

A5.514 *Lithophyllum* maerl beds

Summary

Lithophyllum spp. are minor maerl-forming species that are known to form beds in very few locations, with recent observations restricted to discrete sites in western Ireland and Brittany, France. In each of these locations, beds are recorded as comprising one or both of two maerl species, *L. fasciculatum* and *L. dentatum*, but the taxonomy remains uncertain. *Lithophyllum* maerl beds, as with other maerl bed habitats, form complex structures with a highly diverse associated flora and fauna. This maerl habitat occurs in particularly shallow and very sheltered conditions.

In the locations where it has been observed to occur there are significant ongoing pressures from invasive species and damaging human activity that threaten the continued existence of this habitat. In the Bay of Brest, maerl beds have been lost due to eutrophication, but measures to reduce sewage discharges are likely to reduce this pressure in the near future. *Lithophyllum* beds remain under serious threat from the invasive gastropod *Crepidula fornicata* and fishing activity. Scallop dredging and the expansion of clam fishing, in particular, are considered to be major threats to the remaining beds and protection measures concentrating on controlling these activities should be a major priority.

Synthesis

Documented sites where the *Lithophyllum* maerl beds are present are very few, suggesting that the habitat is extremely rare. In common with other maerl habitats, both extent and in quality of the associated communities that they support are declining. The magnitude of the decline is unknown, but is continuing in both Ireland and France the only known locations for this habitat type.

This habitat has been assessed as Endangered for both the EU 28 and EU 28+ because of its restricted distribution, and because it is capable of becoming critically endangered or collapsed within a very short time period.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Endangered	B1/B2/B3	Endangered	B1/B2/B3

Sub-habitat types that may require further examination

The taxonomy of *Lithophyllum* forming maerl is problematic however it is known to be an extremely rare and unusual subtype of Atlantic maerl beds.

Habitat Type

Code and name

A5.514 *Lithophyllum* maerl beds



Maerl bed composed of *Lithophyllum* sp. together with *Lithothamnion corallioides* and *Phymatolithon calcareum*. Roz Bank, Bay of Brest, France (© A.Pibot).



Lithophyllum sp. with *Lithothamnion corallioides* and *Phymatolithon calcareum*. Roz Bank, Bay of Brest, France (© A.Pibot).

Habitat description

Maerl is a collective term for various species of non-jointed coralline red algae (*Corallinophycidae*) that live unattached. These species can form extensive beds, mostly in coarse clean sediments of gravels and clean sands or muddy mixed sediments, which occur either on the open coast, in tide-swept channels or in sheltered areas of marine inlets with weak current. Wave and current-exposed maerl beds, where thicker depths of maerl accumulate, frequently occur as waves and ridge / furrows arrangements. As maerl requires light to photosynthesize, the depth of live beds is determined by water turbidity, from the lower shore to 40 m or more. Water movement also appears to be a key physical environmental factor affecting the distribution of maerl and hence the formation of maerl beds.

Beds of *Lithophyllum* maerl are known from very few locations, with verified records of existing live beds only currently available from two locations; in the Republic of Ireland and France respectively. The taxonomy of the *Lithophyllum* genus is complex and poorly defined, with morphological characteristics sometimes being strongly influenced by environmental factors, such as wave exposure. For this reason the *Lithophyllum* species that create and define particular beds is presently unclear. Molecular analysis has, however, suggested that the beds in France comprise just *L. fasciculatum*, while in Ireland *L. fasciculatum* and *L. dentatum* are present, both taxa being closely related.

Lithophyllum maerl beds are restricted to sheltered and very shallow areas (0-2 m depth in Bay of Brest, Brittany, France, 0-3 m depth in Kingstown Bay, Ireland). In both Brittany and Ireland, the *Lithophyllum* maerl can reach up to 10 cm in diameter, with a highly variable morphology and branch density.

Indicators of quality:

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.

