

## A5.42 Estuarine Atlantic sublittoral mixed sediment

### Summary

This habitat typically occurs to depths of 10 m and comprises shallow sublittoral mixed sediments in estuarine conditions (18-35ppt), often with surface shells or stones, enabling the development of diverse epifaunal communities.

The most significant pressures and threats that the habitat faces include substratum loss, mainly deriving from activities such as coastal protection, barrages, impoundment and dredging. These activities could also change the abiotic conditions of the habitat such as wave exposure and water flow. Additionally, synthetic compound contamination would cause a decline in some characteristic species of the habitat, which are very intolerant to such toxic substances. Nutrient enrichment/eutrophication has been a major pressures on estuarine habitats, including sublittoral muds. Whilst this may increase the food supply to the benthos it can also lead to changes in species composition and numbers, increased biomass, changes in community structure and an impoverishment of benthic communities due to anoxia.

Conservation and management schemes to benefit estuarine habitats have been applied at a number of scales ranging from whole estuary systems to small areas within an estuary. They include the removal of dykes, and water quality improvement programmes to reduce the risk of toxic contamination or nutrient inputs leading to eutrophication. Furthermore, spatial management, including zoning of activities as part of Integrated Coastal Zone Management Schemes and Marine Protected Areas, that cover the entire estuary complex, as well as water quality management throughout the watershed, are beneficial.

### Synthesis

This habitat has a widespread distribution (EOO >50,000 km<sup>2</sup>) and although not reported to occur in many locations (AOO <50) it is unlikely that the available data cover its full distribution. This habitat has therefore been assessed as Data Deficient both at the EU 28 and EU 28+ levels because of the lack of information on its extent and on any trends in quantity and quality.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Data Deficient	-	Data Deficient	-

### Sub-habitat types that may require further examination

None.

### Habitat Type

#### Code and name

A5.42 Estuarine Atlantic sublittoral mixed sediment



Sublittoral mixed sediments in an estuary. Saltash, River Tamar, UK (© K. Hiscock).

## Habitat description

This habitat comprises shallow sublittoral mixed sediments in estuarine conditions (18-35ppt), often with surface shells or stones, enabling the development of diverse epifaunal communities. There may be moderately strong (1-3kn) to negligible tidal streams. Wave exposure can vary from sheltered to extremely sheltered. This habitat typically occurs to depths of 10m. This habitat type is quite species rich, compared with more homogeneous sediments.

Indicators of quality:

Long term studies of many estuaries typically focus on the physical, biological and chemical characteristics. Indicators of quality of this habitat are frequently linked to those for the whole estuarine environment and therefore include morphological and physical characteristics, carrying capacity and water quality parameters. For the specific habitat, benthic indices, contaminant levels and productivity are some of the frequently used measures of quality.

Indices developed to assess the ecological status of coastal waters, including estuaries, according to the Water Framework Directive, include physical indicators, water quality indicators and measures of benthic diversity, species richness and abundance. The latter group, which is particularly relevant to benthic habitats, includes a Benthic Quality Index, an Infaunal Trophic Index, a Marine Biotic index based on ecological groups, and the Benthic Opportunistic Polychaetes/Amphipods Index.

Characteristic species:

Species which may frequently be present in moderate abundance, include *Crepidula fornicata*, *Nephtys hombergii*, *Aphelocheata marioni*, *Mediomastus fragilis*, *Exogone naidina*, *Polydora ciliate*, *Caulleriella zetlandica*, *Capitella capitata*, *Melinna palmate*, *Tubificoides benedii*, *T.swirencoides*, *Abra alba* and *A.nitida*.

## Classification

EUNIS (v1405:

Level 4. A sub-habitat of 'Atlantic shallow/infralittoral mixed sediment' (A5.4).

Annex 1:

1130 Estuaries

MAES:

Marine - Marine inlets and transitional waters

Marine - Coastal

MSFD:

Shallow sublittoral mixed sediment

EUSEaMap:

Shallow coarse or mixed sediments

IUCN:

9.4 Subtidal sandy

9.5 Subtidal sandy-mud

9.6 Subtidal muddy

**Does the habitat type present an outstanding example of typical characteristics of one or more biogeographic regions?**

Yes

Regions

Justification

Estuaries are a characteristic coastal habitat of the North East Atlantic. They are present in all the subbasins of this regional sea, except for Macaronesia, and are common because of the numerous rivers which discharge to the sea in a region where there is a significant tidal range (over 12 m). The sublittoral areas are usually soft sediments including areas where the substrate is mixed.

