



# SSC DIVE IN!

## SEALS



Grey seal pup ©  
Emily Burton



Harbour seal ©  
Jamie McDermaid



Seals on Isle of May © Greg MacVean



# WELCOME!

**Hello, and welcome to the Scottish Seabird Centre “Dive In” Packs of resources providing some seaside fun directly into family homes and classrooms.**

**This pack’s theme: [Seals](#)**

Sleek and agile, seals are perfectly adapted to life at sea. Seals breathe air but can also dive deep under water. You may spot their whiskered faces bobbing up above the waves, or catch them taking some time out of the water to rest on a rock or sandbank.

Dive into this pack to discover more about seals around Scotland and beyond.

## **Inside this pack:**

- **Introduction: Seal Overview**
- **Factfile: Seal facts from around the world**
- **Discover: Seals in Scotland**
- **Discover: Threats to Seals**
- **Puzzle: Word Search**
- **Factfile: Protection of Seals**
- **Wildlife Watching Tips**
- **Craft: Make a life-size cut-out seal**
- **Factfile: Seal Scientists**
- **Seal Myths and Stories**

**We’d love to hear from you!** If you’ve had fun having a go at activities, experiments and crafts, let us know. Any comments or pictures can be sent to [marineengagement@seabird.org](mailto:marineengagement@seabird.org). More resources are available on our [website](#).

**Enjoy using our packs and want to see more?** The Scottish Seabird Centre is an environmental conservation and education charity. Every penny we raise helps us deliver our important education and conservation work. If you enjoy using our resources and would like to support our work, please consider making a donation to our [JustGiving page](#). Thank you.

We hope you enjoy diving in to the pack!

***Scottish Seabird Centre Learning Team***





# INTRODUCTION

## SEAL OVERVIEW

Seals, like humans, are **mammals**. Did you know that there are 33 species of seals in the world? They are part of the animal group known as **pinnipeds** (carnivorous aquatic mammals). This group includes **true seals** – lacking a visible external ear flap (*Phocidae*), **eared seals** (*Otariidae*) and the **walrus** (*Odobenidae*). Seals are amazing animals with lots of special features, some of which are shown below.

Seal eyes are specially adapted to see under water.

All seals moult their old skin and hair once a year.

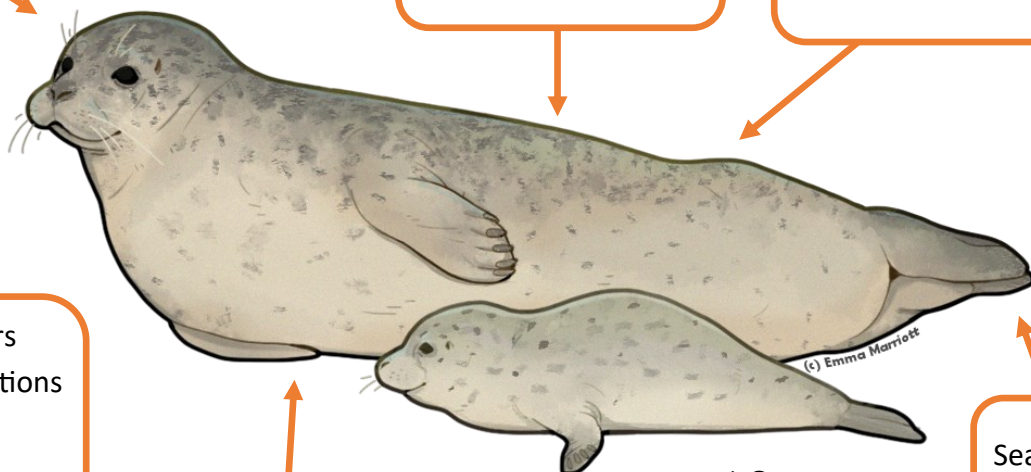
Seals have a layer of fatty tissue under their skin called **blubber**.

Seal whiskers detect vibrations in the water caused by moving **prey**.

Long claws on their front flippers help seals move on land.

Female seals produce milk to feed their young.

Seals are 'pinnipeds' meaning fin-footed.



Artwork © Emma Marriott

A female seal is known as a **cow**. A male seal is known as a **bull**. A young seal is called a **pup**. A newborn seal pup can look quite different from its parents. The coat that a Grey seal pup is born with is fluffy and not waterproof. As pups feed from their mothers, they quickly gain weight, develop **blubber** and will soon moult to replace their first coat with a waterproof one.





