



Natura 2000 Seminars

Atlantic Biogeographic Region

Background Document

Summary



14 June 2012



Introduction

This document contains the summaries of the twenty habitat descriptions selected for the Atlantic Biogeographic Region as part of the Natura 2000 Seminar process which started in 2011. The information summarised in this document is based on: 1) the main findings of the Atlantic Pre-scoping Document (available on the CIRCA site) prepared by the European Topic Centre on Biodiversity (ETC CBD) in cooperation with the European Environmental Agency (EEA); 2) the results of a literature review by the consortium; and 3) the contributions of a wide range of national experts, whose thorough review we wish to acknowledge here. The full and detailed habitat descriptions are included in the Background Document. In addition to the Pre-Scoping Document, the Background Document and this Summary Document, two other essential resources for this process have been produced: 1. a document with selected Case Study Descriptions and 2. a Peer-Reviewed Literature Bibliography.

All documents referred to above are available on the CIRCA website:

http://circa.europa.eu/Public/irc/env/natura_2000/library?l=/biogeographic_atlantic&vm=detailed&sb=Title

Note: this document has been prepared for the European Commission by ECNC-European Centre for Nature Conservation (NL) and its consortium partners Arcadis Belgium (B), Aspen International (UK), Centre for Ecology and Hydrology (UK) and ILE SAS (SK) as part of contract number 07.0307/2011/60517/SER/B.3.

Authors: Dr Lawrence Jones Walters (ECNC, Editor), Dr Roger Catchpole (Aspen International), Ben Delbaere (ECNC), Dr Danny Hooftman (CEH), Manon Kaandorp (ECNC), Katrijn Loosveldt (Arcadis), Mark Sneath (ECNC), Gijs Steur (ECNC) and Amor Torre-Marin Rando (ECNC).

Contents

Coastal Habitats	4
1130 - Estuaries.....	4
1310 – <i>Salicornia</i> and other annuals colonizing mud and sand.....	7
2120 - Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes").....	10
2130 - Fixed coastal dunes with herbaceous vegetation ("grey dunes").....	13
2190 – Humid Dunes Slacks	16
Grasslands	19
1330 – Atlantic Salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)	19
6210 - Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites)	22
6230 - Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas in Continental Europe).....	25
6410 - <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>)	28
6510 - Lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>)	31
Heaths and Bogs	34
4010 - Northern Atlantic wet heaths with <i>Erica tetralix</i>	34
4030 – European Dry Heaths	38
7110 – Active Raised Bogs.....	43
7140 - Transition mires and quaking bogs.....	46
7230 – Alkaline Fens	50
Lakes and Rivers.....	53
3110 - Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>)..	53
3130 - Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i>	57
3150 - Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> - type vegetation	60
3260 - Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	63
91E0 - Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>).....	66

Coastal Habitats

1130 - Estuaries

Summary

Estuaries are partly enclosed, coastal water bodies that connect inland water bodies to the sea. They mark a transition, not only between rivers and the ocean but also between the terrestrial and aquatic environments. The influence of the terrestrial environment is not just restricted to the immediate area but typically extends along the catchments of the rivers that feed these highly complex, dynamic systems.

Estuaries are characterised by steep environmental gradients that determine the distribution of animal and plant communities. Vertical gradients from the sea to dry land lead to substantial differences in temperature and desiccation. Horizontal gradients of wave exposure, running from sheltered bays to exposed headlands, lead to substantial differences in mechanical stress and the erosion rates of substrate that determine which species can survive. Particle size gradients, created by wave action and river sediment load, create wide variation in the suitability of substrates for colonization by different species. Vertical and horizontal salinity gradients occur within the estuary itself as well as across the whole littoral zone which has had a profound evolutionary impact on species physiology within these zones.

These gradients interact with one another to create zones suitable for the development of a diverse mosaic of distinct habitats, such as intertidal mudflats and sandflats, saltmarshes and reefs. The biodiversity that this highly productive ecosystem can support, in combination with the significant threats posed by human activities, has led to their inclusion as habitats in their own right in Annex I of the Directive. However, one cannot exist without the other. Unless the natural processes that create a full range of environmental gradients are maintained within a whole-estuary context then the conservation of these constituent habitats is not possible.

Estuaries are not defined by the presence of particular species, nor are they structurally dependent upon particular species. However, they play an important role in key life cycle stages of many species listed in the annexes of the Birds and Habitats Directives which makes them critical to their continued survival.

Table 1 Number of SCIs and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States (ETC BD 2012)

	BE		DE			DK		ES				FR				IE	NL		PT			UK
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL	
number of sites	2			11	10	2	2		35		6		49		6	21	3	3		5	24	
habitat area (ha)	4196			65269	67389	1624	2090		5354		2068		84287		2287	44441	50057	900		10418	254771	

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 76-100%¹. This means that Natura 2000 network provides an important framework for the management of this habitat type (ETC BD 2012).

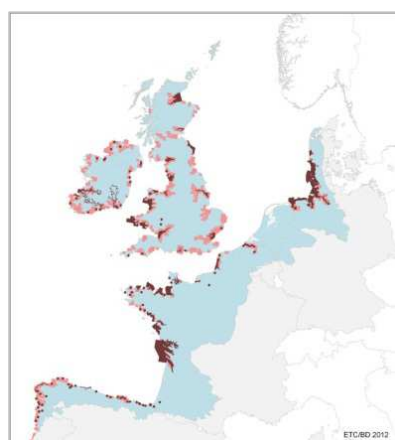


Figure 1 Map of SCIs proposed for the Estuaries & Article 17 distribution (ETC BD 2012)



Overall the **conservation status of this habitat type** in the Atlantic Region has been assessed as 'unfavourable -bad' due to structural and functional issues as well as poor future prospects. Range and area, however, have been assessed as favourable in spite of losses to port developments in some countries.

Table 2 Conservation status (CS) assessed at the Atlantic region and MS level (ETC BD 2012)

N2K code	Habitat name		BE	DE	DK	ES	FR	IE	NL	PT	UK	REGION
1130	Estuaries	range	U1	FV	FV	XX	U2	FV	U2	FV	FV	FV
		area	U2	FV	FV	XX	U2	FV	U2	FV	FV	FV
		structure	U2	U2	FV	XX	U2	XX	U2	XX	U2	U2
		future	FV	U2	XX	XX	XX	U1	U1	XX	U2	U2
		overall	U2	U2	FV	XX	U2	U1	U2	XX	U2	U2

The main reported threats and pressures to estuaries in the Atlantic Region are:

- changes in morphology, coastal development and coastal squeeze arising from the construction and operation of port and industrial installations (e.g. power stations) and the impacts of associated shipping (e.g. erosion) dike building, bank revetments;
- upstream modifications and impacts;
- declining water quality due to suspended matter, nutrient load and pollutants;
- climate change and subsidence;
- seafloor disturbance as a result of fisheries, dredging and other activities;
- fisheries including bait collecting and aquaculture;
- over-exploitation of species;
- invasive alien species;
- disturbance arising from tourism and recreation; and
- predation of coastal breeding birds.

¹ See the problems with data quality on page 16 of the Pre-scoping document dated 27.3.2012 (ETC BD 2012)

Management measures to address these threats and pressures are not straight-forward as they involve a diverse range of actors; broadly management should focus on prevention and/or reduction of: threatening activities and developments on the site themselves (such as destruction of natural habitats, overfishing and disturbance; and negative effects from outside (such as the inflow of pollutants and release of invasive alien species). In addition to these management principles there should be adequate control of process; for example, Appropriate Assessment/Environmental Impact Assessments should be required before any engineering activities are carried out in order to avoid any significant impacts to the key biodiversity features of any estuary (and the latter should also include measures for habitat compensation such as the establishment of functioning fisheries and structures with barrier effect and the creation or improvement of aquatic structures in the floodplain, etc). Ideally management plans for estuaries should be established in order to manage the complexity of interaction between human interests and activities, the biodiversity and the hydrological aspects. Such plans should provide an interface with: national legislation governing (for example) pollution, the management of industrial sites, water flow, ballast water; the Water Framework Directive and other related directives; and spatial planning (at municipal and regional level).

The complexity of estuary ecosystems provides one of the most frequently encountered **bottlenecks** in the conservation or restoration of favourable conservation status. Specifically the following factors contrive, together, to create the main problems:

- the external origin of certain pressures (e.g. inflow of contaminants in river water);
- the favourable geographical and morphological conditions of estuaries for various forms of development (ports, industry, infrastructure, agriculture, tourism, and housing);
- and the limited space available for these developments.

Solutions to the pressures, threats and bottlenecks are to be sought in the development of:

- comprehensive, integrated plans and policies, ideally at the level of water catchments (but certainly for the area of the estuary) that can integrate policy and good practice and which also consider funding, communication, research and knowledge management; and
- the establishment of effective working relationships and constructive dialogue with the key sectors involved (e.g. transport, fisheries, industry, hunting, recreation, tourism, etc).

1310 – *Salicornia* and other annuals colonizing mud and sand

Summary

Pioneer saltmarsh vegetation with *Salicornia* and other annuals colonises intertidal mud and sandflats in areas protected from strong wave action and is an important precursor to the development of more stable saltmarsh vegetation. It develops at the lower reaches of saltmarshes where the vegetation is frequently flooded by the tide and can also colonise open creek sides, depressions and pans within more developed saltmarshes. The main ecological requirements are the presence of salt water together with erosion by flooding and wind.

There is little variation in this habitat which is comprised of a small number of salt tolerant plant species and which has few vegetation subtypes; associated species with conservation status are generally mud wading birds like waders, snipe and plovers. Habitats are generally very open but plant densities can vary. The habitat does provide some ecological services as a gene pool for tolerance to salinity and historical and cultural soap production.

This form of saltmarsh vegetation is widely distributed throughout the coastal areas of the EU. In the Atlantic region it is widespread in the UK, Ireland and The Netherlands. Between 76-100% of the habitat area is included within the Natura 2000 network, making this an important framework for the management of the habitat type.

Table 3 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States

	BE		DE		DK		ES				FR				IE	NL		PT		UK	
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL
number of sites	3			8	6	7	29		26		73		59	1	21	23	12	3		8	21
habitat area (ha)	57			5061	19	2216	6214		1070		6034		15676	0	2953	1627	5261	127		3543	2255

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 76-100%. This means that Natura 2000 network provides an important framework for the management of this habitat type(ETC BD 2012).

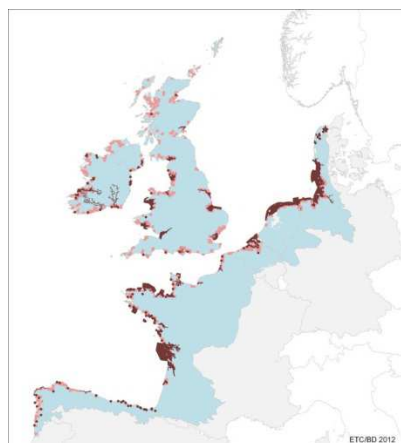


Figure 2 Map of SCIs proposed for the Salicornia and other annuals colonizing mud and sand & Article 17 distribution (for legend, see Figure 1 on page 5)

The **conservation status of this habitat type** has been assessed as unfavourable-inadequate. The available range is generally considered favourable but current human impacts on the habitats are unfavourable. In the UK and Ireland the area of this habitat type is declining, rates of 1% per year are suggested, whereas it is stable in The Netherlands.

Table 4 Conservation status (CS) assessed at the Atlantic region and MS level (for legend, see introduction of chapter 3)

N2K code	Habitat name		BE	DE	DK	ES	FR	IE	NL	PT	UK	REGION
1310	Salicornia and other annuals colonizing mud and sand	range	U2	FV	FV	XX	FV	FV	FV	FV	FV	FV
		area	U1	FV	FV	XX	U1	U1	U1	U1	U1	U1
		structure	U1	FV	XX	XX	U1	U1	FV	FV	U2	U1
		future	U1	FV	XX	XX	U1	U1	U1	FV	U2	U1
		overall	U2	FV	XX	XX	U1	U1	U1	U1	U2	U1

The main reported **threats and pressures** to *Salicornia* habitats in the Atlantic zone include:

- erosion due to sea level rise in combination with land defence structures causing a decreased range;
- land claims and coastal changes such as dike constructions which affect the range directly and indirectly through decreasing available as sediment supply; (this has been mentioned as major factor in The Netherlands, further affecting food supplies for the bird populations);
- the spread of the invasive common cord-grass, *Spartina anglica*, is seen as a foremost threat to the habitat’s structure and functioning especially in England and Ireland.

The main **management measures** to address the threats and pressures include:

- the protection within designated sites as Special Areas for Conservation and/or biodiversity action plan schemes;
- to reduce active management to a regime of non-management or only seasonal grazing by cattle;
- the control and removal of invasive cord grass *Spartina anglica*.

Bottlenecks that can be encountered in the conservation or restoration of favourable conservation status in *Salicornia* habitats are:

- the lack of resources;
- continuing human activity;
- the pace of losses due to coastal squeeze associated with sea level rise (where the creation of new saltmarshes will need to/is struggling to keep up with the losses);
- the public perception of the value of this ecosystem might not be high as it lacks clear ecosystem services (e.g. for tourism and the habitat is considered to be “dirty and smelly”).

Solutions to the pressures and bottlenecks are found through the creation of space for new intertidal areas through the removal of coastal defence banks and assuring new sediment influx. However, to re-create or restore previous habitat area requires the right combination of topography, sediments and intertidal flooding. It is estimated that approximately 100 ha of saltmarsh needs to be created annually to keep up with coastal losses.

2120 - Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes")

Summary

Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes') encompasses most of the vegetation of unstable dunes where there is active sand movement. Under these conditions sand-binding marram, *Ammophila arenaria*, is always a prominent feature of the vegetation and is usually dominant. This is a dynamic vegetation type maintained only by change. It can occur on both accreting and eroding dunes, but will rapidly change and disappear if stability is imposed. It rarely occurs in isolation because of its dynamic nature and because it is successional related to other dune habitats.

Shifting dunes are less salty than embryo dunes and are constantly replenished with fresh sand. The habitat type excludes the low, embryonic dunes where occasional exposure to saltwater flooding constrains the growth of marram and where plants of the strandline mingle with salt-tolerant, sand-binding grasses; such vegetation falls within Annex I type H2110 Embryonic shifting dunes.

Shifting dunes are characterized by a varied species composition. The most marked floristic variation relates to the degree of instability. Where sand accretion is extremely rapid it is possible to find vegetation that consists only of *A. arenaria*. As rates of sand deposition decline the marram is joined by more species, first by other specialised dune plants, then by less specialised grasses, drought-tolerant annuals and a restricted number of specialised bryophytes such as the moss *Tortula ruralis* ssp. *ruraliformis*. This moss plays an important part in completing the stabilisation of the sand surface. Towards the seaward edge of the zone of shifting dunes, salt-tolerant plants such as sea sandwort *Honckenya peploides* may be prominent, along with the sand-binding sand couch *Elytrigia juncea*. Further inland these species are rarely prominent.

Table 5 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States (ETC BD 2012)

	BE		DE			DK		ES				FR				IE	NL		PT			UK
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL	
number of sites	1			10	25	14	30		31		50		63		26	46	17	1		10	43	
habitat area (ha)	454			1445	252	2839	8006		900		4078		9011		2708	2597	4252	140		5031	1592	

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 76-100%. This means that Natura 2000 network provides an important framework for the management of this habitat type (ETC BD 2012).

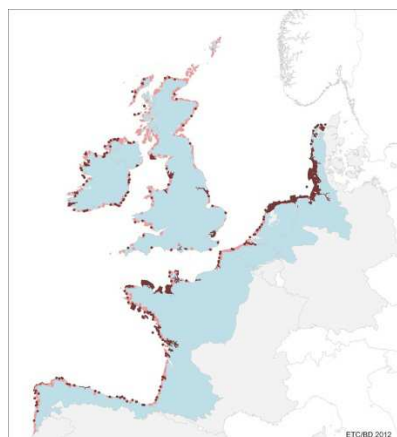


Figure 3 Map of SCIs proposed for Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes") & Article 17 distribution (ETC BD 2012) (for legend, see Figure 1 on page 5)

Overall the **conservation status of this habitat type** in the Atlantic region has been assessed as 'unfavourable-bad'. Many countries note threats from tourism related activities and from works to control coastal erosion. In several countries (including France, the Netherlands and Belgium) the area of the habitat type is regressing due to (i) the spontaneous encroachment which fixes the initially un-vegetated mobile sand dunes, (ii) relative sea level rise and (iii) a shortage of sediment.

