



OUR SEAS

Whether our homes are near or far from the sea, our lives depend on our planet's oceans. Covering about 70% of the earth's surface, our seas supply half the oxygen we breathe, and provide food and livelihoods for more than a billion people.

They are also home to a wondrous array of wild species, from tiny plankton to the biggest creature that's ever existed – the blue whale. There are known to be more than 260,000 different species living in the seas, and we know that there are many yet to be discovered. Some scientists believe there are more than a million species in the seas, though human activity is driving some to extinction before we have had a chance to study them.

those that were food for that species, since predators stop populations from getting too big and using up all of the resources. Food chains can be delicate and complex!

Fishing provides the main income for over 200 million people, so it's really important to humans that these coastal seas are supported to be healthy habitats in which fish can live and breed now and forever.

COASTAL SEAS

Although they make up only 10 per cent of the ocean, these shallow waters of coastal seas (within 230 km of land) are home to 90 per cent of all marine species. Here sunlight reaches the sea floor, so plants can grow. These provide food for animals, protection from predators and a safe place for animals to breed and raise young. The coastal seas are made up of many different ecosystems including coral reefs, river estuaries, rock pools, salt marshes, mangrove forests and fields of underwater sea grasses.

Every species in a coastal sea community is important to the rest. If one is taken away, it can cause big problems for the other species that needed them for food – and even for

Pacific Herring move into shallow waters in spring to spawn. Allowing fish to safely breed and grow in our coastal seas would help increase fish populations throughout the ocean.



HIGH SEAS

Beyond the beaches and shallow coastal waters lie the high seas which cover more than 60 per cent of our planet's surface. This is by far the largest habitat on our planet, but also one of the least understood.

On average our oceans are 2.5 miles deep, and parts of the high seas are nearly 7 miles deep, forming the largest space for life on the planet. At present we have explored only 5% of the world's oceans.

PHYTOPLANKTON: TINY LIFE SAVERS

An expanse of seemingly empty ocean may contain much more life than it appears to the naked eye.

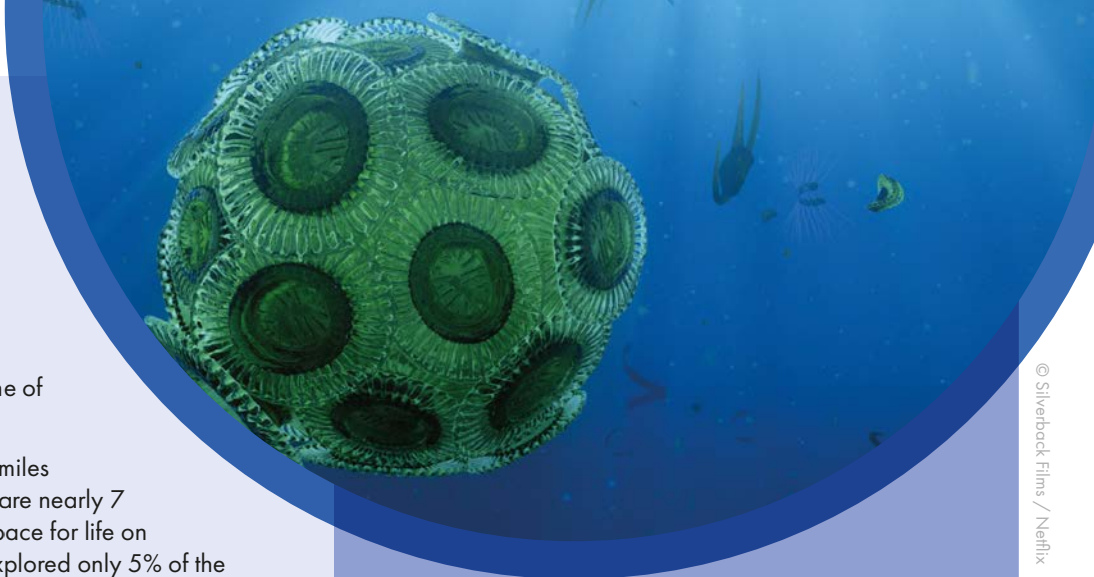
Phytoplankton are microscopic floating algae which drift on the ocean currents. Phytoplankton convert CO₂ to Oxygen and protect themselves from harmful UV rays by releasing a chemical that causes clouds to form overhead. These clouds play a role in slowing global warming by reflecting sunlight back into space. This role forming clouds mean that the oceans also drive weather systems that sustain life in other parts of the world.

As well as doing this amazing job, phytoplankton are food for **zooplankton** (simple water-dwelling creatures), such as **krill**, which are the most numerous animals on earth. These in turn provide food for many sea creatures including the biggest animal that has ever lived on earth – the **blue whale**.

