Alderney Wildlife Trust

SEAGRASS

Basic information of eelgrass in Alderney's waters

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What is seagrass?

Seagrasses are species of flowering plant which have adapted to live in the marine environment. They look like long, green blades of grass poking out of the sand. As a plant, seagrass produce pollen, flowers and seeds.

All Eelgrass species are seagrass, but not all seagrass is Eelgrass. Eelgrass refers to 15 species of seagrass in the Zostera genus.

Across the Bailiwick of Guernsey, two different species of Eelgrass have been recorded:

- Dwarf eelgrass *(Nanozostera noltei)*
- Common Eelgrass *(Zostera marina)*

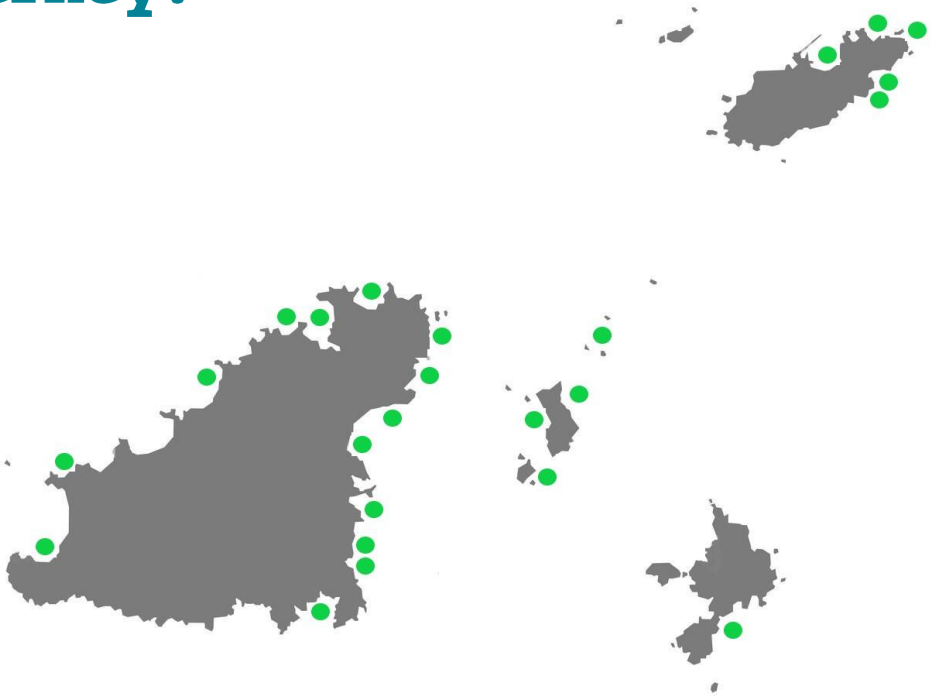
In Alderney, only Common Eelgrass has been recorded so far.

Eelgrass at Frying Pan Bay
© Jon Moore

Common Eelgrass has long blades (20 cm – 2 m) with rounded ends and a sheath around stem. Found in clumps, beds or meadows on lower shore – shallow sublittoral zone (0 – 7 m deep).

Eelgrass at low tide / Photo by MBA

Where is eelgrass located in Alderney?



Map of eegrass recorded in the Bailiwick of Guernsey
Map by the Bailiwick Eelgrass Exploration Project

In Alderney, eelgrass has been recorded in the following bays.

- Longis Bay
- Maggie's Bay
- Braye Bay
- Cats Bay
- Longis Bay
- Frying Pan Bay

Can you identify all those bays on this outline map? Put a green dot in the bays where eelgrass has been recorded.

Why is eelgrass important to Alderney?

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Eelgrass bed is important for a variety of reasons.

1 Eelgrass provides home and feeding area for many species.

Eelgrass meadows (large areas of seagrass) are the nursery of many species such as the Atlantic cod.

Eelgrass habitat is home to many species like plaice, cod and herring.

- Fish hunt and hide in between eelgrass leaves.
- Sea anemones anchor themselves to eelgrass leaves to feed.
- Invertebrates (animals without backbones) such as shellfish, crabs, and urchins, grazing or hiding between the leaves or in the sediment underneath.
- Starfish also hide in the eelgrass meadow.

