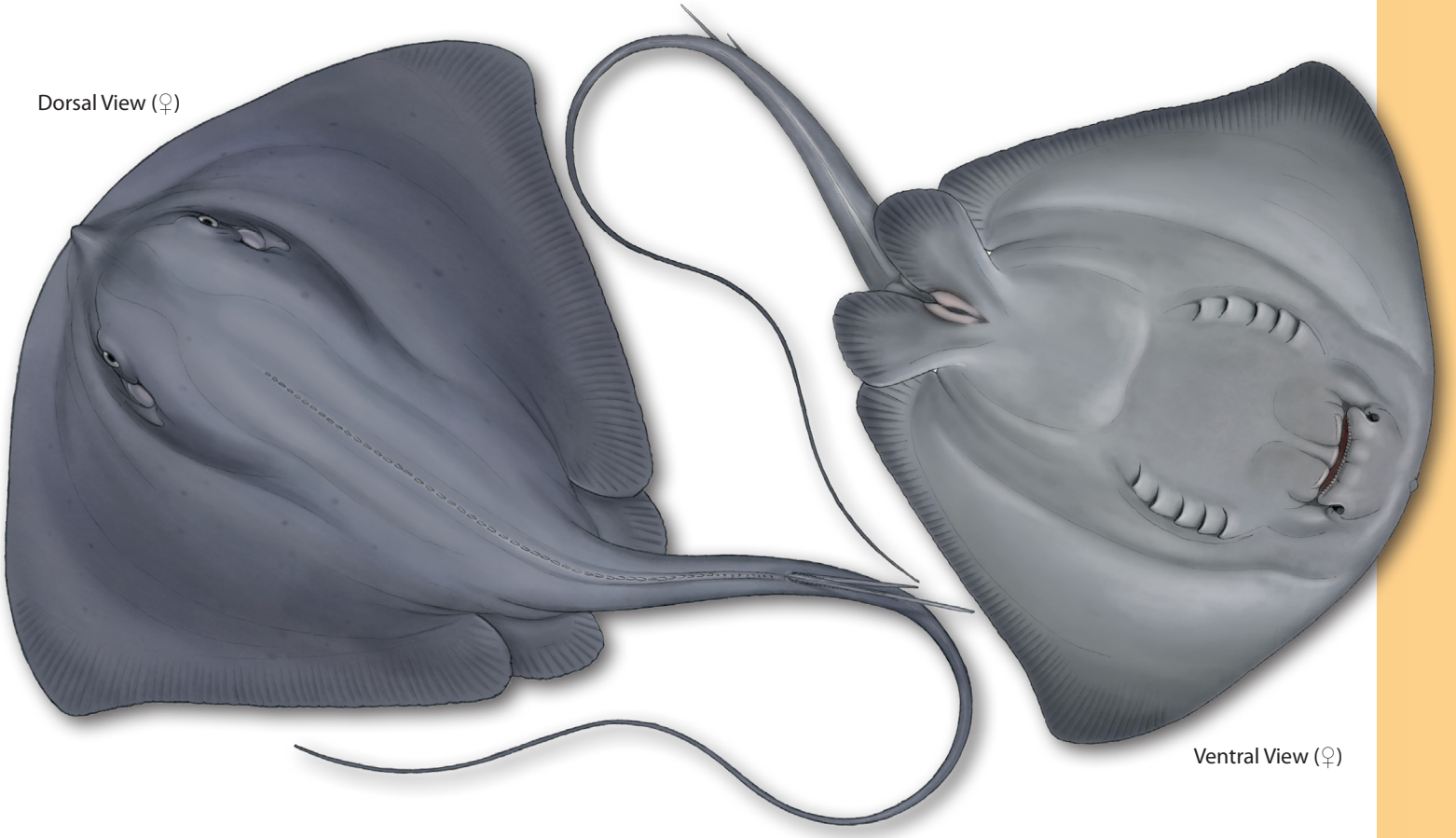
ii. Bester, C; Unknown. Florida Museum of Natural History.

iii. Consalvo, I. *et al*; 2007. *Scientia Marina*, 71(2), 213–222.

iv. Gibson, C. *et al*; 2006. IUCN SSC Shark Specialist Group.

v. Luna, S. M; 2008. Fishbase.

Pelagic Stingray *Pteroplatytrygon violacea*



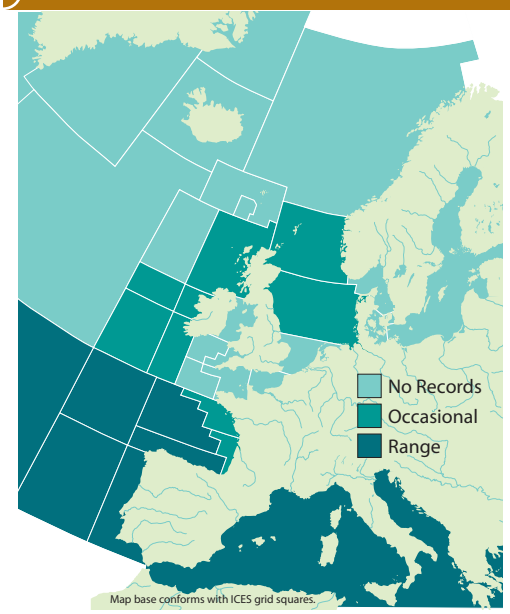
COMMON NAMES

Pelagic Stingray, Violet Stingray, Blue Stingray, Guiler's Stingray, Pastenague Violette (Fr), Raya Latigo Violeta (Es), Trigone Viola (It).

SYNONYMS

Dasyatis violacea (Bonaparte, 1832), *Trygon violacea* (Bonaparte, 1832), *Dasyatis purpurea* (Müller & Henle, 1841), *Dasyatis purpureus* (Müller & Henle, 1841), *Trygon purpurea* (Müller & Henle, 1841), *Trygon violaceus* (Duméril, 1865), *Dasyatis (Pteroplatytrygon) violaceus* (Fowler, 1910), *Dasybatus (Dasybatus) violaceus* (Garman, 1913), *Dasyatis atratus* (Ishiyama & Okada, 1955), *Dasyatis guileri* (Last, 1979).

DISTRIBUTION



The Pelagic Stingray is found worldwide in tropical and temperate waters, although it is absent from the Indian Ocean. In the east Atlantic it is known from the southwest British Isles, the Cape Verde Islands, the Mediterranean Sea, west Africa around Gabon/ Angola and South Africa (Bester *et al.*, Unknown).

APPEARANCE

- Broad disc, wider than long.
- Broadly rounded snout with terminal lobe.
- Tail is double the length of the body with long lower caudal fold.
- Small eyes do not protrude from the body.
- Spine with 161–181 (♀), 166–191 (♂) serrations.
- Spine 121–132mm (♀), 109–147mm (♂).
- Cuspidate teeth in both sexes. 34 files of teeth in upper jaw, 39 in lower.
- Dark purple or blue-green dorsally. Deep purple to grey ventrally. No distinguishing markings.
- Maximum size of 80cm disc width (DW) and 160cm total length (TL).

The body of the Pelagic Stingray is wider than it is long with a tail that is double the length of the body. The snout is rounded with a prominent terminal lobe (Bester *et al.*, Unknown). The eyes are small and do not protrude from the body (de Sigueira *et al.*, 2007).

A useful distinguishing feature of the Pelagic Stingray is the venomous tail spine, between the serrations of which are distinct 'cul-de-sacs'. Depending on the area, the number of serrations can vary from 161-181 for females and 166–191 for males. The length of the spine also varies with location from 121–132mm for females and 109–147mm for males (Schwartz, 2005; Schwartz, 2007a; Schwartz, 2007b).

The dorsal colouration is dark purple to blue-green. The ventral surface is deep purple to grey. There are no markings making it difficult for predators near the surface to pick out the Pelagic Stingray against the dark water below (Bester *et al.*, Unknown).

NE ATL MED

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PLS

Pelagic Stingray

SIMILAR SPECIES

Dasyatis centroura, Roughtail Stingray
Dasyatis pastinaca, Common Stingray
Pteroplatytrygon tortonesi, Tortonese's Stingray
(not illustrated)

Pteroplatytrygon violacea,
Pelagic Stingray

Dasyatis centroura,
Roughtail Stingray

Dasyatis pastinaca,
Common Stingray, dorsal

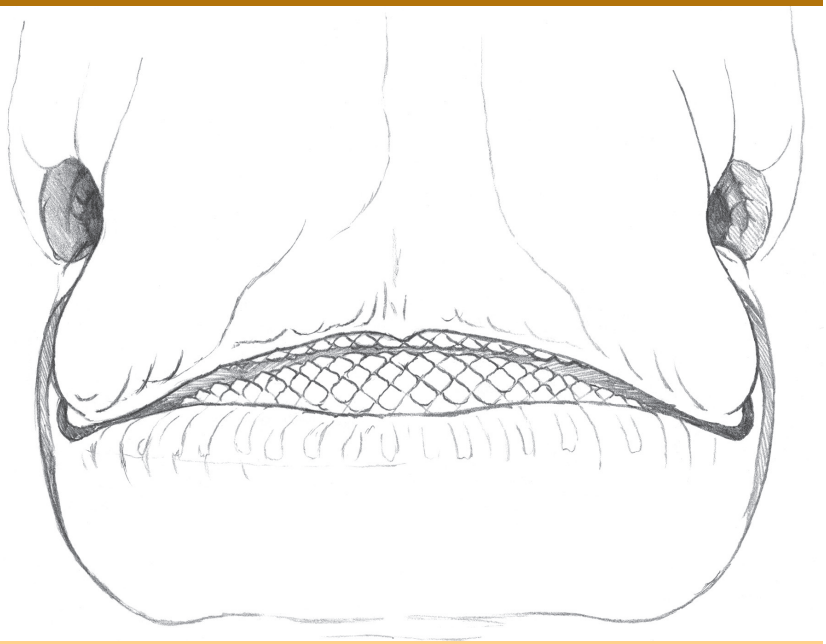
Dasyatis pastinaca,
Common Stingray, ventral

(Not to scale)

Pelagic Stingray *Pteroplatytrygon violacea*

TEETH

The upper jaw projects slightly at the symphysis while the lower jaw is slightly indented. The upper jaw has 34 files of teeth, 17 on each side. The lower jaw has 39 files of teeth, 19 each side of the symphysial tooth. Unlike most stingrays, the teeth are sharp in both sexes (Bester *et al.*, Unknown).



ECOLOGY & BIOLOGY

HABITAT

The Pelagic Stingray is a pelagic species, possibly the only Dasyatid that is not found on or near the bottom. This makes it vulnerable to large pelagic predators such as the Oceanic Whitetip Shark, *Carcharhinus longimanus*, a known predator of the species. It can be found at depths up to 238m (780ft) although it is most usually found in the top 100m (330ft) over deep water (Bester *et al.*, Unknown).

EGGCASE

N/A

DIET

Analysis of stomach contents have shown that the diet of the Pelagic Stingray consists mainly of planktonic crustaceans such as euphausiids and amphipods, as well as jellyfish, squid, octopus, shrimp and small pelagic fish such as herring and mackerel. It has been observed using its pectoral fins to manipulate food to its jaws (Bester *et al.*, Unknown).

REPRODUCTION

Males reach sexual maturity around 35–40cm DW, females around 40–50cm DW. An ovoviviparous species, the Pelagic Stingray retain their eggcases within the uterus. At some point early on in the gestation period, the embryo emerges from the eggcase into the uterus. During the first part of the gestation period the embryos are nourished by a yolk sac which most likely lasts until they leave the eggcase. When they reach a size of around 5cm DW, the yolk sac runs out and they are nourished by uterine milk (histotroph) (Bester *et al.*, Unknown).

After 2–4 months the female gives birth to 4–9 young with each pup measuring 15–25cm DW. In the warm waters of the central and western Pacific Ocean, parturition occurs through March. In the cooler waters of the Mediterranean, it takes place during August and September (Bester *et al.*, Unknown).

Pelagic Stingray

COMMERCIAL IMPORTANCE

There is no commercial interest in the species although it is regularly taken as bycatch by driftnets and longlines (Bester *et al*., Unknown). Landed and utilised in some areas such as Indonesia (IUCN, 2008).

IUCN RED LIST ASSESSMENT

Least Concern (2008).

THREATS, CONSERVATION, LEGISLATION

The Pelagic Stingray is regularly captured on longline gear targeting tuna and swordfish, although it is rarely landed. It is utilised in some areas such as Indonesia but for the most part is discarded at sea, sometimes with serious mouth and jaw damage limiting survival rates (IUCN, 2008). It has been reported from the southwest Atlantic and from the Mediterranean that "hooks are removed by smashing the fish against the rail because the crew are concerned about injury from the ray's spine, which can result in them being off work for a few days" (Domingo *et al*., 2005; Piovano *et al*., 2008).

While no decrease in stocks of the species have been observed, declining stocks of more valuable species could lead to increased utilisation and landings need to be carefully monitored. Its widespread distribution and relatively high fecundity should make the Pelagic Stingray more resistant to fishing pressure than many other elasmobranchs (IUCN, 2008).

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large venomous spine 1/3 of the way down tail.
- Sharp teeth in both sexes.

REFERENCES

BESTER, C., MOLLET, H. F., BOURDON, J. Unknown. Pelagic Stingray. Florida Museum of Natural History. www.flmnh.ufl.edu/fish/.

DE SIQUEIRA, A. E., DE SANT'ANNA, V. B., 2007. Data on the Pelagic Stingray, *Pteroplatytrygon violacea* (Bonaparte, 1832) (Myliobatiformes: dasyatidae) caught in the Rio de Janeiro coast. *Braz. J. Oceanogr.* 55 (4).

DOMINGO, A., MENNI, R. C., FORSELLEDO, R. 2005. Bycatch of the pelagic ray *Dasyatis violacea* in Uruguayan longline fisheries and aspects of distribution in the southwestern Atlantic. *Sci. Mar.* 69 (1): 161-166.

IUCN. 2008. IUCN SSG Red List Assessments for Chondrichthyan Fishes of the Northeast Atlantic.

PIOVANO, S., CLÒ, S., BASCIANO, G., GIACOMA, C. 2008. Reducing Pelagic Stingray (*Pteroplatytrygon violacea*) By-Catch in Central Mediterranean Longline Fisheries. European Commission Life Nature Program.

SCHWARTZ, F. J. 2005. Tail Spine Characteristics of Stingrays (Order Myliobatiformes) Found in the Northeast Atlantic, Mediterranean, and Black Seas. *Electronic journal of Ichthyology.* 1: 1–9.

SCHWARTZ, F. J. 2007a. A Survey of Tail Spine Characteristics of Stingrays Frequenting African, Arabian to Chagos-Maldive Archipelago Waters. *Smithiana*, Bulletin 8: 41-52.

SCHWARTZ, F. J. 2007b. Tail Spine Characteristics of Stingrays (Order Myliobatiformes) Frequenting the FAO Fishing Area 61 (20°N 120°E – 50°N 150°E) of the Northwest Pacific Ocean. *The Raffles Bulletin of Zoology*. 14: 121-130.

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.

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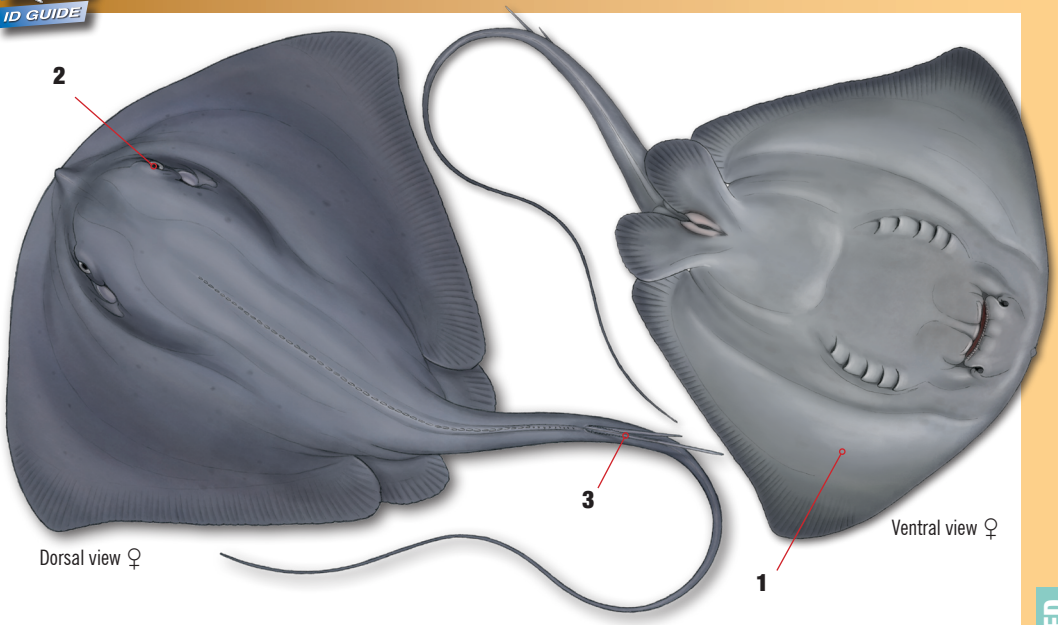
Pelagic Stingray *Pteroplatytrygon violacea*

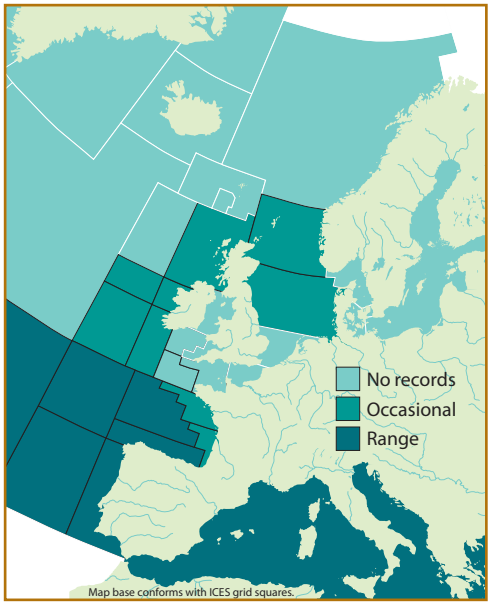


SCIENTIFIC NAME

Pteroplatytrygon violacea (Bonaparte, 1832).

DISTRIBUTION

Found worldwide except. East Atlantic from the British Isles to South Africa, including the Mediterranean[i].



COMMON NAME

PELAGIC STINGRAY, Violet Stingray, Blue Stingray, Guiler's Stingray, Pastenague Violette (Fr), Raya Latigo Violeta (Es), Trigone Viola (It).

IDENTIFICATION

1 Broad disc wider than long.

2 Eyes do not protrude from body[ii].

3 Cul-de-sacs between serrations on spine[iv].

COLOUR

- Dark purple to blue green dorsally.
- Dark purple to grey ventrally.
- No distinguishing markings[i].

BIOLOGY AND SIZE

- Born: 15–25cm DW. Mature: 40–50cm DW ♀, 35–40cm DW ♂. Max: 80cm DW, 160cm TL.
- 2–4 month gestation period. Litters of 4–9 pups have been recorded.
- Feed on a wide variety of planktonic crustaceans, jellyfish, octopus, squid, shrimp and small fish[i].

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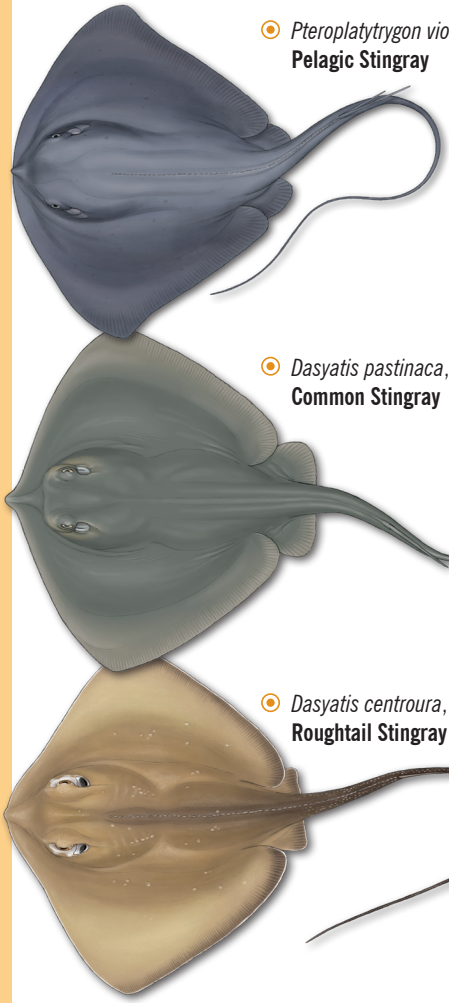
PLS

Pelagic Stingray

SIMILAR SPECIES



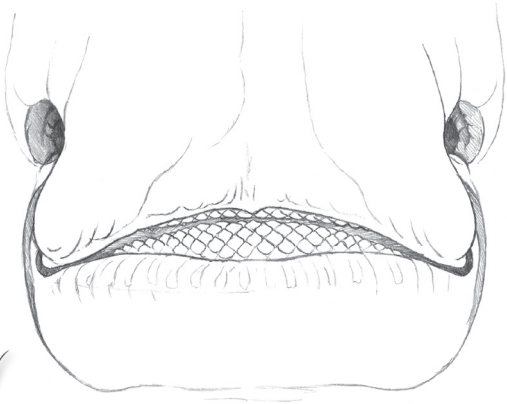
- *Pteroplatytrygon violacea*, **Pelagic Stingray**
- *Dasyatis pastinaca*, **Common Stingray**
- *Dasyatis centroura*, **Roughtail Stingray**
- *Dasyatis tortonesi*, **Tortonese's Stingray** (not illustrated).

HABITAT

- Epipelagic, possibly the only Dasyatid not found demersally.
- From surface to 240m.
- Most usually found in the top 100m over continental slopes and oceanic deep water[i].

TEETH

- Upper jaw has 34 rows of teeth (17–17).
- Lower has 39 rows of teeth with a symphysial tooth (19–S–19).
- Teeth sharp in both sexes[i].



CONSERVATION STATUS

- Wide distribution and relatively high fecundity make it a robust species. Populations seem stable and may be increasing in some areas[iii].
- Red List status: Least Concern (2008).

COMMERCIAL IMPORTANCE

- Of no commercial importance.
- Taken as bycatch on longlines and in driftnets but usually discarded.
- Post discard survival rates may be reduced by jaw damage during handling and hook removal[iii].

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large venomous spine 1/3 of the way along tail.
- Sharp teeth in both sexes.

REFERENCES

i. Bester, C. *et al;* Unknown. Florida Museum of Natural History.

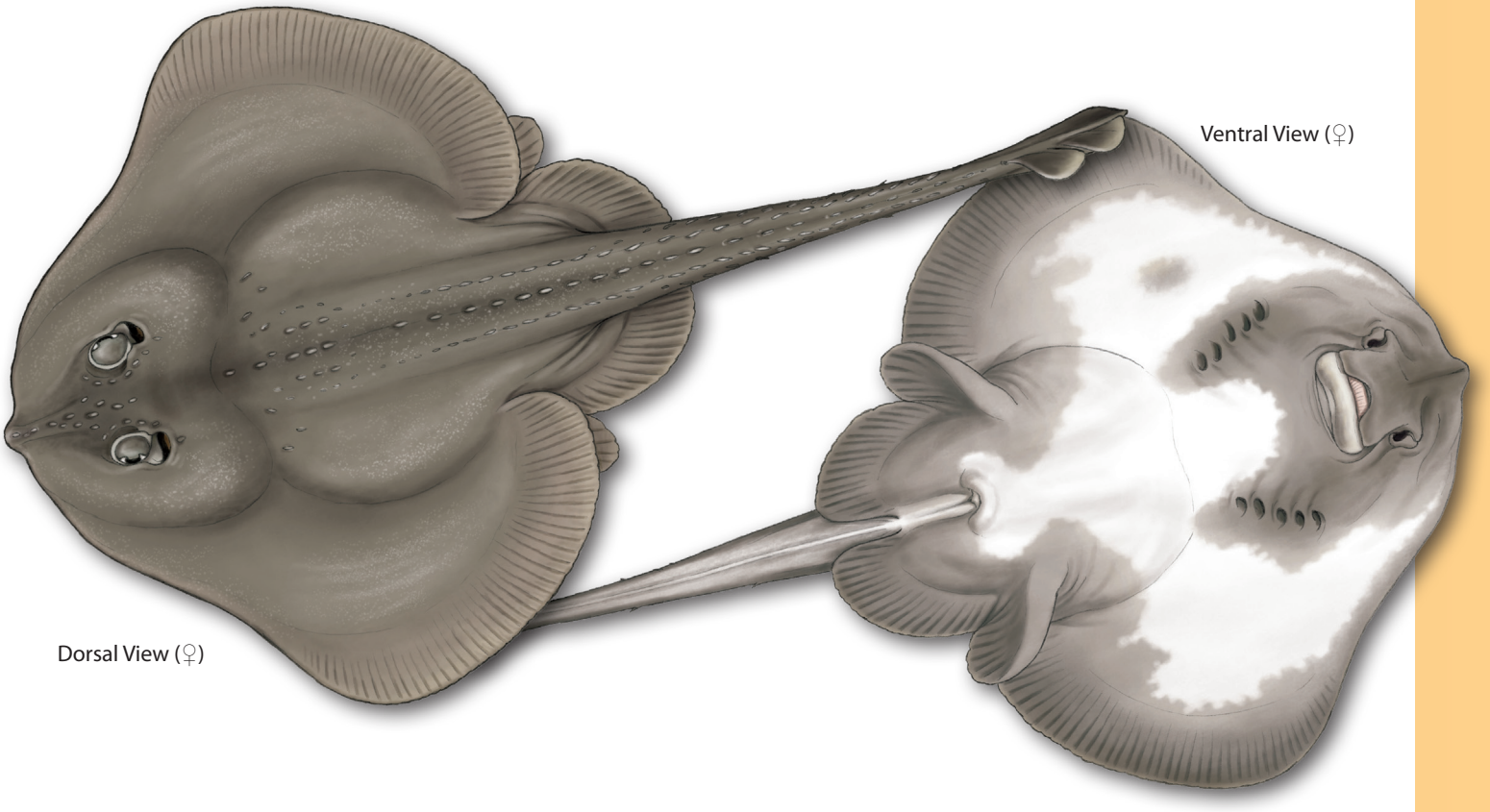
ii. De Sigueira, A, E *et al*; 2007. *Braz. J. Oceanogr.*

iii. IUCN; 2008.

iv. Schwartz, F. J; 2005. *Electronic Journal of Ichthyology*.

Round Ray

Rajella fyllae



COMMON NAMES

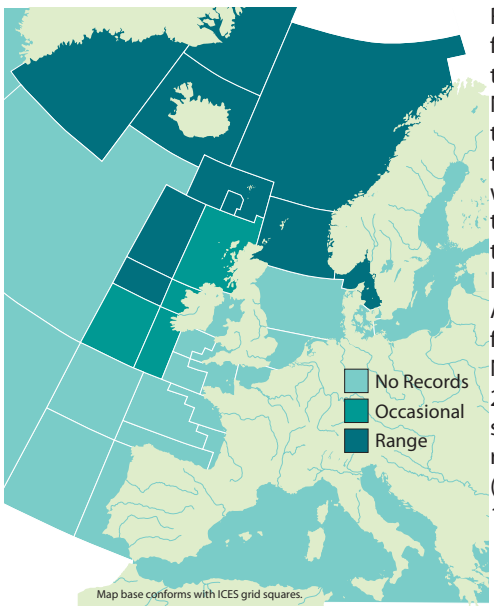
Round Ray, Round Skate, Sandy Skate, Raie Ronde (Fr), Raya Redonda (Es).

SYNONYMS

Raja fyllae (Lütken, 1888), *Raja circularis* (Günther, 1887), *Raja falsavela* (Smitt, 1895), *Raja fyllae lipacantha* (Jensen, 1905).

DISTRIBUTION

Found across the North Atlantic. In the northeast Atlantic, the Round Ray is known from Spitsbergen to southern Norway, Iceland, the Faeroe Islands, the Shetlands, the western coasts of the British Isles and the Bay of Biscay. In the northwest Atlantic it is found from Greenland to Nova Scotia (Agustin, 2009). There is a single questionable report from Morocco (Whitehead *et al.*, 1986).



APPEARANCE

- Maximum 55cm total length.
- Short snout and distinctive rounded disc.
- Dorsal surface grey to dark brown.
- Juveniles have dark spots and blotches.
- Ventral surface white to grey.
- Tail very long with dark spots or banding.

The Round Ray has a very short snout with greatly rounded edges to the disc, giving the skate its common name. Along the leading edge of the disc, males are undulate whilst females and juveniles are concave (Stehmann and Bürkel, 2000). The tail is noticeably longer than the body and is usually plain coloured, distinguishing it from the Winter Skate, *Leucoraja ocellata*, and Little Skate, *Leucoraja erinacea*, in the northwest Atlantic. The dorsal surface of the disc is grey to dark brown and sometimes paler in adults, younger animals have distinct dark blotches. The ventral surface ranges from white to grey. The tail often has dark banding or spots which extend to the pelvic fins and along the margins of the disc (Whitehead *et al.*, 1986).

The dorsal surface of the disc is entirely rough with many prickles on the pectoral fins and thornlets concentrated on the head and on the rear of the disc. Males have bare patches on the pectoral fins whilst females have a patch of large thorns on the inner portion of the pectorals. There is a complete row of 5-9 thorns around the inner margin of the eye in larger specimens and a large triangle of thorns on the shoulder. Adults typically have thorns running along the whole midline of the disc to the end of the tail in several parallel lines (CMB, Unknown). If the dorsal fins are separate there may be a thorn between (Stehmann and Bürkel, 2000). The dorsal surface is smooth. The skate reaches a maximum total length of around 55cm (Whitehead *et al.*, 1986).

NE ATL

LC

RJY

Round Ray

SIMILAR SPECIES

Rajella bigelowi, Bigelow's Ray (not illustrated)

Raja asterias, Starry Ray (not illustrated)

Raja rondeleti, Rondelet's Ray (not illustrated)

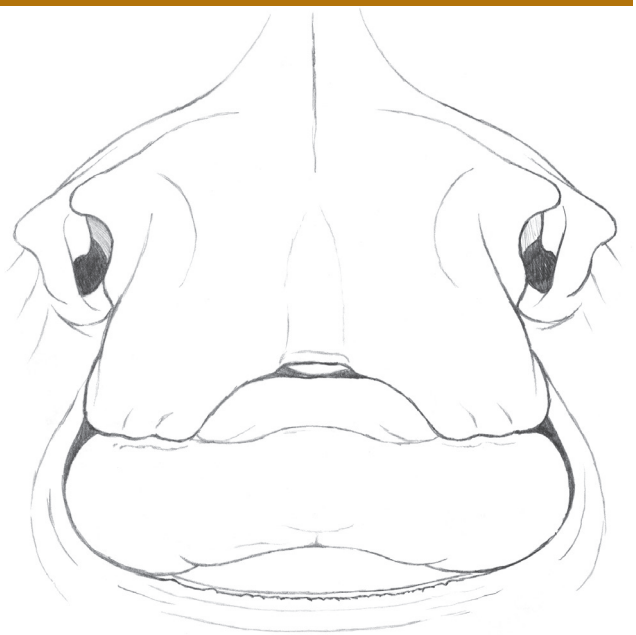
(Not to scale)

Round Ray

Rajella fyllae

TEETH

The Round Ray has 30-38 rows of teeth in the upper jaw which are blunt, conical and cusped, perfect for eating crustaceans (CMB, Unknown). Males have sharper teeth than females (Clark, 1926).



