

What are Sublittoral Sands and Gravels?

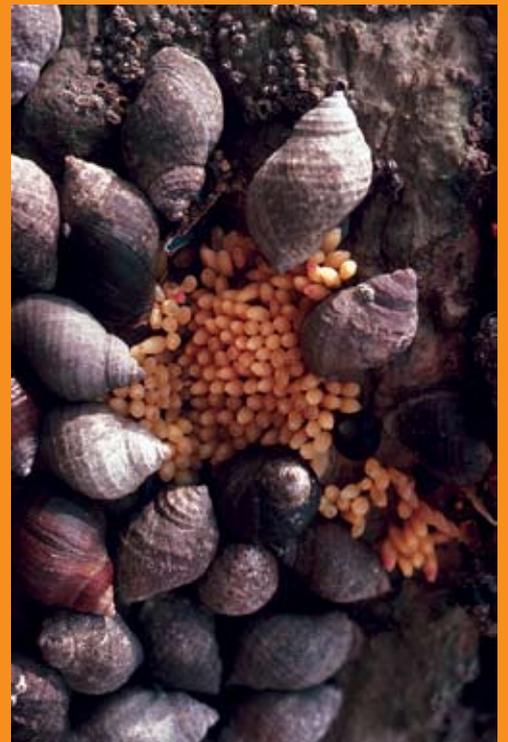
Sublittoral sand and gravel sediments are the most common habitat found below low tide around the coast of the United Kingdom. This habitat occurs in a wide variety of environments, from sheltered (enclosed bays and estuaries) to highly exposed conditions (open coast). Its particle structure ranges from mainly sand, through various combinations of sand and gravel, to mainly gravel. While very large areas of seabed are covered by sand and gravel in various mixes, much of this area is covered by only very thin deposits over bedrock, glacial drift or mud. The strength of tidal currents and exposure to wave action are important determinants of its topography and stability.



Species Supported

The diversity of flora and fauna living within sand and gravel habitats varies according to the level of environmental stress to which they are exposed. Habitats that are exposed to variable salinity in the mid and upper regions of estuaries, and those exposed to strong tidal currents or wave action, have low diversity and are inhabited by robust, fauna specific to the habitat such as polychaete worms, rapidly burrowing bivalves and crustaceans. The sediment surface dwelling animals in these habitats tends to be dominated by mobile predatory species. Upper estuarine mobile sands, subject to very low fluctuating salinity, are species poor. This habitat is characterised by shrimps and other crustaceans.

Sand communities are usually inhabited by species that dwell within the sediment such as polychaete worms, bivalves and gastropod molluscs, sea urchins, crustaceans and burrowing fish. The exact species composition will depend upon local conditions. In inshore waters in the southeast, species commonly associated with sandy habitats include the sandmason worm, sea mouse, common whelk, netted dog whelk, hermit crab, masked crab, dragonet, sand goby, plaice and Dover sole.



On the east side of the entrance to Chichester Harbour is a twenty five metre sand 'cliff' which is cemented together by the ross worm, *Sabellaria*, reefs of which species constitute a UK BAP habitat. This area also supports dense forests of tubeworm species.

An area off East Wight is possibly the UK's only known pupping ground for the globally endangered porbeagle shark. Indeed, the Solent and Wight area has been highlighted as a shark and ray 'hotspot', providing a pupping ground for smooth hound, tope and possibly thresher shark. The area is also a nursery for the starry smoothhound, common smoothhound, tope, thornback ray, stingray, and undulate ray. Small-spotted catshark are also seen, and South Wight has been the location for almost all of the UK reports of marbled electric ray and electric ray.

Shallow inshore and offshore sandbanks, such as Ryde Sands, are also important feeding grounds for many birds, including divers, terns, cormorants and sea ducks, while littoral areas provide haul-outs for the Solent's seal population. There is a small, resident population of common seals in Chichester Harbour.

Photos courtesy of JNCC, Hampshire and Wight Wildlife Trust and National Oceanography Centre

SUBLITTORAL SANDS AND GRAVELS



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Economic and Social Value

Most of the commercially important flatfish species mature, feed and spawn over fine and muddy sand, either offshore or in coastal waters, with the result that these habitats are of considerable economic importance. Stingrays have been known to congregate on the sandbanks at the mouths of some of the Solent estuaries. Commercial scallop and whelk fisheries also depend upon sandy habitats.

In addition to their importance for biodiversity, sand and gravel habitats play a significant role as sources and sinks in sediment processes and, in the case of sand and gravel banks, act as natural coast defences.

Sand and gravel are commercially valuable resources for the construction industry and it is estimated that twenty five percent of the UK's annual consumption of sand and gravel aggregate comes from offshore sources. In the Solent, extraction takes place south of the Isle of Wight and within Bembridge Harbour. Aggregates are landed at a number of the Solent's mainland wharves.

Designations

Sublittoral sands and gravels appear as a priority habitat in the UK Biodiversity Action Plan. Action plan objectives and targets are to protect the extent and quality of a representative range of sublittoral sand and gravel habitats and communities.

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.

Sands and gravels that occur within the Solent's estuaries are protected by its European Marine Site status. The associated EC Directives are designed to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest.

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 sandy gravel seabed included:

- St Helen's Fort, North Bembridge - boulders were covered in brown seaweeds, with a small bed of common eelgrass to the south of the tower. Japweed was abundant through the area while the only fish observed were Baller Wrasse.
- Sandown bay, Isle of Wight – this site was species rich with leathery seasquirts, hydroids, anemones and sponges. Hermit crabs, netted dogwhelks and spiral bryozans were also found.



Issues, Threats and Opportunities

- Fishing - may alter the food chain interactions within this habitat by removing predators and competitors. However, the removal of some species may not necessarily adversely affect the ecological functioning of the community. Most flatfish fisheries are found in areas of sandy seabed and are subjected to intensive perturbation by bottom fishing gears (such as beam trawling).
- Aggregate extraction - can cause physical damage through the removal of habitats and species, the smothering of organisms and the clogging of feeding and breathing mechanisms of some species and toxic contamination due to the remobilisation of pollutants bound within the dredged sediment.
- Physical disturbance - including land claim, construction of marinas and slipways, the widening and dredging of channels, pipe and cable laying and the construction of sea defences. These activities can alter tidal flow regimes and wave exposure, or result in deposition of sediments that influence the structure of sedimentary habitats.
- Organic pollution - from sewage discharge and aquaculture activities leading to anoxic conditions and a decrease in benthic diversity.
- Chemical pollution - is caused by persistent bio-accumulating chemicals (e.g. polychlorinated biphenyls and tri-butyl tin), heavy metals and other chemicals.