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Biological Diversity

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Fact sheets on marine habitats and species for the Marine Atlantic region and the Marine Macaronesian subregion

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Context:

The Topic Centre has prepared this Technical paper in collaboration with the European Environment Agency (EEA) under its 2018 work programme as a contribution to the EEA's work on Natura 2000 biogeographical seminars, making use of information from the EU Red List of Habitats[1] and from the information reported by Member States under Art. 17 of the Habitats Directive, Art. 12 of the Birds Directive and Natura 2000.

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[1] Gubbay, S. Sanders, N., Haynes, T, Janssen, J.A.M, Rodwell, J.R, Nieto, A., Garcia Criado, M., Beal, S., Borg, J., Kennedy, M., Micu, D., Otero, M., Suanders, G., and Calix, M. 2016. European Red List of Habitats, Part 1. Marine habitats. European Commission. Luxembourg. Publications of the European Union.

Contents

1 Introduction

1.1 Background

The new Natura 2000 Seminars at the biogeographical level aim to exchange and analyse information on measures necessary to achieving favourable conservation status of species and habitats of Community interest, with special attention to the management and coherence of the Natura 2000 network. The seminars involve Member States, key user groups, NGOs and independent experts (Arvela et al., 2012).

The 'Pre-scoping document for the marine regions (Core document)' published as ETC/BD Technical paper n°2/2015, presented the general background as well as the approach used by ETC/BD to guide the selection of habitat-types and species for priority consideration by Member States and stakeholders for discussion on management issues during the 1st Natura 2000 marine seminar held in Saint Malo (France) in May 2015.

The present document complements the above-mentioned report and the 'Fact sheets on selected marine habitats and species' presented in 2015 by providing the following information for the Marine Atlantic and Marine Macaronesian regions:

- Descriptive fact sheets on two EU Red list habitat-types directly extracted from *Gubbay et al.* 2016[2].
- Updated fact sheets prepared by ETC/BD for four Annex I habitat-types which are sub-types of the two EU Red List habitat-types.
- Updated fact sheets prepared by ETC/BD for one Annex II species.
- Fact sheets prepared by ETC/BD for one bird species.

1.2 Fact sheets prepared by ETC/BD

Each fact sheet prepared by ETC/BD presents the habitat/ species conservation status (trend for bird species) together with a distribution map for the Marine Atlantic and Marine Macaronesian regions, information on pressures as well as on most important conservation measures implemented.

Quantitative information on Natura 2000 sites hosting the concerned habitat/ species is also provided.

1.2.1 Conservation status

The assessment of conservation status is based on the reporting of the EU Member Countries based on requirements of the Habitats Directive Article 17 for period 2007-2012 (further "Article 17 Reporting"). For this assessment the following categories are used:

FV	Favourable	U1	unfavourable – inadequate
U2	unfavourable-bad	XX	unknown

As this information is not reported in Article 12 of the Birds Directive, birds species population trends at EU level have been provided.

[2] Gubbay, S. Sanders, N., Haynes, T, Janssen, J.A.M, Rodwell, J.R, Nieto, A., Garcia Criado, M., Beal, S., Borg, J., Kennedy, M., Micu, D., Otero, M., Suanders, G., and Calix, M. 2016. European Red List of Habitats, Part 1. Marine habitats. European Commission. Luxembourg. Publications of the European Union.

1.2.2 Maps

Maps showing the distribution of habitat types and species in the Marine Atlantic and Macaronesian regions were prepared using the Article 17 and 12 national distribution GIS layers (reporting cycle 2007-2012, 2008 - 2012). In addition, these maps also show the conservation status for habitat types and non-bird species, however this information is not available for bird species.
The second map depicts the Sites of Community Importance or Special Protection Areas designated for each habitat type and species. As with the statistics, non-significant sites (those containing D population for species and D representativity for habitats) have been differentiated on maps.

1.2.3 Methodology on statistics for pressures and conservation measures

The list of pressures and conservation measures used for the assessment can be found on the Article 17 Reference Portal[3]. The list of pressures is structured in a hierarchical way, with 3 levels reflecting different degrees of precision, see Table 1.1.

Table 1.1 Pressure (and threats) categories used for Article 12 & 17 reporting, Level 1 in full and examples of Levels 2 and 3

Level 1		Level 2 (part)		Level 3 (part)	
Code	**Name**				
A	Agriculture				
B	Forestry				
C	Mining, quarrying & energy production				
D	Transportation & service infrastructure				
E	Urbanisation, residential & commercial development				
F	Use of living resources (other than agriculture & forestry)	F01	Marine and freshwater aquaculture		
		F02	Fishing and harvesting aquatic resources	F02.01	Professional passive fishing
				F02.02	Professional active fishing
				F02.03	Leisure fishing
		F03	Hunting and collection of terrestrial wild animals		
		F04	Taking and collection of terrestrial plants		
		F05	Illegal taking of marine fauna		
		F06	Other hunting, fishing and collection activities		
G	Disturbances due to human activities				
H	Pollution				
I	Invasive and introduced species				
J	Modification of natural conditions				
K	Natural processes (excluding catastrophes)				
L	Geological events, natural catastrophes				
M	Climate change				
X	No pressures or threats				
XO	Threats and pressures from outside the Member State				
XE	Threats and pressures from outside the EU territory				
U	Unknown threat or pressure				

[3] http://bd.eionet.europa.eu/activities/Reporting/Article_17/reference_portal

For the Article 17 reports, Member States were requested to report pressures at the second hierarchical level, but were given the option of using more precise categories (i.e. third and fourth level). The following analyses of pressures are based on this requested hierarchical level.

In addition to the types of pressure and conservation measures (up to 20 maximum) for each habitat/species, Member States also ranked the relative importance of the pressure or conservation measure as falling under one of three categories: low, medium and high importance/impact. A maximum of five high ranked entries could be reported by Member States for each habitat/species in a given region.

The following habitats and species fact sheets only retain high-ranked pressures and conservation measures. As the ranking code was not obligatory to indicate unknown/no pressures and no measures, these categories have been excluded from statistics.

For the bird species triggering SPA classification, Member States were asked to report the 20 most important pressures and threats using an agreed hierarchical list which can be found on the Article 12 Reference Portal (http://bd.eionet.europa.eu/activities/Reporting/Article_12/reference_portal).
The table below only contains information from Member States, where a species triggers SPA classification. Pressures and threats were ranked in three classes 'high, medium and low importance', the table below only shows pressures and threats classed as 'high', for some species there were less than ten pressures and threats reported as highly important.

This methodology is also applicable for conservation measures, Member States were asked to report up to 20 conservation measures being implemented for this species using an agreed list which can be found on the Article 12 Reference Portal. Member States were further requested to highlight up to five of the most important ('highly important') measures; the table below only shows measures classed as 'high' (for many species there were less than ten measures reported as highly important).

1.2.4 Habitats and non-bird species in SCIs and bird species in SPA

Statistical information is provided on the occurrence of each habitat type and species in Natura 2000 sites for individual Member States in the Marine Atlantic region, i.e. the number of sites and habitat area within the sites. Data is presented differentiating significant and non-significant sites (those containing D population for species and D representativity for habitats). For species tables, data on population size in Natura 2000 sites have been included as reported by Member States in the Article 17 and Article 12 reports (2007- 2012, 2008 – 2012 reporting cycle). Note that data on birds are not available at marine region level, only at MS's level.
These data have been extracted from the Natura 2000 European database end 2017 with the exception of population size which comes from Article 17 and 12.

2 Habitats fact sheets

Descriptive fact sheets for habitat A2.72 *Mussels beds in the Atlantic littoral zone* and A5.53 *Seagrass beds on Atlantic infralittoral sand* are extracted from the European Red List of Habitats

Descriptive fact sheets for habitat 1160 *Large shallow inlets and bays,* 1170 *Reefs and* 1110 *Sandbanks which are slightly covered by sea water all the time* have been prepared by ETC/BD, making use of information from Art. 17 reporting

2.1 A2.72 Mussels beds in the Atlantic littoral zone[4]

European Red List of Habitats - Marine Habitat Group

A2.72: Mussel beds in the Atlantic littoral zone

Summary

Dense aggregations of blue mussels (living and dead) form a single or multi-layered framework, held together by byssus threads, that stabilise sediment and provide a habitat for many infaunal and epifaunal species. They are important in sediment dynamics of coastal systems, provide shelter for a large number of species, are important as food source for birds, and form an often rare area of hard substrata in areas of soft sediment. The temporal stability of mussel beds can vary a lot. Some beds are permanent, maintained by recruitment of spat in amongst adults. Other beds are ephemeral and beds can recovery quickly following disturbance. The morphological structures of littoral areas are enhanced by the mussel beds even where absent, as remnants are visible as elevations of clay banks or shell layers. Very old beds may also stabilise creek patterns because clay and shell layers are relatively erosion resistant.

Pressures such as intensive commercial fisheries and harvesting, coastal development, chemical pollution, and other human activities that physically disturb the mussel bed habitat result in widespread losses and may even lead to long-term disappearances of mature mussel beds on sandy and mixed sediments. The main management measures, which would assist the conservation of this habitat, are the regulation of the fisheries which target the mussel beds and protection from physical damage. Specific measures include control of fisheries through quotas, closed areas, specified fishing methods, regulations on the movement of spat including collection of spat for aquaculture, and prohibiting spat collection from intertidal areas.

Synthesis

When determining trends in this habitat it is important to recognise that the temporal stability of mussel beds can vary a lot. Some beds are permanent, maintained by recruitment of spat in amongst adults. Other beds are ephemeral. Many mussel beds are subject to total destruction by storms, ice drifts and tidal surges and on occasion, this may involve hundreds of hectares. Trend analysis also needs to take account of the fact that many intertidal *Mytilus* beds are subject to relaying and commercial exploitation.

There has been a significant decline in the extent and biomass of this habitat, in the Netherlands, Denmark and Germany both historically and in recent decades. The quality of this habitat has also been reduced by fishing as this regularly depletes the mussel beds. Invasive species are also an issue in some locations. In the German Waddensea, for example all eulitoral mussel beds are now inhabited by the invasive species *Crassostrea gigas* and many are dominated by this species to the extent that the biomass of *C.gigas* is sometimes 4 to 5 times higher than biomass of blue mussels.

ICES found sufficient evidence for the decline and threat of this habitat over the whole OSPAR area, and this habitat is on the list of threatened and/or declining species in the OSPAR area.

Where there is good evidence, the decline in extent in recent years has been greater than 50% (and in some cases >80%) however, as this is not the case for all examples of this habitat, the overall decline over the last 50 years is estimated to be >50%. There has been a very substantial reduction in biotic quality of this habitat over the last 50 years in many locations. Expert opinion is that this is at least a severe decline affecting more than 50% of the extent of this habitat. On this basis the habitat is assessed as being Endangered for both the EU 28 and EU 28+.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria

[4] https://forum.eionet.europa.eu/european-red-list-habitats/library/marine-habitats/north-east-atlantic

Overall Category & Criteria			
Endangered	A1, C/D1	Endangered	A1, C/D1

Sub-habitat types that may require further examination

None.

Habitat Type

Code and name

A2.72: Mussel beds in the Atlantic littoral zone

Aerial photograph of mussel beds at low water in the Waddensea, Netherlans (© F.Klinge).

Intertidal mussel bed in the Waddensea, Netherlands (© N.Dankers).

Habitat description

Sediment shores characterised by beds of the mussel *Mytilus edulis* occur principally on mid and lower shore mixed substrata (mainly cobbles and pebbles on muddy sediments) but also on sands and muds. In high densities (at least 30% cover) the mussels bind the substratum and provide a habitat for many infaunal and epibiotic species. This habitat is also found in lower shore tide-swept areas, such as in the tidal narrows of sealochs. A fauna of dense juvenile mussels may be found in sheltered firths, attached to algae on shores of pebbles, gravel, sand, mud and shell debris with a strandline of fucoids. Two associated biotopes are *M.edulis* beds on littoral mixed substrata and *M.edulis* beds on littoral sand.

The temporal stability of mussel beds can vary a lot. Some beds are permanent, maintained by recruitment of spat in amongst adults. Other beds are ephemeral, for example in locations where large amounts of spat settle intermittently on a cobble basement. In such situations mussels rapidly build up mud, and are unable to remain attached to the stable cobbles and are then liable to be washed away during gales. A second example of ephemeral mussel dominated biotopes occurs when mussel spat ("mussel crumble") settles on the superficial shell of cockle beds.

'Mussel mud', composed of faeces, pseudofaeces and sediment, accumulates underneath mussel beds. In sheltered habitats, pseudofaeces (undigested, filtered particles) can build up forming a thick layer of anoxic mud. The layer of mud may prevent the attachment of mussels to the underlying substratum, but the silt layer often consolidates and forms a firm clay bank which is very erosion resistant including the mussels embedded into it. 'Mussel mud' (that is not anoxic) supports a diverse range of infauna.

Indicators of quality:

Both biotic and abiotic indicators have been used to describe marine habitat quality. These include: the presence of characteristic species as well as those which are sensitive to the pressures the habitat may face; water quality parameters; levels of exposure to particular pressure, and more integratedindices which describe habitat structure and function, such as trophic index, or successional stages of development in habitats that have a natural cycle of change over time.

There are no commonly agreed indicators of quality for this habitat, although particular parameters may have been set in certain situations e.g. protected features within Natura 2000 sites, where reference values have been determined and applied on a location-specific basis.

The overall quality and continued occurrence of this habitat is largely dependent on the presence of *Mytilus edulis* which creates the biogenic structural complexity on which the characteristic associated communities depend. The density and the maintenance of a viable population of this species is a key indicator of habitat quality, together with the visual evidence of presence or absence of physical damage. Monitoring programmes may include measures of biomass, coverage, length frequency distribution, a condition index for the mussels (a ratio between biomass versus shell lenght) and descriptions of the structure of a bed including vertical height profile, thickness and type of accumulated sediment, coverage and biomass of macroalgae.

Characteristic species:

Dense aggregations of the mussel *Mytilus edulis*. The wrack *Fucus vesiculosus* (and *Fucus mytili*, currently regarded as a synonym of *F.vesiculosus*) is often found attached to either the mussels or cobbles and it can be abundant. The mussels are often encrusted with the barnacles *Semibalanus balanoides, Elminius modestus* or *Balanus crenatus*. Where boulders are present they can support the limpet *Patella vulgata*. The winkles *Littorina littorea* and *L. saxatilis* and small individuals of the crab *Carcinus maenas* are common amongst the mussels, whilst areas of sediment may contain the lugworm *Arenicola marina*, the sand mason *Lanice conchilega*, the cockle *Cerastoderma edule*, and other infaunal species. Although a wide range of species are associated with *Mytilus edulis* beds biotopes these characterizing species occur in a range of other biotopes and are therefore not considered to be obligate associates.

Classification

EUNIS (v1405):

Level 4. A sub-habitat of 'Atlantic littoral biogenic reefs' (A2.7).

Annex 1:

1140 Mudflats & sandflats not covered at low tide

1160 Large shallow inlets and bays

1170 Reefs

MAES:

Marine - Marine inlets and transitional waters

Marine - Coastal

MSFD:

Littoral Sediment

EUSeaMap:

Not mapped

IUCN:

12.3 Shingle and/or Pebble shoreline and/or Beaches

12.4 Mud Shoreline and Intertidal Mud Flats

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

Regions
Atlantic

Justification
Intertidal *Mytilus edulis* beds on mixed and sandy sediments are specific to the North East Atlantic region. The majority are found in the Wadden Sea area (the Netherlands, Germany, Denmark) and in UK waters, although they are also present along the coast of Iceland and Ireland. Historical data report some intertidal *Mytilus edulis* beds on mixed and sandy sediments along the coast of France, but those records have yet to be confirmed.