Table 6 Conservation status (CS) assessed at the Atlantic region and MS level (ETC BD 2012) (for legend, see introduction of chapter 3)

N2K code	Habitat name		BE	DE	DK	ES	FR	IE	NL	PT	UK	REGION
2120	Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes")	range	FV	FV	FV	XX	FV	FV	FV	FV	FV	FV
		area	U1	FV	XX	XX	U1	U2	FV	U1	U1	U2
		structure	U2	FV	XX	XX	U1	U2	U1	U1	U2	U2
		future	U1	U1	XX	XX	U1	U2	FV	XX	U1	U2
		overall	U2	U1	XX	XX	U1	U2	U1	U1	U2	U2

The main reported threats and pressures to shifting dunes in the Atlantic region are:

- Sand extraction (both on shore and off shore).
- Intensive recreation (outdoor sports and leisure activities): trampling, erosion, fragmentation, sand compaction caused by (non-) motorised vehicles, walking and horse riding.
- Construction of sea defence work and coastal protection works, including afforestation, tidal barrages, sea defences.
- Fixation of the coastline and dune stabilisation (by planting marram grass, setting up reed screens, beach nourishment and building up 'stuifdijken', sand trap fences, etc).
- Intensive agriculture and built-up areas (roads and buildings) directly behind the dune area.
- Beach nourishment which uses sand that differs in chemical composition from the original sand.
- Invasive non native species (e.g. infestation by *Phomopsis juniperovora*, *Rosa rugosa*, *Senecio inaequidens*, *Populus candicans* and *Populus alba*).
- Atmospheric N-deposition; which speeds up succession and leads to the fixation of shifting dunes.
- Increase of spontaneous colonization and fixation of 'white dunes' by *Ammophila arenaria* and *Hippophaë rhamnoides*, probably caused by climate change (increased precipitation, mild winters) and atmospheric nitrogen deposition.

Most of the threats lead to fixation of the white dunes. The typical species, marram grass, is dependent on a constant aeolian supply of fresh sand. If the supply stops, the species will decrease and succession will proceed towards grey dune (2130).

The most important **management measure** in this habitat type is to stop fixing the sand by using artificial structures and to simulate the drifting of sand where it has become too much stabilized in the past. The replenishments will stimulate the growth of embryonic dunes which can change to shifting dunes by natural succession. When shifting dunes become dynamic again this will help them to recover from (too much) nitrogen deposition, which can cause a rapid succession to shrubs. Other relevant management measures to address the threats and pressures are:

- Removal of exotic invasive species.
- Control of public access (construction of walkways through dunes, information boards, fence off dunes, etc).
- Grazing by large herbivores can create rather small scale bare sand patches and, under aeolian influence, blowouts.
- Encouraging the use of soft protection measures over hard coastal protection works.
- A new development in the Netherlands is the 'sand engine' concept (beach nourishment) which may result in a more or less natural advection of fresh blown sand.(pilot project – started in 2011).

The most frequently encountered **bottlenecks** in the conservation or restoration of favourable conservation status for this habitat are that with marram (mobile) dunes there is a public perception that moving sand is bad and needs to be prevented. Climate change and the fear of flooding from sea level rise can cause panic among the public whenever there is any erosion at the coast and authorities come under pressure to 'fix' the 'problem' urgently. This has led to an increase in the number of schemes for coastal protection works and dune stabilisation measures being carried out. This has resulted in a number of inappropriate works being carried out and has led to over-stabilisation of some dune systems. Lack of resources (time and funds) has limited the removal of invasive species such as sea.

Solutions to the pressures, threats and bottlenecks may include:

- Awareness raising, communication, influencing policies (e.g. to stop planting of invasive aliens in or near dune sites, etc)
- Experiments of re-mobilisation of the dunes on small as well as large scale with the necessary attention for debris and root material.
- In the long run: extended use of natural processes to ensure coastal safety under a scenario of sea-level rise.

2130 - Fixed coastal dunes with herbaceous vegetation ("grey dunes")

Summary

Fixed and semi-fixed dunes are generally stable and colonised, at first, by herb-rich and, in later successional stages, by more or less closed perennial grasslands and abundant carpets of lichens and mosses. The content of lime (Ca²⁺) may vary greatly, generally diminishing with age and succession. Fixed dunes develop as part of a succession from mobile dunes; the decaying tussocks of *Ammophila arenaria* (marram grass), *Calamophila x baltica* (hybrid marram) and *Leymus arenarius* (lyme-grass) provide a substantial source of nitrogen in the early stages of grey dune development.

Fixed dune landscapes are usually characterised by undulating dune forms giving many variations of aspect, slope and micro-climate. On most sites there will be differences in the plant communities between north and south facing slopes, some species being generally confined to specific zones; for example *Corynephorus canescens* (grey hair-grass) on south facing slopes and *Empetrum nigrum* (crowberry) and *Polypodium vulgare* (common polypody) on north facing slopes.

Soil humidity is a main determining factor in germination and seedling establishment, biomass production, and soil development. Groundwater exceeding a depth of about 2 m under the soil surface is not accessible to most grassland plants. The organic matter content, calcium content and sand-grain size are the main factors determining the capacity of the sand to retain water and these factors vary considerably across Europe. Stabilised dune soils decalcify due to continuous carbonate leaching. Nitrogen and phosphorus are key elements and partly co-limiting in the nutrient dynamics of grey dunes.

This habitat type is a main component of the extensive dune systems along the exposed Atlantic coasts of Portugal and France and also from north France to Denmark and much of the southern Baltic Sea. Grey dunes are found in almost all dune systems in the Atlantic region.

Table 7 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States (ETC BD 2012)

	BE		DE			DK		ES				FR				IE	NL	PT			UK
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL
number of sites	1			10	29	19	43		31	12	10		65			43	20	1	1	11	45
habitat area (ha)	681			3727	664	4750	12152		1741	647	1290		11396			7082	15224	280	4	11859	9935

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 76-100%. This means that Natura 2000 network provides an important framework for the management of this habitat type (ETC BD 2012).

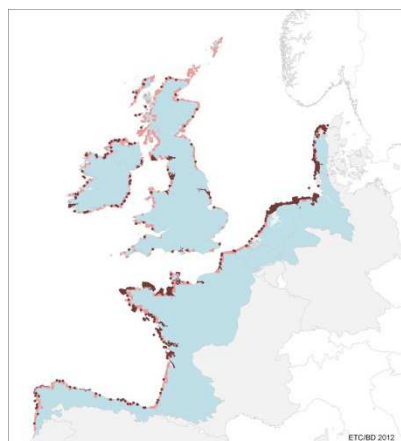


Figure 4 Map of SCIs proposed for the Fixed coastal dunes with herbaceous vegetation ("grey dunes") & Article 17 distribution (ETC BD 2012) (for legend, see Figure 1 on page 5)

Except for Atlantic Germany which has reported the status as 'favourable', the overall the **conservation status of this habitat** type in the Atlantic region has been assessed as 'unfavourable-bad'.

Table 8 Conservation status (CS) assessed at the Atlantic region and MS level (ETC BD 2012) (for legend, see start of chapter 3)

N2K code	Habitat name		BE	DE	DK	ES	FR	IE	NL	PT	UK	REGION
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	range	FV	FV	FV	XX	U2	FV	FV	FV	FV	U1
		area	U2	FV	FV	XX	U2	U1	U1	U1	FV	U1
		structure	U2	FV	U1	XX	U1	U2	U2	U1	U2	U2
		future	FV	FV	U1	XX	U1	U2	U2	U1	U2	U2
		overall	U2	FV	U1	XX	U2	U2	U2	U1	U2	U2

The main reported threats and pressures to fixed coastal dunes ("grey dunes") are:

- Decreased grazing pressure and loss of traditional grazing management (undergrazing) practices which leads to: (1) succession to scrub development and dune woodland, (2) over-stabilisation of the dunes and loss of bare sand patches, (3) loss of heterogeneity at local and landscape level and (4) loss of species diversity, especially of typical dune species.
- Intensification of grazing (overgrazing) by horses and cattle, with feeding supplementation and indirect/direct manuring, especially in transition areas between dunes and polders.
- The impact of nitrogen deposition which leads to: (1) further grass and moss encroachment, (2) spread of ruderal species and (3) loss of calciphilous species in dry dunes.
- The consequences of coast erosion: fixed, and especially semi-fixed dune habitats become squeezed between advancing mobile dunes and dune scrub, and often built or other human related development on the back dunes.
- The direct and indirect impact of human activities: (1) coast protection and dune stabilization, (2) urbanisation and infrastructure development, (3) land uses including golf courses and military training areas, (4) tree plantations (of pines, Eucalyptus and Acacia), (5) invasion of non-indigenous trees, shrubs, vascular plants and mosses in open dune areas, (6) introduction of large numbers of exotic species arising as escapes from gardens, (7) off-road driving, (8) rubbish dumping and (9) impact of recreation pressure (including dogs).

- Climate change effects: (1) increased aridity and prolonged growing season could influence dune vegetation and soil, (2) favour the establishment of exotic species and (3) increase erosion of dune systems by an increase in sea level.

The principal **management measures** for this habitat include:

- Extensive year-round grazing by large herbivores (optionally combined with cautious removal of scrub and litter).
- Sod-cutting of the tall grasses (also referred to as turf-cutting or turf-stripping).
- Mechanical removal of the scrub.
- Soil reversal (deep ploughing and turning over the soil).
- Removal of invasive species and plantations of non-native woodlands.
- Mowing of dune grasslands with removal of the mowed material (management measure used in Belgium and Denmark).
- Control of public access (construction of walkways through dunes, fence off dunes, information boards, etc).

The most frequently encountered **bottlenecks** in the conservation or restoration of favourable conservation status for this habitat are:

- Non-cooperating owners or other stakeholders.
- Lack of knowledge about efficient ways of controlling invasive alien species.
- Dislike of the public for deforestation.
- Lack of awareness of the public.
- Lack of cooperation from the local authorities.
- Species return is limited due to dispersal problems.
- Insufficient funds.
- Large number of people leaving farming leading to site abandonment (removal of grazing stock).

Solutions to the pressures, threats and bottlenecks:

- Purchase of land by nature conservation agencies or NGOs.
- Awareness raising, purchase of land, influencing policies (e.g. to stop planting of invasive alien species in or near dune sites).
- Improved enforcement of planning regulations and wildlife legislation.

2190 – Humid Dunes Slacks

Humid dune slacks represent the wetland component of dune systems, usually where the underlying water table reaches the surface. There are two main types, distinguished on the basis of their geomorphological history. Primary dune slacks run parallel to a dune coastline and are formed when a developing sand ridge cuts off a portion of beach. Secondary dune slacks are formed by wind eroded depressions in the dune system or in eroding systems by the landward movement of dune ridges over stable wet sand at the water table.

Dune slacks appear as flat valleys in the dune system, usually rich in species and associated with other wetland habitats. European vegetation classifications recognise a succession of slack types from bare damp sand to wet slacks dominated by trees and shrubs. The characteristic species of slacks are forms of dwarf willow, most commonly creeping willow. A number of rare species are associated with dune slacks including the fen orchid, petalwort (a bryophyte) and the natterjack toad.

In general, sand is initially calcareous (from the input of shelly material) and the groundwater is more or less base-rich. Low nutrient levels deter the establishment of competitors and lead to high species diversity. Slack features may be maintained at least partly by disturbances, including fluctuations in the water table, blown sand, the effects of nutrient limitation and grazing. Vegetation development is strongly associated with the average depth and seasonal fluctuation of the water table, the water-holding properties of the sand, the water flow and the water chemistry.

Table 9 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States (ETC BD 2012)

	BE		DE			DK		ES				FR				IE	NL		PT			UK
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL	
number of sites	1			6	14	17	25				19		52		1	15	18	1		6	33	
habitat area (ha)	38			514	136	4512	7920				1534		5431		1137	648	1987	0		4109	1276	

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 76-100%. This means that Natura 2000 network provides an important framework for the management of this habitat type (ETC BD 2012).

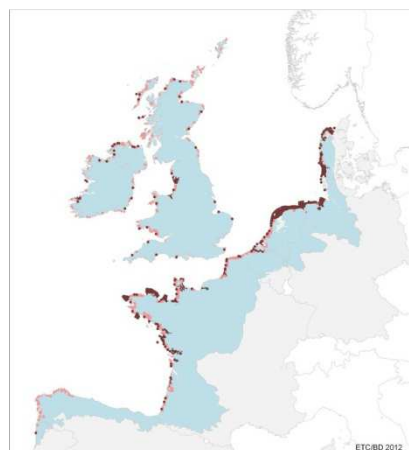


Figure 5 Map of SCIs proposed for the Human dune slacks & Article 17 distribution (ETC BD 2012) (for legend, see Figure 1 on page 5)

Overall the **conservation status of this habitat type** in the Atlantic region has been assessed as ‘unfavourable-bad’ due to human impact, including drainage and tourism. Range however has been assessed as favourable.

Table 10 Conservation status (CS) assessed at the Atlantic region and MS level (ETC BD 2012) (for legend, see introduction of chapter 3)

N2K code	Habitat name		BE	DE	DK	ES	FR	IE	NL	PT	UK	REGION
2190	Humid dune slacks	range	FV	FV	FV	XX	FV	FV	FV	XX	FV	FV
		area	U2	FV	U1	XX	U2	U1	U1	U1	U1	U2
		structure	U2	U1	U1	XX	U1	U1	U1	U2	U2	U2
		future	FV	U1	U1	XX	U1	U2	FV	U1	U2	U2
		overall	U2	U1	U1	XX	U2	U2	U1	U2	U2	U2

The main reported threats and pressures to humid dune slacks in the Atlantic region are:

- Water over-abstraction and drainage leading to salt water infiltration under the dune aquifer and lowering of phreatic groundwater level with desiccation of dune slacks as consequence.
- Lack of natural dynamics: the fixation of dunes by planting *Ammophila arenaria*, scrub and trees has reduced dune mobility and, as a consequence, the formation of secondary slacks.
- Atmospheric nitrogen deposition: the growth of most pioneer species is limited by nitrogen.
- Afforestation: an indirect effect by drawing down the overall water table.
- Under-grazing: leads to the development of coarse grasses, scrub and woodland.
- Over-grazing.
- Shoreline management (sea defences, shoreline management and harbour management activities): limits the opportunities for the spontaneous formation of new primary slack features.
- Encroachment with scrub, especially *Hippophaë rhamnoides* and *Salix cinerea*, *Salix alba* and tall grasses (*Calamagrostis epigejos*).
- Recreation (eg. golf course developments).
- Proximity of/isolation due to urbanised areas leading to: (1) deficit of infiltration by precipitation water caused by the built up and paved surfaces; and (2) permanent drainage of the precipitation and groundwater.
- Climate change effects.

The principal **management measures** for this habitat include:

- Mechanical removal of scrub and tall grasses, including the litter layer and the soil layer that is enriched with organic material, leaving the mineral substrate bare.
- Mowing: prevents grasses, *Salix repens* and tree species from dominating.
- Extensive grazing with herbivores (such as cattle, horses and sheep).
- Sod-cutting to restore the slack to an earlier stage of succession.
- Re-wetting via changes/interventions to the hydrological regime.
- Restoration and creation of dune slacks:

- Removal of obsolete infrastructures and buildings to increase the infiltration surface for precipitation water.
- Reducing the draining of groundwater from building pits by imposing re-infiltration of the pumped up groundwater to a nearby dune site or imposing hydrological isolation of the building pit
- Further reduction of the abstraction of (natural) groundwater from the phreatic aquifer of the dunes by increasing alternative water supply.
- Removal of artificially planted forest
- Construction of walkways through dunes, fence off dunes, Information boards etc.

The most frequently encountered **bottlenecks** in the conservation or restoration of favourable conservation status for this habitat are:

- Lack of willingness to demolish infrastructure and buildings.
- Economic feasibility and lack of resources.
- Non-cooperation of private owners.
- Public resistance to deforestation (often because of a lack of awareness).
- In cases where the dune sites are privately owned, non-cooperation of private owners.
- Lack of knowledge, particularly at the level of an individual site.

Solutions to the pressures, threats and bottlenecks are to be sought in the development of:

- Awareness raising, communication, influencing policies of licensing authorities.
- Stakeholder participation.
- Experiments in relation to the re-mobilisation of the dunes.
- Purchase of privately owned dune sites by nature conservation agencies or NGOs to provide the required management.
- Influencing planning policy towards an integrated, strategic approach.

Grasslands

1330 – Atlantic Salt meadows (*Glauco-Puccinellietalia maritimae*)

Summary

Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) are widespread along the coasts of Western Europe, occurring in tidal estuaries and behind barrier islands as well as on open coast and in lagoons. The habitat depends strongly on tidal cycles, sediment transport and sedimentation and on the establishment of salt tolerant plants. The balance between erosion and accretion, which can be very local, plays a specific role in defining the extent of the habitat. Salt meadows are characterized by salt tolerant vascular species, mostly in successional zones of differentiating salt tolerance.

