

B1.9 Machair

Summary

Machair is a highly distinctive coastal landscape confined to the extreme north-west coast of the Atlantic region, most extensively developed in Ireland and the Scottish Isles, where the climate is very moist, mild and windy. It develops on plains of calcareous shell sand blown inland which, though largely stabilised, roll inland at their inner edge, over bedrock and bog. Machair comprises a mosaic of dune grasslands with lochs and mires, always influenced by long histories of low-input exploitation by grazing and rotational arable cultivation. The species-rich grasslands which always play a central role in these systems - and which are the core of this definition - are traditionally grazed by cattle, sheep, sometimes horses and goats, and also by rabbits and such extensive grazing is essential for maintaining quality. The main threats are agricultural intensification with fertilising, overgrazing and drainage, and construction of golf courses and (more locally) airports.

Synthesis

This habitat type is not endangered in either EU28 or EU28+. The habitat has lost a small area during the last 50 years, while about 1/3 of the remaining part is slightly negatively affected in quality. The habitat has a restricted range, but values for EOO and AOO are well above the thresholds for criterion B.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Least Concern	-	Least Concern	-

Sub-habitat types that may require further examination

The habitat type is a landscape mosaic, but further sub-habitat types are not needed for an appropriate assessment.

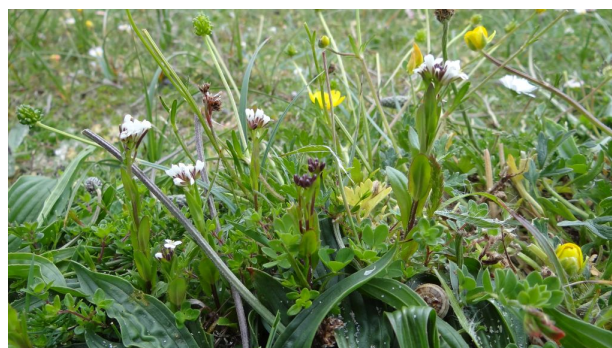
Habitat Type

Code and name

B1.9 Machair



Machair on the Island of Omay in Western Ireland. The dune grasslands here are mainly grazed by cattle. (Photo: Joop Schaminée).



The endemic *Arabis brownii* (white flowers) is a prominent species in the Irish machairs, here accompanied by among others *Ranunculus repens*, *Plantago lanceolata* and *Luzula campestris*. (Photo: Joop Schaminée).

Habitat description

Machairs are complex landscapes that support more or less extensive, short-turf dune grasslands in mosaics with calcareous lochs, saltmarshes, fens and other coastal habitats. In the National Vegetation Classification of the United Kingdom, twelve vegetation types have been mentioned belonging to the machair landscape. The grassland part is generally considered as 'machair in the strict sense' or 'machair grassland'. The landscape always shows a long history of human intervention, especially through grazing, low-intensity systems of rotational cropping and fishery-related activities. Grazing may include cattle and/or sheep grazing, sometimes grazing by horses or goats is involved. Grazing by rabbits is an important natural phenomenon. The habitat type is found along the Atlantic coasts of Ireland and Scotland (where the largest and richest examples are found on the Outer Hebrides), characterised by a moist and cool climate, on calcareous sandy soils, that are blown inland from the shores by strong prevailing western winds, overlying peat or impermeable bedrock. The pH values are normally above 7.0. The dynamics of the system are enhanced by the digging and trampling activities of rabbits and domestic animals. The name machair is derived from the Irish word *magh*, meaning low-lying, fertile plain. A smooth surface is often considered an important criterion, like in the definition of Curtis: 'systems in which the bulk of the area consists of a flat to gentle-sloping landform from which ridges are absent or very restricted and with a consequent restriction of the area of *Ammophila*'. The more or less humid sandy soils contain a significant proportion of shell fragments (up to 60 % of the soil or even more), producing lime-rich conditions. During winter, the low-lying parts of the system are flooded or at least waterlogged. The grasslands are dominated by rather generalist grasses including *Poa pratensis* and *Festuca rubra*, but a species- and flower-rich herb layer attracts many insects, whereas the complex landscape setting is important for breeding waders and other birds. As an example, at present, machairs support the healthiest western European population of the threatened Corncrake (*Crex crex*). On the European continent, to some extent, similar landscapes can be found, but not in the same complex landscape setting. In the Netherlands, for instance, low-lying, undulating plains with species-rich dry to humid dune grasslands do occur on old grazing grounds in the southwestern part of the country (*vroongronden*), but these sites are not dynamic and to a large extent decalcified. Calcareous, dynamic grasslands with a long history of human interference can be observed in the mainland dunes of Holland province (*zeedorpenlandschap*), but these are lacking the other landscape elements and wide-ranging grazing.