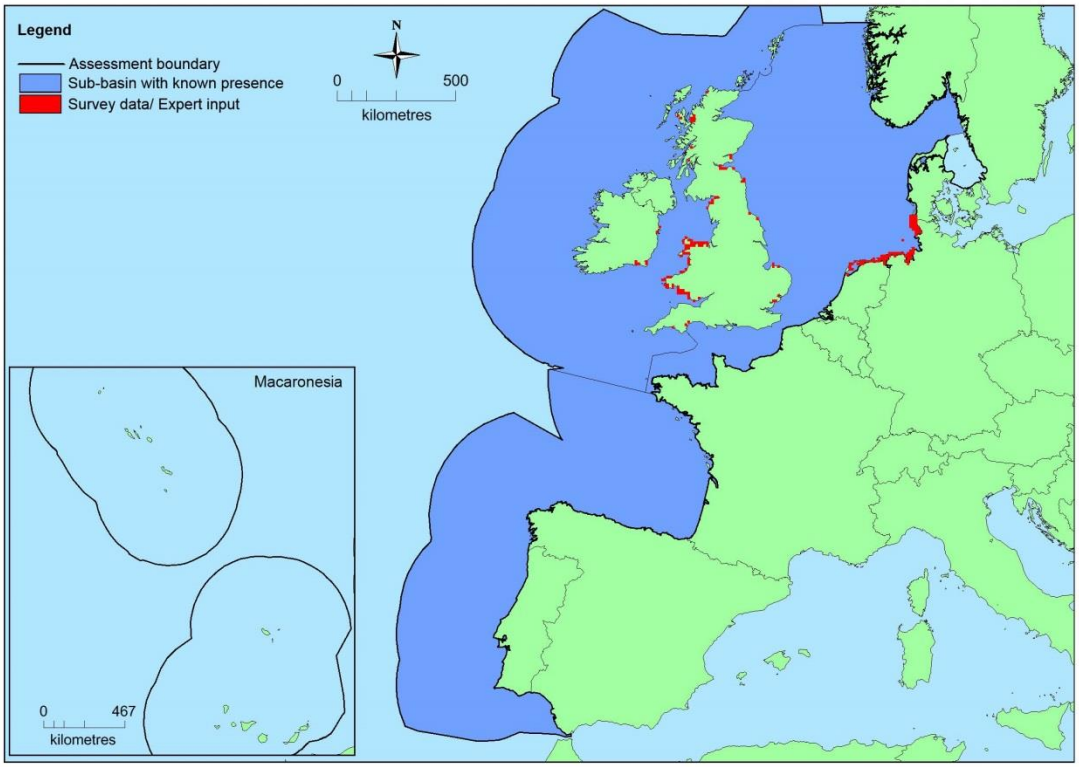
Geographic occurrence and trends

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

Extent of Occurrence, Area of Occupancy and habitat area

	Extent of Occurrence (EOO)	Area of Occupancy (AOO)	Current estimated Total Area	Comment
EU 28	584,502 Km^2	184	Unknown Km^2	EOO and AOO have been calculated on the available data. Although this data set is known to be incomplete the figures exceed the thresholds for threatened status.
EU 28+	584,502 Km^2	184	Unknown Km^2	EOO and AOO have been calculated on the available data. Although this data set is known to be incomplete the figures exceed the thresholds for threatened status.

Distribution map



There are insufficient data to provide a comprehensive and accurate map of the distribution of this habitat. 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). EOO and AOO have been calculated on the available data presented in this map however these should be treated with caution as expert opinion is that this is not the full distribution of the habitat.

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

Unknown but likely to be more than 90% as the majority of reported examples of this habitat are in the southern North Sea.

Trends in quantity

There has been a significant decline the extent and biomass of this habitat, in the Netherlands, Denmark and Germany both historically and in recent decades. In Germany, a series of surveys covering the whole littoral of Niedersachsen revealed a decrease in the extent of beds and, more drastically, in biomass from roughly 5,000 ha in extent to the late 1950s (100,000 t fresh weight), 2 700 ha in 1989/1990, 1,300 ha in 1994 to 170 ha (1,000 t) in 1996. Following some good spatfalls an area of 1,280 ha survived the severe winter of 1996/97. In the Dutch Waddensea there was a more or less stable area of 4,500 ha until the middle of the 1980s. Because of the fishery in a period with limited spatfall all beds had disappeared in 1991. Fishing on intertidal beds was then forbidden and the population recovered to about 2500 ha in 2015. About half of these present beds should be considered as mixed beds of mussels and Pacific Oysters. In Schleswig-Holstein a decrease of biomass of approximately 50% was reported between 1989 and 1990.

Comparisons using aerial photography of the German Wadden Sea (Schleswig-Holstein) taken in 1959 reveal severe decline in the extent of this habitat over that time period. Historically (between 60-250 years ago) there has been an estimated reduction in the extent of this habitat in the German Waddensea of

more than 90%. In the Netherlands, Higler *et al.* (1998) observed a serious decline in the populations of mussels between 1988 and 1990, mainly caused by fisheries. The extent of mussel beds decreased from the 1970s to the 1990s. In Denmark, intensive fisheries during 1984 to 1987 almost led to a complete disappearance of the mussel population.

In the UK, large beds exist in the Wash, Morecambe Bay, Conwy Bay and other estuaries of south-west England, north Wales and West Scotland as well as the sea loughs of Northern Ireland many of which have historical data associated with mussel fisheries. In the Wash, for example there appear to have been at least four large fluctuations in abundance since the 1920s. High exploitation and variable recruitment led to a severe decline in the number of productive beds, with 31 beds covering around 1,320 ha in 1940, 14 beds covering 510ha in 1977 and 6 beds covering 155ha in 1992. In the Exe estuary since the farming of mussel beds stopped in the 1950s/60s, the intertidal area occupied by mussels has shrunk considerably. Comparison of known beds covered an area of just over 51ha from the period 1976-1990 compared to just over 36 ha in 2013/14. While there were 31 mussel beds occupying a combined areas of 80ha in 1976, today there are 12 main mussel beds and almost all of the smaller beds have disappeared.

- Average current trend in quantity (extent)
  EU 28: Decreasing
  EU 28+: Decreasing
- Does the habitat type have a small natural range following regression?
  No
  Justification
  This habitat does not have a small natural range as it occurs in locations as widely separated as the Wadden Sea coast of the Netherlands, Germany and Denmark and in UK waters.
- Does the habitat have a small natural range by reason of its intrinsically restricted area?
  No
  Justification
  This habitat does not have a small natural range as it occurs in locations as widely separated as the Wadden Sea coast of the Netherlands, Germany and Denmark and in UK waters.

Trends in quality

The quality of this habitat has been reduced by fishing as this regularly depletes the mussel beds. Invasive species are also an issue. In the German Waddensea all littoral mussel beds are now inhabited by the invasive species *Crassostrea gigas* and many are dominated by this species to the extent that the biomass of *C.gigas* is sometimes 4 to 5 times higher than biomass of mussels. Decrease in quality is also indicated by decrease in biomass. In Schleswig-Holstein for example, a decrease of biomass of approximately 50% was reported between 1989 and 1990. There may be some beds with good quality (e.g. Exe estuary) which can be used as reference sites on quality.

- Average current trend in quality
  EU 28: Decreasing
  EU 28+: Decreasing

Pressures and threats

Directed fisheries are the principal athropogenic threat to this habitat. The extensive, heavily exploited mussel fisheries (especially spat collecting for aquaculture) removed close to the entire stock in the Wadden Sea between 1988 and 1990 as well as having knock on effects such as an increased mortality for seabirds (e.g. eider ducks) and affecting the benthic diversity. The pressure from fisheries activities is exacerbated when settlement of spatfall is low. Another threat is from alien species. The introduced Pacific Oyster (*Crassostrea gigas*) has increased significantly in the Wadden Sea since the beginning of the 21st century and one of the preferred settlement structures for the larvae are existing mussel beds. The result

has been a conversion of a large parts of mussel beds into oyster beds. In the Lower Saxony part of the Wadden Sea, for example, every intertidal mussel bed holds at least some oysters. Bait collection can have a localised effect while phytoplankton blooms, produced by nutrient enrichment (e.g. industrial and residential sewage discharge, agriculture), are another potential threat. Mussel beds could also have intermediate sensitivity to anti-fouling substances and heavy metal contaminants. Climate change effect the reproductive success directly or indirectly eg. via higher abundance of shrimp (*C.crangon*) surviving the winter which are major predators of spat. In the eastern Scheldt oyster drills (aquaculture transfer of spat, with non-indigenious species).

List of pressures and threats

Urbanisation, residential and commercial development

Discharges

Biological resource use other than agriculture & forestry

Marine and Freshwater Aquaculture
Bottom culture
Fishing and harvesting aquatic resources
Professional active fishing
Benthic dredging
Leisure fishing
Bait digging / Collection

Pollution

Pollution to surface waters (limnic, terrestrial, marine & brackish)
Nutrient enrichment (N, P, organic matter)

Natural System modifications

Human induced changes in hydraulic conditions
Modification of hydrographic functioning, general

Climate change

Changes in abiotic conditions
Temperature changes (e.g. rise of temperature & extremes)
Changes in biotic conditions
Migration of species (natural newcomers)

Conservation and management

The main management measures, which would assist the conservation of this habitat, are the regulation of the fisheries which target the mussel beds and protection from physical damage. Specific measures include control of fisheries through quotas, closed areas, specified fishing methods, regulations on the movement of spat including collection of spat for aquaculture, and prohibiting spat collection from intertidal areas.

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 marine habitats

Restoring marine habitats

Measures related to spatial planning

Legal protection of habitats and species

Measures related to hunting, taking and fishing and species management

Regulation/Management of fishery in marine and brackish systems
Specific single species or species group management measures

Measures related to special resouce use

Regulating/Managing exploitation of natural resources on sea

Conservation status

Annex 1:

1140: MATL U2, MMAC XX

1160: MATL U2, MMAC FV

1170: MATL U2, MMAC FV

Intertidal *Mytilus edulis* beds on mixed and sandy sediments are identified by OSPAR as a threatened and/or declining habitat in all OSPAR regions.

Intertidal mussel beds are on the Red List of biotopes and biotope complexes of the Wadden Sea.

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

The mussel beds which characterise this habitat may be transient and dynamic or permanent and persistent. Their capacity to recover is generally strong where there are good spatfalls although development into established beds will be influenced by many factors, such as the presence of predators, local hydrographic conditions, and exposure of the location.

Blue mussels are sessile, attached organisms that are unable to repair significant damage to individuals. They do not reproduce asexually and therefore the only mechanism for recovery from significant impacts is larval recruitment to the bed or the area where previously a bed existed. Recruitment is often sporadic, occurring in unpredictable pulses, although persistent mussel beds can be maintained by relatively low levels or sporadic recruitment. Recovery from human activity impacts may take at least 5 years, although in certain circumstances and under some environmental conditions (e.g. recurring physical disturbance or sporadic recruitment) recovery may take significantly longer. Nearly complete recovery from disturbance is a characteristic common to *Mytilus* beds throughout the world.

Effort required

10 years
Naturally

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3

Criterion A	A1	A2a	A2b	A3
EU 28	>50 %	unknown %	unknown %	unknown %
EU 28+	>50 %	unknown %	unknown %	unknown %

There has be a significant decline in biomass and extent of this habitat, both historically and over the last 50 years. The declines differ in extent in different parts of the region. For example in Schleswig Holstein, Niedersachsen, in the Netherlands and Denmark the losses were so substantial that this habitat was almost lost in 1990. There has been a slow recovery but this is still only around half the level of 50 years ago. The intertidal beds in the Wash (UK) also almost completely disappeared in the 1990s which is attributed to a combination of heavy exploitation and poor spatfalls.

Where there is good evidence, the decline in extent in recent years has been greater than 50%.In some cases it has been greater than 80% and in the Eastern Scheldt the decline has been 100% in the last 100 years with only a small area of artificial lays present now. However, as this large scale decline is not the case for all examples of this habitat, the overall decline over the last 50 years is estimated to be >50%. This habitat has therefore been assessed as Endangered under criterion A1 for both the EU 28 and EU 28+.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	>50,000 Km^2	Yes	Unknown	No	>50	Yes	Unknown	No	No
EU 28+	>50,000 Km^2	Yes	Unknown	No	>50	Yes	Unknown	No	No

This habitat has a large natural range in the North East Atlantic region as it occurs in locations as widely separated as the Wadden Sea coast of the Netherlands, Germany and Denmark, and in UK waters. The precise extent is unknown however as EOO >50,000km^2 and AOO >50, this exceeds the thresholds for a threatened category on the basis of restricted geographic distribution. Future trends are unknown but the distribution of the habitat is such that the identified threats are unlikely to affect all localities at one. This habitat has therefore been assessed as Least Concern under Criteria B1(a,c), B2 (a,c) & B3 and Data Deficient under 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	50 %	severe %	unknown %	unknown %	unknown %	unknown %
EU 28+	50 %	severe %	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%

There has been a very substantial reduction in biotic quality of this habitat over the last 50 years in many locations. Expert opinion is that this is at least a severe decline affecting more than 50% of the extent of this habitat. There has also been a historical reduction in quality. The scale of historical change is harder to estimate but is not believed to be above the thresholds for Red Listing. This habitat has therefore been assessed as Endangered under criteria C/D1 for both the EU 28 and EU 28+.

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	EN	DD	DD	DD	LC	LC	LC	EN	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	EN	DD	DD	DD	LC	LC	LC	EN	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
Endangered	A1, C/D1	Endangered	A1, C/D1

Confidence in the assessment
Medium (evenly split between quantitative data/literature and uncertain data sources and assured expert knowledge)

Assessors
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Reviewers
R. Haroun.

Date of assessment
06/08/2015

Date of review
29/03/2016

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2.1.1 1140 Mudflats and sandflats not covered by seawater at low tide

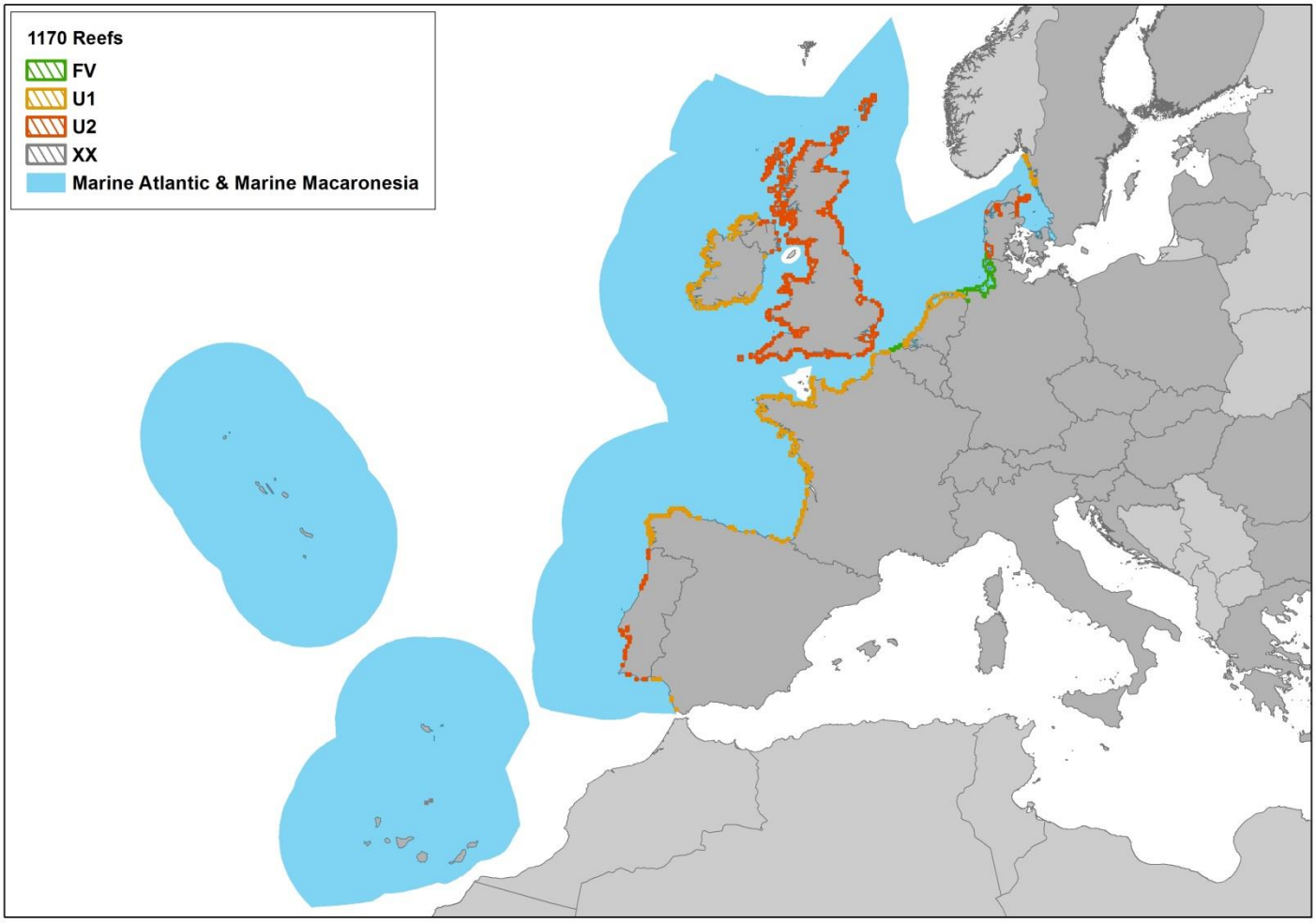
The habitat 1140 “Mudflats and sandflats not covered by seawater at low tide“ is defined in the Interpretation Manual of European Union Habitats - EUR28 as:

Sands and muds of the coasts of the oceans, their connected seas and associated lagoons, not covered by sea water at low tide, devoid of vascular plants, usually coated by blue algae and diatoms. They are of particular importance as feeding grounds for wildfowl and waders. The diverse intertidal communities of invertebrates and algae that occupy them can be used to define subdivisions of 11.27, eelgrass communities that may be exposed for a few hours in the course of every tide have been listed under 11.3, brackish water vegetation of permanent pools by use of those of 11.4. Note: Eelgrass communities (11.3) are included in this habitat type.