Eelgrass is the food of species like Brent goose and sea snails.

Corkwing wrasse juveniles in eelgrass bed / Paul Naylor www.marinephoto.co.uk

Two spotted gobies in eelgrass / Paul Naylor

Dark-bellied Brent Geese / AWT staff

Hermit crab in eelgrass / Paul Naylor

Why is eelgrass important to Alderney?

2 Eelgrass buffers strong waves and help protect the coastlines.

As an island in the Channel Islands, Alderney is prone to dozens of storms per year. These storms involve strong waves that affect the coastlines. Eelgrass meadows help reduce the energy of the waves with their long leaves and roots as anchors in the sand. Plus, seagrass holds underwater soil (known as sediment) together, preventing coastal erosion due to storms and large waves.

Alderney is prone to strong waves during storms / Bill Black

3 Eelgrass helps fight climate change.

Eelgrass absorbs large amounts of carbon dioxide from the surrounding seawater and converts them to oxygen.

Eelgrass, like other plants, has special food producers inside their cells, called chloroplasts. Chloroplasts use energy from the sun to convert carbon dioxide and water into sugar and oxygen for growth, through the process called photosynthesis.

Eelgrass bed at Frying Pan Bay © Jon Moore

Carbon dioxide + Water —(Sunlight)→ Glucose + Oxygen

Cool fact

A hectare of seagrass meadow, with its small living biomass, may hold as much carbon as one to two hectares of typical temperate forest.[1]

(1 hectare of seagrass meadow ~ 1.4 football field)

1. Murray, B. C., Pendleton, L., Jenkins, W. A., & Sifleet, S. (2011). *Green Payments for Blue Carbon Economic Incentives for Protecting Threatened Coastal Habitats* [Review of *Green Payments for Blue Carbon Economic Incentives for Protecting Threatened Coastal Habitats*]. NICHOLAS INSTITUTE. https://nicholasinstitute.duke.edu/sites/default/files/publications/blue-carbon-report-paper.pdf

Why is eelgrass important to Alderney?

By removing carbon dioxide from the water, eelgrass stabilises the pH of the water. A stable pH might protect the animals that cannot survive in the low-pH seawater. These animals can include corals and molluscs such as clams, oysters and their relatives.

Common Oyster / Paul Naylor
www.marinephoto.co.uk/

Green Ormer at Clonque
© Jon Moore

Chancre crab / Poppy Emmens

Chiton / Lou Collings

4 Eelgrass reduces water pollution.

Eelgrass soaks up nutrients (e.g. Nitrogen and Phosphorous)[2] and bacteria, helping to keep our seawater clean.

2. Pernice, M., Sinutok, S., Sablok, G., Commault, A. S., Schliep, M., Macreadie, P. I., Rasheed, M. A., & Ralph, P. J. (2016). Molecular physiology reveals ammonium uptake and related gene expression in the seagrass Zostera muelleri. *Marine Environmental Research*, *122*, 126–134. https://doi.org/10.1016/j.marenvres.2016.10.003

Eelgrass bed at Frying Pan Bay
© Jon Moore

Why is eelgrass important to Alderney?

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5 Eelgrass supports Alderney residents' livelihoods.

Eelgrass supports many species. Lots of these, including small fish and invertebrates, can be caught for food and have commercial benefits (people can buy and sell them). Some of the most commonly caught fish in Alderney, such as sea bass and black sea bream, use eelgrass meadows. Therefore, eelgrass meadows indirectly support human activities like fishing.

Photo by mas_hha from Pexels.com

Plus, eelgrass meadows support recreational activities like diving, which can be a big part of tourism. Many people appreciate the beauty and diversity of marine species, and they are willing to pay to see these landscapes.