Indicators of good quality:

The following characteristics can be considered as indicators of good quality:

- High richness in herb species
- Long-term, non-intensive human land-use, including grazing
- Complex landscape setting, with grasslands and small water bodies and other elements

Characteristic species:

Flora: *Achillea millefolium*, *Arabis brownii*, *Asperula cynanchica*, *Bellis perennis*, *Cochlearia scotica*, *Erodium cicutarium*, *Euphrasia marshallii*, *Euphrasia officinalis*, *Galium verum*, *Gentianella campestris*, *Lotus corniculatus*, *Plantago lanceolata*, *Sedum acre*, *Thalictrum minus* ssp. *arenarium*, *Thymus praecox*, *Trifolium repens*, and many orchids, among which *Coeloglossum viride*, *Dactylorhiza fuchsii* subsp. *hebridensis*, *Dactylorhiza purpurella*, *Gymnadenia conopsea*, *Orchis mascula*, *Platanthera chlorantha* and *Spiranthes spiralis*. *Arabis brownii* is endemic to Ireland, *Cochlearia scotica*, *Dactylorhiza fuchsii* subsp. *hebridensis* and *Euphrasia marshallii* are endemic to Scotland.

Classification

This habitat may be equivalent to, or broader than, or narrower than the habitats or ecosystems in the following typologies.

EUNIS:

B1.9 Machair

(also part of X27 Machair complexes)

EuroVegChecklist:

Ammophilon Br.-Bl. 1921

Armerion elongatae Pötsch 1962

Caricion fuscae Koch 1926

Koelerion arenariae Tx. 1937 corr. Gutermann et Mucina 1993

Thero-Airion Tx. ex Oberd. 1952

Violion caninae Schwickerath 1944

Annex I:

21A0 Machairs (* in Ireland)

Emerald:

B1.9 Machair

MAES-2:

Coastal

IUCN:

4.4 Temperate grassland

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

Yes

Regions

Atlantic

Justification

This habitat types only occur in Western Ireland and Scotland.