ECOLOGY

HABITAT

The Round Ray is found at depths of 170-2,050m (560–6,725ft) on the upper slope and deeper shelf waters of the North Atlantic and is most common between 300-800m (985–2,625ft) (Gibson *et al*., 2006; Whitehead *et al*., 1986). It is found in waters ranging from 1-7°C (33.8–44.6°F) but prefers water temperatures of around 3-5.5°C (37.4–41.9°F) (Whitehead *et al*., 1986; Agustin, 2009).

DIET

The diet of the Round Ray has not been well studied but it apparently preys on small crustaceans, copepods, amphipods and mysids (Agustin, 2009). A study from the Barents Sea found that Polychaeta were the most important prey (31% by mass), followed by Northern Shrimp (26% by mass), Gammaridae (14% by mass) and fisheries waste (10% by mass) (Dolgov, 2005). Similar studies from the Grand Banks show Polychaetes form 80% of the diet of the Round Ray in that area, followed by Gammeridae (5%) (Gonźalez *et al*., 2006).

REPRODUCTION

The eggcases of the Round Ray measure 38-42mm long (excluding horns) and 24-26mm wide. They are deposited in sandy or muddy substrates and left to incubate (Agustin, 2009). Nothing more is known of their reproduction.

EGGCASE

1. 38–42mm in length (excluding horns).
2. 24–26mm in width (Agustin, 2009).

Similar eggcase to the Starry Skate, *Amblyraja radiata*.

Round Ray

COMMERCIAL IMPORTANCE

The Round Ray is taken as bycatch in deepwater trawl and longline fisheries across the North Atlantic and is often discarded. Its wide depth range offers it refuge beyond the deepest depths presently reached by commercial fisheries (Gibson *et al*., 2006).

THREATS, CONSERVATION, LEGISLATION

The Round Ray is small and has a reasonably high population increase rate making it resilient to fishing pressure. Its wide depth range offers it refuge from most fishing pressure, although it is still taken as bycatch in trawl and longline fisheries. The majority are discarded at sea. The available data on trends suggest that the population is relatively stable and is possibly increasing in some small areas (Gibson *et al*., 2006).

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
VIId	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, 2008). 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. The SFC's which implement these and the details are shown in the table below.

SFC	DW (cm)	Other
Cumbria	45	Cannot land wings less than 22cm in their maximum dimension
Kent & Essex	40	Cannot land wings less than 19cm in their maximum dimension
Southern	40	Cannot land wings less than 20cm in their maximum dimension
South Wales	45	Cannot land wings less than 22cm in their maximum dimension
States of Guernsey	36	

Cumbria SFC, Unknown; Kent & Essex SFC, Unknown; South Wales SFC, Unknown; Southern SFC, 2006; NFFO, 2004)

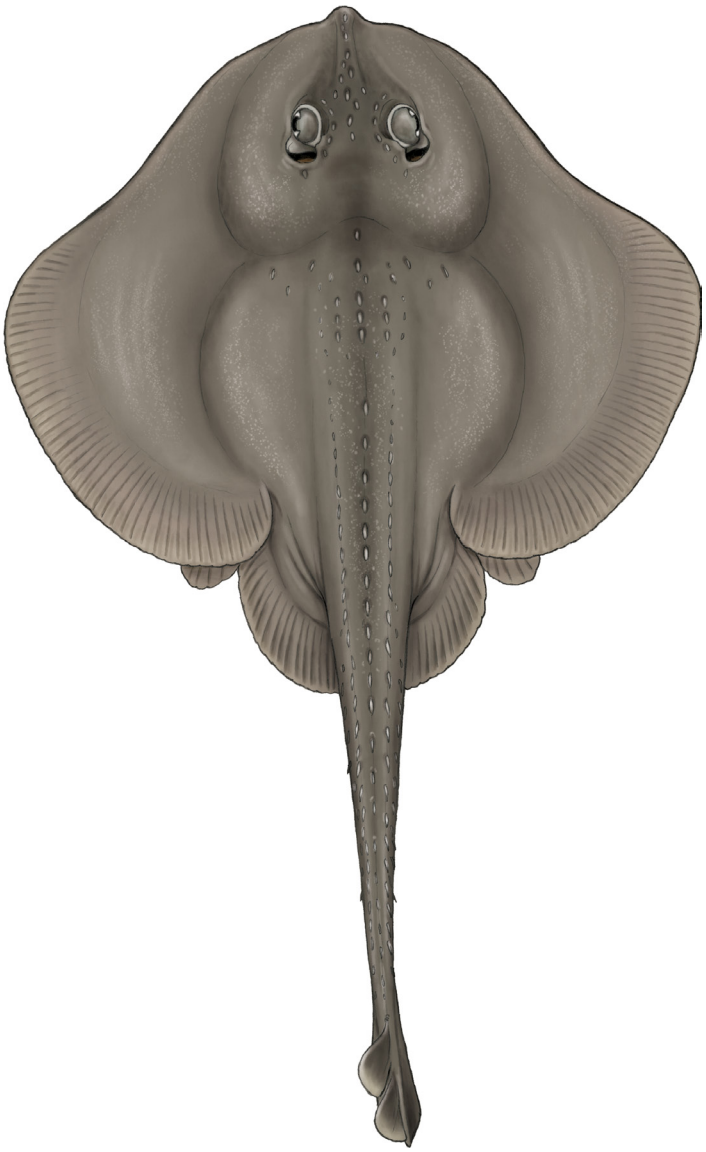
Many recreational anglers return any sharks, skates and rays they catch alive and some angling clubs have begun tag and release programmes (Holt, 2005).

IUCN RED LIST ASSESSMENT

Least Concern (2008).

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Several rows of midline thorns.



REFERENCES

AGUSTIN, L. Q. 2009. *Rajella fyllae*. Round Ray. Fishbase. www.fishbase.org.

CMB. Unknown. Round Ray (*Rajella fyllae*). Centre for Marine Biodiversity, Canada. www.marinebiodiversity.ca.

CUMBRIA SFC. Unknown. Minimum Fish Sizes. www.cumbriasfc.org.uk.

DOLGOV, A. V. 2005. Feeding and Food Consumption by the Barents Sea Skates. *J. Northw. Atl. Fish. Sci.*, Vol. 35: 495-503.

EUROPEAN UNION. 2009. Council Regulation (EC) No. 43/2009. *Official Journal of the European Union*, L22/1. www.mfa.gov.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.

GONŹALEZ, C., PAZ, X., ROMÁN, E., HERMIDA, M. 2006. Feeding Habits of Fish Species Distributed on the Grand Bank (NAFO Divisions 3NO, 2002-2005). Northwest Atlantic Fisheries Organisation.

HOLT, D. 2005 Common Skate Tagging Programme. The Scottish Angling Homepage: www.catchalot.co.uk.

ICES. 2008. Demersal elasmobranchs in the North Sea (Sub-area IV), Skagerrak (Division IIIa), and eastern English Channel (Division VIId). ICES advice 2008, Book 6.

KENT & ESSEX SFC. Unknown. Minimum Fish Sizes. www.kentandessex-sfc.co.uk.

NFFO. 2004. Official Yearbook and Diary. Grimsby, UK.

SOUTH WALES SFC. Unknown. Byelaws. www.swsfc.org.uk.

SOUTHERN SFC. 2006. Minimum Landings Sizes. www.southernsfc.org.uk.

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.

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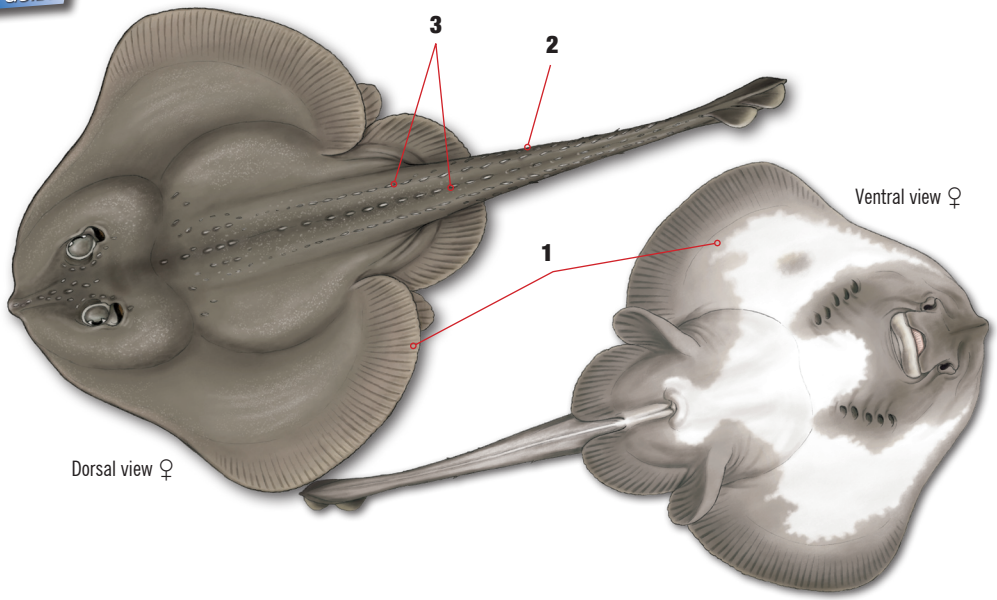
Round Ray

Rajella fyllae

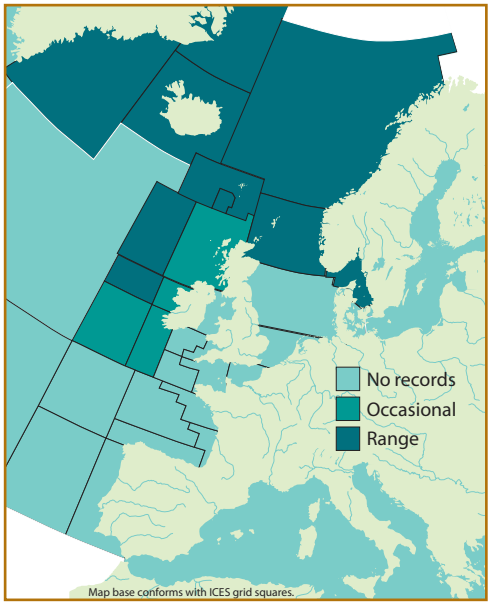


SCIENTIFIC NAME

Rajella fyllae (Lutken, 1888).

DISTRIBUTION

East Atlantic from Greenland to Spitsbergen and south to the western British Isles[v]. West Atlantic from Nova Scotia to Greenland[i].



COMMON NAME

ROUND RAY, Round Skate, Sandy Skate, Raie Ronde (Fr), Raya Redonda (Es).

IDENTIFICATION

1. Distinctive rounded disc.
2. Very long tail, sometimes with dark banding or spots.
3. Several rows of thorns running down midline to first dorsal fin[ii].

COLOUR

- Dorsal surface dark grey to brown.
- Juveniles have dark spots and blotches.
- Ventral surface white to grey[v].

BIOLOGY AND SIZE

- Max TL: 55cm[v].
- Feed on small crustaceans, copepods, amphipods and mysids[i].
- Eggs are deposited in sandy and muddy flats and left to incubate[i].

NE ATL

LC

RJY

Round Ray

SIMILAR SPECIES

- *Rajella bigelowi*, **Bigelow's Ray**
- *Raja asterias*, **Starry Ray**
- *Raja rondeleti*, **Rondelet's Ray**

HABITAT

- Demersal, 170–2,050m[iv] in temperatures of 1–7°C[v].
- Most common 300–800m[v] in temperatures of 3–5.5°C[i].
- Prefer soft substrates such as sand and mud[v].

CONSERVATION STATUS

- Small with high fecundity compared to many other skate species, making them less vulnerable to fishing pressure[iv].
- Red List status: Least Concern (2008).

COMMERCIAL IMPORTANCE

- It is taken as bycatch in deepwater trawl and longline fisheries across the North Atlantic.
- When caught, it is usually discarded due to its small size and low value.
- Its wide depth and geographic range offers its refuge from many commercial fisheries[iv].
- 2009 – Species currently subject to TAC in EU waters.

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Several rows of midline thorns.

REFERENCES

i. Agustin, L. Q; 2009. Fishbase.
ii. Centre for Marine Biodiversity; Unknown.
iii. Clark, R. S; 1926. Fishery Board for Scotland.
iv. Gibson, C. *et al*; 2006 IUCN SSC Shark Specialist Group.
v. Whitehead, P. J. P. *et al*; 1986. UNESCO.

TEETH

- 30–38 rows of teeth in upper jaw.
- Blunt and conical in females, males sharper[ii].
- Teeth of both sexes have circular bases[iii].

EGGCASE

1 38–42mm in length (excluding horns).

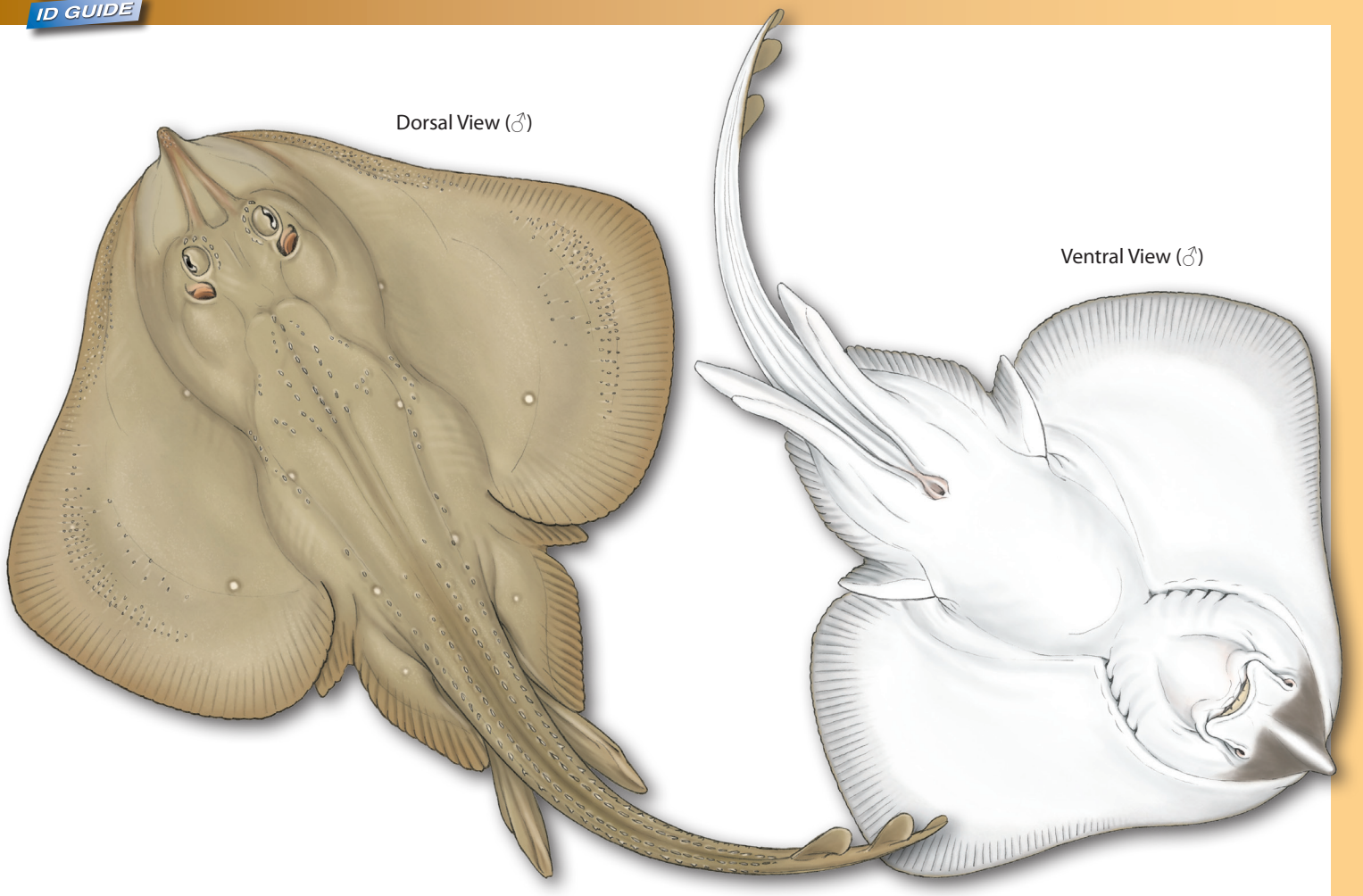
2 24–26mm in width[i].

Similar eggcase to the Starry Skate, *Amblyraja radiata*.

(Eggcase shown actual size.)

Sandy Ray

Leucoraja circularis



COMMON NAMES

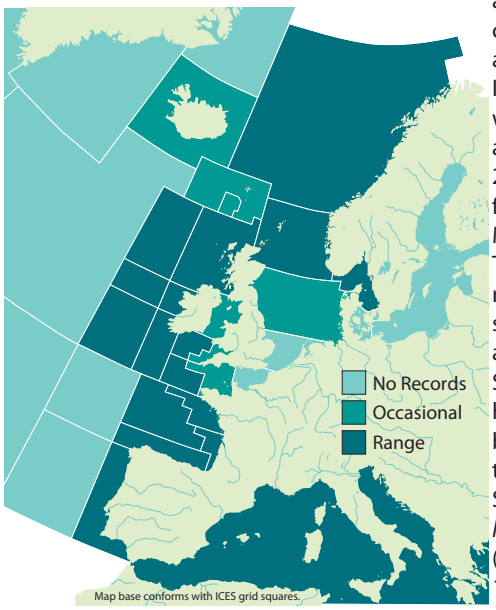
Sandy Ray, Sandy Skate. Leather Ray, Faroese Roker, Raie Circulaire (Fr), Sandroche (De), Raya Falsa Vela (Es), Razza Rotonda (It).

SYNONYMS

Raja circularis (Couch, 1838), *Raja falsavela* (Bonaparte, 1839), *Amblyraja circularis* (Malm, 1877), *Raja falsavela* (Doderlein, 1884), *Alpharaia circularis* (Leigh-Sharpe, 1924).

DISTRIBUTION

Found in the east Atlantic from northern Morocco to southern Norway and out to Iceland. Around the UK it is predominantly found along the north coast of Scotland and the Shetland Isles, occasionally western Scotland and Ireland (Barnes, 2008). It is also found in the western Mediterranean. There are uncertain records of the species as far south as Mauritania and Senegal which have generally been attributed to the Whitedappled Skate (*Leucoraja leucosticte*) (Whitehead *et al*., 1986).



APPEARANCE

- Up to 120cm total length.
- Upper surface light brown (sandy) to red brown.
- 4-6 creamy spots on each pectoral fins.
- Solid tail slightly longer than the body.
- Closely spaced dorsal fins with no thorns between.

The Sandy Ray is a large skate that can reach 120cm in length, but is most usually around 70cm (Whitehead *et al*., 1986). It has a short snout with a very pronounced tip and strong tail which is only slightly longer than the body (Serena, 2005). The teeth are arranged in 64-84 rows in the upper jaw. These are more pointed in mature males than in females and juveniles as they are used for holding the female during copulation (Clark, 1926).

The upper surface of the disc is entirely covered in spines except for small bare areas on the hind half in adults. In juveniles there is a median row of thorns along the centre of the body and tail with a parallel row of thorns on each side. These are greatly reduced in adults (Whitehead *et al*., 1986). In adults there is a row of around 8 thorns on the inner margin of each eye and a triangle of thorns near the shoulder (Barnes, 2008). On the underside of the disc there are prickles only on the snout, between the gill-slits, along the abdomen and on the anterior margins of the disc (Agustin, 2009). The dorsal fins are very closely spaced with no thorns between (Whitehead *et al*., 1986).

The Sandy Ray gets its name from its sandy colouration, although this is variable and can be darker brown or red (Barnes, 2008). On each pectoral fin there are 4-6 symmetrically arranged creamy spots. The underside is white in both juveniles and adults (Whitehead *et al*., 1986).

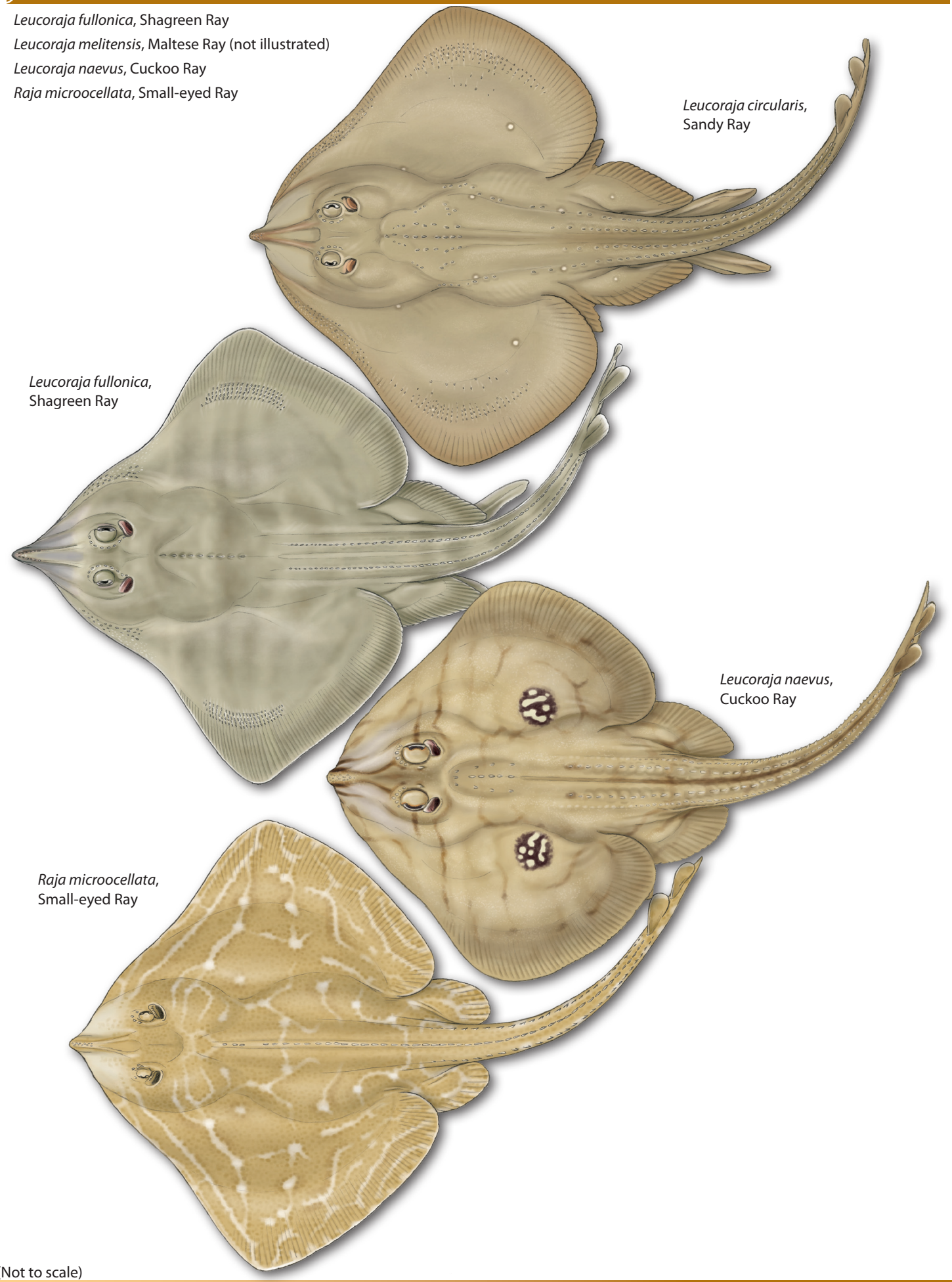
NE ATL MED

MED: EN VU RJI

Sandy Ray

SIMILAR SPECIES

Leucoraja fullonica, Shagreen Ray
Leucoraja melitensis, Maltese Ray (not illustrated)
Leucoraja naevus, Cuckoo Ray
Raja microocellata, Small-eyed Ray



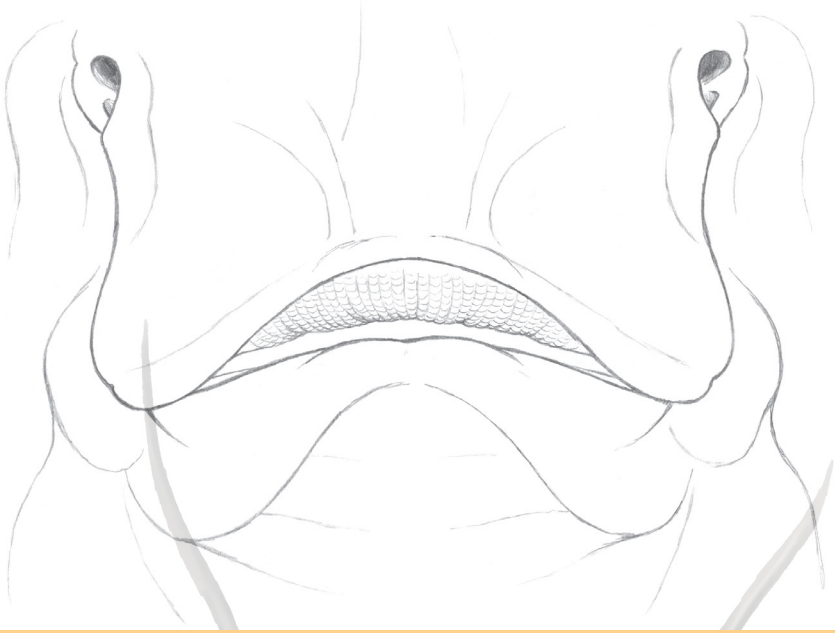
(Not to scale)

Sandy Ray

Leucoraja circularis

TEETH

There are 64-84 rows of teeth in the upper jaw. These are more pointed in adult males than in females and juveniles (Clark, 1926).



ECOLOGY & BIOLOGY

HABITAT

The Sandy Ray is a relatively large skate most commonly found in offshore shelf waters and on the upper continental shelf around the northeast Atlantic and the Mediterranean (Gibson *et al*.,2006). Across the majority of its range it is found in depths ranging from 70 to 275m (230–900ft) and is most common around 100m (330ft), although it has been suggested that they now favour slightly deeper water (~180m) in Scotland (Serena, 2005; Gibson *et al*., 2006). In the Ionian Sea it is only encountered in deeper waters from 463-676m (1,500–2,200ft) (Agustin, 2009). Like most skates it tends to prefer soft substrates such as sand and mud (Barnes, 2008).

DIET

Its diet is poorly understood but it most likely feeds on various bottom dwelling invertebrates, particularly crustaceans, and small teleost fish (Agustin, 2009).

REPRODUCTION

Little is known of the reproductive strategy and life history of the Sandy Ray except that the females lay their eggs in soft substrates from August to November (Serena, 2005). These eggcases measure 83-92mm long (excluding horns) and 46-53mm wide (Agustin, 2009).

EGGCASE

1. 82–94mm in length (excluding horns).
2. 46–53mm in width (Agustin, 2009).

Similar eggcase to the Cuckoo Ray, *Leucoraja naevus*, but larger (Clark, 1926).

Sandy Ray

COMMERCIAL IMPORTANCE

The Sandy Ray is taken as bycatch of multi-species trawl fisheries and offshore bottom longlines (Gibson *et al*., 2006). Of local fisheries importance towards the southern part of its range (Whitehead *et al*., 1986).

THREATS, CONSERVATION, LEGISLATION

While there is no targeted fishery for the species, the Sandy Ray is often taken as bycatch in multi-species trawl fisheries which operate intensively across its range. It can be seen from landings data and survey trawls that this is having an impact on populations. French landings of the species have declined from ~500t a year to ~300t a year since the early 1990's. Survey trawls have not recorded the Sandy Ray in the North Sea since 1996 or in the Celtic Sea since 1997. It is still found in Scottish waters although most recent captures have been between 180-500m (590–1,640ft), deeper than expected. Like most skate and ray species around the UK, little is known of the population trends of the Sandy Ray (Gibson *et al*., 2006).

In 2007, the Sandy Ray was included on the UK Biodiversity Action Plan (BAP) list. Though this does not provide any legal protection for the species in itself, it includes provisions to work towards European conservation legislation. Its main targets included plans to stabilise populations in refuge areas and to facilitate the migration of animals from refuge populations to areas where they are scarce or extinct.

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
VIId	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, 2008). 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. The SFC's which implement these and the details are shown in the table below.

THREATS, CONSERVATION, LEGISLATION

SFC	DW (cm)	Other
Cumbria	45	Cannot land wings less than 22cm in their maximum dimension
Kent & Essex	40	Cannot land wings less than 19cm in their maximum dimension
Southern	40	Cannot land wings less than 20cm in their maximum dimension
South Wales	45	Cannot land wings less than 22cm in their maximum dimension
States of Guernsey	36	

(Cumbria SFC, Unknown; Kent & Essex SFC, Unknown; South Wales SFC, Unknown; Southern SFC, 2006; NFFO, 2004)

However, such localised management strategies are unlikely to be significant for the conservation of regional populations (Fowler *et al*., 2005). Many recreational anglers return any sharks, skates and rays they catch alive and some angling clubs have begun tag and release programmes (Holt, 2005). As with most European skate and ray species, there is very little effective management in place to protect the Sandy Ray.

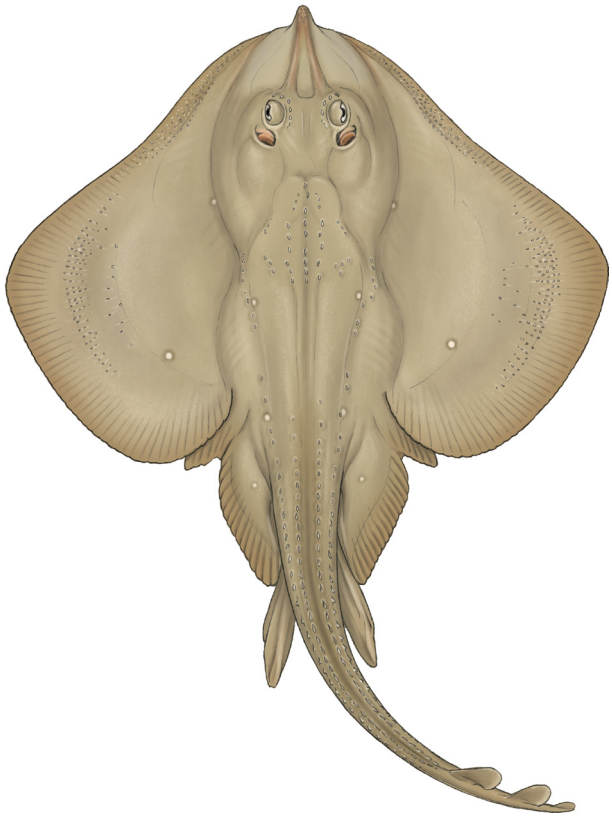
IUCN RED LIST ASSESSMENT

Vulnerable (2008).

Endangered in Mediterranean.

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Rows of thorns on midline.
- Orbital and snout thorns.
- Body covered in thorns and spines.



REFERENCES

AGUSTIN, L. Q. 2009. *Leucoraja circularis*. Sandy Ray. Fishbase. www.fishbase.org.

