

THE GREAT EGGCASE HUNT!

celebrating >100,000 records





FOREWORD BY NICK BAKER

Naturalist & Shark Trust Patron

I think back to the first time I found a 'mermaid's purse' on a Sussex beach, it was the beginning of a journey, one fuelled by a natural, innate curiosity. When my grandfather who accompanied me on our regular beachcombing forays told me it was the eggcase of some kind of shark, my 8 year old mind started pinging!

Holding this honey-coloured treasure in the palm of my hand, I savoured its rubbery feel, and its alien perfection. I absolutely loved the curly tendrils that emanated from each corner and when I found the little slit through which a diminutive shark had emerged, my imagination kicked in. Looking out into the uninviting brown water of the English Channel, I had never really thought about what might be living out there just below the surface - I guess up until that point the idea that we had sharks in our waters had never really crossed my mind.

I found many similar objects over the next few years; some black - looking like something Batman might have dropped from his utility belt - others various browns and tans and once I even found one with a

tiny, barely alive Smallspotted Catshark writhing around in its embryonic fluid.

These were my natural treasures, and it was exciting to know that I had a collection produced by different species of skates, rays and a couple of small sharks all found in our waters. I set about collecting, identifying and hoarding as many as I could. Sharks, their cousins and their eggcases were special to me.

These natural vessels, it turns out are so much more than treasure in the beachcombers pocket they're special to the Shark Trust too. Not just as beautiful natural curios but they're vital in helping find these elusive elasmobranchs. Who would have thought you could track fish this way? For that is what they're doing - by collating the presence of these eggcases around our shores, each of which is unique and distinctive to the species, the Trust is able to get a handle on which species are breeding, where and in what sort of numbers - all without getting wet!

Information vital in understanding the state of shark, skate and ray populations can be gleaned from these. This simple survey is a great way of helping the Shark Trust and gives a focus to a visit to the shore at any time of the year. So if you've stepped out, identified and filled in your Great Eggcase Hunt recording form you should be proud that the products of your strandline adventures and natural curiosity have all directly helped the Shark Trust and more importantly, those little understood enigmatic elasmobranchs.

Nick Baker

Welcome to the GREAT EGGCASE HUNT!

Since the first mermaid's purse was recorded at the Shark Trust's inaugural Great Eggcase Hunt in 2003, a whopping 100,000 individual eggcases have been submitted and the project is now rapidly gathering momentum! Over the years, eager beachcombers and eggcase hunters have been busy searching the shores up and down the country, helping to represent most of the British coastline on the Great Eggcase Hunt results maps. The mermaid's purses of ten species of skate and three species of shark have so far been documented from British shores - with some finds rarer than others - and increasingly we are getting more records submitted from beyond the British Isles.

Empty eggcases washed ashore can give us a better understanding of the species living in our waters and could even be used to indicate the possible whereabouts of egg-laying grounds. Records submitted to the Great Eggcase Hunt have already helped to build up a clear picture of where many species regularly occur, as well as revealing some odd finds that have popped up in places we wouldn't necessarily expect! In the early days of the project we had to match empty eggcases to the adults to find out which species different mermaid's purses

belonged to. However even now, over a decade later, there is still much to learn about these egg-laying species.

This citizen science recording project encourages people to get out on the beach and search for the evidence of sharks, skates and rays (elasmobranchs) in British waters, which in turn, provides important information about this diverse group of species. You don't have to be a scientist to be a citizen scientist, and this project certainly wouldn't be possible without the help of volunteers keen to search for and record eggcases - so a huge thank you to everyone, whether a regular recorder or an occasional finder, who has participated in the Great Eggcase Hunt over the years!

C. Gordon

Cat Gordon



**Shark Trust
Conservation Officer**



The taxonomy bit...

What is it that makes one particular marine animal a 'shark' and another a 'skate'? How are we able to accurately tell one species from another? The answer is taxonomy: the scientific field concerned with the classification of organisms, providing the bedrock for our understanding of (in our case) sharks, skates, rays and chimaeras.

Collectively known as Chondrichthyans, sharks, skates, rays and chimaera are set apart from bony fish (or Teleosts) like cod or haddock by their flexible skeleton made of cartilage. There are over 1,200 species in this diverse group of fish which have evolved over the past 400 million years.

Chondrichthyans are divided into two sub-classes: the Elasmobranchs (sharks, skates and rays) and the Holocephalans (chimaera). There are two super-orders within the sub-class elasmobranch: Selachians (sharks) and Batoids (skates and rays), each of these is then split into orders, families, genus and species.

For example, for the **Thornback Ray**...

Kingdom: *Animalia*
Phylum: *Chordata*
Class: *Chondrichthyes*
Sub-class: *Elasmobranchii*
Super-order: *Batoidea*
Order: *Rajiformes*
Family: *Rajidae*
Genus: *Raja*
Species: *Raja clavata*, **Thornback Ray**

SHARKS

Smallspotted Catshark

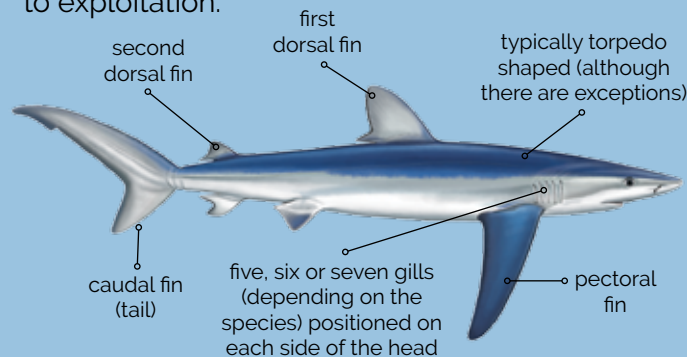


>500 species



>40 species

Sharks evolved over 400 million years ago and occupy most marine ecosystems, with some even able to survive in freshwater. Sharks are generally late to mature, produce few young after long gestation periods and are long-lived – characteristics which often make them vulnerable to exploitation.



SKATES

Blonde Ray (it's really a skate!)



>600 species



>30 species

Skates and rays evolved around 200 million years after the first sharks and are now widespread across all oceans and also extend into many inland freshwater habitats.



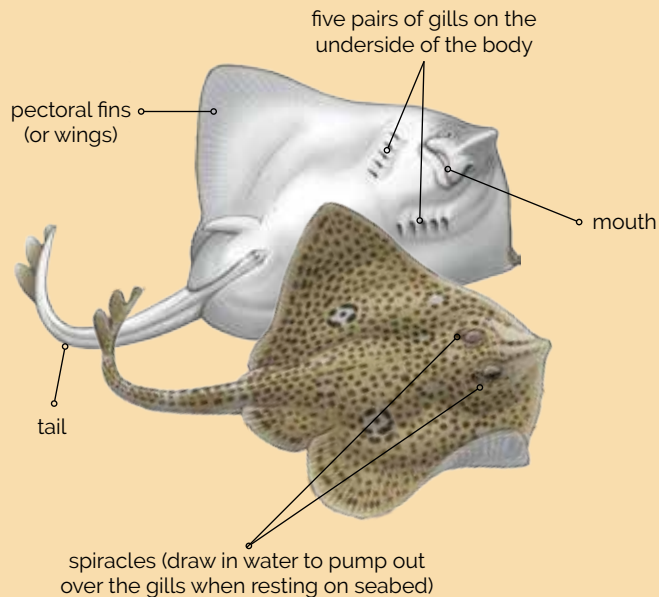
Bluespotted Ribbontail Ray

& RAYS

Skate vs Ray

So what is the difference between a skate and a ray? Although they do have a number of different features, the use of their common names often complicates the answer.

Many species have historically been misnamed in the UK, with species such as the Blonde Ray, Small-eyed Ray, Thornback Ray, Undulate Ray, Spotted Ray and Cuckoo Ray all technically skates, which understandably causes confusion! The simplest difference is that true rays give birth to live young (viviparous), whereas true skate produce tough leathery eggcases that protect the embryo as it develops outside of the mother's body (oviparous). Although it is only skate that produce these eggs, they are often referred to collectively as 'skates and rays'.



CHIMAERA

Rabbitfish Chimaera



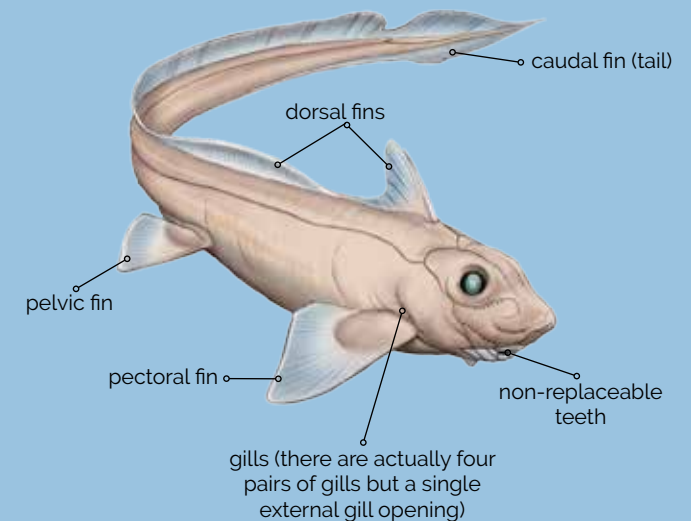
50 species



8 species

Chimaera (also known as ratfish, elephantfish and ghostsharks) are deep water egg-laying species. They produce spindle shaped eggcases that are deposited on the seafloor while the young develops inside.

To date, no chimaera eggcases have been reported to the Great Eggcase Hunt from the British Isles, but maybe one day soon we'll receive our first record of one found on a British beach!



REPRODUCTION

Reproduction takes many forms in sharks:

OVIPARITY - egg-laying

Skate and some species of shark (including catsharks and horn sharks) produce eggs that are encompassed in a tough, leathery eggcase (or mermaid's purse), which the female deposits on the seabed. This protective capsule acts as a life-support machine, with everything that is needed enclosed within.

VIVIPARITY - live bearing

The shark develops inside the mother's body, receiving nutrients and oxygen from the mother through an umbilical cord. This is the same method used by mammals, however unlike mammals, when the pups are born they are immediately independent and must fend for themselves.

OVOVIVIPARITY

In a process somewhere in between egg-laying and live birth, fertilised eggs develop but are retained inside the mother until the pups have absorbed the yolk. The embryos develop within an eggcase which has a thin membrane-like covering rather than the hard mermaid's purses. This allows for a good supply of oxygen and, as there is no danger from predators, it leads to a greater chance of survival. Once the food supply has finished and the embryo has fully developed, it will hatch inside the female and she will give birth to the young.

In some species, the pups are not born immediately after hatching out of the thin eggcases. Instead they stay in the uterus where they are provided with more food in the form of unfertilised eggs that are released to feed the growing embryos (**oophagy**). Sandtiger Sharks *Carcharias taurus* take this one step further, as the pups will not only eat the unfertilised eggs, but they will also eat their un-hatched siblings (**intrauterine cannibalism**).

EGG-LAYING ELASMOBRANCHS



To give them the best chance of developing safely, eggcases need to be anchored securely in locations where they won't be damaged by wave or tidal action. Depending on which species it is, features such as curled tendrils, horns and sticky mucus filaments attach the eggcase to a substrate (e.g. seabed, reef, seaweed) while the young shark or skate develops.

What does a mermaid keep in her purse?

Although eggcases are relatively impermeable, small slits along the horns allow fresh oxygenated seawater in and waste to seep out. A large yolk sac nourishes the embryo and, as it grows, the wings (for skate) will fold over its back and the tail will curve into the base of a horn and twitch to pump fresh seawater into the eggcase. The top end of the capsule is only loosely closed and after the incubation period, which can be as long as a year (although varies between species and with water temperature), the young will force its way out through the top of the eggcase between the horns. When the pup finally emerges, it is an independent, fully formed, miniature copy of its parents.

What is a mermaid's purse made from?

Eggcases are made up of a keratin and collagen substance, similar to human hair and fingernails - these tough, 'leathery' capsules serve to protect the embryo as it slowly develops.



SKATE LIFE CYCLE

6

Once the young have absorbed the yolk sac, the skate emerges from between the horns of the upper field of the eggcase and hatches as a miniature version of the adult.

5

Developing embryos pump sea water into the eggcase by beating their tails.

4

As the embryo grows, its pectoral fins fold up over its back and its tail curves up the side of the eggcase.

Eggcases are made from collagen and keratin, which are the same proteins that make up human hair and fingernails.

7

The juvenile skate will continue to develop to adulthood.

3

Small slits open up along the horns allowing oxygenated sea water to enter.

2

Eggs are anchored onto the seabed using mucus filaments. The embryo feeds on a yolk sac. Incubation periods vary (approximately 5 months to over one year) according to species.

1

Eggs are laid (often in pairs, one from each ovary) by the female at daily or weekly intervals.

8

Once mature, the now adult female will produce her own eggs and the process is repeated.

FINDING MERMAID'S PURSES

Once eggcases are empty, they are much lighter and can be easily dislodged from their resting place. Wave action and currents will help to wash them ashore where the wind may then blow them further up the beach - eggcase hunting after stormy weather can be particularly fruitful. Public reporting of these mermaid's purses forms the basis of the Shark Trust's Great Eggcase Hunt.

CITIZEN SCIENCE

"the collection and analysis of data relating to the natural world by members of the general public, typically as part of a collaborative project with professional scientists."





The Great Eggcase Hunt is a citizen science recording project that encourages participants to search for eggcases that have washed ashore, or report those sighted while snorkelling or diving.

Anyone and everyone can take part; all that's needed is a beach, plenty of enthusiasm and quite often, a bit of patience! As a citizen science project, the Great Eggcase Hunt relies heavily on public submissions, and so the resulting data highlights areas of 'presence' rather than being an effort-based survey but the sheer volume of records certainly has significant value. Over 100,000 individual records were submitted to the project as of early 2016, with 78% verified using either photographs or specimens - this is really important so we can make sure the right species are recorded.

