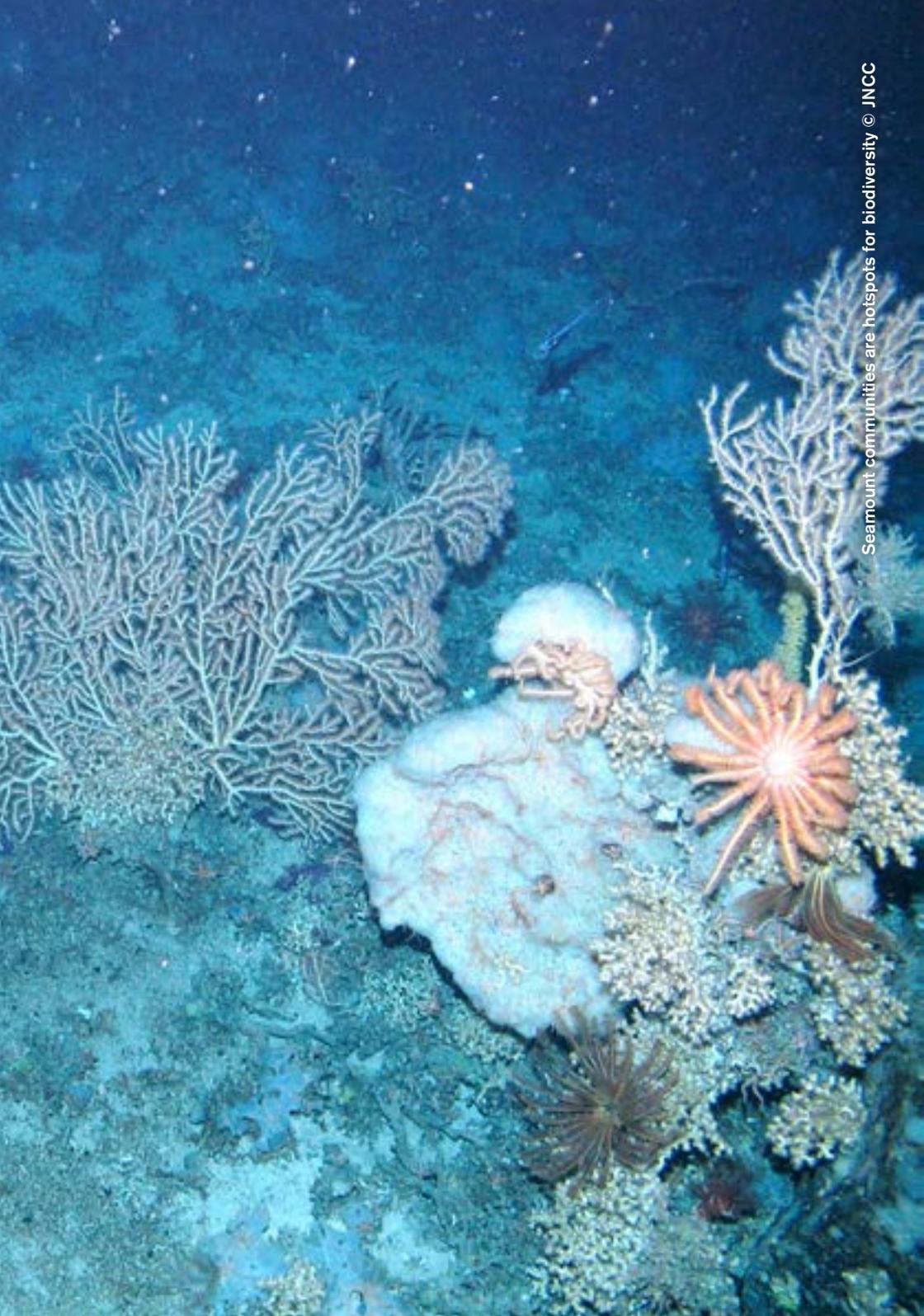


Scotland's Special Seas



A phosphorescent seapen © Paul Naylor

Hidden wonders revealed



Scotland's Special Seas

Introduction

The following pages explore the extraordinary range of animals, plants and undersea landforms that Scotland's seas contain. Beyond the coastline which stretches over 18,000 km, the seas around Scotland are home to about 6,500 different species of plants and animals. Our seas are important both for the diversity of life they support and the services they provide. Covering an area six times that of Scotland's landmass, the sea is one our most valuable assets.

Positioned on the edge of the continental shelf, Scotland is ideally located where warm waters from the Atlantic mix with cold, nutrient rich waters from the Arctic. This mixing of waters is crucial for the production of plankton, a food source for many marine animals and the building blocks of all life in our seas. The sea bed around the coast is every bit as varied as the land, with underwater ridges and trenches, and deep-ocean seamounts rising from the sea bed to heights greater than Ben Nevis. Not only does the sea support an array of wildlife, it can also help unlock the history of the past by providing a valuable insight into how the landscape around us was formed.

Scotland's seas directly support our economy by providing sources of food and energy, and opportunities for nature based tourism, leisure and recreational activities. They also provide essential benefits through helping to regulate our climate.