BARNES, M. K. S. 2008. *Leucoraja circularis*. Sandy Ray. Marine Life Information Network: Biology and Sensitivity Key Information Sub-programme [on-line]. Plymouth: Marine Biological Association of the United Kingdom. www.marlin.ac.uk.

CLARK, R. S. 1926. Rays and Skates: A Revision of the European Species. Fishery Board for Scotland, HM Stationary Office. Edinburgh, UK.

CUMBRIA SFC. Unknown. Minimum Fish Sizes. www.cumbriasfc.org.uk.

EUROPEAN UNION. 2009. Council Regulation (EC) No. 43/2009. *Official Journal of the European Union*, L22/1. www.mfa.gov.uk.

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. 2008. Demersal elasmobranches in the North Sea (Subarea IV), Skagerrak (Division IIIa), and eastern English Channel (Division VIId). ICES advice 2008, Book 6.

KENT & ESSEX SFC. Unknown. Minimum Fish Sizes. www.kentandessex-sfc.co.uk.

NFFO. 2004. Official Yearbook and Diary. Grimsby, UK.

Serena, F. 2005. Field Identification Guide to the Sharks and Rays of the Black Sea. FAO. Rome, Italy.

SOUTH WALES SFC. Unknown. Byelaws. www.swsfc.org.uk.

SOUTHERN SFC. 2006. Minimum Landings Sizes. www.southernsfc.org.uk.

STEHMANN, M., BÜRKEL, L. 2000. Field Key to Common skate Species (*Raja* spp.) in Northern EC Shelf Waters. Grafik Design Studio GmbH. Hamburg, Germany.

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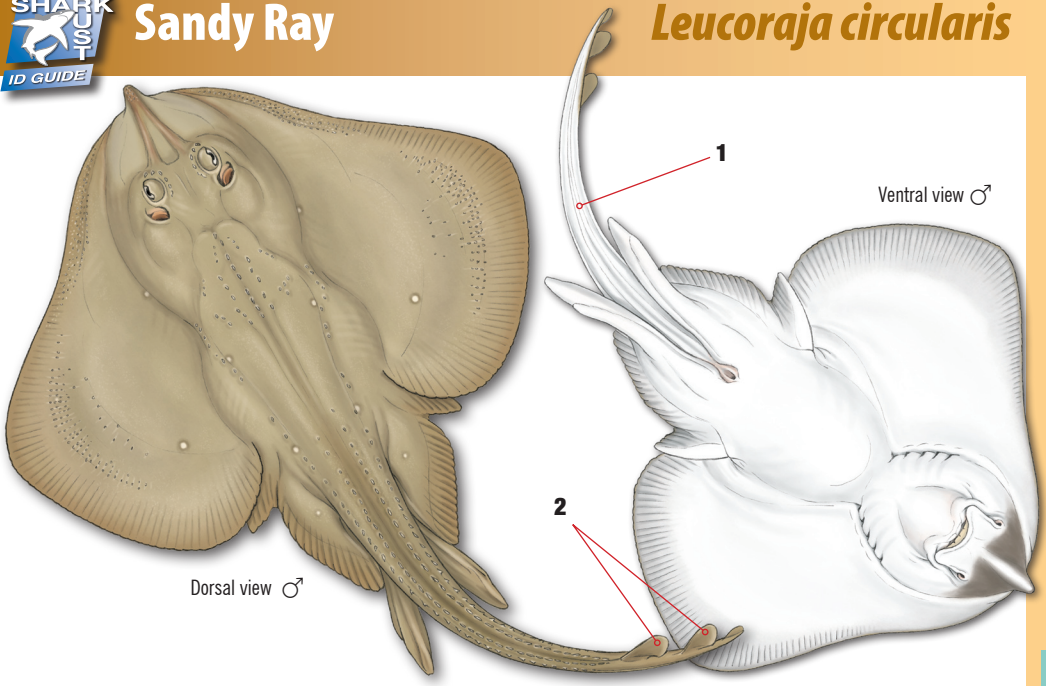
Sandy Ray

Leucoraja circularis

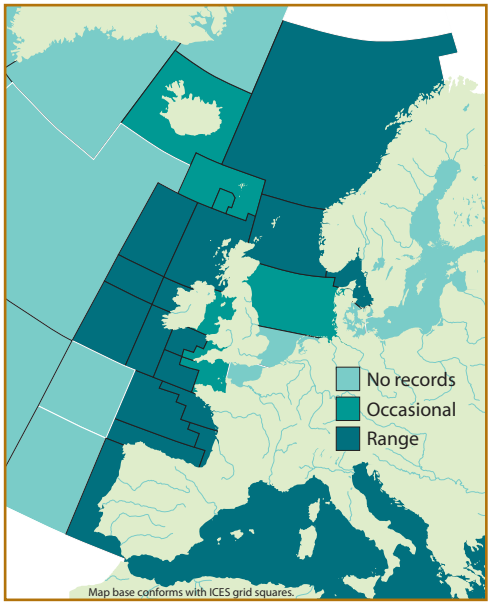


SCIENTIFIC NAME

Leucoraja circularis (Couch, 1838).

DISTRIBUTION

Northeast Atlantic from Morocco to Norway and Iceland. Also found in the western Mediterranean[ii].



COMMON NAME

SANDY RAY, Sandy Skate, Leather Ray, Faroese Roker, Raie Circulaire (Fr), Sandroche (De), Raya Falsa Vela (Es), Razza Rotonda (It), Zandrog (Ne).

IDENTIFICATION

1 Slender tail only slightly longer than body[iv].

2 Closely spaced dorsal fins with no thorn in between.

3 Dorsal surface spinulose[vi].

COLOUR

- 4–6 symmetrical creamy spots on each pectoral fin.
- Dorsal surface light brown (sandy) to red brown[ii].
- Ventral surface white[vi].

BIOLOGY AND SIZE

- Max TL: 120cm[vi].
- Feed on various benthic invertebrates and small bony fish[i].
- Females lay their eggs on soft substrates from August to November[iv].

NE ATL MED

MED: EN VU RJI

Sandy Ray

SIMILAR SPECIES

- *Leucoraja fullonica,* **Shagreen Ray**
- *Leucoraja melitensis,* **Maltese Ray**
- *Leucoraja naevus,* **Cuckoo Ray**
- *Raja microocellata,* **Small-eyed Ray**

HABITAT

- Demersal from 70–275m[iv], likely to occur deeper.
- Most common ~100m[iv] although depth preference may be shifting deeper (~180m)[v].
- Prefer soft substrates such as sand and mud[ii].

CONSERVATION STATUS

- Intensive trawling across its range may have lead to declines in populations particularly on the continental shelf (at the edge of its range). As with most large skate, low fecundity means they are vulnerable to intensive fishing[v]. Infrequently taken in inner continental shelf waters.
- Red List status: Vulnerable (2008). Endangered in Mediterranean.

COMMERCIAL IMPORTANCE

- Currently no targeted fishery for the species but often taken as bycatch in multispecies trawl fisheries[v].
- Commercially important in the southern part of its range and into the Mediterranean[vi].
- 2009 – Species currently subject to TAC in EU waters.

HANDLING AND THORN ARRANGEMENT

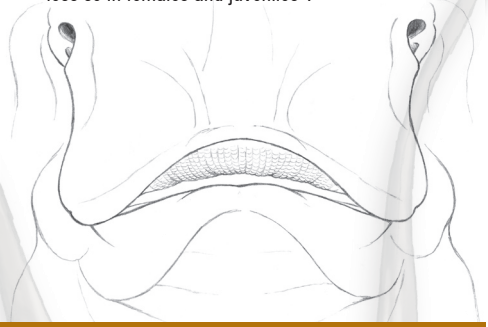
- Handle with care.
- Rows of thorns on midline.
- Orbital and snout thorns.

REFERENCES

i. Agustin, L. Q; 2009.
ii. Barnes, M. K. S; 2008. Marine Biological Association.
iii. Clark, R. S; 1926. Fishery Board for Scotland.
iv. FAO; 2005.
v. Gibson, C. *et al*; 2006. IUCN SSC Shark Specialist Group.
vi. Whitehead, P. J. P. *et al*; 1986. UNESCO.

TEETH

- 64–84 rows in the upper jaw. Pointed in adult males, less so in females and juveniles[iii].



EGGCASE

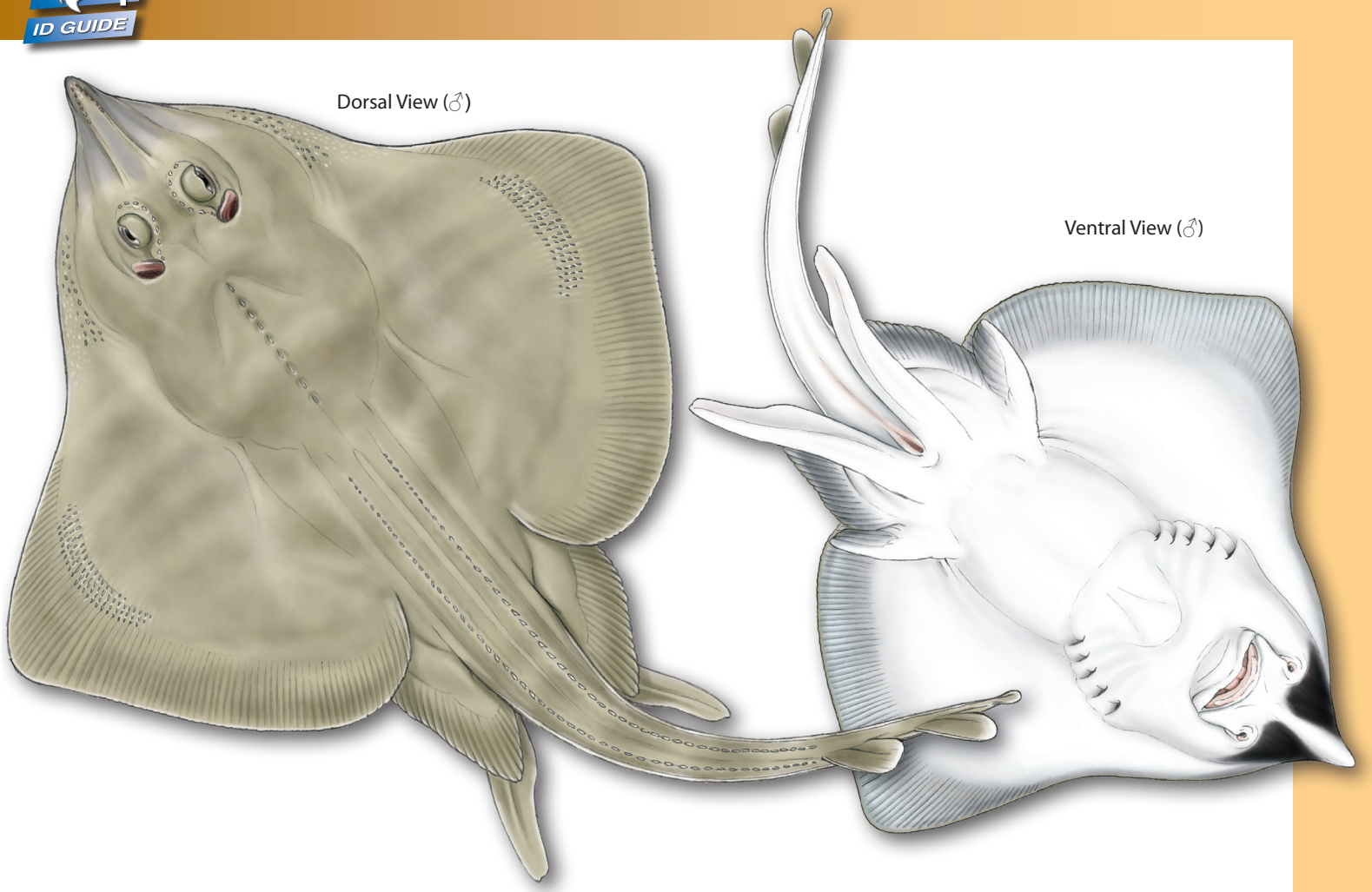
1 82–94mm in length (excluding horns).
2 46–53mm in width[i].

Similar eggcase to the Cuckoo Ray, *Leucoraja naevus*[iii].

(Eggcase shown actual size.)

Shagreen Ray

Leucoraja fullonica



COMMON NAMES

Shagreen Ray, Shagreen Skate, Fuller´s Ray, Fuller´s Shagreen Ray, Raie-Chardon, Rough Flapper, French Ray, Raie Chardon (Fr), Raya Cardadora (Es), Razza Spinosa (It), Kaardrog (Ne).

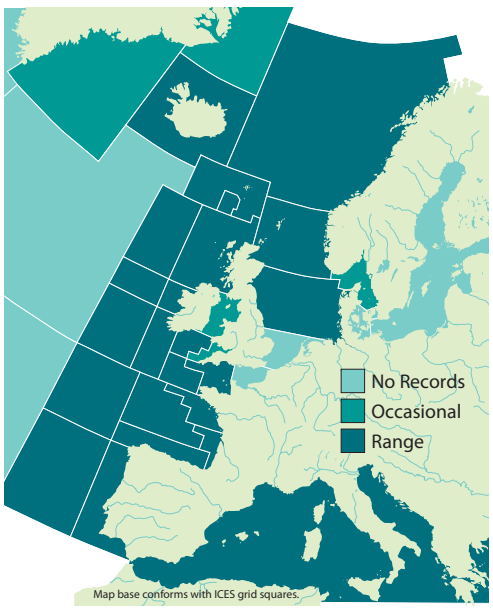
SYNONYMS

Raja fullonica (Linnaeus, 1758), *Raja chagrinea* (Shaw, 1804), *Betaraia fullonica* (Leigh-Sharpe, 1924).

APPEARANCE

- Maximum total length of 120cm.
- Pronounced snout.
- Upper surface plain ash grey.
- Some patterning of transverse dark bands.
- White lower surface, sometimes dark under snout.
- Rows of ~50 large thorns running down either side of midline.

DISTRIBUTION



Found in the east Atlantic from Murmansk in Russia to northern Morocco and out to Iceland. Also found in the western Mediterranean and out to the Islands of Madeira (Agustin, 2009). Within British waters it is most common in the Celtic Sea and off north-western Scotland (CEFAS, 2008).

The Shagreen Ray has a rhomboid-shaped disc with sharply angled outer corners and an obvious, pronounced snout (Agustin, 2009). The teeth are arranged into 58–68 rows in the upper jaw. These are pointed in both sexes (Clark, 1926).

The dorsal surface of the disc is entirely spiny with a row of 50 larger thorns on each side of the midline from the shoulder to the first dorsal fin. These rows are much less prominent on older individuals as they wear down over time. Around the inner margin of the eye there is a complete row of eight thorns and there are small thorns on the scapular. Generally there are between three and nine thorns running in a longitudinal row on the upper part of the head. There are no thorns between the close-set dorsal fins. The majority of the ventral surface of the disc is prickly, with the exception of the hind two-thirds of the pectoral fins (Whitehead *et al*., 1986).

The colouration in adults is generally plain ash grey although there may be variable patterningof transverse dark bands. The ventral surface is always white. Unusually for an elasmobranch, the largest recorded male is larger than the largest recorded female, being 120cm and 111cm respectively (Agustin, 2009).

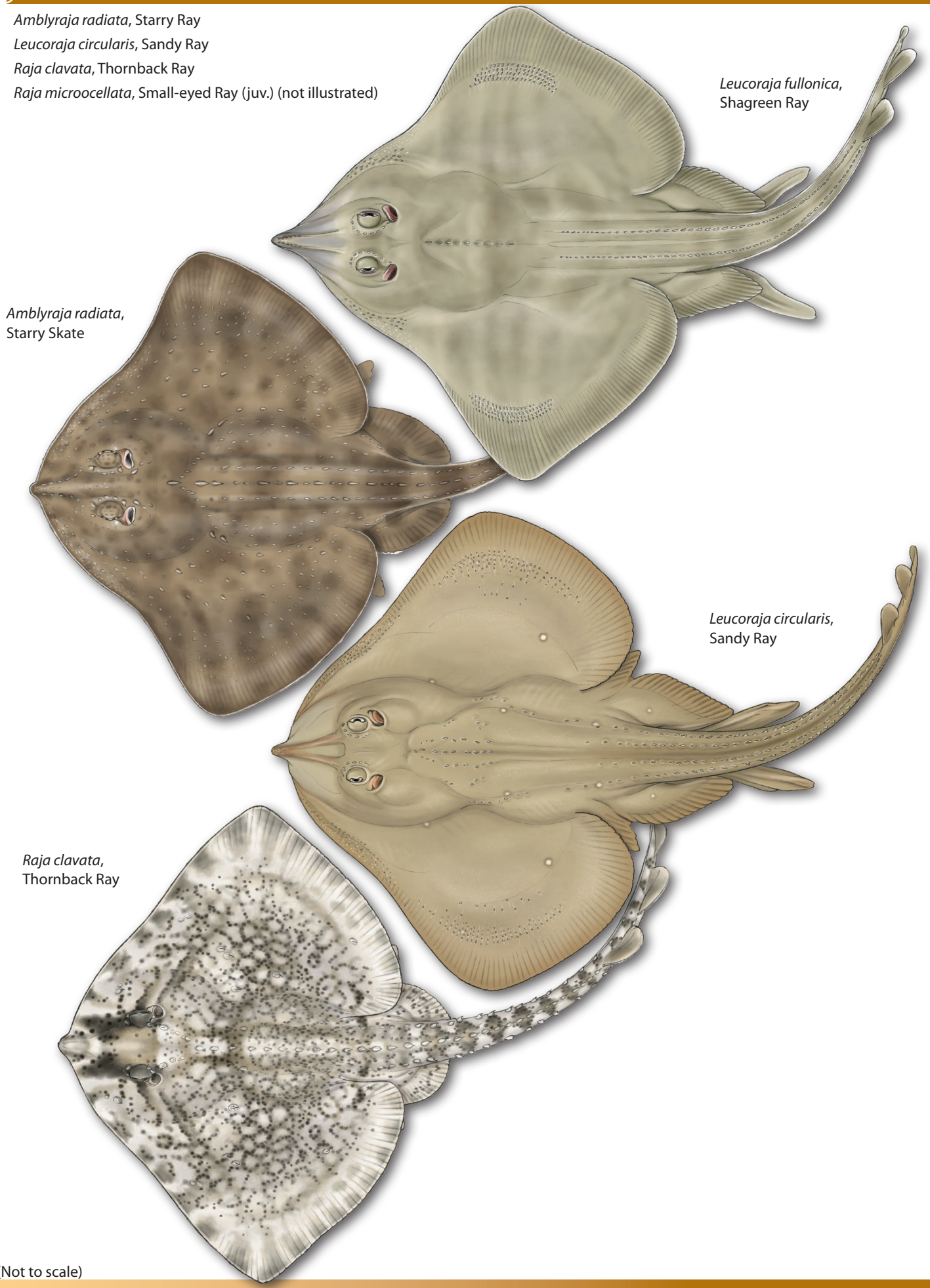
NE ATL MED

MED: DD NT RJF

Shagreen Ray

SIMILAR SPECIES

Amblyraja radiata, Starry Ray
Leucoraja circularis, Sandy Ray
Raja clavata, Thornback Ray
Raja microocellata, Small-eyed Ray (juv.) (not illustrated)



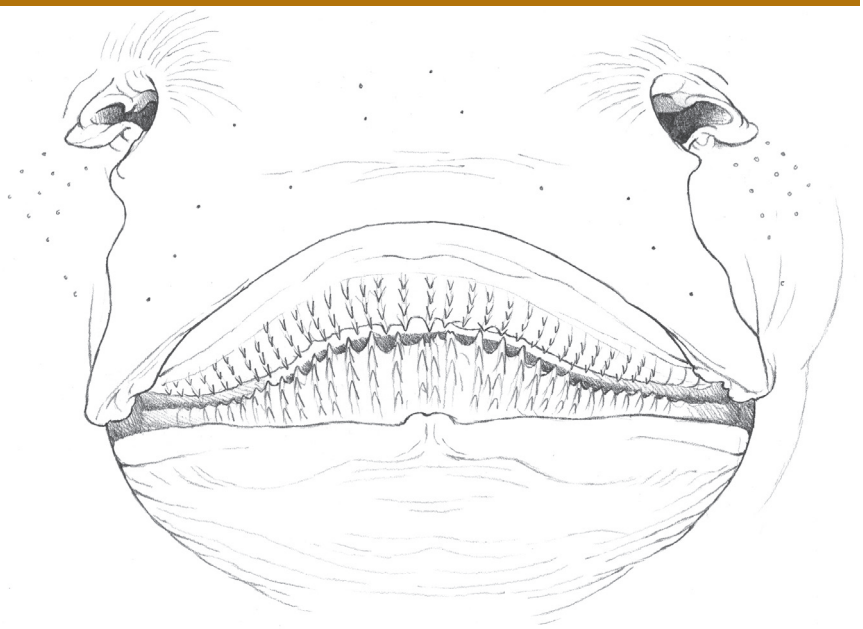
(Not to scale)

Shagreen Ray

Leucoraja fullonica

TEETH

There are 58 (young)–68 (adult) rows of teeth in the upper jaw. These are pointed in both sexes (Clark, 1926).



ECOLOGY & BIOLOGY

HABITAT

Very little is known of the ecology of the Shagreen Ray except that it is a demersal species found along continental shelves and inshore waters at depths of 30-550m (100–1,800ft) (Gibson *et al*., 2006). Records of catches from longline fisheries suggest that it has a preference for rough ground (Stehmann *et al*., 2000). It has been reported from Icelandic waters that a summer-time inshore migration occurs, more likely for feeding purposes then for spawning (Wheeler, 1969). Shagreen Rays are by no means abundant in inshore waters and are not common across any of their range (Ellis *et al*., 2004).

DIET

It feeds on a variety of bottom dwelling species but most probably prefers fish and crustaceans (Zidowitz *et al*., 2008). Mature individuals of both sexes have sharp teeth indicating no significant differences in diet between the genders (Stehmann *et al*., 2000).

REPRODUCTION

Very little is known of the reproduction of the Shagreen Ray except that it is oviparous and that the eggcases measure about 80mm long (excluding horns) by 50mm wide (Whitehead *et al*., 1986). When breeding and laying occurs, the development time of the embryos and the size of the young at birth has not been determined.

EGGCASE

1. ~80mm in length (excluding horns).
2. ~50mm in width (Whitehead *et al*., 1986).

Similar eggcase to the Small-eyed Ray, *Raja microocellata*.

Shagreen Ray

COMMERCIAL IMPORTANCE

There is no targeted fishery for the Shagreen Ray but it is caught and landed in multi-species trawls throughout its range and by longlines in the north (Gibson *et al*., 2006; Serena, 2005).

THREATS, CONSERVATION, LEGISLATION

As with most species of European skate and ray, the current trends and status of the population are difficult to determine. There is definite potential for overfishing and CEFAS surveys have not recorded the species in the North Sea since 1998. It is still recorded by Scottish surveys though in small numbers and deeper than expected, such as along the edge of the continental shelf at around 200m (655ft) (Gibson *et al*., 2006).

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
VIId	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, 2008). 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. The SFC's which implement these and the details are shown in the table below.

SFC	DW (cm)	Other
Cumbria	45	Cannot land wings less than 22cm in their maximum dimension
Kent & Essex	40	Cannot land wings less than 19cm in their maximum dimension
Southern	40	Cannot land wings less than 20cm in their maximum dimension
South Wales	45	Cannot land wings less than 22cm in their maximum dimension
States of Guernsey	36	

(Cumbria SFC, Unknown; Kent & Essex SFC, Unknown; South Wales SFC, Unknown; Southern SFC, 2006; NFFO, 2004)

However, such localised management strategies are unlikely to be significant for the conservation of regional populations (Fowler *et al*., 2005). Many recreational anglers return any sharks, skates and rays they catch alive and some angling clubs have begun tag and release programmes (Holt, 2005). As with most European skate and ray species, there is very little effective management in place to protect the Shagreen Ray.

IUCN RED LIST ASSESSMENT

Near Threatened (2008).

Data Deficient in Mediterranean.

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Row of strong thorns on midline.
- Row of thorns on head.
- Orbital thorns.

REFERENCES

AGUSTIN, L. Q. 2009. *Leucoraja fullonica*. Shagreen Ray. Fishbase. www.fishbase.org.

CEFAS. 2008. Shagreen Skate. www.cefas.co.uk.

CLARK, R. S. 1926. Rays and Skates: A Revision of the European Species. Fishery Board for Scotland. HM Stationary Office. Edinburgh, UK.

CUMBRIA SFC. Unknown. Minimum Fish Sizes. www.cumbriasfc.org.uk.

ELLIS, J. R., CRUZ-MARTÍNEZ, A., RACKHAM, B. D., ROGERS, S. I. 2004. The Distribution of Chondrichthyan Fishes around the British Isles and Implications for Conservation. *Journal of Northwest Atlantic Fishery Science*, Vol. 35: 195-213.

EUROPEAN UNION. 2009. Council Regulation (EC) No. 43/2009. *Official Journal of the European Union*, L22/1. www.mfa.gov.uk.

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. 2008. Demersal elasmobranches in the North Sea (Subarea IV), Skagerrak (Division IIIa), and eastern English Channel (Division VIId). ICES advice 2008, Book 6.

KENT & ESSEX SFC. Unknown. Minimum Fish Sizes. www.kentandessex-sfc.co.uk.

NFFO. 2004. Official Yearbook and Diary. Grimsby, UK.

SERENA, F. 2005. Field Identification Guide to the Sharks and Rays of the Mediterranean and Black Sea. FAO. Rome, Italy.

SOUTH WALES SFC. Unknown. Byelaws. www.swsfc.org.uk.

SOUTHERN SFC. 2006. Minimum Landings Sizes. www.southernsfc.org.uk.

STEHMANN, M., BÜRKEL, L. 2000. Field Key to Common skate Species (*Raja* spp.) in Northern EC Shelf Waters. Grafik Design Studio GmbH. Hamburg, Germany.

WHEELER, A. 1969. The Fishes of the British Isles and North-West Europe. Macmillan and Co Ltd. London, UK.

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.

ZIDOWITZ, H., GEORGE, M., FORDHAM, S., KULLANDER, S. O., PELCZARSKI, W. 2008. Sharks in the Baltic: Distribution, Use and Conservation of Cartilaginous Fishes in the Baltic Sea. The Shark Alliance. www.sharkalliance.org.

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.

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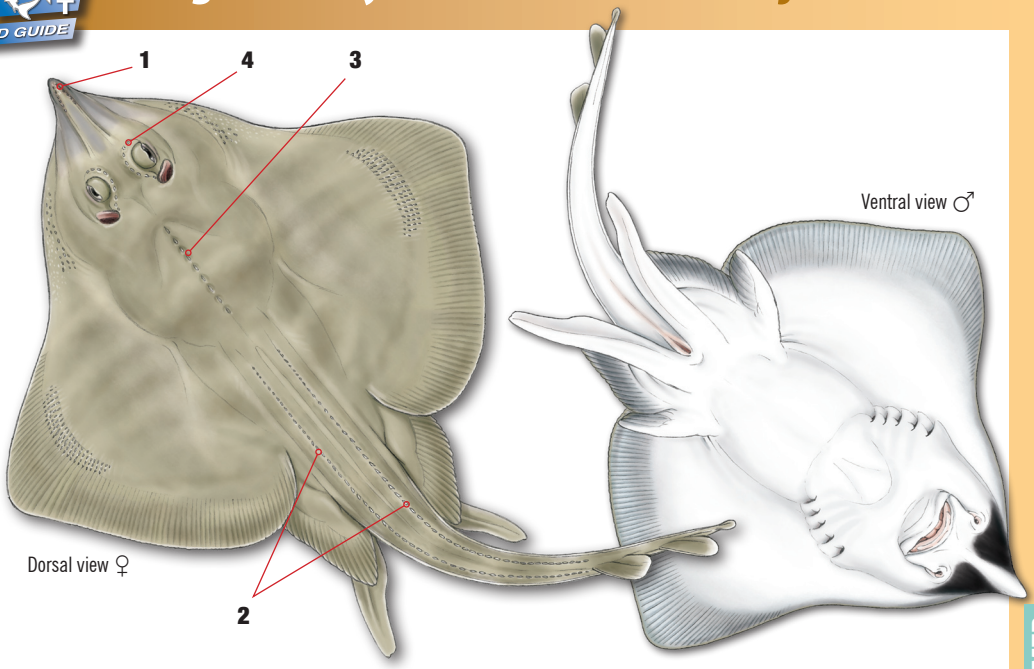
Shagreen Ray

Leucoraja fullonica

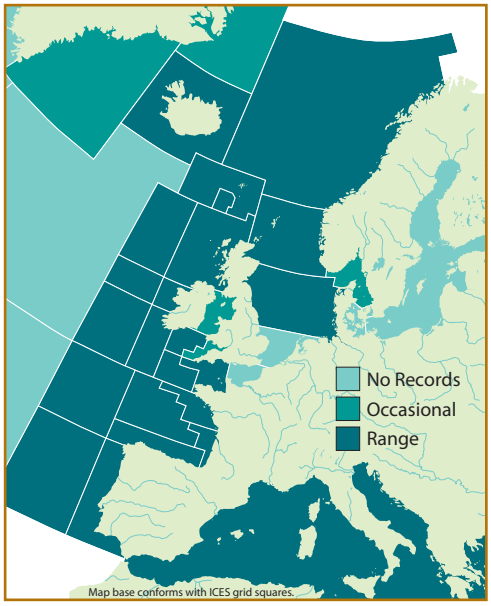


SCIENTIFIC NAME

Leucoraja fullonica (Linnaeus, 1758).

DISTRIBUTION

Northeast Atlantic from Russia and Iceland to Morocco and Madeira, including the Mediterranean Sea[i].



COMMON NAME

SHAGREEN RAY, Shagreen Skate, Fuller's Ray, Fuller's Shagreen Ray, Rough Flapper, French Ray, Raie Chardon (Fr), Raya Cardadora (Es), Razza Spinosa (It), Kaardrog (Ne).

IDENTIFICATION

1. Pronounced snout.
2. 2 rows of ~50 large thorns either side of the midline to first dorsal fin.
3. 3–9 thorns in longitudinal row on upper part of head.
4. 8 orbital thorns[vi].

COLOUR

- Adults solid ash grey/brown.
- Inconspicuous darker lines may run across body.
- Ventral surface white, some with dark snout[i].

BIOLOGY AND SIZE

- Max TL: 120cm[i].
- Prey on a variety of benthic species such as small invertebrates and bony fish[ii].
- Reported to move inshore during the spring in Icelandic waters, most likely for feeding purposes[v].

NE ATL MED

MED: DD

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RJF

Shagreen Ray

SIMILAR SPECIES

- *Amblyraja radiata,* **Starry Skate**
- *Leucoraja circularis,* **Sandy Ray**
- *Raja clavata,* **Thornback Ray**
- *Raja microocellata,* **Small-eyed Ray** (juv.)

HABITAT

- Demersal from 30–550m.
- Found along outer continental shelves and occasionally in inshore waters.
- Thought to have a preference for rough ground[iv].

CONSERVATION STATUS

- Biology and life history not well understood but high potential for overfishing[iv].
- Red List status: Near Threatened (2008). Data Deficient in Mediterranean.

COMMERCIAL IMPORTANCE

- No targeted fishery but it is taken in multispecies trawl fisheries across its range.
- Regularly taken by longline fisheries in the north of their range.
- When caught, they are often landed and sold for human consumption[iv].
- 2009 – Species currently subject to TAC in EU waters.