# FACTFILE

## SEALS AROUND THE WORLD

### SMALLEST

The **Baikal seal** is the smallest true seal (no external ear flap) in the world. These seals are only found in Lake Baikal in Siberia, Russia. Adult Baikal seals typically grow to about 1.1 to 1.4 metres (3.6 to 4.6 feet) in length and weigh between 50 to 130 kilograms (110 to 290 pounds). For most of the year they are solitary animals (live alone).



### LARGEST

The **Southern Elephant seal** is the largest seal in the world. Males can reach lengths of up to 6.85 metres (22.5 feet) and weigh as much as 4,000 kilograms (8,818 pounds), which is the same as a male Asian elephant. These massive seals are mainly found in the Southern **Hemisphere**, particularly around sub-Antarctic islands and the Antarctic Peninsula.



© Martin Fuchs, Pixabay

### DEEPEST DIVER

**Northern Elephant seals** are one of the deepest divers reaching depths of 760 metres (2,500 feet). This is as deep as the world's tallest building – the iconic Burj Khalifa in Dubai, United Arab Emirates. During their deep dives this seal is catching up on their sleep with short naps. We know this because their brain activity has been recorded by scientists.





# FACTFILE

## SEALS AROUND THE WORLD

### LONGEST MIGRATION

**Northern Elephant seals** also hold the record for the longest migration of any mammal travelling approximately 20,000 kilometres (about 12,427 miles) each year. Their journey sees them commute between their breeding beaches in California's Channel Islands to rich feeding grounds in the Pacific Ocean.



© Jamie McDermaid

### LONGEST LIVED

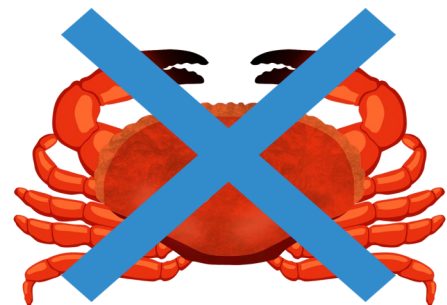
**Grey seal** holds the record for the longest lifespan among seals. A female grey seal off the coast of the Shetland Isles in Scotland is recorded to have lived to 46 years old.

### RARE AND EXTINCT

Some seals are rare, and one seal species has even gone **extinct**. **Caribbean monk seals** were once common in the Caribbean Sea and the Gulf of Mexico but sadly, due to over hunting and **habitat** destruction, they were declared extinct in 2008.

### MOST CONFUSING NAME

The **crabeater seal**, which is found in Antarctica, does not eat crabs at all. In fact they feed on another crustacean called Antarctic krill. This species of seal has highly specialized teeth to filter water for these tiny krill.





# DISCOVER

## SEALS IN SCOTLAND

Two seal species are commonly found, year-round, around the coastline of Scotland. Both the **Grey seal** and the **Harbour seal** (also known as the common seal) are well adapted to the North Sea's environment. They are true seals (without external ear flaps) and therefore belong to the Phocidae family. In this section we will help you find out more about the characteristics of these two marine mammals.

If you look carefully at the photograph below, you will see two Harbour seals resting on rocks, in a familiar 'banana' pose, and the head of a grey seal popping up above the surface of the water next to them on the right.



© Jamie McDermaid

We do occasionally have sightings of other seals around Scotland including the harp, hooded, bearded and ringed seals. Scotland has even been visited by walrus. The first to be sighted since 1954 was affectionately named "Wally" and visited the Western Isles, the Orkney islands and was seen off the Caithness coast of Northern Scotland in 2018. He was estimated to weigh 800 kilograms (1,800 pounds). In 2021 another massive walrus was spotted by a creel fisherman off the Treshnish islands which lie off the West coast of Mull.







# DISCOVER

## SPECIES PROFILE

### Grey Seal

**HALICHOERUS GRYPUS**



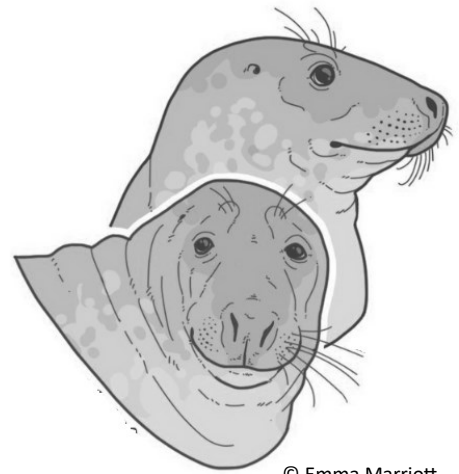
© Emma Marriott

#### SIZE:

The larger of the two species found in Scotland, the grey seal is about 1.8 to 2.1 metres long (6-7 feet). The male (bull), shown at the back of the image above, is larger than the female (cow).