The habitat is present in the Marine Atlantic and Marine Macaronesian regions. The overall conservation status in unfavourable bad for the Atlantic region because both parameters, “structures and functions” and “future prospects”, are reported as bad. The overall conservation status for the Marine Macaronesian region is unknown (XX). The Macaronesian region is likely to have favourable conditions since they report favourable “structures and functions” and only one low rated threat. However, since overall conclusion is unknown (XX), more knowledge is needed for this region.

Threats and pressures are numerous, among them overfishing, changes in hydraulic conditions and pollution, eg. eutrophication due to nutrient run-off from the catchment area also threatens the quality of the habitat; run-off from urban areas introduces various hazardous substances that can accumulate in the soft sediments; oil spills at sea that are washed ashore on mudflats or sandflats pose a serious threat, as oil is very difficult to remove from this type of soft sediment, etc.

Map of habitat distribution and conservation status



Habitat conservation status at the Member State and EU levels

Conservation status parameters	MATL											MMAC	
	BE	DE	DK	ES	FR	IE	NL	PT	SE	UK	EU27	PT	EU27
range	FV	FV	FV	FV	FV	FV	FV	FV	FV	FV	FV	XX	XX
Area	FV	FV	FV	U1	FV	FV	FV	U1	FV	XX	XX	XX	XX
structure	XX	FV	U2	XX	U1	U1	U1	U2	U1	U2	U2	FV	FV
future	FV	XX	U2	U1	U1	FV	XX	U2	U1	U2	U2	XX	XX
overall	FV	FV	U2	U1	U1	U1	U1	U2	U1	U2	U2	XX	XX

Proportion of pressures reported by MS as 'Highly important'

Pressures - Level 2	MATL
A07 - Use of 'pesticides' in agriculture	4.0%
A08 - Fertilisation in agriculture	4.0%
D03 - Shipping lanes and ports	4.0%
E01 - Urbanisation and human habitation	4.0%
E03 - Discharges (household/industrial)	4.0%
F01 - Marine and freshwater aquaculture	4.0%
F02 - Fishing and harvesting aquatic resources	16.0%
F06 - Other hunting, fishing and collection activities	4.0%
G01 - Outdoor sports, leisure and recreational activities	8.0%
G05 - Other human intrusions and disturbances	4.0%
H01 - Pollution to surface waters	16.0%
H02 - Pollution to groundwater	4.0%
H03 - Pollution to marine waters	4.0%
I01 - Invasive alien species	4.0%
J02 - Changes in water bodies conditions	16.0%

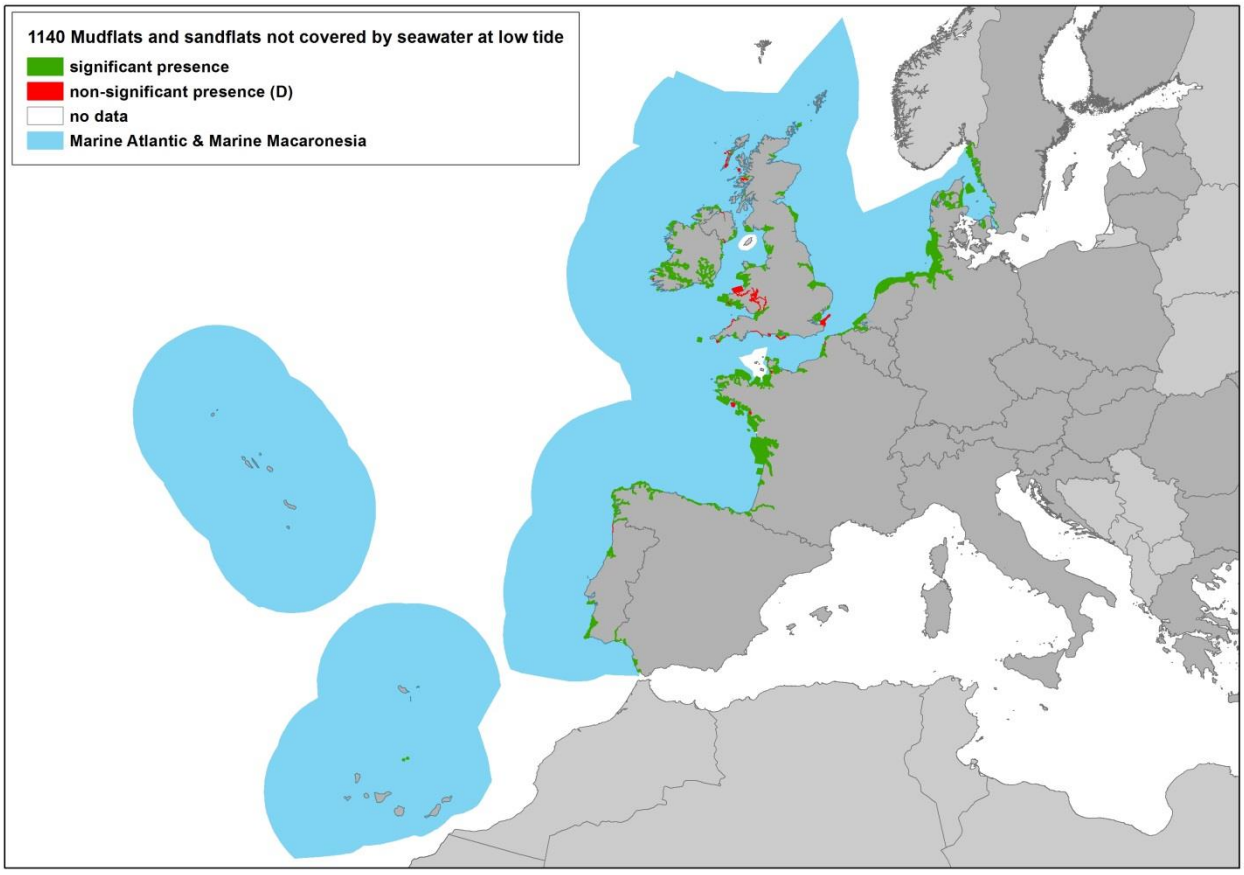
No high ranking pressures reported in MMAC although Portugal reported the following pressure with low ranking code: marine macro-pollution (i.e. plastic bags, styrofoam).

Proportion of conservation measures reported by MS as 'Highly important'

Conservation measures - Level 2	MATL
4.0 - Other wetland-related measures	6.7%
4.1 - Restoring/improving water quality	0%
4.2 - Restoring/improving the hydrological regime	6.7%
4.3 - Managing water abstraction	0%
4.4 - Restoring coastal areas	6.7%
5.0 - Other marine-related measures	13.3%
5.1 - Restoring marine habitats	0%
6.0 - Other spatial measures	6.7%
6.1 - Establish protected areas/sites	20.0%
6.3 - Legal protection of habitats and species	13.3%
7.3 - Regulation/ Management of fishery in marine and brackish systems	0%
7.4 - Specific single species or species group management measures	0%
8.3 - Managing marine traffic	13.3%
9.1 - Regulating/Management exploitation of natural resources on land	0%
9.2 - Regulating/Managing exploitation of natural resources on sea	13.3%

No high ranking conservation measures reported in MMAC although Portugal reported the following conservation measures with medium ranking code: other marine-related measures, legal protection of habitats and species, other resource use measures.

SCI distribution map for this habitat type



Number of SCIs where this habitat type occurs and habitat area covered by Natura 2000 per Member State (Natura 2000 End_2017 database)

MS	TOTAL SCI	SIGNIFICANT SCI	COVER (km²)	SIGNIFICANT COVER (km²)
BE	1	1	3,71	3,71
DE	13	13	3253,95	3253,95
DK	14	14	569,63	569,63
ES	51	51	91,92	91,92
FR	77	70	1032,51	1025,48
IE	44	42	428,40	422,85
NL	7	7	1349,17	1349,17
PT	5	4	31,99	31,99
SE	36	36	19,33	19,33
UK	55	30	1918,71	1850,84

2.1.2 1160 Large shallow inlets and bays

According to the Interpretation Manual of European Union Habitats - EUR28, the habitat "Large shallow inlets and bays" is defined as:

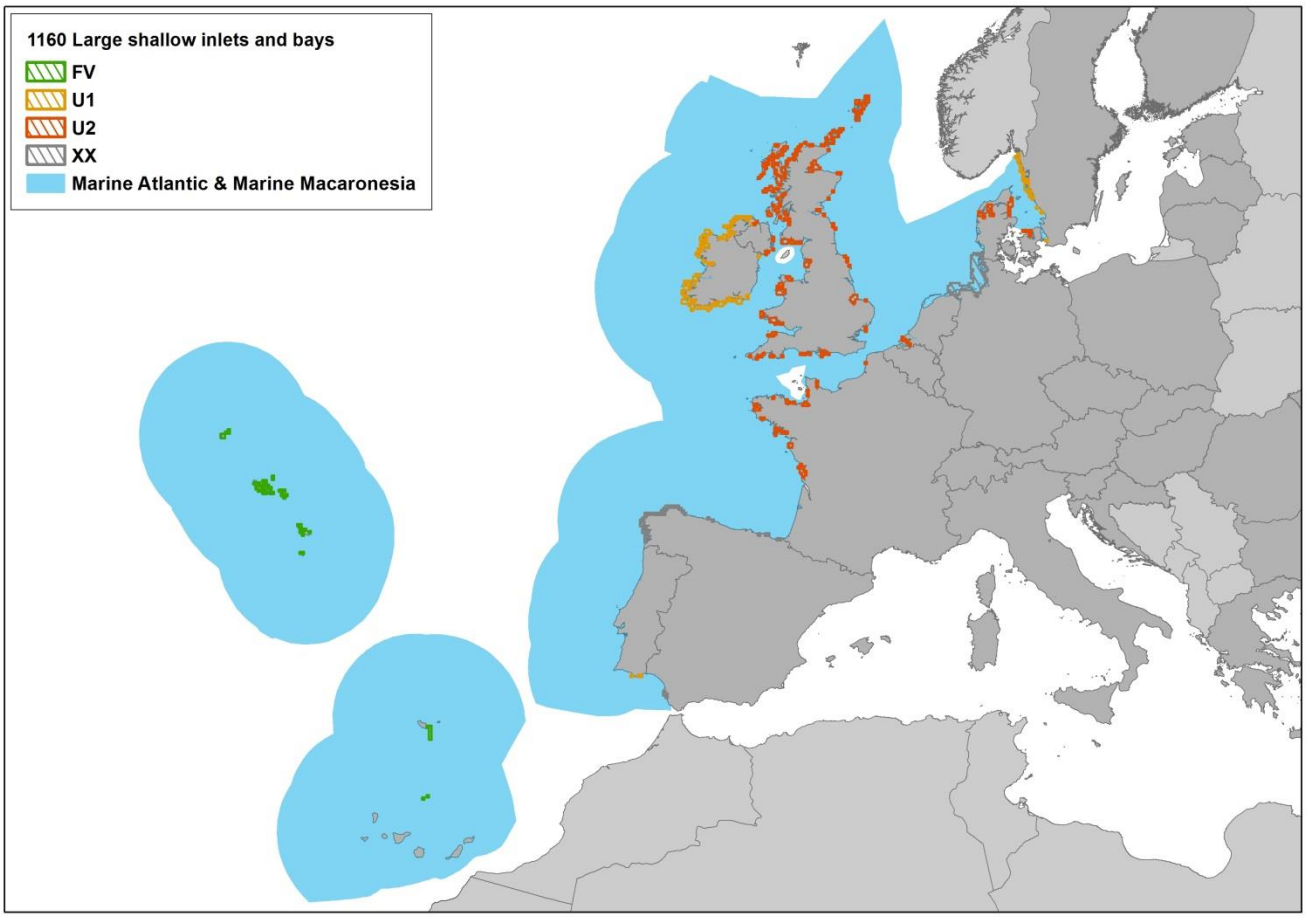
Large indentations of the coast where, in contrast to estuaries, the influence of freshwater is generally limited. These shallow indentations are generally sheltered from wave action and contain a great diversity of sediments and substrates with a well-developed zonation of benthic communities. These communities have generally a high biodiversity. The limit of shallow water is sometimes defined by the distribution of the Zosteretea and Potametea associations. Several physiographic types may be included under this category providing the water is shallow over a major part of the area: embayments, fjards, rias and voes.

The habitat is present in the Marine Atlantic-, Marine Baltic-, Marine Black Sea-, Marine Macaronesian and Marine Mediterranean region.

The overall conclusion is unfavourable- bad (U2) in the Marine Atlantic; however, the overall conclusion for the Marine Macaronesian region is favourable (FV).

Pressures and threats towards the habitat mainly involve overfishing, and water quality by both eutrophication and various pollutants, but also by the local extraction of oil or gas and aquaculture activities.

Map of habitat distribution and conservation status



Habitat conservation status at the Member State and EU levels

Conservation status parameters	MATL										MMAC	
	DE	DK	ES	FR	IE	NL	PT	SE	UK	EU27	PT	EU27
range	FV	FV	XX	FV	FV	FV	FV	FV	FV	FV	FV	FV
area	FV	FV	XX	U1	FV	FV	FV	FV	FV	FV	XX	XX
structure	XX	U2	XX	U2	U1	U2	U1	U1	U2	U2	FV	FV
future	XX	U2	XX	U2	FV	U1	U1	U1	U2	U2	FV	FV
overall	XX	U2	XX	U2	U1	U2	U1	U1	U2	U2	FV	FV

Proportion of pressures reported by MS as 'Highly important'

Pressures - Level 2	MATL
A08 - Fertilisation in agriculture	4.5%
D03 - Shipping lanes and ports	4.5%
E01 - Urbanisation and human habitation	0%
E03 - Discharges (household/industrial)	0%
F01 - Marine and freshwater aquaculture	9.1%
F02 - Fishing and harvesting aquatic resources	27.3%
F05 - Illegal taking of marine fauna	0%
F06 - Other hunting, fishing and collection activities	4.5%
G01 - Outdoor sports, leisure and recreational activities	0%
G05 - Other human intrusions and disturbances	4.5%
H01 - Pollution to surface waters	9.1%
H03 - Pollution to marine waters	9.1%
I01 - Invasive alien species	9.1%
J02 - Changes in water bodies conditions	13.6%
J03 - Other changes to ecosystems	4.5%
K01 - Abiotic natural processes	0%

There are no high ranking pressures reported in MMAC although Portugal reported the following pressures with low or medium ranking: shipping lanes and ports, discharges (household/industrial), outdoor sports, leisure and recreational activities, sport and leisure infrastructures, pollution to surface waters, pollution to marine waters, soil pollution and solid waste (excl. discharges), invasive alien species, changes in water bodies conditions, collapse of terrain, landslide.

