Natura 2000 Seminars

Alpine Region

Background document

Grasslands - Draft 5

An initiative of the European Commission

NATURA 2000

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1 Introduction: the New Biogeographical Process in the Alpine Biogeographical Region

The purpose of the New Biogeographical Process is to help Member States to manage Natura 2000 as a coherent ecological network, whilst exchanging experience and best practice, addressing objectives and priorities and enhancing cooperation and synergies. The process should contribute to the achievement of Favourable Conservation Status (FCS) for those habitats and species of community interest (listed in annex one of the Habitats Directive) that have been identified as having priority within the given biogeographical region, with a special focus on the contribution of the Natura 2000 network, but without ignoring horizontal measures where necessary.

In the context of the viability of the Natura 2000 network it is important to know how to ensure that habitats also achieve a level of favourable conservation status outside Natura 2000 site boundaries, and also how to address the major threats that occur there.

The process for each biogeographical region consists of three milestone meetings:

1) Steering Committee (meetings): The Steering Committee has an essential role and each regional process starts with a meeting of the Steering Committee. It is composed of representatives of the Member States that fall in the biogeographical region and in addition the following organisations are also represented: European Commission (EC), European Environment Agency (EEA), and European Topic Centre on Biological Diversity (ETC/BD). Observers from other MS are also allowed to attend upon invitation. The Steering Committee reviews the pre-scoping document, and makes the final decision about the priority habitats and species, and the habitat groups.

2) Preparatory Workshop: The workshop is used to prepare the seminar. The workshop is a very informal working meeting that provides the basic material and preparation for the Seminar. It is informed by the Background Document but does not consider the content or technical detail of the latter; rather it provides a set of themes (crosscutting or unique to the individual habitat groups) whose elaboration in terms of solutions and actions will form the basis of the seminar document. The role of the contractor regarding the preparatory workshop is to work with the EC and to assist MS in preparation, minutes, proceedings, organising, leading discussions, and to decide with MS on themes.

3) Seminar: The Seminar is based on the Seminar Document whose content is derived from the preparatory workshop. Central to this document are a list of habitat groups related and crosscutting issues and problems whose solutions will directly contribute to achieving FCS. The seminar should draw conclusions and make recommendations regarding management and actions in relation to selected habitat types (based on the habitat specific and cross cutting issues). The seminar should result in a jointly agreed list of actions on the part of MS. As the seminar returns only once every five years, what happens in between is very important.

- Ad Hoc Expert Group Meetings can be held between the workshop and the seminar in order to address specific issues (which may be raised during the workshop or may become clear after the workshop).
- A pre-scoping document with lists of priority habitats and species is drafted by the ETC/BD. The pre-scoping document explains the selection of habitats and is posted on CIRCABC. The Contractor and partners are free to contact ETC/BD for information on the contents and composition of the pre-scoping doc.
- For each biogeographical region the pre-scoping document provides details on a selection of a manageable number of habitats and species: focusing on those habitat types where action is most needed. This first list is discussed and agreed with the Member States inside the biogeographical region during and shortly after a Steering Committee meeting.
- During any given biogeographical process, information is collected through the use of a targeted questionnaire. This is then compiled into a Background Document which informs the working groups within the preparatory workshop. The Background Document has a life beyond the seminar; it should therefore be continuously improved, modified and added to as each five-year cycle continues.
- The Seminar brings together key actors (including ministry and state institute officials, NGOs and stakeholders) from different countries for the exchange of practice and should result in the

creation of expert networks about similar habitats inside a biogeographical region. The Biogeographical Process is to be used to assess of management practices and best practices and result in the formulation of recommendations based on the process.

- Internal Communication within the process for each biogeographical region is particularly important; thus:
  - CIRCABC is currently the main internal information platform for the process: https://circabc.europa.eu;
  - In order to make the relevant documents easily accessible, special interest groups for each Biogeographical Region (BGR) are created on CIRCABC;
  - An Interest Group for the Alpine Steering Committee has already been created and is composed of representatives of the EC, the EEA, the ETC/BD and member states (MS).
  - For the moment CIRCABC is to be used to store meeting agendas, minutes, documents.

The Alpine process is led by Austria. The Steering Committee of the Alpine process is composed of representatives of the 12 Member States (AT, BG, CZ, DE, ES, FR, FI, IT, PL, SE, SI, SK) and the EEA, ETC/BD, and EC. Based on the pre-scoping document and the discussions of the Steering Committee, four focus habitat groups were selected: forests, wetlands; grasslands; freshwater. For the Alpine process, a number of species has been identified that will be covered as part of cross-cutting issues.
An internet based platform for external and internal communication is being developed as part of project. The primary target audience for the internet platform should include those people that can take action for Natura 2000 (in a first instance site managers but also policy makers, civil society, and land owners).

The drafting process of the background document

The Alpine Background Document compiles the readily available information regarding 22 selected habitat types, as selected by the MS for the Alpine Seminar Process. In its first version it contains the habitat descriptions as included in a pre-scoping document, prepared by the European Topic Centre on Biological Diversity (ETC/BD) and the EEA[1]. In a next steps, MS are invited to ask their habitat experts to complete an Expert Input Form to collect additional knowledge about the habitat types concerned.

The information that is collected in the pre-scoping document and by the expert input forms will be complemented by a selection of case studies that will illustrate specific issues that are referred to in the background document.

Description of the selected habitat types

This section provides overview information for each of the 22 selected priority habitat types.

The habitat types are presented in ascending order of their Natura 2000 code as introduced in Annex I of the EC Habitats Directive. The colour codes refer to the habitat groups to which they belong: freshwater (blue), grasslands (light green), wetlands (purple), forests (dark green).

CODE	HABITAT NAME
3140	Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.
3150	Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation
3220	Alpine rivers and the herbaceous vegetation along their banks
3230	Alpine rivers and their ligneous vegetation with *Myricaria germanica*
3240	Alpine rivers and their ligneous vegetation with *Salix elaeagnos*

[1] Available online at https://circabc.europa.eu/faces/jsp/extension/wai/navigation/container.jsp?FormPrincipal:_idcl=FormPrincipal:_id3&FormPrincipal_SUBMIT=1&id=31d9c683-b68d-47c7-b80e-900eca33c1e0&javax.faces.ViewState=rO0ABXVyABNbTGphdmEubGFuZy5PYmplY3Q7kM5YnxBzKWwCAAB4cAAAAAN0AAEzcHQAKy9qc3AvZXh0ZW5zaW9uL3dhaS9uYXZpZ2F0aW9uL2NvbnRhaW5lci5qc3A=

CODE	HABITAT NAME
3260	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco - Brometalia*) * important orchid sites
6230	Species-rich *Nardus* grasslands, on silicious substrates in mountain areas (and sub-mountain areas in Continental Europe)
6410	*Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
6510	Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*)
6520	Mountain hay meadows
7110	Active raised bogs
7140	Transition mires and quaking bogs
7230	Alkaline fens
91D0	Bog woodland
91E0	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)
9130	*Asperulo-Fagetum* beech forests
9170	*Galio-Carpinetum* oak hornbeam forests
9180	*Tilio-Acerion* forests of slopes, screes and ravines
9260	*Castanea sativa* woods
9410	Acidophilous *Picea* forests of the montane to alpine levels (*Vaccinio-Piceetea*)

Legends for the maps, figures and tables

Factual information for each habitat type is given in the form of standard tables, figures and maps presented in the pre-scoping document. Reading and interpreting the maps, figures and tables provided by the EEA / ETC/BD requires a legend for their clear understanding. The respective legends and explanations are presented here, with cross-references to the sections within each habitat type.

For each habitat type, tables represent the conservation status of species and habitats in the following manner.

code	status
FV	Favourable
U1	Unfavourable – inadequate
U2	Unfavourable – bad
XX	Unknown

Pressures/threats are driven by the habitat type and the species sharing the same pressures/threats are noted in the table as well. This means that a species may have other pressures/threats as well, which do not appear in the table. Only those pressures/threats for habitat types are taken into account when they are reported by more than 1/3 of MS where the habitat type/species is present. If a pressure/threat is reported by more than 2/3 of MS this is indicated in light blue colour. If a pressure/threat is reported by all MS where the habitat type or species occurs, it is indicated with darker blue colour.

For each habitat type, a table presents the species that have been identified as particularly associated to the habitat type. It shows linkage at European level according to data by the ETC/BD. Where available, additional information on country level has been included.

Explanations:
HD Annex II & IV species occurring in 8-12 MS
HD Annex II & IV species occurring in 3-7 MS
BD Annex I species occurring in 8-12 MS
BD Annex I species occurring in 3-7 MS

All expert input has been collated into a series of tables for each habitat and a summary has been provided at the beginning of each section to provide a concise overview. Feedback that used the Article 17 threats/pressues codes and which linked advice between the different questions was captured first. This is reflected in the numbering of each table. So for example, threat number four will be linked to management requirement, solution and bottleneck number four in each habitat section. When recommendations have been made that are unconnected with previous questions/tables then the text has been shown in blue and is not numbered. Please note that the numbering does not indicate the priority of specific threats and pressures. Please also note that the numbering is only sequential in the first threats and pressures table for each habitat. This is because of the need to preserve the relationships between the tables in each section and the fact that the same threat/pressure was often identified by more than one MS.

Most text, especially additional information, has been edited for grammar and simplified in some cases to convey a clearer meaning. This has been done from both an ecological and liguistic perspective. A very limited amount of elaboration has been required in some cases where input has been incomplete. This has been indicated through the use of 'review comments', as has been the case for any direct comments made by experts about the background document itself. This was done to provide an initial audit trail to help in redrafting. It is enviaged that these will not be retained in the final document once the content has been agreed by the Alpine Steering Committee. As this is a 'living document' there will be opportunities for contributors to modify their own text if the wrong meaning has been conveyed through this process.

Blue text shows general recommendations not directly linked to specific threats or pressures. Information has been aggregated if listed as separate points in the original input in order to save space. This type of input was either replicated by individual experts as a generic recommendation across more than one habitat type or was simply not linked in the individual expert input form. This is why it cannot be directly associated with particular threats or pressures and lacks specificity in some cases.

Sub-section numbering was used for recommendations that addressed a specific pressure or threat but which had sufficiently different meanings or MS specificity to remain separate. The numbering of tables, apart from the threats and pressues table, is not sequential as suggestions relating to specific threats and pressures was often lacking in the expert input form. The number of times a threat or pressure was identified or recommendation made by experts from each country is indicated so that the relative importance of different issues can be quickly evaluated by users. This information was also used to support the overall summary for each habitat group. It was necessary to make a 'value judegement' in relation to the equivalence of the input in some instances which means that this process was not entirely objective or error free which was inevitable given the nature of the input. Where the meaning was equivocal or highly specific then a precautionary approach was used and a new entry was made.

No habitat-based expert input was received from Spain or the Slovak Republic at the time this draft was completed. Blank cells indicate this fact as well as a lack of comment from individual countries in relation to specific habitats or questions. Only one country provided general comments in relation to *Castanea sativa* woodlands (9260) possibly reflecting the limited extent of N2K sites in most of the countries of the Alpine Region.

2 Grasslands

Summary

Process participation and representation

The following figures summarise the input that was provided by the country experts for the freshwater habitat group that consisted of: 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco - Brometalia*) *important orchid sites; 6230 Species-rich *Nardus* grasslands, on silicious substrates in mountain areas (and sub-mountain areas in Continental Europe); 6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*); 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels; 6510 Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*); 6520 Mountain hay meadows.

	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
Number of habitats considered	6	1	6	0	1	6	5	6	1	5	5	5*
Number of participating experts	7	1	6	0	1	5	3	5	1	1	2	1*
Habitat area (1000s ha)	30.4	93.8	8.0	42.2	0.8	84.5	123.1	22.9	139.6	6.4	22.0	22.1
Habitats considered	all	6230	all	n/a	6430	all	6210, 6230, 6410, 6510, 6520	all	6410	6210, 6230, 6410, 6430, 6520	6210, 6230, 6410, 6510, 6520	6210, 6230, 6410, 6430, 6510

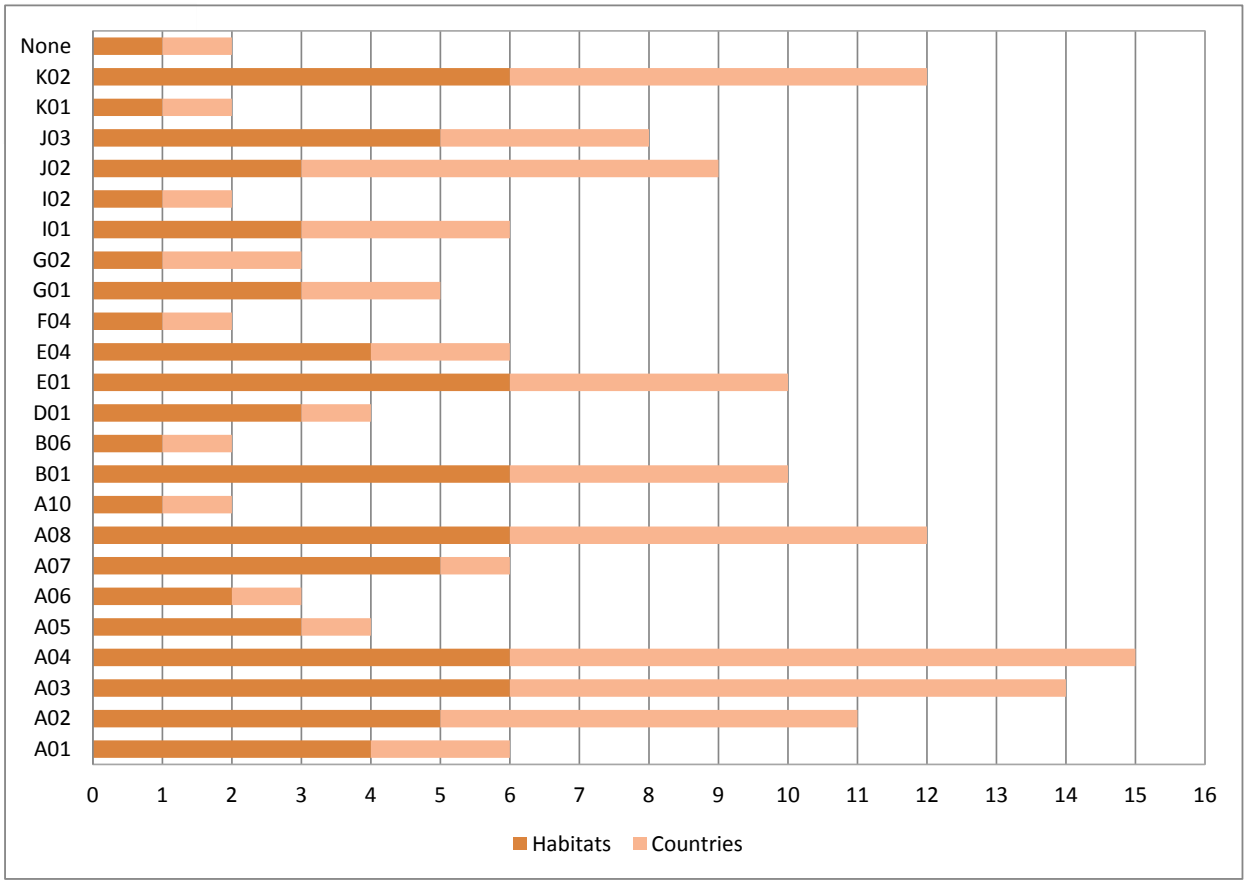
* case studies only

A detailed record of the submissions can be found in the following sections that show the number of experts and countries that made specific recommendations, in relation to particular threats and pressures, or more general recommendations that were either related to individual habitats or the overall habitat grouping. This section is designed to provide a rapid overview of the collated information but the figures need be interpreted with some caution because of the nature of the underlying data. This is because a number of experts applied the same comments to all the habitats which means that the number of habitats shown in the following figures may be indicating this fact in some instances rather than showing a genuinely emergent issue. The number of countries shown should also be carefully interpreted as it is directly related to the number of experts who participated in the process. As the preceding table shows, participation was highly variable between countries. This means that an issue that is apparently only present in one country could actually be more widespread. Some experts also submitted the same input for more than one country which had the same effect as submissions that were made for multiple habitats although this only occurred in a couple of instances. Overall, these issues only relate to less than 25% of submissions which should still enable a valid interpretation of the stronger patterns where an issue is associated with the majority of habitats and countries (experts). These could potentially indicate areas that need to be developed further in the workshop and provide the basis for some concrete collaborative actions across the alpine biogeographical region.

Threats and pressures identified by country experts

The reported threats reflect the nature of this habitat group – because of semi-natural grasslands depending on regular human intervention (with certain exception of the habitat type 6430) are represented, main threats and pressures were related to the management (grazing, mowing) issues – either to their high intensity, timing or absence. There are threats and pressures operating across whole group of the selected grassland habitats: mowing/cutting of grassland, grazing, fertilisation, afforestation, urbanised areas**,** biocenotic evolution and succession. For high number of habitat types were reported also modification of cultivation practices, use of biocides & chemicals and other ecosystem modifications. Grazing (reported by 9 countries), mowing (8), succession (6), modification of cultivation practices (6), fertilisation(6) and changes in hydraulic conditions (6) were the most widespread pressures across countries reflecting the main 2 processes: intensification of agricultural management and abandonment. Many countries reported both processes and several countries

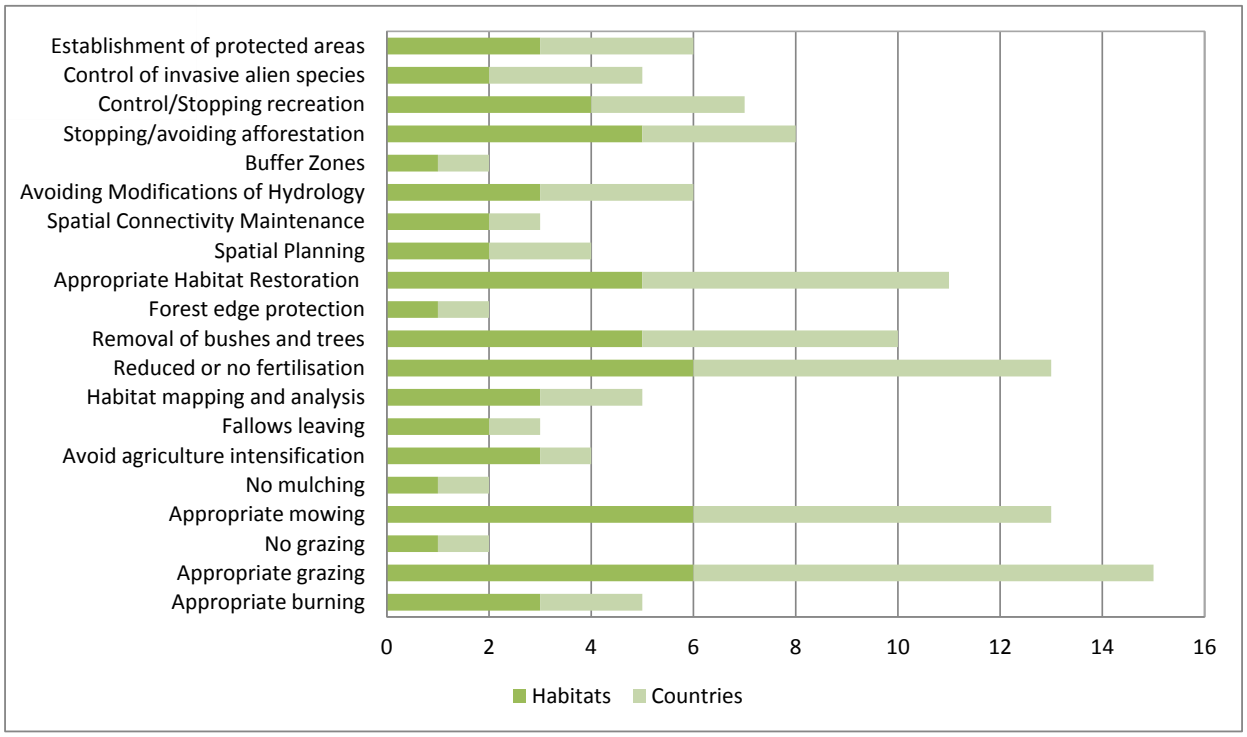
specifically indicated the polarization of agricultural landscape (intensive use of fertile, well accessible sites and abandonment of remote sites with low-productivity) as a threat. The urbanisation and reduction of habitat connectivity by fragmentation are considered as important pressures as well.
The invasive non-native species are not perceived in this habitat group as crucial problem because they were identified as a threat only by three countries in relation to three habitat types. This is probably linked to certain resistance of grasslands against invasions – because of regular disturbances (mowing, grazing) in grasslands and strong competition between species (semi-natural grasslands are usually specie-rich), especially stress tolerant competitors are favoured in the community what is not a case of the invasive species having usually ruderal strategy.
The habitat type 6430 is not under pressure in Finland because it represents a natural type of vegetation in the Finish Alpine region which does not need traditional land use and management such as grazing or mowing. In addition, most of the sites of this type are within Natura 2000 areas.