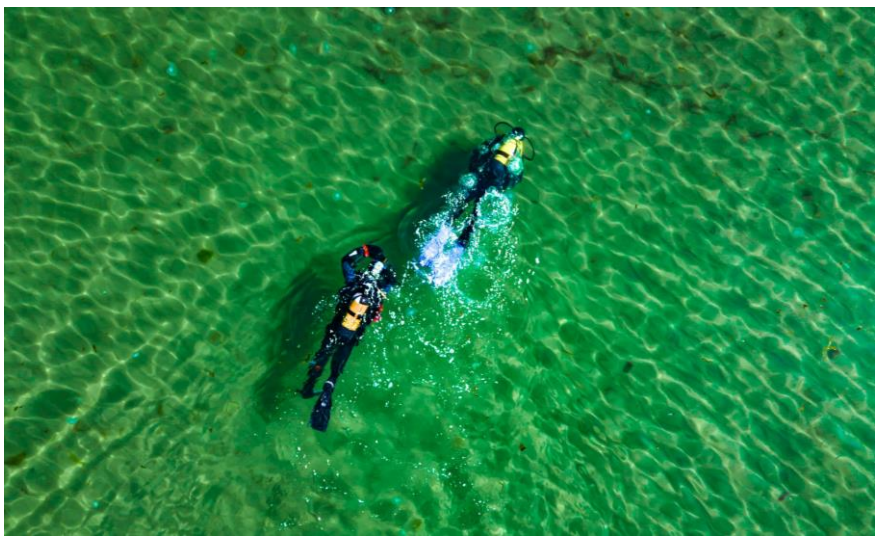


Photo by Şahin Doğdu from Pexels.com

Some food chains related to seagrass

Food chains show the feeding relationships between species. Simply put, who eats who?

Plankton > Two-spotted Goby > (Young) Pollack

'>' means 'is eaten by'

(For example, Plankton (are eaten by) Two-spotted goby, (which are eaten by), Young Pollack)

- Plankton > Mussel > Netted Dog whelk > Crabs
- Plankton (tiny sea life like copepods and microalgae) > Shrimp > Atlantic Cod > Grey Seal
- Detritus (Decaying matter) > Tiny crustaceans (e.g. amphipods, copepods, and isopods) > Small fish (e.g. damselfish, wrasses) > Sea anemones > Sea star
- Phytoplankton (microscopic plant-like organisms, e.g. algae, diatoms) > Zooplankton (larval crustacean, krill) > Juvenile fish (herring, sprat, sand eel) > Larger fish (cod, pollock, bass) > Top predator (shark, dolphin, seal)
- Plankton > Sand eel > Puffins, Kittiwakes, Dolphins, Whales
- Plankton > Crabs, molluscs (e.g. squid, octopus), small fish > Small-spotted catshark, mackerel, dragonet, herring > Nursehound
- Epiphyte (any plant that grows upon another plant or object merely for physical support) on eelgrass > Sea Urchin > Lobster > Seal
- Algae > Mussel > Paddle worm > Lobster > Octopus > Seal
- Eelgrass > Crabs > Sea Bass > Bottlenose Dolphin
- Plankton > Barnacles > Ribbon worm > Grey Plover
- Detritus, phytoplankton, zooplankton > Clam > Oystercatcher
- Microscopic algae > Chiton > Crabs and fish > Seabirds (like Herring gulls, Great Black-backed gulls, Lesser Black-backed gulls)