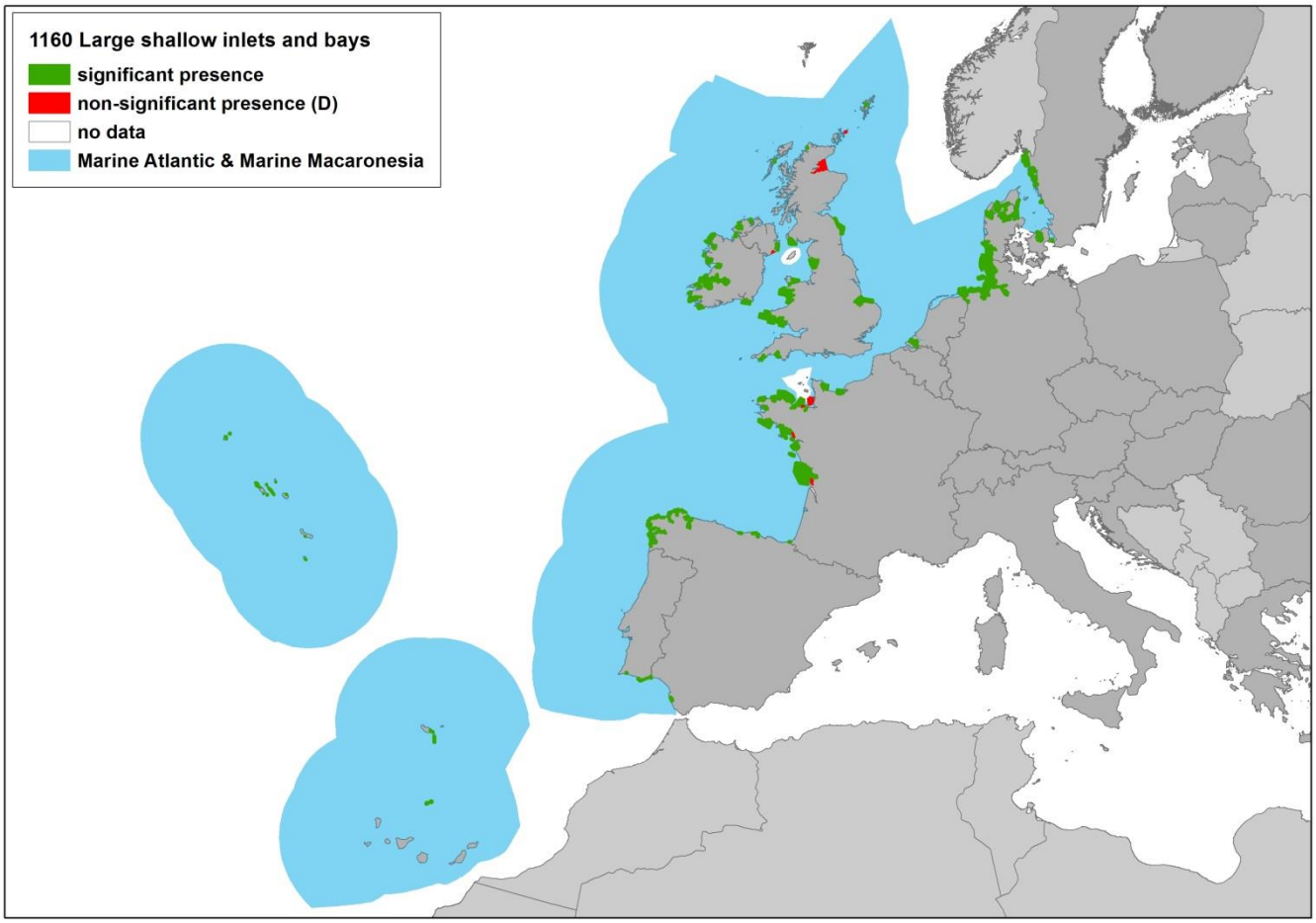
Proportion of conservation measures reported by MS as 'Highly important'

Conservation measures - Level 2	MATL
2.0 - Other agriculture-related measures	7.1%
4.0 - Other wetland-related measures	7.1%
4.1 - Restoring/improving water quality	0%
4.2 - Restoring/improving the hydrological regime	7.1%
4.3 - Managing water abstraction	0%
5.0 - Other marine-related measures	7.1%
6.0 - Other spatial measures	7.1%
6.1 - Establish protected areas/sites	28.6%

Conservation measures - Level 2	MATL
6.3 - Legal protection of habitats and species	7.1%
7.3 - Regulation/ Management of fishery in marine and brackish systems	7.1%
8.3 - Managing marine traffic	14.3%
9.2 - Regulating/Managing exploitation of natural resources on sea	7.1%

No high ranking conservation measures were reported in MMAC although Portugal reported the following conservation measures with medium ranking code: other marine-related measures, restoring marine habitats, establish protected areas/sites, legal protection of habitats and species, regulation/ management of hunting and taking, other resource use measures and regulating/managing exploitation of natural resources on sea.

SCI distribution map for this habitat type



Number of SCIs where this habitat type occurs and habitat area covered by Natura 2000 per Member State (Natura 2000 End_2017 database)

MS	TOTAL SCI	SIGNIFICANT SCI	COVER (km²)	SIGNIFICANT COVER (km²)
DE	7	7	4273,28	4273,28
DK	18	18	592,65	592,65
ES	27	27	87,62	87,62
FR	32	26	1048,04	1030,103
IE	22	22	1902,97	1902,97
NL	1	1	347,00	347,00
PT	19	19		
SE	18	18	80,76	80,76
UK	17	14	3816,90	3033,17

2.1.3 1170 Reefs

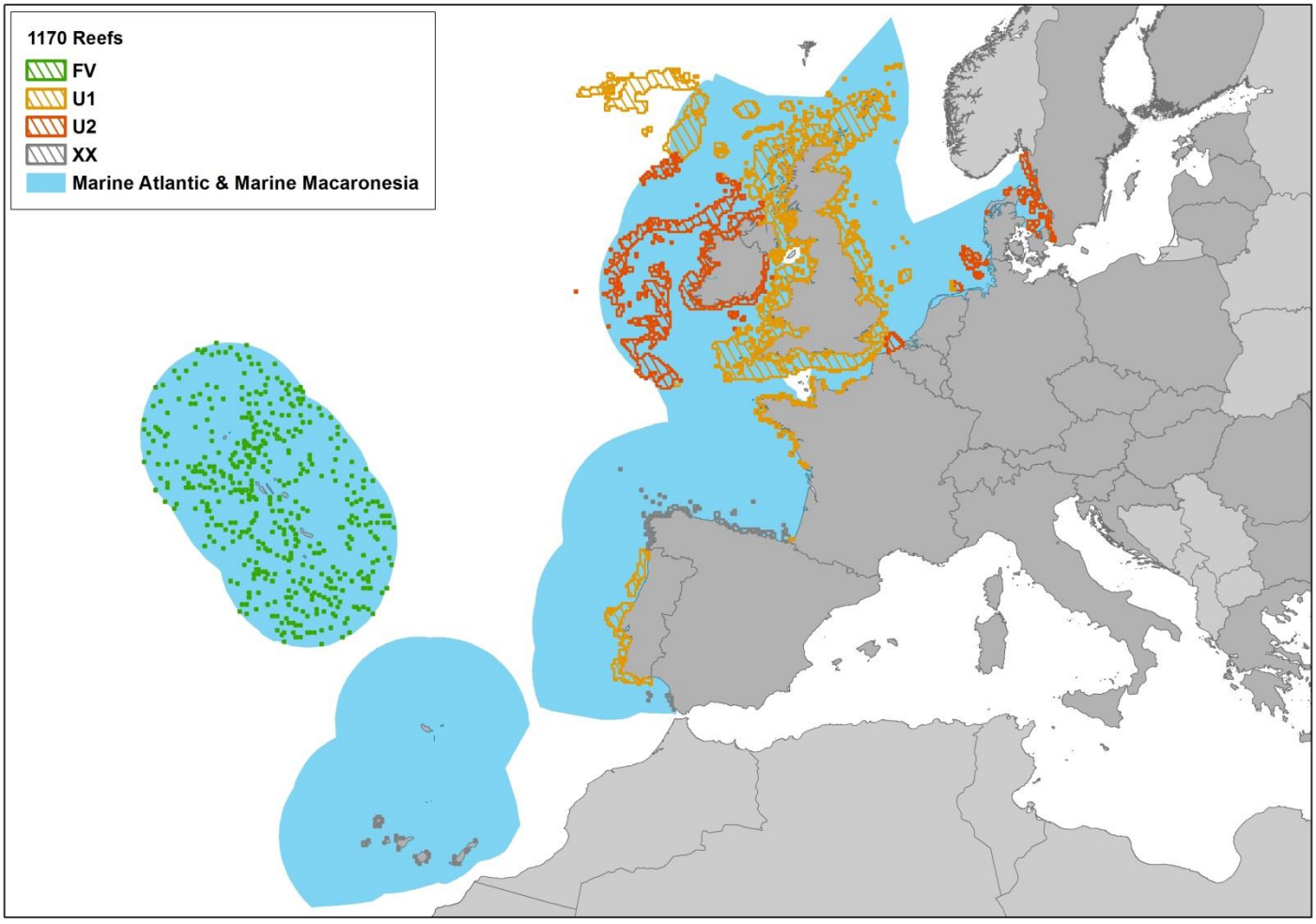
The Interpretation Manual of European Union Habitats - EUR28 includes an extensive definition for this habitat type due to the multiple subtypes. *'Reefs can be either biogenic concretions or of geogenic origin. They are hard compact substrata on solid and soft bottoms, which arise from the sea floor in the sublittoral and littoral zones. Reefs may support a zonation of benthic communities of algae and animal species as well as concretions and corallogenic concretions'.*

Coastal reef habitat is present in the Marine Atlantic as well as the Marine Macaronesian regions. These habitats are reported as mainly threatened by fishing, pollution, temperature changes and invasive alien species (for the Marine Macaronesian region).

It is assessed as unfavourable bad in the Marine Atlantic region due to several Member states reporting bad "Structure and functioning" and bad "future prospect". In 2007 the status was U1 and the change is considered genuine since in Ireland (having 22% of distribution area) there was a genuine deterioration from inadequate to bad between assessments periods.

In Marine Macaronesian the status is favourable, the same as in the previous reporting cycle.

Map of habitat distribution and conservation status



Habitat conservation status at the Member State and EU levels

Conservation status parameters	MATL											MMAC		
	BE	DE	DK	ES	FR	IE	NL	PT	SE	UK	EU27	ES	PT	EU27
range	U1	U1	FV	FV	FV	FV	FV	FV	FV	XX	XX	FV	FV	FV
area	U1	U1	FV	FV	FV	FV	FV	FV	U1	XX	XX	FV	FV	FV
structure	U2	U2	U2	XX	U1	U2	U1	U1	U2	U1	U2	XX	XX	XX
future	U1	U2	U2	XX	U1	U2	U1	XX	U2	XX	U2	XX	FV	FV
overall	U2	U2	U2	XX	U1	U2	U1	U1	U2	U1	U2	XX	FV	FV

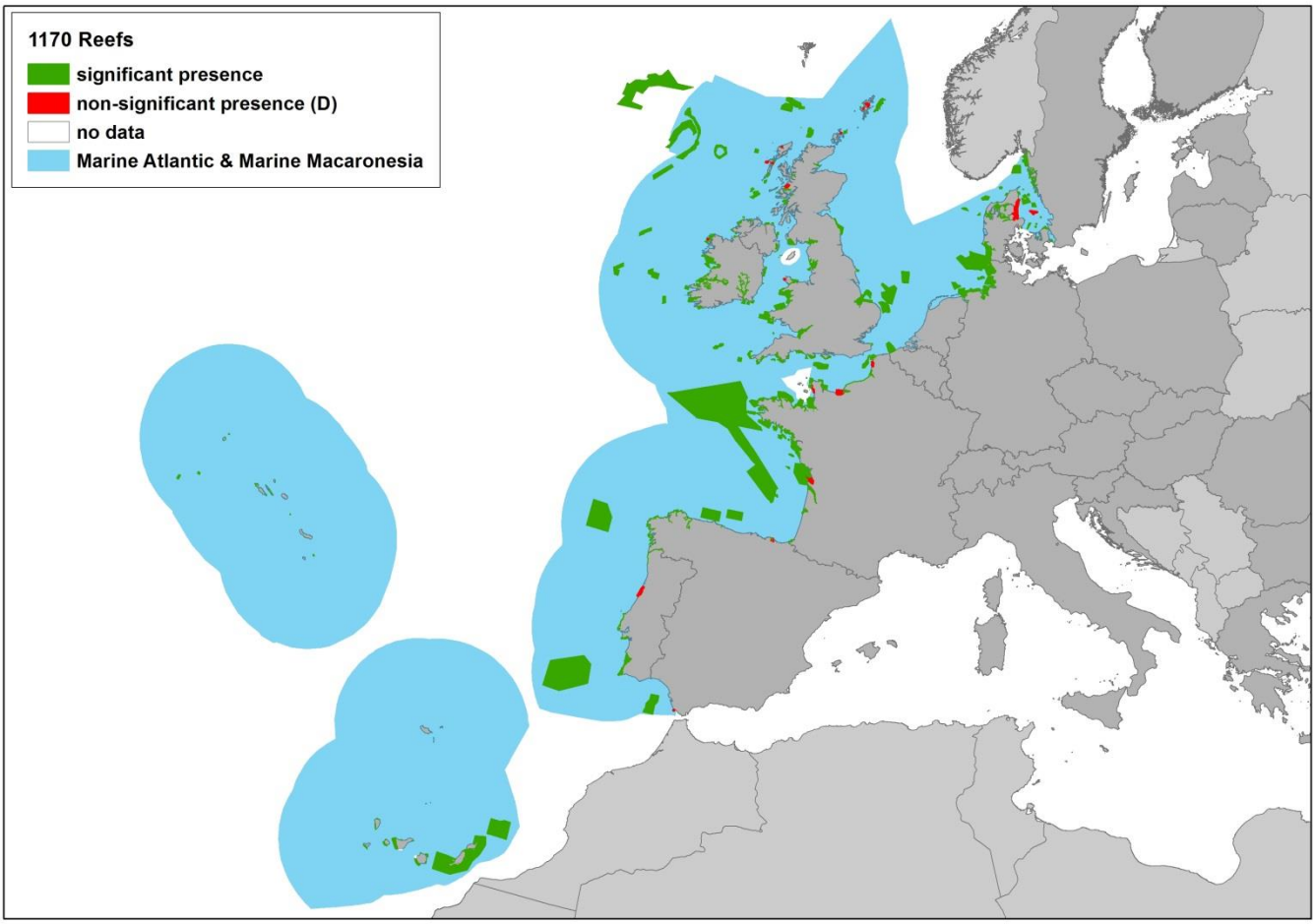
Proportion of pressures reported by MS as 'Highly important'

Pressures - Level 2	MATL	MMAC
C01 - Mining and quarrying	0%	0%
E01 - Urbanisation and human habitation	0%	0%
E03 - Discharges (household/industrial)	0%	0%
F02 - Fishing and harvesting aquatic resources	50.0%	20.0%
G01 - Outdoor sports, leisure and recreational activities	0%	0%
G05 - Other human intrusions and disturbances	6.3%	0%
H01 - Pollution to surface waters	6.3%	0%
H03 - Pollution to marine waters	6.3%	20.0%
H04 - Air pollution, air-borne pollutants	6.3%	0%
I01 - Invasive alien species	6.3%	20.0%
J02 - Changes in water bodies conditions	12.5%	20.0%
J03 - Other changes to ecosystems	6.3%	20.0%
K01 - Abiotic natural processes	0%	0%
M01 - Abiotic changes (climate change)	0%	0%

Proportion of conservation measures reported by MS as 'Highly important'

Conservation measures - Level 2	MATL	MMAC
4.0 - Other wetland-related measures	3.3%	0%
4.1 - Restoring/improving water quality	10.0%	20.0%
4.2 - Restoring/improving the hydrological regime	0%	0%
4.4 - Restoring coastal areas	3.3%	0%
5.0 - Other marine-related measures	6.7%	0%
5.1 - Restoring marine habitats	6.7%	0%
6.0 - Other spatial measures	6.7%	0%
6.1 - Establish protected areas/sites	23.3%	20.0%
6.2 - Establishing wilderness areas/ allowing succession	3.3%	0%
6.3 - Legal protection of habitats and species	6.7%	20.0%
7.1 - Regulation/ Management of hunting and taking	0%	0%
7.3 - Regulation/ Management of fishery in marine and brackish systems	10.0%	20.0%
7.4 - Specific single species or species group management measures	0%	0%
8.1 - Urban and industrial waste management	0%	0%
8.3 - Managing marine traffic	6.7%	20.0%
9.2 - Regulating/Managing exploitation of natural resources on sea	13.3%	0%

SCI distribution map for this habitat type



Number of SCIs where this habitat type occurs and habitat area covered by Natura 2000 per Member State (Natura 2000 End_2017 database)

MS	TOTAL SCI	SIGNIFICANT SCI	COVER (km²)	SIGNIFICANT COVER (km²)
BE	1	1	506,00	506,00
DE	6	6	217,13	217,13
DK	30	28	960,00	960,00
ES	57	55	3844,06	3838,65
FR	71	67	3456,11	3452,61
IE	47	46	2299,51	2299,52
NL	1	1	769,34	769,34
PT	25	24	22794,84	22794,34
SE	27	27	325,53	325,53
UK	67	59	28661,45	28634,09

2.2 A5.53 Seagrass beds on Atlantic infralittoral sand[5]

European Red List of Habitats - Marine Habitat Group

A5.53 Seagrass beds on Atlantic infralittoral sand (non-Macaronesian)

Summary

Seagrass beds play an important role in the trophic status of marine and estuarine waters, acting in sediment stabilization as well as an important conduit or sink for nutrients. The beds of seagrass occur in shallow sublittoral sediments. These communities are generally found in sheltered embayments, marine inlets, estuaries and lagoons, with weak tidal currents. Wasting disease in the 1930s has been the most significant threat leading to substantial loss of this habitat. Historically *Zostera* was also of great commercial value, being harvested for use in dikes, World War I trenches, insulation and mattresses. Current pressures and threats come from coastal development, dredging, shellfisheries, eutrophication and localised damage from mooring. Conservation and management measures include the regulation of fisheries and waste water treatment (to reduce the risk of eutrophication) and reduction in suspended sediments.