Cultivation (**A01**); Modification of cultivation practices (**A02**); Mowing/cutting of grassland (**A03**); Grazing (**A04**); Livestock farming and animal breeding (without grazing) (**A05**); Annual and perennial non-timber crops (**A06**); Biocides, hormones & chemicals (**A07**); Fertilisation (**A08**); Restructuring agricultural land holding (**A10**); Forest planting on open ground (**B01**); Grazing in forests/ woodland (**B06**); Roads, paths and railroad (**D01**); Urbanised areas, human habitation (**E01**); Structures, buildings in the landscape (**E04**); Taking / Removal of terrestrial plants, general (**F04**); Outdoor sports & leisure activities (**G01**); Sport and leisure structures (**G02**); Invasive non-native species (**I01**); Problematic native species (**I02**); Human induced changes in hydraulic conditions (**J02**); Other ecosystem modifications (**J03**); Abiotic (slow) natural processes (**K01**); Biocenotic evolution, succession (**K02**); Changes in abiotic conditions (**M01**).

Management requirements identified by country experts

Mostly the proper, non-intensive grazing and mowing were identified as the appropriate management measures for semi-natural grasslands what is not a surprise. Other frequently mentioned requirement was low fertilisation or avoidance of the fertilisation. In reaction to quite widespread problem of grassland abandonment, the habitat restoration, removal of bushes and trees overgrowing grasslands and stopping of their afforestation represented other frequently proposed management measures. Besides existence and intensity of grassland utilisation, also its timing in a year is considered important, especially in relation to the butterfly species. The habitat mapping and analysis was also reported especially because of lack of information about some habitat types.



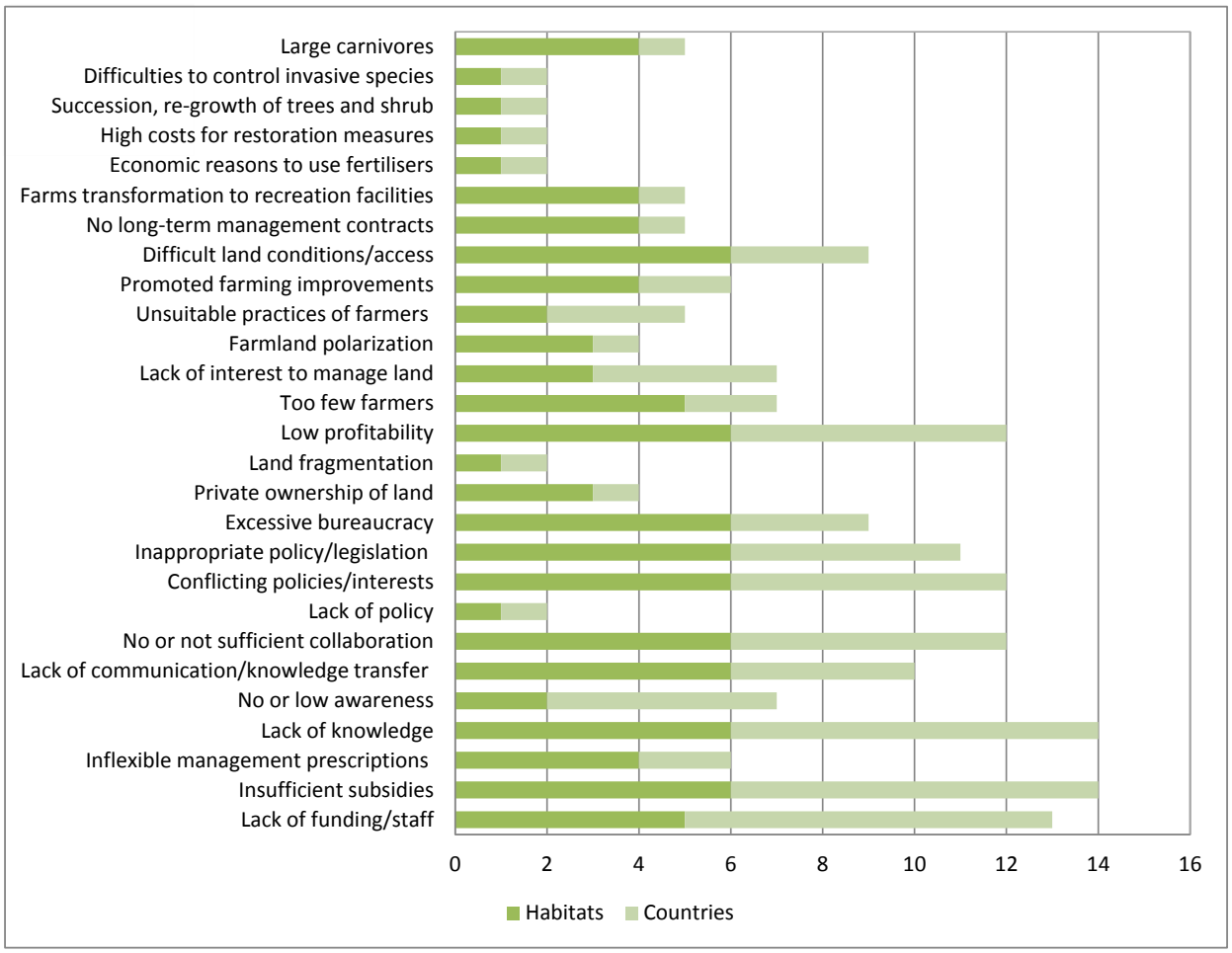
Barriers and bottlenecks identified by country experts

Not surprisingly, the top-ranked barrier was the lack or not sufficient funds for grassland management, but quite surprisingly also the lack of knowledge. It is a twofold surprise because it is believed that the grasslands are in Europe studied sufficiently.

The insufficient subsidies were reported by 8 countries, this refers especially to the CAP subsidies and it covers both amount of funds available for individual measures and setting of measures: not suitable definition, low flexibility of the measures, complicated procedures and administration etc. Besides lack of funding, also lack of staff or low personnel capacity in institutions managing the funding schemes were often reported. The low profitability of the grassland management represent other important barrier for quite high number of countries (6) similarly as the absent or not sufficient collaboration and conflicting policies and inappropriate policy/legislation. It looks that especially communication with farmers and other stakeholders, education, awareness raising and transfer of knowledge are fields in which the improvement is needed. Other fields needing improvements are policy and legislation where insufficient policy, conflicting policies and not suitable approval procedures are reported.

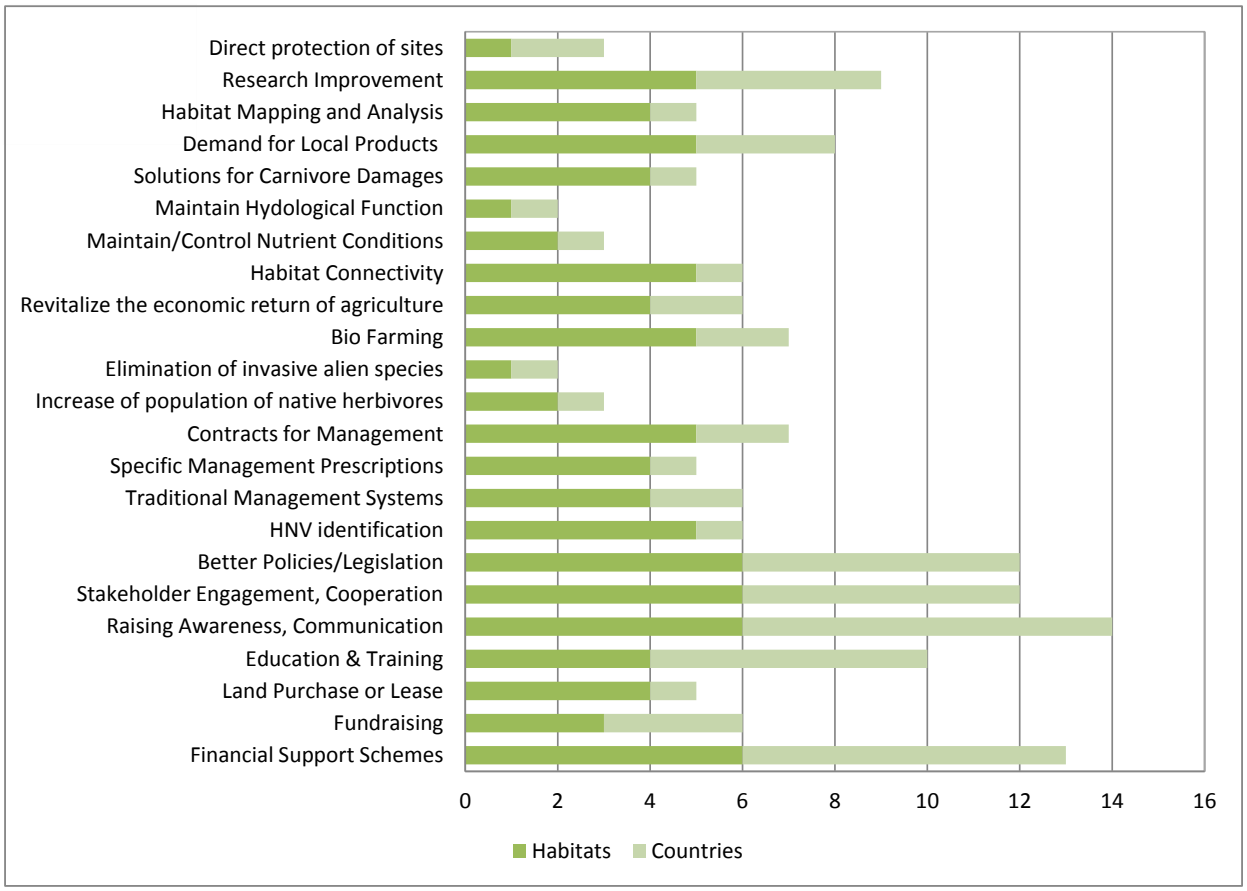
Certain homogeneity of this habitat group is visible from the fact that nine barriers/problems were reported for all 6 habitat types of this group: insufficient subsidies, lack of knowledge, lack of communication or knowledge transfer, absent or not sufficient collaboration, conflicting policies / interests, inappropriate policy/legislation, excessive bureaucracy, low profitability, and difficult natural conditions or access (remote places). The excessive bureaucracy is related especially to the quite demanding administrative procedures that result in situation when it is relatively complicated for farmers to get the financial support.

Some specific features has Swedish Alpine region for which are reported specific bottlenecks like the large carnivores, remoteness, transformation of the summer farms to facilities for recreation.



Solutions identified by country experts

The experts consider the work with stakeholders, especially farmers and local/regional institutions as the most promising area for improvement or field where the biggest reserves exist, because most countries (8) proposed as solution of current situation awareness rising, communication, cooperation and stakeholder engagement. The better financial support schemes are important for experts from 7 countries respectively. Quite frequently (by experts from 6 countries) were specified education and training, stakeholder engagement and cooperation, better policies and legislation.
Similar proposals were most frequently reported also for habitat types – four solutions were proposed for all 6 habitat types: rising awareness and communication, cooperation and stakeholder engagement, financial support schemes, and better policies and legislation. The High-Nature Value farmland areas identification was also found as a useful solution and the policy instrument. Surprisingly, there was relatively low reference to the appropriate management practices for individual types of grassland habitats. Probably the experts consider them as a basic precondition for the grassland habitats maintenance and did not referred specifically to them.



Species requiring special management measures

Name	Group	6210	6230	6410	6430	6510	6520
Botrychium sp.	plants		1				1
Botrychium simplex	plants		1	1			
Cypripedium calceolus	plants	1					
Dracocephalum austriacum	plants	1					
Eryngium alpinum	plants				1		1
Gentianella campestris	plants	1					1
Gymnadenia nigra	plants	1					1
Trollius europaeus	plants						1
Argynnis niobe	butterflies	1	1	1			
Boloria selene	butterflies		1	1			
Carcharodes flocciferus	butterflies			1	1		
Chazara briseis	butterflies	1					
Coenonympha oedippus	butterflies			1			
Coenonympha tullia	butterflies			1	1		
Euphydryas aurinia	butterflies	1	1	1	1	1	1
Lopinga achine	butterflies	1	1	1			
Lycaena helle	butterflies			1	1	1	1
Lycaena hippothoe	butterflies		1	1			1
Lycaena tityrus	butterflies						1
Maculinea (Phengaris) alcon	butterflies			1	1		
Maculinea (Phengaris) arion	butterflies	1	1	1		1	1
Maculinea (Phengaris) nausithous	butterflies				1	1	1
Maculinea (Phengaris) telejus	butterflies			1	1	1	1
Melanargia russiae	butterflies	1					
Minois dryas	butterflies			1	1		
Parnassius mnemosyne	butterflies				1	1	1
Polyommatus dorylas	butterflies	1	1	1			
Proclossiana eunomia	butterflies			1	1		
Pyrgus alveus	butterflies	1	1				
Pyrgus serratulae	butterflies		1	1			
Endemic butterflies	butterflies	1					1
Aquila chrysaetos	birds						1

2.1 6210 - Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)

Habitats Manual (2007) Extract

Dry to semi-dry calcareous grasslands of the *Festuco-Brometea*. This habitat is formed on the one hand by steppic or subcontinental grasslands (*Festucetalia valesiacae*) and, on the other, by the grasslands of more oceanic and sub-Mediterranean regions (*Brometalia erecti*); in the latter case, a distinction is made between primary *Xerobromion* grasslands and secondary (semi-natural) *Mesobromion* grasslands with *Bromus erectus*; the latter are characterised by their rich orchid flora. Abandonment results in thermophile scrub with an intermediate stage of thermophile fringe vegetation (*Trifolio-Geranietea*).
Important orchid sites should be interpreted as sites that are important on the basis of one or more of the following three criteria:

(a) the site hosts a rich suite of orchid species
(b) the site hosts an important population of at least one orchid species considered not very common on the national territory
(c) the site hosts one or several orchid species considered to be rare, very rare or exceptional on the national territory.

Often in association with scrubland and thermophile forests and with dry pioneer *Sedum* meadows (*Sedo-Scleranthea*).

Albertsson, N. (1950). *Das grosse südliche Alvar der Insel Öland*. Eine Pflanzensoziologische Übersicht. Sven. Bot. Tidskr. 44:269-331.

Conservation status (CS) assessed at the Alpine region and MS level

N2K code	Habitat name		AT	BG	DE	ES	FR	IT	PL	RO	SE	SI	SK	REGION
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	range	FV		FV	XX	FV	FV	U1		FV	FV	U1	XX
		area	U1		U1	XX	U1	FV	U1		U2	U2	XX	XX
		structure	XX		U1	XX	XX	FV	U1		U2	U2	FV	XX
		future	U1		U1	XX	U1	FV	U1		U2	U2	XX	XX
		overall	U1		U1	XX	U1	FV	U1		U2	U2	U1	XX

Grasslands on chalk or limestone typical of much of Europe, where the habitat is orchid rich it is considered to be a 'priority' habitat.

Assessed as 'unfavourable-bad' in the Atlantic, Boreal, Continental and Pannonic regions. In all these regions all parameters except 'range' are 'unfavourable-bad'. Within these regions only Italy (Continental) assessed this habitat as 'favourable' although Spain reported 'unknown' for its Atlantic region.

Assessed as 'unknown but not favourable' for the Alpine and Mediterranean regions largely as a result of Spain reporting 'unknown' for both regions. Again Italy assessed the habitat as 'favourable' for both regions as did Portugal (Mediterranean).Many threats and pressures are reported but many countries note changes in agriculture, leading to both abandonment and overgrazing. Better information required, especially from Spain (Summary sheet of the online report on Article 17 of the Habitats Directive).