This habitat type is highly variable hosting a large plant and animal diversity occurring in different successional phases, ranging between pioneer marshes to habitat containing tree species on the upper tidal limits. There is also a North-South European gradient in accompanying plant communities caused by different grazing regimes. In general, the vegetation is sensitive to changes in grazing, which could have knock-on effects for other species. Hence species dependent management prescriptions can be very specific based on country and tidal zone. Many vegetation subtypes are described depending on the location on the tidal range as well as location inside or outside dikes. Associated species with conservation status include a wide range of migratory birds that use the salt meadows as feeding and breeding sites, as well as several toad species and specialized invertebrates. There is a range of ecological services associated with this habitat type that include its use as sea and flood defence, the provisioning of grazing habitat, as well as fish and shellfish collection. The habitat functions as a sink for pollutants and is therefore important for water quality improvement. Salt marshes also have a high scientific, landscape, recreational and cultural value.

This habitat is present in all member states of the Atlantic region, with exception of Belgium where it is rare. In the Atlantic region, this habitat type is widespread with between 76-100% of the habitat area included in the Natura 2000 network, making this an important framework for the management of the habitat type.

Table 11 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States (ETC BD 2012)

	BE		DE			DK		ES				FR				IE	IIL		PT		UK
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL
number of sites	3			14	27	11	57		41				61			39	12	3		2	48
habitat area (ha)	353			16511	3756	12541	18009		2110				25360			3303	9181	309		103	24036

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 76-100%. This means that Natura 2000 network provides an important framework for the management of this habitat type(ETC BD 2012).

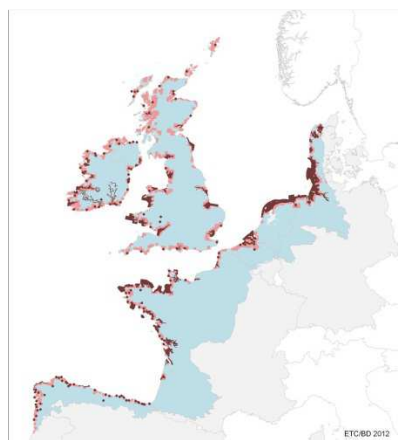


Figure 6 Map of SCIs proposed for the Atlantic salt meadows & Article 17 distribution (ETC BD 2012) (for legend, see Figure 1 on page 5)

The **conservation status of this habitat type** in the Atlantic has been assessed as ‘unfavourable-bad’. The reasons for this negative status include changed coastal dynamics, agricultural activities and human impacts. The trends for this habitat are negative due to abandonment of intensity grazing, and the enclosure and reclaiming of salt meadows, especially in The Netherlands, France and the UK.

Table 12 Conservation status (CS) assessed at the Atlantic region and MS level (ETC BD 2012)

N2K code	Habitat name		BE	DE	DK	ES	FR	IE	NL	PT	UK	REGION
1330	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)	range	U1	FV	FV	XX	FV	FV	FV	FV	FV	FV
		area	U1	FV	FV	XX	FV	U1	FV	U1	U1	U1
		structure	U2	U1	U2	XX	U1	U1	U1	U1	U2	U1
		future	U1	U1	XX	XX	U1	U1	U1	XX	U2	U1
		overall	U2	U1	U2	XX	U1	U1	U1	U1	U2	U1

The exact pressures differ among member states: land claim, erosion and grazing are most important in the UK, Ireland and The Netherlands; additionally eutrophication and pollution are important in Germany and Denmark. The main **threats and pressures** to salt meadows in the Atlantic region include:

- changes in the grazing regime, which could have knock-on effects towards bird populations;
- since the habitats are maintained by a balance between erosion and accretion by sediment, they are threatened by changes in these dynamics, especially loss of sediment transport and coastal squeeze through building embankments and enclosure of the salt meadows.

Because of the different threats **management measures** and activities are partly member state specific, but include:

- active management: changing the grazing pressure depending on the sub type ranging from heavily grazed to completely ungrazed (grazing could also be used as management tool for creating more diversity);

- management of invasive species such as *Spartina*
- control of the impact of predation on bird populations;
- the promotion of salt marsh accretion through plantings or building groynes (in order to prevent the loss of salt meadows and/or to restore them);
- erosion control through the creation of wave breaks and increasing available sediments;
- reintegration with the sea of former tidal land which is now enclosed.

The **bottlenecks** that are encountered in conservation and restoration of favourable conservation status in salt meadows are mainly:

- lack of resources;
- ongoing human activities;
- public perception of the value of this ecosystem is often low because they perceive it as “smelly and dirty”;
- since the habitat is often divided over many owners it is seen as difficult to agree on common management activities.

Solutions for the pressures and bottlenecks are found in:

- better education;
- good and early planning of management activities as well as improved enforcement of these activities;
- raising public awareness and improved communication about this habitat.

6210 - Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)

Summary

Semi-natural dry grasslands and scrub on calcareous substrates occur on thin, well-drained, infertile lime-rich soils that have developed from a variety of limestone bedrocks. The habitat is one of the most species-rich plant communities in Europe and is characterised by a wide variety of grasses and herbs, in which there is at least a moderate representation of calcicolous species. Some species are associated with tall-growing vegetation, others with woodland fringes and gaps; other species are more typical of open grassland with both tall and short vegetation. The habitat has two important sub-types defined by the water supply. One is steppic or subcontinental, the other oceanic or sub-Mediterranean. The latter is semi-natural and is often characterised by a rich orchid flora. Abandonment results in the development of scrub. Variation within the habitat vegetation is also significantly related to human activities.

Table 13 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States (ETC BD 2012)

	BE		DE			DK		ES				FR				IE	NL		PT		UK
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL
number of sites	16	64	22	20	891	16	85	53	86		114	76	161	192	93	36	5			12	82
habitat area (ha)	128	1052	2313	297	27969	2227	6531	24503	46563		55301	27951	32011	31526	40808	3581	87			10837	33509

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 51-75%. This means that Natura 2000 network provides an important framework for the management of this habitat type (ETC BD 2012).

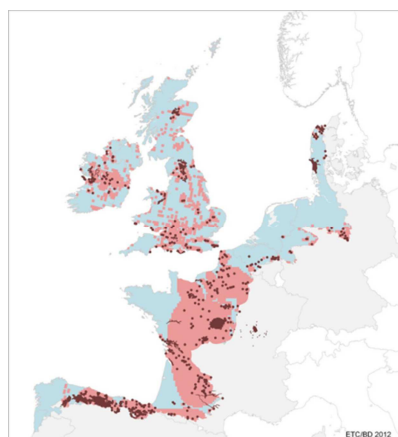


Figure 7 Map of SCIs proposed for the Semi-natural dry calcareous grasslands & Article 17 distribution (for legend, see Figure 1 on page 5)

Overall the **conservation status of this habitat type** in the Atlantic Region has been assessed as 'unfavourable-bad' for all parameters except 'range' are 'unfavourable-bad'. Semi-natural dry grasslands were once widespread in Europe, but are now a scarce and threatened habitat which in recent past decades has been pushed back into isolated residual areas. The pressure on grassland habitats is steadily increasing, mainly due to the abandonment of use or changes in use. The remaining areas have become extremely fragmented, mostly confined to calcareous outcrops or steep slopes.

The main reported threats and pressures to semi-natural dry grasslands are therefore:

- unregulated grazing: overgrazing, under grazing;
- abandonment;
- invasive species: weeds, alien species;
- eutrophication/fertilization, also airborne nitrogen deposition;
- land-use change;
- human activities: mining, quarrying, roads, housing, landfill, recreation;
- fires;
- the encroachment of scrub and trees;
- climate change;
- damage caused by game (excess population density);
- active afforestation;
- fragmentation.

The principal **management measures** for this habitat include:

- grazing and/or mowing (carefully established types and levels);
- prohibition of: the use of fertilisers, harmful human activities, irrigation, ploughing, afforestation, and the introduction of alien species;
- the regular disturbance of the growing substrate in order to keep the habitat at the pioneer stage through: physical soil disturbance, using controlled fires, controlled cutting or chemical treatment;
- deforestation (including the removal of bushes, scrub, trees);
- restricting public access to less sensitive areas;
- habitat restoration;
- the prevention or limitation of agricultural improvement through legislative and incentive measures;
- national/international policy advocacy to seek to reduce impacts from atmospheric nitrogen deposition and climate change;
- control of deer numbers;
- the clearance of invasive or non-native species by cutting or chemical treatments;
- increasing the connectivity between sites through habitat restoration and creation.

The most frequently encountered **bottlenecks** in the conservation or restoration of favourable conservation status for this habitat are:

- insufficient funding/incentives;
- insufficient capability and capacity of key nature conservation organisations to provide adequate management and protection;
- ineffective domestic EIA legislation;
- perverse incentives/markets and an unfavourable livestock policy framework;
- lack of public appreciation of the importance/value of species-rich grassland for society;
- a lack of cooperation and/or awareness of owners/land managers.
- appropriate grazing levels may be difficult to achieve in a mosaic of vegetation types;
- lack of effective pollution control regulations, including in relation to airborne depositions;
- a lack of knowledge and guidance for foresters (e.g. In order that they can plan afforestation without damaging high-value grasslands);
- a lack of effective long-term mechanisms for funding habitat restoration and creation (e.g. to reduce habitat fragmentation);
- a lack of effective mechanisms for preventing fertiliser inputs to non-statutory sites;
- a failure to enforce legislation and cross-compliance measures;
- a lack of access to funding for invasive species eradication/control.

Solutions to the pressures, threats and bottlenecks may include:

- further statutory designations of sites under domestic legislation;
- strengthening of EIA (agriculture) regulations;
- ensuring an appropriate level of funding *via* ERDP for agri-environment schemes;
- policy advocacy in relation to atmospheric pollution, climate change and livestock;
- awareness raising, education and community engagement;
- the provision of advice and guidance for land managers through appropriate communication media;
- agri-environment funding to support appropriate management;
- prioritising the requirements of the different habitats in rotation over several years;
- the development of effective policies and regulations in relation to deer control.

6230 - Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and submountain areas in Continental Europe)

Summary

Species-rich *Nardus* grasslands generally occur on oligotrophic siliceous substrates in hill and mountain areas and can be closed, dry and/or mesophile. *Nardus* grasslands can be in contact with a relatively high variety of habitats at different gradients. The vegetation present on sites varies but is characteristically continuous. The habitat occurs in almost all the EU member states and in spite of the fact that some types of *Nardus* grasslands can be considered as climax vegetation which do not require active ongoing management, the long-term existence of the habitat is in general closely associated with pastoral traditions and with extensive agriculture.

Table 14 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States.

	BE		DE			DK		ES				FR				IE	NL	PT			UK
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL
number of sites	13	49	11	66	559	31	102	6	45		33	44	46	69	19	10	24	2		6	49
habitat area (ha)	117	825	122	435	7752	3330	8519	4227	17565		15178	24661	8390	7530	7748	731	1329	978		1175	4651

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 76-100%. This means that Natura 2000 network provides an important framework for the management of this habitat type. (ETC BD 2012).

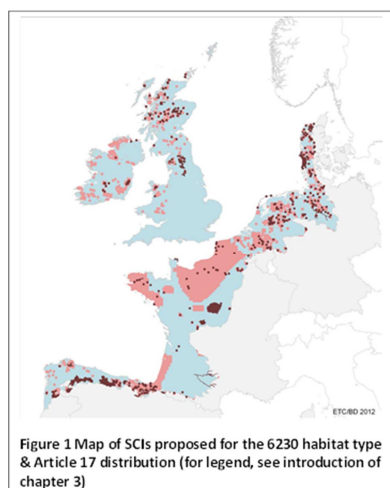


Figure 8 Map of SCIs proposed for the 6230 habitat type & Article 17 distribution (for legend, see Figure 1 on page 5)

Overall the **conservation status of this habitat type** in the Atlantic Region has been assessed as either 'unfavourable-inadequate' or 'unfavourable-bad' across all countries. The pressure on grassland habitats is steadily increasing, mainly due to the abandonment of use or changes in use and the remaining areas have become fragmented.

Table 4 Conservation status (CS) assessed at the Atlantic region and MS level (ETC BD 2012) (for legend, see introduction of chapter 3)

N2K code	Habitat name		BE	DE	DK	ES	FR	IE	NL	PT	UK	REGION
6230	Species-rich <i>Nardus</i> grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	range	U1	XX	FV	XX	U1	FV	U1	FV	FV	U1
		area	U2	U1	XX	XX	U2	U2	U2	U1	FV	U2
		structure	U2	U2	U2	XX	U1	U2	U2	U1	U2	U2
		future	U1	U2	U2	XX	U2	U2	U2	XX	U2	U2
		overall	U2	U2	U2	XX	U2	U2	U2	U1	U2	U2

The main reported threats and pressures to species rich *Nardus* grasslands are therefore:

- Fertilization/Eutrophication: Land conversion from historical extensive farming to more productive grasslands during the 20th century’s intensification of agriculture.
- Input from outside the habitat and lowering of the water table (and the consequent mineralization associated with these changes).
- Abandonment: a substantial area of the sites occur in remote mountainous areas.
- The natural succession of vegetation, and the invasion of scrub and forest species, that often follows after abandonment.
- Active afforestation.
- Inappropriate grazing practices: *Nardus* grasslands are usually highly dependent on regular grazing.
- Tourism pressure: high-altitude mountain areas are highly attractive tourist destinations both in summer and winter.
- Acidification.
- Damage by excess population densities of game.

The principal **management measures** for this habitat include:

- The minimum viable area of habitat should be set at greater than 0.5 ha.
- Avoidance of disturbance.
- The surrounding environment should be monitored and controlled in relation to possible impacting measures; e.g. wastes, use of salt on roads during winter, grazing improvement measures, introduction of selected species, stocking loads.
- Actions that affect the water table, certain fertilizations should be prohibited.
- Cooperation of stakeholders in the management of the grasslands should be actively pursued and encouraged.
- Research into the ecological dynamics of these grasslands should be pursued.
- The public value of these grasslands should be the subject of active promotion campaigns.
- Resumption of traditional farming (e.g. grazing of the grasslands).

The most frequently encountered **bottlenecks** in the conservation or restoration of favourable conservation status for this habitat are:

- Historical/traditional agricultural management is nowadays too costly.

- Remaining intact habitat is often small and isolated (fragmented).
- There is often a lack of cooperation from owners/land managers.
- Lack of effective pollution control regulations.
- There is a lack of knowledge and guidance needed to help foresters to avoid damaging the habitat.

Solutions to the pressures, threats and bottlenecks may include:

- Remove nutrients from the system where necessary (and if possible).
- Communication and guidance for land managers.
- Develop or encourage the use of agri-environmental funding.
- Prioritize the requirement of the different habitats in rotation over several years.
- Effective policies and regulations in relation to deer control.
- Effective pollution control regulations.

6410 - *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)

Summary

Molinia meadows on calcareous, peaty or clayey-silt-laden soils occur on plain to montane levels, on more or less wet oligotrophic and slightly acidic to base-neutral soils. Buffering of the pH is caused by the influence of base-rich ground and or surface water. During winter the water table is at the surface, during the summer it falls to a few centimetres below. These meadows can stem from either extensive, traditional agricultural management, sometimes with a cut late in the year, or they correspond to a deteriorated stage of draining peat bogs. Such grasslands can be found in proximity to (often in direct physical contact with) the *Nardetalia* community or *Cnidion dubii* alliances.

Table 15 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States (ETC BD 2012)

	BE		DE			DK		ES				FR				IE	NL		PT			UK
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL	
number of sites	12	55	21	50	687	31	68	24	6		49	36	122	143	23	18	21	2		14		43
habitat area (ha)	133	2212	432	171	7678	3337	6904	1821	304		18538	5055	12446	12304	3049	3074	364	942		2205		2039

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 51-76%. This means that Natura 2000 network provides an important framework for the management of this habitat type (ETC BD 2012).

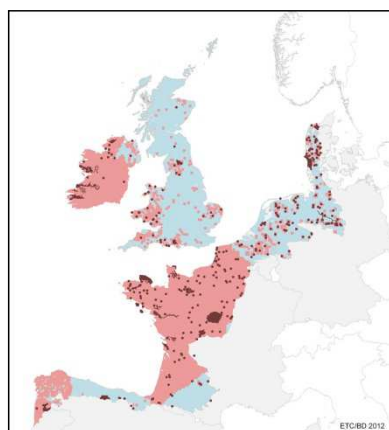


Figure 9 Map of SCIs proposed for the 6410 habitat type & Article 17 distribution (for legend, see Figure 1 on page 5)

Overall the **conservation status of this habitat type** in the Atlantic Region has been assessed as ‘unfavourable-bad’ in all the countries of the Atlantic biogeographic region with the exception of Portugal where this habitat has been assessed as ‘favourable’. The area of the habitat has been found to have suffered a dramatic decreased in the 19th century in most countries because agricultural intensification. Whilst some countries have introduced restoration programmes it is only in the U.K. that the range seems to be stable.

