



# UK Biodiversity Action Plan Priority Habitat Descriptions

## Subtidal Sands and Gravels

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## Subtidal Sands and Gravels

This habitat description has been adapted from the 1994 UK BAP Action Plan for Sublittoral sands and gravels (<http://tna.europarchive.org/20110303145238/http://www.ukbap.org.uk/UKPlans.aspx?ID=44>).

Subtidal sands and gravel sediments are the most common habitats found below the level of the lowest low tide around the coast of the United Kingdom. The sands and gravels found to the west of the UK (English Channel and Irish Sea) are largely shell derived, whereas those from the North Sea are largely formed from rock material.

The Steering Group associated with the Marine UK BAP Review, agreed in 2007 that this habitat would benefit from being split into six subcategories (but would require expert input to define each of the subcategories) i.e.:

- Estuarine subtidal coarse sediment
- Shallow coarse sediment
- Coastal coarse sediment
- Shelf/offshore coarse sediment
- Estuarine subtidal sand
- Shallow subtidal sand
- Coastal subtidal sand
- Shelf subtidal sand

For the purposes of this habitat action plan, inshore is defined as extending to six nautical miles, and offshore as six nautical miles to the limit of UK waters. This plan encompasses both the inshore and offshore environments.

### Correspondence with existing habitats

Habitats Directive Annex I: Sandbanks that are slightly covered by seawater all the time & Estuaries

### Description

Sublittoral sand and gravel habitats occur in a wide variety of environments, from sheltered (sea lochs, enclosed bays and estuaries) to highly exposed conditions (open coast). The particle structure of these habitats 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 the topography and stability of sand and gravel habitats.

The diversity of flora and fauna living within the biotopes varies according to the level of environmental stress to which they are exposed. Sand and gravel 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, errant fauna specific to the habitat such as small polychaetes, small or rapidly burrowing bivalves and amphipods. The epifauna 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 mysids (*Neomysis integer*) and amphipods (*Gammarus* spp).

Coarse sand sediment can occur in sand-wave formations in shallow water, wave exposed and tide-swept coasts. The infauna in this type of habitat is highly impoverished and is typified by small opportunistic capitellid and spionid polychaetes and isopods (*Pontocrates arenarius*, *Haustorius arenarius* and *Eurydice pulchra*) that are adapted to living in a highly

perturbed environment. The epifauna is characterised by mobile predators such as crabs (*Carcinus maenas* and *Liocarcinus* spp), hermit crabs (*Pagurus bernhardus*), whelks (*Buccinum undatum*), and occasionally sand eels (*Ammodytes* spp). Similar habitats also occur in estuaries where the marine fauna is replaced with a sparse low salinity tolerant fauna (Forth and Humber Estuaries, Solway Firth).

Well-sorted medium and fine sands on exposed coasts subjected to frequent wave action and variable tidal currents are typified by errant polychaetes such as *Nephtys cirrosa* and isopods such as *Bathyporeia* spp (common in full salinity areas of many estuaries). A low salinity variant of this habitat occurs in the Humber and Severn Estuaries.

Loose, coarse sand habitats fully exposed to wave action and swept by strong tidal streams are comparative with the 'Shallow *Venus* Community', the 'Boreal Off-shore Sand Association' and the '*Goniadella*-*Spisula* Association' defined in past studies. This habitat is dominated by small or highly mobile polychaetes, thick shelled and rapidly burrowing bivalves (*Spisula elliptica* and *S. subtruncata*) and mobile amphipods that are adapted to periodic disturbance. It is a common habitat with examples found from Shetland to the Scilly Isles.

A close variant of this community occurs in fine compacted sands with moderate exposure and weak tidal currents. This habitat is characterised by the thin-shelled bivalve *Fabulina fabula*, and is found in the Irish Sea, north-east coast of England and in numerous Scottish sea lochs.