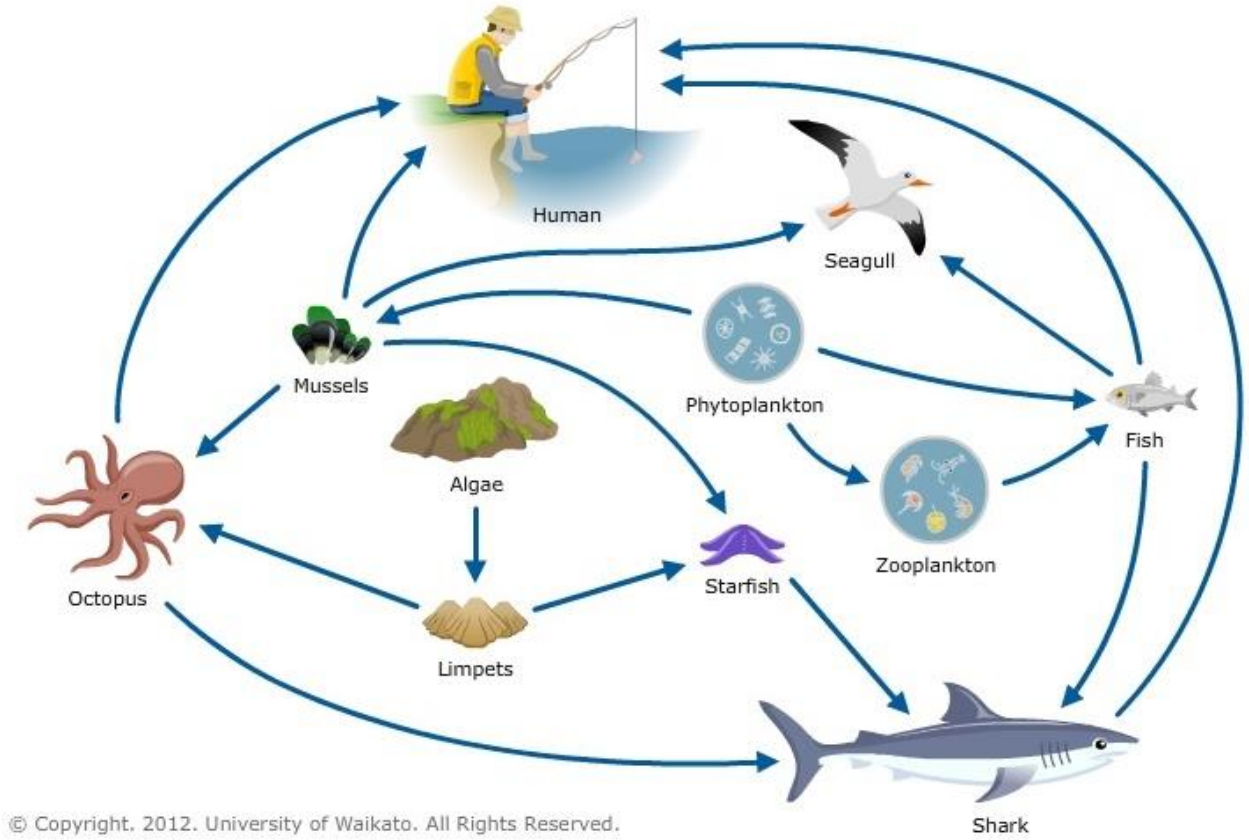
Game

Who eats who?

Print and cut out the elements from the food chain sheets at the end of this document.
Then, create as many food chains as possible using them.
If you play this game with your friends, who can create the most food chains in two minutes?

Food webs

A food web consists of food chains, interwoven, showing the true complexity of these marine ecosystems.



Example of a food web. Retrieved from https://static.sciencelearn.org.nz/images/images/000/000/380/full/Marine-food-web20151019-1336-t7gkmr.jpg?1522294193

Game

Food webs

Create a food web from the food chains that you created from the game on page 8.

Some questions for children to learn about food webs and the impact of one species on another.

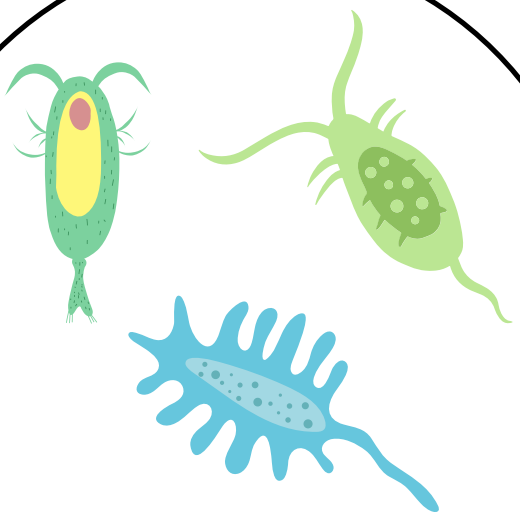
- What are some examples of animals that are both predators and prey?
- What happens if one animal in a food web disappears? For example, what happens if all the sand eels disappear?
- How can a change in the population of one species affect other species in the food web? For example, if there's a decrease in the sea bass, how does that affect other species?
- How do humans affect food webs?
- How can pollution affect food webs?
- What are some ways we can protect food webs?