HANDLING AND THORN ARRANGEMENT

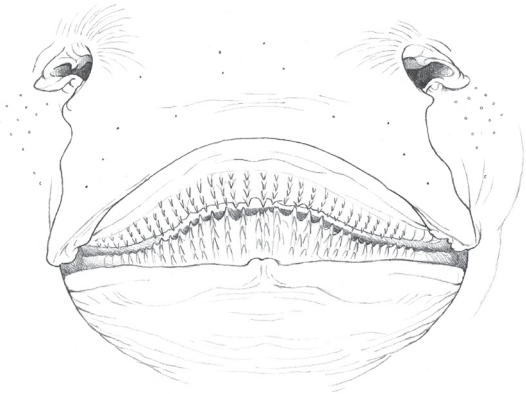
- Handle with care.
- Rows of strong thorns on midline.
- Row of thorns on head.
- Orbital thorns.

REFERENCES

i. Agustin, L. Q; 2009. Fishbase.
ii. Clark, R. S; 1926. Fishery Board for Scotland.
iii. FAO; Unknown.
iv. Gibson, C. *et al*; 2006. IUCN SSC Shark Specialist Group.
v Wheeler, A; 1969. Macmillan and Co. Ltd.
vi. Whitehead, P. J. P. *et al*; 1986. UNESCO.
vii. Zidowitz, H. *et al*; 2008. The Shark Alliance.

TEETH

- 58 (young)–68 (adult) rows in upper jaw. Pointed in both sexes[ii].



EGGCASE

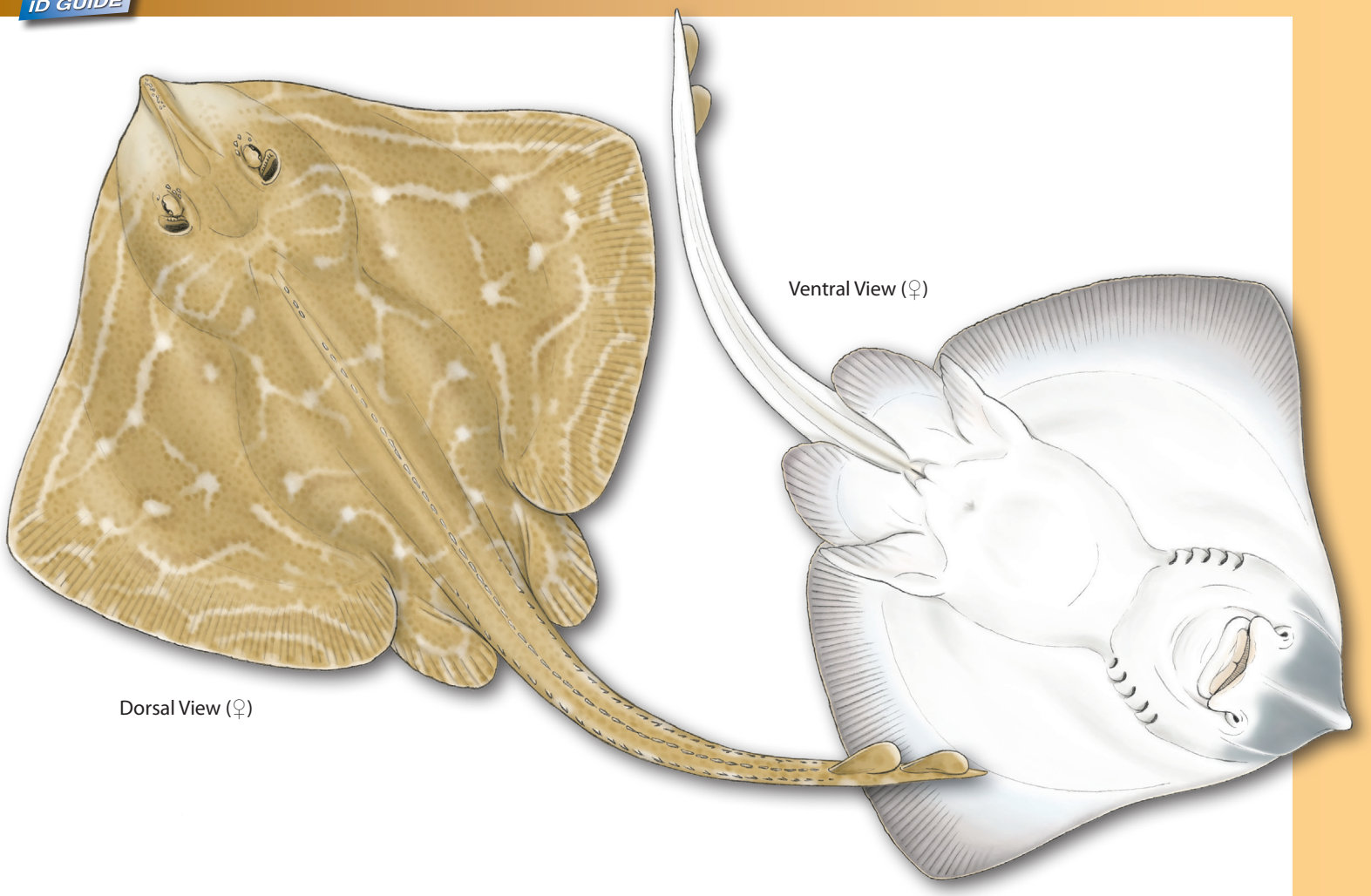
1 ~80mm in length (excluding horns).

2 ~ 50mm in width[iii].

Similar eggcase to the Sandy Ray, *Leucoraja circularis*, and the Cuckoo Ray, *Leucoraja naevus*..

Small-eyed Ray

Raja microocellata



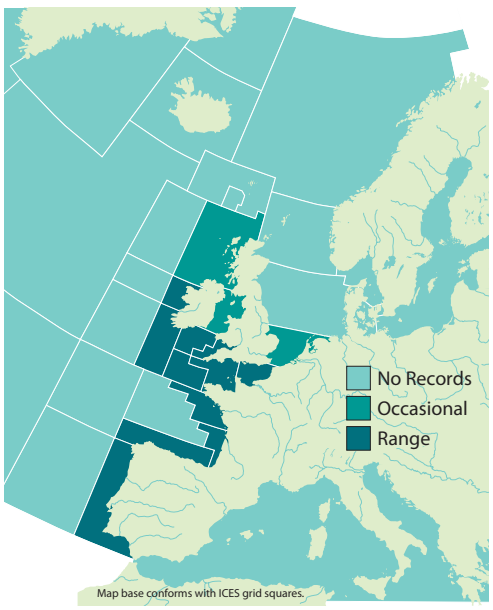
COMMON NAMES

Small-eyed Ray, Small-eyed Skate, Painted Ray, Sandy Ray, Owl Ray, Painted Skate, Raie Melee (Fr), Raya Colorada (Es), Kleinoogrog (Ne).

SYNONYMS

Betaraia microcellata (Leigh-Sharpe, 1924).

DISTRIBUTION



Found on continental shelves in the east Atlantic from southwest England and Ireland to Gibraltar and northern Morocco. Not found in the North Sea or the Mediterranean Sea (Gibson *et al.*, 2006). Small-eyed Rays are only abundant in a few sites such as the Bristol Channel in the UK and Bertheaume Bay in France (Ellis, 2000).

APPEARANCE

- Maximum total length ~90cm.
- Conspicuously small eyes.
- Upper surface sandy in colour.
- Lighter streaks, spots and blotches in regular patterns.
- Lower surface white.
- Tail slightly shorter than body.
- Row of ~50 large thorns along midline to first dorsal fin.

The Small-eyed Ray gets its name from its conspicuously small eyes, surrounded by small orbital thorns. The upper surface of the disc is predominantly spiny with the exception of the centre and rear third of the pectoral fins which are smoother. Along the midline from the head to the first dorsal fin there is a regular row of around 50 thorns. These can become worn in older specimens. There are sometimes thorns on the lower edges of the tail, particularly in older females. At the end of the tail there are sometimes thorns between the dorsal fins. The underside of small individuals is smooth but the centre and head of the disc become rougher as the skate matures (Whitehead *et al.*, 1986).

The dorsal surface of the disc is sandy in colour with lighter, almost white streaks which run parallel to the edges of the disc in a regular pattern. These are complimented with blotches and spots of the same colour. The edges of the pectoral fins in younger rays are translucent. The ventral surface of the disc is white. The Small-eyed Ray matures around 57-58cm in length and reaches a maximum size of 90cm in length (Fowler *et al.*, 2005).

NE ATL

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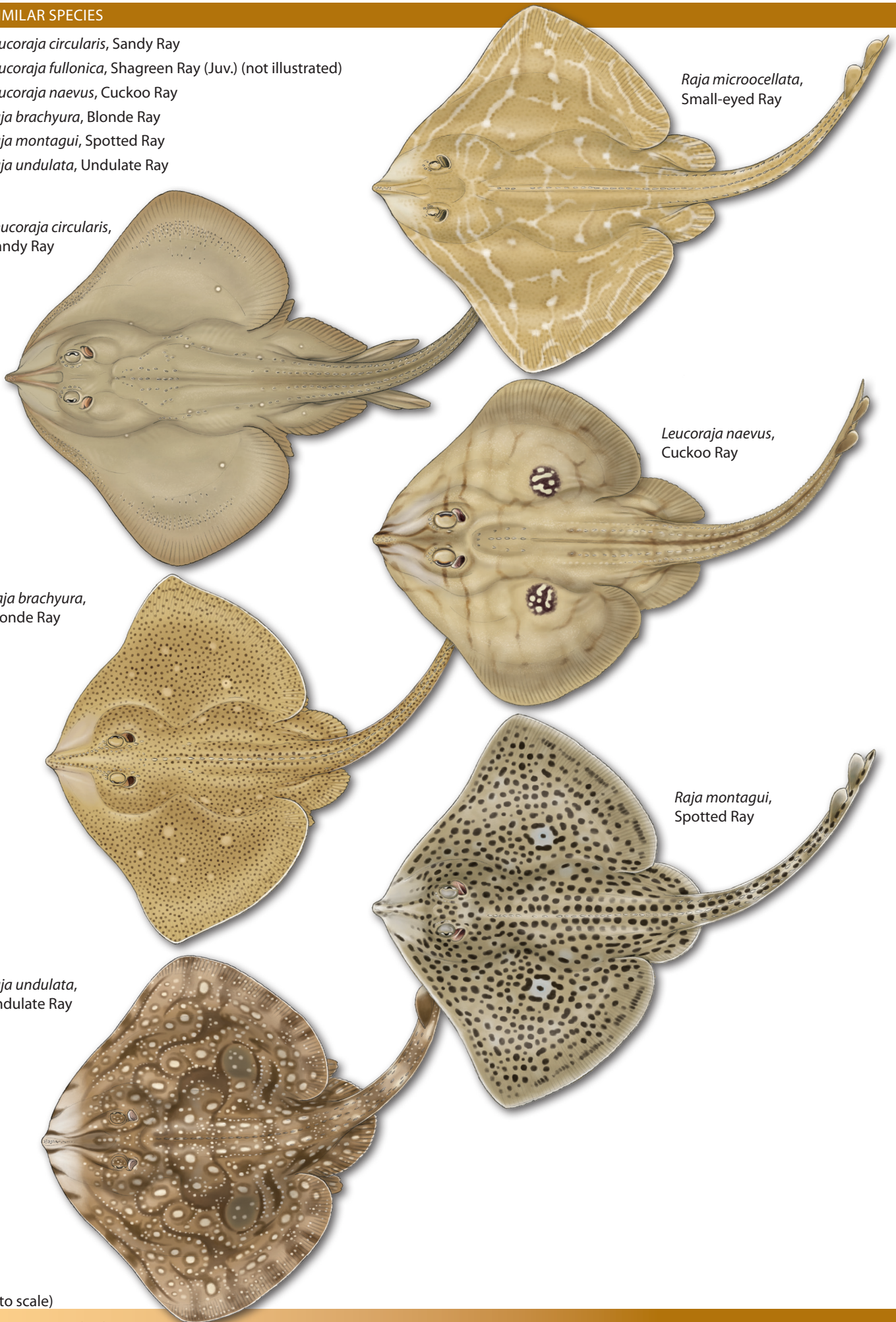
Small-eyed Ray

SIMILAR SPECIES

Leucoraja circularis, Sandy Ray
Leucoraja fullonica, Shagreen Ray (Juv.) (not illustrated)
Leucoraja naevus, Cuckoo Ray
Raja brachyura, Blonde Ray
Raja montagui, Spotted Ray
Raja undulata, Undulate Ray



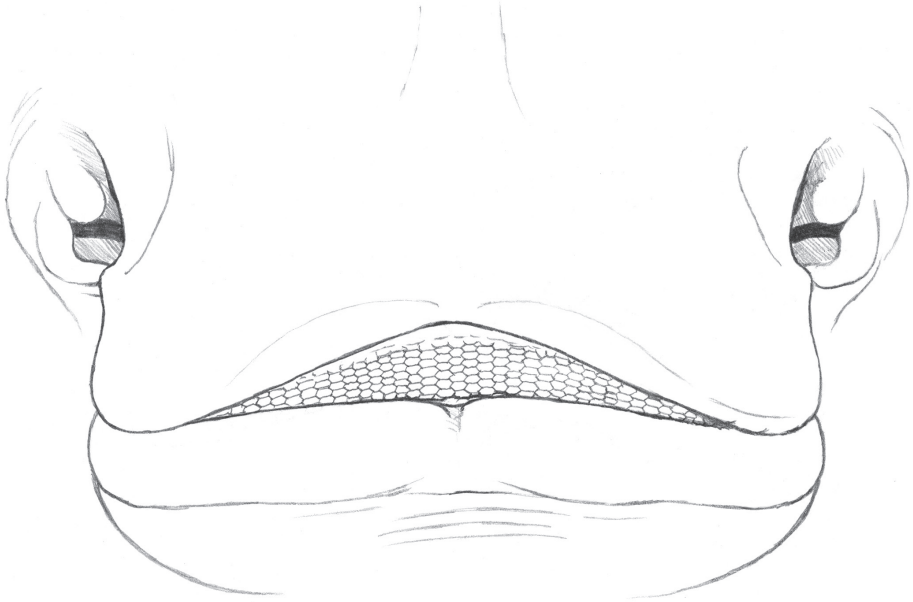
(Not to scale)

Small-eyed Ray

Raja microocellata

TEETH

The teeth are arranged into 44–52 rows in the upper jaw. They are obtuse, flat and close-set in females and juveniles. The middle series are sharper in males (Rousset, 1987).



ECOLOGY & BIOLOGY

HABITAT

The Small-eyed Ray inhabits inshore and coastal waters down to about 100m (330ft) (Whitehead *et al*., 1986). It is found on soft substrates favouring sandy bays and sand banks to which its camouflage is perfectly suited (Kaiser *et al*., 2004).

DIET

Very little is known about the diet of the Small-eyed Ray, though it most likely feeds on a variety of bottom dwelling invertebrates such as crustaceans and teleost fish (Whitehead *et al*., 1986). Studies from Bertheaume Bay, France have shown that it feeds almost exclusively on fast, teleost fish such as sandeels, particularly *Ammodytes tobianus* (Rousset, 1987). Ambush predators, once buried only their eyes and spiracles are visible.

REPRODUCTION

In the English Channel at least, the Small-eyed Ray breeds during the summer producing between 54 and 61 eggs a year. These measure from 55-100mm in length (excluding horns) and from 35-63mm in width (Whitehead *et al*., 1986; Binohlan, 2009). The embryos take about 7 months to develop and the newly hatched young measure less than 13cm long (Fowler *et al*., 2005)

EGGCASE

1. 55–100mm in length (excluding horns).
2. 35–63mm in width.
3. Long, filamentous horns (Shark Trust, 2008).

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

Small-eyed Ray

COMMERCIAL IMPORTANCE

The Small-eyed Ray is a minor component of commercial fisheries, particularly in southern England from the Bristol Channel. They are taken as bycatch in trawl and set-net fisheries throughout their small range (Gibson *et al*., 2006).

THREATS, CONSERVATION, LEGISLATION

Given its small geographical distribution and localised abundance, populations may be vulnerable to declines caused by over-fishing, habitat degradation and other anthropogenic disturbance (Ellis, J; 2000).

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.

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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
VIId	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 are 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, 2008). 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. The SFC's which implement these and the details are shown in the table below.

SFC	DW (cm)	Other
Cumbria	45	Cannot land wings less than 22cm in their maximum dimension
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South Wales	45	Cannot land wings less than 22cm in their maximum dimension
States of Guernsey	36	

(Cumbria SFC, Unknown; Kent & Essex SFC, Unknown; South Wales SFC, Unknown; Southern SFC, 2006; NFFO, 2004)

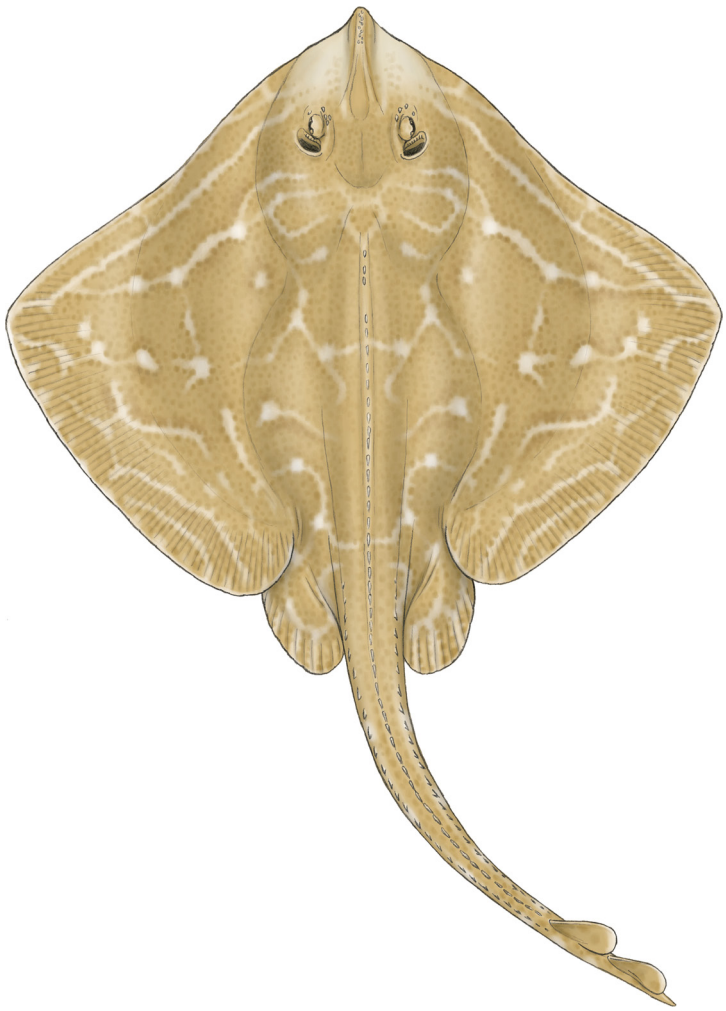
However, such localised management strategies are unlikely to be significant for the conservation of wider populations (Fowler *et al*., 2005). Many recreational anglers return any sharks, skates and rays they catch alive and some angling clubs have begun tag and release programmes (Holt, 2005). As with most European skate and ray species, there is very little effective management in place to protect the Small-eyed Ray.

IUCN RED LIST ASSESSMENT

Near Threatened (2000).

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Row of ~50 thorns on midline.
- Orbital thorns.



REFERENCES

BINOHLAN, C. B. 2009. *Raja microocellata*. Small-eyed Ray. Fishbase. www.fishbase.org.

CUMBRIA SFC. Unknown. Minimum Fish Sizes. www.cumbriasfc.org.uk.

ELLIS, J. 2000. *Raja microocellata*. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. www.iucnredlist.org.

EUROPEAN UNION. 2009. Council Regulation (EC) No. 43/2009. *Official Journal of the European Union*, L22/1. www.mfa.gov.uk.

FOWLER, S. L., CAVANAGH, R. D., CAMHI, M., BURGESS, G. H., CAILIET, 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.

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. 2008. Demersal elasmobranchs in the North Sea (Sub-area IV), Skagerrak (Division IIIa), and eastern English Channel (Division VIId). ICES advice 2008, Book 6.

KAISER, M. J., BERGMANN, M., HINZ, M., GALANIDI, M., SHUCKSMITH, R., REES, E. I. S., DARBYSHIRE, T., RAMSAY, K. 2004. Demersal Fish and Epifauna Associated with Sandbank Habitats. *Estuarine, Coastal and Shelf Science*, Vol. 60 (3), 445–456.

KENT & ESSEX SFC. Unknown. Minimum Fish Sizes. www.kentandessex-sfc.co.uk.

NFFO. 2004. Official Yearbook and Diary. Grimsby, UK.

ROUSSET, J. 1987. Régime alimentaire de *Raja microocellata*, Montagu, 1818 (Pisces, Rajidae) dans l'anse de Berheaume. *Cah. Biol. Mar.* 28 (2): 199-206.

SOUTH WALES SFC. Unknown. Byelaws. www.swsfc.org.uk.

SOUTHERN SFC. 2006. Minimum Landings Sizes. www.southernsfc.org.uk.

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.

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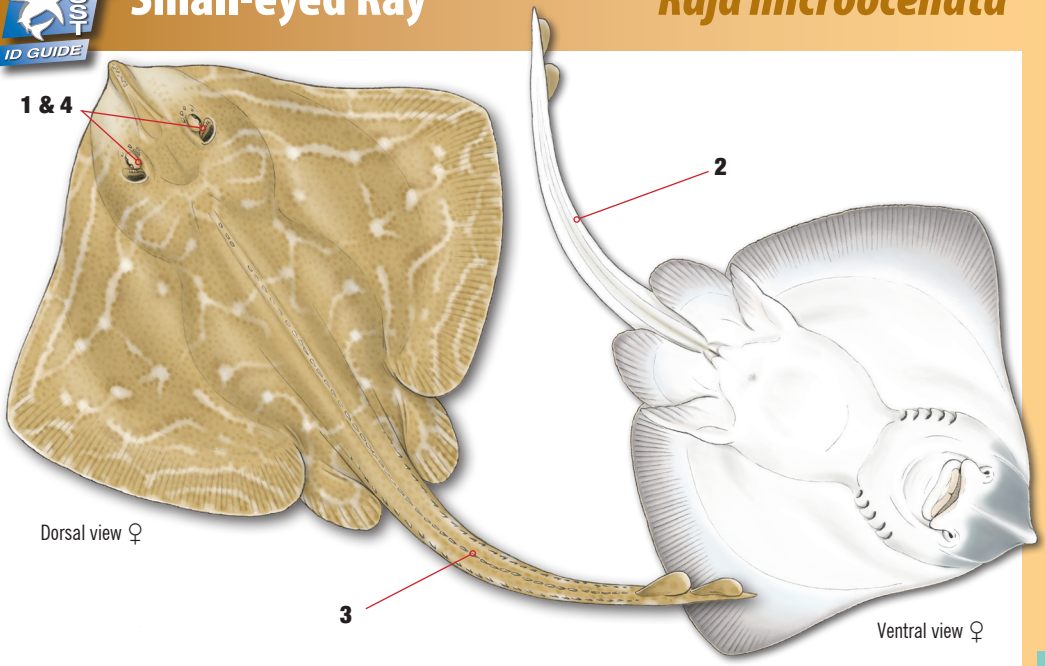
Small-eyed Ray

Raja microocellata

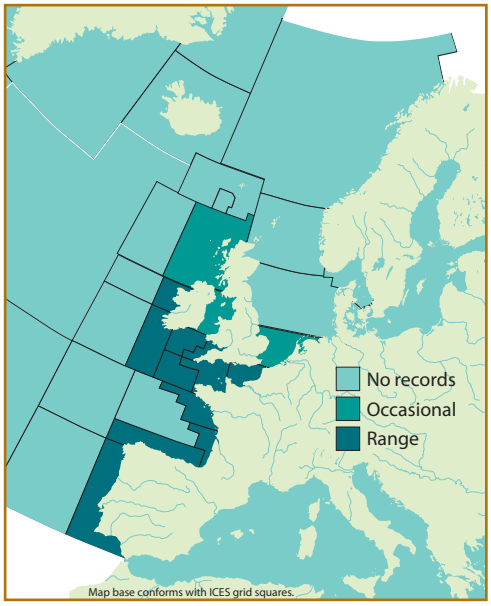


SCIENTIFIC NAME

Raja microocellata (Montagu, 1818).

DISTRIBUTION

Northeast Atlantic from the British Isles to Morocco. Absent from North Sea and Mediterranean[v]. Most common around the UK in the Bristol and English Channels[iii].



COMMON NAME

SMALL-EYED RAY, Small-Eyed Skate, Painted Ray, Sandy Ray, Owl Ray, Painted Skate, Raie Melee (Fr), Raya Colorada (Es), Kleinoogrog (Ne).

IDENTIFICATION

1 Conspicuously small eyes.

2 Tail slightly shorter than body.

3 Row of ~50 thorns along midline to first dorsal fin.

4 Orbital thorns present[ii].

COLOUR

- Dorsal surface pale sandy brown.
- Light bands running parallel to margins of disc.
- Lighter streaks, spots and blotches in regular patterns.
- Ventral surface white[iv].

BIOLOGY AND SIZE

- Born: ~13cm. Mature: ~58cm. Max TL: 90cm[iv].
- Juveniles feed on small crustaceans, adults feed almost exclusively on bony fish, particularly the Lesser Sandeel[vii].
- Once buried in sand only its eyes and spiracles are visible[ix].
- The eggcase incubation period is around 7 months[ix].

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Small-eyed Ray

SIMILAR SPECIES

- *Leucoraja circularis,* **Sandy Ray**
- *Leucoraja fullonica,* **Shagreen Ray** (juv.)
- *Leucoraja naevus,* **Cuckoo Ray**
- *Raja brachyura,* **Blonde Ray**
- *Raja montagui,* **Spotted Ray**
- *Raja undulata,* **Undulate Ray**

HABITAT

- Demersal to ~100m[ix].
- Encountered on soft substrates favouring sandy bays and sandbanks[vi].

CONSERVATION STATUS

- Potentially vulnerable to overexploitation due to restricted geographical distribution, localised abundance[iii] and typical skate reproductive strategy.
- Red List status: Near Threatened (2000).

COMMERCIAL IMPORTANCE

- Minor component of commercial fish catches. Taken as bycatch in mixed demersal fisheries[v].
- Landed where it is abundant such as the Bristol Channel, UK and Bertheaume Bay, France[iii].
- Popular game fish targeted by recreational anglers.
- 2009 – Species currently subject to TAC in EU waters.

HANDLING AND THORN ARRANGEMENT

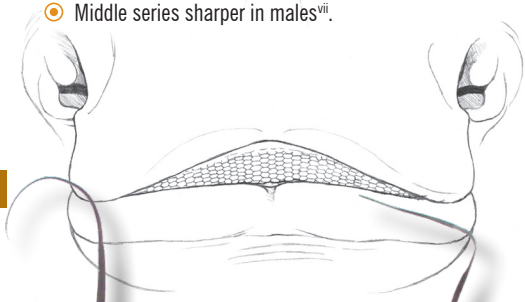
- Handle with care.
- Row of ~50 thorns on midline.
- Orbital thorns.

REFERENCES

i. Barnes, M. K. S; 2008. Marine Biological Association.
ii. Clark, R. S; 1926. Fishery Board for Scotland.
iii. Ellis, J. *et al*; 2000. IUCN Red List.
iv. Fowler, S. L. *et al*; 2005. IUCN SSC Shark Specialist Group.
v. Gibson, C *et al*; 2006. IUCN SSC Shark Specialist Group.
vi. Kaiser, M. J. *et al*; 2004. *Estuarine, Coastal and Shelf Science*, Vol. 60 (3), 445–456.
vii. Rousset, J; 1987. *Cah. Biol. Mar.* 28 (2): 199-206.
viii. Shark Trust; 2008.
ix. Whitehead, P. J. P. *et al*; 1986. UNESCO.

TEETH

- 44–52 rows in the upper jaw. Obtuse, flat and close-set in females and juveniles.
- Middle series sharper in males[vii].



EGGCASE

1. 55–99mm in length (excluding horns).
2. 35–60mm in width.
3. Long, filamentous horns and fibrous keels[viii].

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

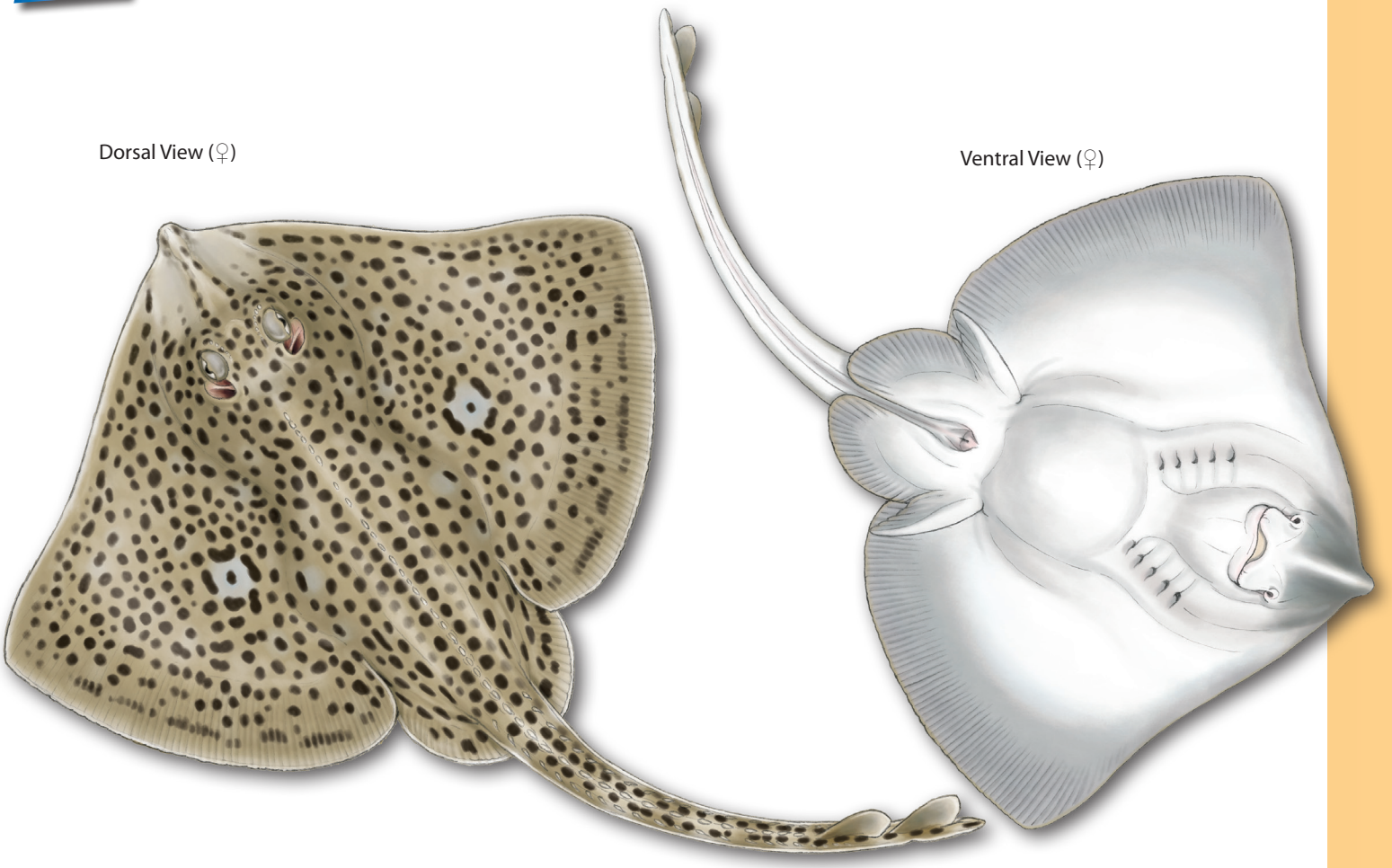
(Eggcase shown actual size.)