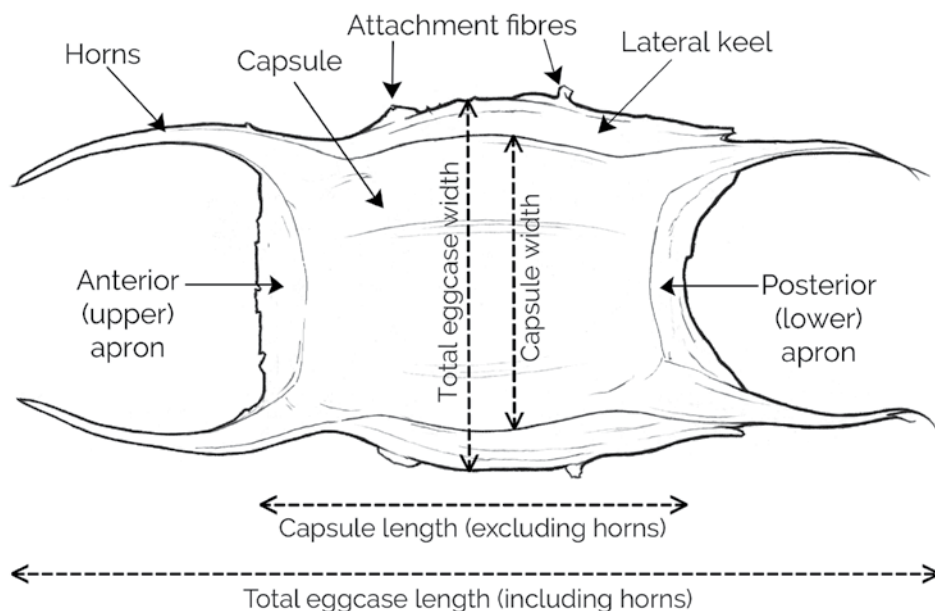
How did it begin?

Established in 2003, the Great Eggcase Hunt was originally developed as an educational tool to inform and enthuse beach goers about the presence and diversity of sharks and their relatives in British waters. This also allowed people to become actively involved in shark conservation without having to travel to tropical climates. However, it became apparent through the overwhelming public response that the project was capable of much more and could actually provide valuable information regarding the relative abundance, regional diversity and geographic distributions of egg-laying elasmobranchs.

Why record eggcases?

In recent years, certain populations of sharks, skates and rays have declined significantly. In particular, the larger bodied skate (such as the White Skate and Flapper Skate) have become some of the most threatened species in British waters. The biological characteristics of an elasmobranch are similar to that of a mammal (slow growth, late maturity, low reproduction rates and longevity); these factors mean that they are vulnerable to overfishing. If individuals are caught before they have reached breeding age, then populations have limited potential to recover.

The Great Eggcase Hunt has helped to fill in knowledge gaps of species biology, including the egg-laying phase. As mermaid's purses are distinctive according to species, they can be used to help indicate presence and diversity of oviparous elasmobranchs. Multiple eggcases of a species washed up in an area could even suggest the occurrence of egg-laying grounds. Recognising these hotspots means better measures can be proposed to help protect them during this important static phase of their life.



EGGCASE HUNTING

Eggcase hunting can take place all year round! However the presence of a mermaid's purse doesn't always indicate a recently hatched shark or skate, as they can lie empty on the seabed for quite some time before being dislodged and brought to shore. The best time to eggcase hunt is often after stormy weather when lots of seaweed and debris has been washed up on the beach.

► **The Chance Find:** you may simply be out walking your dog on your local beach, or on holiday with your family, when you discover an eggcase purely by chance – fantastic! Use the ID Guide to discover what you've found and report it, via the online recording form or smartphone app.

► **The Scientific Approach:** if you are looking to make your hunt more scientific then take it a step further:

 Simple science: set out a timed walk, e.g. walk along the strandline for 20 minutes and see how many eggcases you can find in your set time period.

 Beach survey: walk the entire length of the beach along the lower strandline and then return along the higher strandline, recording as you go.



BE SAFE ON THE BEACH

- Check tide times so you don't become stranded.
- Use a stick or boot to rummage in seaweed to avoid any nasty surprises!
- Be respectful of wildlife and habitats and don't take any living organisms home.
- Take 5! While you are on the beach, help out by picking up five pieces of litter and removing them from the beach.

TOOL KIT

The eggcase hunting tool kit is simple:

- ✓ Bag or bucket to collect your finds;
- ✓ Stick to rummage in seaweed;
- ✓ Camera/phone to photograph your finds;
- ✓ Ruler or coin to use for scale in the photograph;
- ✓ The eggcase ID Guide or downloaded smartphone app;



BUCKET SCIENCE

Empty eggcases found on the beach can often be dry and brittle. Rehydrate them in water for a few hours (longer for larger specimens) and you will find them easier to identify as they will expand and the features will become clearer.

You can then use the ID Guide to identify what species they belong to. Download from www.eggcase.org.



RECORDING

 Use the online recording form to submit records at www.sharktrust.org/recordyoureggcase - be sure to upload photos and use the map to pinpoint your location;

 Download the free iPhone or Android app (search ST Eggcase) and upload details with your photo;

 Post your eggcases to the Shark Trust along with details of where and when you found it;

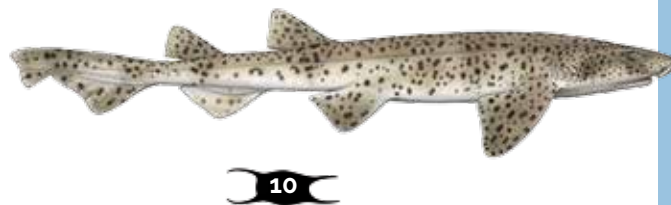
However you record, please send photos of eggcases so we can double check identifications!



EGGCASES UNDERWATER

Over the years, the Great Eggcase Hunt has helped improve the Shark Trust's knowledge about the distribution of egg-laying elasmobranchs; however it doesn't provide information on the type of seabed or seagrass that different species prefer to lay their eggs on. Where eggcases are found isn't always a true indication of where they were laid, as currents can carry them quite a distance. Underwater sightings of eggcases reported by divers and snorkellers could help us to link beach records to actual egg-laying grounds. This will provide more detailed information about the specific geographic areas and the types of seabed that skates and catsharks use as egg-laying or nursery grounds.

Some underwater sightings in Ireland and Scotland demonstrated that some Thornback Ray *Raja clavata* eggcases were attached to the seabed by a mucus 'web' extending from the eggcase. While Flapper Skate *Dipturus intermedia* eggcases were found to be wedged between boulders on a reef with no mucus web. Nursehound *Scyliorhinus stellaris* and Smallspotted Catshark *S. canicula* eggcases have curled tendrils to wrap around seaweed, but do they prefer certain types of seaweed?



Nursehound egg-laying site

One long-term Shark Trust supporter and eggcase recorder discovered a site in Devon where Nursehound eggcases are often laid in a sheltered channel. These eggcases can be observed while snorkelling on a low spring tide (this is when the tide is at it's most extreme). Since April 2014 the eggcases have been photographed and a small tag attached in order to keep track of how many are present. Once the shark has hatched, the original tag is removed. The eggcases are monitored once a month (twice per month when possible), while also recording water temperature, tide height/time and significant weather events such as storms. There is a large amount of Rainbow Wrack *Cystoseira tamariscifolia* in this channel, and the majority of eggcases recorded to date have been found attached to this. The main aim is to record newly deposited eggs in order to monitor the average developmental period in the wild and document whether the eggs are deposited outside of the known egg-laying period. Other factors such as the success of hatching for each egg and the level of bio-fouling (additional growth e.g. algae) are also noted. Information regarding egg-laying habitat, time of year they are deposited, incubation periods and success of hatching will all add to the species profile and could potentially contribute towards better management of both the species and the habitat.



DISCOVERING EGGCASES

In 2010, the Common Skate *Dipturus batis* was recognised as actually being two distinct species that have long been confused under a single name. The eggcase of the more northerly Flapper Skate *Dipturus cf. intermedia* [page 21] was known to the Shark Trust, but at the time the eggcase for the more southerly Blue Skate *Dipturus cf. batis* [page 22] was yet to be described. With help from the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) we now have several Blue Skate eggcases and have been able to incorporate this species into our identification materials. In addition, three Blue Skate eggcases have since been reported to the Great Eggcase Hunt - two were found on Perranporth beach on the north coast of Cornwall and the third was recorded from Penzance in southwest Cornwall.

MYSTERIES

There are still a number of eggcases from deeper-water species that the Trust would like to see, as descriptions of authenticated eggcases are limited; these include the Sandy Ray *Leucoraja circularis*, Shagreen Ray *L. fullonica*, Round Ray *Rajella fyllae*, Black Skate *Dipturus nidarosiensis* and Long-nosed Skate *D. oxyrinchus*.

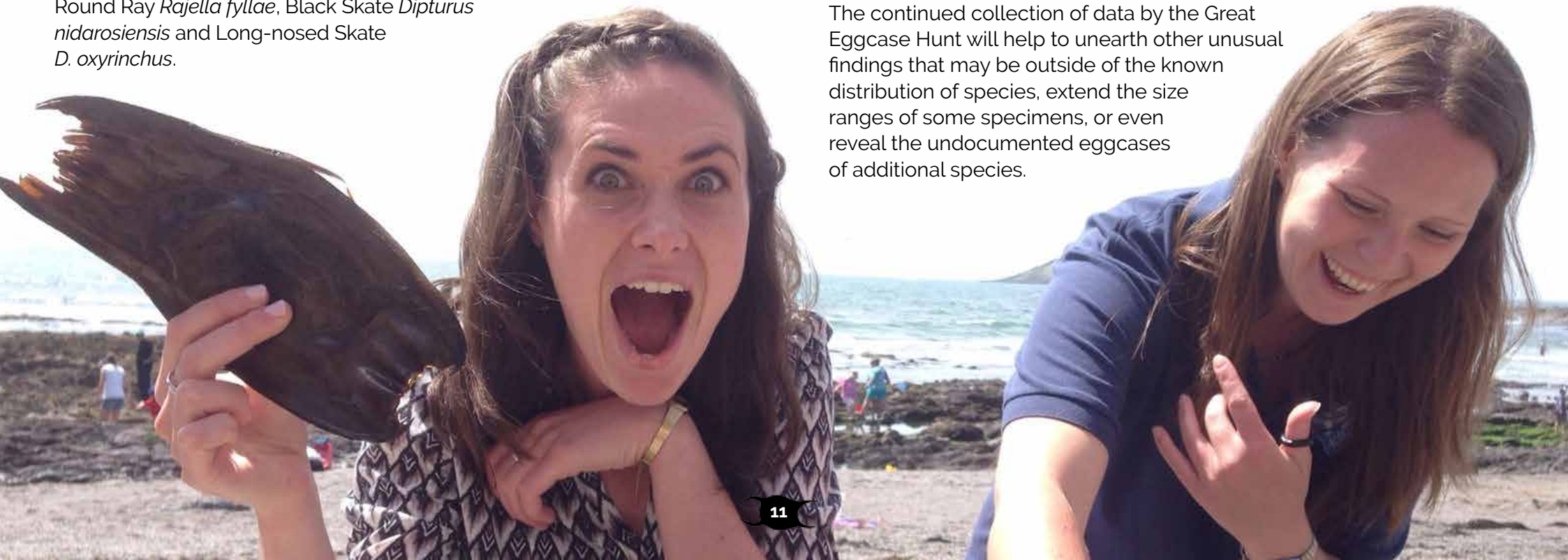
THE ODD ONES

There have been a number of anomalies reported to the project over the years. For example, in early January 2015 what appeared to be a large Starry Skate *Amblyraja radiata* eggcase was reported from Borth, Wales. However, not only was this eggcase well outside of the species known range, but it was much larger than other specimens recorded to the Great Eggcase Hunt and those documented in scientific literature.

Another odd specimen was reported from Brighton, on the south coast of England, which appeared to be an unusually formed Undulate Ray eggcase. We know that eggcases of different species vary in terms of shape, size and features, but it's always interesting to see variations within the same species.

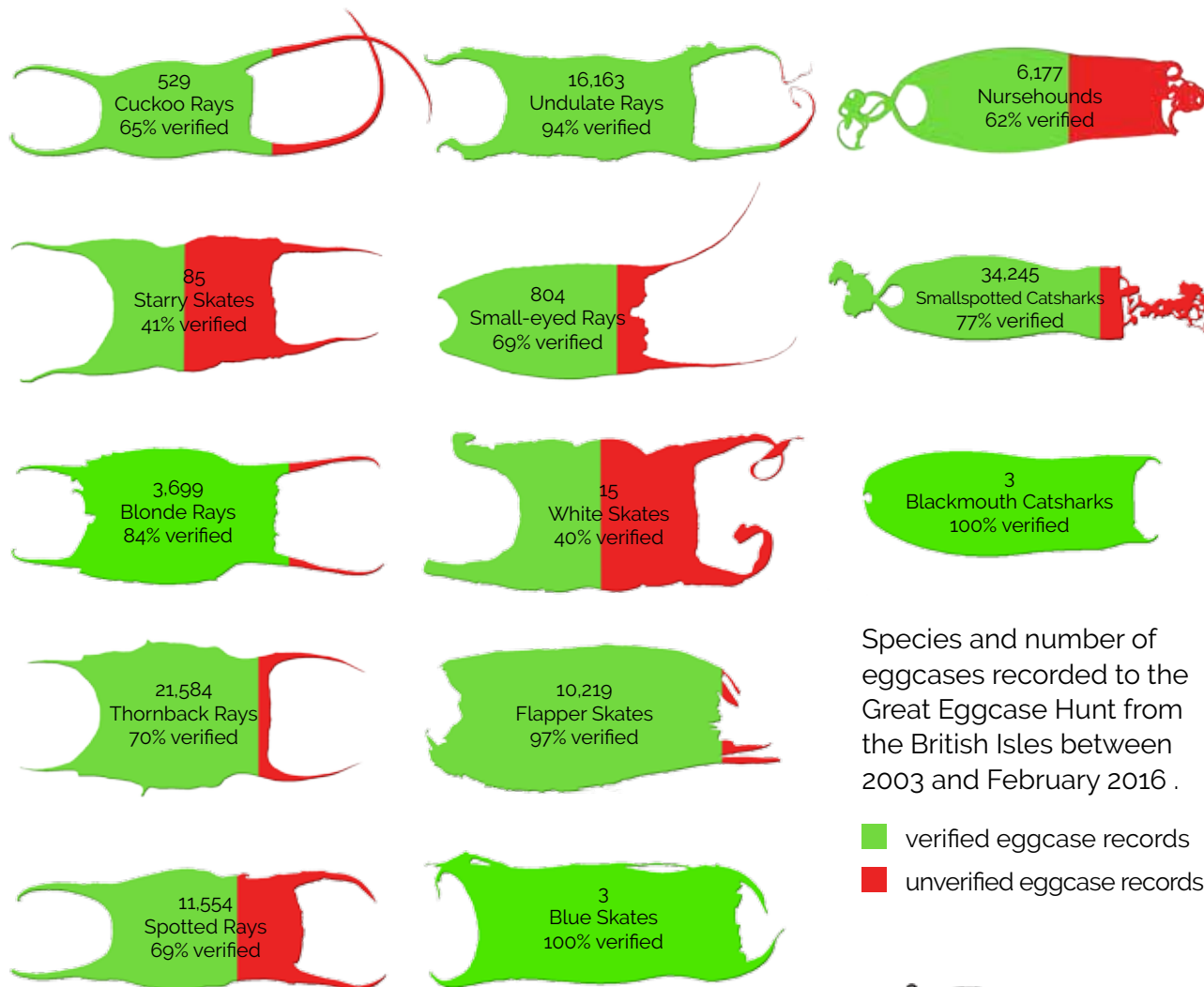
There have also been verified White Skate eggcases, usually found in the Celtic Sea, reported from Peterhead (Scotland), Braunton Burrows (Devon) and even as far north as Fair Isle!