Protecting Scotland's seas

A network of Marine Protected Areas (MPAs) is being developed around Scotland. To complement existing protected areas, new Nature Conservation MPAs are being identified to protect animals, plants and geology. Nature Conservation MPAs will increase the area of Scotland's seas that are protected, helping to maintain the health of our seas into the future.

Flame shell beds

Flame shells or gaping file shells are small bivalve molluscs that grow to around 4 cm long. Their shells are white and cannot completely close, leaving room for their long red and orange tentacles to protrude through the gap. Scotland is home to the world's largest known flame shell bed, which is located in Loch Alsh and made up of millions of shells. Flame shell beds are particularly sensitive and extensive beds are now rare.

Flame shells build nests on the sea bed by sticking together shells, stones and seaweed with their byssus threads, also known as a beard, until they are completely concealed. Hundreds of flame shell nests can combine to form a dense mattress, stabilising the sea bed and encouraging many other plants and animals to grow there, as well as attracting mobile predators in search of food. Flame shell beds are primarily associated with areas of fast flowing water and often occur where tides are squeezed through narrows or around headlands in sea lochs.

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Deep-sea sponge aggregations

Where environmental conditions are just right, many different species of sponges can be found in Scotland's seas. One exceptional deep-sea sponge aggregation occurs in the Faroe-Shetland Channel, where giant and glass sponges dominate the sea bed. These sponges provide shelter for a range of tiny animals seeking protection, and elevated perches for filter feeding animals such as brittlestars. Aggregations of sponges in this area are known as "ostebund" or "cheese-bottoms" by local fishermen due to the way they look.

The sponges are very slow-growing and can take several decades to reach full size. Sponge fields are hotspots of diversity and can support many other different animals. Deep-sea sponges need specific conditions to establish and thrive. They are found in offshore waters where temperatures do not exceed 10°C and currents are moderate, typically in depths of between 250 m and 1,300 m. They are present on a range of sea bed types, notably the rocky ridges and scours carved by icebergs at the end of the last ice age.

Aggregations of deep-sea sponges in the Faroe-Shetland Channel are known as "ostebund" or "cheese-bottoms" by local fishermen due to the way they look.

Seamounts and seamount communities

Like underwater mountains, seamounts tower above the surrounding sea bed from which they rise. Found in Scotland's deep waters they are hotspots for biodiversity, providing a hard surface for sea life such as cold-water corals and deep-sea sponges to settle on. Seamounts have a profound influence on local currents, bringing nutrients and an associated increase in food that give rise to concentrations of deep-sea fish species, including orange roughy and blue ling. These in turn attract larger predators such as sharks, whales and dolphins.

Seamounts are the remnants of extinct undersea volcanoes. When the volcano was active it would typically be found near a plate boundary, which is a line where two pieces of the Earth's crust meet. They rise to at least 1,000 metres above the sea floor, although their peaks do not reach the water's surface. Three seamounts are present in Scottish waters, located in offshore waters off the west coast.

Seamounts are hotspots of biodiversity and can support communities that include cold-water corals and deep-sea sponges.





Burrowed mud

Burrowed mud habitats can be highly productive and are home to many different animals, including the Norway lobster (or langoustine) and various types of seapen. The majority of the species common to this habitat live within the mud itself. A variety of burrowing shrimps, crabs, worms and fish construct complex galleries of tunnels, some extending over a metre down into the mud. This constant digging and feeding keeps the mud well oxygenated and creates a moon-like topography of tracks, craters and mounds across the surface. Protecting burrowed mud is important for conserving both its biodiversity and the high levels of productivity upon which other marine life depends.

Three species of seapen are commonly found anchored into the mud. The largest of these is the nationally scarce tall seapen that can grow up to 2 m in height. Another spectacular resident of burrowed mud is the fireworks anemone that stands 30 cm high with up to 200 white, pink or green striped tentacles.

Burrowed mud is home to a range of wildlife living in the mud and on the surface.

Ocean quahog aggregations

Ocean quahogs are a type of large clam that can be found around the coast of Scotland. A slow-growing species, ocean quahog can live up to 400 years and are one of the oldest living animals on Earth. They are an important source of food for several species of fish, such as cod. Scotland is considered a stronghold for ocean quahog; approximately 70% of British records come from Scottish waters.

Using a shovel-like foot, ocean quahogs bury into the sea bed and siphon in oxygen and food-rich water. Due to the long-lived nature of the ocean quahog, the ridges in their shell can provide valuable information about how our climate has changed over time. In a similar way to tree rings, the shell ridges indicate the age of the animal.

Ocean quahogs are one of the longest living creatures on Earth and can live up to 400 years.