Synthesis

This habitat has a large natural range in the North East Atlantic region, as it is present in locations as widely separated as the Atlantic coast of Portugal, the Isles of Scilly in the UK, and the Channel coast of France. There was a substantial reduction in the quantity and quality in the 1930s, which resulted in 100% loss in the Netherlands and most likely the same in Germany. In Denmark the decline between 1901 and 2000 is estimated to have been 92%. There have been some increases in recent years but this habitat has not recovered to its previous extent. Because of the substantial historical loss and continuing declines in this habitat it has been assessed as Critically Endangered for both the EU 28 and EU 28+.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Critically Endangered	A3, C/D3	Critically Endangered	A3, C/D3

Sub-habitat types that may require further examination

Z. marina beds and those dominated by either *Ruppia* spp. or *Cymodocea* should be assessed separately as these species respond in different ways to pressures and threats.

Habitat Type

Code and name

A5.53 Seagrass beds on Atlantic infralittoral sand (non-Macaronesian)

[5] https://forum.eionet.europa.eu/european-red-list-habitats/library/marine-habitats/north-east-atlantic

Zostera marina seagrass bed on sand. Gruinard Bay, Scotland, UK (© G.Saunders).

Habitat description

This habitat type covers beds of submerged marine angiosperms in the genera *Zostera*, *Ruppia*, and *Cymodocea*, adjacent to mainland coasts of the North East Atlantic region. The Iberian coast is a transitional zone where *Zostera* dominated seagrass beds reach their southern limit and *Cymodocea* dominated seagrass beds reach their northern and western limits. *Ruppia* beds are restricted to brackish environments, where *Zostera* may be interspersed. Seagrass beds play an important role in the trophic status of marine and estuarine waters, acting in sediment stabilization as well as an important conduit or sink for nutrients and consequently some examples of *Zostera marina* beds have markedly anoxic sediments associated with them. It is a spawning area and it harbours increased densities of juvenile and medium sized fish species.

This habitat occurs in shallow sublittoral sediments, generally in sheltered embayments, marine inlets, estuaries and lagoons, with weak tidal currents and under conditoins of low, variable and full salinity. Whilst generally found on muds and muddy sands, particularly marine examples of *Zostera* communities may also occur in coarser sediments. Whilst the seagrass may be considered an epibiotic overlay of established sedimentary communities it is likely that its presence will modify the community offering living space and feeding ground for epibionts and phytal specialists. For example, *Zostera* beds in the south-west of Britain may contain conspicuous and distinctive assemblages of Lusitanian fauna such as *Laomedea angulata*, *Hippocampus* spp. and Stauromedusae. These subtidal beds of *Zostera* contain the specific perennial variant of *Zostera marina*. *Cymodocea nodosa* forms large and dense patches with green leaves that can reach 100 cm long and 8 mm wide in well shorted fine sands or on superficial muddy sands in sheltered waters and depths of 1-30 meters. Frequently it is mixed with other habitat forming phanerogams *Zostera noltei* (formerly known as *Z.noltii or Z.nana)* and *Zostera marina* on muddy sands rich in organic nutrients. Shallow meadows of *Cymodocea* and *Zostera* are usually found in sheltered bays close to harbours or in areas subject to human impact.

Indicators of Quality

Both biotic and abiotic indicators have been used to describe marine habitat quality. These include: the presence of characteristic species as well as those which are sensitive to the pressures the habitat may face; water quality parameters; levels of exposure to particular pressure, and more integrated indices which describe habitat structure and function, such as trophic index, or successional stages of development in habitats that have a natural cycle of change over time.

The overall quality and continued occurrence of this habitat is, largely dependent on the presence of *Zostera marina,* which creates the biogenic structural complexity on which the characteristic associated communities depend. The density and the maintenance of a viable population of this species is a key indicator of habitat quality, together with the visual evidence of presence or absence of physical damage. Seasonal and annual variations in shoot densities and canopy height can be used to evaluate

habitat quality as well as acting as a proxy measure of habitat complexity and refuge capability. The vertical depth limit of submerged seagrass is used in several countries as a Water Framework Directive parameter for assessing ecological status. Other countries use area indices and/or density indices. Seagrass tissue nutrients have also been used as indicators of environmental change in these important ecosystems.

Characteristic species

For the genus *Zostera*, *Zostera marina* is the dominating species for submersed beds. It is current consensus that *Z. angustifolia*, which is often described in older literature is simply an ecotype of *Z. marina*; following recent genetic studies, *Z. angustifolia* is no longer accepted as a separate species and is represented as *Z. marina* L. (WoRMS, 2014). Other biota present are grazing snails, hydrozoans, infaunal species such as *Ensis* spp., *Cerastoderma* spp. and *Echinocardium cordatum*. For *Ruppia* either *Ruppia maritima* or *Ruppia cirrhosa* may occur. In submerged beds of brackish seas, sea inlets, estuaries, permanent pools of mud or sand flats, and coastal lagoons of Atlantic, North Sea and Baltic coasts of boreal and temperate Europe *Zannichellia palustris*, *Chara* spp., *Lamprothamnium papulosum* and *Tolypella nidifica* can be associated with *Ruppia* and/or *Zostera*. These beds may be populated by fish such as *Gasterosteus aculeatus,* which is less common on filamentous algal-dominated sediments. Seaweeds such as *Chaetomorpha* spp., *Enteromorpha* spp., *Cladophora* spp., and *Chorda filum* are often present in addition to occasional fucoids. Infaunal and epifaunal species may include mysid crustacea, the polychaete *Arenicola marina*, the gastropod *Hydrobia ulvae*, the amphipod *Corophium volutator* and oligochaetes such as *Heterochaeta costata*. For *Cymodocea* beds, *Cymodocea nodosa* is the only species represented.

Classification

EUNIS (v1405):

Level 4. A sub-habitat of 'Sublittoral macrophyte-dominated sediment' (A5.5).

Annex 1:

1110 Sandbanks slightly covered all the time

1160 Large shallow inlets and bays

MAES:

Marine - Marine inlets and transitional waters

Marine - Coastal

MSFD:

Shallow sublittoral coarse sediment

Shallow sublittoral sand

Shallow sublittoral mud

Shallow sublittoral mixed sediment

EUSeaMap:

Shallow sands

Shallow muds

Shallow coarse or mixed sediments

IUCN:

9.9 Seagrass (submerged)

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

Regions
Atlantic

Justification
This habitat occurs across the regional sea where there are suitable conditions. It is present as far south as estuaries of Atlantic Spain, as far west as the west coast of Ireland and east to Kattegat.

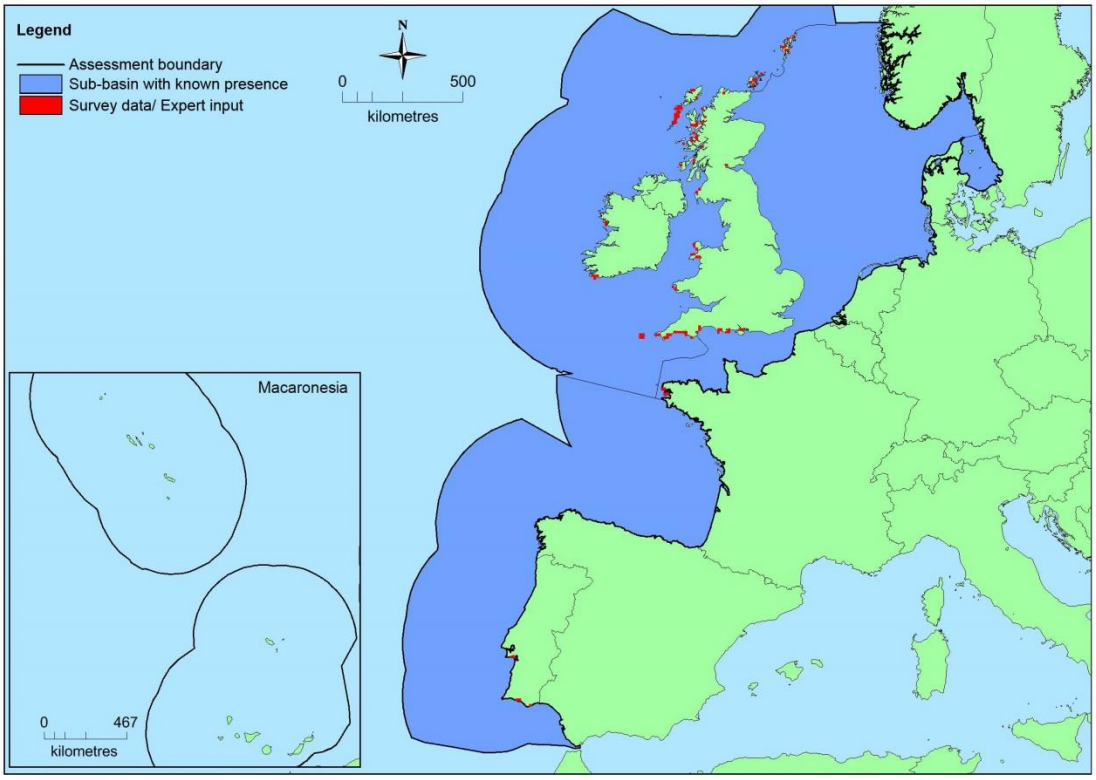
Geographic occurrence and trends

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

Extent of Occurrence, Area of Occupancy and habitat area

	Extent of Occurrence (EOO)	Area of Occupancy (AOO)	Current estimated Total Area	Comment
EU 28	1,026,236 Km^2	115	Unknown Km^2	EOO and AOO have been calculated on the available data. Although this data set is known to be incomplete the figures exceed the thresholds for threatened status.
EU 28+	>1,026,236 Km^2	>115	Unknown Km^2	EOO and AOO have been calculated on the available data. Although this data set is known to be incomplete the figures exceed the thresholds for threatened status.

Distribution map



There are insufficient data to provide a comprehensive and accurate map of the distribution of this habitat. 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). EOO and AOO have been calculated on the available data presented in this map however these should be treated with caution as expert opinion is that this is not the full distribution of the habitat.

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

This habitat is present in Norway where a review of data up to 2010 estimated there to be more than 3,300 meadows with a total cover of 50km^2 on the Skagerrak coast of Norway. In comparison the habitat covered more than 1,680km^2 in Denmark in 2004 so it is likely that more than 95% is hosted by EU 28.

Trends in quantity

There was a substantial reduction in the quantity of this habitat following the wasting disease, which affected subtidal seagrass beds in northern Europe in the 1930's. In the Netherlands and Germany 100% of the habitat was lost. In Denmark the decline between 1901 and 2000 is estimated to have been 92% and the deep eelgrass beds have never recovered to their previous extent. The depth limits along open coasts averaged 7-8 m around 1900, they presently average 4-5 m. Depth limits have continued to decrease over this period despite a general reduction in nutrient loading and a stabilization in nutrient concentrations in coastal waters.

Whilst there has been some local recovery this habitat has not recovered to its previous extent. There are also variations across the region. In the Swedish Skagerrak, for example there has been a 60% decline since the mid-1980's while the small beds in the Chausey Archipelago, France are showing some increases after the mid-1950's.

The situation in Norway (EU 28+) is that there has been recovery in the 1950's and 1960's except for a

temporary decrease in the late 1980's.

- Average current trend in quantity (extent)
  EU 28: Decreasing
  EU 28+: Decreasing
- Does the habitat type have a small natural range following regression?
  No
  Justification
  This habitat has a large natural range, as it is present in locations as widely separated as the Atlantic coast of Portugal, the Isles of Scilly in the UK, and the Channel coast of France.
- Does the habitat have a small natural range by reason of its intrinsically restricted area?
  No
  Justification
  This habitat has a large natural range, as it is present in locations as widely separated as the Atlantic coast of Portugal, the Isles of Scilly in the UK, and the Channel coast of France.

Trends in quality

There has been a substantial historical decline in the quality of this habitat associated with wasting disease in the 1930's. More recently there have been different trends in different locations but overall quality is still considered to be decreasing. In the British Isles, for example, a recent study clearly indicates that many seagrass meadows are under anthropogenic stress and probably in a poor state of health, many of which are in sites of apparent conservation protection.

- Average current trend in quality
  EU 28: Decreasing
  EU 28+: Decreasing

Pressures and threats

Wasting disease in the 1930's has been the most significant threat leading to substantial loss of this habitat. Historically *Zostera* was also of great commercial value, being harvested for use in dikes, World War I trenches, insulation and mattresses. Current pressures and threats come from coastal development, dredging, shellfisheries, eutrophication and localised damage from mooring.

List of pressures and threats

Urbanisation, residential and commercial development

Urbanised areas, human habitation

Human intrusions and disturbances

Outdoor sports and leisure activities, recreational activities
Motorized nautical sports
Other human intrusions and disturbances
Shallow surface abrasion/ Mechanical damage to seabed surface

Pollution

Nutrient enrichment (N, P, organic matter)

Conservation and management

The protection of this habitat is often incorporated into to legislation aimed at protection of seagrass beds. These range from local by-laws and regulations, to cross border agreements as in the case of the Wadden

Sea. Protected areas and management measures include the regulation of fisheries and, waste water treatment (to reduce the risk of eutrophication) and reduction in suspended sediments.

List of conservation and management needs

Measures related to wetland, freshwater and coastal habitats

Restoring/Improving water quality

Measures related to marine habitats

Restoring marine habitats

Measures related to hunting, taking and fishing and species management

Regulation/Management of fishery in marine and brackish systems

Conservation status

Annex 1:

1110: MATL U2

1160: MATL U2.

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

Recovery requires the removal of threats in the first instance. Recoverability rates can vary with shelter, light levels, depth and substratum but also depends on scale of damage and whether there have been changes in the environmental conditions (e.g. water flow, substrate type). Regeneration from root systems is slow and recovery of entire beds, with characteristic structure and associated species will take much longer than re-establishment of the seagrass species. Anchoring rhizome fragments appears to be more successful than using seeds. Transplantation experiments have had limited success to date although recent analysis of restoration projects suggests the successful regrowth appears to required a minimum threshold of reintroduced introduced individuals so a critical mass is important. Recovery also appears to be more likely when transplantation is close to donor beds. Partial recovery is only likely to occur after about 10 years and full recovery may take over 25 years, or never occur.

Effort required

10 years
Naturally

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	25-30 %	unknown %	unknown %	>90 %
EU 28+	25-30 %	unknown %	unknown %	>90 %

There has been a substantial historical decline in the quantity of this habitat. For example in the German part of the greater North Sea all known locations were destroyed and have not recovered since the 1930's and the same is true for the Netherlands sublittoral seagrass beds. Danish sublittoral eelgrass meadows declined by around 92% between 1901 and 2000 and the deep eelgrass beds and have never recovered to their previous extent. The depth limits along open coasts averaged 7-8 m around 1900, they presently average 4-5 m. Depth limits have continued to decrease over this period despite a general reduction in nutrient loading and a stabilization in nutrient concentrations in coastal waters.This habitat has therefore

been assessed as Critically Endangered under criterion A for both the EU 28 and EU 28+.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	>50,000 Km^2	Yes	Yes	No	>50	Yes	Yes	No	No
EU 28+	>50,000 Km^2	Yes	Yes	No	>50	Yes	Yes	No	No

This habitat has a large natural range in the North East Atlantic region as it is present in locations as widely separated as the Atlantic coast of Portugal, the Isles of Scilly in the UK, and the Channel coast of France. The precise extent is unknown however as EOO >50,000 km^2 and AOO >50, this exceeds the thresholds for a threatened category on the basis of restricted geographic distribution. The current trend is declining in quanty and quality although 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 B for both the EU 28 and EU 28+.

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 %	>90 %	extreme reduction %
EU 28+	unknown %	unknown %	unknown %	unknown %	>90 %	extreme reduction %

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%	>90 %	extreme reduction%
EU 28+	unknown %	unknown%	unknown %	unknown%	>90 %	extreme reduction%

In the last 50 years there have been improvements as well declines in quality of this habitat in the North East Atlantic. Overall a substantial decline in quality is believed to have occurred historical given the substantial losses (>90%) of this habitat. This habitat has therefore been assessed as Critically Endangered under criteria C/D3 for both the EU 28 and EU 28+.