The continued collection of data by the Great Eggcase Hunt will help to unearth other unusual findings that may be outside of the known distribution of species, extend the size ranges of some specimens, or even reveal the undocumented eggcases of additional species.



SPECIES

The Great Eggcase Hunt has helped us build a clearer picture of what species are present around the British Isles and where they are, with verified eggcase results reflecting known species distributions. The project has engaged well in excess of 2,500 individual recorders (in turn representing a far larger army of participants) who have already submitted over 100,000 records, from 13 different species found in British waters. Most of the British coastline has been covered, but some areas are better represented than others. Additional species have been reported from around the world, including the Atlantic and Pacific coasts of the USA, Australia, South Africa and across European waters.



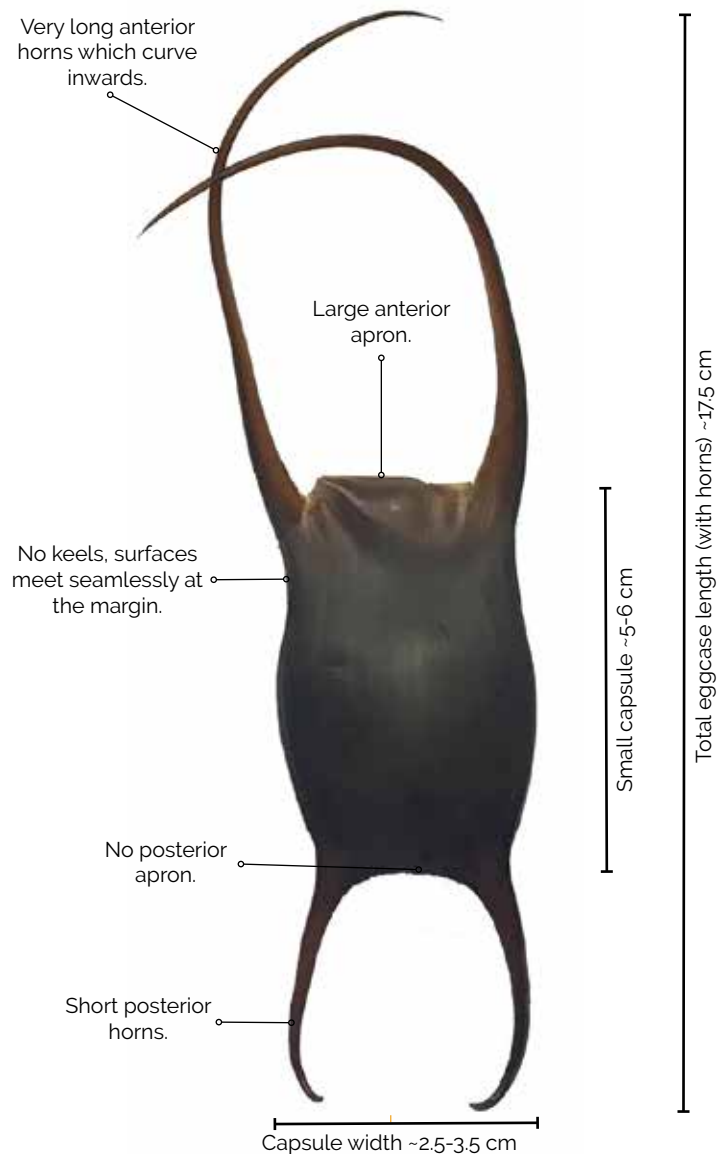
Species and number of eggcases recorded to the Great Eggcase Hunt from the British Isles between 2003 and February 2016 .

- verified eggcase records
- unverified eggcase records

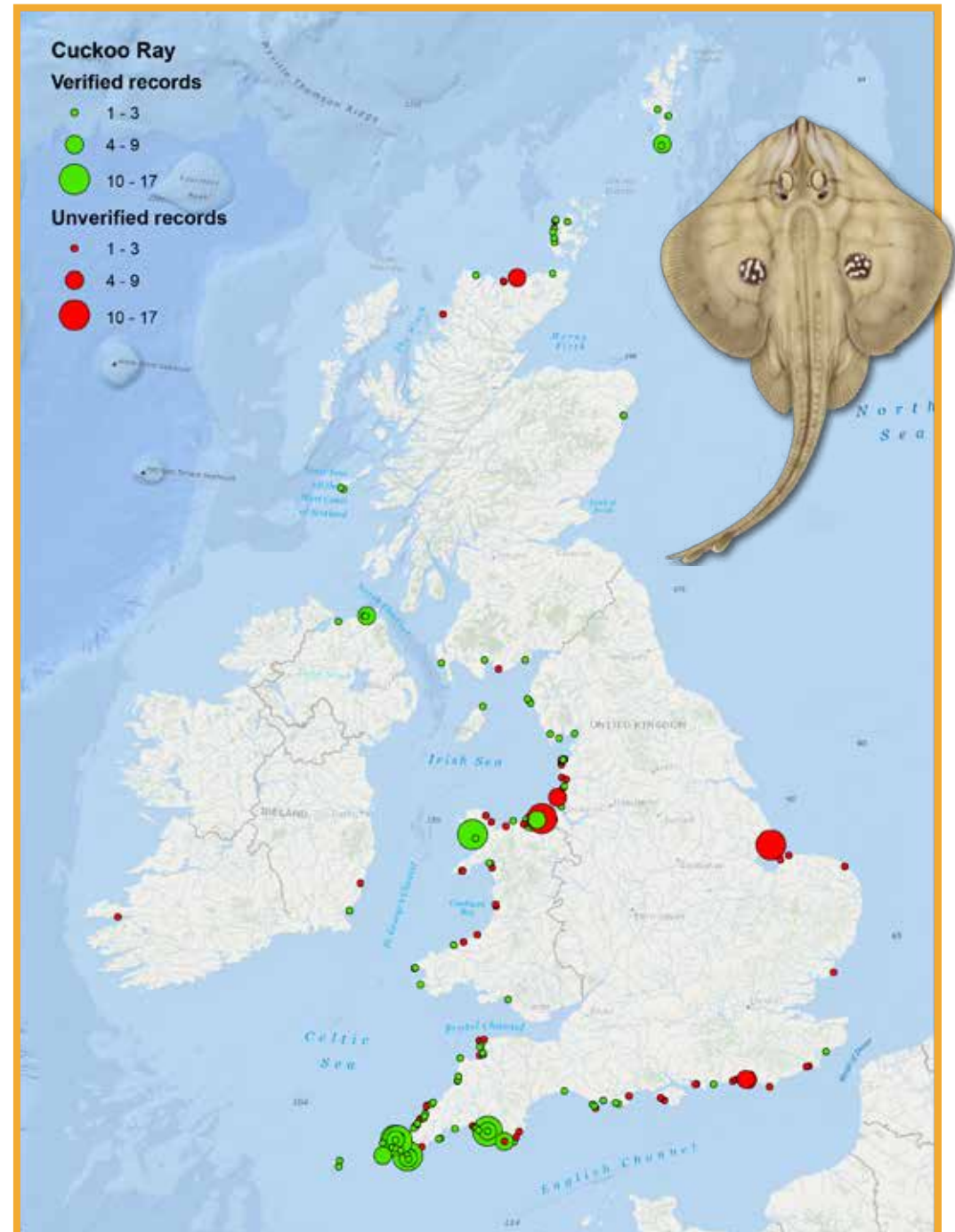


CUCKOO RAY

Leucoraja naevus

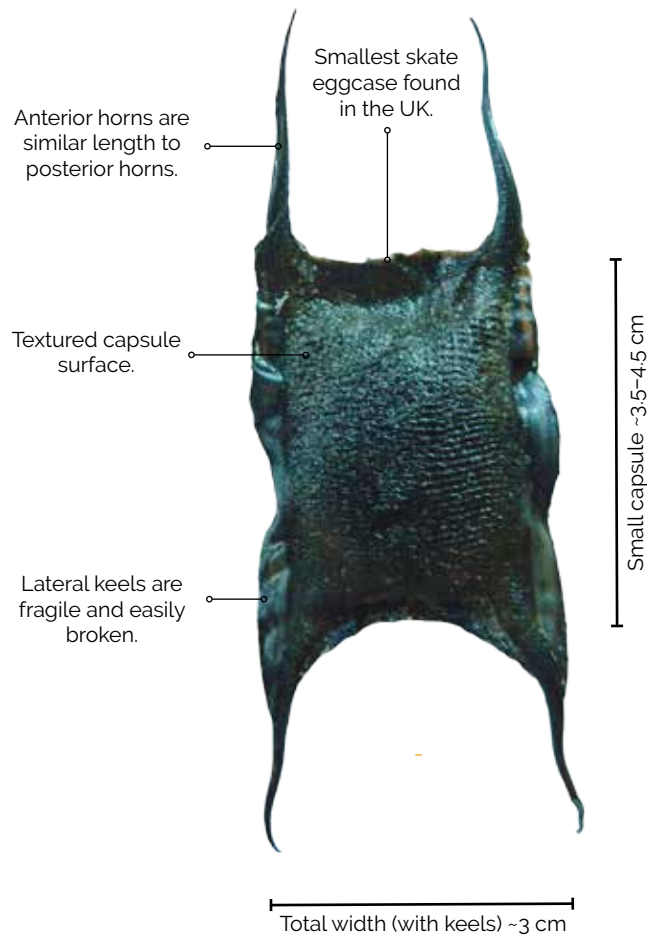


The range of the Cuckoo Ray in the Northeast Atlantic extends from Norway down to Morocco. The majority of verified eggcase records from the British Isles have been submitted from the south and west coasts of England and Wales, with additional reports from Northern Ireland, Scotland and the Northern Isles.

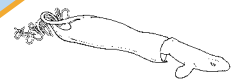
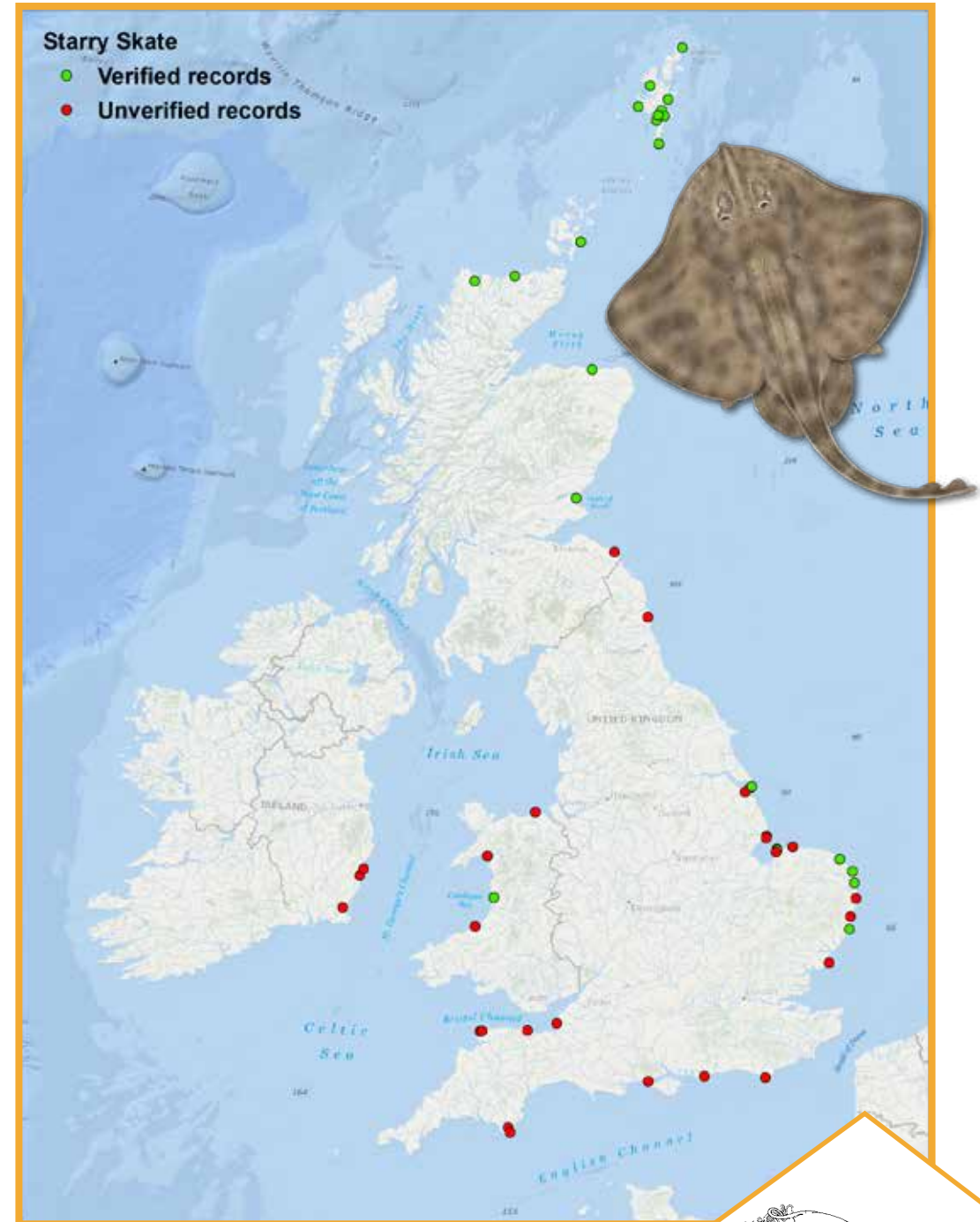


STARRY SKATE

Amblyraja radiata

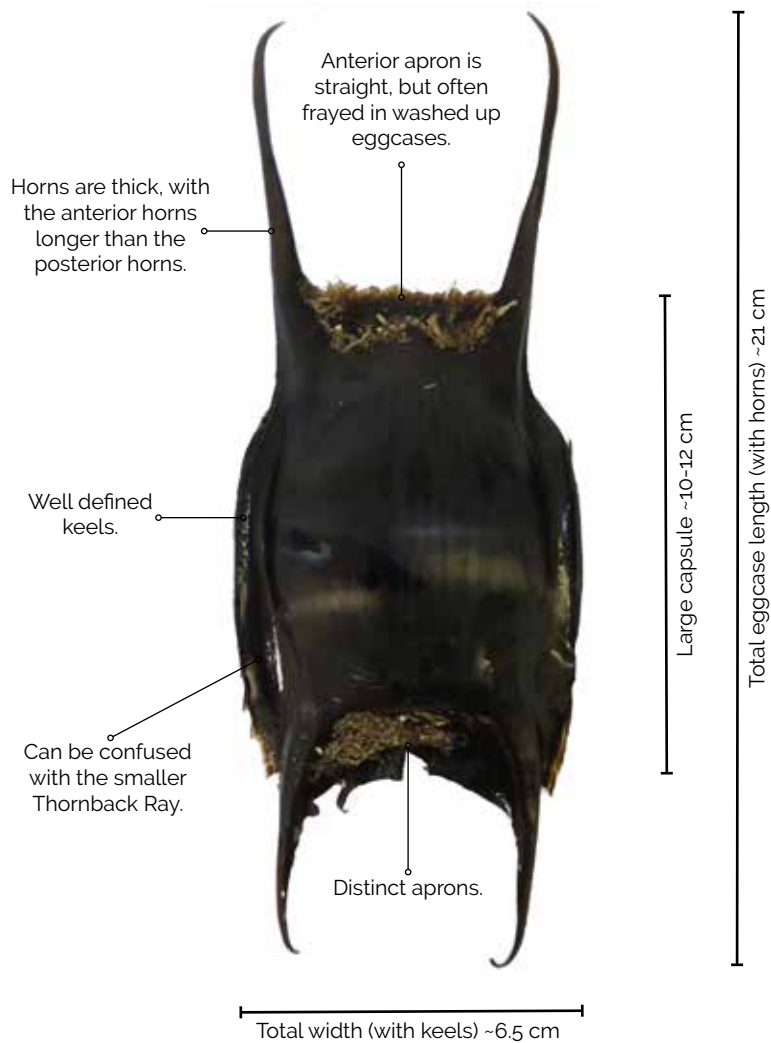


In the East Atlantic, the Starry Skate is present from the southern North Sea to Iceland and Norway. All verified eggcase records submitted to the Great Eggcase Hunt are from North Sea coasts from Suffolk up to the Shetlands, with the exception of one unusually large specimen found in Borth, Wales, which is outside of the expected range.