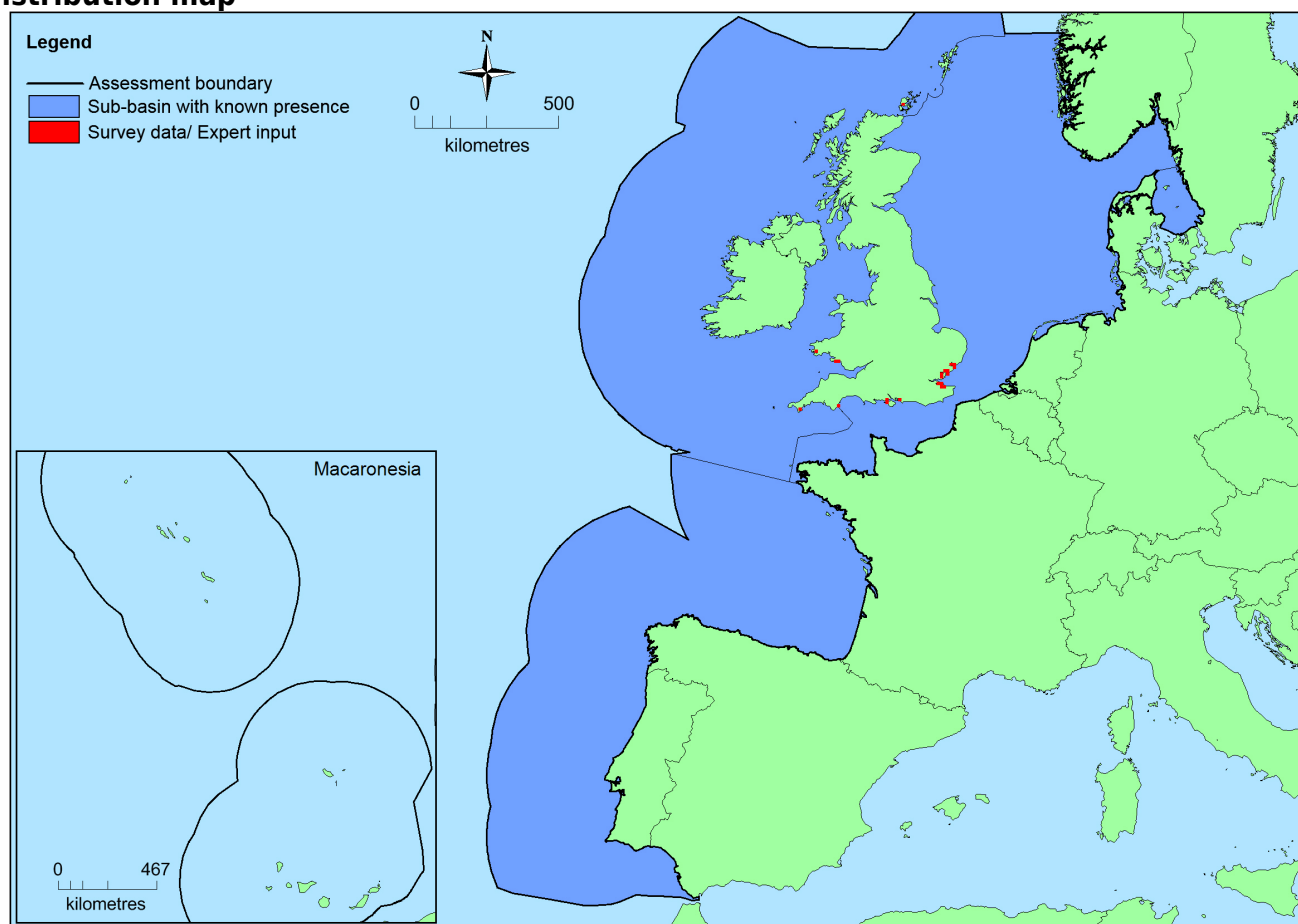
### **Geographic occurrence and trends**

Region	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>North-East Atlantic</i>	Celtic Seas: Present Kattegat: Present Greater North Sea: Present Bay of Biscay and the Iberian Coast: Present	Unknown Km <sup>2</sup>	Unknown	Unknown

### **Extent of Occurrence, Area of Occupancy and habitat area**

	Extent of Occurrence (EOO)	Area of Occupancy (AOO)	Current estimated Total Area	Comment
<i>EU 28</i>	244,272 Km <sup>2</sup>	>23	Unknown Km <sup>2</sup>	Based on a limited data set. AOO is known to be an underestimate.
<i>EU 28+</i>	>244,272 Km <sup>2</sup>	>23	Unknown Km <sup>2</sup>	Based on a limited data set. AOO is known to be an underestimate.

