

The Kelp Forest

Learning Level All
Run Time 9.17 minutes

Welcome to another in the series of Catch my Drift mini talks with Macduff Marine Aquarium, my name is Marie Dare and I am the Learning Officer here at Macduff Marine Aquarium and today I am going to be talking to you about kelp!

Kelp is one of the main features in our largest display tank behind me and that is because this display represents a kelp reef habitat.

Kelp is a large brown alga and it's like a plant in lots of ways. So, I have a bit of kelp that I collected from the hightide mark to show you what it looks like. We have the holdfast which is like a root system, the stipe which is like the stem and the frond which is like the leaves of a plant.

When conditions are right, that is a rocky seabed, kelp can grow in large numbers and produce what we call a kelp forests, so it's much like a forest on land. It's a large amount of kelp growing in an area and it provides one of the most productive and diverse habitats that you will find in the marine environment!

Just like a plant, kelp requires sunlight to grow. This means that it will only grow in shallow water where the sunlight can reach the seabed - from the low tide mark down to on average 20 m or so, deeper if the water is very clear.

Kelp grows on hard, rocky surfaces where they can tangle their root-like holdfasts around the stone and during a very low tide it maybe possible to see the edge of the kelp forests. Kelp can be found all around the coasts of the UK, with forests developing in areas with a suitably rocky seabed. The UK has the most diverse community of kelp species compared to any other country in Europe, with 7 out of the 14 species found across Europe.

Now the type of kelp varies depending on how exposed the coast is to wave action. Very exposed coasts with rough seas have lots of winged kelp, less exposed areas hold tangle weed (oar weed) and cuvie, whilst sheltered bays are dominated by sugar kelp. The main species in our Kelp tank behind me is cuvie (*Laminaria hyperborea*). Our tank is ideal for growing kelp because it's bvery unique and it is the largest of its kind in the UK as it's open to the elements at the top! Making it perfect for growing kelp as there is natural sunlight!

Underneath the growing kelp canopy you find lots of different animals and in fact other seaweeds that can make their home. You find 100s of different types of fish and crustaceans, sponges and sea squirts and loads of starfish and urchins as well. It's a very diverse habitat.

The holdfast at the kelp's base is where it anchors to the rocky substrate and if you have a close look you can see that it has lots of nooks and crannies and these provide living spaces for 100s of individual animals. There is anywhere from 30 and 70 different species of animals that will colonise a single kelp holdfast. It has everything that they need, it can provide shelter, a food source and also great places of attachment for eggs. So you will find lager fish, that don't actually live within the

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holdfast will attach their eggs to them, fish like scorpionfish, lump suckers and even catsharks, will swim around the stipe of the kelp to secure their eggs.

The stipe itself is quite rough to prevent other things from growing on the kelp but as you can see with this bit of kelp I have here it actually has another bit of algae growing on it already. So other algae, bryozoans, sea mats and sea fans will grow on kelp as well. Urchins will climb stipes during calm periods to graze the frond as that is a favourite food source of urchins. They are very fond of kelp.

As we move on to the blade of the kelp which actually secretes a slippery mucus, to help prevent other animals from colonising it. Although it has this protection by the end of summer you will still find loads of different epiphytes, that is animals that live on top of other things, colonising the frond. So what happens is that towards the end of winter into early spring the kelp sheds its frond, and it together with all its attached animals will drift away.

In fact, there is a species of mollusc called the blue-rayed limpet, it's a tiny little snail that grazes and lives on the kelp and it will migrate down the stipe to overwinter in the holdfast so that it is not lost as the frond is shed. Old fronds that drift off into the currents are eaten by a range of marine animals or broken down by bacteria, releasing nutrients back into the water so they can be recycled for the next season's growth.

The thick, floating forest of kelp, the big canopy that floats closer to the surface, provides food and shelter for juvenile fish, and so it's a very important habitat for many commercial fisheries as lots of young fish will seek refuge here. Of course because there are lots of smaller fish, larger fish come in to feed on them and the larger fish attract other predators like grey seals and so this is a bustling and diverse habitat.

Kelp forests are vitally important, not only to wildlife but also to humans. They have been used by people for centuries; as a fertilizer on the crops, in the form of pot ash and iodine extracted from the seaweed was used in medicine.

Nowadays kelp is still harvested on a commercial basis to extract a substance called 'alginates', used in food, textile and pharmaceutical products. It's found in a wide range of products from toothpaste, to tomato ketchup! The sticky stuff on the back of postage stamps, lipstick, beer, and ice cream all have derivatives from kelp! So lots of kelp in some of our diets!

The kelp forest itself is also very important in cycling nutrients in the marine environment and in acting as a carbon sink. As kelp is taking energy from the sun to make sugars and grow very quickly and capturing lots of carbon dioxide from our atmosphere and storing it up in the fronds. So kelp plays a hugely important role in the carbon cycle of our planet, capturing 75% of the net carbon fixed annually in the sea.

As climate change becomes more of a daily reality kelp becomes more important in protecting our coastlines. Much like a forest of trees might provide a wind break to shelter us from a storm, Kelp forest acts in the same way to protect the coastline from turbulent seas.

As climate change creates more severe weather with more frequent storms, kelp forests are becoming more and more important to protecting our coastlines in addition to all the other benefits they provide.

Well that was a little bit about kelp!

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I hope you enjoyed listening and that you agree that it is a fascinating organism that creates a most important and wonderous habitat.