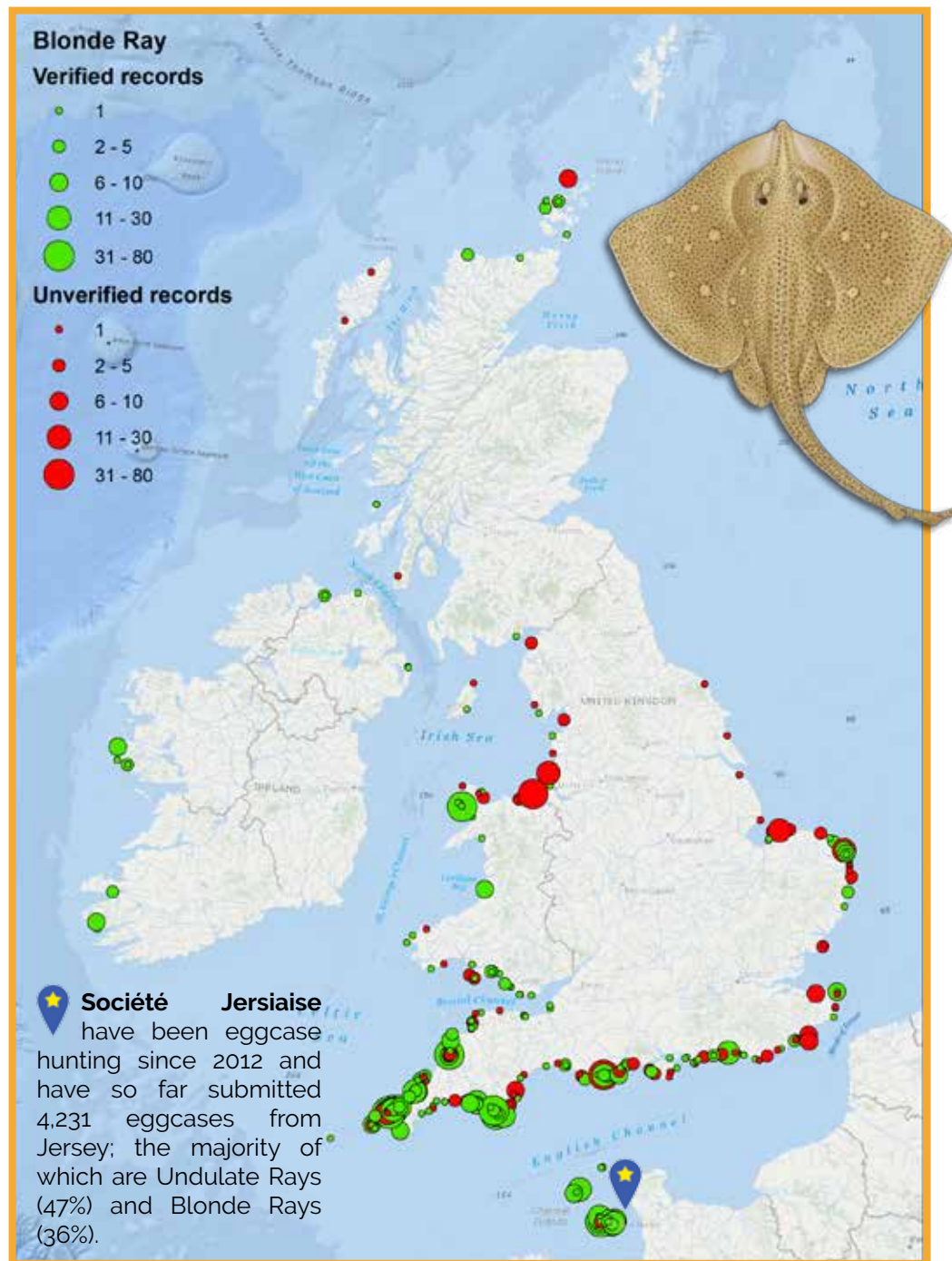


BLONDE RAY

Raja brachyura

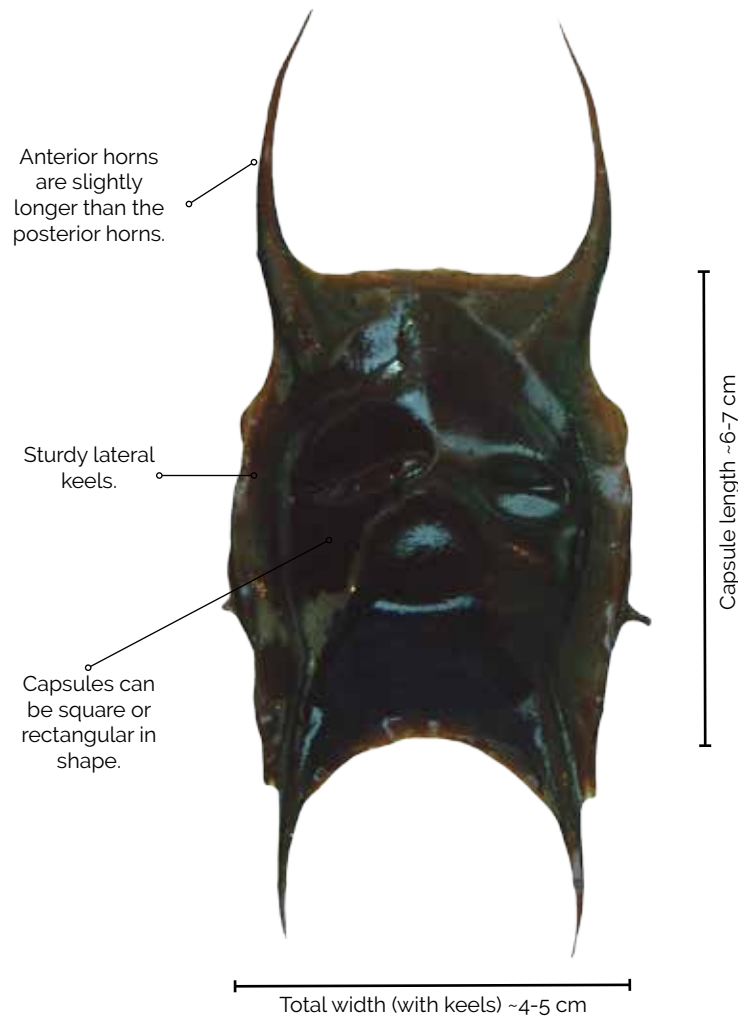


In the Northeast Atlantic the Blonde Ray can be found from Norway down to Morocco. Verified records submitted to the Great Eggcase Hunt are predominantly from southwest coasts and the Channel Islands, with dispersed reports from around the rest of the British coastline.

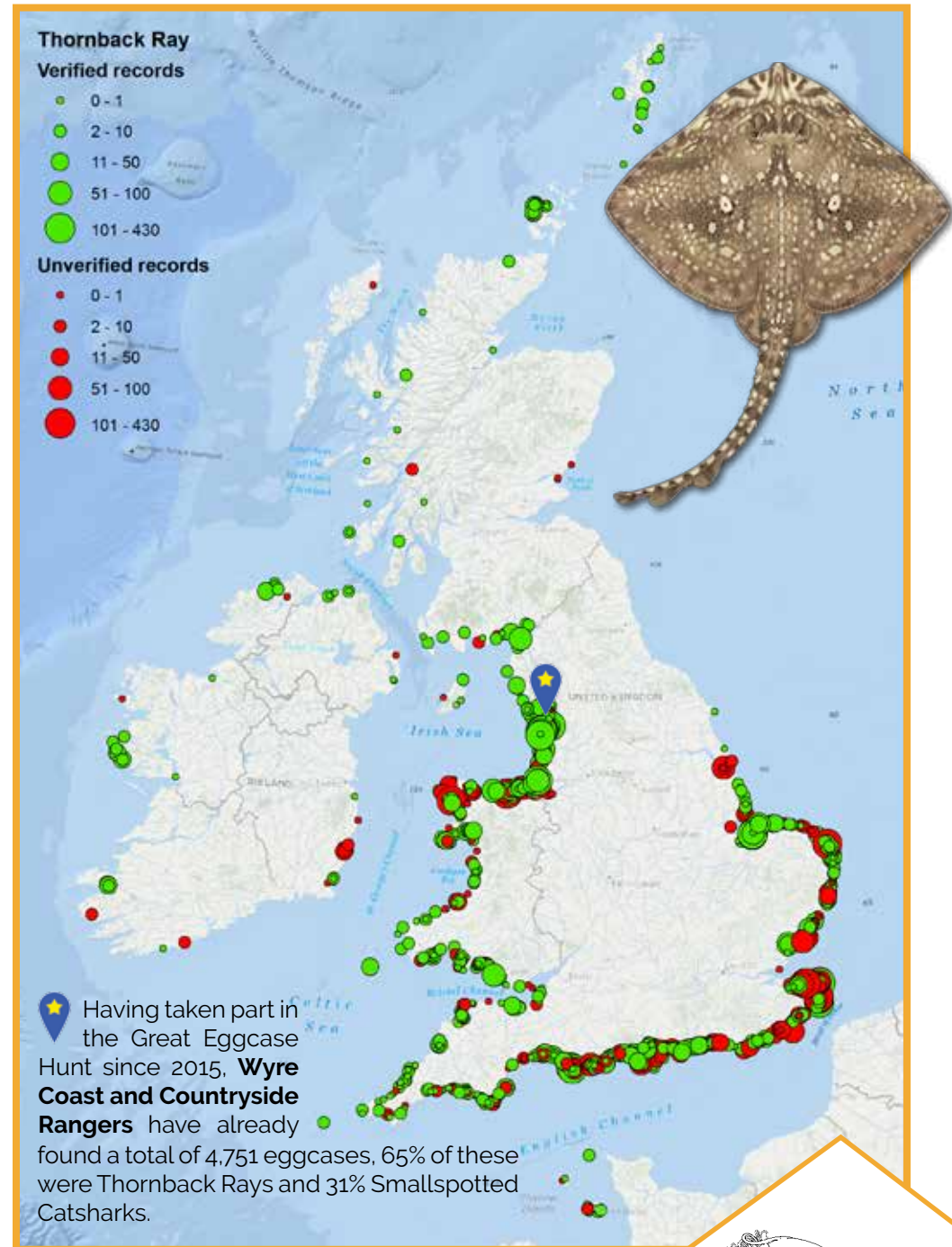


THORNBACK RAY

Raja clavata



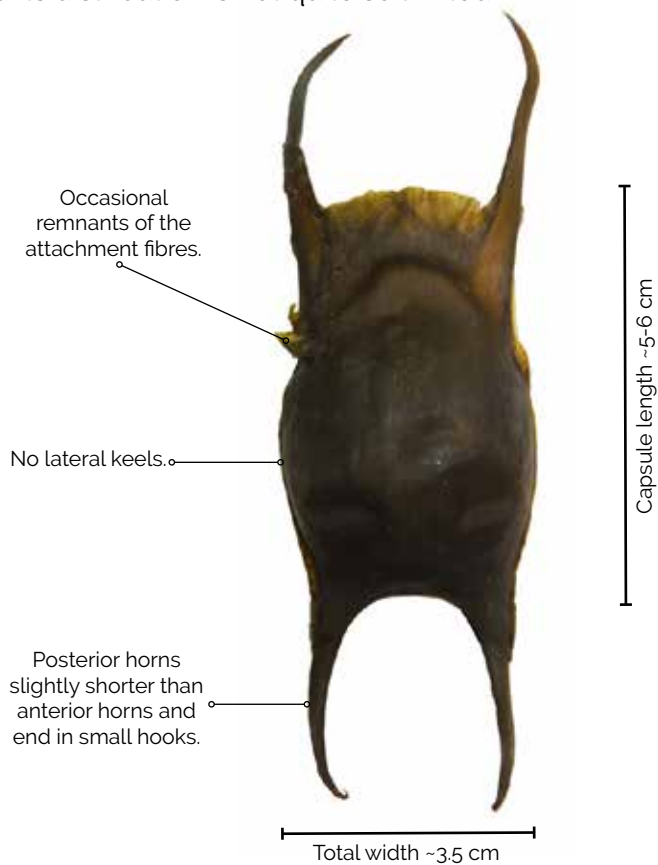
The Thornback Ray has a broad distribution and is one of the most abundant elasmobranchs in the Northeast Atlantic. Thornback Ray eggcases are commonly reported to the Great Eggcase Hunt and have been submitted from the majority of the British coastline.