#### WHAT DOES IT LOOK LIKE?

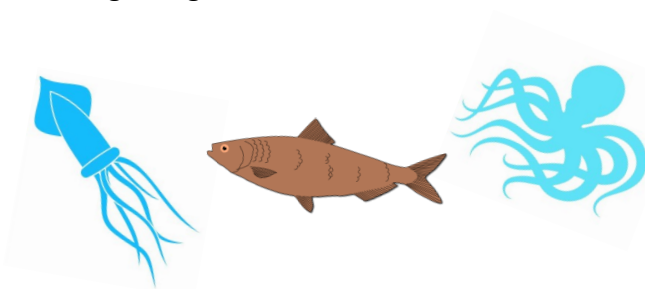
Grey seals have flat noses, their eyes are set midpoint between their nose and the back of their head. The grey seal's coat features more contrasting patterns. They have pale bellies and darker grey backs. Their spots and blotches are irregularly shaped and often larger than those on a harbour seal.



© Emma Marriott

#### MOVEMENT:

The grey seal has a slow and awkward movement on land due to its large size. When it moves it is often described as 'lumbering along'.



#### DIET:

They feed largely on fish with the main **prey** being sand eels; although cod, flatfish, herring, wrasse and skates, as well as squid and octopuses may also be taken.

#### HUNTING:

Skilled divers the grey seal can dive to 1,560 feet (475 metres) and may stay submerged under water for up to an hour.



# DISCOVER

## SPECIES PROFILE

### Grey Seal—continued

**HALICHOERUS GRYPUS**

Young Grey Seal  
© Emily Burton



#### BREEDING:

Female grey seals typically seek out a **dominant** male to breed with just three weeks after giving birth to their pups. The **gestation** period (when the young develops in the **womb**) is around 11 months.

#### PUPS:

Pups generally arrive between September and December at breeding sites (also known as 'rookery' sites). The females remain ashore for around three weeks to suckle (give milk to) the white-coated pups. The females then return to the sea leaving the pups behind for a period of fasting (not taking any food) and to shed their white coats ashore.

#### POPULATION SIZE:

The grey seal population in Scotland is quite significant. During the most recent surveys, approximately **25,412** grey seals were counted which is around a third (33%) of the world's total population.

#### KEY BREEDING SITES:

The largest grey seal colony in Scotland is located on the Isle of May, National Nature Reserve, in the Firth of Forth. It is also the fourth-largest breeding colony in the UK with 2,500 pups born each year. The largest site in the UK is Blakeney Point in Norfolk with over 3,000 pups born each year.