Spotted Ray

Raja montagui

Dorsal View (♀)

Ventral View (♀)



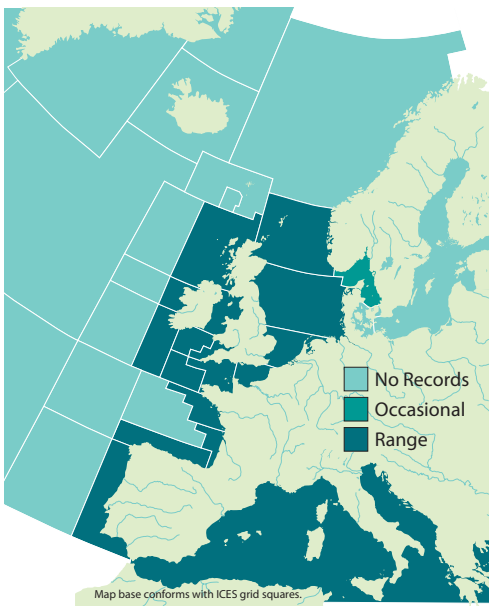
COMMON NAMES

Spotted Ray, Spotted Skate, Homelyn Ray, Spotted Homelyn Ray, Roker, Gefleckte Roche (De), Raie Douce (Fr), Razza Maculata (It), Raia Manchata (Pr), Raya Pintada (Es), Gevlekte Rog (Ne).

SYNONYMS

Raja maculata (Montagu, 1818), *Raja asterias* (non Delaroche) (Müller & Henle, 1841), *Raja maculata* (Günther, 1870), *Raja punctata* (non Risso) (Le Danois, 1913), *Betaraia maculata* (Leigh-Sharpe, 1924).

DISTRIBUTION



The Spotted Ray is widely distributed through the northeast Atlantic from northern Morocco to the western Baltic and the Shetland Isles, including the Mediterranean Sea (Ellis *et al*., 2007). It is widespread around most coasts of Britain and Ireland but appears to be rare off the east coast (Picton and Morrow, 2005).

APPEARANCE

- Maximum total length 80cm.
- Upper surface yellow to pale brown.
- Many dark spots which **do not** extend to edge of pectoral fins.
- Often primitive eye-spot on each pectoral fin.
- Lower surface white.
- Row of 20–50 thorns along midline to first dorsal fin.

The Spotted Ray has a diamond shaped body with broad pectoral fins, the corners of which almost form right angles (Whitehead *et al*., 1986). Along the leading edge of the disc, females have a gently undulating shape. In males, this undulation is more pronounced (Stehmann and Bürkel, 2000). Young animals have small spines along the leading edge of the disc which extend to just behind the eyes. The orbital thorns are separate (Whitehead *et al*., 1986). The rest of the disc is free of spines except for a central row of 20-50 thorns to the first dorsal fin (Luna, 2009). Juveniles also have rows of spines along the sides of the tail (Picton and Morrow, 2005). Pairs of irregular thorns may develop on the tail with age and there are 1–2 thorns between the dorsal fins (Stehmann and Bürkel, 2000).

The dorsal surface of the disc varies in colour from yellow to pale brown with numerous small dark spots which give the ray its name. The dark spots **do not** reach the very edge of the pectoral fins leaving a clear margin. This is the feature which most clearly distinguishes the Spotted Ray from the Blonde Ray, *Raja brachyura*. On each pectoral fin these dark spots often concentrate to create a primitive eyespot. The ventral surface of the disc is white (Whitehead *et al*., 1986).

The maximum reported size of a Spotted Ray is 80cm total length and 50cm disc width but they generally do not grow larger than 60cm total length (Stehmann and Bürkel, 2000; Ellis *et al*., 2007).

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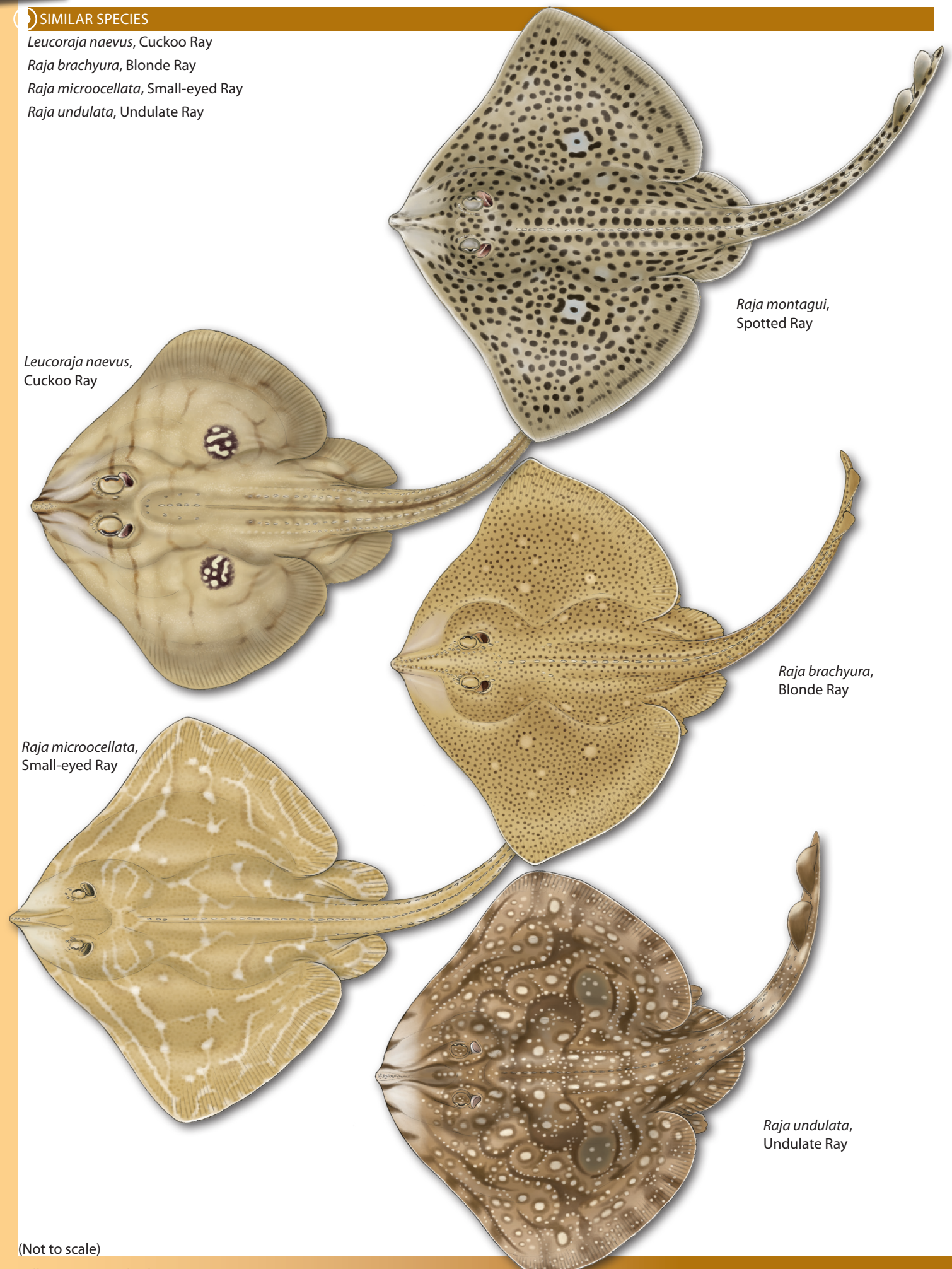
Spotted Ray

SIMILAR SPECIES

Leucoraja naevus, Cuckoo Ray
Raja brachyura, Blonde Ray
Raja microocellata, Small-eyed Ray
Raja undulata, Undulate Ray



Raja montagui, Spotted Ray

Leucoraja naevus, Cuckoo Ray

Raja brachyura, Blonde Ray

Raja microocellata, Small-eyed Ray

Raja undulata, Undulate Ray

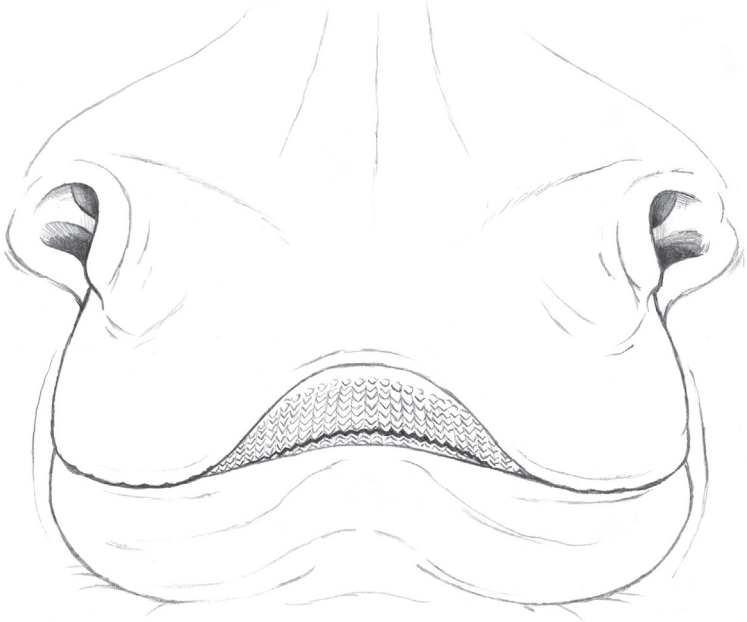
(Not to scale)

Spotted Ray

Raja montagui

TEETH

In the upper jaw there are 38-60 rows of teeth. The teeth of mature males are sharper than the teeth of mature females and juveniles (Stehmann and Bürkel, 2000).



ECOLOGY & BIOLOGY

HABITAT

The Spotted Ray is found from shallow waters to a depth of 530m (1,740ft) with the majority of the population found from100-500m (330-1,640ft). It lives on soft substrates, preferring sand, in coastal seas and on continental shelves (Ellis *et al*., 2007).

DIET

Juveniles feed almost exclusively on small crustaceans such as amphipods, isopods and natantids (Ellis *et al*., 2007). Adults prey on larger crustaceans and teleost fish (Picton and Morrow, 2005).

REPRODUCTION

The Spotted Ray reaches sexual maturity at a total length of around 55cm, which corresponds to an age of 3.5-4 years of age (Gallagher *et al*., 2005). Female Spotted Rays lay their eggcases in shallow water in early summer from April through to July (Whitehead *et al*., 1986). They lay a maximum of 60 to 70 eggs per year with an average number of approximately 24 to 60 (Ellis *et al*., 2007. Luna, 2009). The eggcases measure 53-78mm long (excluding horns) and 30-50mm wide. The embryos take 5-6 months to develop (Shark Trust, 2008).

EGGCASE

1. 53-78mm in length (excluding horns).
2. 30-50mm in width.
3. No keels (Shark Trust, 2008).

Similar eggcase to the Cuckoo Ray, *Leucoraja naevus.*

Spotted Ray

COMMERCIAL IMPORTANCE

The Spotted Ray is not targeted due to its small size but larger individuals are regularly landed and sold in multispecies trawl fisheries across their range (Ellis *et al*., 2007). Often confused with the Blonde Ray, *Raja brachyura*, on fishmarkets.

THREATS, CONSERVATION, LEGISLATION

As one of the smallest rays in the northeast Atlantic and Mediterranean, the Spotted Ray is not targeted by commercial fisheries. However, it is landed and sold across its range when taken as bycatch in multispecies trawls and forms a commercially important part of some localised fisheries (Ellis *et al*., 2007).

Its small body size and relatively high recruitment rate means that it is less vulnerable to fishing pressure than many of the larger European skate. In the intensively trawled Mediterranean, no significant population drop has been observed despite minor fluctuations (Ellis *et al*., 2007).

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
VIId	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 Rajid populations in EU waters (ICES, 2008). 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. The SFC's which implement these and the details are shown in the table below.

SFC	DW (cm)	Other
Cumbria	45	Cannot land wings less than 22cm in their maximum dimension
Kent & Essex	40	Cannot land wings less than 19cm in their maximum dimension
Southern	40	Cannot land wings less than 20cm in their maximum dimension
South Wales	45	Cannot land wings less than 22cm in their maximum dimension
States of Guernsey	36	

(Cumbria SFC, Unknown; Kent & Essex SFC, Unknown; South Wales SFC, Unknown; Southern SFC, 2006; NFFO, 2004)

THREATS, CONSERVATION, LEGISLATION

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

IUCN RED LIST ASSESSMENT

Least Concern (2007).

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Row of strong midline thorns.

REFERENCES

CUMBRIA SFC, Unknown. Minimum Fish Sizes. www.cumbriasfc.org.uk.

ELLIS, J., UNGARO, N., SERENA, F., DULVY, N., TINTI, F., BERTOZZI, M., PASOLINI, P., MANCUSI, C., NOARBARTOLO DI SCIARA, G. 2007. *Raja montagui*. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. www.iucnredlist.org.

EUROPEAN UNION. 2009. Council Regulation (EC) No. 43/2009. *Official Journal of the European Union*, L22/1. www.mfa.gov.uk.

GALLAGHER, M. J., NOLAN, C. P., JEAL, F. 2005. Age, Growth and Maturity of Commercial Ray Species from the Irish Sea. *J. Northw. Atl. Fish. Sci.* Vol. 35: 47-66.

HOLT, D. 2005 Common Skate Tagging Programme. The Scottish Angling Homepage: www.catchalot.co.uk.

ICES. 2008. Demersal elasmobranchs in the North Sea (Subarea IV), Skagerrak (Division IIIa), and eastern English Channel (Division VIId). ICES advice 2008, Book 6.

KENT & ESSEX SFC. Unknown. Minimum Fish Sizes. www.kentandessex-sfc.co.uk.

LUNA, S. M. 2009. Spotted Ray: *Raja montagui*. Fishbase. www.fishbase.org.

NFFO. 2004. Official Yearbook and Diary. Grimsby, UK.

PICTON, B. E., MORROW, C. C. 2005. *Raja montagui* (Fowler, 1920) Spotted Ray. Encyclopaedia of Marine Life of Britain and Ireland.

SHARK TRUST. 2008. Identify Your Eggcase. www.eggcase.org.

SOUTH WALES SFC. Unknown. Byelaws. www.swsfc.org.uk.

SOUTHERN SFC. 2006. Minimum Landings Sizes. www.southernsfc.org.uk.

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.

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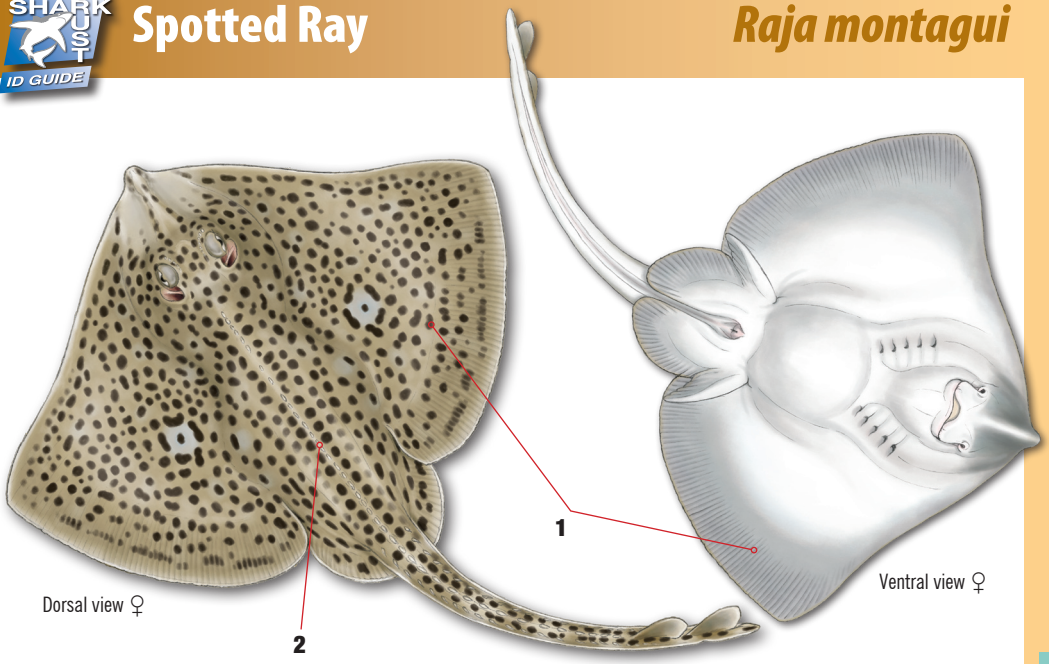
Spotted Ray

Raja montagui

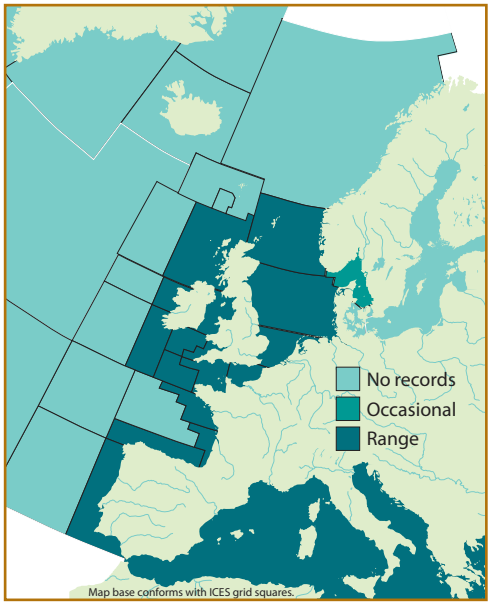


SCIENTIFIC NAME

Raja montagui (Fowler, 1910).

DISTRIBUTION

Northeast Atlantic from the Shetland Isles to Morocco including the Mediterranean and western Baltic[iii].



COMMON NAME

SPOTTED RAY, Homelyn Ray, Spotted Homelyn Ray, Spotted Skate, Roker, Gefleckte Roche (De), Raie Douce (Fr), Razza Maculata (It), Raia Manchata (Pr), Raya Pintada (Es), Gevlekte Rog (Ne).

IDENTIFICATION

1. Broad pectoral fins almost form right angles[vii].
2. Row of 20–50 thorns along midline.
3. Skin smooth.

COLOUR

- Dorsal surface pale brown to yellow.
- Numerous dark spots which **do not** extend to very edge of disc.
- Rosette 'eye-spots' often present.
- Ventral surface white with darker margins[vii].

BIOLOGY AND SIZE

- Born: 8–10cm[i]. Max TL: 80cm[iii].
- Juveniles prey on small crustaceans, adults on larger crustaceans and teleost fish[v].
- Nursery areas occur in coastal waters[vii].

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Spotted Ray

SIMILAR SPECIES

- *Leucoraja naevus,* **Cuckoo Ray**
- *Raja brachyura,* **Blonde Ray**
- *Raja microocellata,* **Small-eyed Ray**
- *Raja undulata,* **Undulate Ray**

HABITAT

- Demersal from coastal waters to 530m[iii].
- Commonly encountered 30–150m[iii].
- Prefer soft substrates such as sand in coastal seas and on the continental shelf[iii].

CONSERVATION STATUS

- Less vulnerable to fishing pressure than many other rays due to small body size and relatively high fecundity[iii].
- Red List status: Least Concern (2007).

COMMERCIAL IMPORTANCE

- No target fishery exists due to its small size but it is commonly taken in multispecies trawl fisheries across its range.
- Larger individuals are landed and sold for human consumption[iii]. Often confused with and marketed as Blonde Ray, *Raja brachyura*.
- 2009 – Species currently subject to TAC in EU waters.

HANDLING AND THORN ARRANGEMENT

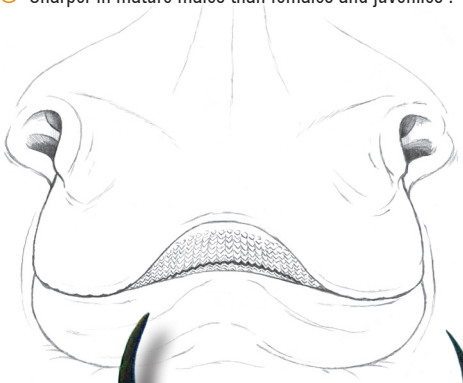
- Handle with care.
- Row of strong thorns on midline.

REFERENCES

i. Clark, R. S; 1922. *JMBA* Vol. XI (4): 577 – 643.
ii. Clark, R. S, 1926. Fishery Board for Scotland.
iii. Ellis, J. *et al*; 2007. IUCN Red List.
iv. Luna, S. M; 2009. Fishbase.
v. Picton, B. E. *et al*; 2005.
vi. Shark Trust; 2008.
vii. Whitehead, P. J. P. *et al*; 1986. UNESCO.

TEETH

- Arranged into 38–60 rows in the upper jaw.
- Sharper in mature males than females and juveniles[ii].



EGGCASE

1 53–78mm in length (excluding horns).

2 30–50mm in width.

3 No keels[vi].

Similar eggcase to the Cuckoo Ray, *Leucoraja naevus,* and Undulate Ray, *Raja undulata*.

(Eggcase shown actual size.)

Starry Skate

Amblyraja radiata

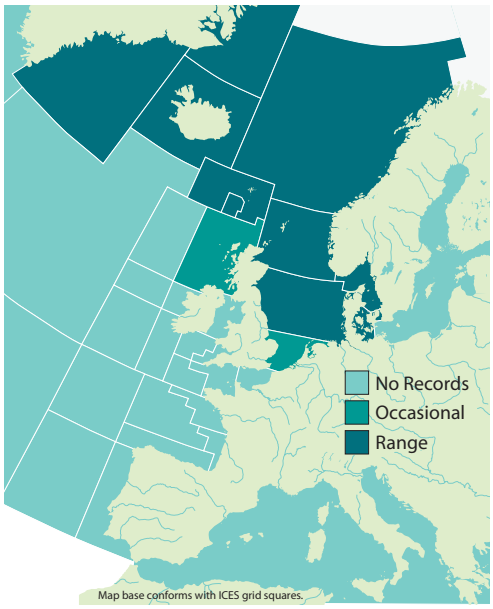
COMMON NAMES

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), *Deltaraia 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 seperate (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

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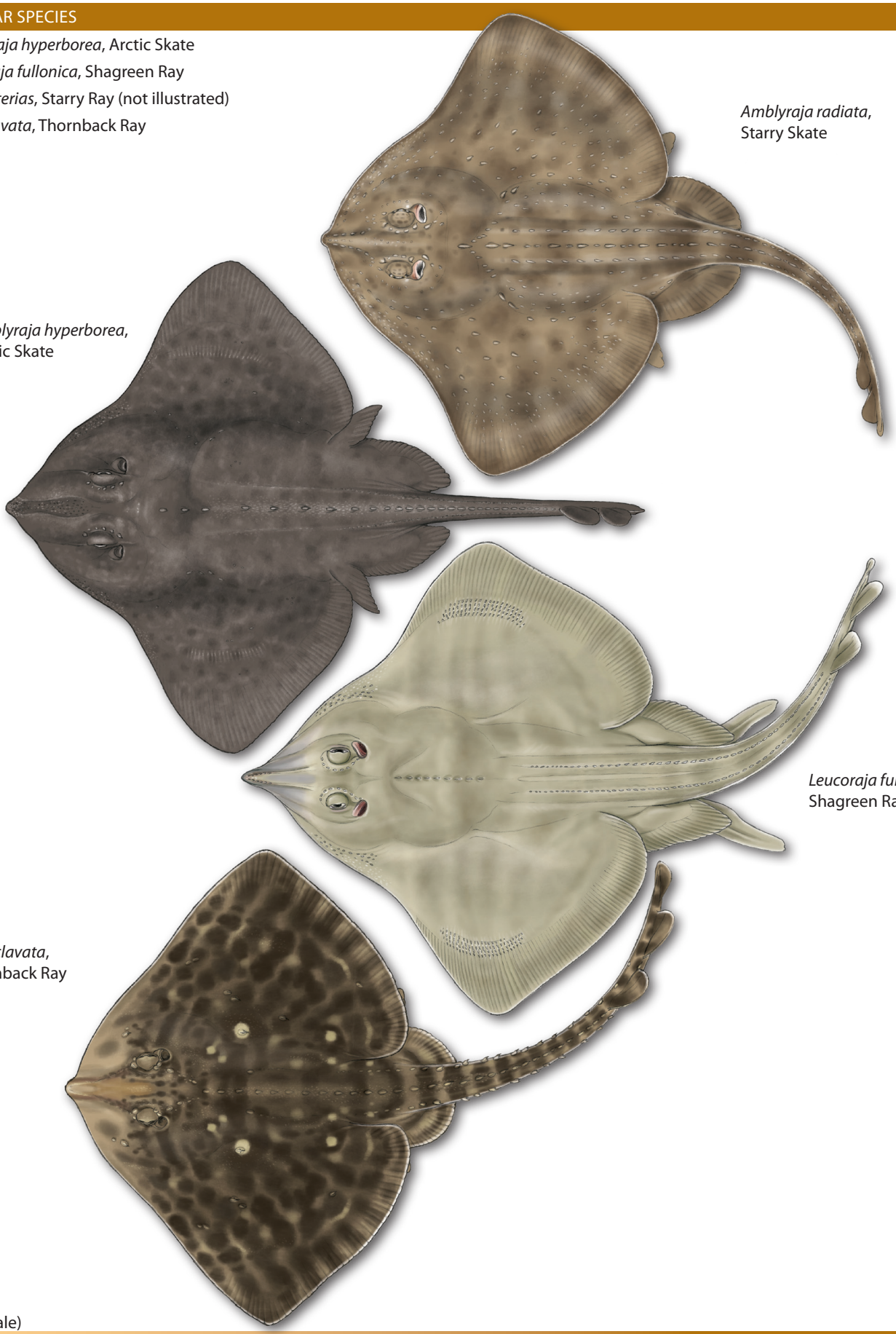
Starry Skate

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



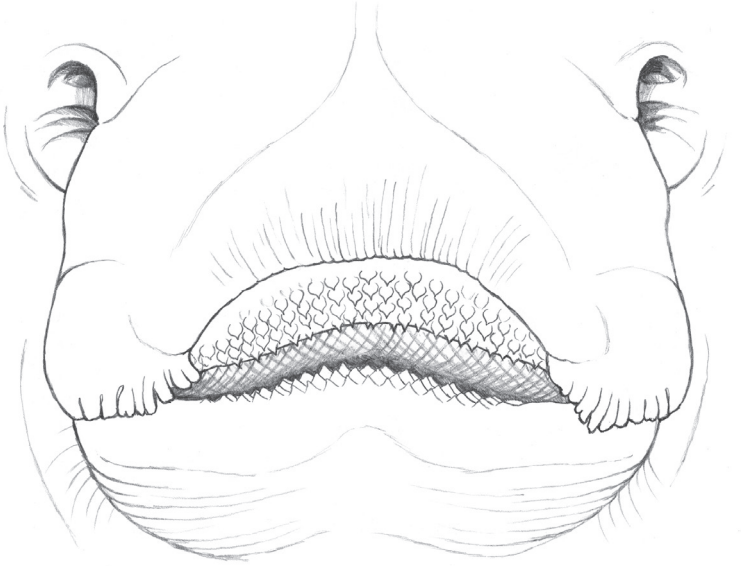
(Not to scale)

Starry Skate

Amblyraja radiata

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*.

Starry Skate

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).

IUCN RED LIST ASSESSMENT

Vulnerable (2008).

Least Concern in northeast Atlantic.

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
VIId	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).

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.

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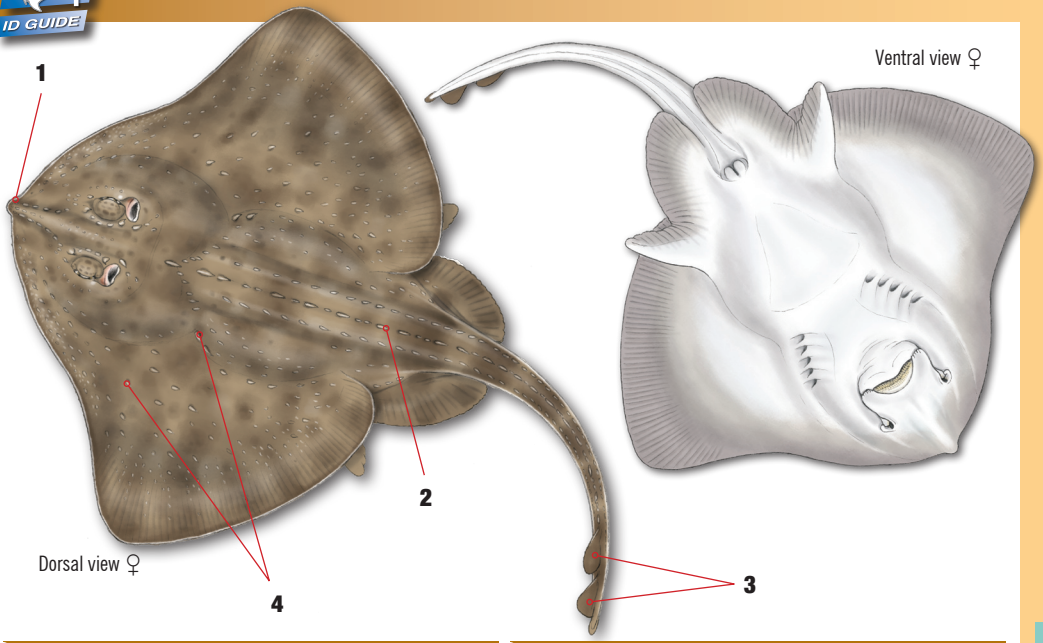
Starry Skate

Amblyraja radiata

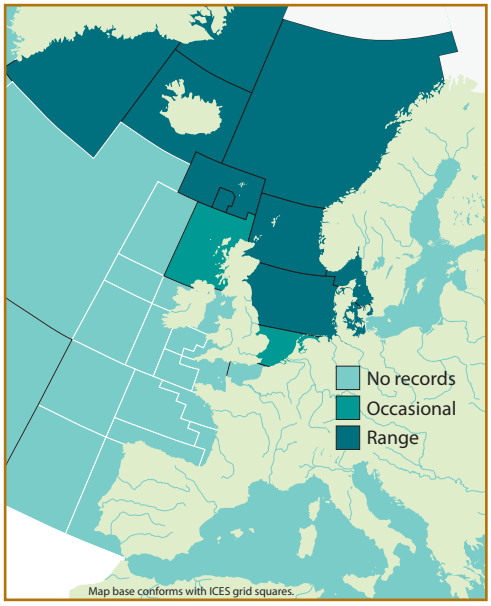


SCIENTIFIC NAME

Amblyraja radiata (Donovan, 1808).

DISTRIBUTION

East Atlantic; southern North Sea to Iceland and northern Norway. West Atlantic; South Carolina to Canada and Greenland[ii].