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. A specific survey protocol is currently being developed for this habitat (J. Grall, pers. comm.), which will include recurring quadrat photography, thalli number, density of live maerl cover, quality of associated community, occurrence of *Crepidula fornicata* and an estimation of the cover of soft macroalgae. The overall quality and continued occurrence of this habitat is, however, largely dependent on the presence of *Lithophyllum* spp. which creates the biogenic structural complexity on which the 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.

Characteristic species:

The communities associated with *Lithophyllum* maerl beds do not differ markedly from those found on other types of maerl bed (see “Atlantic maerl beds”) and are largely determined by the shallow and sheltered location in which this habitat is found. Large numbers of sponges, such as *Tethya* spp, *Suberites* sp and *Haliclona occulata* are reported to be a feature on some beds and a large number of an uncommon polychaete species *Hesion*e pantherina observed to be present.

Classification

EUNIS (v1405):

Level 4. A sub-habitat of ‘Atlantic shallow/infralittoral coarse sediment’ (A5.5).

Annex 1:

1110 Sandbanks which are slightly covered by seawater all the time

MAES:

Marine - Marine inlets and transitional waters

Marine - Coastal

MSFD:

Shallow sublittoral mixed sediment

EUSEaMap:

Shallow coarse or mixed sediments

IUCN:

9.3 Subtidal loose rock/pebble/gravel

9.4 Subtidal sandy

9.5 Subtidal sandy-mud

Other relationships:

HELCOM HUB:

AA.D, AB.D. Baltic photic and aphotic maerl beds

French classification:

III.3.2.1. Faciès du Maerl (= Association à *Lithothamnion corallioides* et *Phymatolithon calcareum*) (peut aussi se rencontrer comme faciès de la biocénose du détritique côtier)

IV.2.2.2. Faciès du Maerl (*Lithothamnion corallioides* et *Phymatolithon calcareum*)

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

No

Justification

This is a rare habitat type in the North East Atlantic Regional Sea area.