## Distribution map



This map has been generated using EMODnet data from modelled/surveyed records for the North East Atlantic (and supplemented with expert opinion where applicable) (EMODnet 2010). There are insufficient data to provide a comprehensive and accurate map of the distribution of this habitat or for calculation of EOO and AOO.

### How much of the current distribution of the habitat type lies within the EU 28?

Unknown.

### Trends in quantity

There is insufficient information to determine any historical and recent trends in quantity of this habitat. Future trends have not been estimated.

- Average current trend in quantity (extent)

EU 28: Unknown

EU 28+: Unknown

- Does the habitat type have a small natural range following regression?

Unknown

*Justification*

Survey records from EMODnet suggest that the EOO is less than 50,000km<sup>2</sup> however this data set is believed to be substantially incomplete. There is no information on trends.

- Does the habitat have a small natural range by reason of its intrinsically restricted area?

Unknown

*Justification*

Survey records from EMODnet suggest that the EOO is less than 50,000km<sup>2</sup> however this data set

is believed to be substantially incomplete. Within its range the habitat is limited naturally to the transition area between river mouths and the sea.

## **Trends in quality**

There is insufficient information to determine any historical and recent trends in quality of this habitat. Future trends have not been estimated.

- Average current trend in quality

EU 28: Unknown

EU 28+: Unknown

## **Pressures and threats**

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This habitat is sensitive to substratum loss, mainly deriving from activities such as coastal protection, barrages, impoundment dredging and spoil disposal. Apart from direct habitat removal there can be indirect effects, through changes in sediment and hydrological regimes. In addition, dredging may increase water flow rate and wave exposure, which in turn will alter the sediment granulometric characteristics, washing away fine silts and muds, resulting in a possible change in community structure. Coastal construction and coast protection works can also cause an increase in water flow rate leading shifts in infaunal community structure.

Many estuaries in the North East Atlantic have had a long history of receiving pollution for example as effluents from heavy industry. The combination of fine sediments and estuarine salinity gradients produce favourable conditions for the binding, deposition and accumulation of toxic contaminants within the muddy substrate. An accumulation of discharged toxic compounds, together with hydrocarbon contamination incidents, such as oil spills, can therefore have significant impacts on this habitat type, either immediately or by remobilisation after storms, dredging or changes in currents. Some oligochaete and polychaete species may be particularly susceptible to synthetic chemicals that bind to sediments, thus synthetic compound contamination would cause a decline in species richness.

## **List of pressures and threats**

### **Urbanisation, residential and commercial development**

Discharges

### **Biological resource use other than agriculture & forestry**

Fishing and harvesting aquatic resources

Professional active fishing

Benthic or demersal trawling

### **Pollution**

Pollution to surface waters (limnic, terrestrial, marine & brackish)

Marine water pollution

Oil spills in the sea

Toxic chemical discharge from material dumped at sea

Non-synthetic compound contamination

Synthetic compound contamination

Radionuclide contamination

### **Natural System modifications**

Human induced changes in hydraulic conditions

Removal of sediments (mud...)

- Estuarine and coastal dredging
- Modification of hydrographic functioning, general
- Modification of water flow (tidal & marine currents)
- Wave exposure changes
- Alteration of sea-floor/ Water body morphology
- Dykes, embankments, artificial beaches, general
- Sea defense or coast protection works, tidal barrages

#### **Climate change**

- Changes in abiotic conditions
  - Water flow changes (limnic, tidal and oceanic)
  - Wave exposure changes

### **Conservation and management**

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Conservation and management schemes to benefit estuarine habitats have been applied at a number of scales ranging from whole estuary systems to small areas within an estuary. They include the removal of dykes, and water quality improvement programmes to reduce the risk of toxic contamination and to reduce nutrient inputs leading to eutrophication.

Spatial management including zoning of activities as part of Integrated Coastal Zone Management Schemes and Marine Protected Areas that cover the entire estuary complex, as well as water shed management, are beneficial.

