

## What are Mudflats?

Mudflats are deposits of mud, silt and clay found in sheltered intertidal areas. They range from soft muds in the most sheltered inner areas of harbours and estuaries, to firm sands in more wave and current-exposed areas. The habitat represents a transition from subtidal sediment areas that are continually covered by the sea, through areas completely inundated by most tides. In shelter, mudflats usually grade into saltmarsh. This is a dynamic habitat, and its continued presence depends on maintaining the balance between the rate of deposition of sediments from the water column and the erosion of sediment by tidal and wave action.

In some areas of the Solent the mudflat resource is increasing and will continue to increase in the future. However, this is often to the detriment of other coastal habitats such as saltmarsh. So while there may be a short to medium term net gain of mudflat this is against a picture of persistent and widespread loss of all intertidal habitats. In the longer term, it is predicted that areas of open coast mudflat in the Solent (e.g. Lymington) will decrease at a faster rate than sheltered sites (e.g. Langstone Harbour) due to the process of coastal squeeze. This will lead to a net loss of habitat.

## Species Supported

Mudflats generally support very little vegetation other than green algae and large beds of eelgrass in some harbours and inlets. Their biodiversity centres on the range of invertebrates living in the sediment which are extremely productive biologically. These include molluscs, crustaceans and worms such as lugworms, ragworms, oysters, cockles and snails.

Mudflats provide an important nursery and feeding ground for many fish species such as plaice and dab. They also provide feeding areas for sole, gobies, sea bass and flounder which feed on the worms, bivalve young and crustaceans.

They also provide a valuable food source for internationally important populations of wintering waders and wildfowl such as brent goose, redshank, bar-tailed godwit, curlew, oystercatcher, turnstone and dunlin.

The Solent is recognised as one of the most important areas in Britain for eelgrass beds, and its associated communities of algae and fauna. These beds occur along the western Solent shore and extensively in the eastern harbours. Eelgrass generally occurs on the more open Solent shores on shallow subtidal sand and gravel and is uncovered only during extreme low water spring tides.

## The Value of Mudflats in the Solent

Mudflats are important to the local fishery economy of the Solent, providing nursery grounds for commercially important fish species including bass. They also provide a source of bait for recreational anglers.

Mudflats are important in helping to dissipate wave energy and so reduce the risk of eroding saltmarshes. This helps to prevent stress on coastal defences and protect low-lying land from flooding.

They also have an intrinsic natural beauty, adding to the unique landscape and seascape of the Solent. This is an economic asset for the area's tourist industry and provides pleasure for local people.

## Did you know?

There's as much energy in a square metre of estuary mud as there is in an average-sized chocolate bar!

## Where can Mudflats be found in the Solent?

### Mainland

- Portsmouth Harbour
- Langstone Harbour
- Chichester Harbour
- Southampton Water
- River Hamble
- Lymington Estuary
- Beaulieu Estuary

### Isle of Wight

- Newtown Harbour
- Wootton Creek
- Medina Estuary
- Yar Estuary
- Bembridge Harbour
- Kings Quay Creek

In the Solent mudflats are found in areas sheltered from the prevailing southwesterly winds with sediment deriving mainly from marine sources, with small inputs from the rivers flowing into the estuaries. They range from low and variable salinity in the upper reaches of the estuaries to the sheltered almost fully marine muds in Chichester and Langstone Harbours. They are characterised by an abundance of organisms, but with a low diversity of species.

On the mainland, sand and mudflats at the low water mark border most of the coastline. Most of the mudflat is located within the eastern Harbours, with sizeable areas also in the Western Solent (sheltered by Hurst Spit) and its rivers, and in Southampton Water.

On the Isle of Wight, Newtown Harbour is the most important location for this habitat, with other important sites found at Wootton Creek, Medina Estuary, Yar Estuary, Bembridge Harbour and Kings Quay Creek.

## Conservation Designations

Most, but not all, of the Solent's mudflats are designated as Sites of Special Scientific Interest. In addition, many of those with SSSI status also fall under one of the Solent's three Special Protection Areas or Ramsar sites due to their importance for breeding gulls and terns and wintering waterfowl.

Intertidal mudflats and sandflats are an Annex 1 habitat under the EU Habitats Directive due to their European importance. The Solent's mudflats are a qualifying feature for the Solent Maritime Special Area of Conservation.

## Issues, Threats and Opportunities

**Development** – past development, land claim and the building of hard coastal defences can lead to the direct loss and the fragmentation of naturally mobile coastal habitats such as mudflats. The loss of intertidal flats can have a profound effect on estuarine productivity and may also impact on other estuarine habitats, e.g. saltmarsh.

**Sea level rise** - the net effect of sea level rise is that the low water mark moves landward while coastal defences prevent a compensating landward migration of the high water mark. This leads to the phenomenon of 'coastal squeeze' and a reduction in habitat.

**Barrage schemes** - schemes for water storage, amenity, tidal power and flood defence continue to pose a threat to mudflats and other estuarine habitats.

**Polluting discharges** - discharges from agriculture, industry and urban areas can lead to the formation of abiotic areas or algal mats which may have a profound impact on invertebrate communities (and indirectly on the communities of birds, fish etc. which feed on them). The loss of embedded fauna can lead to destabilisation of the sediments making them vulnerable to erosion. Additionally, organic material in the sediments can bind to pollutants resulting in elevated concentrations of heavy metals and other contaminants. Shallow water fishing and bait digging - these activities affect both the community structure and substratum of mudflats. For example, bait digging or suction dredging for shellfish affects the sediment structure and disturbs the invertebrate fauna and the species which feed on them.

**Human disturbance** - the presence of humans and many human activities can impact on the use of mudflats by feeding and roosting birds.

**Alien species** - the introduction of novel or non-native species, such as cord grass can have a profound effect on the nature of mudflats leading, for example, to the development of pioneer saltmarsh at their expense.

**Changed estuarine dynamics** - hydrodynamic changes within estuaries and coastal regions will inevitably lead to changes in the pattern of erosion and deposition of fine sediments. Maintenance dredging of navigational channels or marinas and marine aggregate dredging can interrupt sediment movement along the coast and prevent or slow accretion elsewhere, leading to the erosion of mudflats.