Table 4 Conservation status (CS) assessed at the Atlantic region and MS level (ETC BD 2012) (for legend, see introduction of chapter 3)

(ETC BD 2012)N2K code	Habitat name		BE	DE	DK	ES	FR	IE	NL	PT	UK	REGION
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caeruleae</i>)	range	U2	XX	FV	XX	FV	FV	U1	FV	FV	FV
		area	U2	U2	FV	XX	U2	U2	U2	FV	U2	U2
		structure	U2	U2	U2	XX	XX	U2	U2	XX	U2	U2
		future	U2	U2	U1	XX	U2	U2	U1	FV	U1	U2
		overall	U2	U2	U2	XX	U2	U2	U2	FV	U2	U2

The main reported threats and pressures to *Molinia* Meadows on calcareous, peaty or clayey silt laden soils are therefore:

- Lowering of the water table: inducing drought during summer.
- Eutrophication/fertilization also atmospheric nutrient deposition
- Land use change toward more productive grasslands (linked to the abandonment of pastoral systems).
- Active afforestation.
- Stock Density: too few or to intense grazing.
- The natural succession of scrub and woodland due to a lack of management or abandonment.
- Water quality: input of nutrient and of pH rich water.
- Invasive species.
- Too frequent burning.
- Fragmentation.
- Acidification.

The principal **management measures** for this habitat include:

- (Late) cutting and removal of the hay; which can be two or three times per year; mowing from the ‘inside out’; leaving strips intact; avoidance of using heavy equipment; the possible introduction of grazing where appropriate.
- Prohibition of drainage or other modifications to the water table, with special attention to dry summers.
- Enhancing the quality and extent of agricultural wastewater treatment, urban and industrial.
- Conditioning of grazing.
- Conservation of marshland associated with this habitat.
- Restoration of the original water table: close side-ditches.
- Creation of buffering unfertilised strips when adjacent to intensively managed cropland or pastureland.
- Liming or PK-Fertilization.
- Sod/turf cutting.
- Ensuring the maintenance or restoration of appropriate livestock grazing regimes and scrub management.

- Prevent/limit agricultural improvement through legislative and incentive measures.
- National/international policy advocacy to seek to reduce impacts from atmospheric N deposition, diffuse pollution and climate change.

The most frequently encountered **bottlenecks** in the conservation or restoration of favourable conservation status for this habitat are:

- The remaining areas are highly fragmented.
- Insufficient funding/incentives, including insufficient capacity/capability of key nature conservation organisations.
- Land ownership.
- External impact of changed water management on large areas outside Natura 2000-site.
- Ineffective domestic EIA legislation for uncultivated/semi-natural habitats.
- Perverse incentives/markets and an unfavourable livestock policy framework.
- Lack of public appreciation of the importance/value of species-rich grassland for society.
- Global economics affect the profitability of rough grazing on low productivity habitat.
- Loss of appropriate hardy stock and experience to manage them.
- Lack of effective long-term mechanisms for funding habitat restoration to reduce habitat fragmentation.
- Changing rain patterns under climate change scenarios.

Solutions to the pressures, threats and bottlenecks may include:

- Development/restoration of habitat on areas with remaining Molinion grasses (removing nutrients from the system, raising the water table, deforestation) close or adjacent to existing sites with the habitat type.
- Restoration of fallow stages.
- Ensure appropriate level of funding via ERDP for agri-environment schemes/funding to help make low-intensity stock rearing sustainable.
- Awareness raising, education and community engagement.
- Further statutory designations of sites under domestic legislation.
- Strengthen EIA (Agriculture) Regulations.
- Policy advocacy in relation to atmospheric and diffuse pollution, climate change, livestock and water resource/catchment management (e.g. using the Water Framework Directive – WFD)
- Setting up/making use of local grazing animals partnerships to provide expertise and also to match appropriate stock to sites.
- Increased funding support for conservation bodies to enable effective grazing management.

6510 - Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)

Summary

Lowland hay meadows are usually species-rich hay meadows on lightly to moderately fertilised soils on the plain to submontane levels, belonging to the *Arrhenatherion* and the *Brachypodio-Centaureion nemoralis* alliances. These extensive grasslands are rich in flowers and they are usually cut once or twice a per year. Wet to dry sub-types occur. If the management practices become intensive with heavy applications of fertiliser, the species diversity rapidly declines.

Lowland hay meadows are characterised by the dominance of the tall grasses, usually on eutrophic, clayey soils. The habitat occurs in different site conditions (therefore it is quite variable), mainly on river forelands and floodplains. Lower areas are known to be more or less regularly flooded. Lowland hay meadows are very rich in flowering plants and thus support a wide range of other species, including species of conservation concern. This habitat is wide spread in central and northern Europe, also occurring, but more rarely, in the Mediterranean region. According to the Netherlands the following sub-types of 6510 occur:

- A: Alliance *Arrhenatherion elatioris*, on the higher parts (of river forelands, etc.)
- B: Alliance *Alopecurion pratensis*, on the lower parts, exposed to flooding.

Table 16 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States (ETC BD 2012)

	BE		DE			DK		ES				FR				IE	NL	PT			UK
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL
number of sites	36	95	11	111	1586			47	69		80	14	123	163	40	10	11	3		10	5
habitat area (ha)	1726	6383	240	4619	78257			8941	19561		29957	1857	40895	35183	21635	940	606	2336		5655	672

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 76-100%. This means that Natura 2000 network provides an important framework for the management of this habitat type (ETC BD 2012).

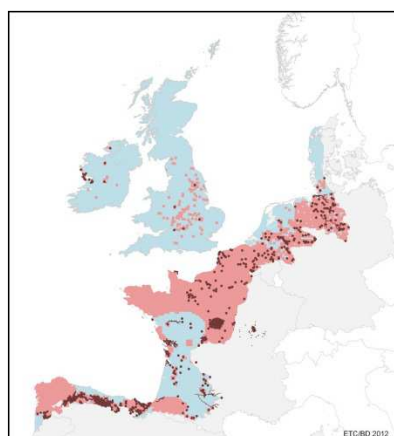


Figure 10 Map of SCIs proposed for the habitat 6510 & Article 17 distribution (for legend, see Figure 1 on page 5)

Overall the **conservation status of this habitat type** in the Atlantic Region has been assessed as 'unfavourable -bad' due to structural issues, missing information about range and area in some countries, and “unfavourable – inadequate” future prospects. Only the range was assessed by some countries as “favourable”.

Table 4 Conservation status (CS) assessed at the Atlantic region and MS level (ETC BD 2012) (for legend, see introduction of chapter 3)

N2K code	Habitat name		BE	DE	ES	FR	IE	NL	PT	UK	REGION
6510	Lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>)	range	FV	XX	XX	U1	U2	U1	FV	FV	XX
		area	U1	U2	XX	XX	U2	U2	U1	U1	XX
		structure	U2	U2	XX	U2	U2	U2	U1	U2	U2
		future	U1	U2	XX	U1	U2	U1	U1	U2	U1
		overall	U2	U2	XX	U2	U2	U2	U1	U2	U2

The main reported threats and pressures to lowland Hay Meadows in the Atlantic region are:

- Land-use or regime changes that have to do mainly with modification of cultivation practices.
- Abandonment or insufficient management of meadows and pastoral systems (and resulting succession)
- Afforestation/general forestry management.
- Recreation and construction/urbanized area.
- Unsuitable ways of management - not proper cultivation, drainage, intensification, ploughing and mulching, fertilization, pesticides use, manuring, eutrophication.
- Invasive species.

The principal **management measures** for this habitat consist of:

- Mowing.
- Grazing and mixed grazing-mowing, in an appropriate way and level of intensity (pasturing in the second crop in late summer-autumn).
- Simulating traditional ways of management.
- Promotion of habitat heterogeneities.
- Variable mowing cycles in over different parts of the habitat.
- Implementation of varied regimes.
- Accompanied by restoration of abandoned grasslands through removal of trees and shrub.

The 6510 habitat type requires mowing, grazing (mowing in midsummer and possible grazing in late summer) and mainly, with respect to the current state of the habitat, intensive restoration management of mowing, grazing and clearing scrub. The main recommendations for the conservation of hay meadows of the alliance *Arrhenatherion* are:

- Prevent land use changes, ensuring, as far as possible, the maintenance of such communities.
- Maintenance of the extensive form of the habitat use: keep balanced management practices on these communities. In this sense, the following management recommendations can be made:
 - Conduct a minimum of one and a maximum of two harvests of grass per year. In many cases, obtaining a second harvest is conditioned by the summer irrigation of the meadow. Hay making in late summer, considering fauna, namely the grassland nesting birds.

- Hay cutting is a basic management type. A combination of mowing and grazing is possible; grazing should be a complementary measure. The grasslands could be used for a maximum of two annual grazing periods: mostly in autumn and if available, the spring one is shorter. Avoidance of drainage, keeping the natural water regime with incidental flooding in winter and low(er) tables in summer.
- In productive sites no or almost no use of fertilizers. If fertilizing necessary, fertilize the lawn with the solid organic manure that has traditionally been used in such fields. The cattle slurry used on some fields has immediate effects on production, but favors grasses compared to other plant species in the community. Prevention of eutrophication is necessary.
- Avoid the reseeding with market forage species. The gaps of vegetation that may arise from some disturbance such as excessive trampling by livestock, the activities of wild boar or voles (*Microtus* sp.) will eventually be colonized by geophytes and seeds of established vegetation.
- Increase awareness of farmers in mountain areas about the importance of maintaining this habitat. For this purpose it may be beneficial that appropriate agro-environmental measures are developed by regional authorities. Farmers benefiting from these measures should commit for a minimum period of five years, to adopt farming practices that help protect this habitat.

The most frequently encountered **bottlenecks** in the conservation or restoration of favourable conservation status for this habitat are:

- Grassland with a good management of 6510 habitats produces a smaller output of grass / hay than grassland with intensive mowing or grazing. Therefore the subsidies are needed to encourage land users to carry out this management.
- In some countries, the 6510 habitats are nowadays quite isolated, there is a low dispersal capacity of several typical plant species.
- The water level depends on larger areas rather than on one single meadow. All stakeholders have to agree to keep a sufficient high water level or to raise it.
- The lack of public appreciation of the importance/value of species-rich grassland for society.

Solutions to the pressures, threats and bottlenecks may include:

- Strengthen EIA (Agriculture) Regulations.
- Ensure appropriate level of funding via ERDP for agri-environment schemes.
- Policy advocacy in relation to atmospheric pollution, Climate change, livestock and water resource/catchment management (linked to the Water Framework Directive – WFD).
- Awareness raising, education and community engagement.
- Further statutory designation of sites under domestic legislation.
- Restoration (close to existing sites with the habitat type). Note that the restoration schemes for 6510 habitats should include a transfer of hay and seeds from existing sites.

Heaths and Bogs

4010 - Northern Atlantic wet heaths with *Erica tetralix*

Summary

Wet heaths are ericoid plant communities that occur on acidic, nutrient-poor soils, such as shallow peats (<0.5m) and sandy soils with impeded drainage. The soils that support these communities are typically waterlogged for at least part of the year and can be found in a variety of circumstances. For example in Belgium and the Netherlands wet heath is often situated in continental dunes within local depressions whilst in the UK it often occupies areas of impeded drainage on lower valley sides and less steeply-sloping ground. It's often found as a transitional community between dry heath and blanket mire within complex habitat mosaics. The degree of waterlogging is crucial in the formation and maintenance of this community.

Wet heaths are characterised by dwarf shrub species. Significant geographical variation in the composition and abundance of these species is observed across its biogeographical range. The community most often includes mixtures of *Erica tetralix* (cross-leaved heath), *Trichophorum cespitosus* (deer grass), *Calluna vulgaris* (heather) and *Molinia caerulea* (purple moor-grass), and in some cases an under-storey of mosses, often consisting of *Sphagnum* species (bog mosses). Other species, such as *Erica cinerea* (bell heather), *Racomitrium lanuginosum* (woolly fringe-moss), *Ulex minor* (dwarf gorse) and *Erica scoparia* can become frequent.

Although wet heath is a naturally occurring community, increasing human influence over the last 6000 years, in the form of grazing, burning and cutting, has removed the woodland component of the heathland mosaic and led to the development of the now characteristic open habitat of the modern era. Variation in the character of these communities is not only the product of past management history but also fundamentally controlled by local hydrological conditions and soil trophic status.

Table 17 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States (ETC BD 2012)

	BE		DE			DK		ES				FR				IE	NL	PT			UK
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL
number of sites	24	43		110	54	31	29		1				37	19		45	52	1		2	135
habitat area (ha)	1592	1985		1358	188	2734	2390		248				8469	580		40943	5172	888		888	103428

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 0-50%. This means that actions should be taken also outside the Natura 2000 network to reach the favourable conservation status for this habitat type.

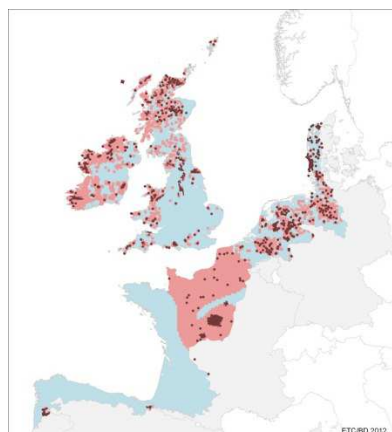


Figure 11 Map of SCIs proposed for the Northern Atlantic wet heaths with *Erica tetralix* & Article 17 distribution (ETC BD 2012) (for legend, see Figure 1 on page 5)

Overall the **conservation status of this habitat type** in the Atlantic Region has been assessed as 'unfavourable-bad' for all parameters except 'range'. No country has assessed this habitat as 'favourable' and this pattern extends beyond the Atlantic Region to the Boreal and Continental regions. The main threats and pressures responsible for its poor conservation status are mostly linked to inappropriate management or to habitat destruction, as is the case in Spain.

Table 18 Conservation status (CS) assessed at the Atlantic region and MS level (ETC BD 2012) (for legend, see start of chapter 3)

N2K code	Habitat name		BE	DE	DK	ES	FR	IE	NL	PT	UK	REGION
4010	Northern Atlantic wet heaths with <i>Erica tetralix</i>	range	FV	XX	FV	XX	U1	FV	FV	FV	FV	U1
		area	U2	U2	U2	XX	U2	XX	U1	U1	FV	U2
		structure	U2	U1	U2	XX	U2	U2	U1	U1	U2	U2
		future	U2	U1	U2	XX	U2	U2	U1	XX	U2	U2
		overall	U2	U2	U2	XX	U2	U2	U1	U1	U2	U2

The main reported threats and pressures to wet heaths in the Atlantic Region are:

- Overgrazing resulting in the loss of dwarf shrubs, which are replaced by species more resistant to grazing; usually leading to an expansion of grassland habitats.
- Undergrazing leading to a degenerate phase where the dwarf shrubs become increasingly 'leggy' with gaps forming in the canopy that can allow invasion by other species and eventual succession to woodland.
- Uncontrolled Burning at an inappropriate frequency (too little or too much) leading to the loss of more sensitive bryophyte species and, at high intensities, causing significant peat erosion as well as the loss of dwarf shrub species.
- Artificial Drainage which lowers the water table, leading to the loss of species that require a high soil moisture content and the local extinction of this community.
- Nitrogen Deposition which favours more competitive grass species, such as *Molinia*, causing fundamental change in plant community composition.
- Afforestation which reduces the area of open habitat, leading to a loss of soil moisture and an increase in the predation rates of ground-nesting birds.
- Fragmentation increases patch isolation leading to the ecological extinction of remaining patches through inbreeding and a loss of recolonisation potential.
- Invasive Species such as *Pteridium aquilinum* and *Molinia caerulea* can become dominant through inappropriate management leading to the loss of wet heath communities.

- Recreation activities such as hiking and mountain-biking can lead to significant erosion problems and a loss of wet heath vegetation.
- Renewable Power Generation infrastructure associated with inshore wind farms and small-scale hydroelectric schemes cause significant hydrological disruption and loss of habitat.
- Artificial Fertilizers used on adjacent land leads to pollution of groundwater and an increase in dominant grass species.