Grey seal pup with mother © Emily Burton

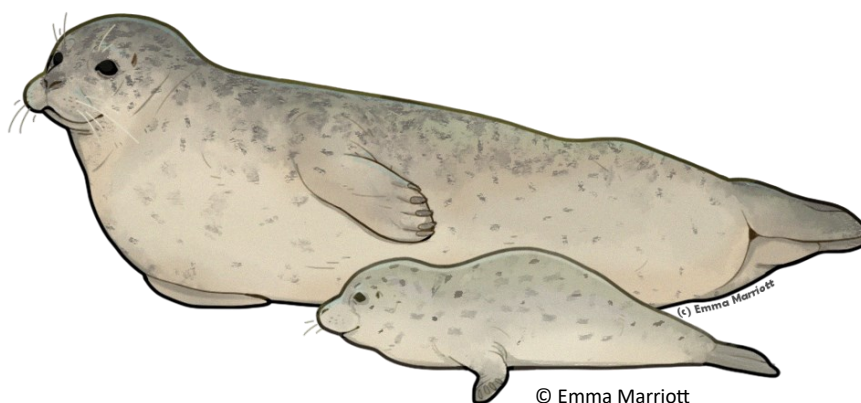




## SPECIES PROFILE

### Harbour Seal

PHOCA VITULINA



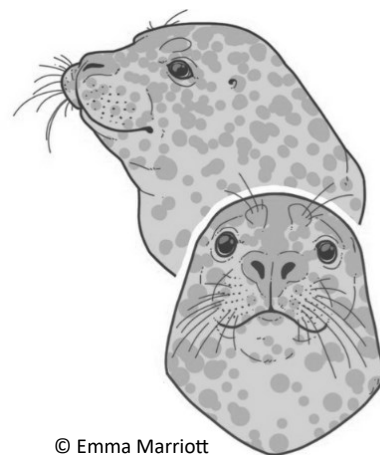
© Emma Marriott

#### SIZE

The smaller of the two species found in Scotland, the harbour seal is about 1.3 to 1.7 metres long. They are often spotted on sandy beaches and **estuaries**.

#### WHAT DOES IT LOOK LIKE?

Harbour seals have rounder, softer faces than grey seals and their eyes and mouth are set forward closer to their nose. Nostrils are 'V' shaped and may seem to meet in the middle. Harbour seals have a sleeker appearance. Their coat is spottier but more evenly distributed. You'll notice a dappled look, with fairly uniform (evenly spaced) spots across their body



© Emma Marriott

#### MOVEMENT

On land these seals are described as having a "caterpillar" motion, inching along gracefully with their flippers.



#### DIET

Their main diet is fish; especially herring, cod, whiting and flat fish. They will also eat crustaceans like shrimp and crabs or **cephalopods** such as squid.

#### HUNTING

They are opportunistic feeders (meaning that they will eat what they can), diving up to 50 metres deep and staying submerged for up to 10 minutes.



# DISCOVER

## SPECIES PROFILE

### Harbour Seal—continued

*PHOCA VITULINA*



© Jamie McDermaid

#### BREEDING:

Mating usually occurs three weeks after the seals have given birth. The **gestation** period (development of the young in the **womb**) is for 10 months (slightly shorter than the grey seal).

#### PUPS:

Single pups are born on the intertidal sands or rocks in June and July, with their spotted adult coat. They will take to the water within a few hours. They will continue to feed off their mother's milk for around 4 – 6 weeks.

#### POPULATION SIZE:

There are about 100,000 harbour seals in Europe and around 30% of these are found in the seas around the UK. Scotland is home to about 90% of the 33,000 harbour seals found in the UK.

#### KEY BREEDING SITES:

The Wash on the East coast of England has large intertidal flats that support around 7% of the total UK harbour seal population. Meanwhile in Scotland sites such as the Dornoch Firth and the Tay and Eden estuary with their sand banks and sand flats each support around 2% of the UK harbour seal population.





# FACTFILE

## THREATS TO SEALS

### DOES ANYTHING THREATEN SEALS?

Seals are called apex predators. This means that they are at the top of their **food chain** and they **predate** on smaller **predators** such as large fish, octopus and lobsters, allowing other animals to thrive. We can use seal numbers as an indicator of the health of our seas – lots of seals means lots of fish and clean seas (a healthy marine **ecosystem**). Seals do have some natural **predators** - Orcas, known as Killer whales, and some large sharks will **prey** on seals.



Also, seals face threats from many different **human activities**. These include:

- **Overfishing** — Humans sometimes take too many fish out of the sea. This reduces the amount of food available for seals, leading to them becoming undernourished or underweight and therefore less resilient to other pressures (conditions that can make their life more difficult).

© Maggie Sheddin



© M Roden

- **Marine debris and plastic** can harm seals if they mistake the items for food and ingest (eat) them. They may also become caught on fishhooks or entangled in fishing ropes or nets which may lead to injury or, if they are trapped underwater, they will drown.
- **Coastal development** can, if it is not carefully planned for and managed, cause disturbance at seal **haul-out** sites. They may be forced away from these areas to other locations which are less suitable.
- **Marine Pollution** can come from a variety of sources such as oil spills, waste from industry or agricultural **run-off**. Oil spills can remove the waterproofing from a seal's fur making them more likely to be affected by the cold and impacting their ability to swim and catch their prey. Chemicals in waste can build up in the seals **blubber** and passed on from mothers to pups.





# FACTFILE

## THREATS TO SEALS—CONTINUED

- **Climate change** (change in temperature and weather across the Earth that can be natural or caused by human activity) can lead to more storms. These might lead to seals being crushed by falling rocks, the loss of their preferred haul-out sites from flooding, or pups may be washed out to sea in rough sea conditions.