Criterion E: Quantitative analysis to evaluate risk of habitat collapse

Criterion E	Probability of collapse
EU 28	unknown

Criterion E	Probability of collapse
EU 28+	unknown

The risk exists but no quantitative data or estimates of risk of collapse can be made at the present time.

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	NT	DD	DD	CR	LC	LC	LC	DD	DD	CR	DD	DD	DD	DD	DD	DD	DD
EU28+	NT	DD	DD	CR	LC	LC	LC	DD	DD	CR	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
Critically Endangered	A3, C/D3	Critically Endangered	A3, C/D3

Confidence in the assessment
Medium (evenly split between quantitative data/literature and uncertain data sources and assured expert knowledge)

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A5.53 Seagrass beds on Atlantic infralittoral sand (Macaronesian)

Summary

This habitat comprises beds of submerged marine angiosperms in the genera *Cymodocea, Halophila, Ruppia, Thalassia* and *Zostera* occuring on the more sheltered, eastern and southern coasts of the southern islands (Madeira and Canary Islands) in Macaronesia. Marine seagrass meadows are very important in providing several ecological services, such as primary production, habitats, nurseries and coastal protection. Primary productivity may vary, depending on many factors such as the density of the meadow, geographic area or hydrologic factors. These ecosystems are one of the most important habitats for several marine organisms, which depend on them in different phases of their life cycle, not only to feed but also to take shelter from predators.

Coastal development including port developments, and waste disposal, particularly sewage discharges are the main pressures on this habitat. In the case of *C.nodosa*. The causes of epiphytic growth of *Lyngbya* sp over *C. nodosa* communities are not still clear. The blooms of this cyanobacteria are ephemeral and probably related to a mix of natural and anthropogenic origins. Regulation of activities (such as coastal development, dredging, waste disposal) and zoning of aquaculture facilities away from this habitat are useful management measures for this habitat. In some cases they may be introduced within protected areas.

Synthesis

This habitat does not have a restricted geographical distribution but it has suffered declines in both quantity and quality over the last 50 years. The dense meadows of *C.nodosa* in the bay of Machico last recorded in 2000, are now absent with *C.nodosa* currently only present in a few areas on the south coast of Madeira covering a total area less than 1km^2. Subtidal *Zostera* beds have always had a very restricted occurrence in the Canarian Archipelago with just three small patches in a single harbour in Lanzarote. They did occur in Grand Canaria in the 1970s but this is no longer the case. There has also been an overall decline in quality of this habitat as indicated by four metrics of the seagrass; shoot density, biomass, leaf length and coverage.

Expert opinion is that over the last 50 years the decline in quantity is estimated to have been over 30% and that the decline in quality has been substantial with a severe decline affecting more than 30% of the extent of this habitat. The Red List assessment is therefore that this is a Vulnerable habitat for both the EU 28 and EU 28+.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Vulnerable	A1, C/D1	Vulnerable	A1, C/D1

Sub-habitat types that may require further examination

Zostera beds are in more serious condition and therefore would benefit from separate and further examination.

Habitat Type

Code and name

A5.53 Seagrass beds on Atlantic infralittoral sand (Macaronesian)

Zostera marina bed in shallow sublittoral waters. Canary Islands, Spain (© F.Espino, EcoAqua).

Habitat description

This habitat consists of beds of submerged marine angiosperms in the genera *Cymodocea, Halophila, Ruppia, Thalassia* and *Zostera* in the southern islands of Macaronesia (it does not occur in the Azores). Seagrass beds are present mainly off the sheltered eastern coasts of the Canary Islands (Spain), on the wide subtidal platforms with sandy substrata and gently sloping coastlines which are sheltered from the Trade Winds. They may occur in patches or form extensive meadows reaching depths of over 30m where light levels are sufficient to support growth. *C. nodosa* has also been reported in scattered locations along the southern coast of Madeira Island (Portugal). In the Canary Islands, *C.nodosa* can be found forming unispecific meadows, but also mixed with *Halophila decipiens* on muddy bottoms or with the green macroalga *Caulerpa prolifera* on sandy bottoms.

Marine seagrass meadows are very important in providing several ecological services, such as primary production, habitats, nurseries and coastal protection. Primary productivity may vary, depending on many factors such as the density of the meadow, geographic area or hydrologic factors. These ecosystems are one of the most important habitats for several marine organisms, which depend on them in different phases of their life cycle, not only to feed but also to take shelter from predators.

Indicators of quality:

Both biotic and abiotic indicators have been used to describe marine habitat quality. These include: the presence of characteristic species as well as those which are sensitive to the pressures the habitat may face; water quality parameters; levels of exposure to particular pressure, and more integrated indices which describe habitat structure and function, such as trophic index, or successional stages of development in habitats that have a natural cycle of change over time. There are no commonly agreed indicators of quality for this habitat, although particular parameters may have been set in certain situations e.g. protected features within Natura 2000 sites, where reference values have been determined and applied on a location-specific basis. Total area covered, density of the intertidal beds and species composition is, for example, used as a Water Framework Directive parameter for assessing ecological status.

The overall quality and continued occurrence of this habitat is dependent on the presence of seagrass species which create the biogenic structural complexity on which the characteristic associated species depend. The density and the maintenance of a viable population of seagrass is therefore a key indicator of habitat quality, together with the visual evidence of presence or absence of physical damage. Shoot density and leaf length have both been examined as potential indicators of quality of this habitat.

Characteristic species:

C.nodosa, and *H. decipiens* are the most common seagrass species. *Zostera marina* is present and *Z. noltei* occurs but is rare and intertidal.

Classification

EUNIS (2004):

Level 4. A sub-habitat of 'Sublittoral macrophyte-dominated sediment' (A5.5)

Annex 1:

1110 Sandbanks which are slightly covered by seawater all the time

1160 Large shallow inlets and bays

MAES:

Marine - Marine inlets and transitional waters

Marine – Coastal

MSFD:

Shallow sublittoral coarse sediment

Shallow sublittoral sand

Shallow sublittoral mixed sediment

EUSeaMap:

Shallow sands

Shallow coarse or mixed sediments

IUCN:

9.9 Seagrass submerged

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

No

Justification

This is a relatively rare habitat in Macaronesia. It is not present in the Azores, and is present as small patches in Madeira. All other records are from the Canary Islands.

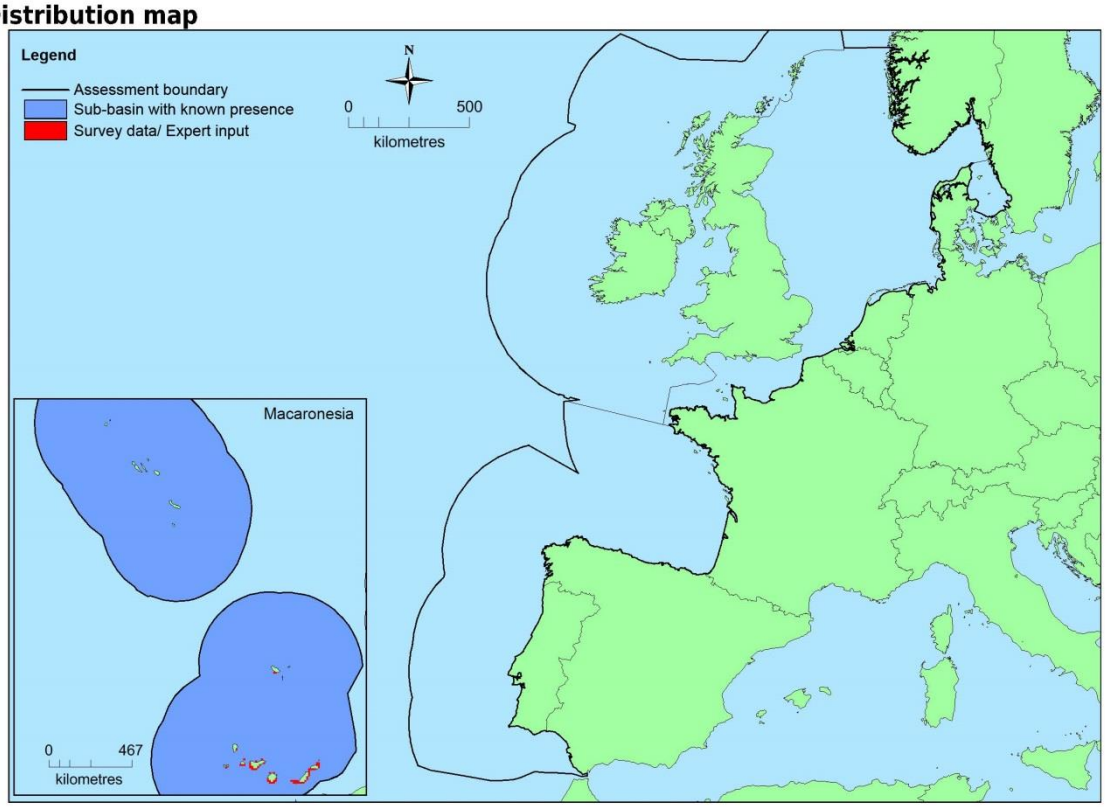
Geographic occurrence and trends

Region	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
North-East Atlantic	Macaronesia: Present	unknown Km^2	Decreasing	Decreasing

Extent of Occurrence, Area of Occupancy and habitat area

	Extent of Occurrence (EOO)	Area of Occupancy (AOO)	Current estimated Total Area	Comment
EU 28	153,446 Km^2	59	unknown Km^2	EOO and AOO have been calculated on the available data. Although this data set is known to be incomplete the figures exceed the thresholds for threatened status.
EU 28+	153,446 Km^2	59	unknown Km^2	EOO and AOO have been calculated on the available data. Although this data set is known to be incomplete the figures exceed the thresholds for threatened status.

Distribution map



There are insufficient data to provide a comprehensive and accurate map of the distribution of this habitat. 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). EOO and AOO have been calculated on the available data presented in this map however these should be treated with caution as expert opinion is that this is not the full distribution of the habitat.

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

100% as this is defined as a Macaronesian habitat although similar habitats occur elsewhere e.g. *Cymodosa* meadows in scattered locations in the North Atlantic from southern Portugal and Spain to Senegal, and *Zostera marina* beds in northern Europe.

Trends in quantity

A compliation of all published data including three structural descriptors (seagrass shoot density, cover

and leaf length of *C.nodosa)* at any place in the Canary Islands between 1991 and 2013 covered a total of 87 meadows at 6 islands of the Canarian Archipelago. Coverage was estimated as the percentage of the area in which the presence of *C.nodosa* was detected typically through 25 or 50m long transects. Over this time period there were no significant temporal patterns at El Hierro and Gomera, and decreases in coverage at Lanzarote, Fuerteventura, Gran Canaria and Tenerife.

At the present time *C.nodosa* beds are present in a few areas on the south coast of Madeira (covering a total area less than 1km^2). The dense meadows in the bay of Machico, recorded in 2000 have disappeared but there is still a bed in the bay of Cais do Carvao. Subtidal *Zostera* beds have always had a very restricted occurrence in the Canarian Archipelago with just three small patches in a single harbour in Lanzarote. They were present in Grand Canaria in the 1970's but this is no longer the case.

- Average current trend in quantity (extent)
  EU 28: Decreasing
  EU 28+: Decreasing
- Does the habitat type have a small natural range following regression?
  No
  Justification
  There has been a significant decline in range of this habitat during the last 50 years but the EOO still exceeds 50,000km^2.
- Does the habitat have a small natural range by reason of its intrinsically restricted area?
  No
  Justification
  There has been a significant decline in range of this habitat during the last 50 years however the EOO still exceeds 50,000km^2

Trends in quality

There has been an overall decline in quality of this habitat as indicated by four metrics (shoot density, biomass, leaf length and coverage) in a study of changes in the demographic structure of *C.nodosa* seagrass meadows in the Canary Islands over the last 23 years. The dense meadows of *C.nodosa* in Machico Bay, Madeira have disappeared since 2000. The *H.decipiens* beds in Tenerife showed an initial increase in leaf length in the vicinity of fish cages but then a rapid decrease.

- Average current trend in quality
  EU 28: Decreasing
  EU 28+: Decreasing

Pressures and threats

Coastal development including port developments, and waste disposal, particularly sewage discharges are the main pressures on this habitat. In the case of *C.nodosa t*he causes of epiphytic growth of *Lyngbya* sp over *C. nodosa* communities are not still clear. The blooms of this cyanobacteria are ephemeral and probably related to a mix of natural and anthropogenic origins.

List of pressures and threats

Transportation and service corridors

Shipping lanes, ports, marine constructions

Biological resource use other than agriculture & forestry

Marine and Freshwater Aquaculture

Pollution

Pollution to surface waters (limnic, terrestrial, marine & brackish)
Nutrient enrichment (N, P, organic matter)

Natural System modifications

Human induced changes in hydraulic conditions
Removal of sediments (mud...)

Conservation and management

Regulation of activities (such as coastal development, dredging, waste disposal) and zoning to ensure that aquaculture facilities are located away from this habitat are useful management measures.

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 marine habitats

Restoring marine habitats

Measures related to spatial planning

Establish protected areas/sites
Legal protection of habitats and species

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:

1110: MMAC U1

1160: MMAC FV

Cymodocea meadows and *Zostera* beds are an OSPAR threatened/declining habitat type

Cymodocea was previously protected under regional regulation in the Canary Islands but this is no longer the case.

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

Recovery can occur if conditions are suitable but will depend on depth, substratum and the scale of the damage. If damage is minor natural recovery may be possible but if there is more extensive damage or loss, intervention may be needed. A small scale pilot project to transplant healthy *C.nodosa* affected by port expansion in Fuerteventura was considered unsuccessful and recent work suggests that there may be a critical mass of transplants needed for recovery and that proxmity of the area selected for transplantation to donor beds is also beneficial.

Effort required

10 years
Naturally

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	>30 %	unknown %	unknown %	unknown %
EU 28+	>30 %	unknown %	unknown %	unknown %

A compliation of all published data including three structural descriptors (seagrass shoot density, cover and leaf length of *C.nodosa)* at any place in the Canary Islands between 1991 and 2013 covered a total of 87 meadows at 6 islands of the Canarian Archipelago. Over this time period there were no significant temporal patterns at El Hierro and Gomera, and decreases in coverage at Lanzarote, Fuerteventura, Gran Canaria and Tenerife.

Expert opinion is that there has been an overall decline in quantity of this habitat of more than 30% in the last 50 years although declines in the last 20 years have been more severe (greater than 50%). This habitat has therefore been assessed as Vulnerable under Criterion A1.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	>50,000 Km^2	Yes	Yes	No	>50	Yes	Yes	No	No
EU 28+	>50,000 Km^2	Yes	Yes	No	>50	Yes	Yes	No	No

There have been and are likely to be future declines in the quantity and quality of this habitat however as EOO >50,000 km^2 and AOO >50, this exceeds the thresholds for a threatened category on the basis of restricted geographic distribution. 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 criterion B.

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	30 %	substantial %	unknown %	unknown %	unknown %	unknown %
EU 28+	30 %	substantial %	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%

There has been an overall decline in quality of this habitat as indicated by four metrics (shoot density, biomass, leaf length and coverage) in a study of changes in the demographic structure of *C.nodosa* seagrass meadows in the Canary Islands over the last 23 years. Expert opinion is that there has been a substantial reduction in quality of this habitat over the last 50 years (severe decline affecting more than 30% of the extent). This habitat has therefore been assessed as Vulnerable under Criteria C/D1.

Criterion E: Quantitative analysis to evaluate risk of habitat collapse

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

A risk of collapse does exist however this has not been quantified.

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	VU	DD	DD	DD	LC	LC	LC	VU	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	VU	DD	DD	DD	LC	LC	LC	VU	DD	DD	DD	DD	LC	DD	DD	DD	DD

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Vulnerable	A1, C/D1	Vulnerable	A1, C/D1

Confidence in the assessment
Medium (evenly split between quantitative data/literature and uncertain data sources and assured expert knowledge)

Assessors
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Contributors
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Reviewers
S.Wells.