Species associated with this habitat and their CS at the Alpine region and MS level

N2K code	Species name	Group		AT	BG	DE	ES	FR	IT	PL	RO	SE	SI	SK	REGION
1050	*Saga pedo*	Invertebrates	range	FV					U2					U1	U1
			population	U1					U2					U1	U1
			habitat	U1					U1					U1	U1
			future	U1					U1					XX	XX

N2K code	Species name	Group		AT	BG	DE	ES	FR	IT	PL	RO	SE	SI	SK	REGION
			overall	U1					U2					U1	U1
1053	*Zerynthia polyxena*	Invertebrates	range	XX				XX	FV				FV	FV	XX
			population	XX				XX	FV				U1	FV	XX
			habitat	XX				XX	FV				U1	FV	XX
			future	XX				XX	U1				U1	FV	XX
			overall	XX				XX	U1				U1	FV	XX
1056	*Parnassius mnemosyne*	Invertebrates	range	FV		FV	XX	FV	U2	U1			FV	FV	U1
			population	FV		XX[2]	XX	FV	U1	U1			U1	FV	U1
			habitat	U1		FV	U1	FV	FV	XX			U1	FV	U1
			future	U1		FV	XX	FV	FV	U1			U1	FV	U1
			overall	U1		FV	U1	FV	U2	U1			U1	FV	U1
1057	*Parnassius Apollo*	Invertebrates	range	U1		FV	XX	FV	FV	FV			U2	U1	U1
			population	U1		FV	XX	FV	FV	FV			U2	U1	U1
			habitat	U1		FV	XX	FV	FV	U1			U2	U1	U1
			future	U1		FV	XX	FV	U1	FV			U2	U1	U1
			overall	U1		FV	XX	FV	U1	U1			U2	U1	U1
1058	*Maculinea arion*	Invertebrates	range	FV		FV	XX	FV	U2	XX			FV	FV	U1
			population	FV		FV	XX	XX	U2	U2			U1	U1	U2
			habitat	U1		FV	XX	FV	U1	U1			U1	U1	U1
			future	U1		FV	XX	FV	U1	U1			U1	U1	U1
			overall	U1		FV	XX	FV	U2	U2			U1	U1	U2
	Species name	**Group**		**AT**	**BG**	**DE**	**ES**	**FR**	**IT**	**PL**	**RO**	**SE**	**SI**	**SK**	**REGION**
1065	*Euphydryas aurinia*	Invertebrates	range	FV		FV	XX	FV	FV				FV		FV
			population	FV		XX[2]	XX	FV	FV				U1		U1
			habitat	U1		FV	XX	FV	FV				U1		U1
			future	U1		FV	U1	FV	FV				U1		U1
			overall	U1		FV	U1	FV	FV				U1		U1
1067	*Lopinga achine*	Invertebrates	range	U1		XX		U1	FV				FV	U2	U1
			population	FV		U1		XX	FV				FV	U2	FV
			habitat	U1		U1		U1	FV				FV	FV	U1
			future	U2		FV		U1	FV				FV	U1	U2
			overall	U2		U1[3]		U1	FV				FV	U2	U2
1072	*Erebia calcaria*	Invertebrates	range	FV					U1				U1		U1
			population	FV					FV				FV		FV
			habitat	U1					FV				FV		FV
			future	U1					FV				U1		U1
			overall	U1					U1				U1		U1
1310	*Miniopterus schreibersii*[4]	Mammals	range	U2			XX	U1	U1				FV	U1	U1
			population	U2			XX	U2	U1				U1	U2	U2
			habitat	U2			XX	XX	U2				XX	XX	XX
			future	U2			U1	U2	U1				XX	XX	U2
			overall	U2			U1	U2	U2				U1	U2	U2
	Species name	**Group**		**AT**	**BG**	**DE**	**ES**	**FR**	**IT**	**PL**	**RO**	**SE**	**SI**	**SK**	**REGION**
1335	*Spermophilus citellus*	Mammals	range	U2										U2	U2
			population	U2										U2	U2
			habitat	U2										U1	U1
			future	U2										U2	U2
			overall	U2										U2	U2
1419	*Botrychium*	Vascular	range	FV				FV	U2						U2

[2] According to the current Art. 17 report assessment: FV
[3] Current Art. 17 report assessment = FV/FV/FV/FV
[4] Connection of *M. schreibersii* with this habityat type was questioned by one contributor

N2K code	Species name	Group		AT	BG	DE	ES	FR	IT	PL	RO	SE	SI	SK	REGION
	simplex[5]	plants	population	U1				U2	U2						U2
			habitat	XX				FV	XX						XX
			future	U1				U2	U2						U2
			overall	U1				U2	U2						U2
1689	*Dracocephalum austriacum*	Vascular plants	range	FV			U2	FV	FV					U1	FV
			population	U1			XX	FV	FV					U2	U1
			habitat	U1			XX	U1	XX					U1	U1
			future	U2			XX	U1	FV					U1	U1
			overall	U2			U2	U1	FV					U2	U1
1902	*Cypripedium calceolus*[6]	Vascular plants	range	FV		FV	U1	U1	FV	U1		FV	FV	FV	FV
			population	XX		FV	XX	FV	FV	U1		FV	FV	U1	XX
			habitat	FV		FV	XX	FV	XX	U1		FV	FV	FV	FV
			future	FV		FV	U1	U1	FV	U1		FV	FV	U1	FV
			overall	FV		FV	U1	U1	FV	U1		FV	FV	U1	FV

[5] According to comments from France not a 6210 species in the French Alps, better to be mentioned in 6230
[6] According to comments from France not a 6210 species, better to be mentioned in 9150

Reported pressures on habitat and their importance to associated species

Pressure description (2nd level)	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	*Saga pedo*	*Zerynthia polyxena*	*Parnassius mnemosyne*	*Parnassius apollo*	*Maculinea arion*	*Euphydryas aurinia*
Cultivation	x	x				x	x
Fertilisation	x						
Grazing		x	x	x			x
General Forestry management	x		x		x	x	
Biocenotic evolution							

Pressure description (2nd level)	*Lopinga achine*	*Erebia calcaria*	*Miniopterus schreibersii*	*Spermophilus citellus*	*Botrychium simplex*	*Dracocephalum austriacum*	*Cypripedium calceolus*
Cultivation						x	
Fertilisation					x		
Grazing					x		
General Forestry management				x	x	x	
Biocenotic evolution							

Reported threats to habitat and their importance to associated species

Threats description (2nd level)	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	*Saga pedo*	*Zerynthia polyxena*	*Parnassius mnemosyne*	*Parnassius apollo*	*Maculinea arion*	*Euphydryas aurinia*
Cultivation	x	x					x
Fertilisation	x						
Grazing	x		x	x			x
General Forestry management	x		x		x	x	
Biocenotic evolution	x						

Threats description (2nd level)	*Lopinga achine*	*Erebia calcaria*	*Miniopterus schreibersii*	*Spermophilus citellus*	*Botrychium simplex*	*Dracocephalum austriacum*	*Cypripedium calceolus*
Cultivation						x	
Fertilisation					x		
Grazing					x	x	
General Forestry management			x	x	x	x	x
Biocenotic evolution							

Threats and Pressures Identified by Country Experts

		LIFE	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1)	A04.03 Abandonment of pastoral systems, lack of grazing	✓	2		1			1	1	1		1		
2)	A05.03 Lack of animal breeding											1		
3)	B01 Forest planting on open ground		1		1							1		
4)	A04.01 Intensive grazing	✓	1		2			3	1				2	
5)	A08 Fertilisation		2		1			2	1				2	
7)	A03.01 Intensive mowing or intensification		1		1			1						
8)	K01.01 Erosion							1						
9)	K02.01 Species composition change (succession)							1		1				
10)	K02 Biocenotic evolution, succession							2					1	
11)	E01 Urbanised areas, human habitation				1			1						
12)	A01 Cultivation							1						
13)	A03.03 Abandonment/lack of mowing		1		2				1	1			2	
14)	D 01.02 Roads, motorways				1									
15)	J03.02 Anthropogenic reduction of habitat connectivity				1			2						
16)	A07 Use of biocides, hormones and chemicals							1						
17)	F04 Taking/removal of terrestrial plants (by collectors)							1						
18)	A02 Modification of cultivation practices		1		1									
19)	A02.01 Agricultural intensification								1				2	
20)	A06.02 perennial non-timber crops								1					
21)	E04 Structures, buildings in the landscape				1									
22)	G01 Outdoor sports and leisure activities, recreational activities	✓							1					
23)	G02.02 skiing complexes				1									

Habitat Impacts: In **Sweden** *abandonment of pastoral systems* is undoubtedly the most important threat to this habitat in the alpine region. It is a more severe problem here than in the other regions due to depopulation. *Lack of animal breeding* is a problem connected to abandonment. In many areas there is a general lack of grazing animals due to too few animal farms. This is even a greater problem in the alpine region than in other parts of Sweden. The problem is intensified because due to the decreasing number of farms the dairy companies stop collecting milk, thus making animal husbandry even more unprofitable in the region. *Forest planting on open ground* is also connected to abandonment and changes of agricultural practices. In Sweden most of the abandoned farm land will soon be planted with trees and used for forestry (Jacobson). In **Austria** this habitat is quite overseen, there is lack of information about its distribution. The abandonment of pastoral systems is linked with the lack of the low-intensity grazing with young cattle. Fertilization occurs as well, especially in relation to intensive grazing and it is sometimes linked to feeding cattle with external (bought) fodder (Koschuh). Intensification: Competitive plants overcome stress tolerant species. Abandonment: The main problem is the litter layer which develops if the biomass is not removed. It hinders germination and growth of small species. Thus it leads to decreased biodiversity. Early mowing: Many species need to produce mature seeds to maintain stable populations. If the plants are cut before seeds are dispersed, these species will disappear in the long term. Highest diversities are reached, if the cutting date varies annually (Bassler). In **Italy** (*over)gazing* could induce as much as a 55% decrease in both species richness and total density. This trend appeared to be fairly general and was not influenced by substrate type, or elevation. Nowadays it is still quite a serious problem in Apennines, while it is localized in the Alps, but it has still a very strong negative impact on some places. Overgrazing could determine an increase in eutrophication that alters vegetation composition, with an increase in nitrophilous species (e.g., *Rumex* sp., *Urtica* sp.) and a simplification of vegetation communities. Such altered vegetation composition could strongly impact butterflies communities, reducing the availability of different kind of larval host plants and nectar sources. Moreover, excess of overgrazing can also determine the local complete disappearance of vegetation (e.g., dung storage, excess of trampling) with even more impacting consequences. The pressures linked to *recreation activities* are concentrated mainly in the Apennines. Activities like picnic areas and open areas games are quite common in the summer. If not properly controlled, tourist pressure can alter habitats in way similar to what is observed for overgrazing (i.e., excess of trampling). Indeed, usually recreation activities are localized in small areas and along selected pathways. High levels of touristic pressure could also increase the impact of collectors, more difficult to be controlled by local rangers (with potentially

strong impacts on small localized populations, e.g. some *Erebia* butterfly species). The Apennines, Pollino Mountain for example, suffers strongly from uncontrolled fires, but in general the alpine region is only marginally affected by them (Bonelli, Cerrato). In **Slovenia** the main threat in Alpine region is *abandonment* of traditional hay meadows and overgrowing with shrubs and trees (Verovnik) or invasive plant species (Čelik) as a consequence. Overgrazing and grazing with cattle is also damaging. *Intensification* is a minor issue; however manuring and mowing with heavy machines are also present at lower elevations and less steep slopes (Verovnik). Wind energy production could become one of the most important threats for dry grasslands in SW Slovenia (known for strong north-east wind – »burja« in Slovene) in the cases of inappropriate (from the conservation point of view) placement of wind farms into the environment. Both the *abandonment* and *intensification* are considered as important pressures in **Germany.** The abandonment leads first of all to a species-poor predomination of tall grasses (e. g. *Molinia, Calamagrostis*) and later on to a colonisation with shrubs and trees. The succession ends with a more or less shady woodland without species of the former habitat. The intensive mowing (mowing more than once a year) - whereby fertilization is normally included - leads to relatively species-poor grassland vegetation without characteristic species of the former habitat. *The construction of urbanised areas, roads and motorways* causes a complete destruction of the concerned habitat (Kraus). The loss of habitats due to leisure and –locally- changes to arable land (Albert Lang). In **France** both the *intensive (sheep) grazing* and a*bandonment and lack of grazing* were identified as the pressures to the habitat. In mountain, before going uphill in spring, or inside after fall, sheep herds graze these types of grasslands. The herd size may not suite at all the amount of grass resources. Consequently, these grasslands turn to be overgrazed and overcrushed. Actually, in the Alps, these grasslands require an equilibrium between grazing pressure enough to maintain their openness, but not too much to avoid deterioration. Without pastoralism, the species composition can change dramatically and quickly, shrubs and trees come up. The grazing is related to another threat - the e*rosion* may in some cases alter this habitat as well, because these grasslands occur naturally in dry zone, with thin soil. However, they also occupy, in inner Alps, fossil river beds which are quite brittle (Dentant). The extensive colonization of dry grasslands by shrubs and later on by dry-forests occurs, especially in areas where neither urbanisation nor cultivation occurs (Mikolajczak). The vegetation *succession* is a natural process within calcareous grasslands ecocomplexes. The threat for butterflies is recognized when shrubs represent a large proportion compared to the herbaceous layer - this mainly affects butterfly abundance. However, some species, particularly those with steppe affinities are very sensitive to this threat (e.g. Chazara briseis or Melanargia russiae). The good state of conservation of calcareous grasslands in the alpine region in France is a key element for the conservation of butterfly species with steppe affinities (Dupont). The moderately dry grasslands are frequently *fertilised* or *over-grazed* by too large and unguarded free-ranging herds (FNE, Mikolajczak). Management through controlled grazing is preferable for this type of habitat. However, a high intensity grazing over long periods and repeated year after year causes *eutrophication*. This is of particular concern for mesophile calcareous grasslands, where it causes a decline of butterfly species richness. If the *fertilisation* takes place, the plant community is changing, with the gradual disappearance of several key host plants for butterfly diversity (mainly Fabaceae) and a progressive loss of floral resource availability for adult feeding. *Fragmentation* of calcareous grasslands is one of the main causes of associated butterfly decline in Continental and Atlantic regions. This threat is lower in the Alpine region, but the fragmentation is important at low and medium altitudes. In some valleys, highest butterfly species richness is observed in the altitudinal limits of the habitat (6210), between 1500 and 1800 m (Dupont). The dry grasslands destruction by *urbanisation* occurs at low altitudes on the lower slopes of mountains. The destruction occurs also by conversion of grasslands to vineyards on south-facing slopes in the bottoms of valleys (Mikolajczak). Abandonment: there are several reasons that individually are not crucial, but their accumulation leads to stopping farming. Where the grazing is missing there are more fires (LIFE project).

Management Requirements Identified by Country Experts

		LIFE	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1.1)	(Low intensity) Grazing	✓	2		1			2	1	1		1	1	
1.2)	Clearing of bushes and trees	✓						1		1		1		
1.3)	Burning (in some cases)											1		
1.4)	Contracts with sheep breeders							1						
1,13)	Grassland restoration							1	1					
3)	No forest planting		1											
4.1)	Reduce animal load by reducing herd size or grazing duration							2	1					

		LIFE	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
4.2	Apply grazing in areas with fixed fencing							1						
5.1)	No fertilisation		1		1			1	1			1		
5.2)	Reduction of nitrogen influx by limiting the manuring practices												1	
6.1)	Mapping		1											
6.2)	Analysis of habitat loss in the past		1											
7.1)	Mowing period restriction		2					1	1					
7.2)	Patchy mowing, rotational haying		1										1	
7.3)	Extensive mowing				1			2	1				1	
7.4)	Extensive grazing							2					1	
13)	Re-establishment of haying in abandoned grasslands							1	1				1	
	Assessment of the conservation status							1						
	Connectivity assessment							1						
	Avoid agriculture intensification				1									
	Controlled distribution of tourists on pathways								1					
	Protection of the area, keep non-intervention zones							1						

Additional information: Sweden: The traditional animal husbandry in this region has been a mixture of different activities, e.g. grazing, harvesting of fodder (grass and leaves) and firewood and burning to improve grazing. This habitat needs grazing animals (mainly cows, sheep, horses or goats) and sometimes clearing of bushes and trees to keep in good conservation status, or it will be overgrown. The process of overgrowing is very slow in the alpine region which means that an area can keep its biological grassland values for a long time after abandonment, but eventually it will become forest or scrubland. It is important that fertilisation is not present in this habitat. Otherwise it will deteriorate and lose much of its biodiversity (Jacobson). **Austria**: Low-intensity grazing with young cattle in low-number stocks (less than 0.8 GVE/ha) and no feeding with external fodder are necessary. No mowing in July. Habitat distribution should be mapped to add the missing knowledge. Analyzing losses in the past based on maps and photos (Koschuh). Late mowing once or twice a year (Bassler). **Italy:** Regular mowing, better if later in the year, without fertilization is the best management practice. For the maintenance of this grasslands it is also possible to provide cuttings every second year and to fertilize them with low quantities of organic materials such as mature manure (Lasen). Correct conservation policy should begin with stopping urbanization and intensive agriculture and with revitalising traditional agro-pastoral activities. Phyto-depuration could be an important management practice to restore overgrazed habitats. Using local plant species, it is possible to create semi-natural ecosystem, able to sustain high biodiversity levels (Bonelli, Cerrato). **Slovenia.** Low intensity grazing with sheep or goats and sheep. Rotational haying or small scale haying in different time intervals to create mosaic habitats (Verovnik). Rotational mowing once a year or light grazing. The grassland conversion to arable land is acceptable only as an extensive management, i.e. in the case that mosaic and diverse landscape is preserved which means that degree of habitat fragmentation enables genetic exchange (Čelik). **Germany**: Mowing once a year in midsummer (for some subtypes grazing is also suitable) (Kraus). Keep or re-install low grazing intensity, including areas that are steep or for other reasons difficult to handle as well as grazing in wooded areas with a focus on wide ecoclines between forest and grassland. No agricultural improvements (removal of stones, fertilisation, etc.) (Dolek). **France**. Assessment of the conservation status is an important part of the management plan of a site, as it will determine management priorities. An initial assessment of connectivity should be done at the landscape scale with GIS tools. Then, we would be able to defined spatial priorities. Rehabilitation of open areas does not mean that other habitats which are spatially connected to calcareous grasslands are not important. For butterflies, the conservation of thermophilous thickets and forest fringes are as important as the conservation of calcareous grasslands (Dupont). The extensive grazing of mowing keeps poor to moderate soil nutrient richness and full-light open habitat. Contracts can be signed with sheep breeders to use the grasslands in a proper way (not too many sheep, and not too long period) (Dentant). Guided herding, based on local action plans for pastoralism. Adapt land use of parcels on basis of actual threats or based on presence of species; keep non-intervention zones (30% annually). Put sensitive grazing areas under permanent or temporary protection. Adapt mowing dates (later in the year, lower frequency) (FNE). Transhumance process - temporary grazing of plots. Orchards: Restoration and management as measures also for maintaining the local varieties of the fruit trees (LIFE projects).

Current Management Practices Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1.1)	Subsidies in CAP	1		1				2			1		
1.2)	Trees and shrub removal						1	1	1				
1.3)	Dry grasslands restoration especially by "natural areas managers".						1						
3)	Permission to plant trees on agricultural land needed										1		
4)	Low intensity grazing			1			1	1				2	
7)	Mowing once a year in midsummer (for some subtypes grazing is also suitable).			1									
13)	Low intensity mowing.			1				1				1	
22)	Activities to distribute tourists among different pathways, to avoid excessive concentration in summer							1					
	Nature Conservation Programme			1									

Additional information: Sweden: Subsidies within the Swedish CAP are addressed to support farming in rural areas (e.g. for summer farms, keeping of animals etc.) and also traditional management of valuable areas and habitats. The County Administrative Boards inform farmers on how to manage valuable habitats. Several restoration projects of grasslands and farms, partly financed by LIFE+ money, have been carried out in the alpine region (Jacobson). **Austria**: Also special management projects (e. g. LIFE) for the sites of very high nature conservation value are implemented (Bassler). **Italy:** Mowing and maintenance measures are supported by a system of compensatory payments that includes a supervision of management. This applies to Natura 2000 sites as well as to any other part of the provincial territory (Lasen). CAP measures ensure correct number of animals for each meadow in order to avoid overgrazing effect. Unfortunately the extension (numbers of hectares) and the number of farmers that ask and use this money is absolutely insufficient to have a positive impact. Phyto-depuration is occasionally applied to restore overgrazed habitats. Using local plant species, it is possible to create semi-natural ecosystem, able to sustain high biodiversity levels (Bonelli, Cerrato). **Germany**: The actual management measures are generally identical as explained above in the management requirements part. Most of these measures are financially supported by Bavarian government and EU (special subsidies to land owners/farmers). Only relatively few areas of the habitat are abandoned (Kraus). The Bavarian Nature Conservation Programme, projects like Econnect for clearing former open land. Intensive cooperation between nature conservation and farming authorities within the management planning for Special Areas of Conservation (Albert Lang). In **France**, currently a pragmatic approach for the assessment of conservation status is developed as part of the management plan of a site, in which a criterion related to butterfly fauna is introduced (MACIEJEWSKI, 2012a). This method is being calibrated (MACIEJEWSKI, 2012b). In 2013, an effort will be made for the calibration of the butterfly criteria (Dupont). Agri-environmental measures schemes have been set up to financially support dry grasslands management by farmers, farming management contract (MAEt) with specifications (frequency, fertilization, etc.). Dry grasslands restoration especially by "natural areas managers". Many dry grasslands have been managed since a long time (and still managed) by farmers and recently by "natural areas managers" (NGO's), either directly or indirectly by supporting and designing agri-environmental measures. Spatial planning policies progressively take into account existence of ecological network where dry grasslands can be a major component (cf. "Trame verte et bleue"). Measures to limit or reduce trees (fire, clearing, grazing, mowing…) are applied (Mikolajczak).

