

## SUBTIDAL ROCKY REEFS INCLUDING SUBLITTORAL CHALK

# What are Subtidal Rocky Reefs?

Reefs are rocky marine habitats or biological concretions that rise from the seabed. Those that are permanently submerged by the sea are known as subtidal or sublittoral reefs. There are particularly distinct biological communities associated with chalk and limestone reefs.

The southern shore of the Isle of Wight includes a number of subtidal reefs that extend into the intertidal zone. To the west and southwest of the Island occur some of the most important subtidal British chalk reefs, representing over five percent of Europe's coastal chalk exposures. These include the extensive tide-swept reef off the Needles and examples at Culver Cliff and Freshwater Bay.

The southern shore of the Isle of Wight also includes a number of submerged or partially submerged sea caves. The exposure of the south coast of the Island to high wave energy has allowed the erosion of the Cretaceous calcareous hard cliffs to form such caves. Examples of this habitat can be found from the Needles along the southwest coast of the Island to Watcombe Bay, and also in Culver Cliff on the southeast coast of the Island. This site also contains the only known location of subtidal chalk caves in the UK.

The most varied chalk topography is found around the Needles and in Alum Bay with sublittoral cliffs, caves, gullies and boulder slopes; this area also support the greatest range of subtidal fauna.



## Species Supported

Key factors in determining the flora and fauna of sublittoral rock habitats are the levels of turbidity and the degree of exposure. Generally the turbidity restricts kelp to sites at depths of two to seven metres below Chart Datum, while luxuriant red algal growth is uncommon below ten metres. Thus, all but the shallowest habitats are dominated by sessile (fixed) animals such as sponges, sea mats, hydroids and sea squirts.

Shallow sublittoral chalk supports a variety of algal species including kelp. The Isle of Wight also boasts the unusual southern species of kelp *Laminaria ochroleuca*. As in the littoral zone, sublittoral chalk is bored extensively by piddocks (bivalve molluscs). The common piddock tends to prefer horizontal rock faces while the rednose occurs mainly on vertical faces. Chalk is also riddled with the tiny burrows of the polychaete worm, the horseshoe worm and the yellow boring sponge. These species act as 'bioeroders', increasing the fragility of the rock. However, this effect is mitigated by the growth of encrusting red algae which form a tough, protective veneer over the rock surface.

The faunal turf is very diverse. Typical species include the breadcrumb sponge, the shredded carrot sponge, the hydroids, anemones, sea mats, plus sea squirts. Mobile species include the lobster, squat lobster, wrasses and the tompot blenny.

Sheltered rocky habitats in the Solent provide a stronghold for the native oyster. The native oyster is the subject of a UK Species Biodiversity Action Plan.

Southampton docks have a flora and fauna typical of rocky habitats in extreme shelter.



## Economic and Social Value

Reefs are extremely important as feeding, breeding and nursery areas for many wide-ranging species, of fish and shellfish. They also act as natural coastal defences.



## Designations

The southern shore of the Isle of Wight has been designated as a Special Area of Conservation (SAC) under European legislation for, amongst other things, its reef and sea cave habitats. Reefs and sea caves are a primary reason for selection of this site and are known as Annex 1 habitats. Known as the South Wight Maritime European Marine Site (SWMEMS) interest features and sub-features have been identified to highlight the ecologically important components of the site. The interest features and sub-features for reefs include the following communities: rocky shore, kelp forest, subtidal red algae and subtidal faunal turf.

The EU Water Framework Directive requires all inland and coastal waters to reach “good status” by 2015 and will establish demanding environmental objectives, including ecological targets for surface waters. This should help to protect this habitat from pollution and ensure that its water quality remains ecologically sound.

## Seasearch Surveys

In 2006, the Hampshire and Isle of Wight Wildlife Trust co-ordinated nine Seasearch surveys, one aim of which was to investigate sand and gravel habitats around the Solent.

The findings for dives in areas of predominantly rocky reef seabed included:

- Southeast of Nab Tower – the rocky reefs were covered in a mixture of short and tall animal turf. Dead mans fingers were common along with painted top shells. The goosebump sponge was found on gravel and the keelworm on boulders.
- Shanklin Chine, Sandown Bay, Isle of Wight – mixed seaweeds and encrusting pink algae covered the boulders and reef. Dominant species included the goosebump sponge, spiral worm and seamat *Membranipora membranacea*. Velvet swimming crabs were seen and the netted dog whelk and piddocks were common throughout the area. Fish included the ballen wrasse, goldsinny and tompot blennys.



## Issues, Threats and Opportunities

- Coastal development - the modification of littoral habitat for coast defence interferes with the natural exchange of rock material and wildlife between the littoral and sublittoral zones. Sublittoral habitat may also be lost during construction of sea defences, as well as marinas, harbours and other waterside developments that extend into the sea.
- Physical disturbance - damage may be caused by fishing gear and boat anchoring, in addition to smothering and increased turbidity caused by spoil dumping and other inputs.
- Pollution - oil, synthetic compounds and eutrophication can all have a significant effect on reef species. The deterioration of water quality by pollutants and nutrients has caused respectively the replacement of fucoid dominated biotopes by mussel-dominated biotopes, and the occurrence of nuisance *Ulva* spp blooms.
- Alien species – the establishment of non-native species is another threat, and one that may be exacerbated by climate change.
- Protection - the sublittoral reefs of South Wight are within a European Marine Site, which provides a mechanism for research, monitoring and integrated management of human activities and impacts.