The principal **management measures** for this habitat include:

- Grazing - prevents successional change and stops tree species from colonising heathland areas.
- Burning - stimulates the new growth of grasses and/or heather for agriculture, game rearing and wildlife conservation. Although an important conservation tool, it is not generally recommended as suitable for wet heath management in either the UK or France.
- Cutting - also prevents successional change and stops tree species from colonising heathland areas; however, can have a similar impact to burning and when heavy machinery is used can also cause serious compaction and erosion problems.
- Scrub Removal - is essential on wet heaths where grazing or regular cutting has failed to prevent the establishment of tree species. It should be used as part of a phased restoration programme where future management ensures that any recolonisation is ideally controlled through a sustainable grazing management system.
- Sod Cutting - is a traditional technique that can be used as a means to maintain conditions for pioneer vegetation that exploits early successional stages within the wet heath mosaics. Most importantly it can also be used to restore degraded.
- Restoration - is undertaken on degraded heaths and requires the removal or reduction of the factor(s) that led to the original degradation. Specific actions are determined by the circumstances of the individual sites but generally this will frequently involve hydrological restoration, removal of accumulated nutrients, re-introduction of plant species and the reinstatement of a suitable grazing regime.
- Spatial Planning - linked to the planting of new woodlands and forests/location of renewable energy sites/etc should be integrated with the needs of wet heath species and should ensure that areas of existing wet heath, outside Natura sites are not planted all built on, and that barriers to movement are not created at a landscape scale.

The most frequently encountered **bottlenecks** in the conservation or restoration of favourable conservation status for this habitat are:

- Landowners are not willing to adopt extensive management systems;
- Lack of knowledge related to local and regional eco-hydrological conditions;
- Lack of knowledge of habitat requirements and life histories of characteristic species to be able to determine the timing and effectiveness of measures;
- Value of habitat is not recognised by land managers or policy makers;
- Limited financial support to encourage appropriate management;
- Poor implementation of legislation and/or cross-compliance measures – reluctance to deal with difficult issues and take action;
- Lack of suitable policy frameworks to tackle cross-sectoral issues; and

- Insufficient funding to tackle diffuse pollution or to implement buffer zones.

Solutions to the pressures, threats and bottlenecks may include:

- Financial support schemes that encourage extensive, mixed grazing systems as well as the development and marketing of niche products;
- Purchase of land to improve management, establish buffer strips and restore habitat at strategic locations;
- Raising awareness of wet heath as a distinct habitat with its own characteristics and management requirements;
- Develop and implement specific management prescriptions; and
- Develop and implement specific measures within agri-environment schemes and ensure sufficient funding to encourage uptake (and meet demand).

4030 – European Dry Heaths

Summary

Dry heaths are found on free-draining acid-neutral soils and are dominated by ericoid plant communities. Species such as *Calluna vulgaris* (heather), *Vaccinium vitis-idaea* (cowberry), *Vaccinium myrtillus* (bilberry), *Empetrum nigrum* (crowberry) and *Erica cinerea* (bell heather) are found consistently throughout its range although the proportions of these species varies considerably. Some of the communities within this habitat type, such as coastal dunes with *Erica vagans* (Cornish heath), are particularly rare and listed as priority habitat types under the Directive. Other species such as *Ulex gallii* (Western gorse), *Potentilla erecta* (tormentil), *Festuca ovina* (sheep’s fescue), *Athoxanthum oderatum* (sweet vernal grass), *Thymus polytrichus* (wild thyme), *Viola riviniana* (common dog violet) and *Danthonia decumbens* (heath grass) are frequent associates. Dry heaths are a widespread community across northern and western Europe. They also occur in southern Europe but are less common and often restricted to mountainous areas.

Dry heaths are characterised by dwarf shrub species. The height and structure of the sub-shrub canopy can vary markedly according to the incidence of burning/grazing as well as the degree of exposure, especially in upland areas. Dry heaths are often found as part of a complex dwarf shrub mosaic, especially when freer draining, more sandy soils are present within a wider peat-dominated soil matrix. Although often part of the same hydrological unit, their ecological processes and land use history are distinct.

This habitat has been characterised and shaped by past human influence. Evidence for widespread clearance of this habitat can be found during the Neolithic; historically these habitats have provided permanent pasture within mixed farming systems where they have not only provided grazing but also fuel, livestock bedding, winter fodder, thatching and even road building material. Their relationship with human communities has since changed and a loss of pastoralism has led to an increasingly fragmented, urbanised, scrubby character, especially in lowland areas.

Table 19 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States (ETC BD 2012)

	BE		DE			DK		ES				FR				IE	NL		PT			UK
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL	
number of sites	39	74		104	353	37	55	15	149		153	38	138	116	28	54	22	5		33	166	
habitat area (ha)	7913	2077		11654	25705	10299	6921	5898	304923		380404	10481	36004	20824	11393	38745	8444	61031		179262	207642	

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 0-50%. This means that actions should be taken also outside the Natura 2000 network to reach the favourable conservation status for this habitat type.

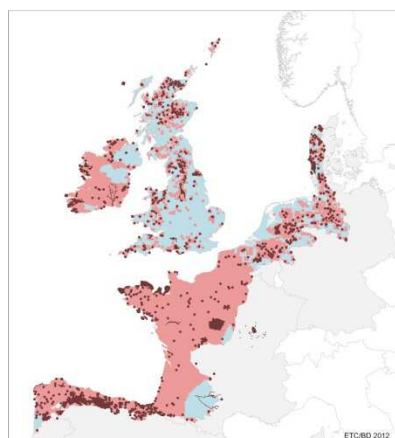


Figure 12 Map of SCIs proposed for the European dry heaths & Article 17 distribution (ETC BD 2012) (for legend, see Figure 1 on page 5)

Overall the **conservation status of this habitat type** in the Atlantic Region has been assessed as 'unfavourable-bad'. This is the case for all Regions except the Alpine where it is 'unfavourable-inadequate'. Dry heaths have been assessed as unfavourable by all countries in the Atlantic Region. Reported threats and pressures are mostly linked to inappropriate land management.

Table 20 Conservation status (CS) assessed at the Atlantic region and MS level (ETC BD 2012) (for legend, see start of chapter 3)

N2K code	Habitat name		BE	DE	DK	ES	FR	IE	NL	PT	UK	REGION
4030	European dry heaths	range	FV	FV	FV	XX	FV	FV	FV	FV	FV	FV
		area	U1	FV	XX	XX	U2	FV	U1	FV	FV	U2
		structure	U2	FV	U2	XX	U1	U1	U2	XX	U2	U2
		future	U1	FV	U2	XX	U1	U1	U1	FV	U2	U2
		overall	U2	FV	U2	XX	U2	U1	U2	FV	U2	U2

The main reported threats and pressures to dry heaths in the Atlantic Region are:

- Overgrazing leading to the loss of dwarf shrubs, which are substituted by species more resistant to grazing; usually leading to an expansion of grassland habitats.
- Undergrazing leaning to a widespread degenerate phase where gaps form in the canopy allowing invasion by other species and eventual succession to woodland. The accumulation of woody material can also increase the risk of high-intensity, unplanned fires, particularly during summer months.
- Uncontrolled Burning can produce even-aged vegetation, especially on small sites, and lead to the loss of more sensitive lichen species; it can also cause the loss of dwarf shrub species as well as important invertebrate assemblages.
- Nitrogen Deposition will favour more competitive grass species by increasing nitrogen levels leading to fundamental changes in plant community composition and potentially increased pest outbreaks (heather beetle) from higher nitrogen concentration in plant tissues.
- Afforestation results in direct habitat loss and can also contribute to habitat fragmentation if poorly designed. Natural regeneration in and around existing plantations can also reduce the area of open habitat and lead to an increase in the predation rates of ground-nesting birds.

- Cultivation of dry heath for intensive agricultural use leads to direct habitat loss and limits the potential for future restoration through destruction of the seed bank and excessive nutrient enrichment.
- Inappropriate Restoration Methods have resulted in ill-structured and species-poor communities dominated by *Calluna*, *Deschampsia* or *Molinia* in the Netherlands where characteristic species (breeding birds, vascular plants, bryophytes) have now become locally or even regionally extinct.
- Land Abandonment leads to scrub encroachment and the eventual loss of this habitat through succession to woodland.
- Fragmentation increases patch isolation through loss of habitat which leads to the ecological extinction of remaining patches through inbreeding and a loss of recolonisation potential.
- Invasive Species such as *Pteridium aquilinum*, *Ulex gallii*, *Rhododendron ponticum* and *Gaultheria shallon* can become dominant through inappropriate management and can lead to the loss of dry heath communities.
- Pesticide Regulations can lead to the banning of herbicides (e.g. Asulox) that provide effective control measures for invasive species ultimately leading to the loss of dry heaths in some countries through competitive displacement.
- Recreation activities can lead to significant erosion problems and the loss of dry heath vegetation.
- Renewable Power Generation infrastructure can cause significant loss of habitat.
- Artificial Fertilizers used on adjacent land leads to pollution of groundwater and an increase in dominant grass species.
- Urbanisation not only leads to a direct loss of habitat but also creates pressures that can change the viability and composition of dry heath communities through increased fragmentation, disturbance, fire, erosion, etc.

The principal **management measures** for this habitat include:

- Grazing - is used to arrest successional change and stop woodland from colonising open areas.
- Culling of wild herbivore populations (e.g. deer) may be necessary in some areas to control grazing pressure.
- Burning - is used in a similar way to grazing and regular controlled burning is generally recommended for dry heaths provided it is coupled with effective post-burning monitoring.
- Cutting - taken in combination with other measures, this is an essential tool for the management of dry heaths, especially on lowland areas where it mimics traditional practices that previously helped to control invasive species such as *Ulex gallii*. As with burning, cutting should be done over relatively small areas on a rotational basis.
- Scrub Removal - is essential on dry heaths where grazing or regular cutting has failed to prevent the establishment of tree species in open areas. This measure should be used as part of a phased restoration programme where future management ensures that any recolonisation is controlled through a sustainable grazing management system.
- Invasive Species Control - the active management of habitats to remove invasive plant species is essential.
- Restoration - is undertaken on degraded heaths and requires the removal or reduction of the factor(s) that led to the original degradation. Specific actions are determined by the circumstances of the individual sites.

- Spatial Planning - linked to the planting of new woodlands and forests/location of renewable energy sites/etc should be integrated with the needs of wet heath species and should ensure that areas of existing wet heath, outside Natura sites are not planted all built on, and that barriers to movement are not created at a landscape scale.
- Visitor Management - 'Duckboards' and 'honey pot' areas should be used to control the impact of visitors on sensitive dry heath vegetation and associated ground-nesting birds during the breeding season.

The most frequently encountered **bottlenecks** in the conservation or restoration of favourable conservation status for this habitat are:

- An assumption that traditional forms of (intensive) land use are suitable for restoring or enhancing characteristic biodiversity;
- A lack of management plans, at the landscape level, that also include woodlands and extensive agriculture;
- Poor understanding of the relationship between conservation measures and biological outcomes at the individual site level;
- Use of overly simplistic compliance monitoring and a lack of clarity over key conservation objectives as well as future 'climate-proofing';
- Lack of appropriate training of advisers/scheme managers and an inability to fully understand the issues;
- Lack of joined up thinking – threats to amphibians and reptiles, ironically, often created by conservation practitioners;
- Opposition to 'open habitats' and their management by pro-woodland conservation organisations and campaigners;
- Lack of knowledge of habitat requirements and life histories of characteristic species to be able to determine the timing and effectiveness of measures;
- Value of habitat is not recognised by land managers or policy makers;
- Limited financial support to encourage appropriate management;
- Poor implementation of legislation and/or cross-compliance measures – reluctance to deal with difficult issues and take action; and
- Lack of suitable policy frameworks to tackle cross-sectoral issues.

Solutions to the pressures, threats and bottlenecks may include:

- Clear funding schemes developed with a full understanding of conservation needs supported by the evaluation of biological outcomes rather than just the delivery of management actions;
- Clearer duties placed on public bodies linked to a need to assist with protection and conservation of dry heath sites;
- Conservation goals/outcomes that account for the complexity and needs of whole assemblages rather than individual species;
- Effective monitoring regimes that link habitat management to a range of biological outcomes;
- Education and training to raise awareness of the importance of heathland, as well as the particular measures needed to conserve its full range of biodiversity;

- Development of policies and incentive schemes that encourage traditional pastoral systems including funding for heavy stock, shepherding etc.;
- Education, training and support for marketing products from pastoral systems e.g. Heathland Beef project in Pembrokeshire or Anglesey Wildlife Friendly Produce labelling scheme;
- Influencing policies on atmospheric deposition particularly on the wider environmental impacts, e.g. human health;
- More accessible funding for INNS eradication/control through European structural funds;
- Financial support schemes that encourage extensive, mixed grazing systems as well as the development and marketing of niche products;
- Raising awareness of dry heath as a distinct habitat with its own characteristics and management requirements;
- Develop and implement specific management prescriptions; and
- Develop and implement specific measures within agri-environment schemes and ensure sufficient funding to encourage uptake (and meet demand).

7110 – Active Raised Bogs

Summary

Active raised bogs are acid bogs, ombrotrophic, poor in mineral nutrients, sustained mainly by rainwater, with a water level generally higher than the surrounding water table, with perennial vegetation dominated by colourful *Sphagnum* hummocks allowing for the growth of the bog (*Erico-Sphagnetalia magellanici*, *Scheuchzerietalia palustris* p., *Utricularietalia intermedio-minoris* p., *Caricetalia fuscae* p.). Active raised bogs are those which are peat forming, disturbed bogs which are no longer active are the non-priority habitat type '7120 Degraded raised bogs capable of natural regeneration'.

There are three key conditions which have to be maintained if lowland raised bogs are to retain their characteristic features. Firstly, they are waterlogged systems so alterations to the rate of water loss will destabilise them. Secondly, water inputs are from precipitation alone and are therefore low in solutes, so significant increases in the base or nutrient status of the system will alter the vegetation cover in favour of non-bog species. However, a lateral water flow providing local CO₂-enriched groundwater will further stabilise the water table and stimulate the growth of both hollow and hummock forming peat mosses. Thirdly, the living layer of vegetation acts as a 'natural' regulator for water loss; so destruction or alteration of the vegetation will have significant implications for the long-term stability of the ecosystem as a whole.

Table 21 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States (ETC BD 2012)

	BE		DE			DK		ES				FR				IE	NL		PT			UK
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL	
number of sites	8	20	15	47	82	8	19	7	31		24	53	54	104	11	53	4		5			56
habitat area (ha)	3	248	421	713	4597	178	2739	396	6743		9259	3928	6738	5673	929	2435	104		779			7870

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 76-100%. This means that Natura 2000 network provides an important framework for the management of this habitat type (ETC BD 2012).

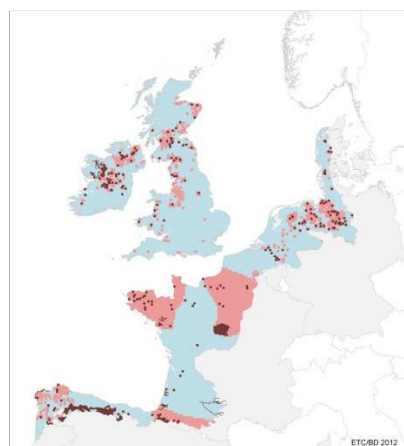


Figure 13 Map of SCIs proposed for Active raised bogs & Article 17 distribution (ETC BD 2012) (for legend, see Figure 1 on page 5)

The **conservation status of this habitat type** in the Atlantic region has been assessed as ‘unfavourable-bad’, except for Spain who reported the Alpine region as ‘unknown’ and the United Kingdom reports the habitat as ‘improving’.

Table 22 Conservation status (CS) assessed at the Atlantic region and MS level (ETC BD 2012) (for legend, see introduction of chapter 3)

NZK code	Habitat name		BE	DE	DK	ES	FR	IE	NL	UK	REGION
7110	Active raised bogs	range	U2	U1	FV	XX	XX	U2	U1	FV	XX
		area	U2	U2	U2	XX	U2	U2	U2	U2	U2
		structure	U2	U2	U2	XX	U2	U2	U2	U2	U2
		future	U1	U1	U2	XX	U2	U2	U2	U1	U2
		overall	U2	U2	U2	XX	U2	U2	U2	U2	U2

The main reported threats and pressures to active raised bogs in the Atlantic region are:

- Peat extraction.
- Water abstraction: loss of area by drainage and conversion to intensive agriculture.
- Destruction (cultivation), isolation and fragmentation resulting in loss of habitat connectivity within 7110 and between related habitats.
- Burning.
- Acid rain and nitrogen-input mainly from agriculture including (eventually) nitrogen enrichment of local groundwater.
- Absence of or inappropriate management: Lack of or inappropriate management of existing bogs leads to drying out, scrub encroachment and succession to woodland.