Main marine species associated with seagrass

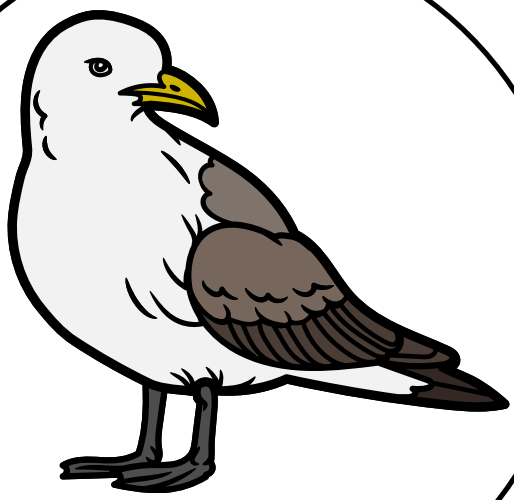
- Black sea bream
- Two spotted goby
- Sea bass
- Netted dog whelk
- Stalked jellyfish
- Sea hare
- Green shore crab
- Marine worms – variety of species including polychaete worms

More information

1. Projects on seagrass in the Bailiwick of Guernsey: Bailiwick Eelgrass Exploration Project, https://www.alderneywildlife.org/current-projects/bailiwick-eelgrass-exploration-project
2. BEEP Report 2023 https://www.alderneywildlife.org/sites/default/files/2024-04/BEEP%20works%20for%202023%20%28Flyer%20%28A4%29%29.pdf
3. Bailiwick Eelgrass Exploration Project, https://www.biologicalrecordscentre.gov.gg/gbrc-work/beep/
4. Secret Gardens Under the Sea: What are Seagrass Meadows and Why are They Important?, https://kids.frontiersin.org/articles/10.3389/frym.2018.00002