- **Disturbance** is when people are too close, too visible or are making too much noise. This may also cause seals to leave a preferred haul out area, can cause mothers to become separated from their pups or just drain their energy at critical times, impacting their feeding and breeding success and the survival of their young.



**Never get close to seals**

**Never feed wild animals**

Read on for tips on how to watch seals safely.



**Keep well away**

**Stay quiet**

**Keep dogs under control**

- **Disease**, such as Phocine Distemper Virus, may also spread rapidly through seal populations. This disease affects the respiratory (breathing) system of seals and can wipe out tens of thousands of seals during an outbreak. It spreads amongst seals just like a cold through coughing and sneezing.
- **Parasitic larvae** that hitch a ride on the fish that seals prey on, can settle in the seals digestive system, **metamorphose** (change from immature to adult) into worms that then move around to other parts of their body affecting their health.



# PUZZLE

## SEAL WORDSEARCH



Can you find the words below in the word search?

TRUE SEAL

HARBOUR SEAL

GREY SEAL

HAUL OUT

PUP

PREDATOR

PREY

BLUBBER

FLIPPER

WHISKERS

SELKIE

DISTURB

MIGRATE

POLLUTION

DISEASE

BREEDING

APEX

DIVE

PINNIPED





# FACTFILE

## PROTECTION OF SEALS



Seals are protected by law in Scotland. The earliest protection was for Harbour seals through the Conservation of Seals Act, 1970. Today the main legal protection of seals comes through the Marine (Scotland) Act 2010. This law makes it an offence to intentionally or recklessly kill, injure or take a seal at any time of the year unless under licence from the Scottish Government (Marine Directorate) or to put an end to the life of a seal that may be suffering.

Under the Marine (Scotland) Act it is also an offence to harass seals on designated **haul-out** sites. The law created a number of protected sites for seals including the East coast, the Moray Firth, the Outer Hebrides and Orkney and Shetland.



Harbour seal haul out © Jamie McDermaid



© M Roden

Although seals are protected in Scotland there are still several countries around the world where they are hunted for food and for their fur. Hunting is said to be part of the culture and economy of some of these countries including in Canada (especially for harp seals), Greenland, Norway, Namibia (especially for Cape fur seals) and Iceland. Commercial seal hunts are often controversial and are opposed by animal rights and welfare organisations.

In Alaska indigenous (first people to live in a place) communities hunt seals as part of their traditional subsistence way of living (having just enough to live but no more).





# FACTFILE

## WILDLIFE WATCHING TIPS

Watching seals along our coastline or from the sea is a wonderful wildlife experience. It is important that you take care not to disturb or spook them, by always keeping your distance, keeping quiet and not blocking their escape route to the sea.



It is best to use binoculars or a telescope to watch them, or a camera with a zoom lens to photograph them.



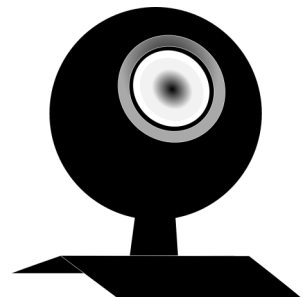
**Please  
keep dogs  
on leads**

When a seal is disturbed, it may react by lifting its head and looking directly at you, its eyes may bulge or it may flipper splash or make a noise, rush, or even throw itself from a height, into the sea or dive suddenly. If you notice any of these signs you are too close. Please slowly and quietly move away to avoid further disturbing the seal.

It is also important to keep dogs on a lead near seals. Even the most well trained, family-pet can frighten wildlife by being curious. Seals can also give a nasty bite, and you do not want your pet to be harmed either.

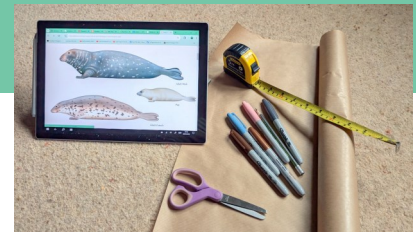
We've created [a handy guide](#) on what to do if you find a seal pup ashore.

You can also watch grey seals, and see their pups being born and growing up day by day, on the Scottish Seabird Centre's wildlife cameras which are located on Craigleith island and the Isle of May National Nature Reserve. Follow them on the live links on our website [www.seabird.org/webcams](http://www.seabird.org/webcams).