The principal **management measures** for this habitat include:

- Restoration of the water regime. Removal of drains, blocking of existing drainage channels and tree removal to lower evapotranspiration. Establishment of natural or near natural hydrological regimes. [Note that often the hydrological requirements can only be achieved by measures at the landscape level, well beyond the site boundaries.]
- Pollution and nutrient reduction. An integrated approach to controlling the full range of pollution sources is needed. The establishment of buffer zones is a powerful measure, especially to avoid nutrient inputs from the immediate area; similarly installation of silt traps, creation of constructed wetlands/surfacing of field drains that avoid direct flow of water to wetland. Control of small and non-point sources is more challenging and requires a strategic catchment-based approach, it requires a range of agricultural and silvicultural management measures to control diffuse pollution loads, including the conversion of highest risk land and land on critical hydrological pathways to semi-natural vegetation.
- Measures to prevent organic matter accumulation (natural acidification) and encroachment by shrubs and trees. These can include mowing in autumn or winter (mowing by hand or with extremely light machinery), grazing (light seasonal grazing by lightweight traditional breeds of domestic animals) and controlled light burning.
- Traditional methods for peat/removal of intensive peat extraction.
- Restoration of degraded habitats.

Note that in the Netherlands several active raised bogs were restored by means of the following **management measures**:

- Compartmentalisation within sites to store rain water and local groundwater and zone bog development (only in subtype A).
- Regeneration of bog development by sod-cutting and excavation (only subtype A).

In all sites, restoration was successful for this kind of initial peat forming process dominated by *Sphagnum cuspidatum* and *S. fallax*. Another effect of restoration is that further degradation of active remnants has been stopped. An important aspect of restoration was the acquisition of land with (former) agricultural function around the sites which function as hydrological buffer zones.

In the UK there are specific conservation programmes for the raised bogs resource. As well as this a suite of agri-environment measures are now in place in the lowlands which are addressing more appropriate management, particularly grazing levels. Furthermore the Water Framework Directive (WFD) adds considerable impetus for widespread action on issues affecting the resource of H7110 such as abstraction licences and pollution.

The **main constraint** in the conservation and/or restoration of active raised bogs is the fact that sustainable bog development requires large-scale restoration and regional hydrological measures. This is not only very expensive, but has the potential to raise conflicts with agricultural interests as well as the peat extraction industry. The most frequently encountered additional **bottlenecks** in the conservation or restoration of favourable conservation status for this habitat are:

- Significantly more of the resource in unfavourable condition is declining than improving.
- Lack of knowledge on hydrological system functioning.
- Lack of regulatory and/or financial incentive to landowners to make necessary beneficial land use.
- Restoration of habitat integrity is not likely to be achieved while background levels of Nitrogen and Ammonia loads remain high and further licenses to emit are still being granted.
- Lack of any mechanism for enabling definition and management of a groundwater protection zone for nature conservation purposes.
- Difficulty of securing meaningful reductions in atmospheric Nitrogen loading.

Solutions to the pressures, threats and bottlenecks are to be sought in the development of:

- Widespread introduction of restoration measures (and associated stakeholder engagement, policy change and implementation, etc).
- Strategic planning of management measures at a site level, changing policy at the landscape level.
- Maintenance of appropriate hydrological conditions.
- Effective control of air quality.
- Harmonising approaches to Habitats Directive and Water Framework Directive implementation.
- Specific measures in agri-environment schemes and sufficient funding to encourage uptake and meet demand. Effective long-term agri-environment mechanism support which provides both flexibility in relation to stocking rates and remuneration that is actually attractive to farmers.

7140 - Transition mires and quaking bogs

Summary

Transition mires are peat-forming communities developed at the surface of oligotrophic to mesotrophic waters, with characteristics intermediate between soligenous/topogenous and ombrogenous types. They present a large and diverse range of plant communities. In large peaty systems, the most prominent communities are swaying swards, floating carpets or quaking mires formed by medium-sized or small sedges, associated with sphagnum or brown mosses. The habitat includes minerotrophic fens not being part of a larger mire complex, open swamps and small fens in the transition zone between water and mineral soil. These mires and bogs belong to the *Scheuchzerietalia palustris* order (e.g. oligotrophic floating carpets) and to the *Caricetalia fuscae* order (quaking communities). Oligotrophic water-land interfaces with *Carex rostrata* are included.

Transition mires are characterised by the vegetation that in floristic composition and general ecological characteristics is transitional between acid bog and alkaline fens, in which the surface conditions range from markedly acidic to slightly base-rich. The vegetation has intimate mixtures of species considered to be acidophile and others thought of as calciphile or basophile. In some cases the mire occupies a physically transitional location between bog and fen vegetation, but they can occur in a variety of situations: flood plain mires, valley bogs, basin mires, lagg zone of raised bogs, and as regeneration surfaces within mires that have been cut-over for peat or areas of mineral soil influence within blanket bogs. Many of these systems are very unstable underfoot and can therefore also be described as ‘quaking bogs’. Transition mires and quaking bogs represent a suitable habitat for many species, amongst which are found rare dragonflies of oligotrophic or dystrophic waters.

Table 23 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States

	BE		DE			DK		ES				FR				IE	NL		PT			UK
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL	
number of sites	9	15	17	182	652	31	57	2	39		44	36	44	86	6	17	16	3		7	93	
habitat area (ha)	182	114	249	3313	6707	791	1855	90	9161		16336	3505	5575	2687	423	1305	1664	1032		1782	3551	

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 76-100%. This means that Natura 2000 network provides an important framework for the management of this habitat type (ETC BD 2012).

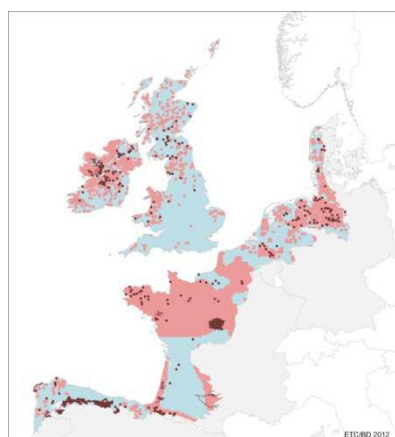


Figure 14 Map of SCIs proposed for the Transition mires and quaking bogs & Article 17 distribution (for legend, see Figure 1 on page 5)

Overall the **conservation status of this habitat type** in the Atlantic Region has been assessed as 'unfavourable-bad'; (in particular due to the 'structure' and 'future prospect' which was classified by majority of countries as 'unfavourable-bad').

Table 24 Conservation status (CS) assessed at the Atlantic region and MS level (for legend, see introduction of chapter 3)

N2K code	Habitat name		BE	DE	DK	ES	FR	IE	NL	PT	UK	REGION
7140	Transition mires and quaking bogs	range	U1	XX	FV	XX	U1	FV	U1	FV	FV	U1
		area	U1	U1	XX	XX	U2	FV	U1	U1	XX	U2
		structure	U2	U2	U2	XX	U2	U2	U2	U2	U2	U2
		future	U2	U1	U2	XX	U2	U2	U1	U2	U2	U2
		overall	U2	U2	U2	XX	U2	U2	U2	U2	U2	U2

The main reported threats and pressures to the Transition mires in the Atlantic Region are:

- Surface Drainage and Abstraction. Both hydrological changes in the fen itself and in the surroundings lead to degradation of the habitat. Many sites have internal ditches, culverted outflows and overflows. The off-site drainage may reduce the quantity of water reaching the site. Excessive water abstraction from aquifers has dried up or reduced spring line flows, and generally lowered water tables, resulting in drying out of sites.
- Aquatic and air pollution. Eutrophication, diffuse pollution to surface waters due to agricultural and forestry activities in surrounding land (input especially of ammonium), also pollution caused by agricultural run-off within the catchments. Nitrogen and sulphate deposition may contribute to eutrophication and represent potentially significant pressure to the habitat structure and function.
- Climate change. It is likely that changes in the hydrological regime will affect peat accumulation rates, recycling of nutrients and plant community composition.
- Lack of management leading to natural succession, including encroachment of shrub and trees, resulting in development of coarse vegetation and secondary woodland. The accumulation of organic matter can result in natural acidification. Removal of grazing has meant that this habitat has often become rank and less diverse, both in species and structural terms.
- Grazing. Degradation due to overstocking: livestock contributes to the acceleration of erosion at the edges of the mire, to increased compaction and exposed peat surfaces.

- Agriculture and forestry use. This includes direct conversion to utilized areas: poplar plantations, fish ponds, agricultural fields. Whilst direct loss of the habitat to more intensive agriculture is not a major threat now, land-use immediately around sites supporting H7140, and in the wider water catchment, has a significant effect on the habitat.
- Peat extraction.
- Fragmentation and isolation. Sites of 7140 now fall largely outside of conventional agriculture as they are incompatible with the modern farming systems, therefore many sites are now isolated in intensively managed agricultural landscapes. This, in combination with a small total area of habitat and critically small population sizes of several key species dependent on the habitat 7140, provides the major threats to the long-term integrity and even survival of the habitat.

The principal **management measures** for this habitat include:

- Restoration of the water regime. Removal of drains, blocking of existing drainage channels and tree removal to lower evapotranspiration. Establishment of natural or near natural hydrological regimes. [Note that often the hydrological requirements can only be achieved by measures at the landscape level, well beyond the site boundaries.]
- Pollution and nutrient reduction. An integrated approach to controlling the full range of pollution sources is needed. The establishment of buffer zones is a powerful measure, especially to avoid nutrient inputs from the immediate area; similarly installation of silt traps, creation of constructed wetlands/surfacing of field drains that avoid direct flow of water to wetland. Control of small and non-point sources is more challenging and requires a strategic catchment-based approach, it requires a range of agricultural and silvicultural management measures to control diffuse pollution loads, including the conversion of highest risk land and land on critical hydrological pathways to semi-natural vegetation.
- Mowing in late summer to prevent organic matter accumulation (natural acidification) and encroachment by shrubs and trees. Bog-moss dominated reed vegetation: mowing in autumn or winter. Mowing by hand or with extremely light machinery.
- Grazing reintroduction. Light seasonal grazing by lightweight traditional breeds of domestic animals.
- Adjustment of peat extraction in the area.
- Restoration of degraded habitats. Various measures could be applied: deforestation, creating new pools, submergence. These methods allow vegetation pioneers who settle spontaneously or when seeds or spores remain in the peat to develop and encourage species that may still be present.

The most frequently encountered **bottlenecks** in the conservation or restoration of favourable conservation status for this habitat are:

- Significantly more of the resource in unfavourable condition is declining than improving.
- Lack of knowledge on hydrological system functioning.
- Lack of regulatory and/or financial incentive to landowners to make necessary beneficial land use.
- Restoration of habitat integrity is not likely to be achieved while background levels of Nitrogen and Ammonia loads remain high and further licenses to emit are still being granted.
- Lack of any mechanism for enabling definition and management of a groundwater protection zone for nature conservation purposes.
- Difficulty of securing meaningful reductions in atmospheric Nitrogen loading.

Solutions to the pressures, threats and bottlenecks are to be sought in the development of:

- Maintenance of oligotrophic conditions. Reducing or eliminating nutrient inputs from local terrestrial and aquatic sources is a critical part of an overall approach to reduce or mitigate nutrient impacts.
- Effective control of air quality
- Strategic planning of management measures at a site level, changing policy at the landscape level.
- Harmonising approaches to Habitats Directive and Water Framework Directive implementation.
- Specific measures in agri-environment schemes and sufficient funding to encourage uptake and meet demand. Effective long-term agri-environment mechanism support which provides both flexibility in relation to stocking rates and remuneration that is actually attractive to farmers.

7230 – Alkaline Fens

Summary

Alkaline fens are wetlands mostly or largely occupied by peat- or tufa-producing small sedge and brown moss communities developed on soils that are permanently waterlogged, with a soligenous or topogenous base rich, often calcareous water supply. This habitat type has a high water table with minimal water level fluctuations. The vegetation in the best-preserved mires has a mosaic-like structure of calciphilous plant communities, pools, springs, pioneer communities and peat-forming moss-sedge communities.

Calciphile small sedges and other *Cyperaceae* usually dominate these mire communities, which belong to the *Caricion davallianae* community. This is a community of open low-growing small sedge vegetation. **It is characterised by** an usually prominent "brown moss" carpet formed by *Campyllum stellatum*, *Drepanocladus cossonii*, *Cratoneuron commutatum*, *Caliergonella cuspidata*, *Ctenidium molluscum*, *Fissidens adianthoides*, *Bryum pseudotriquetrum* and others; a grasslike growth of *Schoenus nigricans*, *S. ferrugineus*, *Eriophorum latifolium*, *Carex davalliana*, *C. flava*, *C. lepidocarpa*, *C. hostiana*, *C. panicea*, *Juncus subnodulosus*, *Trichophorum alpinum*, *Eleocharis quinqueflora*; and a very rich herbaceous flora including *Tofieldia calyculata* (in northern Europe *Tofieldia pusilla*), *Dactylorhiza incarnata*, *D. traunsteinerioides*, *D. russowii*, *D. majalis* ssp. *brevifolia*, *D. cruenta*, **Liparis loeselii*, *Herminium monorchis*, *Epipactis palustris*, *Pinguicula vulgaris*, *Pedicularis sceptrum-carolinum*, *Primula farinose* and *Swertia perennis*.

Vegetation units in alkaline fens have similar physiognomy. Because there is a wide distribution range of alkaline fens, their species composition changes depending on the geographical region, altitude and water chemistry. Mire development is determined by water: the amount of water available and its chemical composition affects the morphology and surface pattern of a mire as well as its floristic composition, the productivity of its vegetation, the distribution of microtopes and the accumulation of peat. Two fundamental processes are prerequisites in the formation of mires: a positive water balance and the accumulation of peat. Both groundwater regime and quality play a crucial role in determining whether fens are formed. Fens can be subdivided on the basis of hydrology into topogenous and soligenous. Soligeneous fens are groundwater-fed systems on an possibly non-calcareous substrate where the chalk comes from the water. Topogeneuous fens are surface water-fed systems on a calcareous substrate where the water just causes wetness and the chalk comes from the substrate. Both types are very sensitive to hydrological changes.

Table 25 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States (ETC BD 2012)

	BE		DE			DK		ES				FR				IE	NL		PT			UK
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL	
number of sites	2	5	36	15	434	35	112	23	20		24	72	72	69	16	39	7				87	
habitat area (ha)	99	123	1206	37	6180	3077	7734	1936	5177		7994	7477	8667	2922	1761	2968	55				1823	

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 76-100%. This means that Natura 2000 network provides an important framework for the management of this habitat type (ETC BD 2012).

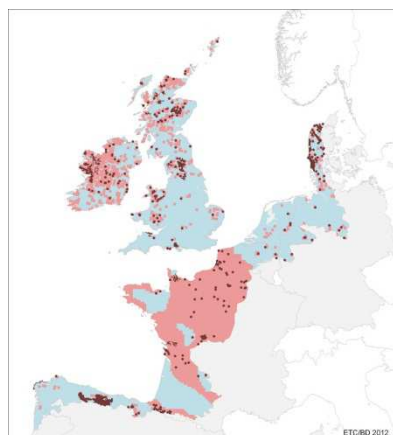


Figure 15 Map of SCIs proposed for Alkaline fens & Article 17 distribution (ETC BD 2012) (for legend, see Figure 1 on page 5)

Overall, **the conservation status of this habitat type** is assessed as ‘unfavourable-bad’ for the Atlantic Region due to changes in hydrological conditions and pollution/eutrophication (incl. atmospheric deposition).

Table 4 Conservation status (CS) assessed at the Atlantic region and MS level (ETC BD 2012) (for legend, see introduction of chapter 3)

N2K code	Habitat name		BE	DE	DK	ES	FR	IE	NL	UK	REGION
7230	Alkaline fens	range	U2	U2	FV	XX	FV	FV	U2	FV	FV
		area	U1	U2	U2	XX	U2	FV	U2	XX	U2
		structure	U1	U2	U2	XX	U2	U2	U2	U2	U2
		future	U1	U2	U2	XX	U2	U2	U1	U2	U2
		overall	U2	U2	U2	XX	U2	U2	U2	U2	U2

The main reported threats and pressures to alkaline fens in the Atlantic Region are:

- Hydrological changes in the fen itself or in the surroundings, causing desiccation which stimulates decomposition and mineralization.
- Eutrophication of surface-water and/or groundwater caused by nutrients filtering in from agricultural soils and waste water.
- Atmospheric deposition of nitrogen.
- Direct conversion into alternative land uses (e.g. Poplar plantations, fish ponds, agricultural fields, etc)
- Abandonment of traditional management practices.
- Peat mining (especially in the past).

The most important **management practices** to address these threats and pressures are:

- Management of the hydrological conditions in order to ensure a stable water regime and the correct nutrient balance. (Note that if the hydrological conditions and the nutrient balance are good, alkaline fens require no special management; however, like many other wetland habitats, because of the variable external conditions and impacts referred to above, ongoing management may be required as listed below).
- Restoration of the water regime/restoring of qualitative and quantitative hydrological conditions.