THE MYSTERIOUS DEPTHS

We used to believe that very little lived in the cold, dark depths of the ocean. The more we explore, the more we realise that there is actually a lot of life down there – though not as we know it! Strange creatures roam, adapted to the pressure of the deep ocean, and often creating their own lights to lure prey. We have even found that coral reefs are not restricted to shallow coastal waters.

Much deep-sea life depends on 'marine snow' consisting of the remains of dead creatures and the poo of living ones which drifts down from the more heavily populated surface waters. In the total darkness of the deep ocean floor volcanic vents release super-hot, mineral rich water. Around these vents a huge abundance of life thrives. Strange creatures survive here by feeding on bacteria that get their energy from the chemicals flowing from the vents. We only found out that these unique habitats existed about 50 years ago, and there may be many more across the ocean floor.



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Phytoplankton support the entire food chain of the open ocean, and produce half the oxygen in the air we breathe. No matter how far from the ocean you live you can thank these little plants for every other breath you take.

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WHAT'S THE PROBLEM?

Despite the vastness of the oceans, human activity is devastating ocean ecosystems. **Illegal fishing** and **overfishing** means that fish can't build up their numbers and whole populations are being wiped out, causing problems to the whole community of creatures and plants in that ecosystem, and the humans who depend on them for a living.

Noise from human activities cause problems for ocean wildlife too. The noise from a ship's propeller can travel 100km through water, and can disturb fish and stop them communicating and breeding. Noise from mining can cause problems in the same way, as well as destroying habitat and risking pollution that can kill wildlife. Scientists and conservationists now argue for 30 per cent of the high seas to be protected from fishing and mining through 'Marine Protected Areas' which all countries agree to leave alone as spaces for nature.

The effects of human activity are felt in the remotest parts of the high seas. Every year almost 9 million tons of plastic enters the ocean. That's the same as a rubbish truck emptying its load every minute. In the middle of the Pacific a huge area of plastic rubbish, twice the size of France, is kept in place by the swirling currents. Plastic chokes the

oceans and harms marine life. Blue whales have been washed up dead on seashores with pieces of plastic in their stomachs which they probably mistook for squid.

Climate change is also harming ocean life. Warmer water can absorb more CO₂ from the air, and this makes the ocean more acidic than before. This means the conditions are changing from those in which sea creatures evolved, and in some cases it stops them from being able to build their shells or exoskeletons.

There is much that needs doing in the oceans. We need to act. The quicker we act, the better the chance that damaged marine ecosystems – the fish we catch for food, the cold-water corals and hydrothermal vents, the vast pods of whales and mysterious deep-sea creatures – will recover fully. The result will be a healthy ocean that provides food and jobs for people as well as homes and food for wildlife well into the future.

WHAT CAN WE DO?

We can keep enjoying the riches of the oceans, but only if we look after them and don't take too much from them. One way to protect the future of the oceans is for countries to create **Marine Protected Areas (MPAs)** in their coastal waters where no fishing is allowed. These safe spaces will mean that there are always places for fish to grow big and reproduce, and as well as ensuring that fish species don't die out this will mean we'll actually catch more fish than we do at the moment. The seas will recover, there'll be more fish in the sea, and we'll catch more too – it's win-win all round!

When seas are within the border of a country, that country can set rules on who can use the waters for fishing, mining and transport of goods in ships, and how much they are

allowed to do these things. The high seas are international waters, owned by no one, and therefore open for anyone to use as they want. This means that they are also the least protected waters, open to damage by over-fishing, mining, shipping and pollution. **Less than 2% of the world's international waters have any form of protection.** In the past – when there were fewer humans on the planet – fish populations seemed limitless and oceans too big to pollute, but with human impacts now extending to the most remote and deepest parts of the oceans, action is needed to stop the damage before it is too late. If we want to keep our oceans healthy, we need an **international treaty** to protect them for generations to come.

Whales and other big sea creatures help sustain phytoplankton and therefore all life in the ocean by fertilising the surface waters with their poo, and by mixing air into the water when they break the surface.

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The choices we make when buying seafood can help ensure a good future for our oceans and seas – and for us! Check labels for information about how fish or shellfish was caught or farmed, and try to avoid species that are known to be in trouble. You can find a local sustainable seafood guide to help you decide what it is OK to eat.

Good	Bad
From a sustainable fishery (eg MSC certified)	No accreditation – could be from over-fished waters
Line Caught	Trawled / long line / gill net
Locally sourced	Imported from other countries
Hand gathered shellfish	Dredged shellfish
Organically farmed	Intensively farmed