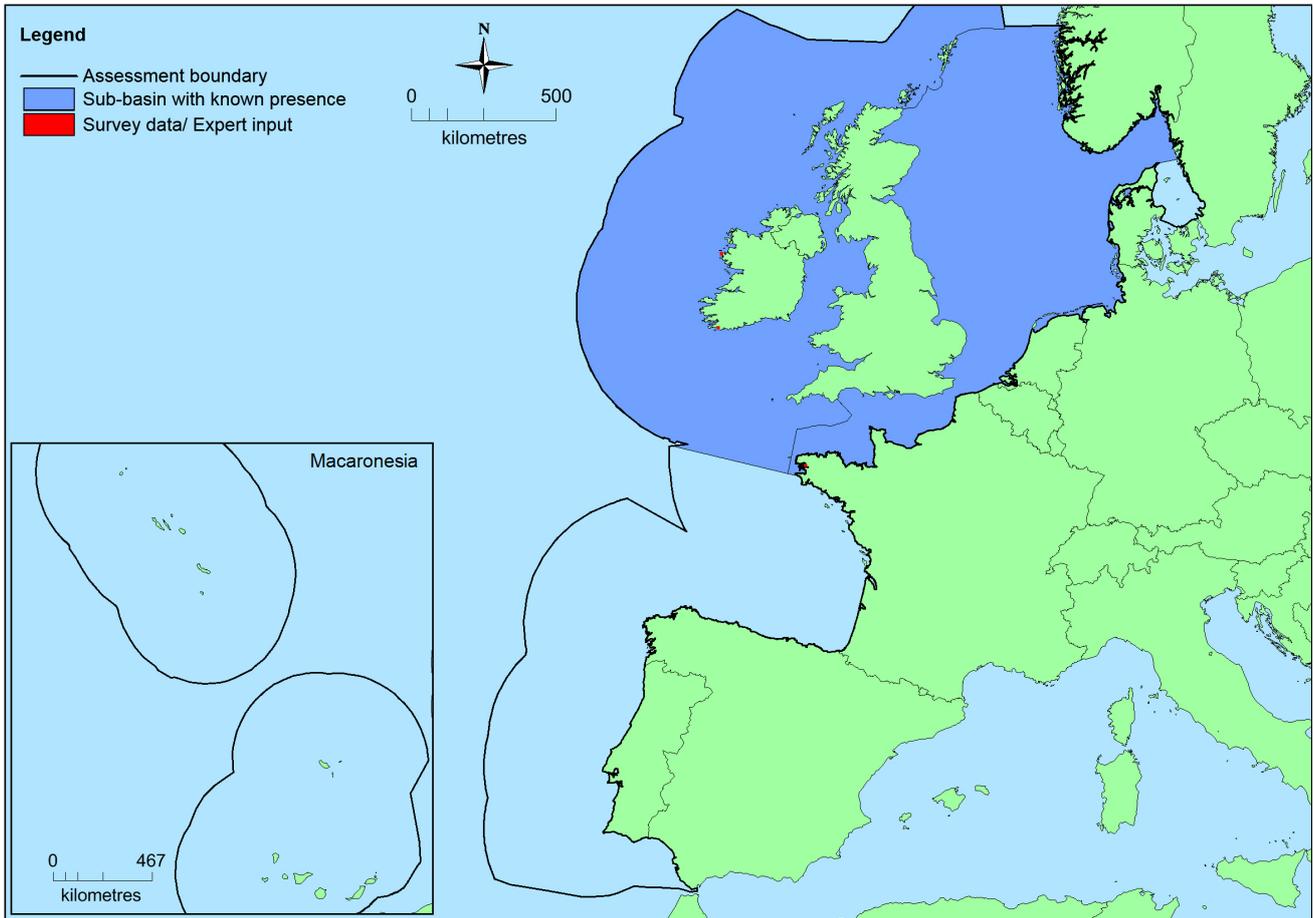
Geographic occurrence and trends

Region	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>North-East Atlantic</i>	Celtic Seas: Present Bay of Biscay and the Iberian Coast: Uncertain Kattegat: Uncertain Greater North Sea: Present Macaronesia: Uncertain	<2 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
<i>EU 28</i>	35,106 Km ²	3	<2 Km ²	Only reported from Ireland and Brittany. Covers less than 1km square in these locations.
<i>EU 28+</i>	35,106 Km ²	3	<2 Km ²	Not known from outside EU28

Distribution map



There are insufficient data to provide a comprehensive 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. These should, however, 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 very rare and has only been recorded in EU 28 (Republic of Ireland and France).

Trends in quantity

This habitat is currently only known to occur in three areas located on the west coast of Ireland and in the Bay of Brest, France. In each case the habitat covers less than 1km². There is some literature evidence to suggest that the habitat may have had a wider occurrence in the past (e.g. in Britain), but monitoring has shown that the distribution of maerl in general is in decline in Ireland and Atlantic French waters. Some *Lithophyllum* beds are known to have disappeared due to eutrophication, while the remainder of the French beds are at risk of future losses through dredging activity.

- Average current trend in quantity (extent)

EU 28: Decreasing

EU 28+: Decreasing

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

Yes

Justification

EOO <50,000 km² and expert opinion suggests that the habitat has declined during the last 50 years

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

Yes

Justification

The known beds occupy very small areas.

Trends in quality

Long term surveys of four maerl beds in the Bay of Brest have shown a decrease in eutrophication and an improvement in the quality of the beds in the northern Bay. There has been a considerable decrease in the quality of the broader maerl habitat here due to clam (*Venus verrucosa*) fishing, which has intensified over the last ten years, with the activity moving year on year to previously unfished maerl grounds. If this pattern of activity continues, it is likely that the *Lithophyllum* maerl beds will be targeted in the near future.

In Ireland, the quality of maerl beds is considered to be stable in some locations whereas in others quality is likely to be in decline due to towed demersal fishing activities, eutrophication and aquaculture. There is presently no information on the status of the *Lithophyllum* maerl bed in Kingstown Bay.