COMMON NAME

STARRY SKATE, Starry Ray, Thorny Skate, Maiden Ray, Miller Ray, Sternroche (De), Raia Repregada (Pr), Raie Radiee (Fr), Raya Radiante (Es), Sterrog (Ne).

IDENTIFICATION

1 Short, blunt snout.

2 Row of 13–17 large thorns on midline.

3 Dorsal fins close with bases sometimes joined.

4 Large thorns with star pattern on base[v].

COLOUR

- Dorsal surface plain or with dark spots[v].
- Regularly a single white spot beside each eye.
- Ventral surface white, sometimes with dark blotches[ii].

BIOLOGY AND SIZE

- Born: ~10cm. Mature: 40–45cm. Max TL: 60cm. Larger in northwest Atlantic[iii].
- Feed mainly on crabs, shrimps and fish (e.g. sandeels and gadoids)[ii].
- 2–88 developing eggs have been found in captured specimens[ii].

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Starry Skate

SIMILAR SPECIES

- *Amblyraja hyperborea,* **Arctic Skate**
- *Leucoraja fullonica,* **Shagreen Ray**
- *Raja asterias,* **Starry Ray**
- *Raja clavata,* **Thornback Ray**

HABITAT

- Demersal from 18–1,400m[i] and temperatures of -1.3°C to 14°C[ii].
- Found over a variety of substrates such as sand, gravel and soft mud[ii].
- In deeper water and higher latitudes it grows larger and matures later, particularly in the northwest Atlantic[ii].

CONSERVATION STATUS

- Most abundant skate in the North Sea where it may have filled the niche left by declining populations of larger skate[i]. Recent reports of declines in western Atlantic populations[ii].
- Red List status: Vulnerable (2008).
  Least Concern in northeast Atlantic.

COMMERCIAL IMPORTANCE

- Of little commercial importance in the Northeast Atlantic due to their small size and are regular discards from multispecies trawl fisheries[ii].
- Commercially important species in the Northwest Atlantic[ii].
- 2009 – Species currently subject to TAC in EU waters.

HANDLING AND THORN ARRANGEMENT

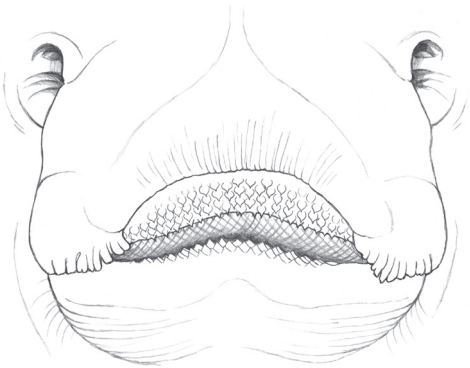
- Handle with care.
- Row of strong thorns on midline.
- Large thorns on shoulder.

REFERENCES

i. Gibson, C. *et al*; 2006. IUCN SSC Shark Specialist Group.
ii. Kittle, K; Unknown. Florida Museum of Natural History.
iii. Packer, D. B. *et al*; 2003. NOAA.
iv. Shark Trust; 2008.
v. Whitehead, P. J. P. *et al*; 1986. UNESCO.

TEETH

- 36–46 rows of teeth with round bases on each jaw plate.
- Sharper in mature males than in females and juveniles[ii].



EGGCASE

1 Small, 34–89mm in length (excluding horns).

2 23–68mm in width.

3 Striated texture and obvious keels[ii].

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

(Eggcase shown actual size.)

Thornback Ray

Raja clavata

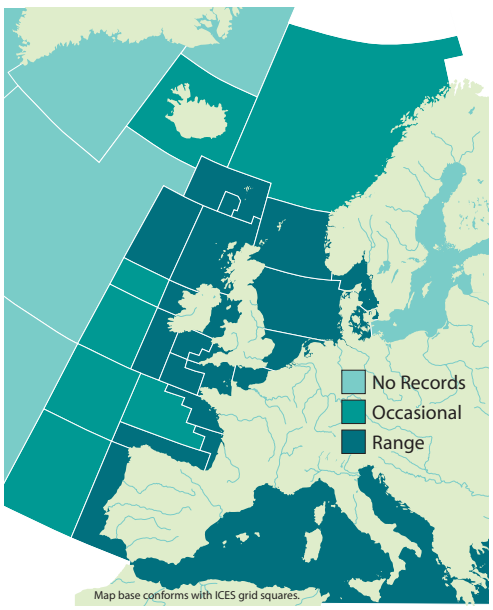
COMMON NAMES

Thornback Ray, Thornback Skate, Roker, Maiden Ray, Hardback, Stekelrog (Ne), Raie Bouclée (Fr), Nagelroche (De), Raya de Clavos (Es), Piggskate (No).

SYNONYMS

Raja rubus (Schneider, 1801), *Raja aspera* (Risso, 1810), *Raja pontica* (Pallas, 1811), *Dasybatis clavata* (Bonaparte, 1840), *Raja capensis* (Müller & Henle, 1841), *Raja rizacanthus* (Regan, 1906), *Betaraia clavata* (Leigh-Sharpe, 1924).

DISTRIBUTION



The Thornback Ray occurs throughout the northeast Atlantic from the Faroe Islands, Iceland and Norway as far south as Namibia. Found in the Mediterranean, Black and western Baltic Seas. It occurs off western Africa and has recently been reported from the southwest Indian Ocean (Fowler, S. L. *et al*; 2005).

APPEARANCE

- Long thorny tail with distinctive light/dark banding.
- Upper surface light brown to grey.
- Variable patterning including dark and yellow patches with dark spots.
- Lower surface creamy white with greyish margin.
- Scattered buckler thorns on upper surface.
- Row of 30–50 thorns along midline to first dorsal fin.

Thornback Ray males can grow to a maximum of 105cm total length while females can reach 130cm, although most are less than 85cm (Whitehead *et al*., 1986; Lockley, 2009). The teeth of both species are arranged into 36–44 rows in the upper jaw, pointed in males, blunter in females and juveniles (Clark, 1926). Both sexes are reported to have a maximum longevity of 12 years (Fowler *et al*., 2005).

The tail is long and solid with rows of thorns running longitudinally. The dorsal surface is covered in spines in both sexes while large females may have spiny ventral surfaces (Whitehead *et al*., 1986). In sexually mature fish some of the spines are thickened with button-like bases, known as bucklers. These are particularly well developed on the tail and back of sexually mature females and may be present ventrally. There are 0–2 thorns between the dorsal fins (Whitehead *et al*., 1986).

Colouration varies from light brown to grey with darker blotches and numerous yellow patches. The yellow patches are sometimes surrounded by small dark spots. The underside is creamy-white with a greyish margin (Whitehead *et al*., 1986). When young they can be pale with large, dark eyespots on each wing. The Thornback Ray shows an incredibly large variation in colouring making identification of the species potentially challenging.

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Thornback Ray

SIMILAR SPECIES

Amblyraja radiata, Starry Skate

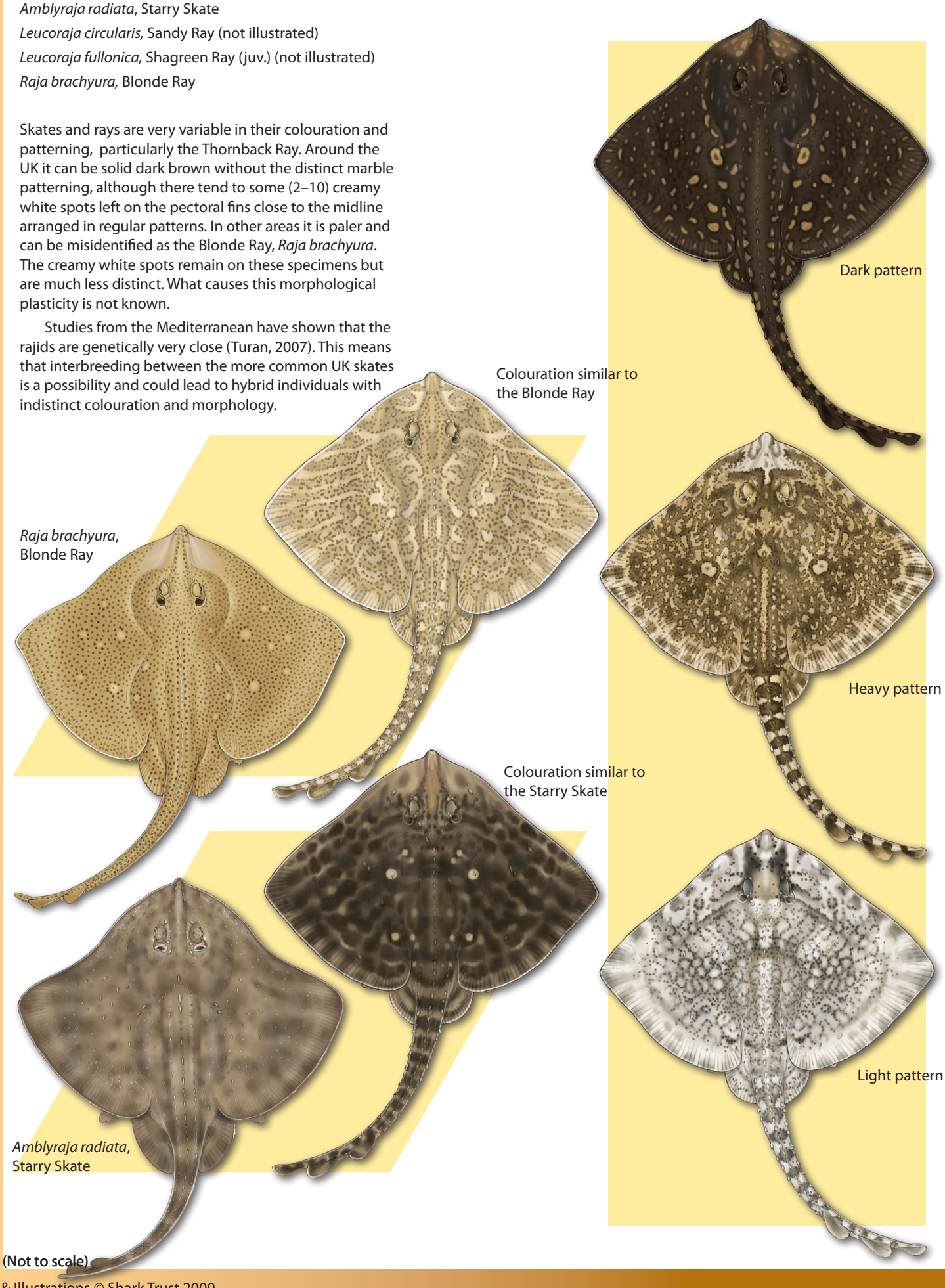
Leucoraja circularis, Sandy Ray (not illustrated)

Leucoraja fullonica, Shagreen Ray (juv.) (not illustrated)

Raja brachyura, Blonde Ray

Skates and rays are very variable in their colouration and patterning, particularly the Thornback Ray. Around the UK it can be solid dark brown without the distinct marble patterning, although there tend to some (2–10) creamy white spots left on the pectoral fins close to the midline arranged in regular patterns. In other areas it is paler and can be misidentified as the Blonde Ray, *Raja brachyura*. The creamy white spots remain on these specimens but are much less distinct. What causes this morphological plasticity is not known.

Studies from the Mediterranean have shown that the rajids are genetically very close (Turan, 2007). This means that interbreeding between the more common UK skates is a possibility and could lead to hybrid individuals with indistinct colouration and morphology.



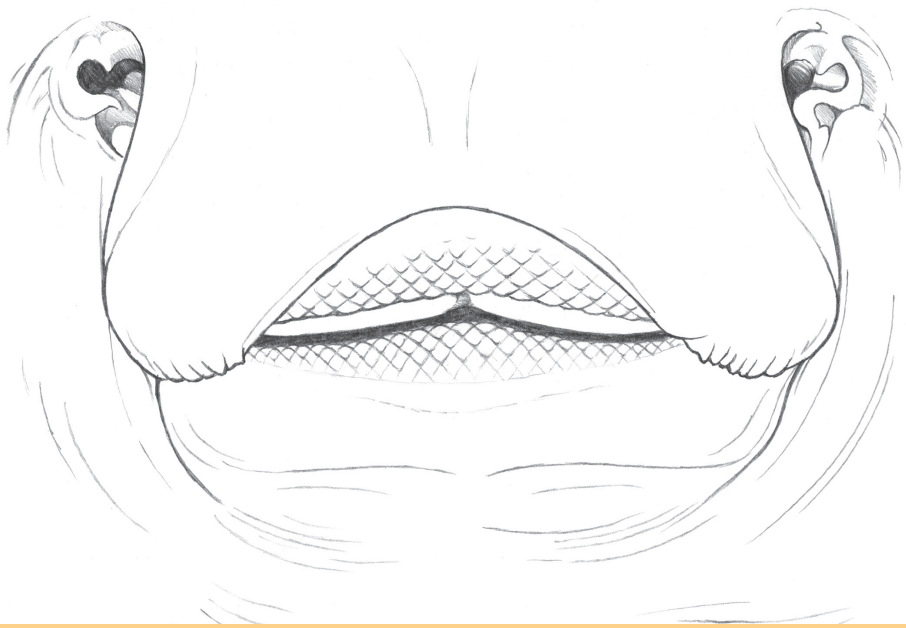
(Not to scale)

Thornback Ray

Raja clavata

TEETH

- Less than 60 rows of unicuspid teeth, usually 36–44 in the upper jaw (Clark, 1926).
- Teeth in males are sharper than in females and juveniles (Ellis and Walker, 2000).



ECOLOGY & BIOLOGY

HABITAT

The Thornback Ray inhabits continental shelf and upper slope waters from 10-300m (32-985ft) through most of their range, with the notable exception of the eastern Ionian Sea where it occurs from 300-577m (985–1,890ft) (Whitehead *et al*., 1986). Around European coastal waters, it is most abundant from 10-60m (32–195ft). Studies from the Thames Estuary have shown the Thornback Ray to be seasonally migratory, spending the winter in deeper water and coming into shallower areas in the late spring and summer to breed (Hunter *et al*., 2005). Juveniles are more likely to found in shallower, coastal waters than adults as these areas are used as nursery grounds.

Studies from the Bristol Channel have shown the Thornback Ray, along with the Small Spotted Catshark, *Scyliorhinus canicula*, to be one of the most important elasmobranch species to the local ecology. As with most demersal skate, it prefers soft substrates such as mud and sand but can also be found over gravel and rock beds. It is known to segregate by sex and size (Fishmap, Unknown).

DIET

Juvenile Thornback Rays feed predominantly on small crustaceans such as amphipods, mysids and crangonid shrimps. Adults feed on larger crustaceans and small teleost fish such as sandeels, small gadoids and dragonets (Fishmap, Unknown). Studies from the Black Sea have shown sprat, horse mackerel and anchovy are the most important prey items (Orlov, 1998).

REPRODUCTION

The Thornback Ray spends the winter in deeper water, migrating inshore to breed and lay eggs during the spring and summer (Hunter *et al*., 2005). It is estimated to reach 50% maturity at a total length of around 77cm (8.8 years) for females and 68cm (7.1 years) for males in the North Sea (Fishmap, Unknown). However, Ryland and Ajayi (1984) reported that they first spawn earlier than this in their 5th year (Ryland and Ajayi, 1984). Other estimates from the northeast Atlantic have given size at maturity figures of 60-81cm total length for males and 60-101cm total length for females (Fishmap, Unknown).

REPRODUCTION CONTINUED

Spawning occurs in inshore waters between February and September (Fowler *et al*., 2005), with a peak in May and June and a theoretical maximum of 140-160 eggs being laid a year. The actual number of eggs laid is likely to be closer to 48-74 (Fishmap, Unknown). Incubation generally lasts for 4-6 months depending on the water temperature and the young hatch measuring 11-13cm total length (Fishmap, Unknown).

EGGCASE

1. 50–90mm in length (excluding horns).
2. Almost as wide as long.
3. Obvious keels and fields (Shark Trust, 2008).

Similar eggcase to the Blonde Ray, *Raja brachyura*.

Thornback Ray

COMMERCIAL IMPORTANCE

The Thornback Ray is one of the most commonly found rajids in European fish markets and constitutes an extremely important part of many commercial fisheries. It is targeted by gillnet and longline fisheries and is taken as bycatch in otter and beam trawls. It is also caught using set nets and is targeted by recreational anglers (Fishmap, Unknown).

THREATS, CONSERVATION, LEGISLATION

The Thornback Ray is a commercially important species targeted across much of its range and taken as bycatch in multispecies fisheries. Although little species-specific landing data is available, market sampling indicates that the Thornback Ray is one of the most frequently landed skates across Europe. Between 1982 and 1994 in France, Thornback Rays accounted for more than 30% of all skates and rays landed (Fishmap, Unknown). However, there has been some evidence of declining catch rates in northwest Europe and concern that the current intensity of fishing pressure is not sustainable. Due to its large size and thorns, the Thornback Ray rarely escapes from trawl nets. Coupled with the slow growth rates and low fecundity common to all skates, they could be extremely vulnerable to over fishing (Ellis and Walker, 2000).

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	2009
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IIIa	N/A	N/A	N/A	N/A	N/A	68	68
VIa-b, VIIa-c, VIIe-k	N/A	N/A	N/A	N/A	N/A	15,748	15,748
VIId	N/A	N/A	N/A	N/A	N/A	1,044	1,044
VIII, IX	N/A	N/A	N/A	N/A	N/A	6,423	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, 2008). This may be difficult however due to the variability in colouration exhibited by the Thornback Ray (Ellis and Walker, 2000). 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. The SFC's which implement these and the details are shown in the table below.

SFC	DW (cm)	Other
Cumbria	45	Cannot land wings less than 22cm in their maximum dimension
Kent & Essex	40	Cannot land wings less than 19cm in their maximum dimension
Southern	40	Cannot land wings less than 20cm in their maximum dimension
South Wales	45	Cannot land wings less than 22cm in their maximum dimension
States of Guernsey	36	

THREATS, CONSERVATION, LEGISLATION

(Cumbria SFC, Unknown, Kent & Essex SFC, Unknown; South Wales SFC, Unknown; Southern SFC, 2006; NFFO, 2004)

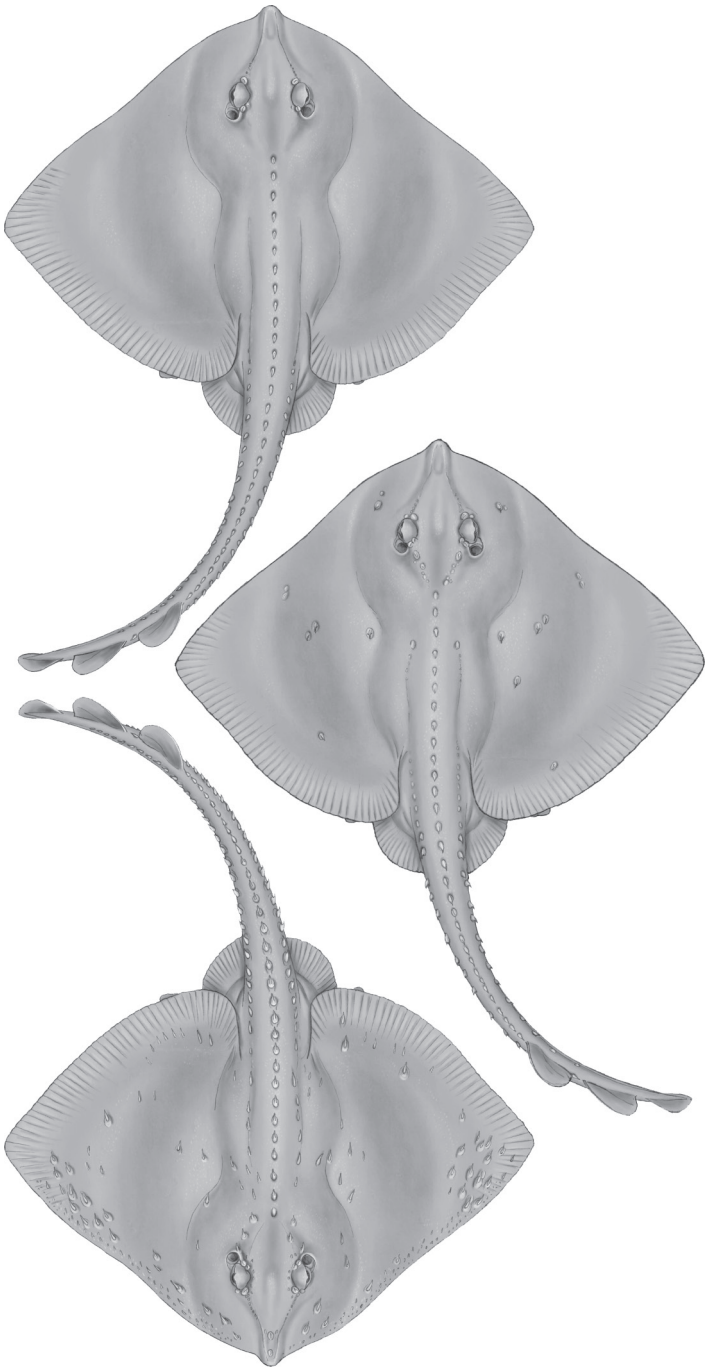
However, such localised management strategies are unlikely to be significant for the conservation of wider populations (Fowler *et al*., 2005). There is currently no effective European management plan for the Thornback Ray.

IUCN RED LIST ASSESSMENT

Near Threatened (2000).

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large, scattered buckler thorns on dorsal surface and occasionally ventral surface.
- Strong midline of thorns.
- Lateral pairs of thorns sometimes present on tail.



REFERENCES

CLARK, R. S. 1926. Rays and Skates. A Revision of the European Species. Fishery Board for Scotland. HM Stationary Office. Edinburgh, UK.

CUMBRIA SFC. 2008. Minimum Fish Sizes. www.cumbriasfc.org.uk.

ELLIS, J., WALKER, P. 2000. *Raja clavata*. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. www.iucnredlist.org.

EUROPEAN UNION. 2009. Council Regulation (EC) No. 43/2009. *Official Journal of the European Union*, L22/1. www.mfa.gov.uk.

FISHMAP. Unknown. Thornback Ray. *Raja clavata*. ICES. Copenhagen, Denmark. www.ices.dk.

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.

HUNTER, E., BUCKLEY, A. A., STEWART, C., METCALFE, J. D. 2005. Migratory Behaviour of the Thornback Ray, *Raja clavata*, in the Southern North Sea. *Journal of the Marine Biological Association of the United Kingdom*, 85: 1,095–1,105.

ICES. 2008. Demersal elasmobranchs in the North Sea (Sub-area IV), Skagerrak (Division IIIa), and eastern English Channel (Division VIId). ICES advice 2008, Book 6.

KENT & ESSEX SFC. 2008. Minimum Fish Sizes. www.kentandessex-sfc.co.uk.

Lockley, P. 2009. Monster Ray Captured. *Fishing News*, 12/06/2009.

NFFO. 2004. Official Yearbook and Diary. Grimsby, UK.

ORLOV, A. M. 1998. The Diets and Feeding Habits of Some Deep-Water Benthic Skates (Rajidae) in the Pacific Waters off the Northern Kuril Islands and Southeastern Kamchatka. *Alaska Fishery Research Bulletin*, 5 (1): 1–17.

RYLAND, J. S., AJAYI, T. O. 1984. Growth and population dynamics of three *Raja* species (Batoidei) in Carmarthen Bay, British Isles. *J. Const. int. Explor. Mer*, 41: 111-120.

SOUTH WALES SFC. 2008. Skate and Ray – Minimum Size. www.swsfc.org.uk.

SOUTHERN SFC. 2008. Minimum Landing Size. www.southernsfc.org.uk.

TURAN, C. 2007. Molecular Systematic Analyses of Mediterranean Skates (Rajiformes). Fisheries Genetics Laboratory, Faculty of Fisheries, Mustafa Kemal University, Iskenderun, Hatay, Turkey.

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.

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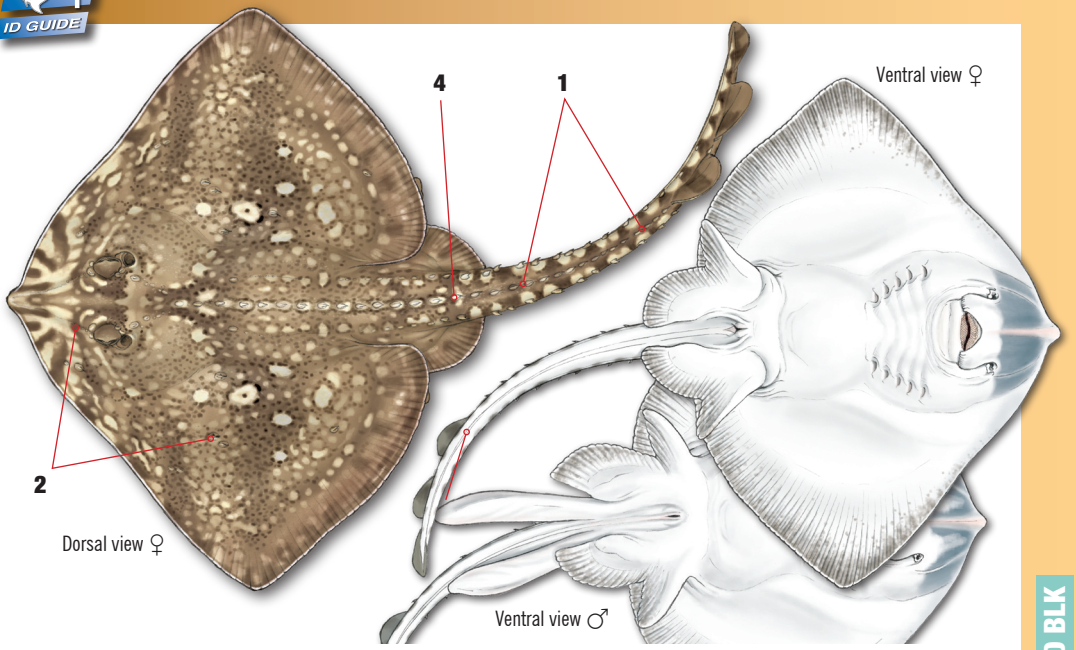
Thornback Ray

Raja clavata

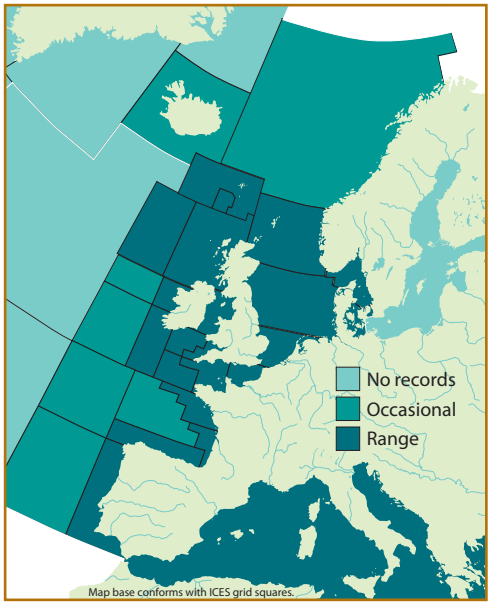


SCIENTIFIC NAME

Raja clavata (Linnaeus, 1758).

DISTRIBUTION

Throughout the northeast Atlantic, Mediterranean Sea, Black Sea and western Baltic Sea. Also off southern Africa[vi].



COMMON NAME

THORNBACK RAY, Thornback Skate, Roker, Maiden Ray, Hardback, Stekelrog (Ne), Raie Bouclée (Fr), Nagelroche (De), Raya de Clavos (Es), Piggskate (No).

IDENTIFICATION

1. Dark/light banding on tail.
2. Scattered dorsal buckler thorns, occasionally ventral.
3. Wholly spinulose dorsal surface.
4. Rows of 25–50 thorns on midline[vi].

COLOUR

- Dorsal surface dark brown to grey.
- Patterning highly variable from extensive yellow marbling to few light spots.
- Ventral surface creamy white with darker margin[i].

BIOLOGY AND SIZE

- Born: 10–13cm[v]. Mature: 60–85cm ♀, 60–77cm ♂[vi]. Max TL: 130cm ♀[vii], 105cm ♂[viii].
- Juveniles feed on small crustaceans, adults on larger crustaceans and a variety of fish[iv].
- Segregate by size and sex, juveniles more often found inshore (<30m)[v].

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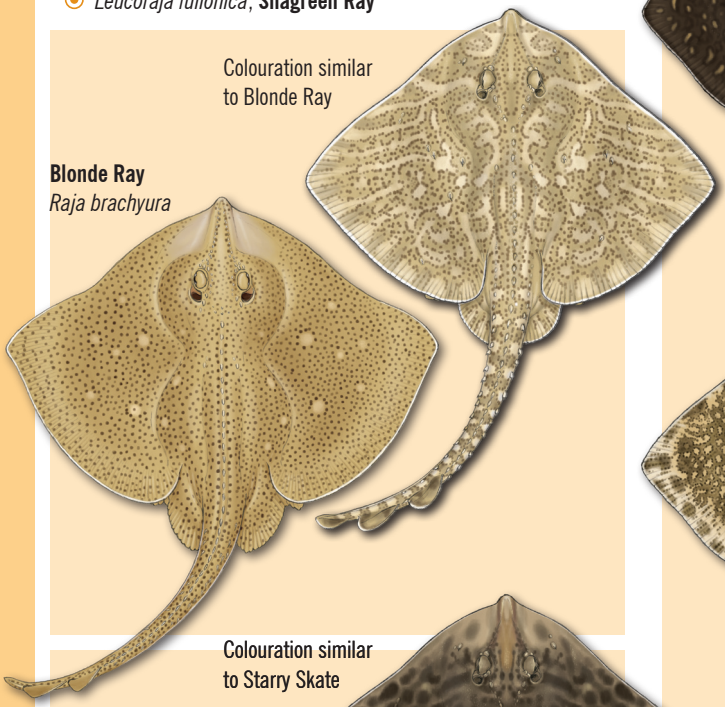
Thornback Ray

SIMILAR SPECIES

- *Raja brachyura*, **Blonde Ray**, illustrated
- *Amblyraja radiata*, **Starry Skate**, illustrated
- *Raja asterias*, **Starry Ray**
- *Leucoraja fullonica*, **Shagreen Ray**

Colouration similar to Blonde Ray

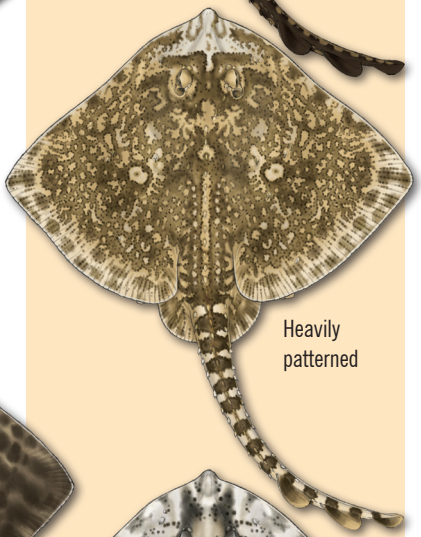
Blonde Ray
Raja brachyura



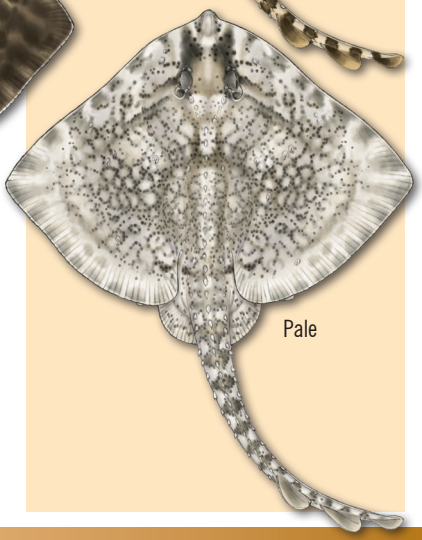
Colouration similar to Starry Skate

Starry Skate
Amblyraja radiata

Dark



Heavily patterned



Pale

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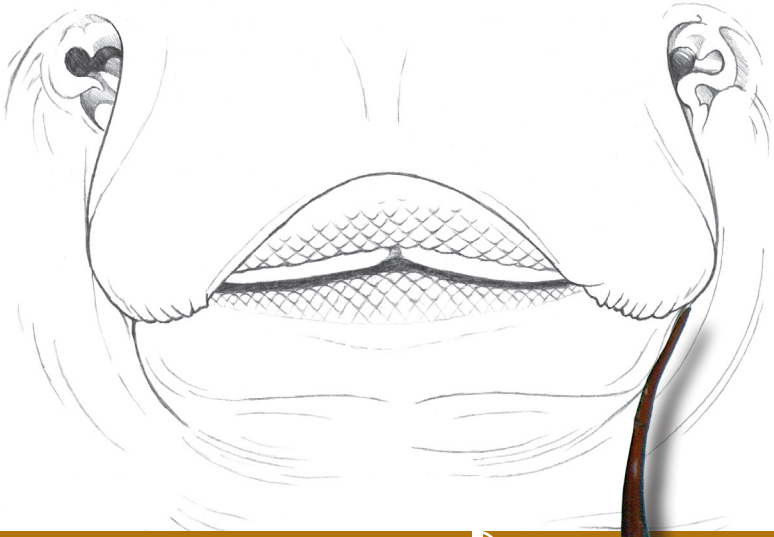
Thornback Ray

Raja clavata

TEETH



- Less than 60 rows[iii] of teeth, usually 36–44 in the upper jaw[i].
- Sharp teeth in mature males, molar-like teeth in females and juveniles[ii].