# CRAFT

## CUT-OUT SEAL CRAFT



It's not often that we have the opportunity to see a seal close up. So by making this life-size cut-out seal you can see how big they really are, while learning some more seal facts and creating some wall art at the same time.

### WHAT DO I NEED?

- Roll of Brown Paper (or similar)
- Measuring Tape
- Pens and Pencils
- Reference Images
- Scissors

1



Unroll your brown paper (or wallpaper or wrapping paper) and measure the length of your seal. We chose a 1.8 metre long adult female grey seal.

2

Using a reference image, draw the outline of your seal onto the paper, to fit your measured length.



3

Carefully cut out your seal outline.



4

Spread out the seal cut-out, to check you are happy with the shape. Make any adjustments as required.





# CRAFT

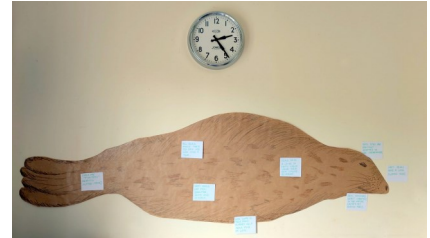
## CUT-OUT SEAL CRAFT

5



Using materials of your own choice, draw or paint on the seal's features, including eyes, nose, mouth, whiskers, flipper detail and markings.

6

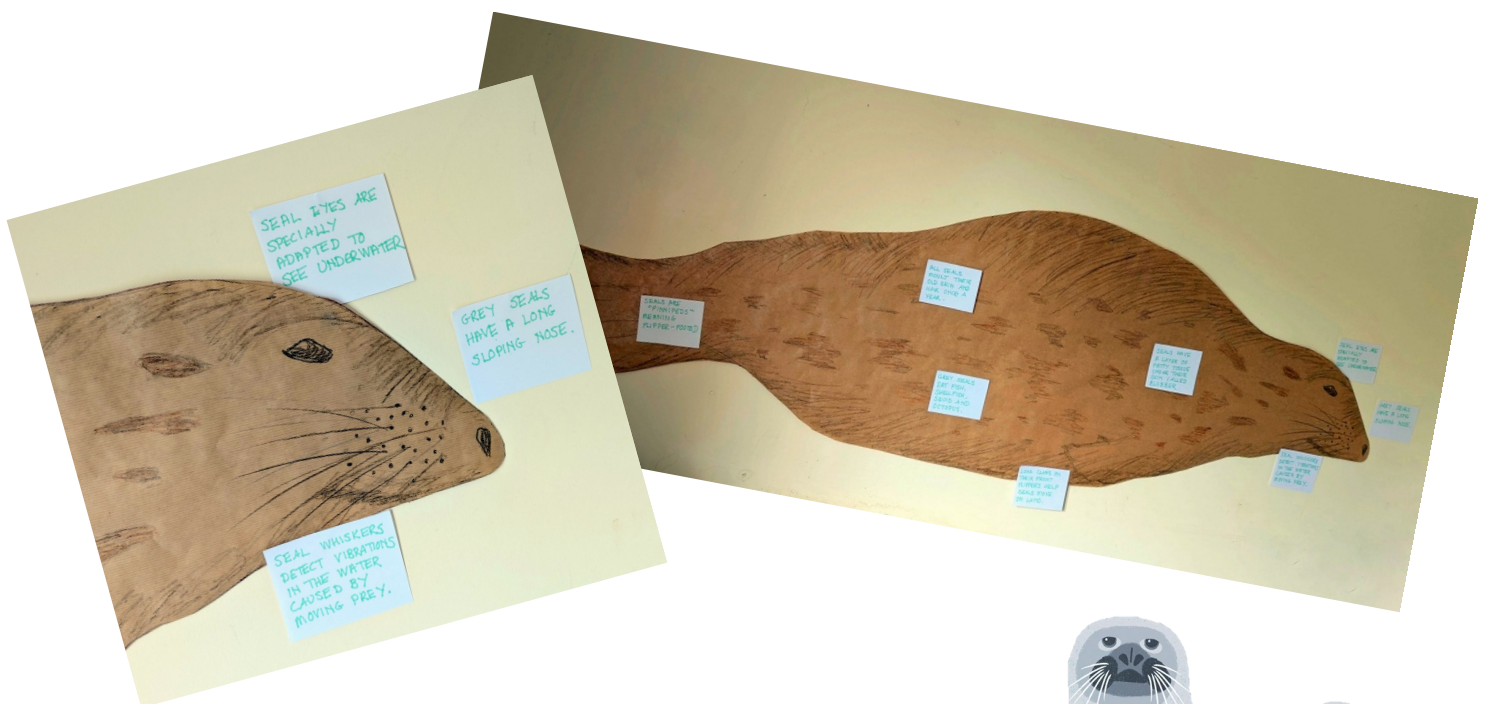


Pin your seal up on the wall and add some labels with seal facts of your choice. You can use the other pages in this pack for inspiration.