- Pollution and nutrient reduction. An integrated approach to controlling the full range of pollution sources is needed. The establishment of buffer zones is a powerful measure, especially to avoid nutrient inputs from the immediate area; similarly installation of silt traps, creation of constructed wetlands/surfacing of field drains that avoid direct flow of water to wetland. Control of small and non-point sources is more challenging and requires a strategic catchment-based approach, it requires a range of agricultural and silvicultural management measures to control diffuse pollution loads, including the conversion of highest risk land and land on critical hydrological pathways to semi-natural vegetation.
- Measures to prevent organic matter accumulation (natural acidification) and encroachment by shrubs and trees. These can include mowing in autumn or winter (mowing by hand or with extremely light machinery), grazing (by sheep), cutting of invasive tree and shrub species and controlled light burning or a combination of these measures.
- Restoration of degraded habitats; removal of the top soil layer is only recommended in case of a highly degraded top layer where the habitat type has disappeared and where hydrological restoration measures alone are not sufficient for restoration.

The most frequently encountered additional **bottlenecks** in the conservation or restoration of favourable conservation status for this habitat are:

- Conflict of interest with other stakeholders in case of managing landscape hydrology.
- Lack of funding at site level.
- Significantly more of the resource in unfavourable condition is declining than improving.
- Lack of knowledge about hydrological system functioning.
- Isolation: often small isolated sites combined with the low dispersal capacity of several typical plant species, small areas are also very sensitive to external pressures.
- External impact of changed water management on large areas outside Natura 2000-site.
- Lack of regulatory and/or financial incentive to landowners to make necessary beneficial Land use.
- Restoration of habitat integrity is not likely to be achieved while background levels of Nitrogen and Ammonia loads remain high and further licenses to emit are still being granted.
- Lack of any mechanism for enabling definition and management of a groundwater protection zone for nature conservation purposes.

Solutions to the pressures, threats and bottlenecks are to be sought in in the development of:

- Widespread introduction of restoration measures (and associated stakeholder engagement, policy change and implementation, etc).
- Strategic planning of management measures at a site level, changing policy at the landscape level.
- At the site level: fund raising.
- Awareness raising.
- Restoration (close to existing sites with the habitat type).
- Maintenance of appropriate hydrological conditions.
- Effective control of air quality.
- Harmonising approaches to Habitats Directive and Water Framework Directive implementation.
- Specific measures in agri-environment schemes and sufficient funding to encourage uptake and meet demand. Effective long-term agri-environment mechanism support which provides both flexibility in relation to stocking rates and remuneration that is actually attractive to farmers.

Lakes and Rivers

3110 - Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)

Summary

The **habitat type 3110** covers shallow oligotrophic waters with few minerals and which are base poor, with an aquatic to amphibious low perennial vegetation belonging to the *Littorelletalia uniflorae* order, on oligotrophic soils of lake and pond banks (fine sands, coarse rocky sands and sometimes on peaty soils). The key process for the oligotrophic waters is carbon limitation. This habitat type may be primary or secondary if its occurrences are subject to (semi-)natural development; as a consequence many local variants exist, such as fishing ponds, moorland pools (isolated or not), isolated lakes, lakes fed by streams, etc.

The vegetation of this habitat type **is characterised by** the presence of *Littorelletalia*-type vegetation. Such vegetation is further characterised by the presence of water lobelia *Lobelia dortmanna*, shoreweed *Littorella uniflora*, or quillwort *Isoetes lacustris* or *Isoetes echinospora*. Typically the vegetation consists of zones in which the individual species form submerged, monospecific lawns. However, this is not always the case in the shallow waters of the north-west atlantic lowlands where isoetids inhabit the full lake and zonation is less evident.

Table 26 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States (ETC BD 2012)

	BE		DE			DK		ES				FR				IE	NL		PT			UK
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL	
number of sites	13	2		14	7	14	12	5	27		19		69	13	1	38	4			5	4	
habitat area (ha)	466	2		55	334	478	1120	261	4604		11572		20523	223	23	26471	139			526	404	

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 51-75%. This means that Natura 2000 network provides an important framework for the management of this habitat type (ETC BD 2012).

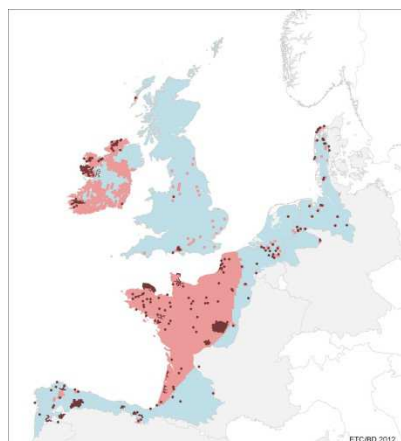


Figure 16 Map of SCIs proposed for the Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) & Article 17 distribution (ETC BD 2012) (for legend, see Figure 1 on page 5)

The **conservation status of this habitat type** in the Atlantic Region has been assessed as 'unfavourable-bad' by each member state, except in Spain where it is 'unknown'. Pressures and threats include eutrophication and pollution in most countries.

Table 27 Conservation status (CS) assessed at the Atlantic region and MS level (ETC BD 2012) (for legend, see introduction of chapter 3)

N2K code	Habitat name		BE	DE	DK	ES	FR	IE	NL	UK	REGION
3110	Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>)	range	U2	FV	FV	XX	FV	FV	U2	FV	FV
		area	U2	U2	U1	XX	U2	FV	U2	XX	U2
		structure	U1	U2	U2	XX	U2	U2	U2	U2	U2
		future	U2	U1	U2	XX	U1	U2	U1	FV	U1
		overall	U2	U2	U2	XX	U2	U2	U2	U2	U2

The main reported **threats and pressures** to the habitat type 3110 in the Atlantic Region are:

- Eutrophication (ground water and surface water): nutrient enrichment from agricultural practices (including overgrazing and excessive fertilization), forestry activities and waste water from housing developments.
- Hydrological pressures: the high hydrological conductivity of sandy substrates has the result that this habitat type may be susceptible to changes to surface and groundwater hydrology (for example falling water tables caused by ground water abstractions for agriculture etc.).
- Recreation pressures: utilization for an increasing number of sport and leisure activities. Especially angling and the associated stocking of many lakes with benthic feeding fish is an important threat.
- Non-native invasive species: habitat type 3110 is particularly vulnerable to invasions by *Crassula helmsii* which occupies a similar niche to *Littorella uniflora* and to introductions of non-native fish species such as *Umbra pygmea* and *Lepomis gibbosus*.
- Grazing: the presence of large numbers of geese (for example Canada geese and Greylag Geese) can exert considerable grazing pressure on submerged vegetation and also import nutrients (especially when their external food supply is plentiful due to nearby agriculture).
- Air pollution: especially nitrogen-input, acidification arising from atmospheric deposition may be an issue for habitat type 3110 as there is limited buffering capacity in the acidic sandy soils.
- Artificial bank protection.

- Afforestation: planting of trees on heathland has resulted in increased evaporation and less groundwater flow towards the lakes resulting in a lowering of their water levels, drying out and subsequent desiccation.
- Climate change: increased CO₂ concentrations may shift the competitive advantage from isoetids towards other species.

The principal **management measures** for this habitat include:

- Restoration of the local hydrology: often this includes a package of measures which is dependent on the local situation; (for example: preventing or reducing the inflow of nutrients and pollutants (by setting up buffer zones and water catchment areas); stopping the outflow of water; removal of trees and shrubs in the direct surroundings that influences the local hydrology of the habitat; regulation of abstractions and impoundments; the re-creation of (natural) dynamics).
- Removal of high vegetation and organic sediments from the banks and bottom in order to restore mineral sands (necessary restoration measure before the isoetid vegetation can develop again), with taking into account the fauna populations.
- Cut sods and / or profiling of banks.
- Supply of alkalinity by liming, letting in of calcium-rich, nutrient poor water or liming of catchment.
- Depletion of the fish stock and setting up extensive fish farming management.
- Control of exotic invasive species (and water birds).
- Limit accessibility of nearby agricultural pastures (or change cultural practices in these fields) in order to prevent dominance of geese.

The most frequently encountered **bottlenecks** in the conservation or restoration of a favourable conservation status are:

- Insufficient funds for habitat restoration.
- Lack of any mechanism for enabling definition and management of a groundwater protection zone for nature conservation purposes.
- Lack of knowledge about hydrology and groundwater.
- Agricultural policies.
- General environmental standards which are not taking into account the more sensitive receptors such as oligotrophic lakes.
- Climate change policies (pressure to increase the land area under trees).

Solutions to the pressures, threats and bottlenecks are to be sought in the development of:

- Stakeholder engagement and communication; including participative process and influencing policies, education and awareness raising, etc.
- Strategic planning of management measures at a site level, changing policy at the landscape level.
- Maintenance of oligotrophic conditions. Reducing or eliminating nutrient inputs from local terrestrial and aquatic sources is a critical part of an overall approach to reduce or mitigate nutrient impacts.
- Effective control of air quality
- Harmonising approaches to Habitats Directive and Water Framework Directive implementation.

- Specific measures in agri-environment schemes and sufficient funding to encourage uptake and meet demand.

3130 - Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*

Summary

The **Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea* Habitat type** is comprised of both oligotrophic and mesotrophic waters, and includes intermediate types. While each type supports a characteristic plant community, the range of conditions to be expected in this habitat type is broad. Substrates of oligotrophic to mesotrophic waters include silt, sand, gravel, stones and boulders. Types of lake associated with this habitat are of low to moderate alkalinity and nutrient concentrations.

This habitat type can consist of two vegetation units which can grow in close association or separately:

1. Aquatic to amphibious short perennial vegetation, oligotrophic to mesotrophic, of lake, pond and pool banks and water-land interfaces belonging to the *Littorelletalia uniflorae* order
2. Amphibious short annual vegetation, pioneer of land interface zones of lakes, pools and ponds with nutrient poor soils, or which grows during periodic drying of these standing waters: *Isoëto-Nanojuncetea* class.

The vegetation community is characterised by amphibious, short, perennial vegetation, with shoreweed *Littorella uniflora* being considered as the defining component. This species often occurs in association with water lobelia, *Lobelia dortmanna*, bog pondweed, *Potamogeton polygonifolius*, quillwort, *Isoetes lacustris*, bulbous rush, *Juncus bulbosus*, needle spike-rush, *Eleocharis acicularis*, alternate water milfoil, *Myriophyllum alterniflorum* and floating water bur-reed, *Sparganium angustifolium*. Yellow water-lily, *Nuphar lutea*, amphibious bistort, *Persicaria amphibia*, stoneworts, *Chara* and *Nitella* spp., least bur-reed, *Sparganium natans*, and other pondweeds, *Potamogeton* spp., may be present in more mesotrophic conditions.

Table 28 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States (ETC BD 2012)

	BE		DE			DK		ES				FR				IE	NL		PT			UK
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL	
number of sites	31	25	3	68	193	22	34				3	29	76	72	16	10	29	1	5	8	68	
habitat area (ha)	964	203	32	628	4134	2305	3360				5	2838	10065	4601	1914	3955	1558	888	697	2125	25368	

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 0-50%. This means that actions should be taken also outside the Natura 2000 network to reach the favourable conservation status for this habitat type.

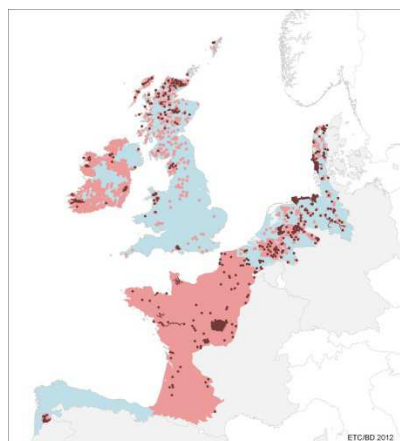


Figure 17 Map of SCIs proposed for the Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea* & Article 17 distribution (ETC BD 2012) (for legend, see Figure 1 on page 5)

The **conservation status of this habitat type** in the Atlantic Region has been assessed as 'unfavourable-bad'. A wide range of threats and pressures are reported including drainage and pollution.

Table 29 Conservation status (CS) assessed at the Atlantic region and MS level (ETC BD 2012) (for legend, see introduction of chapter 3)

NZK code	Habitat name		BE	DE	DK	FR	IE	NL	PT	UK	REGION
3130	Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i>	range	U2	U2	FV	XX	FV	FV	FV	FV	XX
		area	U1	U2	XX	U1	FV	U1	FV	XX	U1
		structure	U2	U2	U2	U2	U2	U1	XX	U1	U2
		future	U2	U1	U2	U1	U2	U1	XX	U1	U1
		overall	U2	U2	U2	U2	U2	U1	XX	U1	U2

The main reported **threats and pressures** to oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea* in the Atlantic Region are:

- Nutrient enrichment: diffuse pollution to surface water and local groundwater due to agriculture (overgrazing and excessive fertilization) and small point sources such as septic tanks (domestic households).
- Angling (fish stocking) and other recreational use.
- Colonisation by invasive, non-native species, e.g. *Crassula helmsii* and non-native fish species e.g. *Umbra pygmea* and *Lepomis gibbosus*.
- Alteration of the hydrological regime: abstraction for potable water supply and agriculture (lowered groundwater tables might influence the habitats resulting in decreased and more fluctuating water tables), also hydroelectric schemes rely on impoundments and alter the hydromorphology of the water supply.
- Air pollution: acidification.
- Climate change: is considered a major threat to the future condition of this habitat especially in the long term.
- Afforestation: planting of trees on heathland has resulted in increased evaporation and less groundwater flow towards the lakes resulting in a lowering of the water levels, drying out and desiccation.
- Fixing of the banks (using concrete and other materials for stabilization) and other artificial structures, modifications, etc.

- Grazing: the presence of large numbers of geese (for example Canada geese and Greylag Geese) can exert considerable grazing pressure on submerged vegetation and also import nutrients (especially when external food supplies for the geese are plentiful due to nearby agriculture).

The principal **management measures** for this habitat include:

- Restoration of the local hydrology; including a package of potential measures that are dependent on the local situation: preventing or reducing the inflow of nutrients and pollutants (for example by setting up buffer zones and water catchment areas); removing trees and shrubs in the direct surroundings that influence the local hydrology of the habitat; re-creation of (natural) dynamics (for example re-establishing the seasonal variation of the water table).
- Restoration of degraded ponds which can include: removal of organic sediments, a process that is necessary before the isoetid vegetation can re-develop (which takes into account the fauna populations in the habitat); removal of rank vegetation and organic material from the banks.
- Ponds used for fisheries or hunting should be managed extensively; (e.g. no artificial feeding, no introduction of alien or burrowing species, no depletion of the fish stock).
- Cut sods and / or profiling of banks.
- Thin out herbs / mowing.
- Control of exotic invasive species and water birds (limiting accessibility of nearby agricultural pastures in order to prevent dominance of geese).

The most frequently encountered **bottlenecks** in the conservation or restoration of a favourable conservation status are:

- Insufficient funds for habitat restoration.
- Lack of any mechanism for enabling definition and management of a groundwater protection zone for nature conservation purposes.
- Lack of knowledge about hydrology and groundwater.
- Agricultural policies.
- General environmental standards which are not taking into account the more sensitive receptors such as oligotrophic lakes.
- Climate change policies (pressure to increase the land area under trees).

Solutions to the pressures, threats and bottlenecks are to be sought in the development of:

- Stakeholder engagement and communication; including participative process and influencing policies, education and awareness raising, etc.
- Strategic planning of management measures at a site level, changing policy at the landscape level.
- Maintenance of oligotrophic conditions. Reducing or eliminating nutrient inputs from local terrestrial and aquatic sources is a critical part of an overall approach to reduce or mitigate nutrient impacts.
- Effective control of air quality
- Harmonising approaches to Habitats Directive and Water Framework Directive implementation.
- Specific measures in agri-environment schemes and sufficient funding to encourage uptake and meet demand.

3150 - Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation

The natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* type vegetation habitat are lakes and ponds with a rather clear water layer in which phosphate concentrations are low in the water layer and moderately high in the sediment. The water is particularly rich in dissolved bases (pH usually > 6.5), with free-floating surface communities of the *Hydrocharition* or, in deep, open waters, with associations of large pondweeds (*Magnopotamion*).

The *Hydrocharition* vegetation-type occurs with watersoldier (*Stratiotes aloides*) or with greater bladderwort (*Utricularia vulgaris*). Watersoldier occurs on the edge of water and land in sheltered, moderately nutrient rich water with a moderately high phosphate content. The vegetation is important as habitat for several species, including the black tern (*Chlidonias niger*) which builds floating nests; the green darner dragonfly (*Aeshna viridis*) which lays its eggs in the Watersoldier; and many kinds of freshwater snails (who live between the dense vegetation in order to find protection from fish predation).

In deeper water aquatic plants with floating leaves (e.g. *Nymphaea alba*) form dense mats of vegetation, accompanied by large-leaved submerged aquatic plants (*Potamogeton lucens*, *P. perfoliatus*, *P. praelongus* and *P. compressus*). These submerged aquatic plants are an indicator of good water quality and provide shelter for fish.