SPOTTED RAY

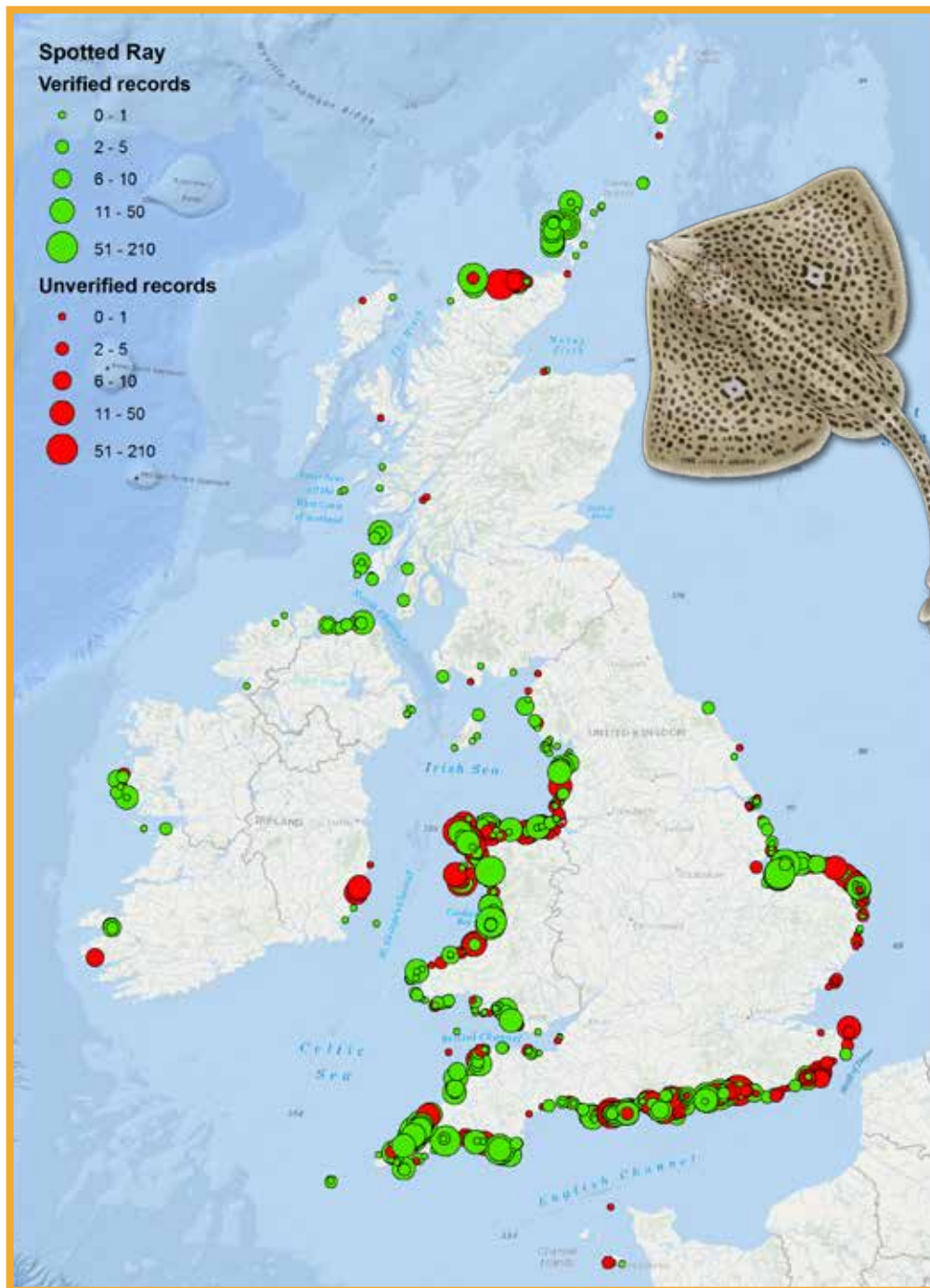
Raja montagui

The Spotted Ray is widely distributed in the Northeast Atlantic. Eggcases have been submitted to the Great Eggcase Hunt from around most of the British coastline. The eggcase of the Spotted Ray is generally smaller, less robust and 'neater' than the larger Undulate Ray eggcase and its distribution is not quite so limited.



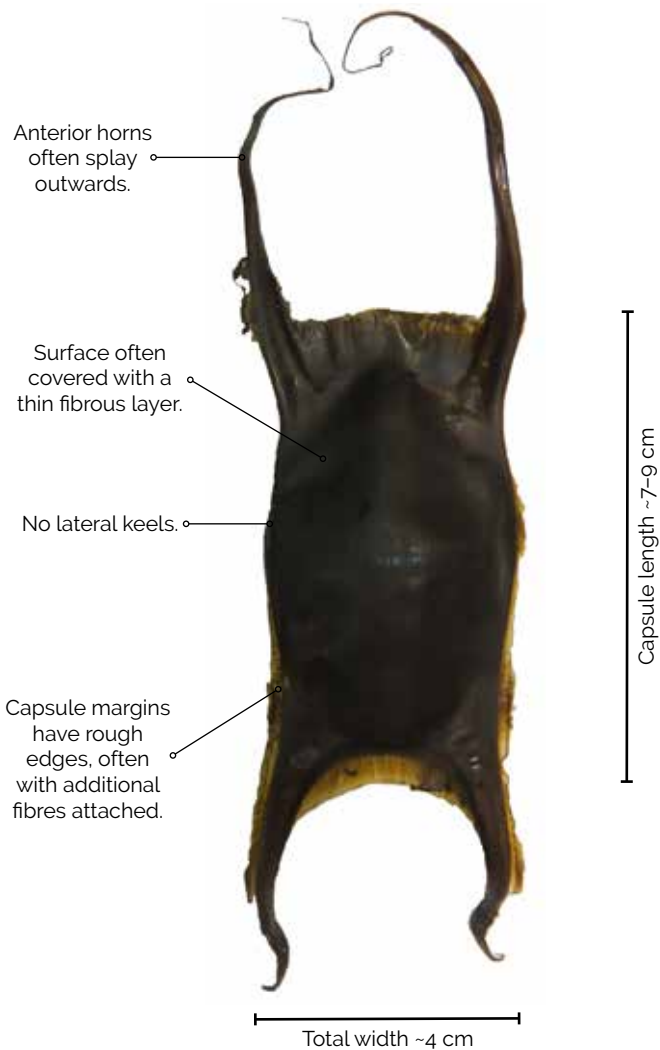
"Spundulates"

Spotted Ray and Undulate Ray eggcases are very similar in appearance and there is often an overlap of size. This can cause confusion between these two species, particularly in areas where both species occur, such as the English Channel.

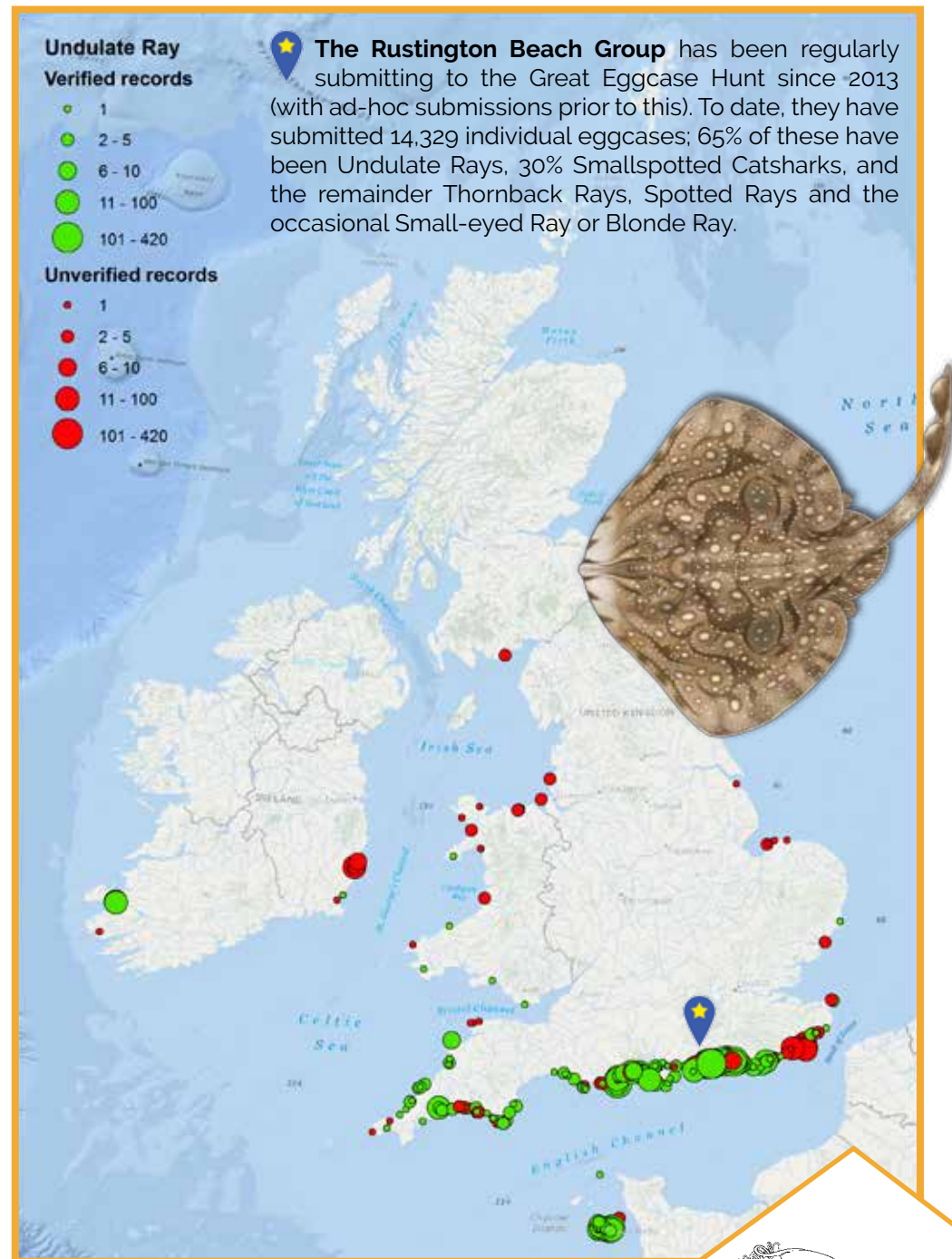


UNDULATE RAY

Raja undulata

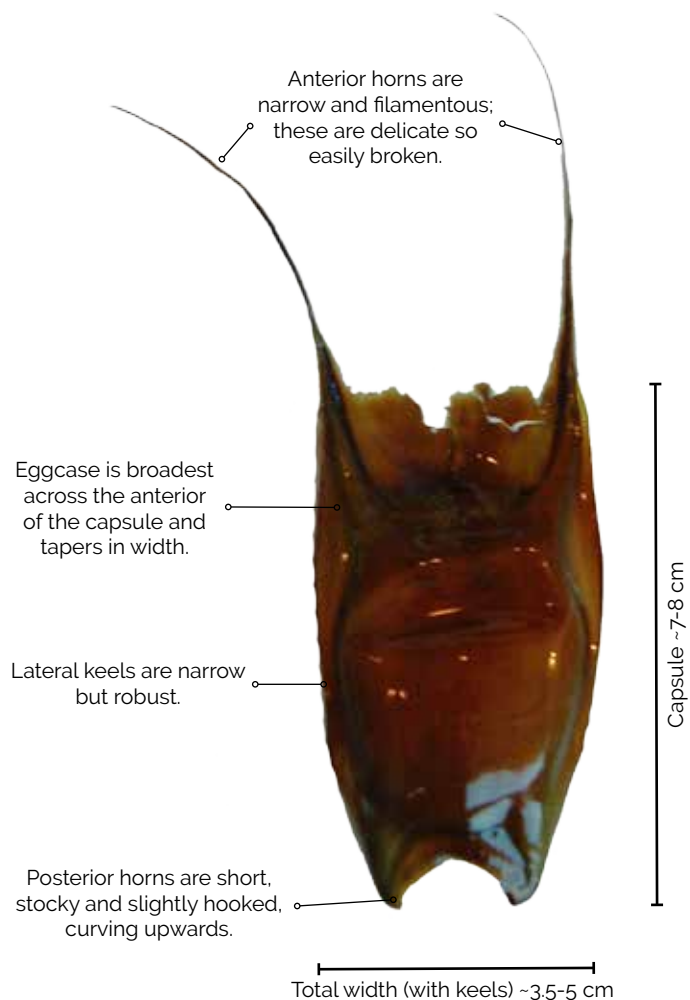


Undulate Rays have a patchy distribution in the Northeast Atlantic, although can be locally abundant in some areas – the south coast of the British Isles represents the most northerly part of their range. The majority of verified records submitted to the Great Eggcase Hunt are from the south coast, in particular the eastern English Channel, and around the Channel Islands. The eggcase of the Undulate Ray is larger and more 'ragged' at the margins than the similar Spotted Ray, and the upper horns are often splayed.