Barriers and Bottlenecks Identified by Country Experts

		LIFE	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1.1)	Insufficient CAP subsidies		1						1			1	2	
1.2)	Lack of funding				1			1	1				2	
1.3)	Low profitability		1		1				1			1		
1.4)	Too few farmers											1		
1.5)	Re-growth of trees and shrub									1				
1.6)	Farmland polarization							1						
1.7)	Grassland management by "natural areas managers"							1						

		LIFE	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1.8)	Local small and fragmented parcellation in combination with low financial compensation	✓						1						
1.9)	Contracts for grazing of short duration							1						
2.1)	Large carnivores	✓										1		
2.2)	Large distances											1		
2.3)	Transformation of summer farms to recreation facilities											1		
3)	Legislation allowing afforestation of grasslands		1									1		
4)	Lack of knowledge, valuation		1					1					1	
5)	Difficulty in changing usual practices (fertilisation)							1						
13.1)	Difficult land use conditions (especially too wet or too steep)				1									
13.2)	Missing knowledge on value of habitats in non-conservation authorities				1									
13.3)	Insufficient communication with farmers				1			1						
14)	Getting financial support is not sufficiently published and relatively complicated for farmers				1				1					
15)	Non-cooperating landowners, stakeholders				2			2	2	1				
19)	Support of agriculture intensification (in the past)								1					
	Policy framework/inappropriate policy								1				1	
	Insufficient human resources to carry out the necessary supervision of land management and of specific projects							1	1					
	Weak inspection/control of prescribed management												1	
	Difficult relationships with other administrations dealing with land management								1					
	Inflexibility of conservation programme prescriptions				1									
	Excessive bureaucracy to approve management								1					

Additional information: Sweden: The current subsidies within the Swedish CAP are not sufficient to prevent the disappearance of farms in this region. Not all farmers are connected to the Swedish CAP. Partly because the subsidies are relatively low, many farmers think that the applications are complicated and they have a feeling of being insecure and supervised. The economic reality of some farmers is that they can't accept being tied into long-lasting agreements concerning subsidies, when an unexpected situation can force them to break the agreement and have to pay back subsidies from the previous year. Furthermore, during the last periods of CAP the subsidies have been reduced leading to a decreased incentive for farmers. The co-financing of restoration projects is unfortunately not always corresponding to the possibilities for increased profit to the farmer's business, i.e. there are sometimes no economic incentives for the agricultural company to restore these kinds of areas. Consequently, some objects of value will not be restored even if there are available subsidies. The resources at the County Administrative Boards are not sufficient to inform adequately and to reach all farmers. There are problems concerning living in rural areas in the alpine region of Sweden with harsh climate, large distances, low population density and a general lack of social functions. The profitability of farming in these regions is also low compared to lowlands and more southern areas in Sweden. This forces the farmers to have other sources of income besides farming, consequently leading to increased travelling and costs. When the number of farms is too low the dairy companies stop collecting milk (too high cost), making animal husbandry even more unprofitable in the region. In some regions farmers have problems with large carnivores such as wolves and bears that make it more difficult to keep animals, especially sheep and goats. This gives rise of a potential for conflicting conservation goals, i.e. grazing of semi-natural grasslands or the presence of large carnivores. Carnivores induce direct damage through attacks, but can also cause indirect problems and costs by their mere presence. Few farms and large distances make it difficult to transport grazing animals and keep them in remote areas. Most of these habitat localities are connected to summer farms in the alpine region of which most have been abandoned during the past century and in many cases transformed into summer houses or different kind of tourist facilities which means that they will not become farms again. The applications for planting of trees on open farm land are mostly formalities and you normally get permission quite easily. Furthermore, after 3 years abandoned farm land automatically becomes forest land in legal sense and can then be planted with trees without permission (Jacobson). **Austria:** The process of further forest planting cannot be stopped in some

LIFE	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK

regions (Koschuh). The management of small or steep slopes often depends on very time-consuming and demanding handwork. Young farmers do not want to do this sort of work and the subsidies of agro-environmental schemes do not cover the high costs. There is lack of valuation of the grassland for its high species richness even though with low forage production (Bassler).
Italy: Excessive bureaucracy: European and national standards, even more than those of the Autonomous Province itself, impose onerous obligations on private citizens. They also make sure that long time is needed for the approval of environmental plans. Difficult relationships with owners: it's always difficult to explain that to preserve nature values (species and habitats) some renouncement is necessary, unless you are able to be more convincing in terms of cost-effectiveness. In the past decades, the productivity of grasslands has been incentivized, while the measures to support mountain farming lead to an increased forage production at the expense of environmental quality (Lasen). **Germany:** Inflexibility of conservation programme prescriptions; lack of cooperation between nature conservation and farming authorities, farmers and landowners (Albert Lang). **France:** The bottleneck is the impossibility to make contract with every sheep breeder for proper management (Dentant). While the intensification process in agriculture run in more productive sites, marginal, poor lands are set aside by most of farmers. Most of the implementation of agro-environmental measures is due to « natural areas managers » NGO's (or not) which regionally or locally work together with farmers for a better management (Mikolajczak). The relationship between grazing and conservation status of calcareous grasslands still requires studies. We believe it is imperative to base these studies on the experience of farmers to have a better analyze of these relationships (Dupont). **Slovenia:** Insufficient funds and thus the Agri-Environmental Measures (AEM) are not financially stimulative. The important bottlenecks in policy are: (i) lack of skills and knowledge in policy because of its insufficient or inappropriate communication with scientist and experts. This results also in inappropriate AEMs, very weak inspection/control over the performance of prescribed management; (iii) sometimes any policy measures are taken although the policy was acquainted with inappropriate management actions observed in the field. The lack of knowledge about species ecology and ecosystem functioning meaning that there is a lack of skills for proposing suitable conservation management in such cases (Čelik). Lack of water supply for animals as well, sometimes need also tanks of water. Different grazing regulations in different communes. (LIFE projects).

Potential Solutions Identified by Country Experts

		LIFE	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1.1)	More efficient and adapted subsidies				3			1				1	1	
1.2)	Land purchase or lease									1				
1.3)	Contracts for land management							2		1				
1.4)	Inclusion to management plans also pastures that are not part of Natura 2000							1						
2.1)	Solutions for damages caused by carnivores											1		
2.2)	Demand for locally produced products and services	✓										1		
3)	Legislation on forest planting better adapted to nature conservation											1		
5)	Controlling nutrient level by monitoring		1											
6)	Mapping and analysing species richness of habitat		1											
13.1)	Better communication of values of habitats, more detailed information on management influence on habitats and species				1									
	Communication							2						
	Bio farming								1				1	
	Always keep some parts of the habitats unmanaged for short periods (1 to few years) and permit this in funding				1									
	Education, awareness raising								2				1	
	Fund raising		1										1	
	Less complicated conditions (no bureaucratism) for the farmers/land owners to get subsidies				1									
	Better coordination between the different sectors of								1					

		LIFE	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
	administration dealing with land management													
	Better cooperation and communication between policy and owners or other stakeholders, including scientists		1		1			1					1	
	Enactment of legislation favouring a more nature-friendly management by discouraging intensive agricultural practices (e.g. manure slurry disposal)								1					
	Identifying high nature value farmland areas and connect them by an ecological network in order to avoid the fragmentation of habitats and to promote the restoration								1					
	Allocate more resources to the quality of the territory starting from research to arrive at quality management awards							1	1					
	Creation of local/regional 'market places for herds' may assist herders and farmers in finding terrain in need of grazing							1						
	Defining strategies for defining the choice of parcels that may be part of Natura 2000 grazing contracts							1						

Additional information: Sweden: Better solutions for protection of animals and better subsidies to compensate for losses connected to the presence of large carnivores. There is a need for a faster and more simplified administrative handling of usual problems with carnivores. There should be a more forgiving attitude from the authorities towards those farmers who interrupts an on-going commitment within the Swedish CAP in connection with predator attacks. There are examples of farmers who have lost animals due to predator attacks and then they have to repay prior year's compensation since they are unable to fulfil their commitments. Increase the demand for locally produced products and services (e.g. eco-tourism). There is however a potential conflict between agricultural tourism and carnivore tourism that has not been fully addressed. Regulations better adapted to nature conservation in the Swedish Act concerning forest planting on formerly open farmland (Jacobson). **Italy:** To improve instruction through a constant ecological education starting from compulsory schooling. In order to obtain some result and to refer to adults as well, it is necessary to involve the productive categories (Lasen, Bonelli, Cerrato). Revitalize the economic return of pastures for example producing local cheese with certification of cheese that respect butterflies or biodiversity (Bonelli, Cerrato). **Slovenia:** CAP reform is a big opportunity that could provide financing for less intensive agriculture, which would provide proper management of grasslands (Verovnik). Fund raising: financial stimulation of owners; financial support for basic studies on species ecology, ecosystem functioning and effects of specific anthropogenic activities on species/ecosystems (Čelik). **Germany:** Better funding and better channelling of funding, better communication of values of habitats, more detailed information on management influence on habitats and species, especially habitats between categories (mixed grassland-tree communities), always keep some parts of the habitats unmanaged for short periods (1 to few years) and permit this in funding - especially if productivity is low (Dolek). A better financial support for the management measures combined with less complicated conditions (no bureaucratism) for the farmers/land owners to get this money (Kraus). Intensive cooperation between the different authorities, landowners and farmers. Strengthening of the relatively small sized farming in upper Bavaria by greening, e.g. nature conservation programme and consulting of landowners and farmers. More staff for the approving authorities (e.g. three for each county) for consulting and controlling (Albert Lang). **France:** To diagnose the way of grazing of this habitat, and to promote a better use of these grasslands among stakeholders because it is a resource that must be saved for a sustainable mountain agriculture (Dentant). Ensuring good group cooperation between DOCOB (action plans) and relevant stakeholders and ensuring that these stakeholders sign the contract. Long-term grazing requirements also require contractual measures to be of longer duration. Resources made available for environment policy to implement surveillance of zones with sensitive species, especially in mountainous areas. Inclusion in management plans of pastures that are not part of Natura 2000 may increase efficiency of exploitation. Abolish veterinary treatments that are most hazardous to the environment and health grazing contracts (FNE). To set up actions plans for promoting products from grasslands. Three groups of products: 1) from herbs: for aromatherapy, for wellness (mixture of herbs and heath), honey, marmalade (orchards) ; 2) milk products (cheese with herbs); 3) dry meat products. Centres to process and sell these products, branding development. Tourism: restoration of trails, camping places and parking, panels to educate the people, information point (about the project and restoration). This will prevent the damage of grasslands by trampling outside trails (LIFE projects).

Species Management Requirements Identified by Country Experts

	LIFE	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
Gymnadenia nigra and *Gentianella campestris,* also some species of rare insects: late grazing, not too intense grazing (Jacobson)											✓		
In certain situations, for *Dracocephalum austriacum* (1689) changes to walking trails or provision of information panels may be necessary, as well as stricter controls of flower picking (FNE).							✓						
Cypripedium calceolus (1902) populations should be taken into account in forest management and by forest works. Following forest management practices concerning forest edges are required: avoiding closure of the canopy, cutting away or pruning certain species of shrubs or trees (except on the south side of a growing location) (FNE).							✓						
Maculinea arion and other butterflies: create more diverse patchy mowing systems (Koschuh).		✓											
Maculinea arion (annex IV): Regularly associated with stones etc. with its larval food-plant Thymus sp. (Dolek).				✓									
Protection of patches in pastures that are grazed (especially by sheep) may be beneficial to *Euphydryas aurinia* (FNE).							✓						
Adapting mowing dates and grazing intensity to local context in order to reach a coverage of at least 5% *Thymus* sp. is beneficial for *Maculinea arion* (FNE).							✓						
Maculinea arion (1058), *Euphydryas aurinia* (1065): establishing corridors between suitable habitats at the landscape level (metapopulation management) (FNE).							✓						
Lopinga achine (1067): ensuring presence of a range of succession stages (FNE).							✓						
Polyommatus dorylas probably retreated to extremely steep south-facing slopes that are hot and very extensively grazed. In large areas already disappeared (Dolek).				✓			✓						
Argynnis niobe: inhabits ecotones (grasslands with some trees or shrubs) with structural mosaic, disturbances, protected pockets, etc. (Dolek).				✓									
Euphydryas aurinia, Pyrgus alveus are characteristic butterflies that need special attention				✓									
Chazara briseis, *Melanargia russiae* and other species with steppe affinities are very sensitive to threats by succesional changes, they need habitats rich in stones and with extraordinary microclimate.							✓						
Special attention need all HD species and endemic subspecies: *Erebia manto trajanus, E. pharte romaniae, E. sudetica radnaensis, E. gorge friedericikoenigi, E. epiphron transsylvanica, E. cassioides ssp., E. pronoe regalis, E. melas carpathicola, E. melas runcensis, Boloria phales carpatomeridionalis*) need special attention. Additionally *Coenonympha tullia, Boloria titania transsylvanica, B. aquilionaris* have limits of their distribution, with important, genetically well differentiated populations and are thus of importance.										✓			
Adapt the mowing regime - threatened species should be favoured (butterflies, plants), whereas undesired species (e. g. weeds like *Senecio* sp., *Colchicum autumnale* and invasive species) should be controlled in order to ensure agricultural usage of the forage (Bassler, Verovnik).		✓										✓	
In case of orchards: birds – *Upupa epops, Jynx torquilla, Picus canus.*	✓												

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Case Studies Identified by Country Experts

	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
Grant „Protection of land ecosystems in Pieniński National Park") between 1992 and 2012 for buterfly *Parnassius apollo* allowed to keep meadows in Pieniński National Park (National Fund of Environmental Protection and Water Management). (Pieniński National Park)								✓				
Management models for grassland habitats: http://www.daphne.sk/sites/daphne.sk/files/uploads/MM04_Bromion_1.pdf (Plassman-Čierna)												✓

Other information

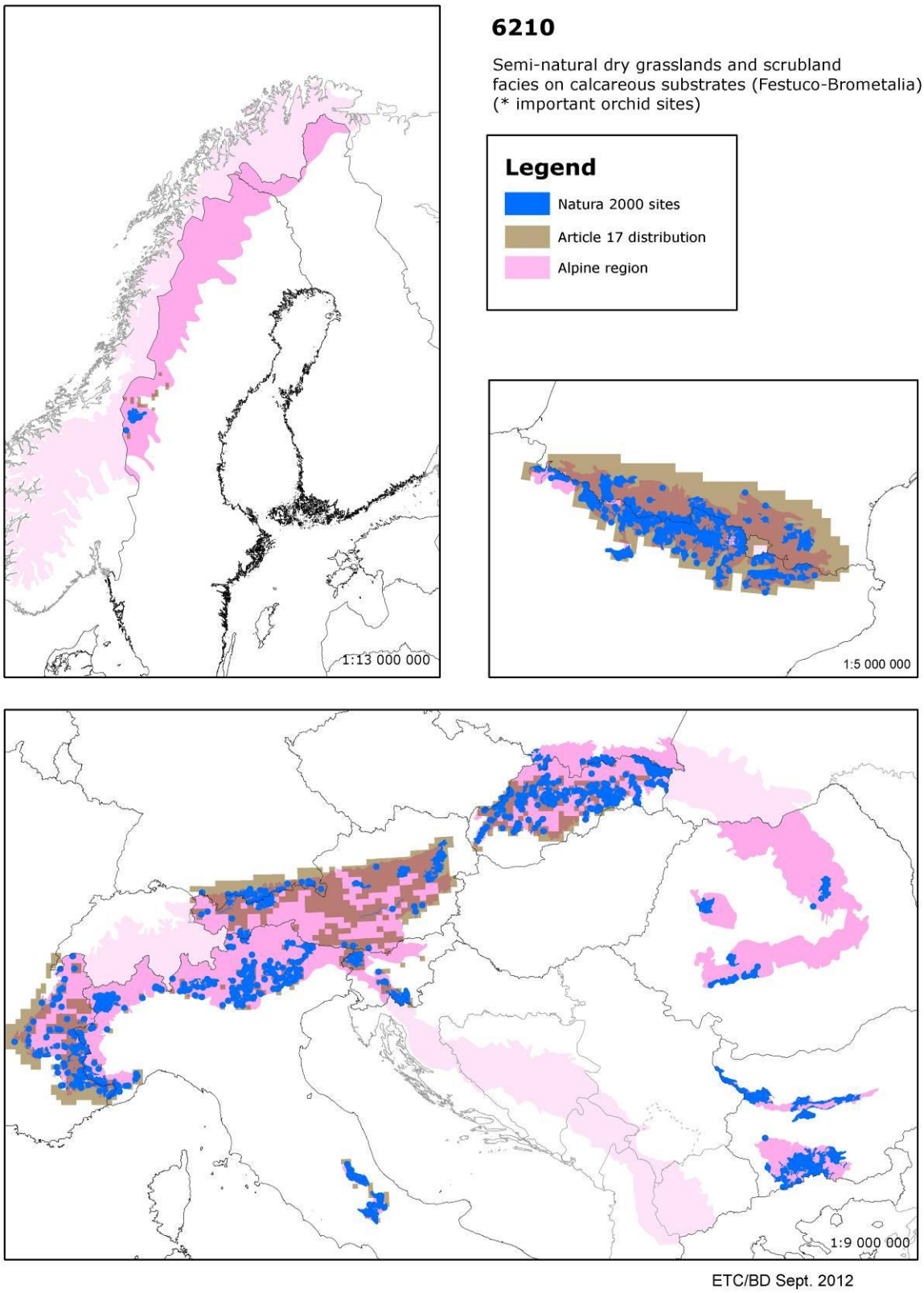
According to the ETC/BD calculations 76-100% of the area of this habitat type are within SCIs. This means that Natura 2000 network provides an important framework for the management of this habitat type.

Number of SCIs and habitat area (ha) within SCIs per Member State in the Alpine biogeographical region

	AT	BG	DE	ES	FR	IT	PL	RO	SE	SI	SK
Number of sites	18	13	22	53	77	130	5	9	2	4	103
Habitat area (ha)	3687	39895	2313	24515	29221	41794	107	4482	5	2072	2987

The figures include all SCIs where the habitat type is mentioned including sites coded as D.

Map of SCIs proposed for Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) & Article 17 distribution



2.2 6230 - Species-rich *Nardus* grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)

Habitats Manual (2007) Extract

Closed, dry or mesophile, perennial *Nardus* grasslands occupying siliceous soils in Atlantic or sub-Atlantic or boreal lowland, hill and montane regions. Vegetation highly varied, but the variation is characterised by continuity. *Nardetalia*: 35.1-*Violo-Nardion* (*Nardo-Galion saxatilis, Violion caninae*); 36.31- *Nardion*. Species-rich sites should be interpreted as sites with are remarkable for a high number of species. In general, the habitats which have become irreversibly degraded through overgrazing should be excluded.

Sjörs, H. (1967). *Nordisk växtgeografi. 2 uppl*. Svenska Bokförlaget Bonniers, Stockholm, 240 pp.

