UK Biodiversity Action Plan
Priority Habitat Descriptions

Intertidal Mudflats

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This habitat description has been adapted from the 1994 UK BAP Action Plan for Mudflats (https://webarchive.nationalarchives.gov.uk/20110303150007/http://www.ukbap.org.uk/UKPlans.aspx?ID=34), and would benefit from an update.

Correspondence with existing habitats
OSPAR habitat: Intertidal mudflats
Habitats Directive Annex I: Large shallow inlet and bays

Description
Mudflats are sedimentary intertidal habitats created by deposition in low energy coastal environments, particularly estuaries and other sheltered areas. Their sediment consists mostly of silts and clays with a high organic content. Towards the mouths of estuaries where salinity and wave energy are higher the proportion of sand increases. Mudflats are intimately linked by physical processes to, and may be dependent on, other coastal habitats such as soft cliffs and saltmarshes. They commonly appear in the natural sequence of habitats between subtidal channels and vegetated saltmarshes. In large estuaries they may be several kilometres wide and commonly form the largest part of the intertidal area of estuaries. However, in many places they have been much reduced by land claim.

Mudflats, like other intertidal areas, dissipate wave energy, thus reducing the risk of eroding saltmarshes, damaging coastal defences and flooding low-lying land. The mud surface also plays an important role in nutrient chemistry. In areas receiving pollution, organic sediments sequester contaminants and may contain high concentrations of heavy metals.

Mudflats are characterised by high biological productivity and abundance of organisms, but low diversity with few rare species. The mudflat biota reflects the prevailing physical conditions. The JNCC Marine Nature Conservation Review (MNCR) biotope codes for mudflats are LMU.SMu (Sandy mud shores), LMU.Mu (Soft mud shores), and LMS.MS (Muddy sand shores). In areas of lowered salinity, the macroinvertebrate fauna is predominantly of the Petersen *Macoma* community, characteristic species being: common cockle *Cerastoderma edule*, sand-hopper *Corophium volutator*, laver spire shell *Hydrobia ulvae*, ragworm *Hediste diversicolor* and, when salinity is low, large numbers of oligochaete annelids (principally *Tubificoides* spp). With a slight increase in the proportion of sand, the polychaetes catworm *Nephtys hombergi* and lugworm *Arenicola marina* occur. In slightly coarser areas, seagrass *(Zostera* spp) beds may develop. Where stones and shells provide an initial attachment for byssus threads, beds of the common mussel *Mytilus edulis* occur and accrete material through faecal deposition. Occasional stones or shells may also provide suitable attachment for stands of fucoid macroalgae such as *Fucus vesiculosus* or *F. spiralis*.

The surface of the sediment is often apparently devoid of vegetation, although mats of benthic microalgae (diatoms and euglenoids) are common. These produce mucilage (mucopolysaccharides) that binds the sediment. Under nutrient-rich conditions, there may be mats of the macroalgae *Enteromorpha* spp. or *Ulva* spp.

The total UK estuarine resource has been estimated as *c*588,000ha, of which 55% is intertidal area, mostly mud and sandflats with a lesser amount of saltmarsh. Intertidal flats cover about 270,000ha. The UK has approximately 15% of the north-west European estuarine habitat.

Mudflats are highly productive areas which, together with other intertidal habitats, support large numbers of predatory birds and fish. They provide feeding and resting areas for

internationally important populations of migrant and wintering waterfowl, and are also important nursery areas for flatfish. They are widespread in the UK with significant examples in the Wash, the Solway Firth, Mersey Estuary, Bridgwater Bay and Strangford Lough.

Illustrative biotopes
The 1994 UK BAP plan states the following biotopes are included in this habitat:
LMU.SMu – Sandy mud shores
LMU.Mu – Soft mud shores); and
LMS.MS – Muddy sand shores.

However the Steering group associated with the marine UK BAP review have suggested that this habitat should focus on the following biotopes 2006 and any (important communities that these biotopes contain):

LS.LSa.MuSa – Polychaete/bivalve dominated muddy sand shores
LS.LMu – Littoral mud

The above grouping separates the habitat from shallow subtidal mud and coastal subtidal mud

Current and potential threats
- *Sea level rise*: Low water moves landward, but sea defences prevent a compensating landward migration of high water mark with the result that intertidal flats are squeezed out. Much of this loss is expected in southern and south-east England although research suggests that the major firths in Scotland will also be affected
- *Land claim*: Urban and transport infrastructure and for industry
- *Barrage schemes*: Water storage, amenity, tidal power and flood defence continue to pose a threat to the integrity and ecological value of mudflats in estuaries and enclosed bays.
- *Diffuse and point source discharges from agriculture, industry and urban areas*: Including polluted storm-water run-off, can create abiotic areas or produce algal mats which may affect invertebrate communities. They can also remove embedded fauna and destabilising sediments thus making them liable to erode.
- *Oil and gas extraction and related activities, and dredging for navigation*: Have an important effect on sediment biota and on sediment supply and transport.
- Fishing and bait digging can have an adverse impact on community structure and substratum. For example, suction dredging for shellfish or juvenile flatfish bycatch from the shrimp fisheries may have a significant effect on important predator populations.
- *Human disturbance*: Affects bird populations' roosting and feeding areas.
- *Introduction of new or non-native species*: For example the spread of cord-grass *Spartina anglica* which has vegetated some upper-shore mudflat areas with important ecological consequences in some areas.
- *Estuarine dynamics*: Within estuaries, mudflats deposited in the past may erode due to changed estuarine dynamics and remobilised sediment may be re-deposited elsewhere in the same littoral sediment cell.
- *Higher sea level and increased storm frequency*: Resulting from climate change, may further affect the sedimentation patterns of mudflats and estuaries.

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