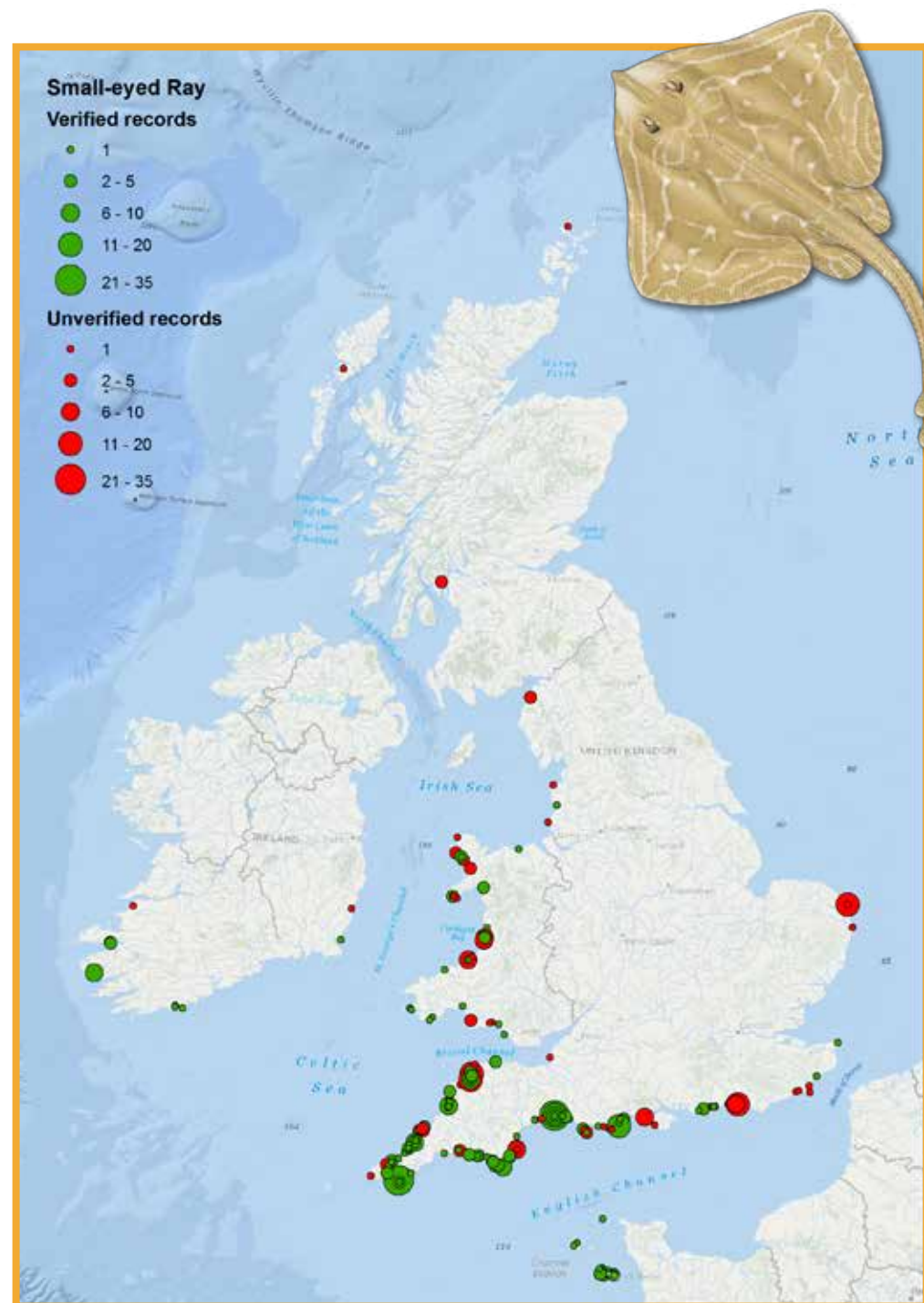


SMALL-EYED RAY

Raja microocellata

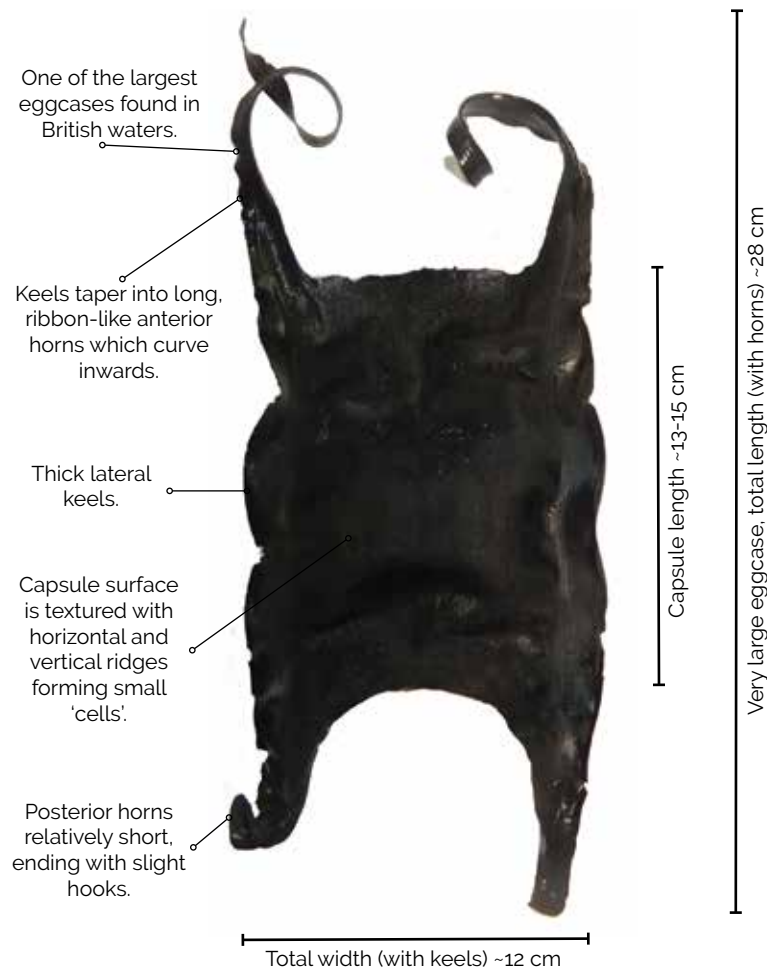


In the waters of the Northeast Atlantic, the range of the Small-eyed Ray extends from the British Isles down to Morocco. In British waters this species is locally abundant in some areas, such as the Bristol Channel. The majority of Small-eyed Ray eggcases are reported to the Great Eggcase Hunt from southwest coasts.

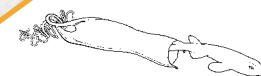
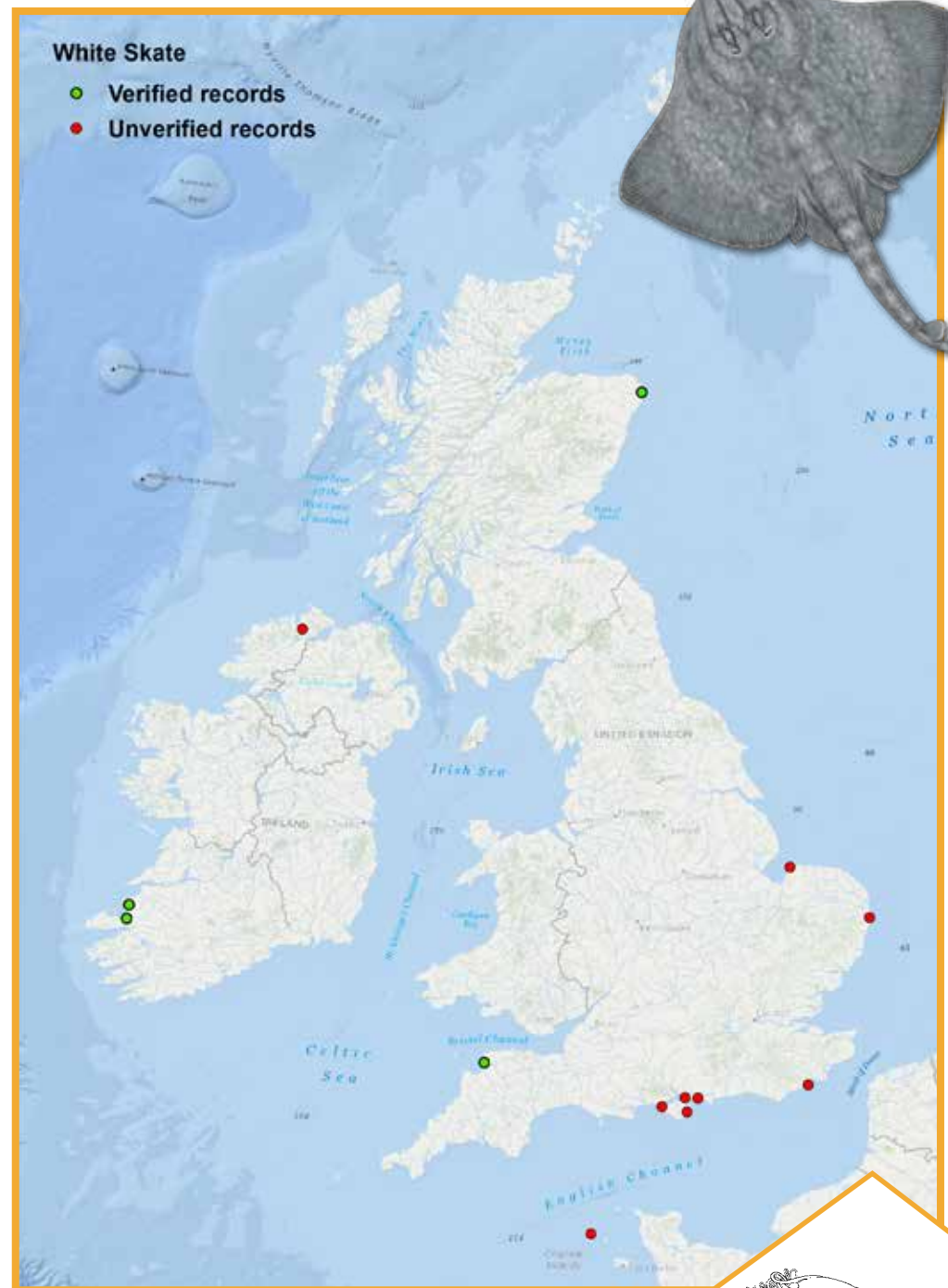


WHITE SKATE

Rostroraja alba

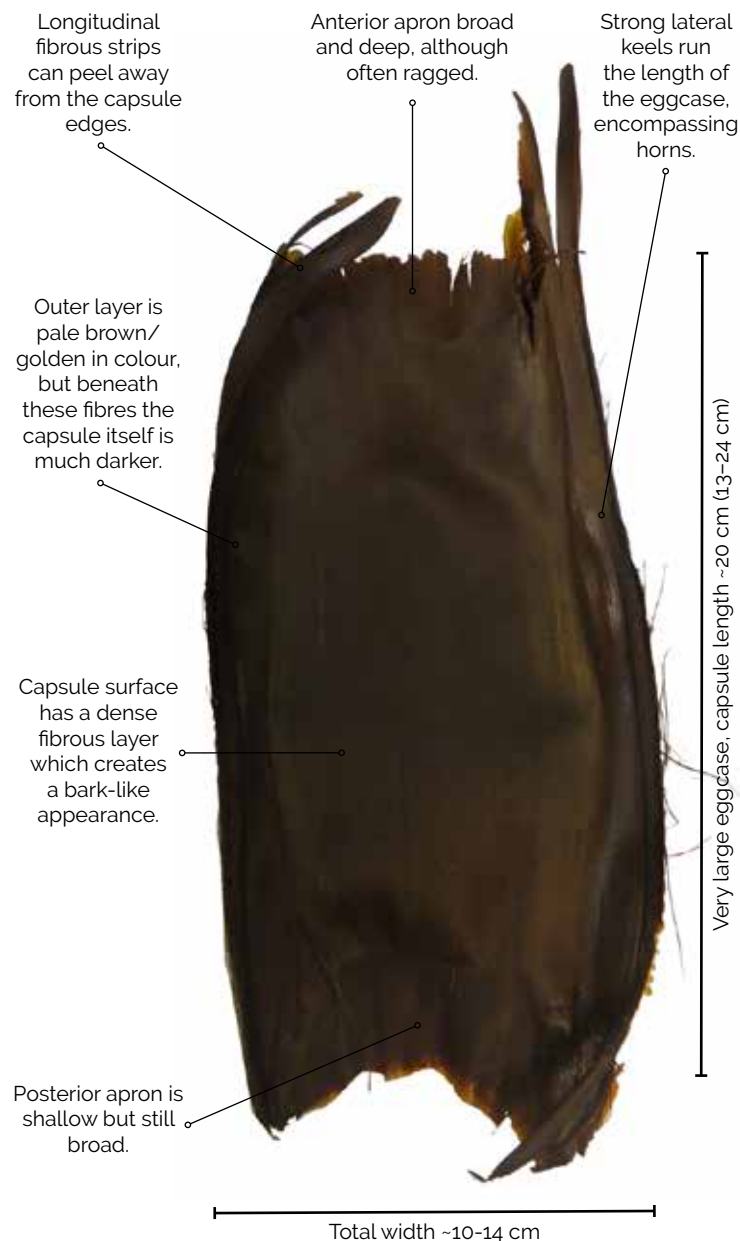


Although the distribution of the White Skate in the Northeast Atlantic extends from the British Isles to South Africa, this Critically Endangered species is now rarely encountered in British waters. Just 15 eggcases have been reported to the Great Eggcase Hunt from the British Isles, with only nine verified by photo or specimen. Three of these were submitted from southwest Ireland which is within their known range, but surprisingly, verified White Skate eggcases have also been recorded from Peterhead (Scotland), Braunton Burrows (North Devon) and Fair Isle.