This is a semi-natural grassland widespread across much of the European Union with distinct upland and lowland subtypes. The definition of this habitat has caused problems as several countries have large areas of species poor grassland dominated by matgrass (*Nardus stricta*) as a result of long periods of overgrazing of little interest for nature conservation - these grasslands should not be included in this habitat.

Conservation status (CS) assessed at the Alpine region and MS level:

N2K code	Habitat name		AT	BG	DE	ES	FR	IT	PL	RO	SE	SI	SK	REGION
6230	Species-rich *Nardus* grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	range	FV		FV	XX	U1	FV	U1		FV	FV	XX	FV
		area	U1		U1	XX	U1	FV	U2		U1	U1	XX	U1
		structure	XX		FV[7]	XX	FV	FV	U1		U2	U1	U1	XX
		future	U1		U1	XX	FV	FV	U2		U2	U1	XX	U1
		overall	U1		U1	XX	U1	FV	U2		U2	U1	U1	U1

Habitat used in the past for grazing, at present threatened by abandonment. On EU-25 level assessed as either 'unfavourable-inadequate' or 'unfavourable-bad' across all countries except for Greece and Italy who reported 'favourable' in all regions. As the pressures reported elsewhere as responsible for its unfavourable conservation status (abandonment of grazing or overgrazing) are likely to exist in these countries it is not clear why there should be such a difference. Should be investigated and cleared, because these driving forces are all the same in the whole alpine region (particularly in the Alps) (Kudrnovsky). In the Alpine region, overall conclusion is "inadequate" mainly due to habitat area and future prospects in AT (that represents 55,2% of the real habitat area) supported by other countries (e.g. SI and FR). (Summary sheet of the online report on Article 17 of the Habitats Directive).

Species associated with this habitat and their CS at the Alpine region and MS level[8]

N2K code	Species name	Group		AT	BG	DE	ES	FR	IT	PL	RO	SE	SI	SK	REGION
1050	*Saga pedo*	Invertebrates	range	FV					U2					U1	U1
			population	U1					U2					U1	U1
			habitat	U1					U1					U1	U1
			future	U1					U1					XX	XX
			overall	U1					U2					U1	U1
1053	*Zerynthia polyxena*	Invertebrates	range	XX				XX	FV				FV	FV	XX
			population	XX				XX	FV				U1	FV	XX
			habitat	XX				XX	FV				U1	FV	XX
			future	XX				XX	U1				U1	FV	XX

[7] According to the current Art. 17 report assessment: U1
[8] *Arnica montana* - although this is an Annex V species it is very closely associated to 6230 and should perhaps be considered here

N2K code	Species name	Group		AT	BG	DE	ES	FR	IT	PL	RO	SE	SI	SK	REGION
			overall	XX				XX	U1				U1	FV	XX
1056	*Parnassius mnemosyne*	Invertebrates	range	FV		FV	XX	FV	U2	U1			FV	FV	U1
			population	FV		XX[7]	XX	FV	U1	U1			U1	FV	U1
			habitat	U1		FV	U1	FV	FV	XX			U1	FV	U1
			future	U1		FV	XX	FV	FV	U1			U1	FV	U1
			overall	U1		FV	U1	FV	U2	U1			U1	FV	U1
1057	*Parnassius Apollo*	Invertebrates	range	U1		FV	XX	FV	FV	FV			U2	U1	U1
			population	U1		FV	XX	FV	FV	FV			U2	U1	U1
			habitat	U1		FV	XX	FV	FV	U1			U2	U1	U1
			future	U1		FV	XX	FV	U1	FV			U2	U1	U1
			overall	U1		FV	XX	FV	U1	U1			U2	U1	U1
1058	*Maculinea arion*	Invertebrates	range	FV		FV	XX	FV	U2	XX			FV	FV	U1
			population	FV		FV	XX	XX	U2	U2			U1	U1	U2
			habitat	U1		FV	XX	FV	U1	U1			U1	U1	U1
			future	U1		FV	XX	FV	U1	U1			U1	U1	U1
			overall	U1		FV	XX	FV	U2	U2			U1	U1	U2
1065	*Euphydryas aurinia*	Invertebrates	range	FV		FV	XX	FV	FV					FV	FV
			population	FV		XX[7]	XX	FV	FV					U1	U1
			habitat	U1		FV	XX	FV	FV					U1	U1
			future	U1		FV	U1	FV	FV					U1	U1
			overall	U1		FV	U1	FV	FV					U1	U1
1067	*Lopinga achine*	Invertebrates	range	U1		XX		U1	FV				FV	U2	U1
			population	FV		U1		XX	FV				FV	U2	FV
			habitat	U1		U1		U1	FV				FV	FV	U1
			future	U2		FV		U1	FV				FV	U1	U2
			overall	U2		U1[7]		U1	FV				FV	U2	U2
1072	*Erebia calcaria*	Invertebrates	range	FV					U1				U1		U1
			population	FV					FV				FV		FV
			habitat	U1					FV				FV		FV
			future	U1					FV				U1		U1
			overall	U1					U1				U1		U1
	Species name	**Group**		**AT**	**BG**	**DE**	**ES**	**FR**	**IT**	**PL**	**RO**	**SE**	**SI**	**SK**	**REGION**
1310	*Miniopterus schreibersii*	Mammals	range	U2			XX	U1	U1				FV	U1	U1
			population	U2			XX	U2	U1				U1	U2	U2
			habitat	U2			XX	XX	U2				XX	XX	XX
			future	U2			U1	U2	U1				XX	XX	U2
			overall	U2			U1	U2	U2				U1	U2	U2
1335	*Spermophilus citellus*	Mammals	range	U2										U2	U2
			population	U2										U2	U2
			habitat	U2										U1	U1
			future	U2										U2	U2
			overall	U2										U2	U2
1419	*Botrychium simplex*	Vascular plants	range	FV				FV	U2						U2
			population	U1				U2	U2						U2
			habitat	XX				FV	XX						XX
			future	U1				U2	U2						U2
			overall	U1				U2	U2						U2
1604	*Eryngium alpinum*[9]	Vascular plants	range	FV				FV	U1					U1	U1
			population	XX				FV	U1					U1	U1
			habitat	XX				U1	XX					U1	XX
			future	XX				U1	U1					U1	U1
			overall	XX				U1	U1					U1	U1
4070	*Campanula serrata*	Vascular plants	range							FV				FV	U1
			population							FV				FV	U1
			habitat							U1				FV	U1
			future							FV				XX	XX
			overall							U1				FV	U1

[9] According to comments from France not a 6230 species

Reported pressures on habitat and their importance to associated species

Pressure description (2nd level)	6230	*Saga pedo*	*Zerynthia polyxena*	*Parnassius mnemosyne*	*Parnassius apollo*	*Maculinea arion*	*Euphydryas aurinia*
Cultivation	x	x				x	x
Fertilisation	x						
Grazing		x	x	x			x
General Forestry management	x		x		x	x	
Sport and leisure structures	x						
Outdoor sports and leisure activities	x						
Biocenotic evolution	x						

Pressure description (2nd level)	*Lopinga achine*	*Erebia calcaria*	*Miniopterus schreibersii*	*Spermophilus citellus*	*Botrychium simplex*	*Eryngium alpinum*	*Campanula serrata*
Cultivation						x	x
Fertilisation					x		
Grazing					x	x	
General Forestry management				x	x		x
Sport and leisure structures		x		x			x
Outdoor sports and leisure activities						x	x
Biocenotic evolution							

Reported threats to habitat and their importance to associated species

Threats description (2nd level)	6230	*Saga pedo*	*Zerynthia polyxena*	*Parnassius mnemosyne*	*Parnassius apollo*	*Maculinea arion*	*Euphydryas aurinia*
Cultivation	x	x					x
Fertilisation	x						
Grazing	x		x	x			x
General Forestry management	x		x		x	x	
Biocenotic evolution	x						

Threats description (2nd level)	*Lopinga achine*	*Erebia calcaria*	*Miniopterus schreibersii*	*Spermophilus citellus*	*Botrychium simplex*	*Eryngium alpinum*	*Campanula serrata*
Cultivation							x
Fertilisation					x		
Grazing					x		
General Forestry management			x	x	x		
Biocenotic evolution							

The mountainous *Nardus* grasslands, especially on silicious substrates in mountains, represent non climax vegetation which long-term existence is closely related to the continuation of pastoral traditions (extensive land-use forms). Due to deep, broad and irreversible socio-economic changes since the 1950s, many regions suffer from migration to cities and thus, labours for this time and labour-

intensive work are missing. Additionally, the service sector provides lucrative job offers. Thus, grazing is given up at many places or the grazing intensity is too low to maintain this vegetation type (Dieker).

Threats and Pressures Identified by Country Experts

		LIFE	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1)	A04.01 Intensive grazing		1	1	2			3	2	1			1	
2)	B01 Forest planting on open ground		1							1				
3)	A08 Fertilisation		2		2			1	1				1	
4)	A02.01 Agriculture intensification		1						1				1	
5)	A04.03 Abandonment of pastoral systems, lack of grazing	✓	2	1	2			1	2	3		1		
7)	A05.03 Lack of animal breeding											1		
8)	A02 Modification of cultivation practices		1		1					1				
9)	A03.01 Intensive mowing or intensification		1		1					1				
10)	A03.03 Abandonment/lack of mowing		1		2				1	2			1	
11)	K02 Biocenotic evolution, succession or K02.01 Species composition change (succession)			1				2		3			1	
12)	E01 Urbanised areas, human habitation				1			1						
13)	G01.06 skiing, off-piste				1									
14)	D 01.02 Roads, motorways				1									
15)	J03.02 Anthropogenic reduction of habitat connectivity				1			1						
16)	A07 Use of biocides, hormones and chemicals							1						
18)	G01 Outdoor sports and leisure activities, recreational activities	✓						1	1					

Habitat Impacts: In **Sweden** *Abandonment of pastoral systems* is undoubtedly the most important threat to this habitat in the alpine region. It is a more severe problem here than in the other regions due to depopulation. *Lack of animal breeding* is a problem connected to abandonment. In many areas there is a general lack of grazing animals due to too few animal farms. This is even a greater problem in the alpine region than in other parts of Sweden. The problem is intensified because due to the decreasing number of farms the dairy companies stop collecting milk, thus making animal husbandry even more unprofitable in the region. *Forest planting on open ground* is also connected to abandonment and changes of agricultural practices. In Sweden most of the abandoned farm land will soon be planted with trees and used for forestry (Jacobson). In **Austria** as for intensification: Competitive plants overcome stress tolerant species. Abandonment: The main problem is the litter layer which develops if the biomass is not removed. It hinders germination and growth of small species. Thus it leads to decreased biodiversity. Early mowing: Many species need to produce mature seeds to maintain stable populations. If the plants are cut before seeds are dispersed, these species will vanish in the long term. Highest diversities are reached, if the cutting date varies annually (Bassler). The reported threats and pressures include *agriculture intensification, fertilisation, intensive grazing,* and *forest planting.* All these impacts destroy *Nardus stricta* as this plant is replaced by plants more tolerant to high levels of nutrients. This effect is a desired improvement by the farming practice. The *intensive grazing* is accompanied with improvement of pastures with a new kind of machines, replacement of special structures like stones or by renovating pastures after destructions by heavy natural impacts. Austria highlighted the lack of information about this habitat type (Koschuh). In **Bulgaria**, majority of the wild herbivores are rare because of high level of poaching and they cannot maintain the pastures open. Extensive grazing by domestic animals was proposed as the management measure and it was subsidized. Unfortunately this led to significant increase of domestic animals in the Bulgarian National Parks (protected areas II category of IUCN), thus to overgrazing on some places, illegal burning of bushes and forests, poaching and illegal poisoning of predators. There is a strong pressure for more subsidies for more animals inside the Parks (Avramov). In **Poland** the abandonment leads in the first phase to a species-poor predomination of tall grasses and later on to a colonisation with shrubs and trees. The succession ends with more or less shady woodland without species of the former habitat. *Lack of grazing* results in increase of share of tall grasses and herbs, restricts species dispersal and share of small, shade-intolerant plants. Abandoned are especially less productive areas at higher altitudes and established are intensive, species poor, cultivated grasslands on former arable lands near villages. Thus, the extensive traditional farming is replaced with *intensive practices* (fodder based on maize, earlier harvesting times for hay for silage). Intensive mowing, mowing more than once a year or intensification lead to decrease in species richness and decline of light-demanding plants. The result is relatively species-poor grassland vegetation without characteristic species of the former habitat. The succession

connected with eutrophication and accumulation of organic material is the main threat of all grasslands habitats across the Polish Carpathians due to recession of farming practices. For 6230 this effect is practically irreversible. *Forest planting* on open ground affects mainly habitat 6230 on montane glades at higher altitudes (Korzeniak, Kucharzyk). In **Italy** (*over)gazing* could induce as much as a 55% decrease in both species richness and total density. This trend appeared to be fairly general and was not influenced by substrate type, or elevation. Nowadays it is still quite a serious problem in Apennines, while it is localized in the Alps, but it has still a very strong negative impact on some places. Overgrazing could determine an increase in eutrophication that alters vegetation composition, with an increase in nitrophilous species (e.g., *Rumex* sp., *Urtica* sp.) and a simplification of vegetation communities. Such altered vegetation composition could strongly impact butterflies communities, reducing the availability of different kind of larval host plants and nectar sources. Moreover, excess of overgrazing can also determine the local complete disappearance of vegetation (e.g., dung storage, excess of trampling) with even more impacting consequences. The pressures linked to *recreation activities* are concentrated mainly in the Apennines. Activities like picnic areas and open areas games are quite common in the summer. If not properly controlled, tourist pressure can alter habitats in way similar to what is observed for overgrazing (i.e., excess of trampling). Indeed, usually recreation activities are localized in small areas and along selected pathways. High levels of touristic pressure could also increase the impact of collectors, more difficult to be controlled by local rangers (with potentially strong impacts on small localized populations, e.g. some *Erebia* butterfly species). The Apennines, Pollino Mountain for example, suffers strongly from uncontrolled fires, but in general the alpine region is only marginally affected by them (Bonelli, Cerrato). In **Slovenia** the main threat in Alpine region is *abandonment* of traditional hay meadows and overgrowing as a consequence. Overgrazing and grazing with cattle is also damaging. Intensification is a minor issue; however manuring and mowing with heavy machines are also present at lower elevations and less steep slopes (Verovnik). Both the *abandonment* and *intensification* are considered as important pressures in **Germany.** The *abandonment* leads first of all to a species-poor predomination of tall grasses (e. g. *Molinia, Calamagrostis*) and later on to a colonisation with shrubs and trees, including *Pinus uncinata*. The succession ends with a more or less shady woodland without species of the former habitat (Kraus). Well accessible sites even in higher altitudes such as passes and skiing resorts often receive high livestock densities, and the *grazing intensification* and overgrazing in certain parts takes place, including fertilisation, removal of stones and other structures restricting agriculture (loss of structural heterogeneity), while other parts (steep slopes, difficult to access areas) are neglected and not grazed anymore. Additionally, grazing in the Alps is more and more concentrated on non-wooded areas, keeping cattle out of tree structured parts and removing trees in grazed parts. All mixed types of habitats between dense forests and open grasslands, which are extremely important as butterfly habitats, are reduced (Dolek). The intensive mowing (mowing more than once a year) - whereby fertilization is normally included - leads to relatively species-poor grassland vegetation without characteristic species of the former habitat. *The construction of urbanised areas, roads and motorways* causes a complete destruction of the concerned habitat (Kraus). The loss of habitats due to leisure and –locally- changes to arable land (Albert Lang). **France:** The main risk for this habitat type represents *abandonment of grazing* activity. In mountain areas where grazing has strongly decreased the vegetation composition changes, the habitat loses its typical open character and is replaced by heath and mountain shrubs (Mikolajczak). In the Alpine region, stopping grazing causes a shift towards Vaccinium heaths. This process is accompanied by changes in animal assemblages. The habitat type is associated with a diversity of butterfly species which is significantly less than in semi-natural dry grasslands and scrubland facies on calcareous substrates, but still important. In the Alpine region, species observed in this habitat are especially well represented on the alpine meadows (such as *Erebia* sp.). Management through controlled grazing is preferable for this type of habitat (Dupont). However, a high grazing *intensity* by too large and unguarded free-ranging herds over long periods and repeated year after year causes a change in the plant community with the disappearance of dicotyledons and dominance of Nardus stricta. There is an impoverishment of butterfly diversity with a dominance of generalists on Poaceae (Dupont, FNE). Over-grazing happens in many places across the French Alps, especially in the southern Alps where sheep grazing is locally very intensive. *Fertilisation* is a long-lasting process started in the 18th century, especially in sub-mountain areas where it is a major cause of historical habitat (6230) loss. Small remaining patches of the habitats are vulnerable to *urbanisation,* cultivation (Mikolajczak). In **Pyrenees** the main risk for this habitat type represents abandonment of grazing activity. The grazing is given up at many places or the grazing intensity is too low to maintain this vegetation type. As consequences the vegetation composition changes occur, Pinus uncinata and other shrub and trees are invading, the habitat loses its typical open character. This process is accompanied by changes in animal assemblages. In contrast, well accessible sites such as passes and skiing resorts often receive high livestock densities (consequences: nitrogen deposition, loss of structural heterogeneity). The local impact of skiing resorts is high. Firstly, recent extensions of skiing resorts are often modified

yearly by prolonging and widening ski runs or by connecting skiing resorts (direct impact on habitat type through destruction. Secondly, the use of snow guns and therewith of artificial snow leads to changes of typical vegetation (e.g. increased nutrient and water deposition, longer snow cover and missing isolation effect of artificial snow cover) (Dieker).

Management Requirements Identified by Country Experts

		LIFE	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1.1)	Reduce animal load by reducing herd size or grazing duration	✓						1						
1.2)	Apply grazing in areas with fixed fencing							1						
2)	Stop afforestation of grasslands		1							1				
3.1)	No/low fertilisation		1		1				1			1	1	
4)	(Low intensity) Grazing		2	1	3			4	2	2		1	1	
5.1)	Clearing of bushes and trees									1		2		
5.2)	Burning (in some cases)											1		
5.4)	Restore the density of the indigenous wild herbivores			1										
5.5)	Restore/reintroduce the traditional grazing				1			1	1	1		1	1	
6.1)	Mapping		1											
6.2)	Analysis of habitat loss in the past		1											
9.1)	Maintain an extensive mowing		1		1			1	2	1				
9.2)	Rotational or small-scale haying in different time intervals to create mosaic habitats and												1	
10)	Re-establishment of haying in abandoned grasslands												1	
13)	Avoiding further extensions and connections of skiing resorts to attract more winter tourists.							1						
4)	Sensible restoration of habitat		1						1					
	Avoid agriculture intensification				1									
	Controlled distribution of tourists on pathways								1					
	Strengthening nature conservation programme				1									
	Protection of the area, keep non-intervention zones							1						

Additional information: Sweden: The traditional animal husbandry in this region has been a mixture of different activities, e.g. grazing, harvesting of fodder (grass and leaves) and firewood and burning to improve grazing. This habitat needs grazing animals (mainly cows, sheep, horses or goats) and sometimes clearing of bushes and trees to keep in good conservation status, or it will be overgrown. The process of overgrowing is very slow in the alpine region which means that an area can keep its biological grassland values for a long time after abandonment, but eventually it will become forest or scrubland (Jacobson). **Austria:** Late mowing once or twice a year (Bassler). Low-intensity grazing with young cattle in low-number stocks (less than 0,8 GVE/ha) and no feeding with external fodder are necessary. This habitat was a symbol of starvation in the past. This negative image should be removed from this habitat (emphasising nature protection). Habitat distribution should be mapped to add the missing knowledge. Analyzing losses in the past should be done based on maps and photos. Avoid the EU promoted drastic improvement of pastures with a new kind of machine, replacement of special structures like stones or renovation of pastures after destructions by heavy natural impacts (Koschuh). **Bulgaria.** To promote extensive grazing in Natura 2000 sites outside protected areas of I and II category of IUCN. Fighting the poaching and restoration of the normal density of the wild herbivore fauna can influence the succession on many places in the National Parks. This should be the only possible management activity in protected areas which are of I and II category of IUCN. We should accept that this habitat will decrease partially in some protected areas of I and II category of IUCN because it is of the secondary, human-induced origin (Avramov).
Poland: Maintain an extensive mowing, important as a way of decreasing soil fertility and protecting against overshading. Develop local initiatives connected with shepherding revitalization (like Owca Plus in the Silesia province). Possibility of agricultural use (grazing, mowing) should be checked before forest plantation (Korzeniak). **Italy:** Best management practice is a regular late cut of the grassland, possibly not too frequent, with no fertilization. Extensive grazing and/ or less regular mowing (as long as not too early in the year) as well as a weak fertilization (excluding manure slurry) are tolerated (Lasen). Correct conservation policy should begin with stopping urbanization and intensive agriculture and with revitalising traditional agro-pastoral activities. Phyto-depuration could be an important management practice to restore overgrazed habitats. Using local plant species, it is possible to create semi-natural ecosystem, able to sustain high biodiversity levels (Bonelli, Cerrato).