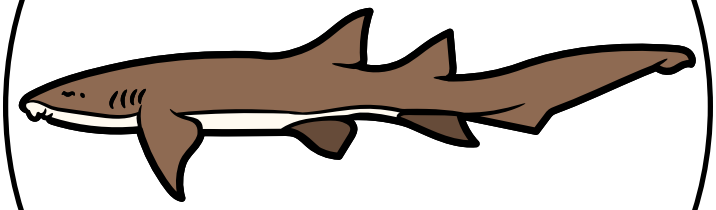


Plankton



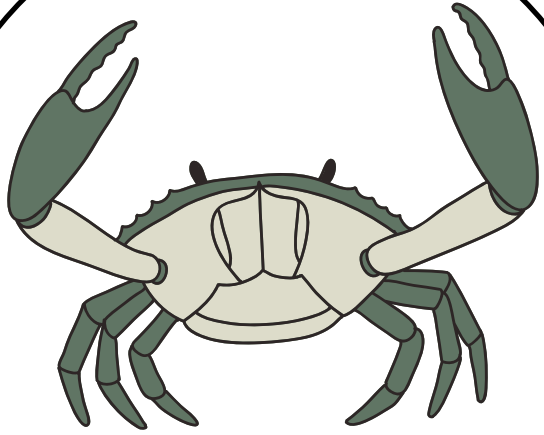
Kittiwake

Shrimp



Nursehound

Puffin

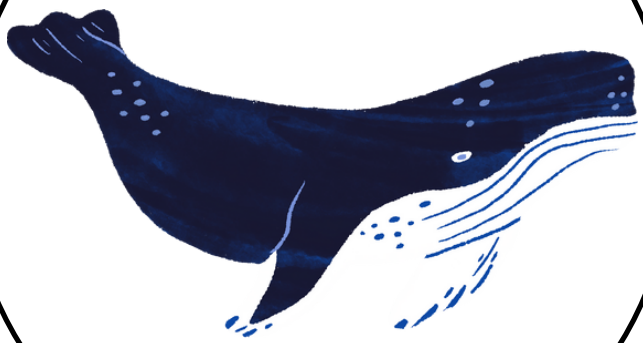


Crab

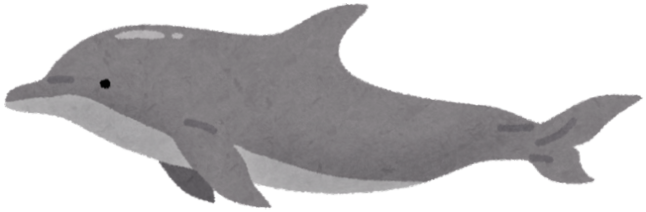
Seal

Mussel

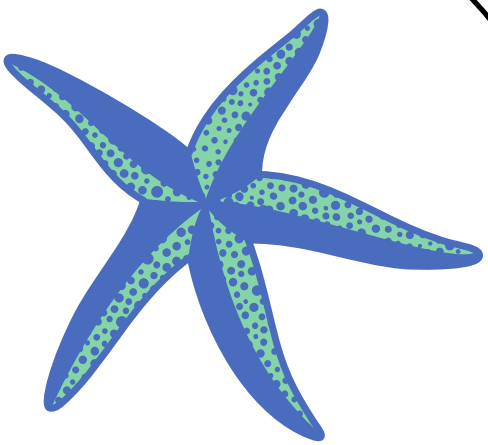
Octopus



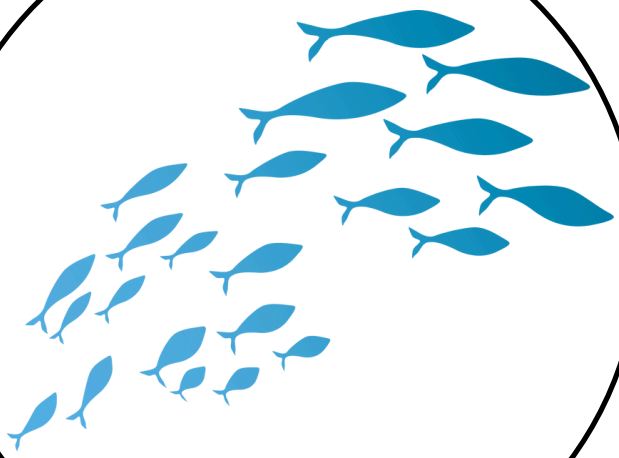
Whale



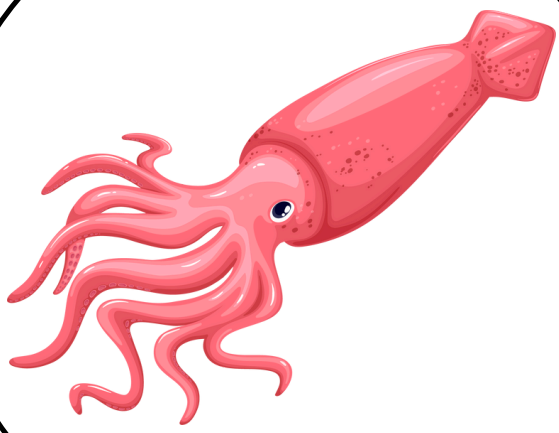
Dolphin



Starfish

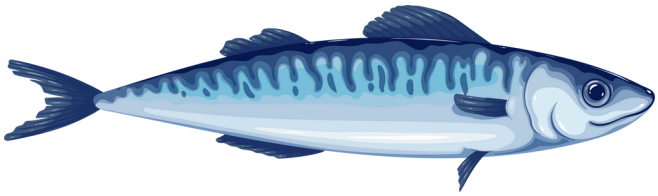