HABITAT

- Temperate to sub-tropical, 10–300m[x].
- Demersal, adults make seasonal migrations inshore to mate and spawn[vii].
- Prefer soft substrates such as sand and mud but can be found over coarser ground[v].

CONSERVATION STATUS

- It is long lived, matures late and has a low fecundity, making it vulnerable to fisheries pressure[v]. Its range appears to have contracted, particularly in the North Sea[ii].
- Red List status: Near Threatened (2000).

COMMERCIAL IMPORTANCE

- One of the most common skate in European fish markets. Constitute an important part of many demersal fisheries[iv].
- Targeted by gillnet, set net and longline fisheries. Substantial numbers are taken as bycatch in otter and beam trawls[v].
- Readily taken by rod and reel and are targeted by recreational anglers[vi].
- 2009 – Species currently subject to TAC in EU waters.

EGGCASE

1 50–90mm in length (excluding horns).

2 Capsule almost as wide as long.

3 Obvious keels and fields[ix].

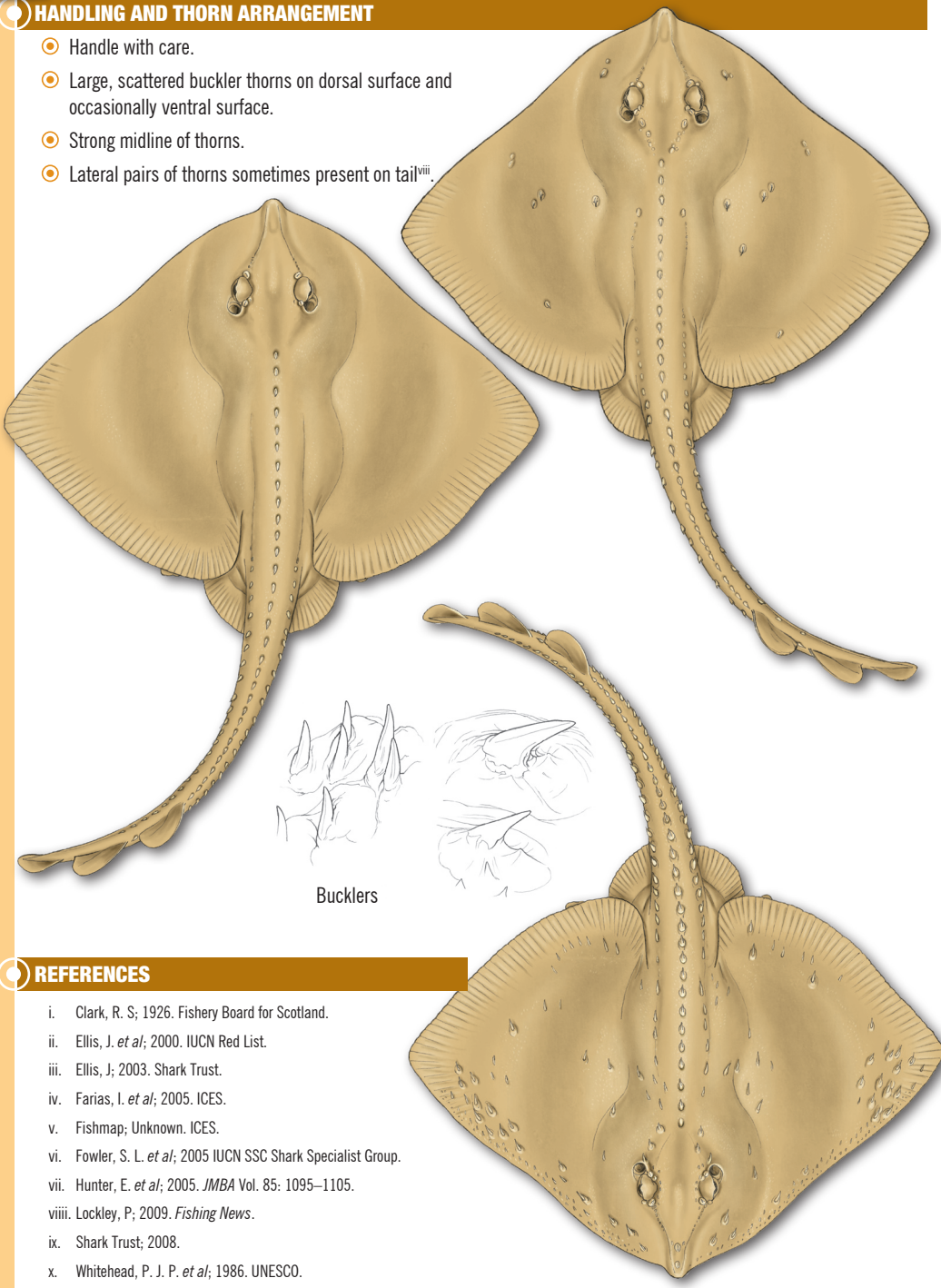
Similar eggcase to the Blonde Ray, *Raja brachyura*, but significantly smaller.

(Eggcase shown actual size.)

Thornback Ray

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large, scattered buckler thorns on dorsal surface and occasionally ventral surface.
- Strong midline of thorns.
- Lateral pairs of thorns sometimes present on tail[viii].



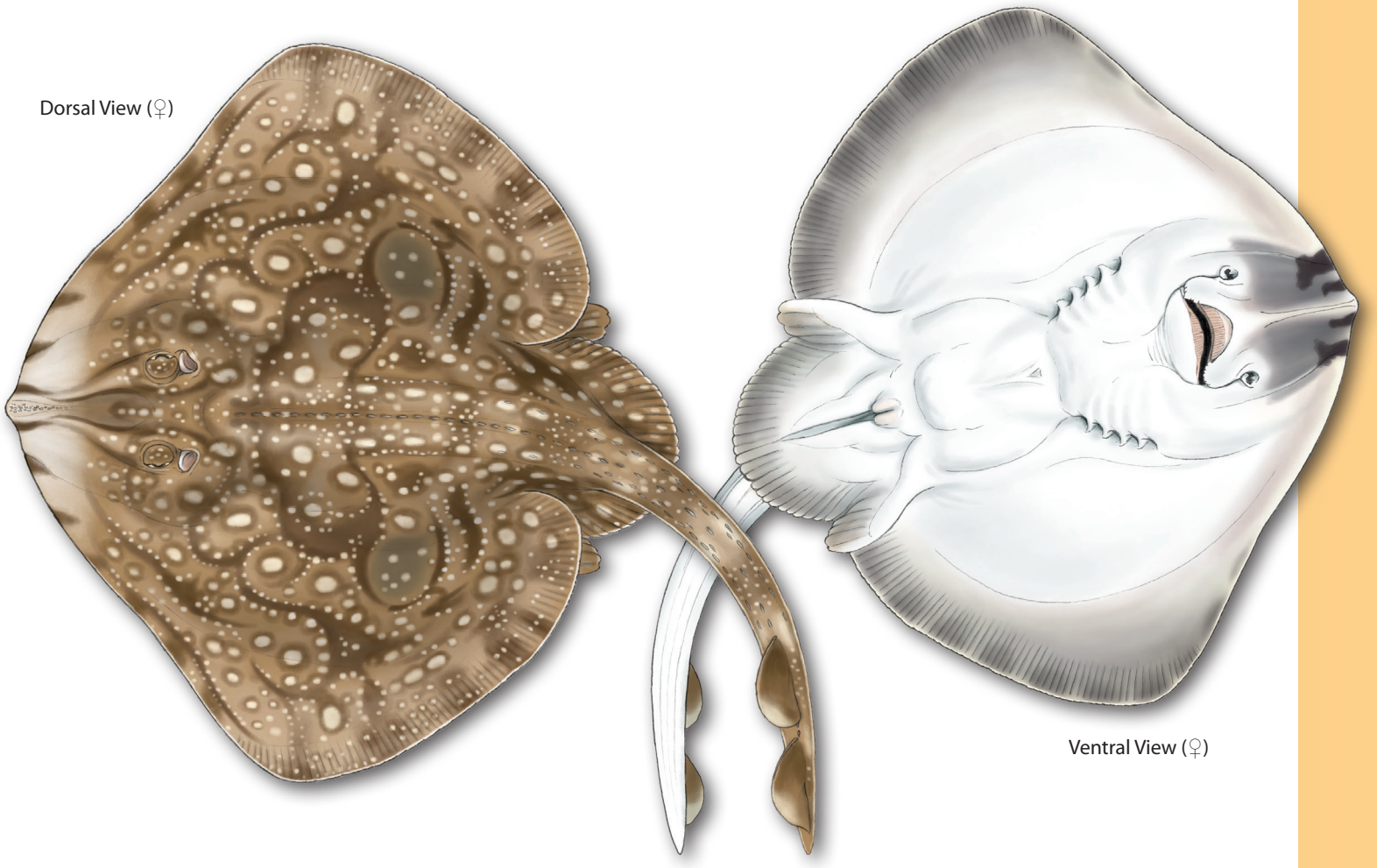
Bucklers

REFERENCES

i. Clark, R. S; 1926. Fishery Board for Scotland.
ii. Ellis, J. *et al*; 2000. IUCN Red List.
iii. Ellis, J; 2003. Shark Trust.
iv. Farias, I. *et al*; 2005. ICES.
v. Fishmap; Unknown. ICES.
vi. Fowler, S. L. *et al*; 2005 IUCN SSC Shark Specialist Group.
vii. Hunter, E. *et al*; 2005. *JMBA* Vol. 85: 1095–1105.
viii. Lockley, P; 2009. *Fishing News*.
ix. Shark Trust; 2008.
x. Whitehead, P. J. P. *et al*; 1986. UNESCO.

Undulate Ray

Raja undulata



Dorsal View (♀)

Ventral View (♀)

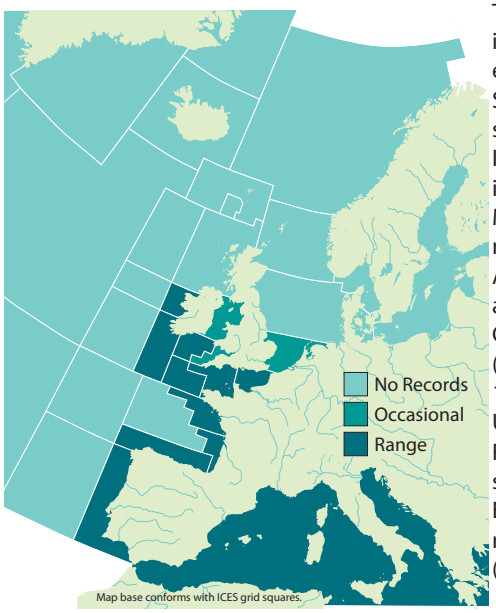
COMMON NAMES

Undulate Ray, Undulate Skate, Painted Ray, Raie Brunette (Fr), Raya Mosaica (Es), Razza Ondulata (It), Golfrog (Ne).

SYNONYMS

Raja picta (Lacepède, 1802), *Raja mosaica* (Lacepède, 1802), *Raja fenestrata* (Rafinesque, 1810), *Raja atra* (Muller & Henle, 1841).

DISTRIBUTION



The Undulate Ray is found in the east Atlantic from Senegal to the southern British Isles. It is encountered in the western Mediterranean, mainly along the African coast, and as far west as the Canary Islands (Whitehead *et al*., 1986). Around the UK, the Undulate Ray is found off the southern coasts of England, Wales and much of Ireland (Barnes, 2008).

APPEARANCE

- Maximum total length 85cm.
- One row of 20–55 thorns along midline on males, three on females.
- Upper surface from light yellow to black.
- Pattern of dark wavy bands lined with twin row of white spots.
- Other larger white spots add to pattern.
- Lower surface white with dark margins.

The leading edge of the disc undulates from the snout to the wingtips, giving the species its name. The dorsal surface, except for the rear quarters, is covered with small prickles with a dense patch on the snout region. The dorsal fins are widely spaced, normally with two dorsal spines between them. Median spines are scattered in adults, regular on young. Males have one row of 20-55 median thorns while females have three (Whitehead *et al*., 1986).

Colouration ranges from almost black to light yellow-brown with dark wavy bands lined by a twin row of white spots. Other white spots add to the complex pattern. The underside is white with dark margins (Barnes, 2008).

Some sources claim total lengths for the Undulate Ray of up to 100cm but the largest reliable reports are closer to 85cm. Coelho *et al* (2005) found the maximum total length for males was 88.2cm and 83.2cm for females (Coelho *et al*., 2005). This suggests that there is little sexual dimorphism.

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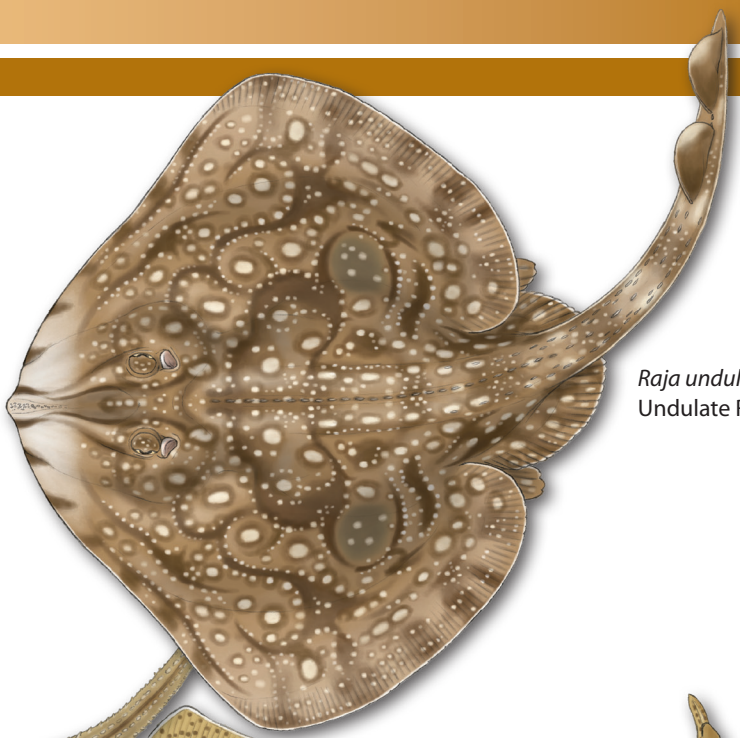
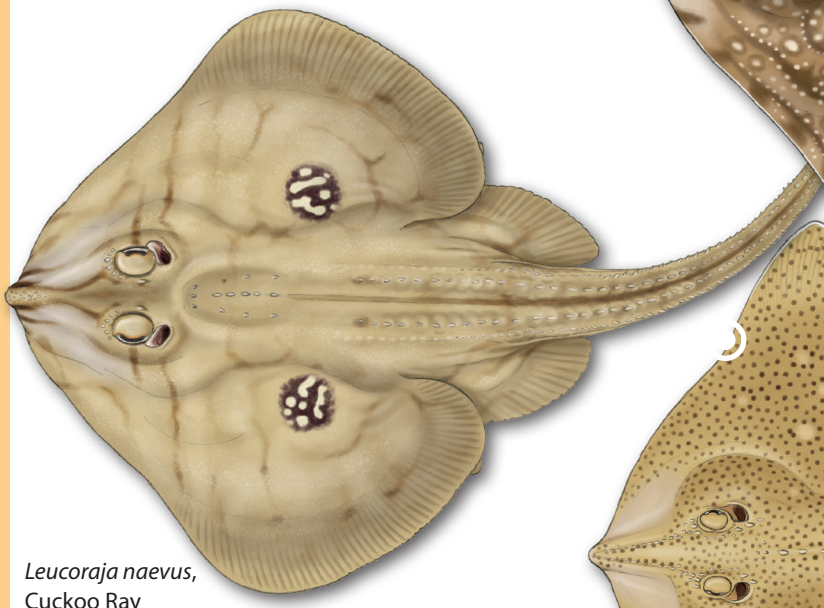
Undulate Ray

SIMILAR SPECIES

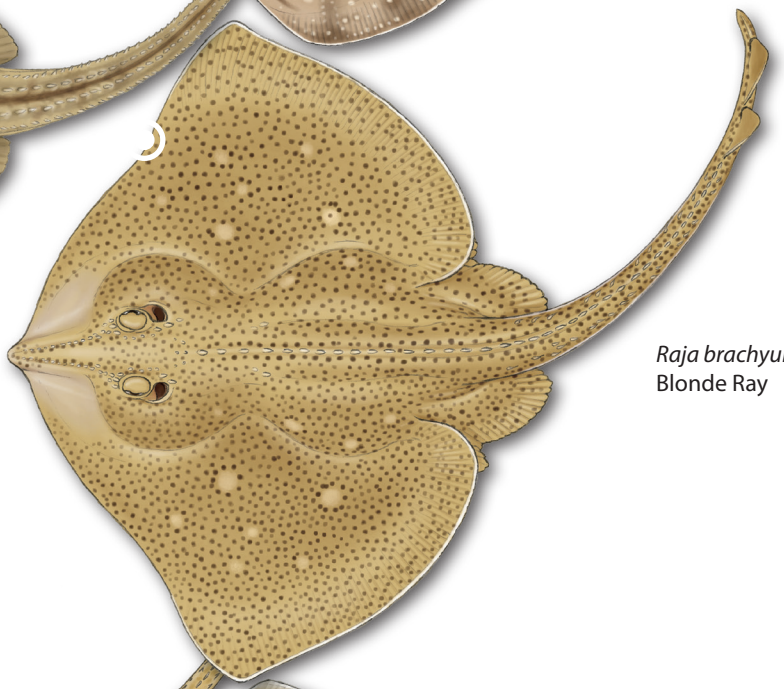
Leucoraja naevus, Cuckoo Ray
Raja brachyura, Blonde Ray
Raja microocellata, Small-eyed Ray
Raja miraletus, Brown Ray (not illustrated)
Raja montagui, Spotted Ray
Raja radula, Rough Ray (not illustrated)



Raja undulata, Undulate Ray

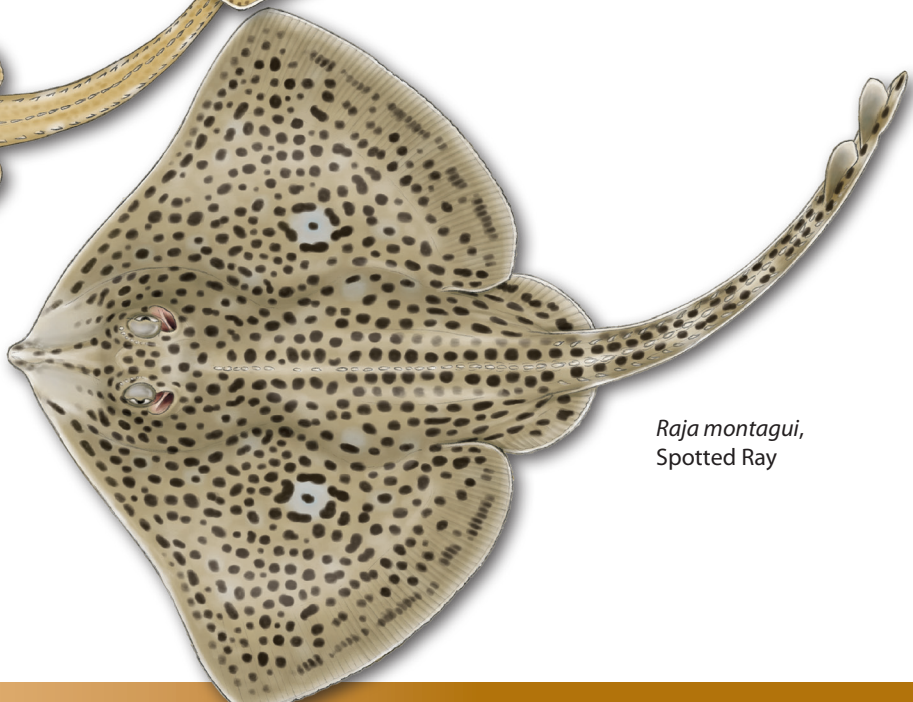


Leucoraja naevus, Cuckoo Ray



Raja brachyura, Blonde Ray

Raja microocellata, Small-eyed Ray



Raja montagui, Spotted Ray

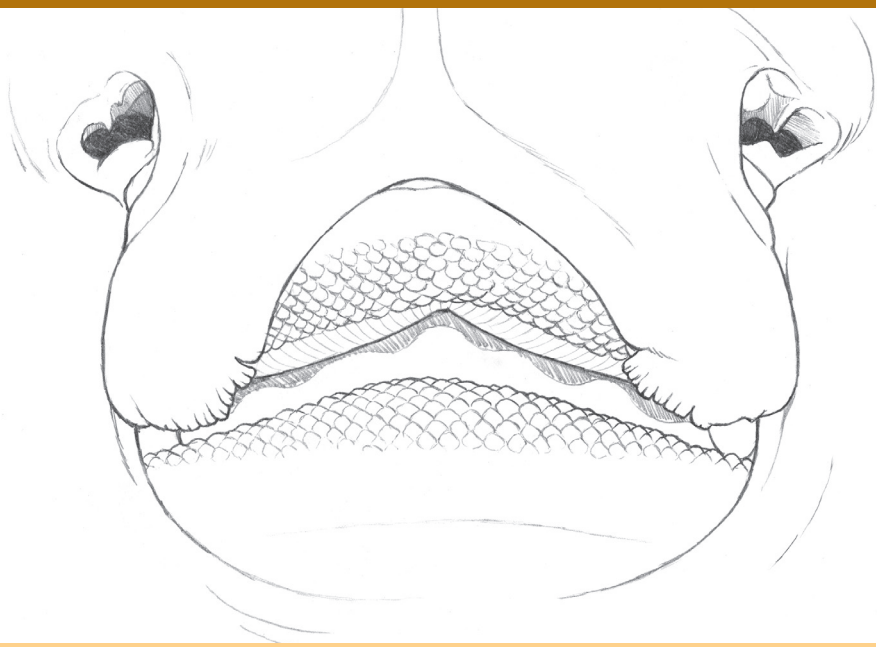
(Not to scale)

Undulate Ray

Raja undulata

TEETH

There are 40-50 rows of teeth in the upper jaw. The inner series are wedge-shaped, the middle series are pointed and the outer series are chisel-edged (Clark, 1926).



ECOLOGY & BIOLOGY

HABITAT

The Undulate Ray is a bottom dwelling species found on continental shelves, most commonly on sandy substrates (Barnes, 2008). Studies from the Portuguese continental shelf show that the Undulate Ray is most common from 10-30m (33–100ft) with the number of individuals caught decreasing rapidly with depth (Coelho *et al*., 2005). The maximum depth the species has been recorded at is ~200m (655ft), whilst in UK waters it has been found at depths of up to 72m (235ft) (Moura *et al*., 2008; Ellis *et al*., 2004).

DIET

The Undulate Ray has a varied diet depending on sex, maturity stage and season. When young, it has a fairly generalised diet consisting of crustaceans, molluscs and small fish. When mature, it becomes more specialised and feeds almost entirely on crustaceans. In southern Portugal, the vast majority (up to 79.5% by mass) of the diet of the Undulate Ray is *Polybius henslowi*, a small, pelagic crab. This is unusual among rajids, many of which show a change in diet from predominantly small crustaceans to bony fish as they mature (Moura *et al*., 2008).

REPRODUCTION

Female Undulate Rays mature around 75cm in length when around 9 years old, males mature slightly smaller at ~73cm when around 7½ years old. In common with most elasmobranchs, it matures relatively late in its life cycle as its maximum estimated age is just over 20 years (Coelho *et al*., 2005).

The Undulate Ray is oviparous, meaning that it lays eggs that then develop outside the parent until ready to hatch. It breeds seasonally between March and June and its eggcases are commonly found on beaches across the south coast of England (Moura *et al*., 2008; Shark Trust, 2008). These eggcases are 70–90mm long and 45–60mm wide when wet with very long horns on each corner. These horns are distinctive in that they curve inwards at the end and have thin and curly tips. When washed up on beaches however, these tips are sometimes not present (Shark Trust, 2008). In 1997, a female Undulate Ray in the Benalmádena Sea Life Centre in Spain started laying 25 days after mating and continued for 77 days, during which time she laid 88 eggs. The incubation period before the first skate hatched was 91 days and it measured 14cm in length (De la Rosa, 1998). It is not known if this is typical for wild populations.

EGGCASE

1. 70–90mm in length (excluding horns).
2. 45–60mm in width.
3. No keels (Shark Trust, 2008).

Similar eggcase to the Spotted Ray, *Raja montagui*.

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Undulate Ray

COMMERCIAL IMPORTANCE

Historically a commercially important fish, the Undulate Ray was taken as bycatch in multispecies trawl fisheries across much of its range, particularly in the south (Gibson *et al*., 2006). In southern Portugal, it can constitute more than 40% of all elasmobranchs caught in trammel net fisheries and is often taken on longlines (Coelho *et al*., 2005).

IUCN RED LIST ASSESSMENT

Endangered (2008).

THREATS, CONSERVATION, LEGISLATION

The status of the Undulate Ray in Europe is uncertain. It is potentially vulnerable to exploitation because, as with most elasmobranchs, it matures relatively late and produces few young. As a result, juvenile and immature specimens are vulnerable to fishing mortality before they have had a chance to breed (Gibson *et al*., 2006). It is targeted across much of its range by trawl and trammel nets, as well as occasionally being caught by long-line fishing techniques. In some areas, it also constitutes a substantial portion of fisheries by-catch. In southern Portugal, it represents more than 40% of all elasmobranchs caught in trammel nets (Coelho *et al*., 2005).

The Undulate Ray is also considered a game fish and is caught by recreational anglers, though the majority of these are returned alive and stand a good chance of surviving (Catchpole *et al*., 2007). Data from areas where the Undulate Ray was locally common has suggested serious declines due to fishing pressure. In Tralee Bay, southwest Ireland, populations have declined by 60-80% since 1981 and it has been absent in English Channel surveys in recent years (Gibson *et al*., 2006).

In 2007, the Undulate Ray was included on the UK Biodiversity Action Plan (BAP) list. Though this does not provide any legal protection for the species in itself, it includes provisions to work towards European conservation legislation. Its main targets included plans to stabilise populations in refuge areas and to facilitate the migration of animals from refuge populations to areas where they are scarce or extinct.

In 2009 the Undulate Ray received full protection from the European Council in ICES areas VIa-b, VIIa-k, VIII and IX, meaning that it cannot be retained or landed if caught. As elasmobranchs have no swim bladder that can overinflate or rupture, they are more likely to survive capture and release than teleost fish (DEFRA, 2008). The mandatory release order is therefore likely to significantly reduce the level of fishing mortality.

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Strong row of midline thorns.
- Thorns present between dorsal fins.

REFERENCES

AGUSTIN, L. Q. 2009. *Raja undulata*. Undulate Ray. Fishbase. www.fishbase.org.

BARNES, M. K. S. 2008. *Raja undulata*. Undulate ray. Marine Life Information Network: Biology and Sensitivity Key Information Sub-programme [on-line]. Plymouth: Marine Biological Association of the United Kingdom. www.marlin.ac.uk.

CATCHPOLE, T. L., ENEVER, R., DORAN, S. 2007. Programme 21: Bristol Channel Ray Survival. CEFAS. Lowestoft, UK.

COELHO, R., ERZINI, K., BENTES, L., CORREIA, C., LINO, P. G., MONTEIRO, P., RIBEIRO, J., GONÇALVES, J. M. S. 2005. Semi-pelagic Longline and Trammel Net Elasmobranch Catches in Southern Portugal: Catch Composition, Catch Rates and Discards. *Journal of Northwest Atlantic Fishery Science,* Vol. 35: 531–537.

DE LA ROSA, J. P. 1998. Painted Ray, *Raja undulata*, Reproduction. Florida Museum of Natural History. www.flmnh.ufl.edu/fish/.

DEFRA. 2008. Impact Assessment of Tope Shark Protection Measures. www.defra.gov.uk.

ELLIS, J. R., CRUZ-MARTÍNEZ, A., RACKHAM, B. D., ROGERS, S. I. 2004. The Distribution of Chondrichthyan Fishes around the British Isles and Implications for Conservation. *Journal of Northwest Atlantic Fishery Science*, Vol. 35: 195–213.

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.

MOURA, T., FIGUEIREDO, I., FARIAS, I., SERRA-PEREIRA, B., NEVES, A., DE FÁTIMA, M., SERRANO GORDO, B., SERRANO GORDO, L. 2008. Ontogenetic dietary shift and feeding strategy of *Raja undulata* Lacepède, 1802 (Chondrichthyes: Rajidae) on the Portuguese continental shelf. *Scientia Marina*, 72 (2): 311-318.

SHARK TRUST. 2008. Undulate Ray – Raja undulate. www.eggcase.org.

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.