Table 30 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States (ETC BD 2012) (for legend, see introduction of chapter 3)

	BE		DE		DK		ES				FR				IE	NL		PT		UK	
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL
number of sites	22	33		131	1108	36	120	9	35	1	162	10	130	73	18	11	16	1		21	16
habitat area (ha)	959	347		6649	47359	8306	21681	729	4157	103	33891	1521	26924	13728	4049	19674	5357	888		6489	5260

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 76-100%. This means that Natura 2000 network provides an important framework for the management of this habitat type (ETC BD 2012).

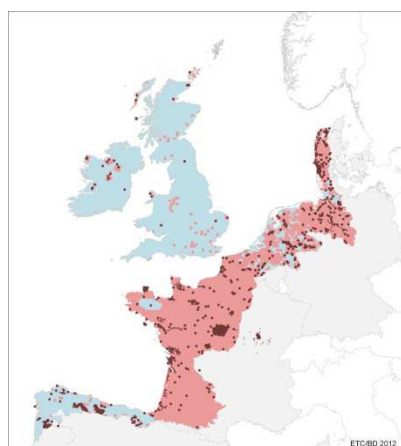


Figure 18 Map of SCIs proposed for Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation & Article 17 distribution (ETC BD 2012) (for legend, see Figure 1 on page 5)

Overall the **conservation status of this habitat type** in the Atlantic region has been assessed as ‘unfavourable-bad’, mainly due to pollution.

Table 31 Conservation status (CS) assessed at the Atlantic region and MS level (ETC BD 2012) (for legend, see introduction of chapter 3)

N2K code	Habitat name		BE	DE	DK	ES	FR	IE	NL	UK	REGION
3150	Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> - type vegetation	range	U1	FV	FV	XX	FV	XX	U1	FV	FV
		area	U1	U1	FV	XX	XX	XX	U1	XX	XX
		structure	U2	U2	U2	XX	U2	XX	U1	U2	U2
		future	U1	U1	U2	XX	U1	U2	U1	U2	U1
		overall	U2	U2	U2	XX	U2	U2	U1	U2	U2

The main reported threats and pressures to natural eutrophic lakes in the Atlantic region are:

- Nutrient enrichment (eutrophication) and inflow of pollutants (eg. by sewage discharges).
- Changes in land use in adjacent areas.
- Abstraction of ground and surface water (eg. for agriculture).
- Large scale fluctuations in water levels: water-levels are controlled and fixed for agricultural purposes; high in summer and low in winter.
- Recreation: angling and the associated stocking of lakes with benthic feeding fish.
- Motorized water sports.
- Non-native, invasive species (eg. *Crassula helmsii*, *Myriophyllum aquaticum*, *Elodea canadensis*, *Eichornia crassipes*, *Hydrocotyle ranunculoides*).
- Fixing of the banks (using concrete and other materials for stabilization) and other artificial structures, modifications, etc.
- Grazing: Large congregations of geese can exert considerable grazing pressure on submerged vegetation and also import nutrients. Additionally, geese can cause considerable damage to marginal and emergent fringing vegetation.
- Air pollution.
- Climate change and increasing population growth, resulting in an increased demand for fresh water.

The principal **management measures** for this habitat include:

- Restoration of the local hydrology; preventing or reducing the inflow of nutrients and pollutants (for example by setting up buffer zones and water catchment areas); re-creation of (natural) dynamics (for example re-establishing the seasonal variation of the water table).
- Improve surface water quality and promote limitation of the aquatic ecosystem by phosphate (eg. extent of agricultural, urban and industrial waste water treatment).
- Removal of sediment-disturbing fish.
- Removal of organic material and nutrient-rich sediment.
- Installation of de-phosphortation traps between agricultural areas and nature areas.
- Control of exotic invasive species and water birds (limiting accessibility of nearby agricultural pastures in order to prevent dominance of geese).

The most frequently encountered **bottlenecks** in the conservation or restoration of a favourable conservation status are:

- Insufficient funds.
- Contrary interests by stakeholder groups (farmers, nature managers)
- Lack of knowledge related to restoration
- Insufficient funds for habitat restoration.
- Lack of any mechanism for enabling definition and management of a groundwater protection zone for nature conservation purposes.
- Lack of knowledge about hydrology and groundwater.
- Agricultural policies.

Solutions to the pressures, threats and bottlenecks are to be sought in the development of:

- Stakeholder engagement and communication; including participative process and influencing policies, education and awareness raising, etc.
- Strategic planning of management measures at a site level, changing policy at the landscape level.
- Reducing or eliminating nutrient inputs from local terrestrial and aquatic sources is a critical part of an overall approach to reduce or mitigate nutrient impacts.
- Effective control of air quality
- Harmonising approaches to Habitats Directive and Water Framework Directive implementation.
- Specific measures in agri-environment schemes and sufficient funding to encourage uptake and meet demand.
- More research.
- More funding.

3260 - Water courses of plain to montane levels with the *Ranunculus fluitantis* and Callitricho-Batrachion vegetation

Summary

Water courses of plain to montane levels are characterised by the abundance of water-crowfoots *Ranunculus* spp., subgenus *Batrachium* (*Ranunculus fluitans*, *R. penicillatus* ssp. *penicillatus*, *R. penicillatus* ssp. *pseudofluitans*, and *R. peltatus* and its hybrids). Floating mats of these white-flowered species are characteristic of river channels in early to mid-summer. They may modify water flow, promote fine sediment deposition, and provide shelter and food for fish and invertebrate animals.

Functional aspects determine the heterogeneity of this habitat type. Five different types can be distinguished:

1. Fast running rivulets in hilly areas
2. Slow running rivulets in low lying areas
3. Fast running rivers in mountainous areas
4. Slow running rivers and disconnected meanders in low lying areas
5. Rivers in delta's

Table 32 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States (ETC BD 2012)

	BE		DE			DK		ES				FR				IE	NL		PT		UK
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL
number of sites	7	54	6	110	1241	44	78	6	23		106	8	119	145	25	21	10	2		29	28
habitat area (ha)	136	625	25	2689	16654	3281	7947	93	4630		30839	1039	20496	9921	3294	4436	300	914		8131	2935

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 50-75%. This means that Natura 2000 network provides an important framework for the management of this habitat type (ETC BD 2012).

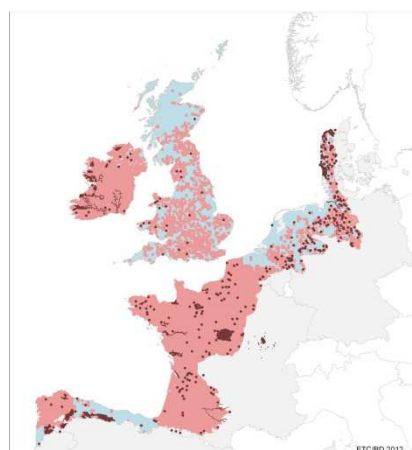


Figure 19 Map of SCIs proposed for the Water courses of plain to montane levels with the *Ranunculus fluitantis* and Callitricho-Batrachion vegetation & Article 17 distribution (ETC BD 2012) (for legend, see Figure 1 on page 5)

Overall the **conservation status of this habitat type** in the Atlantic region has been assessed as 'unfavourable-bad'.

Table 33 Conservation status (CS) assessed at the Atlantic region and MS level (ETC BD 2012) (for legend, see introduction of chapter 3)

N2K code	Habitat name		BE	DE	DK	ES	FR	IE	NL	PT	UK	REGION
3260	Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation	range	U2	FV	FV	XX	XX	FV	U1	FV	FV	XX
		area	U2	U2	FV	XX	XX	FV	U1	U1	U1	XX
		structure	U2	U2	U1	XX	XX	U2	U1	U1	U2	U2
		future	U2	U1	U1	XX	U1	U2	U1	U1	U2	U2
		overall	U2	U2	U1	XX	U1	U2	U1	U1	U2	U2

The main reported **threats and pressures** to water courses in the Atlantic region are:

- Diffuse pollution (including organic pollution, eutrophication, siltation, acidification, and other forms of toxic pollution (industrial discharges, sheep dip and other agrochemicals). Pollution may arise from atmospheric sources, consented effluents, catchment land uses (particularly agriculture), or small point sources such as septic tanks.
- Extensive physical modification, including channel widening, channel deepening, channel straightening, major upland impoundments and the construction of in-channel structures that impound flows, enhance siltation and prevent movement of species.
- Non-native species (e.g. *Impatiens glandulifera*, *Fallopia japonica*)
- Water abstraction (either direct from the river habitat or from groundwaters supplying them) for agriculture, public water supply and industry.
- Dikes, bank fixation and flooding defence in inland water systems. The floodplains are reduced to a fraction of the original floodplains. Therefore natural sedimentation and erosion processes are nearly absent.
- Sand and gravel extraction: creation of very deep artificial lakes.
- Management of aquatic and bank vegetation for drainage purposes, these activities also often result in damaging dredging and the associated removal of limnic sediments.
- Electricity production (hydropower).
- Cooling water.
- Shipping.
- Intensive recreational use.

The principal **management measures** for this habitat include:

- Excavation: broadening the bed or bevel off the bank.
- Habitat sensitive dredging /thinning out of herb species.
- Restoration of the level regime and flow.
- Preventing eutrophication.
- Local habitat (restoration) measures (re-meandering parts of rivulets, etc).
- Control of exotic invasive species.
- Rewetting of infiltration areas.
- Reversing the effects of hydropower barriers.

The most frequently encountered **bottlenecks** in the conservation or restoration of a favourable conservation status are:

- Insufficient knowledge about the ecology and biogeography of fresh water communities included in this habitat in order to develop adequate management measures. There is therefore a need to increase research in this field.
- Insufficient funds for habitat restoration/management measures.
- Lack of any mechanism for enabling definition and management of local hydrology for nature conservation purposes (and lack of knowledge about hydrology and groundwater).
- Agricultural policies.
- Stakeholder awareness and a lack of integrated land use and management planning (e.g. in relation to hydroelectric power generation issues, spatial planning, etc).

Solutions to the pressures, threats and bottlenecks are to be sought in the development of:

- Stakeholder engagement and communication; including participative process and influencing policies, education and awareness raising, etc.
- Strategic planning of management measures at a site level, changing policy at the landscape level.
- Harmonising approaches to Habitats Directive and Water Framework Directive implementation.
- Targeting funds at restoration management.
- An increase research.

91E0 - Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)

Summary

Alluvial forests include riparian ash (*Fraxinus excelsior*) and alder (*Alnus glutinosa*) forests and willow (*Salix alba*, *S. fragilis*) and black poplar (*Populus nigra*) galleries along lowland and hilly watercourses, together with grey alder (*Alnus incana*) riparian forests of sub-montane to sub-alpine rivers. All types occur on alluvial deposits (generally rich in clay), mostly inundated by the annual rise of the river (or brook) level, but otherwise well-drained and aerated during periods of low-water. The herb layer is composed of tall herb species preferring humid and nutrients rich soils. Most of these forests are in contact with humid meadows or ravine forests (*Tilio-Acerion*). A succession towards *Carpinion* (*Primulo-Carpinetum*) can be observed.

Alluvial forests need a high base saturation (especially calcium), a pH (KCl) of more than 5.5, a high moisture demand, and high to medium demand for nutrients. Inundations, a high clay content, or lithotrophic groundwater influence can help to meet these demands. Seed banks are also influenced by actual fluvial processes or a fluvial past. In addition some Alderwoods of the brook valleys may tolerate somewhat lower pH and peaty soils. Spring fed alluvial forests are favoured by base rich groundwater with a low content of phosphorus and tolerate small fluctuations between highest and lowest groundwater level.

This habitat type is relatively widespread, but occurs as fragmentary stands where the hydrologic regime is favourable.

Table 34 Number of Sites of Community Interest (SCIs) and habitat area (ha) within SCIs per Member State in the different biogeographical regions of the Atlantic Member States (ETC BD 2012)

	BE		DE			DK		ES				FR				IE	NL		PT			UK
	ATL	CON	ALP	ATL	CON	ATL	CON	ALP	ATL	MAC	MED	ALP	ATL	CON	MED	ATL	ATL	ATL	MAC	MED	ATL	
number of sites	79	155	21	213	1715	18	108	22	154		150	39	224	232	48	29	35	6		25	74	
habitat area (ha)	6804	5455	867	5002	42168	1003	7304	944	16477		37472	17216	62424	23591	7385	3490	3321	3230		14666	3340	

According to the ETC/BD estimation the percentage of the habitat area in the network falls into the class 51-76%. This means that Natura 2000 network provides an important framework for the management of this habitat type (ETC BD 2012).

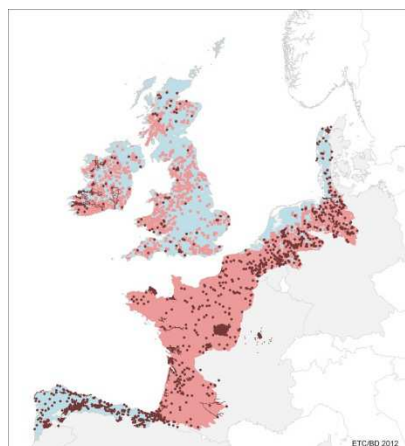


Figure 20 Map of SCIs proposed for Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) & Article 17 distribution (ETC BD 2012) (for legend, see Figure 1 on page 5)

The **conservation status of this habitat type** is mostly ‘unfavourable bad’ in the Atlantic region due to management of water levels and regulation of water courses.

Table 35 Conservation status (CS) assessed at the Atlantic region and MS level (ETC BD 2012) (for legend, see introduction of chapter 3)

N2K code	Habitat name		BE	DE	DK	ES	FR	IE	NL	PT	UK	REGION
91E0	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>)	range	FV	FV	FV	XX	FV	FV	FV	FV	FV	FV
		area	FV	U1	FV	XX	U2	U2	U1	FV	U1	U2
		structure	U2	U1	FV	XX	U2	U2	U1	XX	U2	U2
		future	FV	U1	XX	XX	U2	U2	U1	FV	U1	U2
		overall	U2	U1	FV	XX	U2	U2	U1	FV	U2	U2

The main reported threats and pressures to alluvial forests in the Atlantic Region are:

- Inappropriate grazing regimes and poaching of the soil by livestock
- General forestry management (cessation of traditional management, clear cut heavy equipment).
- Poor water quality arising from eutrophication (mainly by fertilizers from the agricultural surroundings), industrial effluents or rubbish dumping.
- Atmospheric pollution from ammonia and oxides of nitrogen.
- Water management: (i) lowering of water tables through drainage or water abstraction; (ii) flood prevention measures, river control and canalization.
- Modification of hydrological functioning.
- Biocenotic evolution – the encroachment of trees and scrub.
- Invasive non-native species (*Acer pseudoplatanus*, *Fagus sylvatica*, *Rhododendron ponticum*, *Prunus laurocerasus*, *Cornus sericea*, *Impatiens glandulifera* and *Heracleum mantegazzianum*, Himalayan balsam, *Fallopia japonica*)
- Fragmentation: small wooded areas are more vulnerable to external impacts, genetic isolation, climate change, the border effects are relatively great, etc.
- Clearance and conversion for other land uses

The principal **management measures** for this habitat include:

- Re-afforestation (of the appropriate species) in order to improve connectivity and extend the area of existing sites.
- Active control and the prevention of colonisation by non-native, invasive species.
- Development / restoration of a species-rich herb layer, a rich forest structure with a characteristic tree composition and sufficient quantities of dead wood.
- Transformation of popular plantations through the (re)planting of appropriate species.
- Rewetting by blocking drains.
- Improving the water quality and the local groundwater influences.

The most frequently encountered **bottlenecks** in the conservation or restoration of favourable conservation status for this habitat are:

- Insufficient funds and personnel.
- Lack of understanding and knowledge by landowners/stakeholders.
- Weak policies/lack of regulatory and/or financial incentive to landowners to make necessary beneficial land use.
- Conflicts with other interests (eg. the 'roughness' [their perceived propensity to impede the flow of floodwater off the inundated surface] of the alluvial forests is seen as a risk in times of excessive flooding leading to the removal of forests and bushes to lower the roughness of the inundated surface).
- Conflicting interests with agriculture, forestry.
- No solution presently available for the Elm and Ash disease.

Solutions to the pressures, threats and bottlenecks are to be sought in the development of:

- Awareness raising.
- Education, training and communication
- Balanced policy on conflicting items; (e.g. strategic planning of management measures at a site level, changing policy at the landscape level).
- Creation of buffer zones with low levels of fertilization around this habitat type.
- Reducing or eliminating nutrient inputs from local terrestrial and aquatic sources.
- Harmonising approaches to Habitats Directive and Water Framework Directive implementation.
- Specific measures in agri-environment schemes and sufficient funding to encourage uptake and meet demand.