Sand eel

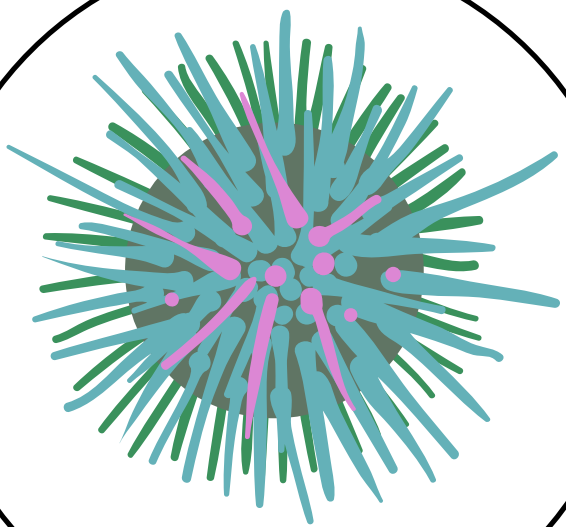


Squid

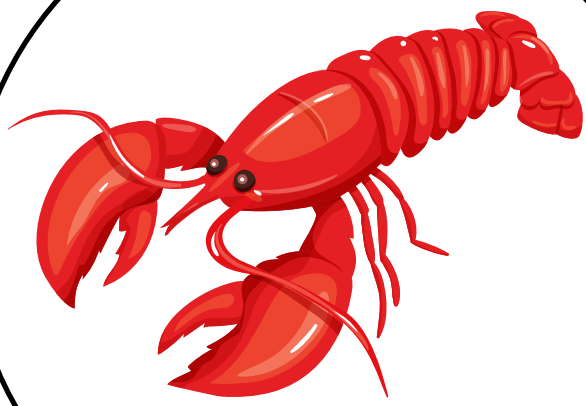
Sea anemone



Mackerel

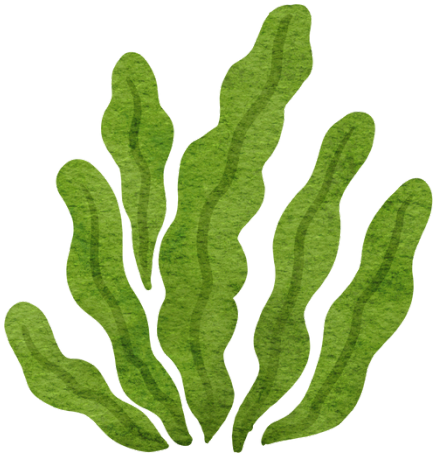


Sea urchin

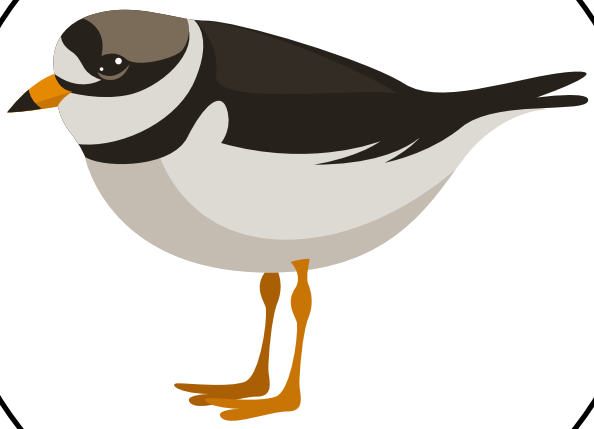


Lobster

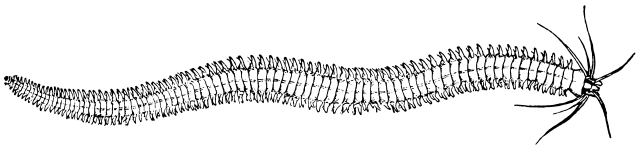
Barnacles



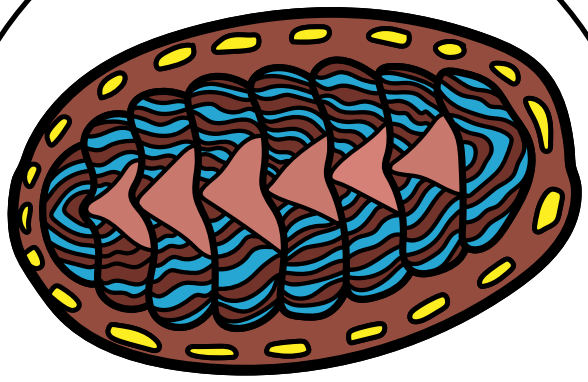
Algae



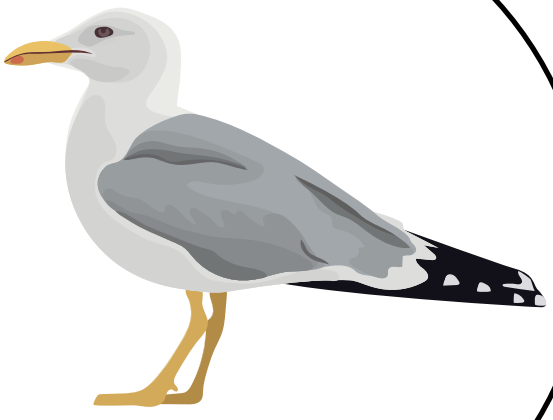
Grey plover



Marine worm



Chiton



Gull