### Don't have the space for a full-sized seal?

No problem. Why not try making a seal cub instead of an adult, or try a scaled-down adult seal. If you wanted to make a **half-sized** seal simply divide the length by **2**. Or for a **quarter-sized** seal, divide the length by **4**.

Our 1.8 metre (180 cm) seal would become **90cm** long at **half-size** and **45 cm** long at **quarter-size**.







# FACTFILE

## SEAL SCIENTISTS

Are you interested in what seal scientists study? Here are some examples:

**Movements:** seals can be tagged with coloured flipper tags or with electronic monitoring devices (both VHF tags and satellite tags). The VHF tags are like homing beacons and when a seal hauls-out scientists can move in and remove the tag to collect the data and find out more about where the seal has been. Satellite tags are a higher spec (more advanced) tag and allow scientists to track the movement of seals live (real-time).



Seal tracker on display in our exhibition



Pair of images showing same seal group with a normal camera (left) and with an infra-red camera (with permission of SMRU)

**Counts:** seal researchers take to the air, in a helicopter or a fixed wing plane, to undertake counts of seals. The helicopter shown to the right is fitted with special cameras.

As seals can be **camouflaged** when lying on rocks or seaweed, the researchers use infra-red cameras that use heat radiation to produce a thermal image of the warm seal against the cooler background of the rocks. High resolution video and photographs are taken of all seals that are detected with the thermal imaging and counted. In time it will be possible to use Artificial intelligence (AI) to read the images, which will significantly speed up the counting process.



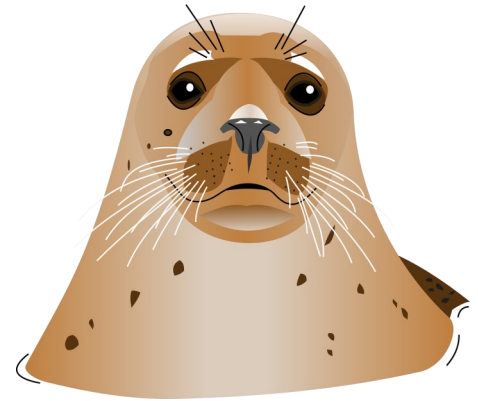


# FACTFILE

## SEAL SCIENTISTS—CONTINUED

**Hunting:** scientists have discovered that seal whiskers, known as **vibrissae**, are highly sensitive and help them to navigate and hunt underwater. Each whisker is packed with nerves at their end, and these transmit tactile (touch like you feel through your fingertips) information back to the brain.

Each whisker also moves independently, allowing the seal to explore its environment. In studies where seals have been blindfolded or wear headphones they can still effectively hunt using their whiskers.



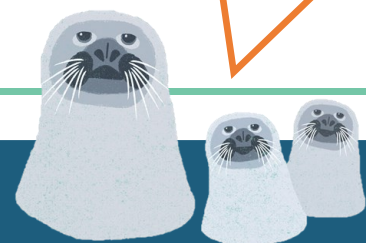
**Diet:** researchers at organisations like the [Scottish Sea Mammal Research Unit](#) (SMRU) study the diet of seals. This can be done in several different ways such as looking at pictures captured from cameras attached to seals, or examining the stomach contents (autopsy) of seals that have died or investigating the content of seal poop to find the hard bits of prey that have survived the digestion process.

New technology can also be used to assess the proportion of fatty acids in seal **blubber** or the isotopes (different forms of elements) in the seals. Scientists can also analyse seal DNA (genetic information) from environmental samples of water or sediment to identify prey species.



**Ocean currents:** seals are also used by scientists to find out more about ocean currents and climate change. Special tags with environmental sensors are attached to the seals and as they move around their underwater world the tags collect data on temperature, salinity (saltiness) and other environmental factors. Scientists then collect this data and use it to see how seals are, for example, adapting to changes in climate and a warming ocean.