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Slovenia. Low intensity grazing with sheep or goats and sheep. Rotational haying or small scale haying in different time intervals to create mosaic habitats (Verovnik). **Germany:** Keep or re-install low grazing intensity, including areas that are steep or for other reasons difficult to handle as well as grazing in wooded areas with a focus on wide ecoclines between forest and grassland. No agricultural improvements (removal of stones, fertilisation, etc.) (Dolek). Mowing once a year in midsummer (for some subtypes grazing is also suitable) (Kraus). **France:** Depending on altitude, extensive grazing management by sheep and/or cattle; as mountainous grasslands are more sensitive in comparison to lowland ones, suitable livestock intensities should not exceed 1 LU-ha. As it is well known that different species groups (e.g. plants, insects) have different requirements concerning suitable grazing pressure, grazing management should act at landscape scale (e.g. across a whole valley). Thereby varying grazing intensities could help to maintain and restore dynamic landscape entities. Such management would also counterbalance sudden changes in the grazing regime. In this context, it is of considerable role to maintain a network of 'species (group)-specific' pastures to foster genetic exchange among populations (Dieker). Guided herding, based on local action plans for pastoralism (FNE). The extensive grazing of mowing keeps poor to moderate soil nutrient richness and full-light open habitat (Mikolajczak).

Current Management Practices Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
2)	Permission to plant trees on agricultural land needed										1		
5.1)	Subsidies in CAP		1					2			1		
5.2)	In sub-mountain areas, remaining small patches of the habitat are barely managed						1						
5.3)	Grassland restoration						1	1					
5.4)	Extensive grazing kept and supported	1		2			1	1	2			1	
5.5)	Extensive mowing kept	1		1			1	1					
	Removal of bushes and trees							1	1				
	Nature Conservation Programme			1									
	Activities to distribute tourists among different pathways, to avoid excessive concentration in summer							1					

Additional information: Sweden: Subsidies within the Swedish CAP are addressed to support farming in rural areas (e.g. for summer farms, keeping of animals etc.) and also traditional management of valuable areas and habitats. The County Administrative Boards inform farmers on how to manage valuable habitats. Several restoration projects of grasslands and farms, partly financed by LIFE+ money, have been carried out in the alpine region (Jacobson). **Austria**: Also special management projects (e. g. LIFE) for the sites of very high nature conservation value are implemented (Bassler). **Italy:** Mowing and maintenance measures are supported by a system of compensatory payments that includes a supervision of management. This applies to Natura 2000 sites as well as to any other part of the provincial territory (Lasen). CAP measures that are applied should ensure a correct number of animals for each meadow in order to avoid overgrazing effect. Unfortunately the extension (numbers of hectares) and the number of farmers that ask and use this money is absolutely insufficient to have a positive impact. Phyto-depuration is occasionally applied to restore overgrazed habitats. Using local plant species, it is possible to create semi-natural ecosystem, able to sustain high biodiversity levels (Bonelli, Cerrato). **Germany**: The actual management measures are generally identical as explained above in the management requirements part. Most of these measures are financially supported by Bavarian government and EU (special subsidies to land owners/farmers). Only relatively few areas of the habitat are abandoned (Kraus). The Bavarian Nature Conservation Programme, projects like Econnect for clearing former open land. Intensive cooperation between nature conservation and farming authorities within the management planning for Special Areas of Conservation (Albert Lang). **France:** Mowing every second or third years is currently required with the presence of not mown strips as refuge areas. In mountain and sub-alpine areas, experiences of grassland restoration (heath cutting) have been carried out both for grazing and for conservation of black grouse (Mikolajczak). In the Spanish, but especially in the French Western **Pyrenees**, *grazing* is still often organised by local pastoral institutions acting at valley level (and in some cases also across borders). This traditional form of organisation allows that most of the pastures in valleys are taking into grazing regime and thus are in good condition (pastures rarely receive more than 0.6 LU/-ha). This way of management is not realised because of conservation

concern, but because it has been proved and remains as a useful relic from former times. If such structures are missing, just single pastures instead of entire valleys are used for grazing. Sudden changes have thus an directly impact. Since changes in vegetation composition become apparent after abandonment of grazing, local scientific institutions tried to encourage shepherd families to continue and re-establish, respectively, local traditional grazing practices (Dieker).

Barriers and Bottlenecks Identified by Country Experts

		LIFE	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1)	Subsidies leading to overgrazing in National Parks			1										
2)	Legislation allowing afforestation of grasslands		1									1		
4)	Promoted farming improvements		1						1					
5.1)	Insufficient CAP subsidies		1		1			1	1	1		1	1	
5.2)	Lack of funding				1				2				1	
5.3)	Low profitability		1		1				1	1		1		
5.4)	Large distances											1		
5.5)	Too few farmers											1		
5.6)	Polarization of agriculture. Intensification/abandonment process in agriculture: marginal, poor lands are set aside and rich lands are being more intensively used.							1						
5.7)	The management is less agro-pastoral driven; its goal shifts towards the conservation of biodiversity itself (e.g. black grouse). Farmers are not interested in managing these meadows							1						
5.8)	Competition agriculture–tourism for the same labour							1						
5.9)	Competition of mountain–lowland agriculture							1						
5.10)	Missing financial incentives at long-term for shepherds							1						
5.11)	Contractual measures of short duration							1						
5.12)	Difficult land use conditions (especially too wet or too steep),				1									
5.13)	Getting financial support is not sufficiently published and relatively complicated for farmers				1				1	1				
5.14)	Difficulties in the organization of extensive grazing in some areas									1				
6)	Lack of knowledge and low valuation of this habitat		2	1						1				
7.1)	Large carnivores	✓										1		
7.2)	Transformation of summer farms to recreation facilities											1		
10.1)	Non-cooperating landowners/stakeholders				2			1	2	1				
10.2)	Missing knowledge on value of habitats in non-conservation authorities				1									
10.3)	Insufficient communication with mountain farmers				1									
General	Insufficient human resources to carry out the necessary supervision of land management and of specific projects								1					
General	Difficult relationships with other administrations dealing with land management								1					
	Many land plots in private property									1				
	Excessive bureaucracy to approve management								1					

Additional information: Sweden: The current subsidies within the Swedish CAP are not sufficient to prevent the disappearance of farms in this region. Not all farmers are connected to the Swedish CAP. Partly because the subsidies are relatively low, many farmers think that the applications are complicated and they have a feeling of being insecure and supervised. The economic reality of some farmers is that they can't accept being tied into long-lasting agreements concerning subsidies, when an unexpected situation can force them to break the agreement and have to pay back subsidies from the previous year. Furthermore, during the last periods of CAP the subsidies have been reduced leading to a decreased incentive for farmers. The co-financing of restoration projects is unfortunately

not always corresponding to the possibilities for increased profit to the farmer's business, i.e. there are sometimes no economic incentives for the agricultural company to restore these kinds of areas. Consequently, some objects of value will not be restored even if there are available subsidies. The resources at the County Administrative Boards are not sufficient to inform adequately and to reach all farmers. There are problems concerning living in rural areas in the alpine region of Sweden with harsh climate, large distances, low population density and a general lack of social functions. The profitability of farming in these regions is also low compared to lowlands and more southern areas in Sweden. This forces the farmers to have other sources of income besides farming, consequently leading to increased travelling and costs. When the number of farms is too low the dairy companies stop collecting milk (too high cost), making animal husbandry even more unprofitable in the region. In some regions farmers have problems with large carnivores such as wolves and bears that make it more difficult to keep animals, especially sheep and goats. This gives rise of a potential for conflicting conservation goals, i.e. grazing of semi-natural grasslands or the presence of large carnivores. Carnivores induce direct damage through attacks, but can also cause indirect problems and costs by their mere presence. Few farms and large distances make it difficult to transport grazing animals and keep them in remote areas. Most of these habitat localities are connected to summer farms in the alpine region of which most have been abandoned during the past century and in many cases transformed into summer houses or different kind of tourist facilities which means that they will not become farms again. The applications for planting of trees on open farm land are mostly formalities and you normally get permission quite easily. Furthermore, after 3 years abandoned farm land automatically becomes forest land in legal sense and can then be planted with trees without permission (Jacobson). **Austria:** The process of further forest planting cannot be stopped in some regions (Koschuh). The management of small or steep slopes often depends on very time-consuming and demanding handwork. Young farmers do not want to do this sort of work and the subsidies of agro-environmental schemes do not cover the high costs. There is lack of valuation of the grassland for its high species richness even though with low forage production (Bassler). The process of further forest replanting cannot be stopped in some regions (Koschuh). **Bulgaria:** Subsidies for grazing and growing pressure for more subsidies without taking into account the adverse impact of overgrazing on the National Parks. There are extensive discussions between the scientists in Bulgaria how to manage this habitat in the most efficient and non controversial way – there is lack of knowledge. There is no information about the role of the wild herbivores in the management of the open spaces (Avramov). **Poland.** Low effectiveness of agri-environmental subsidies due to land fragmentation in mountainous area. Funding system not suitable for small farms. Lack of economical reason to maintain grasslands or pastures (lack of animals). All barriers and bottlenecks are directly or indirectly connected with low economical profitability of extensive farming in Poland. Present solutions, including funds, are insufficient for maintain grasslands of high natural value in a large spatial scale (Korzeniak). **Italy:** Excessive bureaucracy: European and national standards, even more than those of the Autonomous Province itself, impose onerous obligations on private citizens. They also make sure that long time is needed for the approval of environmental plans. Difficult relationships with owners: it's always difficult to explain that to preserve nature values (species and habitats) some renouncement is necessary, unless you are able to be more convincing in terms of cost-effectiveness. In the past decades, the productivity of grasslands has been incentivized, while the measures to support mountain farming lead to an increased forage production at the expense of environmental quality (Lasen). **France:** Changes in the European Common Agriculture Policy in direction to a more 'green' and sustainable agriculture promoting extensive land-use forms and thus, biodiversity. Agri-environmental schemes should be adapted to regional characteristics to support e.g. the maintenance of still existing organisation structures (Dieker). **Germany:** Inflexibility of conservation programme prescriptions; lack of cooperation between nature conservation and farming authorities, farmers and landowners (Albert Lang). Lack of water supply for animals as well, sometimes need also tanks of water. Different grazing regulations in different communes. (LIFE projects).

Potential Solutions Identified by Country Experts

		LIFE	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1)	Stop promoted improvement of pastures		1											
2)	Legislation on forest planting better adapted to nature conservation											1		
3)	Controlling nutrient level by monitoring		1											
4)	Replacing intensive management by traditional methods (cutting, burning etc.).		1											
5.1)	More efficient and adapted subsidies	✓	1		3			1		2		1	1	

		LIFE	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
5.2)	Increase of population of native herbivores			1										
6)	Mapping and analyzing species richness of habitats		1											
7.1)	Solutions for damages caused by carnivores											1		
7.2)	Demand for locally produced products and services											1		
10.1)	Less complicated conditions (no bureaucratism) for the farmers/land owners to get subsidies		1		1									
10.2)	Better communication of values of habitats, more detailed information on management influence on habitats and species				1									
	Bio-farming								1				1	
	Agricultural policy in mountain areas							1						
	To keep always some parts of the habitats unmanaged for short periods (1 to few years) and permit this in funding				1									
	Better coordination between the different sectors of administration dealing with land management								1					
	Education, awareness raising								2					
	Enactment of legislation favouring a more nature-friendly management by discouraging intensive agricultural practices (such as those related to manure slurry disposal)								1					
	Identifying high nature value farmland areas and connect them by an ecological network in order to avoid the fragmentation of habitats and to promote the restoration								1					
	Revitalize the economic return of pastures for example producing local cheese with certification of cheese that respect butterflies or biodiversity.								1					
	Allocate more resources to the quality of the territory starting from research to arrive at quality management awards								1					
	Purchase of private plots									1				
	Cooperation between authorities and relevant stakeholders				1			1						
	Contracts with stakeholders of longer duration							1						

Additional information: Sweden: Better solutions for protection of animals and better subsidies to compensate for losses connected to the presence of large carnivores. There is a need for a faster and more simplified administrative handling of usual problems with carnivores. There should be a more forgiving attitude from the authorities towards those farmers who interrupts an on-going commitment within the Swedish CAP in connection with predator attacks. There are examples of farmers who have lost animals due to predator attacks and then they have to repay prior year's compensation since they are unable to fulfil their commitments. Increase the demand for locally produced products and services (e.g. eco-tourism). There is however a potential conflict between agricultural tourism and carnivore tourism that has not been fully addressed. Regulations better adapted to nature conservation in the Swedish Act concerning forest planting on formerly open farmland (Jacobson). **Bulgaria:** Fighting against the game poaching in the National parks and restoration of the indigenous wild fauna including reintroduction of extinct species as the European bison and wild horse (Avramov). **Poland:** It seems that additional form of subsidies focused on particular conservation objectives should be created, especially on areas where grasslands are still well preserved (Korzeniak). Effective financial mechanisms that support breeding of sheep in the mountains (Kucharzyk). **Italy:** To improve instruction through a constant ecological education starting from compulsory schooling. In order to obtain some result and to refer to adults as well, it is necessary to involve the productive categories (Lasen, Bonelli, Cerrato). Revitalize the economic return of pastures for example producing local cheese with certification of cheese that respect butterflies or biodiversity (Bonelli, Cerrato). **Slovenia:** CAP reform is a big opportunity that could provide financing for less intensive agriculture, which would provide proper management of grasslands (Verovnik). **Germany:** A better financial support for the management measures combined with less complicated conditions (no bureaucratism) for the farmers/land owners to get this money (Kraus). Better funding and better channelling of funding, better communication of values of habitats, more detailed information on management influence on habitats and species, especially habitats between categories (mixed

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grassland-tree communities), always keep some parts of the habitats unmanaged for short periods (1 to few years) and permit this in funding - especially if productivity is low (Dolek). Intensive cooperation between the different authorities, landowners and farmers. Strengthening of the relatively small sized farming in upper Bavaria by greening, e.g. nature conservation programme and consulting of landowners and farmers. More staff for the approving authorities (e.g. three for each county) for consulting and controlling (Albert Lang). **France:** Changes in the European Common Agriculture Policy in direction to a more 'green' and sustainable agriculture promoting extensive land-use forms and thus, biodiversity. Agri-environmental schemes should be adapted to regional characteristics to support e.g. the maintenance of still existing organisation structures (Dieker). Ensuring good group cooperation between DOCOB (action plans) and relevant stakeholders and ensuring that these stakeholders sign the contract. Long-term grazing requirements also require contractual measures to be of longer duration (FNE). Creation of individual management plans for farms (where to graze). Consultation with communities and other stakeholders to develop and agree on grazing regulations (timing and intensity of grazing: capacity of animal, period, frequency, better distribution). Support to farmers to graze: fencing around lakes so the livestock does not enter, building watering spots, building shelters for lambs not to make grazing only seasonal, fences to protect herds against carnivores. To motivate farmers to create groups, to provide subsidies for them to get machinery to clear the site and start grazing. Improvement of grazing economy: use of hay (esp. Nardus stricta, Carex brizoides) for beds. Plan to prepare brickets from Nardus hay – for feeding cattle in winter, or small pellets for home mammals. Agrotourism – horse riding. To restore the economy for wool products: use the breeds with high-quality wool (e.g. MERINO), to create a processing chain to the final product – in a group to share the benefits. Low quality wool for isolation of buildings. To improve the processing chain for cheese, meat (LIFE projects).												