Sand mixed with cobbles and pebbles that is exposed to strong tidal streams and sand scour is characterised by conspicuous hydroids (*Sertularia cupressina* and *Hydrallmania falcata*) and bryozoans (*Flustra foliacea* and *Alcyonidium diaphanum*). These fauna increase the structural complexity of this habitat and may provide an important microhabitat for smaller fauna such as amphipods and shrimps. Examples of the habitat are to be found in Shapinsay Sound, Cromarty Firth, Lowestoft, Thames, Thanet, Menai Strait, Lough Foyle and in numerous Scottish sea lochs.

In contrast, those biotopes found in full salinity in sheltered or deeper waters that are less perturbed by natural disturbance are among the most diverse marine habitats with a wide range of anemones, polychaetes, bivalves, amphipods and both mobile and sessile epifauna. Clean stone gravel habitats are characterised by the sea anemones *Halcompa chrysanthellum* and *Edwardsia timida*, associated with hydroid/bryozoan turfs and red seaweeds. This habitat type has limited recorded distribution: Loch Creran, Loch Eynort (Skye), Church Bay (Rathlin Island) and Strangford Narrows.

Shallow areas with coarse sand swept by tidal currents but sheltered from wave exposure may develop dense beds of the polychaete *Lanice conchilega*. Dense beds of polychaete tubes reduce near-bed currents and significantly increase sediment stability. Examples are to be found in Outer Hebrides lagoons, Skye and sea lochs.

Circalittoral gravels, sands and shell gravel are split into three different biotopes and have communities of high diversity. These habitats are dominated by thick-shelled bivalve and echinoderms species, (e.g. *Pecten maximus*, *Circomphalus casina*, *Ensis arcuatus* and *Clausinella fasciata*), sessile sea cucumbers (*Neopentadactyla mixta*), and sea urchins (*Psammechinus miliaris* and *Spatangus purpureus*). These biotopes have been described by previous workers as the 'Boreal Off-Shore Gravel Association' and the 'Deep Venus Community', and can be found in Shetland, the western coasts, Irish Sea and English Channel.

Many of the inshore habitats are important nursery grounds for juvenile commercial species such as flatfishes and bass. Offshore, sand and gravel habitats support internationally important fish and shellfish fisheries while SE have recently carried out a comprehensive survey of benthic communities in the Greater Minch. Broad scale habitat mapping has also been carried out on behalf of the nature conservation agencies to support their work on marine SACs and by other organisations responsible for carrying out environmental assessments, for example for dredging and cable laying

### **Illustrative biotopes**

SS.SCS.SCSVS – Sublittoral coarse sediment in variable salinity (estuaries)

SS.SCS.ICS – Infralittoral coarse sediment

SS.SCS.CCS – Circalittoral coarse sediment

SS.SCS.OCS – Offshore circalittoral coarse sediment

SS.SSa.SSaVS – Sublittoral sand in variable salinity (estuaries)

SS.SSa.IFiSav – Infralittoral fine sand

SS.SSa.IMuSa – Infralittoral muddy sand

SS.SSa.CFiSa – Circalittoral fine sand

SS.SSa.CMuSa – Circalittoral muddy sand

SS.SSa.OSa – Offshore circalittoral sand

Please note that only the highest biotope level has been recorded in this section, all of the above contain subbiotopes and some of these biotopes contain important biological communities as described in the main body of the habitat description.

### **Current and potential threats**

- *Pollutants in riverine discharge*
- *Trawling and aggregate dredging activities*: Most flatfish fisheries are found in areas of sandy seabed and are subjected to intensive perturbation by bottom fishing gears. Gravel substrata are also disturbed by scallop dredging. Large bodied, slow growing fauna such as bivalves are sensitive to fishing, as are biogenic reefs.
- *Aggregate extraction in licensed areas*.
- *Other physical disturbances* include land claim, construction of marinas and slip ways, 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 (e.g. polychlorinated biphenyls and tributyl tin), heavy metals and other chemicals. These pollutants have led to decreases in the populations of common whelks in the North Sea and cause DNA breakdown in some marine organisms.
- *Oil exploration*, leakages and shipping accidents lead to localised pollution of sediment organisms.