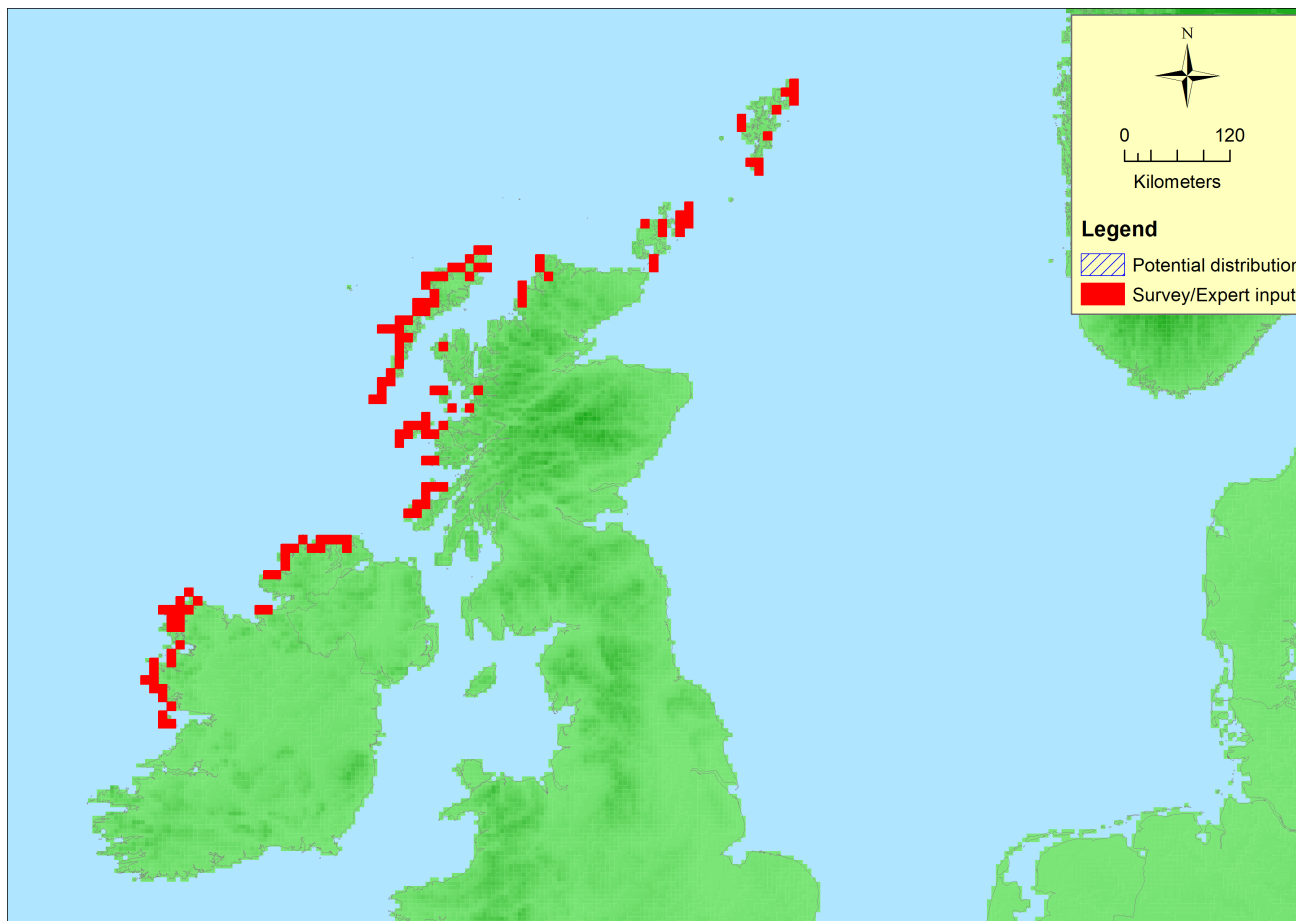
Geographic occurrence and trends

EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Ireland</i>	Present	29.4 Km ²	Decreasing	Decreasing
<i>UK</i>	United Kingdom: Present	145 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	142950 Km ²	129	174.6 Km ²	
EU 28+	142950 Km ²	129	174.6 Km ²	

Distribution map



The map is complete. Data sources: Art17.

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

The habitat type is restricted to the Atlantic region of the EU28.

Trends in quantity

Recent trend EU28: -5% or even less. Recent trend EU28+: -5% or even less. Although there are limited data that provide the whole picture, it can be concluded that there is only a slight decrease in quantity.

- 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

The EOO is larger than 50.000 km²

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

No

Justification

Although the habitat type is restricted to Ireland and Scotland, it still covers quite some area (up to several km²) distributed over quite some locations.

Trends in quality

About two third of the habitat type is found in UK (Scotland), one third in Ireland. Both countries report only a slight decrease in habitat quality, often local. The only exception concerns the Orkney Islands in Northern Scotland where agricultural intensification has resulted in quite some losses.

