

MUDDY GRAVELS

What are Muddy Gravels?

Sheltered muddy gravels are a marine habitat of mixed muds and gravel. It consists of a variety of diverse sediments ranging from fine silt and mud to pebbles and cobbles. This habitat occurs principally in estuaries, rias and sea lochs, in areas protected from wave action and strong tidal streams. In fully marine conditions on the lower shore, this habitat can be extremely species-rich. The complex nature of the substratum supports a high diversity of both infauna (aquatic animals that live within the sediment) and epifauna (animals that live upon the surface of sediments).

Sheltered muddy gravels in fully saline conditions occur extensively in the Solent, but are rare in the UK as a whole, and are a UK BAP habitat. Provided that there is sufficient clean material for attachment, these areas support populations of the native oyster. The presence of this species increases local habitat diversity, providing attachment sites for sea squirts and other organisms. The Solent has the largest naturally occurring native oyster fishery in Europe. Such fisheries are human managed features where suitable material for spat to attach too have been deposited in the past including tiles, pottery and bricks and they are then dredged and 'harrowed' to remove fine silts before the breeding cycle.



Species Supported

The muds of the Solent are dominated by polychaete worms and molluscs. Unusually dense beds of the peacock worm have been reported in certain locations. Cockles, mussels, oysters and clams are common, though the American hard shelled clam has declined in recent years.

Across large areas, the habitat has been dramatically modified by large populations of the introduced slipper limpet, *Crepidula fornicata*. The shells of live and dead slipper limpets form a veneer on the mud surface, providing a home for species more typical of gravels and mixed ground. This has the effect of increasing sediment deposition. The Solent is one of the few known British strongholds of the nationally scarce mantis shrimp, which lives in large pipeshaped burrows in fine and sandy mud.



Perhaps the region's most unusual muddy habitat lies north of Bembridge off the Isle of Wight. This area of fine, deep, soft mud, known as the St Helen's Road anchorage, supports species such as the echiuroid worm which is normally associated with Scottish sea lochs. Another important area is Sandown Bay, where soft, muddy mounds are bound together by crustaceans.

In some strong current locations, gravel substrates could provide suitable conditions for the growth of maerl, a complex of slow-growing crustose calcareous red algae. Fragments of live maerl (another BAP species) have been found in gravel south of Culver Spit on the Isle of Wight.

Gravel beds are amongst the UK's most diverse marine habitats. The large particle size results in a range of microhabitats for sessile (immobile) and mobile animals. In very shallow water, gravels provide a sufficiently stable substrate for the attachment of algae, while in deeper water a dense and diverse attached fauna of sponges, sea squirts, anemones, sea-mats, hydroids and polychaetes (worms) can be found. Mobile species include scallops, together with a variety of gastropod molluscs, sea urchins, crustaceans and fish.

Economic and Social Value

Due to their high biological productivity, nearshore subtidal muds are vital feeding grounds for many species of seabird, including sea ducks and divers.

Gravels provide important feeding, breeding and nursery grounds for a number of fish species. Many species of North East Atlantic fish are known to spawn on sand and gravel habitats. The high productivity of gravel beds means that they are also important feeding grounds for birds such as auks and divers. Where gravel occurs in banks and ridges, it acts as a natural coastal defence and is important to the sediment dynamics and budgets of the region.

Designations

Muddy 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.

Muddy gravels appear as a priority habitat in the UK Biodiversity Action Plan. This seeks to maintain the extent, distribution and quality of sheltered muddy gravel bed habitats.

Seasearch Surveys

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

The findings for dives in areas of predominantly muddy gravel seabed included:

Nr Fossil Beds, Hampshire/West Sussex Border - the area was dominated by sponges including the elephant hide sponge, the golf ball sponge, shredded carrot sponge, mermaids glove and the goosebump sponge. Seamats and keelworms were also common along with the fish goldsinny and tompot blennys.

Bracklesham Bay, West Sussex - several types of gobies were found including the black goby, rock goby and common goby. Tompot blennys were also observed. Sponges included the shredded carrot sponge and goosebump sponge. Hydroids such as kelp fur and annelids, notably the sand mason and peacock worm were also found.

South Culver Cliff, Sandown Bay, Isle of Wight - the boulders were covered with encrusting pink algae, mixed seaweeds and short animal turf. Dead maerl was found over several areas along with piddock holes and the goosebump sponge.



Issues, Threats and Opportunities

- Physical disturbance - coastal developments such as the construction of marinas and slipways, the widening and dredging of channels and sea defences may alter tidal flow patterns, affecting the sedimentary conditions across the habitat. It can also result in the physical loss of habitat both directly and through the smothering or abrasion of sediments.
- Bait digging – digging for bait can result in the smothering of habitats if holes are not back-filled and the exposure of worms and crustaceans to predators. It can also disturb other species living on the seabed and in the soft sediment and release toxins into the environment if contaminated sediments are disturbed. Sediment habitat damage is most severe in sheltered habitats where holes can persist for weeks or months.
- Fisheries – dredging for bivalves can severely disrupt this habitat when the soft sediments are raked up and turned over.
- Nutrient enrichment - especially sewage pollution stress. Severe pollution can lead to anoxic conditions and a decrease in species populations and diversity.
- Pollution – from persistent bio-accumulating chemicals (e.g. polychlorinated biphenyls and tri-butyl tin), arising from waste discharges containing heavy metals and chemicals, or the introduction of contaminants bound within sediments when they are physically disturbed.
- Introduction of alien species - the slipper limpet can dominate the fauna resulting in the smothering of the sediment surface leading to oxygen deprivation in the sediment. They are also considered a pest of oyster beds.
- Aggregate extraction – the extraction of gravel can cause physical damage to habitats and species by their direct removal or smothering from the settlement of sediment. It can also remobilise toxins contained within the sediment.