#### **List of conservation and management needs**

##### **Measures related to wetland, freshwater and coastal habitats**

- Restoring/Improving water quality
- Restoring/Improving the hydrological regime

##### **Measures related to spatial planning**

- Establish protected areas/sites

##### **Measures related to hunting, taking and fishing and species management**

- Regulation/Management of fishery in marine and brackish systems

##### **Measures related to urban areas, industry, energy and transport**

- Urban and industrial waste management

#### **Conservation status**

Annex 1:

1130: MATL U2

#### **When severely damaged, does the habitat retain the capacity to recover its typical character and functionality?**

Unknown

#### **Effort required**

### **Red List Assessment**

### Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	unknown %	unknown %	unknown %	unknown %
EU 28+	unknown %	unknown %	Unknown %	unknown %

There is insufficient information to determine the extent any trends in quantity of this habitat at the present. This habitat has therefore been assessed as Data Deficient under criterion A.

### Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	>50,000 Km <sup>2</sup>	Unknown	Unknown	No	>23	Unknown	Unknown	No	No
EU 28+	>50000 Km <sup>2</sup>	Unknown	Unknown	No	>23	Unknown	Unknown	No	No

Records for the occurrence of this habitat indicate that it does not have a narrow geographical distribution (EOO >50,000km<sup>2</sup>). AOO records are recognised as incomplete and there are no data on trends. The distribution of the habitat is such that the identified threats are unlikely to affect all localities at once. This habitat has therefore been assessed as Least Concern under criteria B1(c) B2 (c) and B3 and Data Deficient for all other criteria.

### Criterion C and D: Reduction in abiotic and/or biotic quality

Criteria C/D	C/D1		C/D2		C/D3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	unknown %	unknown %	unknown %	unknown %	unknown %	unknown %
EU 28+	unknown %	unknown %	unknown %	unknown %	unknown %	unknown %

Criterion C	C1		C2		C3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	unknown %	unknown %	unknown %	unknown %	unknown %	unknown %
EU 28+	unknown %	unknown %	unknown %	unknown %	unknown %	unknown %

Criterion D	D1		D2		D3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	unknown %	unknown%	unknown %	unknown%	unknown %	unknown%
EU 28+	unknown %	unknown%	unknown %	unknown%	unknown %	unknown%

Experts consider there to be insufficient data on which to assess criteria C/D.

### Criterion E: Quantitative analysis to evaluate risk of habitat collapse

Criterion E	Probability of collapse
EU 28	unknown
EU 28+	unknown

There is no quantitative analysis available to estimate the probability of collapse of this habitat type.

### Overall assessment "Balance sheet" for EU 28 and EU 28+

	A1	A2a	A2b	A3	B1	B2	B3	C/D1	C/D2	C/D3	C1	C2	C3	D1	D2	D3	E
EU28	DD	DD	DD	DD	LC	DD	LC	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	DD	DD	DD	DD	LC	DD	LC	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Data Deficient	-	Data Deficient	-

### Confidence in the assessment

Low (mainly based on uncertain or indirect information, inferred and suspected data values, and/or limited expert knowledge)

### Assessors

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### Reviewers

J. Janssen.

### Date of assessment

28/12/2015

### Date of review

01/04/2016

## References

- Borja, A., Franco, J. & Perez, V 2000. A Marine biotic index to establish the ecological quality of soft-bottom benthos within European estuarine and coastal environments. *Marine Pollution Bulletin*. 40(12):1100-1114.
- Connor, D.W., Allen, J.H., Golding, N. *et al.* 2004. The Marine Habitat Classification for Britain and Ireland Version 04.05 JNCC. [online] Peterborough: ISBN 1 861 07561 8. Available at: [http://jncc.defra.gov.uk/pdf/04\\_05\\_introduction.pdf](http://jncc.defra.gov.uk/pdf/04_05_introduction.pdf). (Accessed: 30/08/2014).
- European Environment Agency 2014. EUNIS habitat type hierarchical view. Available at: <http://eunis.eea.europa.eu/habitats-code-browser.jsp>. (Accessed: 05/01/2016).
- MarLIN (Marine Life Information Network) .2015. MarLIN - The Marine Life Information Network. Available at: <http://www.marlin.ac.uk/speciesfullreview.php>. (Accessed: 18/11/2015).
- Muxika, I., Borga, A. & Bald, J. 2007. Using historical data, expert judgement and multivariate analysis in assessing reference conditions and benthic ecological status according to the European Water Framework Directive. *Marine Pollution Bulletin* 55:16-29.