Date of assessment
06/08/2015

Date of review
16/01/16

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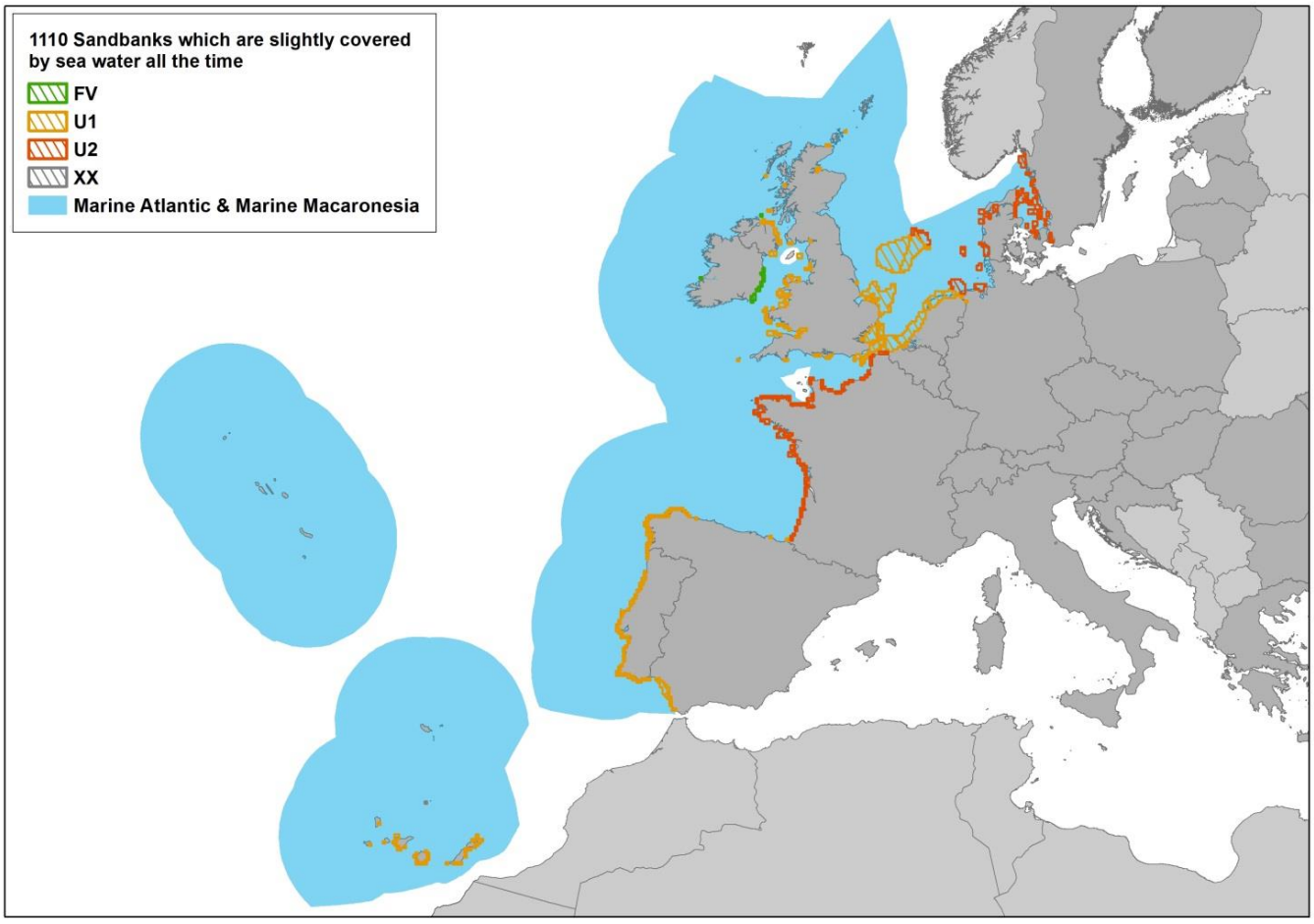
2.2.1 1110 Sandbanks which are slightly covered by sea water all the time

The habitat "1110 - Sandbanks which are slightly covered by sea water all the time", is basically a habitat complex that can encompass a variety of soft bottoms. According to the Interpretation Manual of European Union Habitats - EUR28, Sandbanks are: *elevated, elongated, rounded or irregular topographic features, permanently submerged and predominantly surrounded by deeper water. They consist mainly of sandy sediments, but larger grain sizes, including boulders and cobbles, or smaller grain sizes including mud may also be present on a sandbank*.

The overall conclusion for the habitat is unfavourable in all regions where the habitat is present; unfavourable- bad (U2) in the Marine Atlantic region, and unfavourable- inadequate (U1) in the Marine Macaronesian.

The main pressures and threats reported for the habitat involve pollution including eutrophication effects, over fishing, invasive non-native species, and mechanical damage such as marine construction, benthic trawling, and dredging.

Map of habitat distribution and conservation status



Habitat conservation status at the Member State and EU levels

Conservation status parameters	MATL											MMAC		
	BE	DE	DK	ES	FR	IE	NL	PT	SE	UK	EU27	ES	PT	EU27
range	FV	FV	FV	FV	U1	FV	FV	FV	FV	FV	FV	FV	XX	FV
area	FV	FV	XX	FV	U1	FV	FV	FV	U2	XX	XX	FV	XX	FV
structure	U1	U2	U2	U1	U2	FV	U1	U1	U1	U1	U2	U1	FV	U1
future	U1	U2	U2	FV	U2	FV	XX	U1	U2	U1	U2	FV	XX	FV
overall	U1	U2	U2	U1	U2	FV	U1	U1	U2	U1	U2	U1	XX	U1

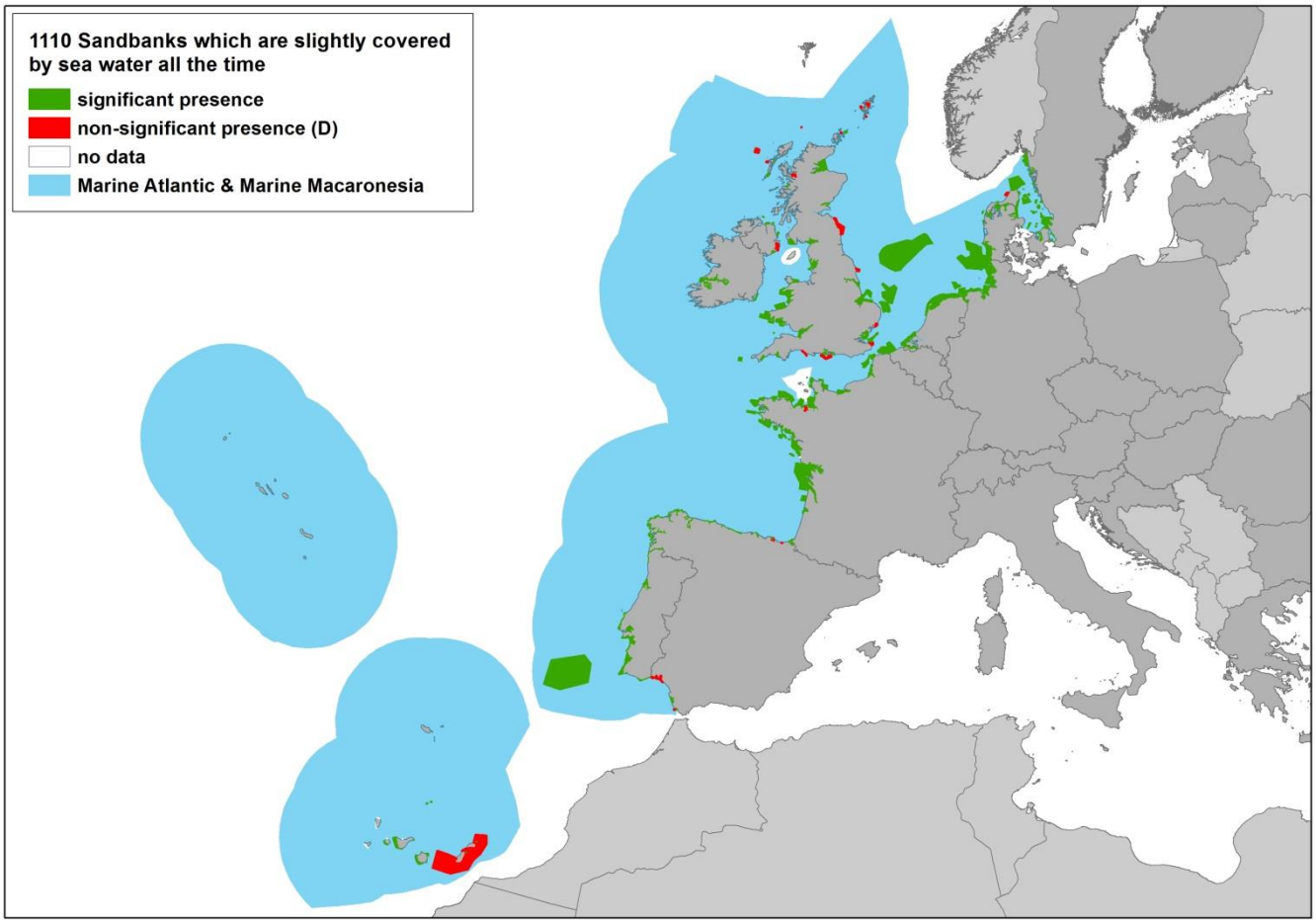
Proportion of pressures reported by MS as 'Highly important'

Pressures - Level 2	MATL	MMAC
C01 - Mining and quarrying	4.8%	25.0%
D03 - Shipping lanes and ports	0%	0%
E03 - Discharges (household/industrial)	4.8%	25.0%
F01 - Marine and freshwater aquaculture	4.8%	0%
F02 - Fishing and harvesting aquatic resources	38.1%	25.0%
F06 - Other hunting. fishing and collection activities	9.5%	0%
G05 - Other human intrusions and disturbances	4.8%	0%
H01 - Pollution to surface waters	0%	0%
H03 - Pollution to marine waters	14.3%	0%
H04 - Air pollution. air-borne pollutants	0%	0%
I01 - Invasive alien species	9.5%	0%
J02 - Changes in water bodies conditions	4.8%	0%
J03 - Other changes to ecosystems	4.8%	25.0%

Proportion of conservation measures reported by MS as 'Highly important'

Conservation measures - Level 2	MATL	MMAC
4.0 - Other wetland-related measures	4.2%	0%
4.1 - Restoring/improving water quality	4.2%	20.0%
4.2 - Restoring/improving the hydrological regime	4.2%	0%
5.0 - Other marine-related measures	4.2%	0%
5.1 - Restoring marine habitats	4.2%	0%
6.0 - Other spatial measures	8.3%	0%
6.1 - Establish protected areas/sites	25.0%	20.0%
6.3 - Legal protection of habitats and species	8.3%	20.0%
7.1 - Regulation/ Management of hunting and taking	0%	0%
7.3 - Regulation/ Management of fishery in marine and brackish systems	16.7%	20.0%
8.1 - Urban and industrial waste management	4.2%	20.0%
8.3 - Managing marine traffic	4.2%	0%
9.0 - Other resource use measures	4.2%	0%
9.2 - Regulating/Managing exploitation of natural resources on sea	8.3%	0%

SCI distribution map for this habitat type



Number of SCIs where this habitat type occurs and habitat area covered by Natura 2000 per Member State (Natura 2000 End_2017 database)

MS	TOTAL SCI	SIGNIFICANT SCI	COVER (km²)	SIGNIFICANT COVER (km²)
BE	2	2	1126,25	1126,25
DE	5	5	2714,18	2714,18
DK	29	28	1655,38	1655,38
ES	67	59	499,50	484,48
FR	67	66	7203,30	7203,29
IE	4	4	111,97	111,97
NL	7	7	8382,56	8382,56
PT	13	13	392,66	392,66
SE	19	19	477,32	477,32
UK	51	36	20747,22	20667,52

3 Species fact sheets

3.1 1349 Bottlenose dolphin *Tursiops truncatus*

(Annexes II and IV)

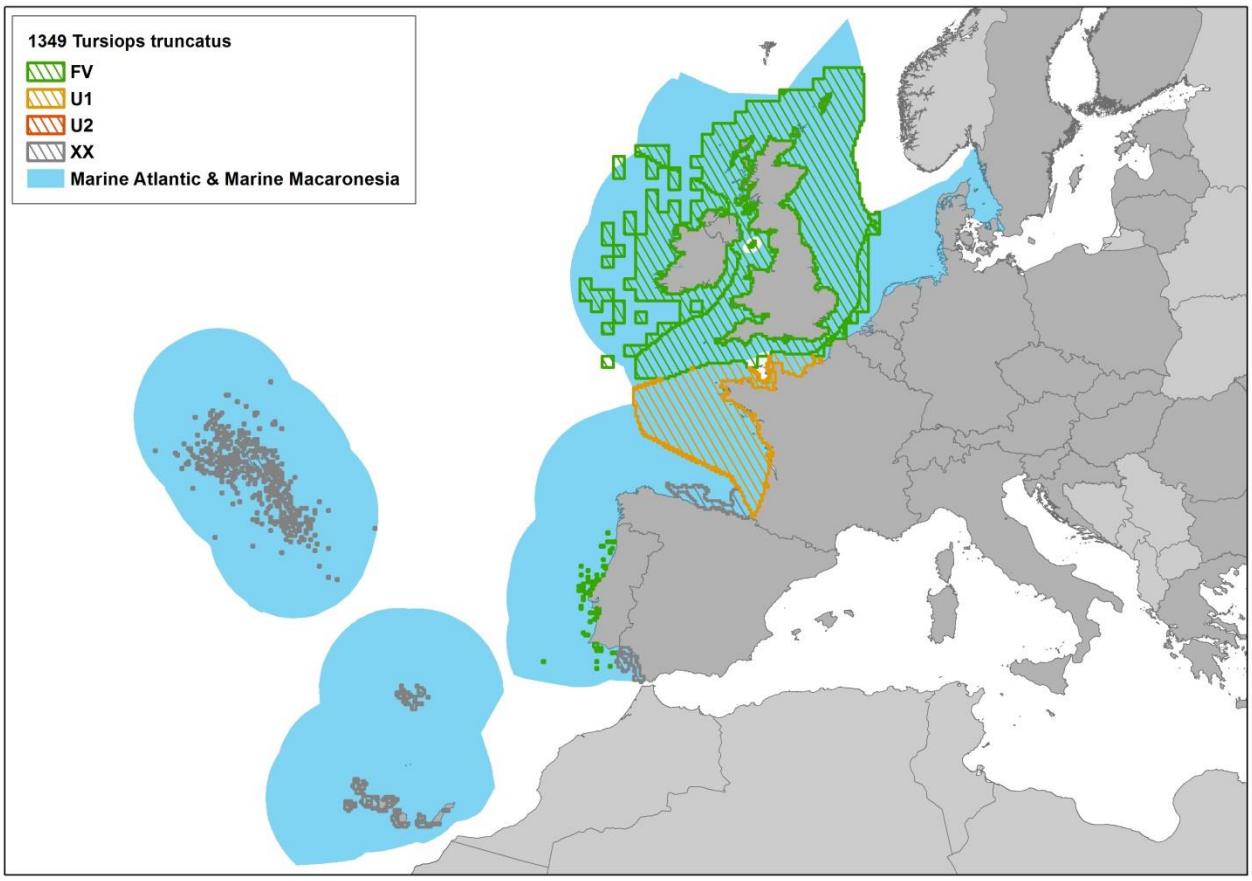
The common bottlenose dolphin, *Tursiops truncates*, inhabits the coastal as well as pelagic waters of the marine Atlantic-, Macaronesian, Black Sea and Mediterranean regions.

The overall assessments in the Marine Atlantic is unknown (XX), thus more data is needed to properly evaluate its conservation status. According to the authorities of the United Kingdom, the Atlantic assessment ignores the fact that bottlenose dolphins in European waters are divided into many small localised populations and a more dispersed wider-ranging offshore group. This population structure means that the favourable conservation status of many of the smaller groups (e.g. those of the NE Scottish coast and Welsh coasts in UK waters) are lost in the overall assessment of the species. In 2001-2007, the species was assessed as favourable (FV) in the Marine Atlantic region. This is in agreement with IUCN list of threatened species, where the species is listed as least concern (LC).

In the Marine Macaronesian region, *Tursiops truncatus* has been assessed as 'Favourable'.

The species has been reported as being vulnerable due to: interaction with fishing gear, disturbance from nautical activities, noise disturbance, population fragmentation, reduction in the availability of prey, various pollution and deliberate killing.