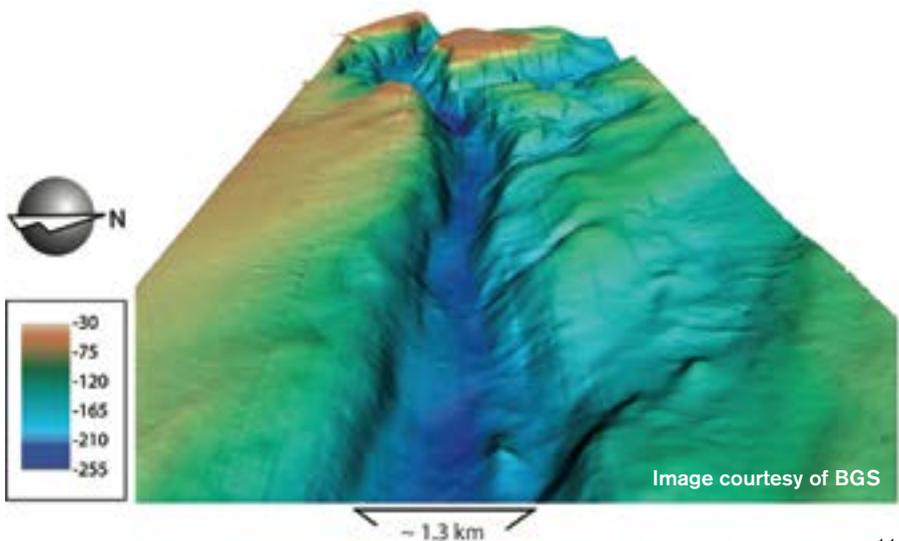


Southern Trench

The Southern Trench is the best example of a large-scale underwater trench in Scottish waters. The complex and irregular shaped trench extends some 58 km along the southern edge of the Moray Firth, running parallel to the shoreline from Banff to Fraserburgh. In places the trench is up to 9 km wide and 250 m deep, whereas the average depth of the North Sea is only 95 m. The area in the vicinity of the Southern Trench is regularly used by feeding minke whales.

Studying the trench system will help improve our understanding of the drainage patterns of ice sheets in this region at the end of the last ice age. Although other smaller and shallower trenches are present within the Moray Firth, the Southern Trench is special because it has cut through the sea bed into the underlying bedrock.

Extending along the southern edge of the Moray Firth, the Southern Trench is the best example of a large-scale underwater trench in Scottish waters.





Fan mussel aggregations

Fan mussels are the largest and one of the most endangered shellfish in Britain. For decades, only a handful of scattered live fan mussels had been recorded in our seas, but in 2009 a survey discovered what is believed to be the largest aggregation in UK waters. Situated in the deep, tide-swept waters between Rum and Canna on the west coast of Scotland, the aggregation is believed to encompass several hundred individuals.

Fan mussels grow up to 50 cm long. They live with the pointed end of their shell buried deep in the sea bed to allow the wider, gaping part to filter seawater for plankton and other organic particles of food. The fan mussel anchors itself to the sea bed with golden, silk-like strands known as byssus threads which are very fine and can attach to a single grain of sand. The threads are so like human hair that superstitious seamen once believed they fed upon drowned sailors. Fan mussels can retract into their shell but cannot close their shell completely. The exposed part of the fan mussel's shell often becomes encrusted with barnacles and tube worms. Fan mussels reproduce by spawning into the sea and need to be close to each other to ensure fertilisation. The fan mussel larvae may then be transported further afield on prevailing currents.

The largest known aggregation of fan mussels was discovered in 2009 in the Sound of Canna.

Black guillemot

Black guillemots are members of the auk family and their black and white plumage, and striking bright red feet make them easy to identify. There are approximately 37,000 breeding individuals in Scotland.

Unlike other auks, the black guillemot typically feeds close inshore, and rarely disperses far from its breeding haunts, even in winter. It is commonly found around the west and north-east coastline of mainland Scotland and the Northern and Western Isles. Black guillemots lay two eggs in May, breeding in crevices and burrows along rocky shorelines and cliffs, although in parts of their range they may occupy artificial structures such as harbour walls. They dive for food, typically taking fish and crustaceans that can be found in abundance in the shallow water kelp forests near their nesting sites.

A member of the auk family, black guillemots are easy to identify by their striking red feet.





Common skate

Common skate were once widespread and abundant in UK waters, but many decades of fishing have significantly reduced their numbers and distribution. The shape and size of skate leave them vulnerable to being caught from a young age, even in the large mesh nets designed to allow the undersize individuals of other species to escape. In Scotland, common skate are now effectively restricted to waters off the west coast and around Orkney. In these areas they are an important sea angling species, subject to tag and release fishing practices.

Information provided by sea anglers taking part in tag-recapture studies on the west coast has greatly improved our understanding of how common skate are using these nearshore areas. Common skate can grow up to 2.5 m long and weigh 100 kg, making them the largest skate in the world. Females breed every other year, and lay up to 40 eggs. The egg cases are large, measuring up to 25 cm long (excluding the 'horns') and 15 cm wide, and are occasionally found washed up on beaches around Scotland's west coast and Orkney.

The egg cases of common skate can occasionally be found washed up on beaches around Scotland's west coast and Orkney.

The future of Scotland's seas

The examples above give a brief insight into the diversity of Scotland's seas and the range of animals, plants and geological heritage it supports. For more information on these features and the network of Nature Conservation Marine Protected Areas being considered to protect them, please visit:

www.scotland.gov.uk/Topics/marine/marine-consultation

www.snh.gov.uk/mpa-consultation

www.jncc.gov.uk/scottish-mpa-consultation

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