Species Management Requirements Identified by Country Experts

	LI FE	A T	B G	D E	E S	F I	F R	I T	P L	R O	S E	S I	S K
Botrychium sp.: This habitat might harbour several species of *Botrychium*. Also some species of rare insects occur in this habitat (Jacobson).											✓		
Adapting grazing pressure and walking routes of herds for *Botrychium simplex* (1419), changes to walking trails, and strictly protecting habitat patches where necessary (FNE).							✓						
Mowing should be adjusted to avoid damaging the larval stages and affect nectar sources for threatened species of butterflies. This should be applicable only to sites where the species is known to occur (Verovnik).												✓	
Maculinea arion (1058), *Euphydryas aurinia* (1065): establishing corridors between suitable habitats at the landscape level (metapopulation management) (FNE).							✓						
Protection of patches in pastures that are grazed (especially by sheep) may be beneficial to *Euphydryas aurinia* (FNE).							✓						
Adapting mowing dates and grazing intensity to local context in order to reach a coverage of at least 5% *Thymus* sp. is beneficial for *Maculinea arion* (FNE).							✓						
Lopinga achine (1067): ensuring presence of a range of succession stages (FNE).							✓						
Polyommatus dorylas probably retreated to extremely steep south-facing slopes that are hot and very extensively grazed. In large areas already disappeared. (Dolek).				✓									
Argynnis niobe: inhabits ecotones (grasslands with some trees or shrubs) with structural mosaic, disturbances, protected pockets, etc. (Dolek).				✓									
Maculinea arion (annex IV): Regularly associated with stones etc. with its larval food-plant *Thymus* sp. (Dolek).				✓									
Boloria selene, Lycaena hippothoe, Pyrgus serratulae are characteristic butterflies that need special attention (Dolek).				✓									

	LI FE	A T	B G	D E	E S	F I	F R	I T	P L	R O	S E	S I	S K
Birds. Below 1500 m a.s.l. – Capercaille (*Tetrao urogallus, T. tetrix*), above 1500 m – *Tetrao tetrix*	✓												

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Case Studies Identified by Country Experts

	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
Management practice in Gorce National Park – SCI PLH120018 (management plan + management practice)								✓				
LIFE03NAT/S/000070 project Natural pastures and hay meadows in Jämtland/Härjedalen http://www2.z.lst.se/naturvard/life/index.html										✓		
http://www.daphne.sk/sites/daphne.sk/files/uploads/MM12_nardeta.pdfManagement models for grassland habitats:												✓

Other information

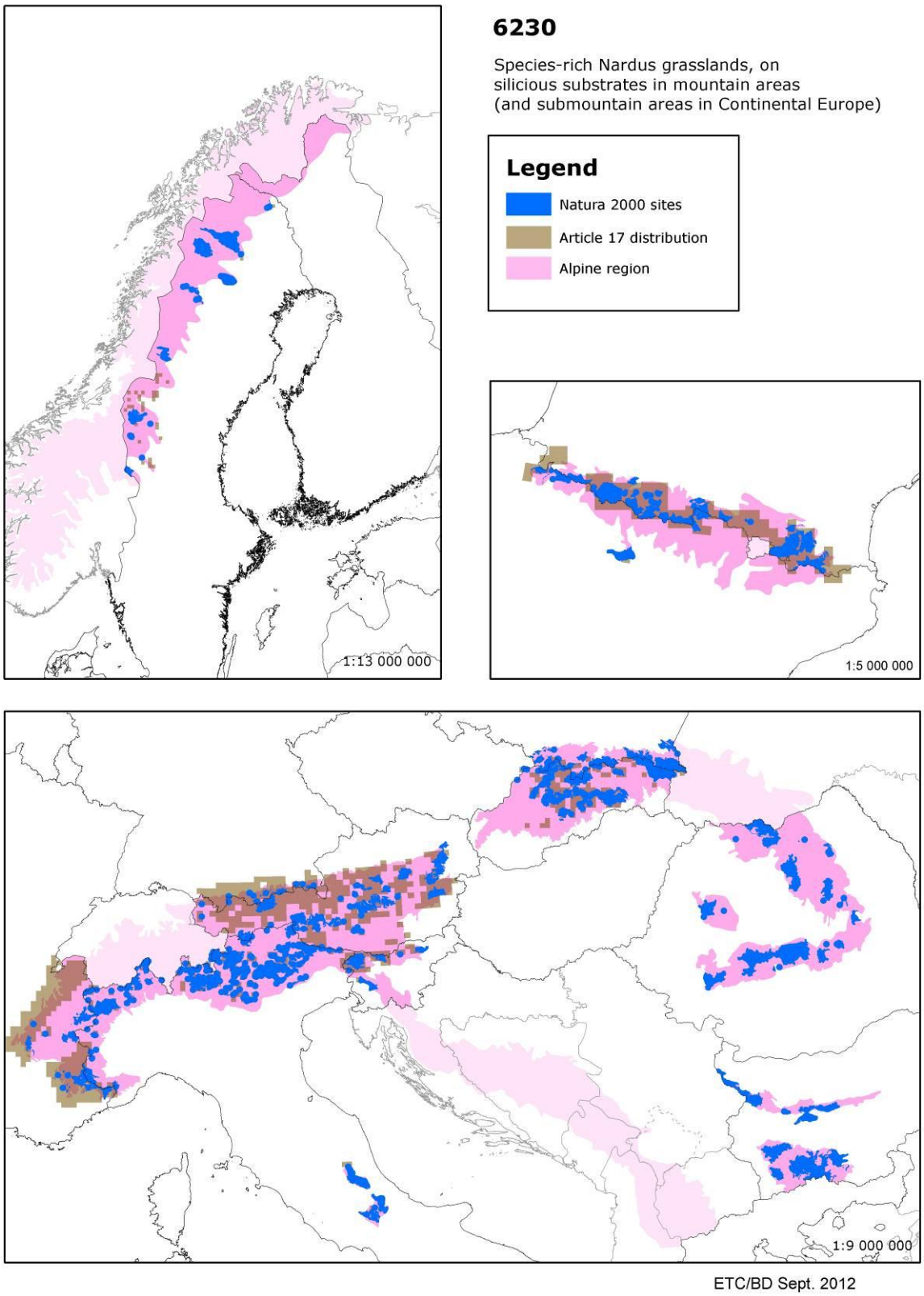
According to the ETC/BD calculations 51-75% of the area of this habitat type are within SCIs. This means that Natura 2000 network provides an important framework for the management of this habitat type. However, this estimation is a bit too high for the Austrian Alps (Kudrnovsky).

Number of SCIs and habitat area (ha) within SCIs per Member State in the Alpine biogeographical region

	AT	BG	DE	ES	FR	IT	PL	RO	SE	SI	SK
Number of sites	28	9	11	6	45	165	16	23	13	5	34
Habitat area (ha)	17046	25343	122	4227	24701	37716	1406	3912	115	2785	6269

The figures include all SCIs where the habitat type is mentioned including sites coded as D.

Map of SCIs proposed for Species-rich *Nardus* grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) & Article 17 distribution



2.3 6410 - *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)

Habitats Manual (2007) Extract

Molinia meadows of plain to montane levels, on more or less wet nutrient poor soils (nitrogen, phosphorus). They stem from extensive management, sometimes with a mowing late in the year or, they correspond to a deteriorated stage of draining peat bogs. Sub-types:
37.311: on neutro-alkaline to calcareous soils with a fluctuating water table, relatively rich in species (*Eu-Molinion*). The soil is sometimes peaty and becomes dry in summer.
37.312: on more acid soils of the *Junco-Molinion* (*Juncion acutiflori*) except species-poor meadows or on degraded peaty soils.
In some regions, these grasslands are in close contact with *Nardetalia* communities. For the *Molinia* meadows of river valleys, a transition toward *Cnidion dubii* alliance is observed.

Ekstam, U., Aronsson, N. & Forshed, N. (1988). *Ängar*. Om naturliga slåttermarker i ängslandskapet. LTs förlag, Stockholm, 209 pp.

Meadows with purple moorgrass (*Molinia caerulea*) on wet, unfertile soils resulting from long periods of traditional management such as mowing. Species-poor meadows dominated by purple moorgrass, often a result of draining peat bogs, are not included in this habitat. This habitat is wide spread across central, northern and western Europe, it also occurs more rarely in the Mediterranean region.

Conservation status (CS) assessed at the Alpine region and MS level

N2K code	Habitat name		AT	BG	DE	ES	FR	IT	PL	RO	SE	SI	SK	REGION
6410	*Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)	range	FV		FV	XX	U1	FV	FV		U2	FV	U1	U1
		area	U1		FV	XX	U1	U1	U1		U2	U2	U1	U2
		structure	XX		XX	U1	U1	FV	U1		U2	U1	U1	U1
		future	U1		XX	U1	U1	XX	U1		U2	U2	FV	U2
		overall	U1		XX	U1	U1	U1	U1		U2	U2	U1	U2

Assessed as 'unfavourable-bad' in all regions in which it occurs except for the Mediterranean region where it is 'unknown' as a result of Spain reporting all parameters as 'unknown'. Only in Estonia (Boreal) and Portugal (Atlantic and Mediterranean) has this habitat been assessed as 'favourable '. Most countries include changes in agricultural management amongst threats and pressures, many also note drainage. Better information required, particularly from Spain and Luxembourg.
In the Alpine region, the overall conclusion is "bad" due to habitat area and future prospects in SI and SE that together represent 35,6% of the real habitat area (SE reports all parameters as "bad"). 6 of remaining 7 countries conclude "inadequate" what is reflected in partial conclusions for range and structure-functions, although a very high proportion of range is "favourable" (Summary sheet of the online report on Article 17 of the Habitats Directive).

Species associated with this habitat and their CS at the Alpine region and MS level[10]

N2K code	Species name	Group		AT	BG	DE	ES	FR	IT	PL	RO	SE	SI	SK	REGION
1042	*Leucorrhinia pectoralis*	Invertebrates	range	FV			XX			XX				U2	XX
			population	XX			XX			XX				U2	XX
			habitat	U2			XX			XX				U1	U2
			future	U2			XX			XX				U1	U2
			overall	U2			XX			XX				U2	U2
1060	*Lycaena dispar*	Invertebrates	range	FV				FV	U1	FV			FV	FV	FV
			population	FV				XX	U1	XX			U1	FV	U1

[10] *Liparis loeselii* and *Euphydryas aurinia* also suggested to be considered here.

			habitat	FV				FV	U1	FV			U1	FV	FV
			future	FV				FV	U1	FV			U1	FV	FV
			overall	FV				FV	U1	FV			U1	FV	U1
N2K code	**Species name**	**Group**		**AT**	**BG**	**DE**	**ES**	**FR**	**IT**	**PL**	**RO**	**SE**	**SI**	**SK**	**REGION**
1193	*Bombina variegata*	Amphibians	range	FV		FV		U2	U1	FV			FV	FV	FV
			population	U1		XX		U2	U1	FV			XX	U1	U1
			habitat	U1		FV		XX	U1	XX			U1	U1	U1
			future	U1		FV		U1	U1	FV			FV	U1	U1
			overall	U1		FV[11]		U2	U1	FV			U1	U1	U1
1197	*Pelobates fuscus*	Amphibians	range							XX				U1	U1
			population							XX				U1	U1
			habitat							XX				U1	U1
			future							XX				U1	U1
			overall							XX				U1	U1
1201	*Bufo viridis*	Amphibians	range	U1		U2			FV	FV			FV	FV	FV
			population	U1		U2			FV	XX			XX	U1	U1
			habitat	U1		U2			FV	XX			XX	U1	U1
			future	U1		U1			FV	FV			XX	FV	FV
			overall	U1		U2[11]			FV	XX			XX	U1	U1
1202	*Bufo calamita*	Amphibians	range	U1			XX	U2							U2
			population	U2			XX	U2							U2
			habitat	U2			XX	U2							U2
			future	U2			XX	U2							U2
			overall	U2			XX	U2							U2
	Species name	**Group**		**AT**	**BG**	**DE**	**ES**	**FR**	**IT**	**PL**	**RO**	**SE**	**SI**	**SK**	**REGION**
1758	*Ligularia sibirica*	Vascular plants	range	FV				FV		XX				FV	U2
			population	U1				FV		U1				FV	U1
			habitat	U1				FV		U1				U1	U1
			future	U2				U1		XX				U1	U2
			overall	U2				U1		U1				U1	U2
4045	*Coenagrion ornatum*	Invertebrates	range							XX			U1	U2	U2
			population							XX			U1	U1	U1
			habitat							XX			U1	U1	U1
			future							XX			U1	FV	U1
			overall							XX			U1	U2	U2
4046	*Cordulegaster heros*	Invertebrates	range										FV	U2	FV
			population										FV	XX	FV
			habitat										FV	FV	FV
			future										FV	FV	FV
			overall										FV	U2	FV
4068	*Adenophora lilifolia*	Vascular plants	range						FV				FV	FV	FV
			population						FV				FV	FV	FV
			habitat						XX				FV	XX	XX
			future						FV				FV	XX	XX
			overall						FV				FV	XX	XX
4096	*Gladiolus palustris*	Vascular plants	range			FV		XX	FV				FV		FV
			population			FV		XX	FV				U1		U1
			habitat			FV		XX	XX				U1		XX
			future			FV		XX	FV				U1		U1
			overall			FV		XX	FV				U1		U1

[11] According to comments from Germany does not have a close relation to 6410.

Reported pressures on habitat and their importance to associated species

Pressure description (2nd level)	*Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)	*Leucorrhinia pectoralis*	*Lycaena dispar*	*Bombina variegata*	*Pelobates fuscus*	*Bufo viridis*
Cultivation				x	x	X
Grazing	x					
General Forestry management	x			x		
Drainage	x		x	x		
Biocenotic evolution						

Pressure description (2nd level)	*Bufo calamita*	*Ligularia sibirica*	*Coenagrion ornatum*	*Cordulegaster heros*	*Adenophora lilifolia*	*Gladiolus palustris*
Cultivation	x		x			X
Grazing		x				X
General Forestry management		x		x		
Drainage	x	x				
Biocenotic evolution						X

Reported threats to habitat and their importance to associated species

Threats description (2nd level)	*Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)	*Leucorrhinia pectoralis*	*Lycaena dispar*	*Bombina variegata*	*Pelobates fuscus*	*Bufo viridis*
Cultivation	x			x	x	X
Fertilisation	x			x		
General Forestry management	x			x		
Landfill, land reclamation and drying out	x	x	x			
Drainage			x	x		
Biocenotic evolution						

Threats description (2nd level)	*Bufo calamita*	*Ligularia sibirica*	*Coenagrion ornatum*	*Cordulegaster heros*	*Adenophora lilifolia*	*Gladiolus palustris*
Cultivation	x		x			X
Fertilisation	x					
General Forestry management		x		x		
Landfill, land reclamation and drying out	x	x	x			
Drainage	x	x				
Biocenotic evolution		x	x			X

The mountainous *Nardus* grasslands, especially on silicious substrates in mountains, represent non climax vegetation which long-term existence is closely related to the continuation of pastoral traditions (extensive land-use forms). Due to deep, broad and irreversible socio-economic changes since the 1950s, many regions suffer from migration to cities and thus, labours for this time and labour-intensive work are missing. Additionally, the service sector provides lucrative job offers. Thus, grazing is given up at many places or the grazing intensity is too low to maintain this vegetation type.

Threats and Pressures Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1)	A04.01 Intensive grazing	1		2			1		1				
2)	B01 Forest planting on open ground	1											
3)	A08 Fertilisation	1		2			1				1	1	
4)	A02.01 Agriculture intensification							1				1	
5)	A04.03 Abandonment of pastoral systems, lack of grazing	1	1	1					1		1		
6)	J02 human induced changes in hydraulic conditions			2			2						
7)	A05.03 Lack of animal breeding										1		
8)	A02 Modification of cultivation practices	2		1			1		1				
9)	A03.01 Intensive mowing or intensification			2					1			1	
10)	A03.03 Abandonment/lack of mowing	2		1				1	1			1	
11)	K02.01 Species composition change (succession)		1				2		1			1	
12)	E01 Urbanised areas, human habitation			1			2						
13)	K02 Biocenotic evolution, succession						1						

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
14)	D01.02 Roads, motorways			1									
15)	J03.02 Anthropogenic reduction of habitat connectivity						1						
16)	A07 Use of biocides, hormones and chemicals						1						
19)	A02.03 grassland removal for arable land											1	
20)	J02.12.02 dykes and flooding defence in inland water systems											1	
21)	A01 Cultivation						2						
22)	J02.01 (Landfill, land reclamation and) drying out, general	2		1			1	1			1	1	
23)	E04 Structures, buildings in the landscape						1						
24)	A04.02.01 non intensive cattle grazing			1									

Habitat Impacts: In **Sweden**, *abandonment of pastoral systems* is undoubtedly the most important threat to this habitat in the alpine region. It is a more severe problem here than in the other regions due to depopulation. *Lack of animal breeding* is a problem connected to abandonment. In many areas there is a general lack of grazing animals due to too few animal farms. This is even a greater problem in the alpine region than in other parts of Sweden. The problem is intensified because due to the decreasing number of farms the dairy companies stop collecting milk, thus making animal husbandry even more unprofitable in the region (Jacobson). In **Austria** the a*bandonment and lack of mowing* is the most important threat. Since the harvested hay cannot be fed to cattle and only be used as litter, the motivation for harvesting Molinia meadows is low. In the moment the subsidies are an encouragement and in the future rising prices for straw might help to ensure mowing. As a result of the reduction in traditional management such as cutting for litter and the production of bog hay, many Molinia meadows have been abandoned. Without active management, most sites are colonised by scrubs and trees, a process that is accelerated by nutrient enrichment and drainage around or within the site. Sometimes the habitats are not mowed but chaffed (mulched?), which increases the nutrient level of the site. Tractors are getting heavier resulting in soil compaction and even in destruction of the vegetation. The *drainage* by ditches represents also a threat in Austria (Hochegger). Yearly regularly mown manage practice on a bigger scale (not diversified) leads to lack in diversity. The increase of intensive high-nutrient farming in surrounding area leads to *increase of nutrient level* in the habitat. Buffer zones are missing (Koschuh). In **Poland**, the abandonment leads in the first phase to a species-poor predomination of tall grasses (e. g. *Molinia, Calamagrostis*) and later on to a colonisation with shrubs and trees. The succession ends with more or less shady woodland without species of the former habitat. Abandoned are especially less productive areas at higher altitudes. The succession connected with eutrophication and accumulation of organic material is the main threat of all grasslands habitats across the Polish Carpathians due to recession of farming practices. Thus, the extensive traditional farming is replaced with *intensive practices* (fodder based on maize, earlier harvesting times for hay for silage). Intensive mowing, mowing more than once a year or intensification lead to decrease in species richness and decline of light-demanding plants. The result is relatively species-poor grassland vegetation without characteristic species of the former habitat. *Intensive grazing* changes species composition from meadow type to pasture type (Korzeniak). In **Slovenia** the threat is drainage, mainly due to intensification of grasslands, but occasionally such sites are abandoned and become overgrown due to lower water levels (Verovnik). Both the *abandonment* and *intensification* are considered as important pressures in **Germany.** Especially habitats that are difficult to reach are still afforested or abandoned and face succession (Dolek). The *abandonment* leads first of all to a species-poor predomination of tall grasses (e. g. *Molinia, Calamagrostis*) and later on to a colonisation with shrubs and trees, including *Pinus uncinata*. The succession ends with more or less shady woodland without species of the former habitat (Kraus). Well accessible sites even in higher altitudes such as passes and skiing resorts often receive high livestock densities, and the *grazing intensification* and overgrazing in certain parts takes place, including fertilisation, removal of stones and other structures restricting agriculture (loss of structural heterogeneity), while other parts (steep slopes, difficult to access areas) are neglected and not grazed anymore. Additionally, grazing in the Alps is more and more concentrated on non-wooded areas, keeping cattle out of tree structured parts and removing trees in grazed parts. All mixed types of habitats between dense forests and open grasslands, which are extremely important as butterfly habitats, are reduced (Dolek). The intensive mowing (mowing more than once a year) - whereby fertilization is normally included - leads to relatively species-poor grassland vegetation without characteristic species of the former habitat (Kraus). The nutrient input from neighbouring agriculture (esp. in lower altitudes) and deposition from the air is a general problem of all nutrient-poor habitats (Dolek). The total area of Molinia-meadows in the ABR in Swabia is relatively small – partly for natural reasons, but also for reasons of *draining* and intensive land use. In higher altitudes the areas are sometimes drained or damaged by the farming or forestry roads which changed the hydrology of

	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK

wetlands (Riegel). *The construction of urbanised areas, roads and motorways* causes a complete destruction of the concerned habitat (Kraus). **France:** In the French Alpine region, this habitat is located in the valleys of the Prealps, mainly in the north of the French Alps. It is associated with the presence of current or former calcareous fens (7230) (Dupont). Along with habitats 7140, 7110 and 7230, this habitat has probably undergone the worst decrease among all Natura 2000 habitats in the French alpine biogeographical region (Mikolajczak). The *urbanization* pressure is high in these valleys. Currently sites are very isolated and connectivity between different wetland systems no longer exists (Dupont). The main risk for this habitat type represents *abandonment of grazing* activity. In mountain areas where grazing has strongly decreased the vegetation composition changes, the habitat loses its typical open character and is replaced by heath and mountain shrubs. In the Alpine region, stopping management causes a shift towards Vaccinium heaths and gradually causes an invasion of shrub layer including alder buckthorn (Frangula dodonei) (Dupont). This process is accompanied by changes in animal assemblages. The habitat type is associated with a diversity of butterfly species which is significantly less than in semi-natural dry grasslands and scrubland facies on calcareous substrates, but still important. In the Alpine region, species observed in this habitat are especially well represented on the alpine meadows (such as *Erebia* sp.). Management through controlled grazing is preferable for this type of habitat. However, a *high grazing intensity* over long periods and repeated year after year causes a change in the plant community with the disappearance of dicotyledons and dominance of Nardus stricta. There is an impoverishment of butterfly diversity with a dominance of generalists on Poaceae. Over-grazing happens in many places across the French Alps, especially in the southern Alps where sheep grazing is locally very intensive. (Dupont, FNE). *Drainage* ditches have been extensively used in both alpine valleys and other wet environment in sub- and mountain areas to make lands best suited for intensive farming. This is connected with rapid modifications of the plant community and disappearance of host plants for many butterfly species (Dupont). Most of remaining semi-natural meadows in alpines valleys and in mountain areas have undergone the long lasting process of *fertilisation* so that these nutrient poor wet meadows have been reduced and are now scattered as small patches in the landscape. Small remaining patches of the habitat are likely to be destroyed by *urbanisation*, especially in urbanised lowland areas. The risk of destruction increases because most of these small patches are no longer used for mowing or grazing (Mikolajczak). The cultivation is mentioned as a specific threat to *Ligularia sibirica*, which has sensitive populations in this habitat type (FNE).