Map of species distribution and conservation status



Species conservation status at the Member State and EU levels per marine region

Conservation status parameters	MATL							MMAC		
	ES	ES	ES	ES	PT	UK	EU27	ES	PT	EU27
range	FV	FV	FV	FV	FV	FV	FV	FV	XX	FV
population	XX	XX	XX	XX	FV	FV	XX	XX	FV	FV
habitat of species	XX	XX	XX	XX	FV	FV	XX	XX	XX	XX
future	XX	XX	XX	XX	FV	FV	XX	XX	FV	FV
overall	XX	XX	XX	XX	FV	FV	XX	XX	XX	FV

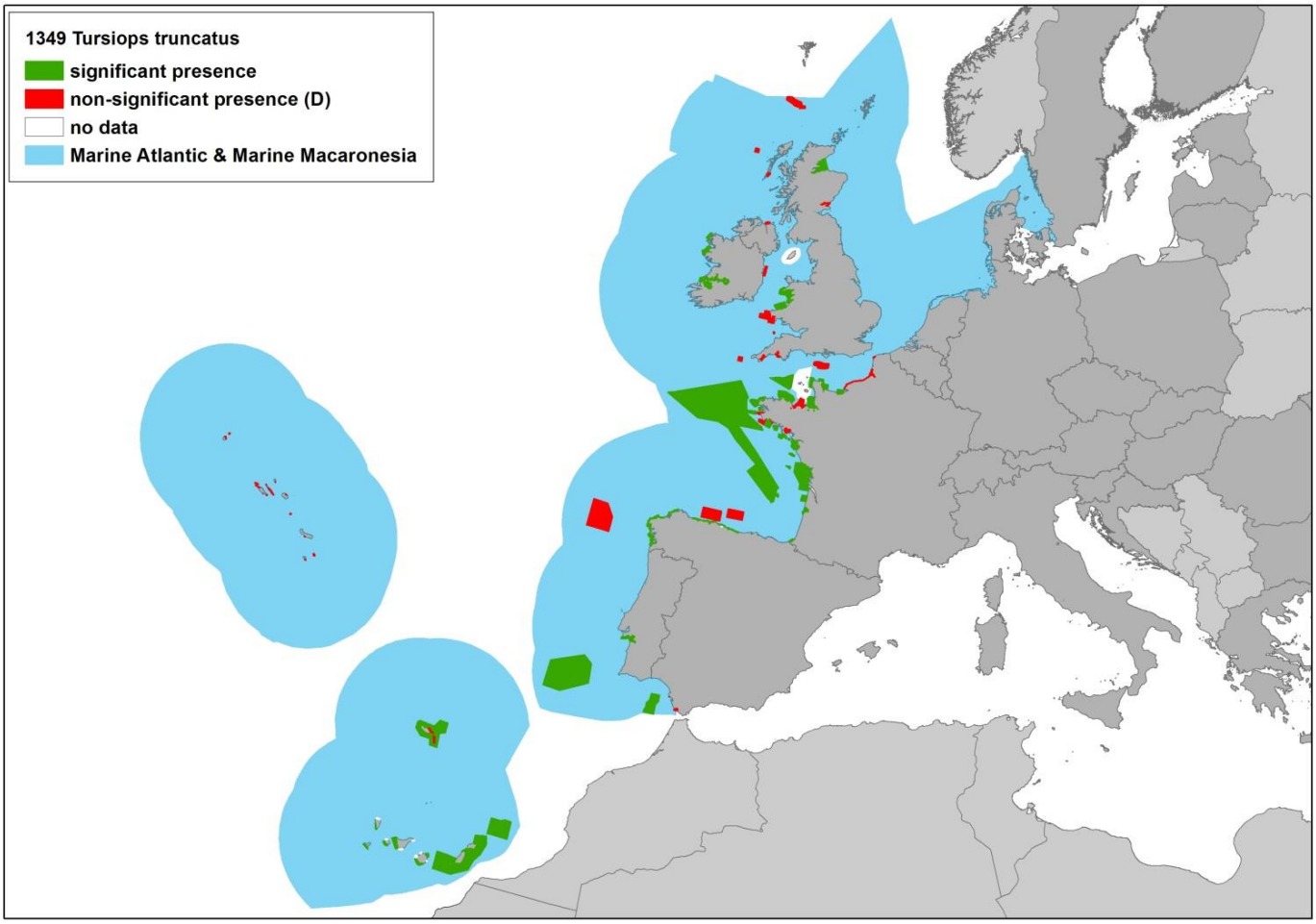
Proportion of pressures reported by MS as 'Highly important'

Pressures - Level 2	MATL	MMAC
D03 - Shipping lanes and ports	0%	20.0%
F01 - Marine and freshwater aquaculture	0%	20.0%
F02 - Fishing and harvesting aquatic resources	20.0%	20.0%
F03 - Hunting and collection of terrestrial wild animals	0%	0%
F05 - Illegal taking of marine fauna	0%	0%
G01 - Outdoor sports, leisure and recreational activities	20.0%	0%
G02 - Sport and leisure infrastructures	20.0%	20.0%
H01 - Pollution to surface waters	0%	0%
H03 - Pollution to marine waters	40.0%	0%
H06 - Excess energy (noise, light, heating, electromagnetic)	0%	0%
J03 - Other changes to ecosystems	0%	20.0%

Proportion of conservation measures reported by MS as 'Highly important'

Conservation measures - Level 2	MATL	MMAC
4.1 - Restoring/improving water quality	5.9%	0%
6.1 - Establish protected areas/sites	17.6%	28.6%
6.3 - Legal protection of habitats and species	23.5%	28.6%
7.0 - Other species management measures	5.9%	14.3%
7.1 - Regulation/ Management of hunting and taking	5.9%	0%
7.2 - Regulation/ Management of fishery in limnic systems	0%	0%
7.3 - Regulation/ Management of fishery in marine and brackish systems	11.8%	14.3%
7.4 - Specific single species or species group management measures	0%	0%
8.3 - Managing marine traffic	17.6%	14.3%
9.2 - Regulating/Managing exploitation of natural resources on sea	11.8%	0%

SCI distribution map for this species



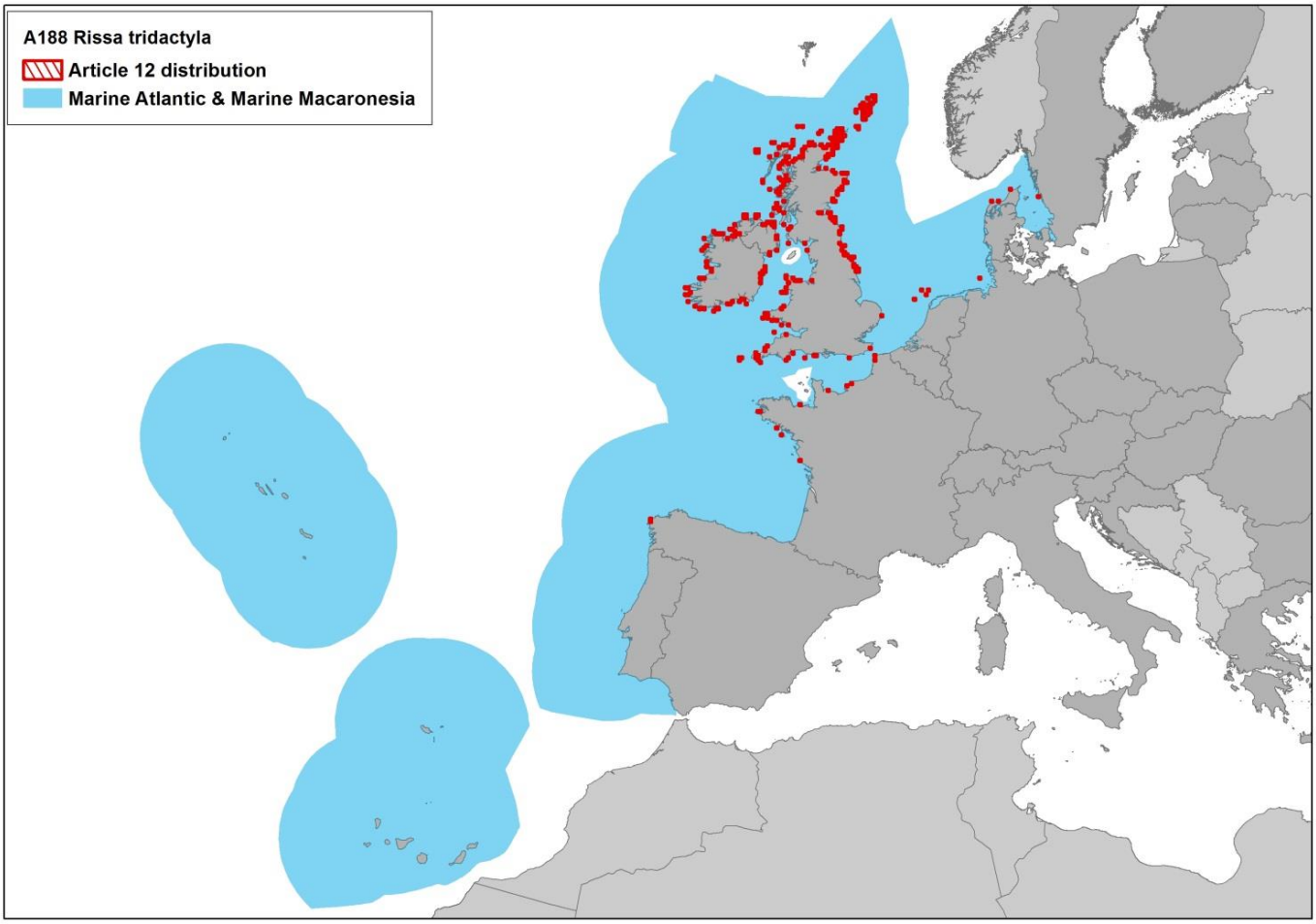
Number of SCIs where this species occurs per Member State (Natura 2000 End_2017 database)

MS	TOTAL SCI	SIGNIFICANT SCI	POPULATION SIZE in N2K SITES (Art.17)	SCI AREA (km²)	SIGNIFICANT SCI AREA (km²)
ES	46	40	490- 2450 i-	42075,75	
FR	41	31	1000- 5000 i	81337,04	79563,84
IE	3	2	10539- 27982 i	1616,02	1342,88
PT	24	4		80583,57	30583,57
UK	14	3	363 – 460 i	9494,81	3931,42

3.2 A188 Black-legged kittiwake *Rissa trydactyla*

Black-legged Kittiwake, *Rissa tridactyla*, is a species of seabird found in unvegetated or sparsely vegetated land, coastal, shelf and open ocean ecosystems.
It has a breeding population size of 421000-422000 pairs and a breeding range size of 33200 square kilometres in the EU27. The breeding population trend in EU27 is decreasing in both, the short term and the long term.
The EU population status of *Rissa tridactyla* was assessed as Threatened, as the species meets one or more of the IUCN Red List criteria for threatened at the EU27 scale. The main pressures, as reported by Member States, having an impact on the species' conservation are pollution of marine waters and fishing.

Article 12 distribution



Species population trends by MS

MS/Ter.	% in EU27	Breeding population size	Breeding population trend		Range area	Breeding range trend		Winter population size	Winter population trend	
			Short term	Long term		Short term	Long term		Short term	Long term
DE	0.3	7083 - 7083 p	-	+	2	0	0	14000 - 14000 i	x	0
DK	0.9	340 - 340 p	-	0	85	-	0			
ES	0.6	0 - 5 p	-	-	402	-	-		x	x
FR	3.4	5000 - 5500 p	0	+	1400	-	-			
IE	18.0	28627 - 28627 p	-	+	7500	+	+			
NL	1.2	25 - 100 p	+	+	400	+	+			
PT								500 - 1000 i	x	x
SE	0.3	31 - 41 p	0	0	100	0	0			
UK	75.2	380000 - 380000 p	-	-	23400	-	-			

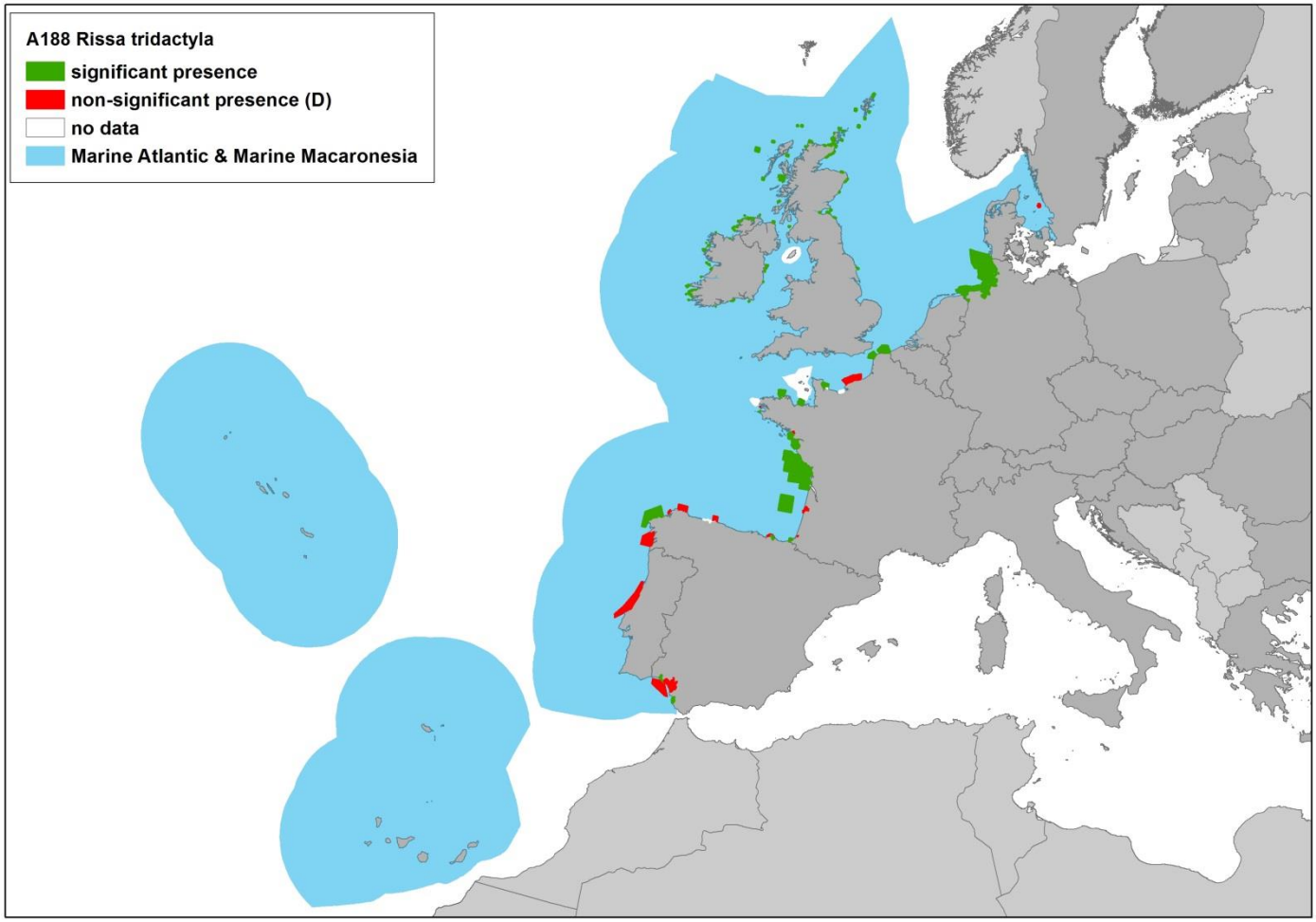
Proportion of pressures reported by MS as 'Highly important' at EU scale

Code	Activity	Frequency
F02	Fishing and harvesting aquatic resources	40
H03	Pollution to marine waters	40
I01	Invasive alien species	10
J03	Other changes to ecosystems	10

Proportion of conservation measures reported by MS as 'Highly important' at EU scale

Code	Measure	Frequency
6.1	Establish protected areas/sites	30
6.3	Legal protection of habitats and species	25
9.2	Regulating/Managing exploitation of natural resources on sea	15
7.3	Regulation/ Management of fishery in marine and brackish systems	10
7.4	Specific single species or species group management measures	10
5.0	Other marine-related measures	5
6.0	Other spatial measures	5

SPA distribution map for species



Number of SPAs where this species occurs per Member State (Natura 2000 End_2017 database)

MS	TOTAL SPA	SIGNIFICANT SPA	POPULATION SIZE in N2K SITES (Art.12)*	SPA AREA (km²)	SIGNIFICANT SPA AREA (km²)
DE	4	4	B 7083 p/ W 2100 i	12936,35	12936,35
ES	13	6		10696,60	3545,35
FR	22	17		22981,46	20865,35
IE	25	25	23807 p	291,12	291,12
PT	2			3955,91	
SE	1			178,40	
UK	30	30	B 217005p/ P 11-50 i	2333,19	2333,19

*Note: population size refers to the MS, not to biogeographical region. B= breeding, W= wintering, P= passage.