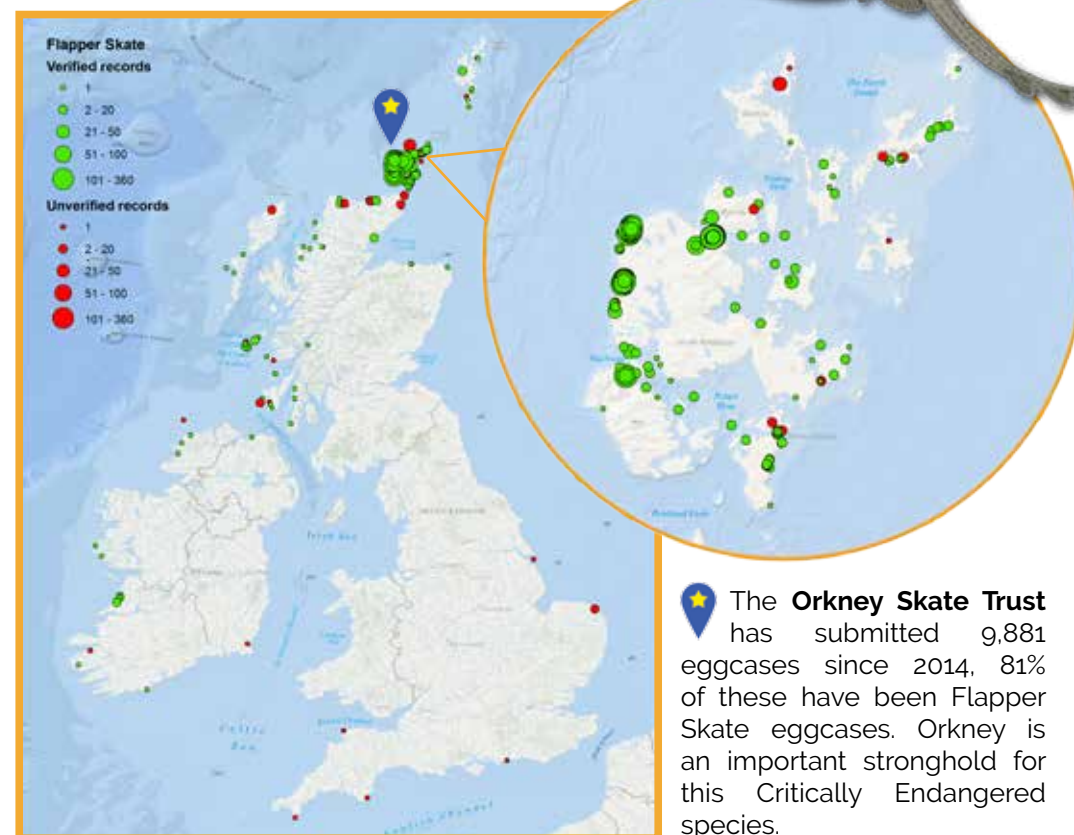
FLAPPER SKATE

Dipturus intermedius



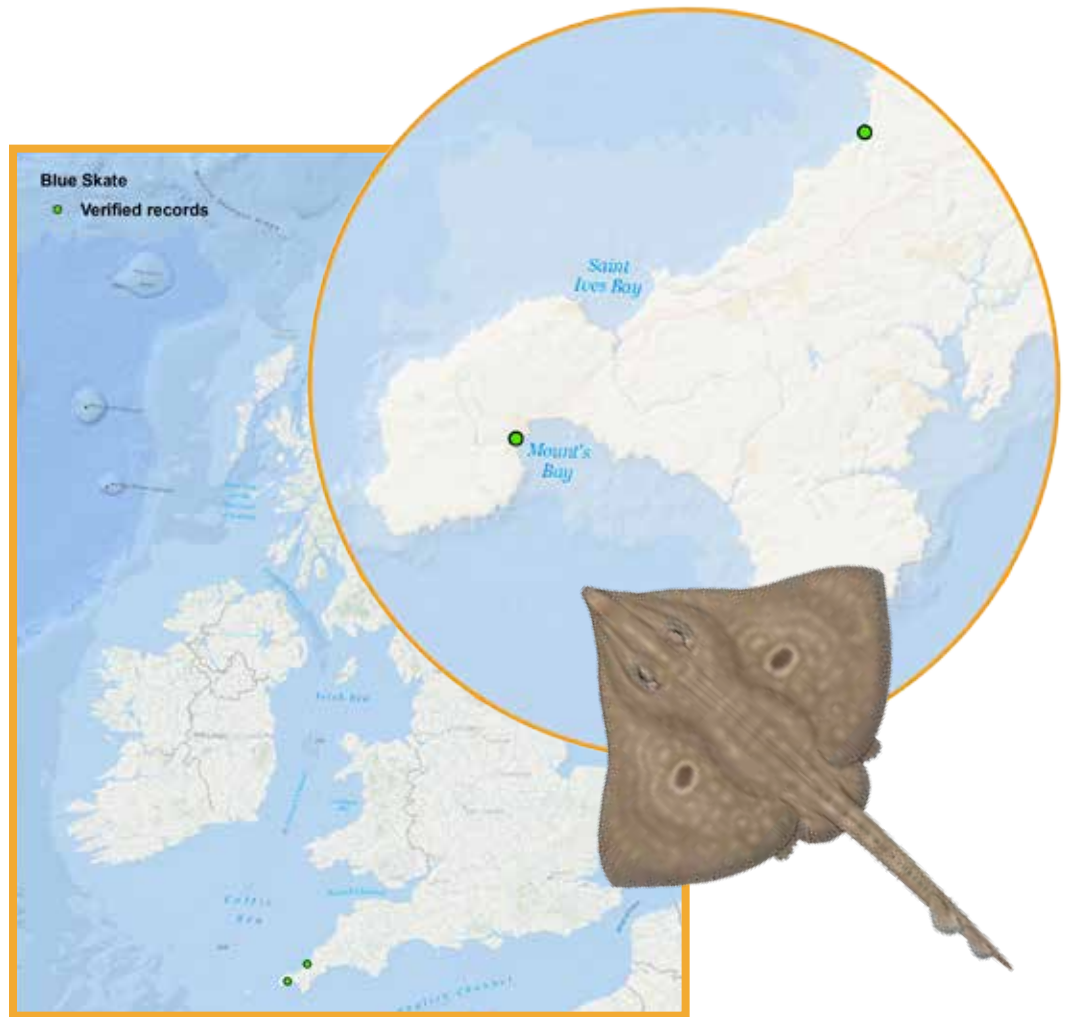
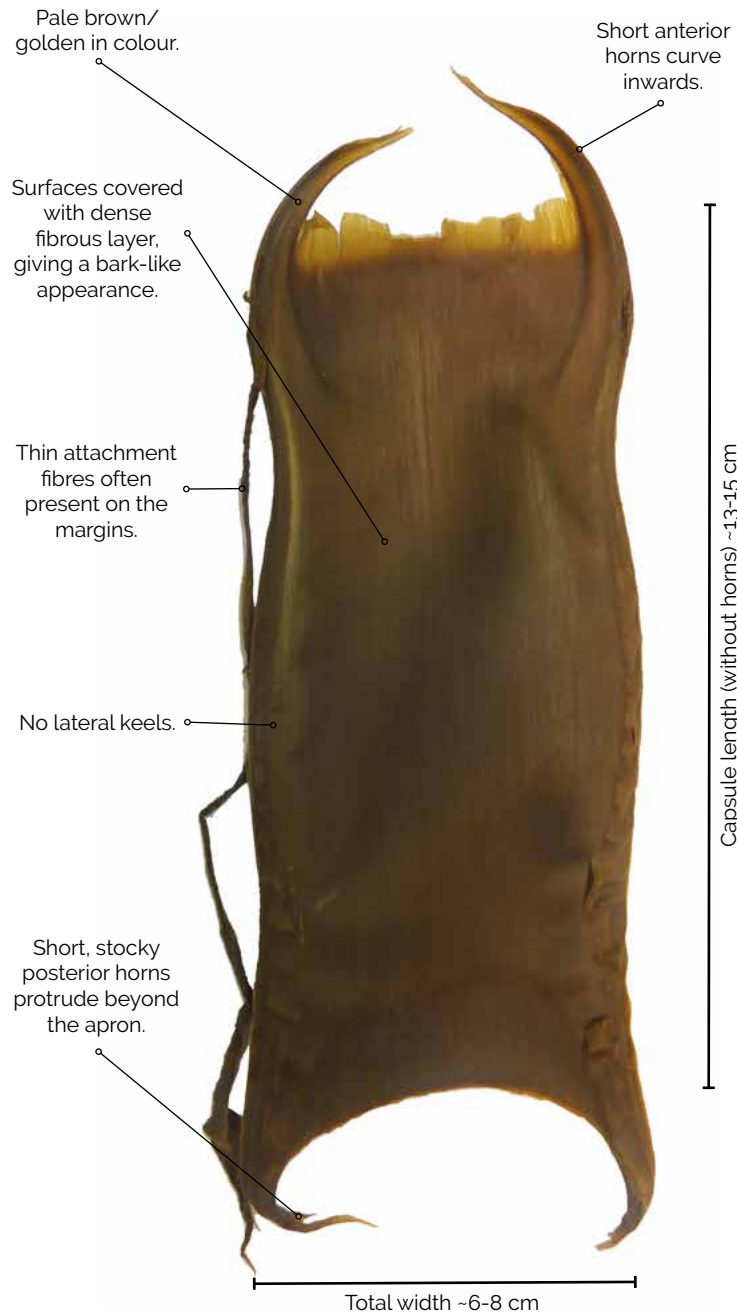
What was previously known as the 'Common Skate' has now been recognised as a complex of two species that have long been confused under the same scientific name

Europe's largest skate was once widespread across large parts of the Northeast Atlantic; however it is now locally extinct from much of its former range. It is still found around northwest Scotland and the Northern Isles, as well as further south in the Celtic Sea. Most Flapper Skate eggcases submitted to the Great Eggcase Hunt have been from Orkney, indicating important grounds for this Critically Endangered species. Other confirmed reports include from the west coast of Scotland and surrounding isles, and from the west coast of Ireland.

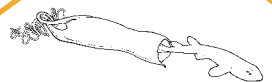


BLUE SKATE

Dipturus batis (or *Dipturus flossada*)

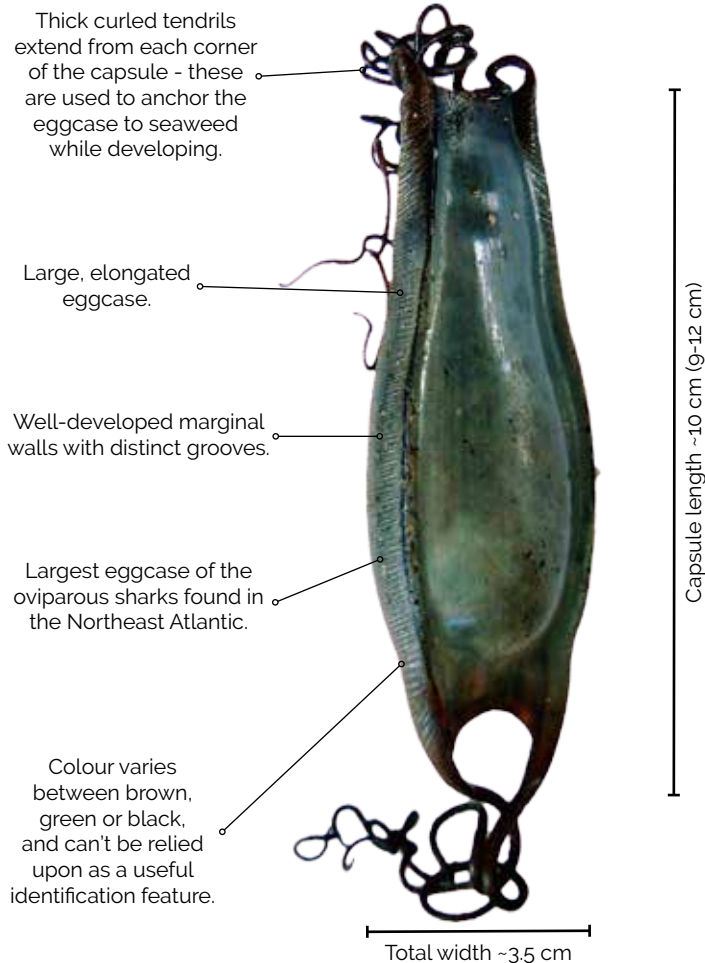


The Blue Skate generally has a more southerly distribution than the Flapper Skate, however the distribution of both species overlaps in the Celtic Sea to northwest Scotland. Only three Blue Skate eggcases have been reported to the Great Eggcase Hunt, two were found in July 2014 on Perranporth Beach, Cornwall, the third was found in Penzance, Cornwall in November 2015.

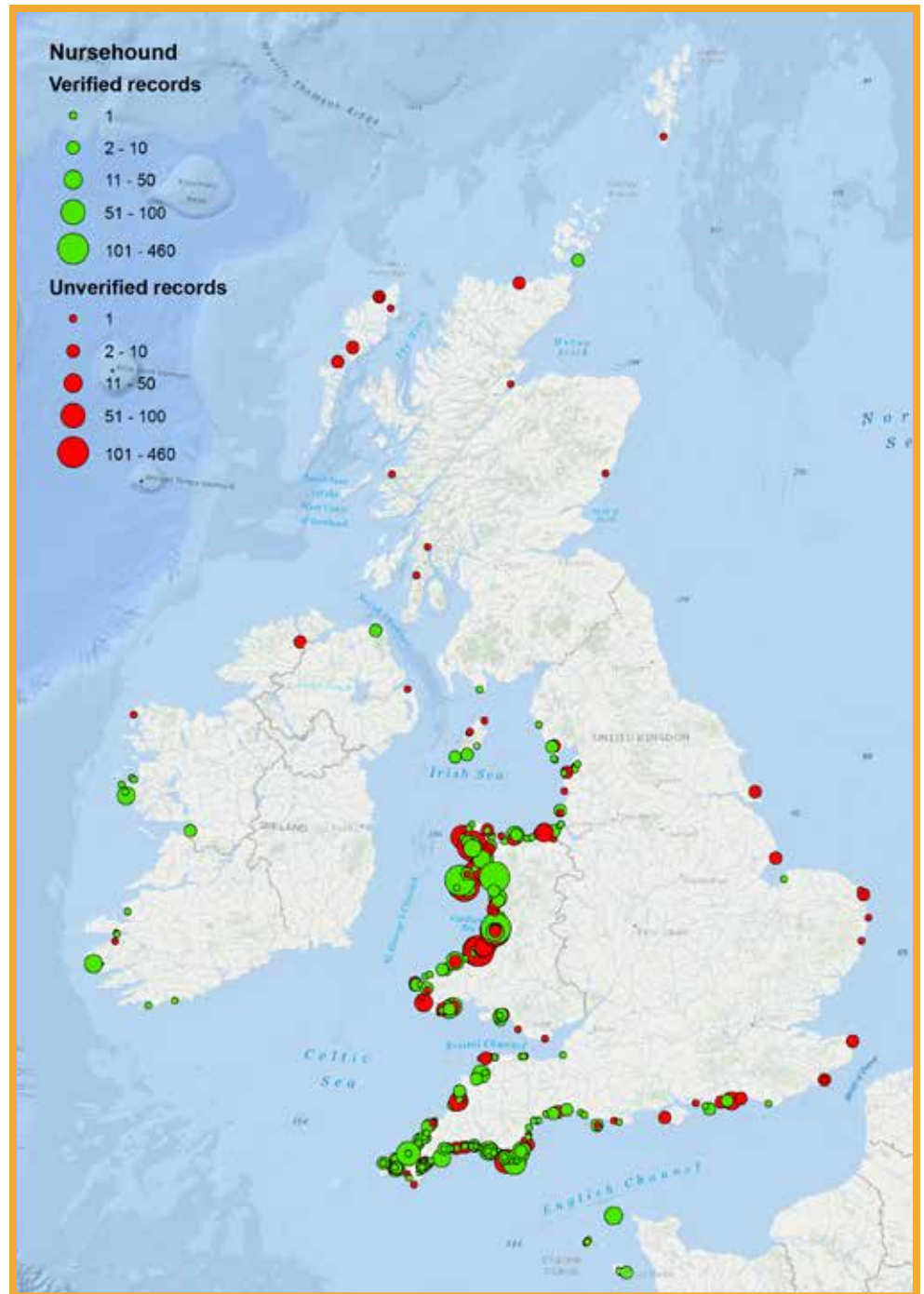


NURSEHOUND

Scyliorhinus stellaris

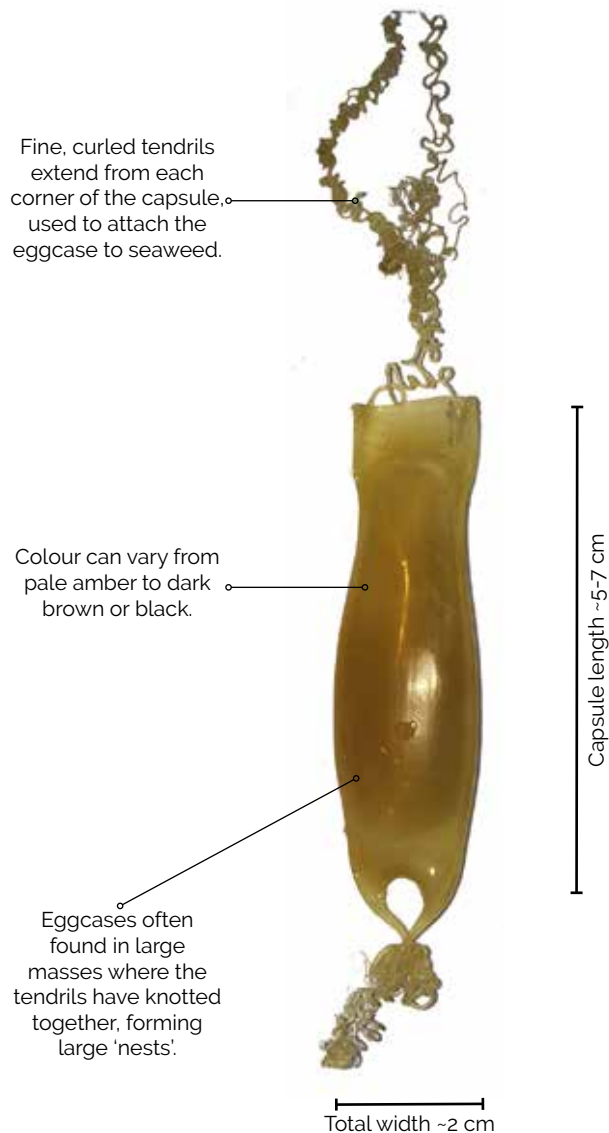


The Nursehound (or Bull Huss) is usually found in shallow waters close to rocky shores. The verified eggcases reported to the Great Eggcase Hunt are predominantly from the southwest of England and around Wales - in particular, large numbers are reported from western and northern Wales including from Aberystwyth and the Llŷn Peninsula.