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

Pressures and threats

Machairs are a classic example of a landscape mosaic that depends on the continuation of traditional management schemes. Both abandonment and intensification may effect its biological - and cultural historical - values. In the light of this, it somehow surprises that still a considerable portion of the old machairs seems to have survived. In Ireland, a decline is reported although quantitative data are lacking; in the UK, the situation is considered to be stable with 5-25% of the present area being degraded. With the exception of the Orkneys, there is little decline and the losses are only local. Agricultural intensification has the main impact on habitat quality, whereas the construction of golf courses and (to a lesser extent) airports have effected the extent of the habitat type.

List of pressures and threats

Agriculture

Agricultural intensification
Intensive grazing

Human intrusions and disturbances

Golf course
Camping and caravans

Natural System modifications

Water abstractions from groundwater

Conservation and management

The best way to preserve this (from the point of nature conservation highly respected) habitat type is the continuation of the traditional management practices, including extensive grazing. In the UK, a Machair Habitat Action Plan has been launched to safeguard these complex habitats. So far, the machairs are still in good condition, both in quantity and quality.

List of conservation and management needs

Measures related to agriculture and open habitats

Maintaining grasslands and other open habitats

Measures related to wetland, freshwater and coastal habitats

Restoring/Improving the hydrological regime

Measures related to spatial planning

Establish protected areas/sites

Measures related to special resource use

Regulating/Management exploitation of natural resources on land

Conservation status

Annex I:

21A0: ATL U1

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

The habitat type needs continuous human intervention for maintenance and/or restoration, by safeguarding or re-introducing traditional grazing regimes and maintaining or improving the hydrological conditions.

Effort required

20 years
Through intervention

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	< 5 %	unknown %	unknown %	unknown %
EU 28+	< 5 %	unknown %	unknown %	unknown %

The values from A1 are calculated from the territorial data sheets. No data (%) available for A2a, A2b and A3.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	142950 Km ²	-	-		129	-	-		
EU 28+	142950 Km ²	-	-		129	-	-		

EOO and AOO are above thresholds for evaluating 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	22.5 %	33 %	unknown %	unknown %	unknown %	unknown %
EU 28+	22.5 %	33 %	unknown %	u %	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%

The values for C/D1 are calculated from the territorial data sheets, which we obtained from 2 countries (Ireland and UK). No data available for C/D2 and C/D3. The degradation in quality refers to both biotic features and abiotic circumstances.

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 that estimates 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	LC	DD	DD	DD	LC	LC	LC	LC	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	LC	DD	DD	DD	LC	LC	LC	LC	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
Least Concern	-	Least Concern	-

Confidence in the assessment

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

Assessors

J. Schaminée

Contributors

Habitat definition: J. Schaminée

Territorial data: S. Angus, A. Church, P. Corbett, J. Creer, T. Haynes, J. Martin, S. Rees, C. Scanlan, S. Watt

Working Group Coastal: A. Acosta, F. Bioret, H. Gardfjell, J. Janssen, J. Loidi, R. Tzonev

Reviewers

J. Rodwell

Date of assessment

18/11/2015

Date of review

27/01/2016

References

Angus, S. 2004. De tha machair ? Towards a machair definition. In: *Delivering sustainable coasts: connecting Science and Policy*. Proceedings Litoral 2004, Vol. 2, Cambridge Publications, pp. 552-558.

Bassett, A. and Curtis, T.G.F., 1985. The nature and occurrence of sand-dune machair in Ireland. *Proceedings of the Royal Irish Academy* 85B: 1-20.

Curtis, T.G.F. 1991. The flora and vegetation of sand dunes in Ireland. In: M.B. Quigley (ed.), *A Guide to the*

Sand Dunes of Ireland. European Union for Dune Conservation and Coastal management, pp. 42-46.

Rodwell, J.S. (1992, ed.). *British plant communities. Volume 3. Grasslands and montane communities*. Cambridge University Press, Cambridge.

Ritchie, W. (1976). The meaning and definition of machair. *Transactions of the Botanical Society of Edinburgh* 42: 431-440.

Ritchie, W. (1979). Machair development and chronology in the Uists and adjacent isles. *Proceedings of the Royal Society of Edinburgh* 77B: 107-122.