- Average current trend in quality

EU 28: Decreasing

EU 28+: Decreasing

Pressures and threats

Activities such as demersal fishing (e.g. with dredges or trawls) may have reduced the extent, complexity and biodiversity of these habitats over 50 years ago and these problems remain today. French maerl deposits have been studied in detail since 1898. There is hard evidence that many *Lithophyllum* maerl beds have been lost due to direct extraction, and others are degraded due to towed fishing gear impacts, eutrophication and infestation by invasive species such as *Crepidula fornicata*.

List of pressures and threats

Mining, extraction of materials and energy production

Mining and quarrying

Sand and gravel extraction

Biological resource use other than agriculture & forestry

Marine and Freshwater Aquaculture

Suspension culture

Fishing and harvesting aquatic resources

Professional active fishing

Benthic or demersal trawling

Benthic dredging

Human intrusions and disturbances

Other human intrusions and disturbances

Shallow surface abrasion/ Mechanical damage to seabed surface

Invasive, other problematic species and genes

Invasive non-native species

Conservation and management

Prohibiting the direct extraction of maerl would be of immediate benefit to this habitat. Other important conservation and management measures would be to stop the use of mobile demersal gears and other

types of fishing activity where this habitat occurs because of the damaging effects of abrasion. Sufficient distance between maerl beds and aquaculture facilities is also important. Mussel aquaculture, for example, contributes large amounts of fine sediment and detritus to the bottom, causing the burial and death of the maerl thalli by reduction of gas exchange around them.

List of conservation and management needs

Measures related to wetland, freshwater and coastal habitats

Restoring/Improving water quality

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

Specific single species or species group management measures

Measures related to special resource use

Regulating/Managing exploitation of natural resources on sea

Conservation status

Annex 1:

1110: MATL U2,MMAC U1

Maerl beds are identified as a threatened and/or declining habitat in all the OSPAR regions.

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

No.

Maerl thalli are fragile and therefore inherently susceptible to seabed abrasion, although they are resilient to natural movement by currents and waves. It is important not to change the natural disturbance regime or increase compaction of maerl as this can kill live thalli through burial in sediment or crush the brittle thalli, reducing their length and complexity. Large live thalli can range from 10s-100s of years old (and dead thalli 100s-1000s of years old) and with increasing maerl size, the three-dimensional complexity of the thalli increases which leads to increases in the diversity of associated flora and fauna. The size of maerl thalli decreases in the presence of activities that abrade or compact the seabed resulting in associated biodiversity loss.

Effort required

200+ years
Naturally

Red List Assessment

Criterion A: Reduction in quantity

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

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

This habitat is only present in the EU 28 in the North East Atlantic region. It is known to have reduced in quantity over the last 50 years however there is insufficient information to quantify the extent of the decline. This habitat has therefore been assessed as Data Deficient under criteria 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	35,106 Km ²	Yes	Yes	<5	3	Unknown	Yes	<5	Yes
EU 28+	35,106 Km ²	Yes	Yes	<5	3	Unknown	Yes	<5	Yes

This habitat has a restricted distribution (EOO <20,000 km², AOO <20) and is found in less than 5 locations. Historical trends are unknown however recent declines in quantity and quality have been reported and are considered likely to continue over the next 20 years. The habitat exists in very few locations and is considered capable of becoming critically Endangered or Collapsed within a very short time period. It has been assessed as Endangered 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 %	unknown %	unknown %
EU 28+	unknown %	unknown %	unknown %	unknown %	unknown %	unknown %

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

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

This habitat is known to have reduced in quality over the last 50 years however there is insufficient information to quantify the extent of the decline. This habitat has therefore been assessed as Data Deficient 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	DD	DD	DD	DD	EN	EN	EN	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	DD	DD	DD	DD	EN	EN	EN	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Endangered	B1/B2/B3	Endangered	B1/B2/B3

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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