*Try our blubber experiment  
by following along with  
the video instruction [here](#).*





# FACTFILE

## SEAL MYTHS AND STORIES



If you enjoy picking up a book and reading a story, you might enjoy some of these story books about seals.

**The wide, wide sea** – by Anna Wilson and Jenny Lovelie. A child makes a special connection with a seal and is taken on an amazing imaginative journey.

**Nobi** - by Leigh Cook and Catherina Matigina. This book follows a young merdog who lives with her seal pod and seal parents.

**Sammy the Seal** - by Syd Hoff. About a seal who leaves the zoo to explore the city and make new friends.

**The Seals That Wouldn't Swim** - by Steve Breen. A story about a group of seals who learn the importance of trying new things and overcoming fears.

**The Wee Seal** – by Janis Mackay and Gabby Grant – About a wee seal that lives on the beach and the little boy that watches over it when its mother is away feeding.



### Have you heard about 'Selkies'?

In Celtic and Norse folklore (a myth or legend) Selkies are creatures that switch between being seals in the sea during the day and humans, on land, at night. The Selkies' seal skins would be transformed into soft, shimmering dresses or handsome coats and they would dance, laugh and share stories with real people on moonlit beaches. Sometimes they might fall in love with real people, but the call of the sea would always draw them back, leaving the people only with memories.

**The Selkie Girl** by Janis Mackay is a book for younger readers featuring a selkie.



© Dark Moon Art, Pixabay





# PUZZLE

## WORDSEARCH ANSWERS

Did you find all 19 of the words in the word search?





# LEARN

## INSPIRED TO LEARN MORE?

If you are inspired to learn more about Scotland's seabirds, marine mammals and habitats you could become a **junior member** at the Scottish Seabird Centre. Our junior membership gives you a membership pack that includes:

- ◆ A species fact file, bookmark, activity sheets, member's card, badge and a fantastic-recycled kit bag celebrating your chosen species (puffin or seal).
- ◆ Quarterly seasonal E-newsletter with details of what to look out for in Spring, Summer, Autumn and Winter and a selection of fun, marine themed activities to enjoy at home.
- ◆ Free entry to our Discovery Experience for 12 months (and a 50% discount for their accompanying adult), where our amazing team will help you learn about Scotland's incredible marine wildlife and what they can spot over the different seasons.



You can find out more about Junior Memberships at <https://www.seabird.org/junior-membership>.

### Blogs and Adoptions

Why not also read our blogs on seals, such as [this one](#) on the impacts of disturbance and [this one](#) about the differences between species?

Also did you know you can adopt a Grey seal through the Scottish Seabird Centre? Find out more [here](#).



Grey seal pup © Emily Burton



# DISCOVER

## GLOSSARY

### BLUBBER

A thick layer of fatty tissue below the skin that helps to keep a seal warm.

### CAMOUFLAGE

When animals conceal themselves by blending into their surroundings, either by the pattern, colour or texture of their skin, or the use of materials around them.

### CEPHALOPOD

The group of animals that includes, squid, octopus and cuttlefish.

### DOMINANT

A dominant animal is the largest, strongest or most aggressive, giving it more influence in a group.

### ECOSYSTEM

A community of living things which interact with each other and their environment.

### ESTUARY

Where a river meets the sea.

### EXTINCT

No longer in existence, having died out.

### FOOD CHAIN

A food chain shows how plants and animals get their energy (the transfer of energy from one organism to another, as organisms eat and are eaten).

### GESTATION

The period of time that a mammal carries her babies, inside her body before giving birth.

### HABITAT

The place where a plant or animal lives.

### HAUL-OUT

Temporarily leaving the water.

### HEMISPHERE

A hemisphere is half of a sphere. The word is often used when referring to the Earth's Northern and Southern Hemispheres.

### MAMMAL

An animal that breathes air, has a backbone, and grows hair at some point during its life. Female mammals have glands that can produce milk.

### METAMORPHOSE

To change into a different physical form e.g. a caterpillar into a butterfly.

### PREDATE

When an animal hunts another animal for food.

### PREY

An animal that is hunted or killed by another animal for food.

### PREDATOR

An animal that hunts or kills another animal for food.

### RUN-OFF

Rainfall that does not soak into the ground but flows into streams and rivers.

### WOMB

The organ in a female mammal's body where a baby develops before birth.