



# Intertidal Mudflats

## Local Biodiversity Action Plan

### Associated Species Action Plans:

- INTERTIDAL MUDFLATS

LOCAL BIODIVERSITY ACTION PLAN



### Ecology

#### What are Intertidal Mudflats?

The UK BAP defines intertidal mudflats as "sedimentary intertidal habitats created by deposition in low energy coastal environments, particularly estuaries and other sheltered areas". As a general rule the precise composition of the sediments is dependent upon wave energy leading to a transition from fine silts in the upper estuaries to coarser sediments with a higher proportion of sand towards the estuary mouth. The sediments generally consist of silts and clays with a high organic content. The JNCC Marine Nature Conservation Review (MNCR) biotope codes for mudflats are LMU.SMu (sandy mud shores) and LMU.Mu (soft mud shores) and LMS.MS (muddy sand shores).

Physical processes, e.g. erosion and deposition, intimately link mudflats and other coastal habitats. They commonly appear in the natural sequence of habitats between subtidal channels and vegetated saltmarshes. In large estuaries, such as the Mersey Estuary, they form the largest part of the intertidal area.

Like most other intertidal areas they dissipate wave energy and thus have an important role to play in reducing the risk of erosion damage to saltmarshes and coastal defences, and of tidal flooding in low-lying coastal areas. In addition the mud (and the microbial and macroinvertebrate fauna



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associated with it) plays an important roll in nutrient cycling. In areas subjected to pollution organic material in the sediments can bind to pollutants and, as a result, the muds may contain elevated concentrations of heavy metals and other contaminants.

### Why are Intertidal Mudflats important?

Intertidal mudflats are typically highly productive habitats supporting a high biomass but relatively low species diversity with few rare species. The precise nature of the biota reflects both the prevalent physico-chemical conditions and the degree of enrichment by, for example, sewage pollution. Generally speaking, in areas of lowered salinity, e.g. estuaries, the macroinvertebrate fauna will typically be of the Petersen Macoma community. Characteristic species are common cockle (*Cerastoderma edule*), laver spire shell (*Hydrobia ulvae*), ragworm (*Hediste diversicolor*) and the gammarid *Corophium voluator*. In conditions of very low salinity, e.g. upper estuaries, there may be large numbers of Oligochaetes, mainly *Tubificoides* spp. In coarser, i.e. more sandy, sediments the Polychaets *Nephtys hombergi* and *Arenicola marina* occur, and where the sediments are very coarse beds of sea-grass (*Zostera* spp) can develop. Where the sediments are artificially enriched, e.g. by sewage pollution, increased microbial activity can significantly reduce their oxygen content leading to stress in the animals living in them. As the level of enrichment increases animals are lost from the biota sequentially, beginning with the larger, deep burrowing species and then smaller Polychaets and Bivalves. In badly polluted areas only worms such as *Capitella* sp, *Scololepis* sp and *Tubificoides* sp may remain, and in extreme cases there may be no macroinvertebrate fauna at all. Beds of common mussel (*Mytilus edulis*) or fucoid macroalgae may be present if there are stones or shells to act as attachment points.

### Current status

The surface of the sediments may appear devoid of vegetation however they are often covered with dense mats of microalgae such as diatoms and euglenoids. These may make a significant contribution to the stability of the sediments as the mucilage that they produce helps to bind particles together. Under eutrophic conditions an extensive cover of the macroalgae *Enteromorpha* sp or *Ulva* sp may develop

### Threats

\* Sea Level Rise - It is estimated that 8 - 10,000 ha of intertidal flats will be lost to sea level rise in England between 1993 and 2013. Sea level rise is due to a combination of postglacial sinking of the landmass and global warming. The net effect is that the low water mark moves landward while coastal defences prevent a compensating landward migration of the high water mark leading to the phenomenon of 'coastal squeeze'. This factor may have a very serious impact in the future, particularly on the Mersey Estuary and North Wirral coast. Both of these areas are heavily constrained by coastal defences and have limited or negligible potential for managed retreat. Any



landward migration of the low water line resulting from sea level rise will therefore result in problems of coastal squeeze.

- \* Land Claim For Development - Approximately 25% of British estuarine intertidal flats have been lost to urban, transport infrastructure and industrial development (with up to 80% loss in some estuaries). The loss of intertidal mudflats can have a profound effect on estuarine productivity and may also impact on other estuarine habitats, eg saltmarsh. Although the rate of loss has slowed considerably in recent years it has not stopped.
- \* Barrage Schemes - Schemes for water storage, amenity, tidal power and flood defence continue to pose a threat to intertidal flats 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.
- \* Oil And Gas Exploration - Many coastal and estuarine areas are now licensed for oil and gas exploration and development. These activities can have a serious impact on the sediment biota, and also on sediment supply and transport.
- \* Fishing And Bait Digging - These activities can have a serious adverse impact on both the community structure and substratum of intertidal flats. For example, suction dredging for shellfish or the juvenile flatfish bycatch from shrimp fisheries may alter predator - prey relationships.
- \* Human Disturbance - The presence of humans and many human activities can impact on the use of intertidal mudflats by feeding and roosting birds.

## Objectives, targets and actions

Objectives, targets and actions to help conserve mudflats in the Cheshire region can be found on the [Biodiversity Action Reporting System \(BARS\)](#) along with full details of progress so far.

## How to find out more about intertidal mudflats

[UK BAP Definition](#)

## Contact details

LBAP Chair Christine Smyth, Wirral MBC  
National Lead Partner, Environment Agency  
National Contact Duncan Huggett, Environment Agency  
Phone: 01491 828545



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### References and Glossary

HMSO (1995): Biodiversity: The UK Steering Group Report, Volume 1: Meeting the Rio Challenge, London.

HMSO (1995): Biodiversity: The UK Steering Group Report, Volume 2: Action Plans, London.