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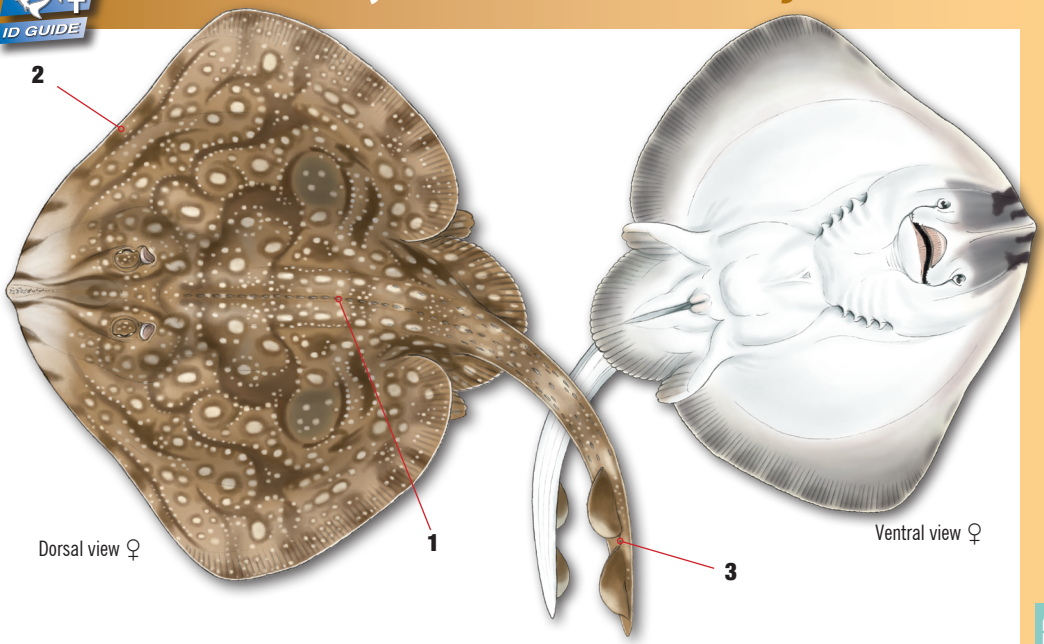
Undulate Ray

Raja undulata

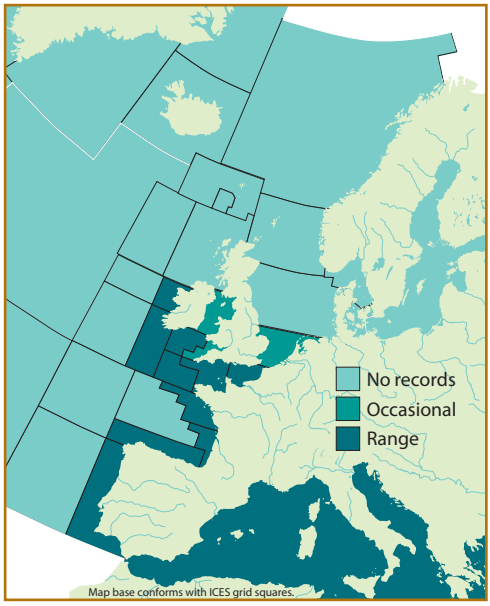


SCIENTIFIC NAME

Raja undulata (Lacepède, 1802).

DISTRIBUTION

Senegal to the southern and western coasts of the British Isles including the western Mediterranean. East to the Canary Isles[x].



COMMON NAME

UNDULATE RAY, Painted Ray, Undulate Skate, Raie Brunette (Fr), Raya mosaica (Es), Razza ondulata (It), Golfrog (Ne).

IDENTIFICATION

1 1 row of 20–55 thorns on midline in males, 3 in females.

2 Anterior disc margin undulates strongly.

3 2 interdorsal thorns[x].

COLOUR

- Dorsal surface light yellow to black.
- Pattern of dark, wavy bands bordered by rows of white spots.
- Other larger white spots present.
- Ventral surface white with darker margins[vi].

BIOLOGY AND SIZE

- Born: ~14cm. Mature: 75cm ♀, 73cm ♂. Max TL: >100cm[v].
- Juveniles feed mostly on small crustaceans, molluscs and fish. Adults specialise in crustaceans[viii].
- Eggs are laid from March to September[x].

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Undulate Ray

SIMILAR SPECIES

- *Raja radula,* **Rough Ray**
- *Raja microocellata,* **Small-eyed Ray**
- *Raja miraletus,* **Brown Ray**
- *Raja montagui,* **Spotted Ray**

HABITAT

- Demersal, 10–200m[x].
- Most common from 10–30m, catches decreasing rapidly with depth[iii].
- Prefer sandy and soft mud substrates[v].

CONSERVATION STATUS

- Vulnerable to overexploitation as they have a patchy distribution, mature at a large size and produce few young. Populations have declined but details are uncertain[vii].
- Red List status: Endangered (2008).

COMMERCIAL IMPORTANCE

- Previously a commercially important species targeted across much of its range by trawl and trammel net fisheries[v].
- In southern Portugal constituted >40% of all elasmobranchs taken by trammel nets[iii].
- 2009 – Prohibition on commercial fishers retaining this species in ICES areas VI, VII, VIII & IX.

HANDLING AND THORN ARRANGEMENT

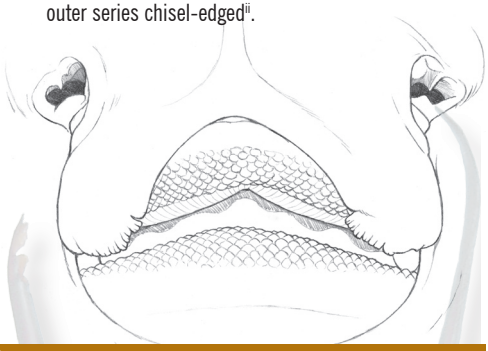
- Handle with care.
- Row of strong thorns on midline.
- Sometimes thorns between dorsal fins.

REFERENCES

i. Barnes, M. K. S; 2008. Marine Biological Association.
ii. Clark, R. S; 1926. Fishery Board for Scotland.
iii. Coelho, R. *et al*; 2005. *J. Northw. Atl. Fish. Sci*. Vol. 35: 531–537.
iv. Coelho, R; 2006. *Fisheries Research* Vol. 81 (1): 80–85.
v. De la Rosa, J. P; 1998. Florida Museum of Natural History.
vi. Gibson, C. *et al*; 2006. IUCN SSC Shark Specialist Group.
vii. Marine Conservation Society; Unknown.
viii. Moura, T. *et al*; 2008. *Scientia Marina* Vol. 72 (2), 311–318.
ix. Shark Trust; 2008.
x. Whitehead, P. J. P. *et al*; 1986. UNESCO.

TEETH

- 40–50 rows of teeth in upper jaw.
- Inner series wedge-shaped, middle series pointed, outer series chisel-edged[ii].



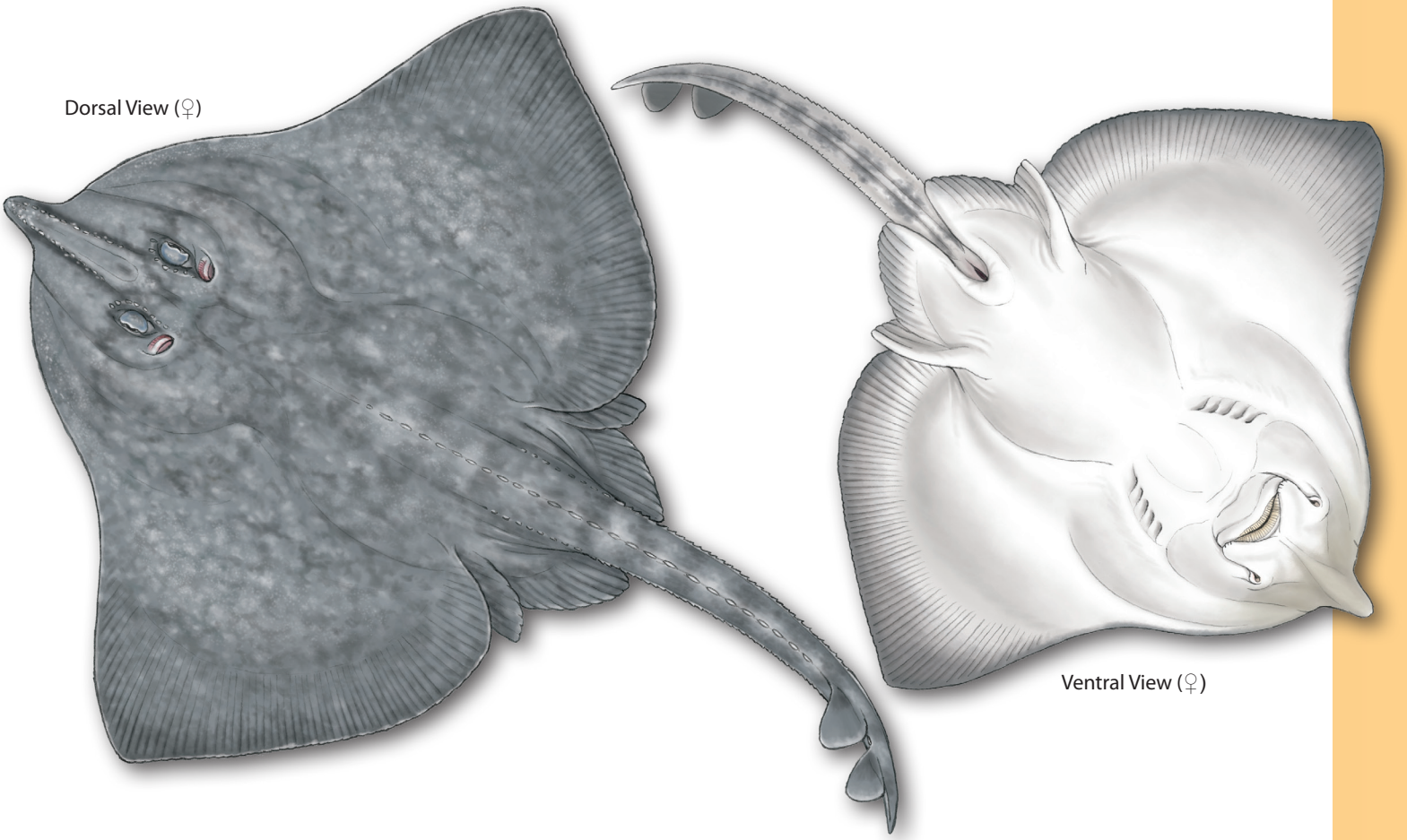
EGGCASE

1 70–90mm in length (excluding horns).
2 45–60mm in width.
3 No keels[ix].

Similar eggcase to the Spotted Ray, *Raja montagui*.
(Eggcase shown actual size.)

White Skate

Rostroraja alba



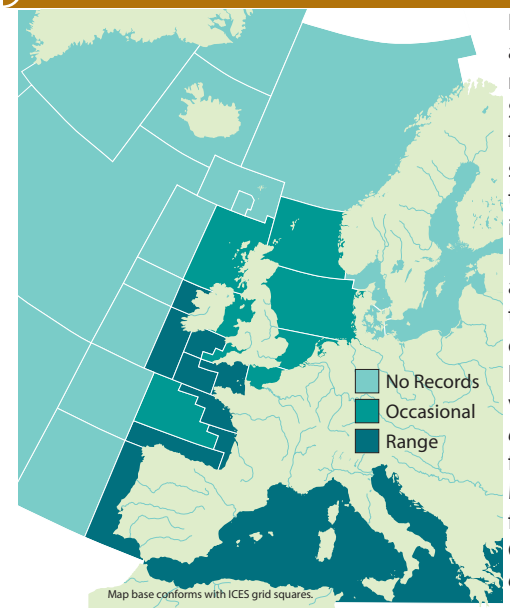
COMMON NAMES

White Skate, Bordered Skate, Bottlenosed Skate, Burton Skate, Spearnose Skate, White-Bellied Skate, Raie Blanche (Fr), Bandroche (De), Raya Bramante (Es), Razza Bianca (It).

SYNONYMS

Raja alba (Lacepède, 1803), *Raja marginata* (Lacepède, 1803), *Raja rostellata* (Risso, 1810), *Raja bicolor* (Risso, 1826), *Raja marginata* (Bonaparte, 1834), *Raja bramante* (Sassi, 1846), *Laeyiraja bramante* (Sassi, 1846), *Lotaraia marginata* (Leigh-Sharpe, 1924).

DISTRIBUTION



No longer common across any of its range, the White Skate can be found from Ireland and southern England to South Africa and into the southwest Indian Ocean. There are records from the Atlantic north of the UK but these have not been verified (Dulvy *et al*., 2006). It is also found in the western Mediterranean as far as Tunisia and Greece (Whitehead *et al*., 1986).

APPEARANCE

- Large, up to 200cm total length.
- Long snout with broad base.
- Tail slightly shorter than body.
- Dorsal surface grey blue in adults, red brown in juveniles.
- Ventral surface white with dark margins.
- Median row of ~15 large thorns along midline.
- Strong rows of thorns on either side of tail lower edge.
- One thorn between dorsal fins.

The White Skate is one of the largest European skate, reaching 200cm in length. It is most commonly found between 60-150cm however (Dulvy *et al*., 2006). It has a long snout with a broad base and a narrow tip, leading into a large, broadly rhombic disc. The outer corners of the pectoral fins are acute with concave leading edges (Whitehead *et al*., 1986). The tail is often slightly shorter than the body (Barnes, 2008).

Juveniles have a smooth dorsal surface, gradually becoming spinier as the skate matures. Patches on the pectoral fins remain bare in larger specimens. Larger thorns are found in front and behind the eye in younger specimens and in a median row of about 15 on the tail, rarely reaching the hind fins. Also on the tail there is one thorn between the dorsal fins and strong rows on either side of the lower edge of the tail. The ventral surface of the disc is smooth in juveniles, becoming spinier as the animal matures (Whitehead *et al*., 1986).

Colouration on the dorsal surface ranges from greyish-blue in adults to reddish-brown with numerous white spots in younger specimens. The ventral surface is white with dark margins around the pectoral and pelvic fins and along the tail (Whitehead *et al*., 1986).

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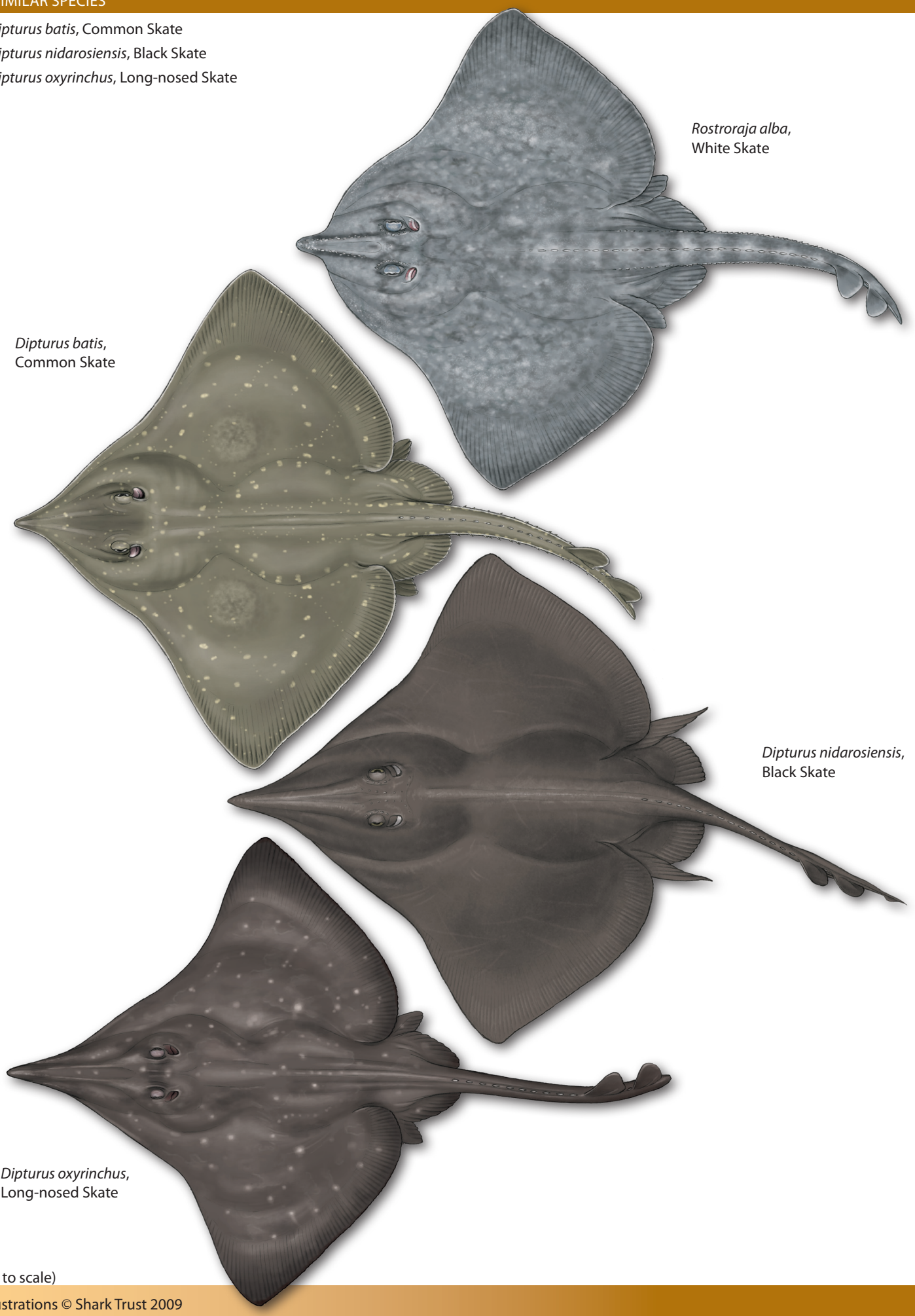
RJA

White Skate

SIMILAR SPECIES

Dipturus batis, Common Skate
Dipturus nidarosiensis, Black Skate
Dipturus oxyrinchus, Long-nosed Skate



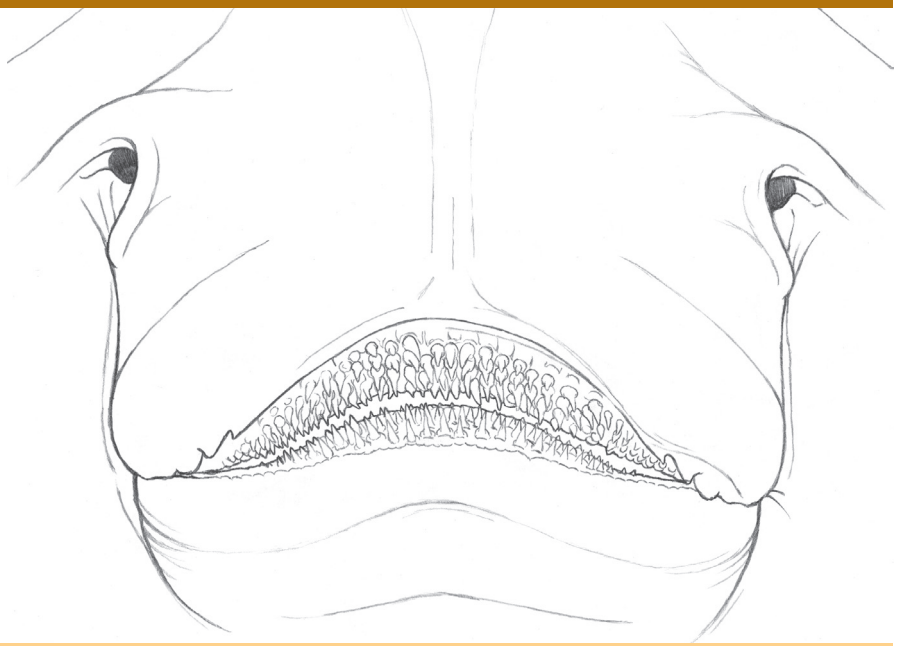
(Not to scale)

White Skate

Rostroraja alba

TEETH

There are 48 rows of teeth in the upper jaw. The middle series have long, conical points. The side series are more obtuse with short points (Clark, 1926).



ECOLOGY & BIOLOGY

HABITAT

The White Skate is a demersal species found in sandy and rocky habitats from 40-400m (130–1,310ft). It has been exceptionally found as deep as 500m (1,640ft) (Dulvy *et al*., 2006).

DIET

Its diet is poorly understood but it most likely feeds on bottom dwelling animals such as fish (teleost fish and other elasmobranchs), crustaceans (crabs, shrimps and mysids) and cephalopods (octopi and cuttlefish) (Agustin, 2009).

REPRODUCTION

Very little is known of the reproductive strategy or life history of the White Skate. It is thought that females mature around 130cm in length, males around 120cm (Serena, 2005). Like all true skate, the White Skate is oviparous. It produces 55-156 ova a year which measure 125-183mm in length (excluding horns) and 100-138mm in width, one of the larger eggcases found around Europe (Dulvy *et al*., 2006; Shark Trust, 2008). The incubation period is around 15 months but the size of the hatchlings at birth is not certain, although Clark (1926) gives a figure of 29.2cm total length (Clark, 1926).

EGGCASE

1. Large, 125–183mm in length (excluding horns).
2. Very square capsule, almost as wide as it is long.
3. Strong ridges run from top to bottom (Shark Trust; 2008).

Similar eggcase to the Blonde Ray, *Raja brachyura*.

(Eggcase shown half actual size)

Supported by:

White Skate

COMMERCIAL IMPORTANCE

Target fisheries for the White Skate have existed in the past but have always lead to rapid stock depletion and the subsequent closure of the fishery, such as in the French port of Douarnenez in the mid 1960's (Iglésias *et al*., 2007). It was taken as bycatch of multispecies trawl fisheries in the Mediterranean and off the Iberian Peninsula, where it was landed for consumption if caught (Dulvy *et al*., 2006).

IUCN RED LIST ASSESSMENT

Endangered (2006).

Critically Endangered in northeast Atlantic.

THREATS, CONSERVATION, LEGISLATION

As with other large skate, the White Skate is long lived, slow growing, matures late and has relatively few young. These characteristics make it extremely susceptible to anthropogenic pressure, particularly overfishing (Dulvy *et al*., 2006). ICES scientists estimate that the White Skate is severely depleted and possibly extirpated from the Celtic Sea and it is now so rarely landed in France that fish markets have stopped using the name (MCS, Unknown; Iglésias *et al*., 2007). In the port of Concarneau, landings of white skate declined by 99.4% between 1964 and 2006 (Iglésias *et al*., 2007).

In 2002, a proposal to include the White Skate on Schedule 5 of the Wildlife and Countryside Act (1981) was not adopted (JNCC, Unknown). It is included in the Barcelona and Bern conventions (Dulvy *et al*., 2006).

In 2007, the White Skate was included on the UK Biodiversity Action Plan (BAP) list. Though this does not provide any legal protection for the species in itself, it includes provisions to work towards European conservation legislation. Its main targets included plans to stabilise populations in refuge areas and to facilitate the migration of animals from refuge populations to areas where they are scarce or extinct.

In 2009, the White Skate received protection from the European Council in ICES areas VI, VIIa-c, VIIe-k, VIII and IX, meaning that it cannot be targeted or retained if taken as bycatch. As elasmobranchs have no swim bladder that can overinflate or rupture, they are more likely to survive capture and release than teleost fish (DEFRA, 2008). The mandatory release order is therefore likely to significantly reduce the level of fishing mortality.

HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Median row of large thorns.
- Row of thorns on lower edge of tail.
- Thorn between dorsal fins.

REFERENCES

AGUSTIN, L. Q. 2009. *Rostroraja alba*. White Skate. Fishbase. www.fishbase.org.

BARNES, M. K. S. 2008. *Rostroraja alba*. White or Bottlenosed Skate. Marine Life Information Network: Biology and Sensitivity Key Information Sub-programme [on-line]. Plymouth: Marine Biological Association of the United Kingdom. www.marlin.ac.uk.

CLARK, R. S. 1926. Rays and Skates. A Revision of the European Species. Fishery Board for Scotland. HM Stationary Office. Edinburgh, UK.

DEFRA. 2008. Impact Assessment of Tope Shark Protection Measures. www.defra.gov.uk.

DULVY, N. K., PASOLINI, P., NOTARBARTOLO DI SCIARA, G., SERENA, F., TINTI, F., UNGARO, N., MANCUSI, C., ELLIS, J. E. 2006. *Rostroraja alba*. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. www.iucnredlist.org.

IGLÉSIAS, S. P., TOULHOAT, L., SELLOS, D. Y. 2007. Resurrection Before Extinction for the World's Largest Skate? Poster Presentation. European Elasmobranch Association, 11th Annual Scientific Meeting. Brest, France.

JNCC. Unknown. The Wildlife and Countryside Act 1981. www.jncc.gov.uk.

MCS. Unknown. Fish to Avoid. www.fishonline.org.

SERENA, F. 2005. Field Identification Guide to the Sharks and Rays of the Black Sea. FAO. Rome, Italy.

SHARK TRUST. 2008. Identify Your Eggcase. www.eggcase.org.

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.

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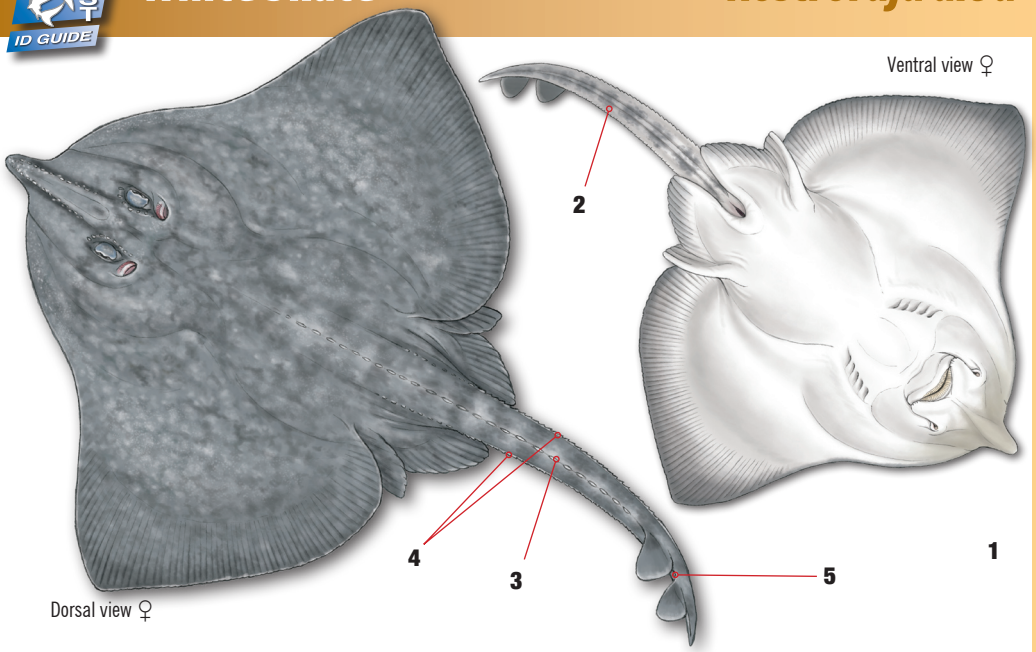
White Skate

Rostroraja alba

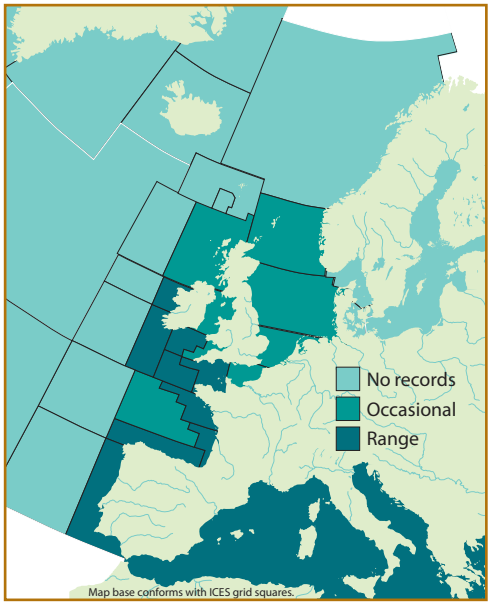


SCIENTIFIC NAME

Rostroraja alba (Lacepède, 1803).

DISTRIBUTION

British Isles to South Africa and into the Indian Ocean[v], including the western Mediterranean Sea[ix].



COMMON NAME

WHITE SKATE, Bordered Skate, Bottlenosed Skate, Burton Skate, Spearnose Skate, White-Bellied Skate, Raie Blanche (Fr), Bandroche (De), Raya Bramante (Es), Razza Bianca (It).

IDENTIFICATION

1 Long snout with broad base[ix].

2 Tail slightly shorter than body[ii].

3 Median row of ~15 large thorns, rarely reaching first dorsal fin.

4 Strong row of thorns either side of tail lower edge.

5 One thorn between dorsal fins[ix].

COLOUR

- Dorsal surface grey/blue in adults, red/brown in juveniles.
- Pattern of numerous light and dark spots and blotches.
- Ventral surface white with darker margins[i].

BIOLOGY AND SIZE

- Born: 29cm[iv]. Mature: 130cm ♀ , 120cm ♂[vii]. Max TL: ~200cm[v].
- Primarily piscivorous, juveniles also feed on crustaceans[vi].
- Eggcase incubation period ~15 months[v].

NE ATL MED

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RJA

White Skate

SIMILAR SPECIES

- *Dipturus batis,* **Common Skate**
- *Dipturus nidarosiensis,* **Black Skate**
- *Dipturus oxyrinchus*, **Long-nosed Skate**

HABITAT

- Demersal, 40–400m, exceptionally to 500m.
- Prefer sand and loose rock substrates[v].

CONSERVATION STATUS

- Slow growing, late maturing, long lived species which gives birth to few young and as such is vulnerable to fishing pressure[v].
- Red List status: Endangered (2006). Critically Endangered in northeast Atlantic.

COMMERCIAL IMPORTANCE

- Historically targeted, fisheries have collapsed when the species becomes locally extirpated[iii].
- Taken as bycatch of multispecies trawl fisheries in the Mediterranean and off the Iberian Peninsula[v].
- 2009 – Prohibition on commercial fishers retaining this species in ICES areas VI, VIIa-c, VIIe-k, VIII & IX.

HANDLING AND THORN ARRANGEMENT

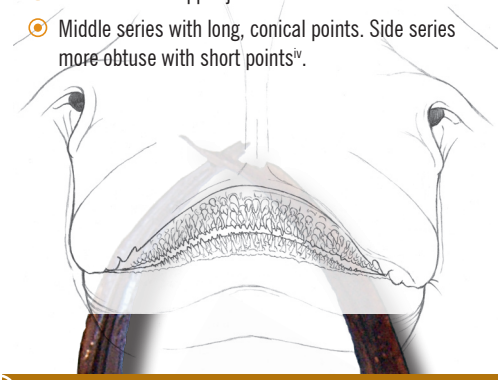
- Handle with care.
- Median row of large thorns.
- Row of thorns on lower edge of tail.
- Thorn between dorsal fins.

REFERENCES

i. Agustin, L. Q; 2009. Fishbase.
ii. Barnes, M. K. S; 2008. Marine Biological Association.
iii. Iglésias, S. P. *et al*; 2007. Poster Presentation.
iv. Clark, R. S; 1926. Fishery Board for Scotland.
v. Dulvy, N. K. *et al*; 2006. IUCN Red List.
vi. Kyne, P. M. *et al*; 2008. *Journal of Fish Biology*, Vol 72 (1) 61 – 77.
vii. Serena, F; 2005. FAO.
viii. Shark Trust; 2008.
ix. Whitehead, P. J. P. *et al*; 1986. UNESCO.

TEETH

- 48 rows in the upper jaw.
- Middle series with long, conical points. Side series more obtuse with short points[iv].



EGGCASE

1 Large, 125–183mm in length (excluding horns).
2 Very square capsule, almost as wide as it is long
3 4 long horns and strong ridges running longitudinally[viii].

Similar eggcase to the Blonde Ray, *Raja brachyura*.

(NB Shown at half size in comparison to an adult's hand.)