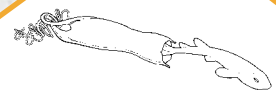
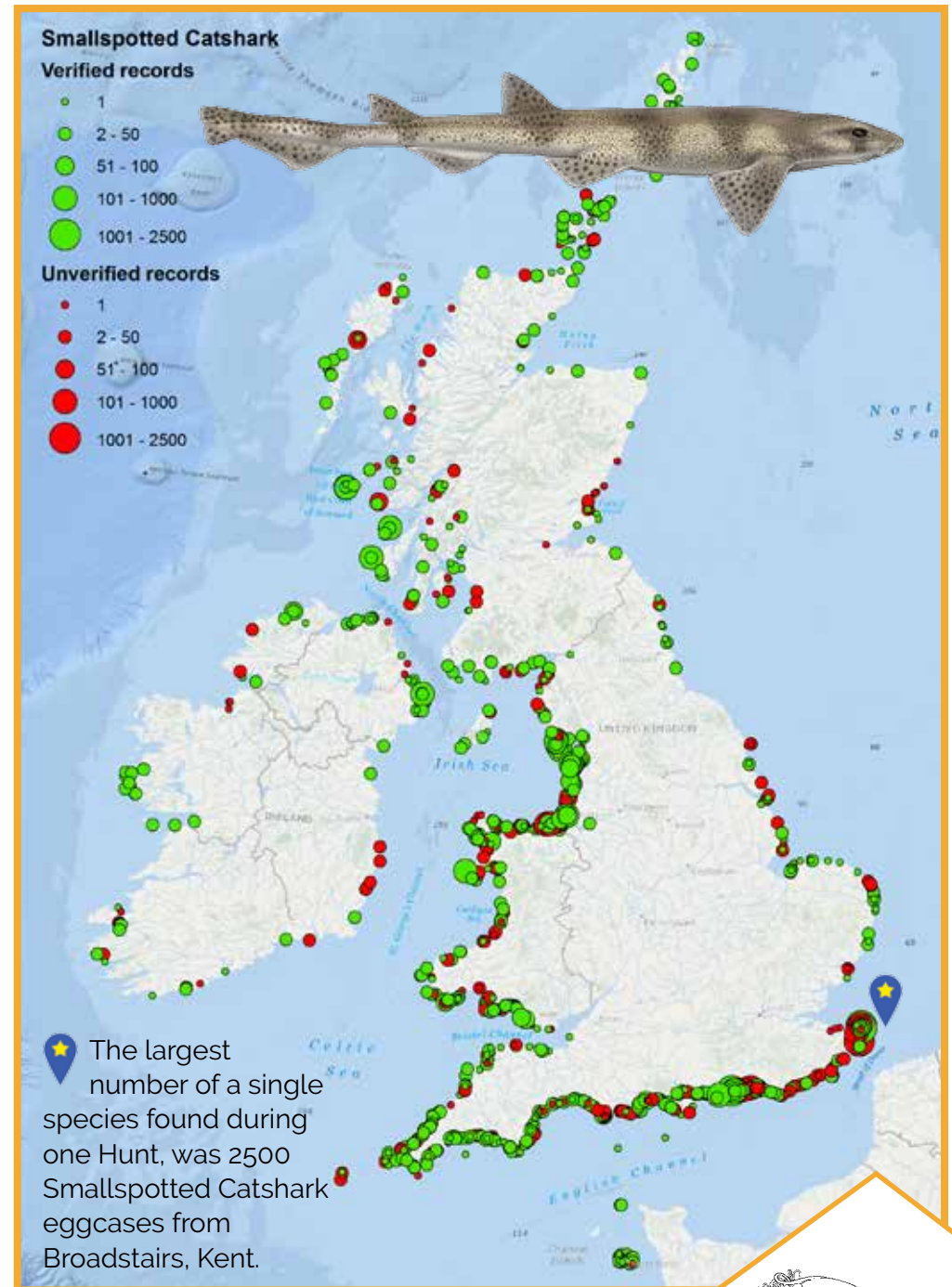


SMALLSPOTTED CATSHARK

Scyliorhinus canicula

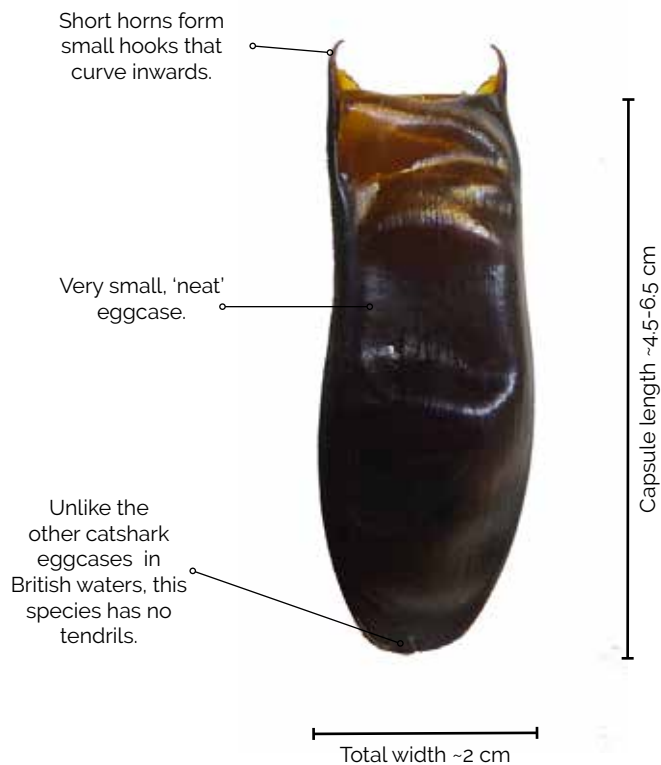


This is one of the most abundant shark species in British waters and as it is a coastal species, it is often encountered by divers and snorkelers. Empty eggcases are frequently washed ashore and have been reported from around the majority of the British coastline, often found in very large numbers. The eggcase is a similar shape to the Nursehound eggcase, but much smaller.



BLACKMOUTH CATSHARK

Galeus melastomus



The Blackmouth Catshark is a deep water species and so eggcases are rarely washed ashore and reported. Just three have been submitted to the Great Eggcase Hunt to date – the first from North Uist (Outer Hebrides) in August 2007, the second from County Donegal (Ireland) in May 2015 and the third from County Clare (Ireland) in February 2016. This species can be confused with the Smallspotted Catshark as it's similar in size and shape, however it has small horns instead of curled tendrils.

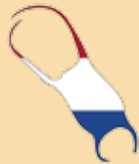


EGGCASES AROUND THE WORLD!

Eggcases have been submitted from all around the world, including South Africa, Australia, USA, South America, Malta and Israel, so the project has certainly generated interest over the years! The Trust is now working with additional partners to extend the project beyond British shores, in particular into the Netherlands, Portugal and the USA. Sister projects to the Great Eggcase Hunt have long been established in Ireland (Purse Search from Marine Dimensions) and France (Programme CapOeRa from APECS).



NETHERLANDS



De Grote Eikapsel Jacht

The Dutch Great Eggcase Hunt (De Grote EikapselJacht) was launched in the Netherlands in April 2015 in collaboration with the Dutch Shark Society. Since the launch, 477 eggcases have been submitted from six different species (Smallspotted Catshark, Nursehound, Blonde, Thornback, Spotted and Undulate Rays). The Dutch Shark Society has linked in with beach cleans and student groups and drummed up media coverage to encourage public recording. Both the Shark Trust and the Dutch Shark Society are excited to see how the project continues to develop! www.eikapsel.org

PORTUGAL



A Grande Caça aos Ovos

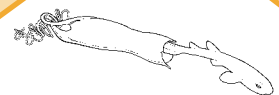
Great Eggcase Hunt materials have been translated into Portuguese, and in collaboration with the Portuguese Association for the Study and Conservation of Elasmobranchs (APECE), we are developing *A Grande Caça aos Ovos*. We're already looking forward to receiving more eggcase reports from the Portuguese coast!

USA



GREAT EGGCASE HUNT: USA

The Shark Trust has been working towards launching the Great Eggcase Hunt in the USA, starting from the Eastern Seaboard. There is very little crossover in species between the British Isles and USA, and so new identification materials are being created for those found in Northwest Atlantic waters. Eggcases are often submitted to the Great Eggcase Hunt from the States and we've already received a huge level of enthusiasm for developing the project there, so we're sure it will be a hit!



THE VALUE OF CITIZEN SCIENCE

We are constantly overwhelmed by the enthusiasm we receive for the Great Eggcase Hunt! You have helped make it a hugely popular and effective project. Shark conservation is often thought of as something that needs to take place in tropical locations or underwater, but this project proves that you can discover evidence of sharks and their relatives while visiting the stunning coastline around the British Isles – no matter the weather! By recording an eggcase, not only are you engaging in shark conservation, you're becoming a citizen scientist and providing us with useful results. One eggcase may not seem like much, but it is information, and as information builds, it becomes data, and that data shows the bigger picture!

Although we have seen a huge increase in submissions over the years, this does not necessarily indicate that there has been a huge increase in egg-laying activity. As the project gathers profile and support, more and more people are actively getting involved and checking out their local beaches. It's so important for us to be able to verify eggcases as it improves the quality and reliability of the database so please continue to submit your records with photos of your finds.

We also love receiving pictures of eggcase hunts in action – no matter the age of the participant. We encounter many people who collected mermaid's purses as a child but never knew what they actually were, others who assumed these strange shaped objects were seaweed and we hear stories from people desperate to discover their first eggcase or find the full set of species. It really is a project for all ages.

The project has a number of dedicated eggcase hunters who survey their local beaches regularly and thoroughly, but equally there are many who simply find one eggcase while taking a stroll and then find their way to the Great Eggcase Hunt to identify and report what they have found. Whether sending us parcels of eggcases with paper forms, submitting the online recording form with photos or uploading submissions through the smartphone app, we are grateful for all records no matter how they come to us! If you have access to a beach, the Great Eggcase Hunt is easy to get involved with, requires very little equipment, contributes to conservation efforts and as well as being competitive and completely addictive, it's fun!





THE FUTURE

The Great Eggcase Hunt shows no sign of slowing down and is receiving more records than ever from our army of eggcase champions. Back in 2003 when the project was first established, just 128 eggcases were recorded; compare that to a staggering 28,451 recorded in 2015 and it shows just how much the project has grown during that time. This report celebrates reaching 100,000 records, yet we've already greatly exceeded this number, so momentum is certainly growing.

While the Great Eggcase Hunt has answered many questions, it has also raised many more. Eggcase hunting has taken us to museums as well as beaches as we search for the identity of some of the eggcases of deeper-water species. We also have plans to combine the results generated by the Great Eggcase Hunt with known distribution data for juvenile skates and in doing so, possible nursery grounds could become more evident.

The Great Eggcase Hunt is expanding and the Shark Trust is working with additional partners to help it reach further shores. De Grote Eikapsel Jacht is already up and running in the Netherlands in association with the Dutch Shark Society and A Grande Caça aos Ovos will soon be reaching the Portuguese coast thanks to APECE. Plans for developing GEH:USA are underway and we look forward to being able to introduce an ID Guide for Northwest Atlantic egg-laying species.

In the meantime, we are excited to see whether any more unusual finds are recorded around the British Isles and of course, we will always be welcoming new eggcase hunters!



GLOSSARY

- ▶ **Batoids:** superorder of **elasmobranchs** - includes rays, skates and sawfish.
- ▶ **Cartilaginous fish:** fish with a skeleton made of cartilage rather than bone.
- ▶ **Chondrichthyans:** refers to Chondrichthyes, the class of fish with a cartilaginous skeleton - includes sharks, skates, rays and chimaera.
- ▶ **Citizen science:** data collection by members of the general public.
- ▶ **Classification:** the ordering of organisms into groups on the basis of their relationship.
- ▶ **Eggcase:** tough 'leathery' case that protects the developing shark or skate embryo.
- ▶ **Elasmobranchs:** collective term for sharks, skates and rays.
- ▶ **Embryo:** early development stage of the young.
- ▶ **Holocephalans:** referring to the subclass Holocephali - chimaera
- ▶ **In-situ:** refers to organisms in the wild

- ▶ **Intrauterine cannibalism:** a form of **ovoviviparity** where pups eat their un-hatched siblings while within the female.
- ▶ **Mermaid's Purse:** the eggcases of **oviparous** sharks, skates and rays.
- ▶ **Oophagy:** a form of **ovoviviparity** where unfertilised eggs are released to feed growing embryos.
- ▶ **Oviparous:** mode of reproduction where eggs are produced and left to develop on the seafloor or attached to a **substrate**.
- ▶ **Ovoviviparous:** mode of reproduction where eggs develop and hatch within the body of the female before being born as fully developed live young.
- ▶ **Selachians:** superorder of **elasmobranchs** - sharks.
- ▶ **Spring tide:** when the tidal range is at its maximum creating the greatest difference between high and low water; occurs just after a new or full moon.
- ▶ **Strandline:** formed of marine debris and seaweed that has washed ashore by the tide.
- ▶ **Substrate:** surface which an organism grows on or is attached to.
- ▶ **Teleost fish:** fish with a skeleton made of bone.
- ▶ **Viviparous:** live-bearing mode of reproduction, as with mammals.

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THANK YOU!

The Great Eggcase Hunt would not be possible without all of you who have recorded eggcase finds over the years - whether you have recorded one eggcase or a hundred, our heartfelt thanks go out to you.

Thank you to all of the marine centres, wildlife groups, conservation clubs and beachcombers who tirelessly submit eggcase records, encourage others to do the same and share the Great Eggcase Hunt with members and visitors.

Thank you to CEFAS (particularly Jim Ellis) for collecting eggcases from sea surveys and for helping us to extend our ID Guide to include the Blue Skate eggcase.

Thank you to John Hepburn for reporting eggcases since day one of the project, and for discovering the Nursehound egg-laying site at Wembury Point. Thank you to Paul Kay for providing photos and details of many underwater eggcase finds.

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www.eggcase.org