Management Requirements Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1.1)	Reduce animal load by reducing herd size or grazing duration						1						
1.2)	Apply grazing in areas with fixed fencing			1			1						
2)	Stop afforestation of grasslands			1					1				
3.1)	No/low fertilisation	1		1				1			1	1	
4.1)	(Low intensity) Grazing	1	1	1			2	1	1		1	1	
4.2)	Always leave some parts fallow			1									
5.1)	Clearing of bushes and trees	1									1		
5.2)	Burning (in some cases)	1									1		
5.4)	Restore the density of the indigenous wild herbivores		1										
5.5)	Restore/reintroduce the traditional grazing	1		1			1		1				
6.1)	Mapping	1											
9.1)	Maintain an (extensive) mowing	2		1			2	1	1		1		
9.2)	Rotational or small-scale haying in different time intervals to create mosaic habitats	1										1	
10)	Re-establishment of haying in abandoned grasslands											1	
13)	Avoiding further extensions and connections of skiing resorts to attract more winter tourists.			1									
	Apply evidence-based approaches						1						
	No drainage - maintain groundwater level	1					1				1		

Additional information: Sweden: The traditional animal husbandry in this region has been a mixture of different activities, e.g. grazing, harvesting of fodder (grass and leaves) and firewood and burning to improve grazing. This habitat needs grazing animals (mainly cows, sheep, horses or goats)

and sometimes clearing of bushes and trees to keep in good conservation status, or it will be overgrown. The process of overgrowing is very slow in the alpine region which means that an area can keep its biological grassland values for a long time after abandonment, but eventually it will become forest or scrubland. It is important that fertilisation is not present in this habitat. Otherwise it will deteriorate and lose much of its biodiversity (Jacobson). **Poland:** Maintain an extensive mowing, as a way of decreasing soil fertility and protecting against overshading. Develop local initiatives connected with shepherding revitalization (like Owca Plus in the Silesia province) (Korzeniak). **Italy:** These meadows should be cut regularly, at least once a year and in late period, and not fertilized. It could be tolerated to cut them every second year and to provide a weak fertilization (excluding manure slurry) as well as an extensive grazing (Lasen). **Slovenia**: The habitat is very local and mostly in small patches, therefore direct protection and specific management could be an option (Verovnik). Rotational mowing once a year - in late autumn. The grassland conversion to arable land is acceptable only as an extensive management, i.e. in the case that mosaic and diverse landscape is preserved which means that degree of habitat fragmentation enables genetic exchange (Čelik). **Germany.** Mowing once a year in autumn (Kraus). **France:** The extensive grazing of mowing keeps poor to moderate soil nutrient richness and full-light open habitat (Mikolajczak). Guided herding, based on local action plans for pastoralism, to reduce animal load by reducing herd size or grazing duration, to adapt the land use of parcels on the basis of actual threats or based on presence of species; keep non-intervention zones (30% annually); put sensitive grazing areas under permanent or temporary protection (FNE). Mowing every second or third years is currently required with the presence of unmowed strips for refuge (Dupont). Depending on altitude, extensive grazing management by sheep and/or cattle; as mountainous grasslands are more sensitive in comparison to lowland ones, suitable livestock intensities should not exceed 1 LU-ha. As it is well known that different species groups (e.g. plants, insects) have different requirements concerning suitable grazing pressure, grazing management should act at landscape scale (e.g. across a whole valley). Thereby varying grazing intensities could help to maintain and restore dynamic landscape entities. Such management would also counterbalance sudden changes in the grazing regime. In this context, it is of considerable role to maintain a network of 'species (group)-specific' pastures to foster genetic exchange among populations. Keep or re-install low grazing intensity, including areas that are steep or for other reasons difficult to handle as well as grazing in wooded areas with a focus on wide ecoclines between forest and grassland (Dieker).

Current Management Practices Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
2)	Permission to plant trees on agricultural land needed										1		
5.1)	Subsidies in CAP for traditional farming	1						1			1		
5.2)	In sub-mountain areas, remaining small patches of the habitat are barely managed						1						
5.3)	Grassland restoration. In mountain and subalpine areas, experiences of grassland restoration (heath cutting) have been carried out both for grazing and for conservation of black grouse						1						
5.4)	Extensive grazing kept and supported			1			1						
5.5)	Extensive mowing kept	1		2			1	1					
	Removing of trees and scrubs	1					1	1					
	Protected and managed natural areas						1						
	Buffer zones			1									
	Management by « natural areas managers »						1						

Additional information: Sweden: Subsidies within the Swedish CAP are addressed to support farming in rural areas (e.g. for summer farms, keeping of animals etc.) and also traditional management of valuable areas and habitats. The County Administrative Boards inform farmers on how to manage valuable habitats. Several restoration projects of grasslands and farms, partly financed by LIFE+ money, have been carried out in the alpine region (Jacobson). **Italy:** Mowing and maintenance measures are supported by a system of compensatory payments that includes a supervision of management. This applies to Natura 2000 sites as well as to any other part of the provincial territory (Lasen). CAP measures that are applied should ensure a correct number of animals for each meadow in order to avoid overgrazing effect. Unfortunately the extension (numbers of hectares) and the number of farmers that ask and use this money is absolutely insufficient to have a positive impact (Bonelli, Cerrato). **Germany**: The actual management measures are generally

identical as explained above in the management requirements part. Most of these measures are financially supported by Bavarian government and EU (special subsidies to land owners/farmers). Only relatively few areas of the habitat are abandoned. Mowing once a year in midsummer (for some subtypes grazing is also suitable) (Kraus). **France:** In the Spanish, but especially in the French Western **Pyrenees**, grazing is still often organised by local pastoral institutions acting at valley level (and in some cases also across borders). This traditional form of organisation allows that most of the pastures in valleys are taking into grazing regime and thus are in good condition (pastures rarely receive more than 0.6 LU/-ha). This way of management is not realised because of conservation concern, but because it has been proved and remains as a useful relic from former times. In case such structures are missing, just single pastures instead of entire valleys are used for grazing. Sudden changes have thus an directly impact. Since changes in vegetation composition become apparent after abandonment of grazing, local scientific institutions tried to encourage shepherd families to continue and re-establish, respectively, local traditional grazing practices (Dieker).

Barriers and Bottlenecks Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1)	Subsidies leading to overgrazing in National Parks		1										
4)	Promoted farming improvements							1					
5.1)	Insufficient CAP subsidies			2				1	1		1	1	
5.2)	Lack of funding	2		1				1				1	
5.3)	Low profitability			1					1		1		
5.4)	Large distances										1		
5.5)	Too few farmers										1		
5.6)	Polarization of agriculture. Intensification/abandonment process in agriculture: marginal, poor lands are set aside and rich lands are being more intensively used.						1						
5.7)	The management is less agro-pastoral driven; its goal shifts towards the conservation of biodiversity itself (e.g. black grouse). Farmers are not interested in managing these meadows						1						
5.8)	Competition agriculture – tourisms for the same labour						1						
5.9)	Competition of mountain – lowland agriculture						1						
5.10)	Missing financial incentives at long-term for shepherds						1						
5.11)	Long-term grazing requirements also require contractual measures to be of longer duration						1						
5.12)	Difficult land use conditions (especially too wet or too steep),			2									
5.13)	Getting financially support is relatively complicated for farmers			1					1				
6)	Lack of knowledge about this habitat	1	1				1		1			1	
7.1)	Large carnivores										1		
7.2)	Transformation of summer farms to recreation facilities										1		
10.1)	Non-cooperating landowners/stakeholders	1		2			1	1	1				
10.2)	Missing knowledge on value of habitats in non-conservation authorities			1									
10.3)	Insufficient communication with farmers			1								1	
	Insufficient human resources to manage projects and supervise land management			1				1					
	Policy framework/inappropriate policy	1										1	
	Difficult relationships with other administrations dealing with land management							1					
	Excessive bureaucracy to approve management							1					

Additional information: Sweden: The current subsidies within the Swedish CAP are not sufficient to prevent the disappearance of farms in this region. Not all farmers are connected to the Swedish CAP. Partly because the subsidies are relatively low, many farmers think that the applications are complicated and they have a feeling of being insecure and supervised. The economic reality of some farmers is that they can't accept being tied into long-lasting agreements concerning subsidies, when

AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK

an unexpected situation can force them to break the agreement and have to pay back subsidies from the previous year. Furthermore, during the last periods of CAP the subsidies have been reduced leading to a decreased incentive for farmers. The co-financing of restoration projects is unfortunately not always corresponding to the possibilities for increased profit to the farmer's business, i.e. there are sometimes no economic incentives for the agricultural company to restore these kinds of areas. Consequently, some objects of value will not be restored even if there are available subsidies. The resources at the County Administrative Boards are not sufficient to inform adequately and to reach all farmers. There are problems concerning living in rural areas in the alpine region of Sweden with harsh climate, large distances, low population density and a general lack of social functions. The profitability of farming in these regions is also low compared to lowlands and more southern areas in Sweden. This forces the farmers to have other sources of income besides farming, consequently leading to increased travelling and costs. When the number of farms is too low the dairy companies stop collecting milk (too high cost), making animal husbandry even more unprofitable in the region. In some regions farmers have problems with large carnivores such as wolves and bears that make it more difficult to keep animals, especially sheep and goats. This gives rise of a potential for conflicting conservation goals, i.e. grazing of semi-natural grasslands or the presence of large carnivores. Carnivores induce direct damage through attacks, but can also cause indirect problems and costs by their mere presence. Few farms and large distances make it difficult to transport grazing animals and keep them in remote areas. Most of these habitat localities are connected to summer farms in the alpine region of which most have been abandoned during the past century and in many cases transformed into summer houses or different kind of tourist facilities which means that they will not become farms again (Jacobson). **Poland:** All barriers and bottlenecks are directly or indirectly connected with low economical profitability of extensive farming in Poland. Present solutions, including funds, are insufficient for maintain grasslands of high natural value in a large spatial scale. Low effectiveness of agri-environmental subsidies due to land fragmentation in mountainous area. Funding system not suitable for small farms, insufficient funds accompanied by complicated administrative procedures. Lack of economical reason to maintain grasslands or pastures (lack of animals) (Korzeniak). **Italy:** Excessive bureaucracy: European and national standards, even more than those of the Autonomous Province itself, impose onerous obligations on private citizens. They also make sure that long time is needed for the approval of environmental plans. Difficult relationships with owners: it's always difficult to explain that to preserve nature values (species and habitats) some renouncement is necessary, unless you are able to be more convincing in terms of cost-effectiveness. In the past decades, the productivity of grasslands has been incentivized, while the measures to support mountain farming lead to an increased forage production at the expense of environmental quality (Lasen). **Slovenia:** Insufficient funds and thus the Agri-Environmental Measures (AEM) are not financially stimulative. The important bottlenecks in policy are: (i) lack of skills and knowledge in policy because of its insufficient or inappropriate communication with scientist and experts. This results also in inappropriate AEMs, very weak inspection/control over the performance of prescribed management; (iii) sometimes any policy measures are taken although the policy was acquainted with inappropriate management actions observed in the field. The lack of knowledge about species ecology and ecosystem functioning meaning that there is a lack of skills for proposing suitable conservation management in such cases. At present, there are no active measures that take butterflies into account, even in protected areas (e.g. Nature Parks) and Natura 2000 sites (Čelik). **Germany:** Changes in the European Common Agriculture Policy in direction to a more 'green' and sustainable agriculture promoting extensive land-use forms and thus, biodiversity. Agri-environmental schemes should be adapted to regional characteristics to support e.g. the maintenance of still existing organisation structures (Dieker). An important reason is the lack of man-power for project-management. The cooperation with private land-owners, farmers and foresters needs time. The staff being engaged in Natura 2000 is limited; therefore difficult measures are hardly to be realized (Riegel). **France:** Variability in the quality of hay depending on the mowing date: the latest the mowing, the lowest is the quality of hay: this limits the possibility of intervention by local farmer (Dupont).

Potential Solutions Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
3)	Controlling nutrient level by monitoring	1											
4)	Replacing intensive management by traditional methods (cutting, burning etc.).	1											
5.1)	More efficient and adapted subsidies			2					1		1		
5.2)	Increase of population of native herbivores		1										
6)	Mapping and analyzing species richness of habitats	2											
7.1)	Solutions for damages caused by carnivores										1		
7.2)	Demand for locally produced products and services										1		
10.1)	Less complicated conditions (no bureaucratism) for the farmers/land owners to get subsidies			1									
10.2)	Better communication of values of habitats, more detailed information on management influence on habitats and species			1									
	Better cooperation between policy and owners or other stakeholders, including scientists			1								1	
	Fund raising	2		1								1	
	Bio farming											1	
	To keep always some parts of the habitats unmanaged for short periods (1 to few years) and permit this in funding			1									
	Better coordination between the different sectors of administration dealing with land management							1					
	Education, awareness raising, communication			1			1	1				1	
	Enactment of legislation favouring a more nature-friendly management by discouraging intensive agricultural practices (such as those related to manure slurry disposal)							1					
	Identifying high nature value farmland areas and connect them by an ecological network in order to avoid the fragmentation of habitats and to promote the restoration							1					
	Revitalize the economic return of pastures for example producing local cheese with certification of cheese that respect butterflies or biodiversity.							1					
	Experimental studies on the habitat rehabilitation						1						
	Allocate more resources to the quality of the territory starting from research to arrive at quality management awards							1					
	Demonstration of good practices			1									
	Direct protection of the area							1				1	

Additional information: Sweden: Better solutions for protection of animals and better subsidies to compensate for losses connected to the presence of large carnivores. There is a need for a faster and more simplified administrative handling of usual problems with carnivores. There should be a more forgiving attitude from the authorities towards those farmers who interrupts an on-going commitment within the Swedish CAP in connection with predator attacks. There are examples of farmers who have lost animals due to predator attacks and then they have to repay prior year's compensation since they are unable to fulfil their commitments. Increase the demand for locally produced products and services (e.g. eco-tourism). There is however a potential conflict between agricultural tourism and carnivore tourism that has not been fully addressed (Jacobson). **Austria:** Sustainable cultivation methods have to be developed for example the use of Molinia hay for litter (for horses) (Hochegger). **Poland:** It seems that additional form of subsidies focused on particular conservation objectives should be created, especially on areas where grasslands are still well preserved (Korzeniak). **Italy:** To improve instruction through a constant ecological education starting from compulsory schooling. In order to obtain some result and to refer to adults as well, it is necessary to involve the productive categories (Lasen). **Slovenia:** Protection and active management of all important sites (Verovnik). Fund raising: financial stimulation of owners; financial support for basic studies on species ecology, ecosystem functioning and effects of specific anthropogenic activities on species/ecosystems (Čelik). **Germany:** Changes in the European Common Agriculture Policy in direction to a more 'green' and sustainable agriculture promoting extensive land-use forms and thus, biodiversity. Agri-environmental

	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
schemes should be adapted to regional characteristics to support e.g. the maintenance of still existing organisation structures. (Dieker). A better financial support for the management measures combined with less complicated conditions (no bureaucratism) for the farmers/land owners to get this money (Kraus). Public relations and communication: by information and e. g. excursions it is possible to gain support and influence political decisions (Riegel). **France:** Guided herding, based on local action plans for pastoralism, to adapt the land use of parcels on the basis of actual threats or based on presence of species; keep non-intervention zones (30% annually). These measures can be integrated into AEM, grazing contracts between municipalities and livestock breeders and in support to mountain farming. The good group cooperation between DOCOB (action plans) and relevant stakeholders is important as well as ensuring that these stakeholders sign the contracts. The sensitive grazing areas could be subject of permanent or temporary protection (FNE).											

Species Management Requirements Identified by Country Experts

	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
Adapting grazing pressure and walking routes of herds for *Botrychium simplex* (1419), changes to walking trails, and strictly protecting habitat patches where necessary.						✓						
Mowing should be adjusted to avoid damaging the larval stages and affect nectar sources for threatened species of butterflies. This should be applicable only to sites where the species is known to occur (Verovnik).											✓	
Protection of patches in pastures that are grazed (especially by sheep) may be beneficial to *Euphydryas aurinia. Euphydryas aurina* is susceptible against complete mowing and early mowing dates (Dolek).			✓			✓						
E*uphydryas aurina, Coenonympha tullia* and other butterflies of wetland-meadows: the date of mowing is very important for the conservation of the species; it shouldn't happen before 01.09.! (Riegel)			✓									
Adapting mowing dates and grazing intensity to local context in order to reach the coverage of at least 5% thyme is beneficial for *Maculinea arion*.						✓						
Maculinea arion (1058), *Euphydryas aurinia* (1065): establishing corridors between suitable habitats at the landscape level (metapopulation management)						✓						
If *Maculinea teleius* (Annex II of the Habitat Directive) is present and the abundance of the host plant (*Sanguisorba officinalis*) is low, it is recommended to increase the mowing pressure associated with a monitoring of adult butterflies. Significant pressure mowing improves the dynamic of the host plant. (Dupont)						✓						
Lopinga achine (1067): ensuring presence of a range of succession stages.						✓						
Polyommatus dorylas probably retreated to extremely steep south-facing slopes that are hot and very extensively grazed. In large areas already disappeared.			✓									
Argynnis niobe: inhabits ecotones (grasslands with some trees or shrubs) with structural mosaic, disturbances, protected pockets, etc.			✓									
Maculinea arion (annex IV): Regularly associated with stones etc. with its larval food-plant *Thymus* sp.			✓									
Boloria selene, Lycaena hippothoe, Pyrgus serratulae are characteristic butterflies that need special attention			✓									
Lycaena helle, Proclossiana eunomia, Coenonympha oedippus need short-time fallow areas (Dolek); about 20-30% should be permitted to be unmown in certain years, especially on sites of low productivity						✓						

	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
Coenonympha tullia. Litter mowing in end of august might be a problem for this species. There is a lack of knowledge for recent declines. (Dolek)												
Maculinea alcon. Widespread mowing at beginning of September (co-funded by EU) is in certain cases too early (e.g. *Maculinea alcon* on localities depending on Gentiana asclepiadea) (Dolek).			✓									
Minois dryas, Carcharodes flocciferus are further important species with specific requirements (Dolek)			✓									

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Case Studies Identified by Country Experts

	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
Management models for grassland habitats: http://www.daphne.sk/mm/manazmentove-modely												✓

Other information

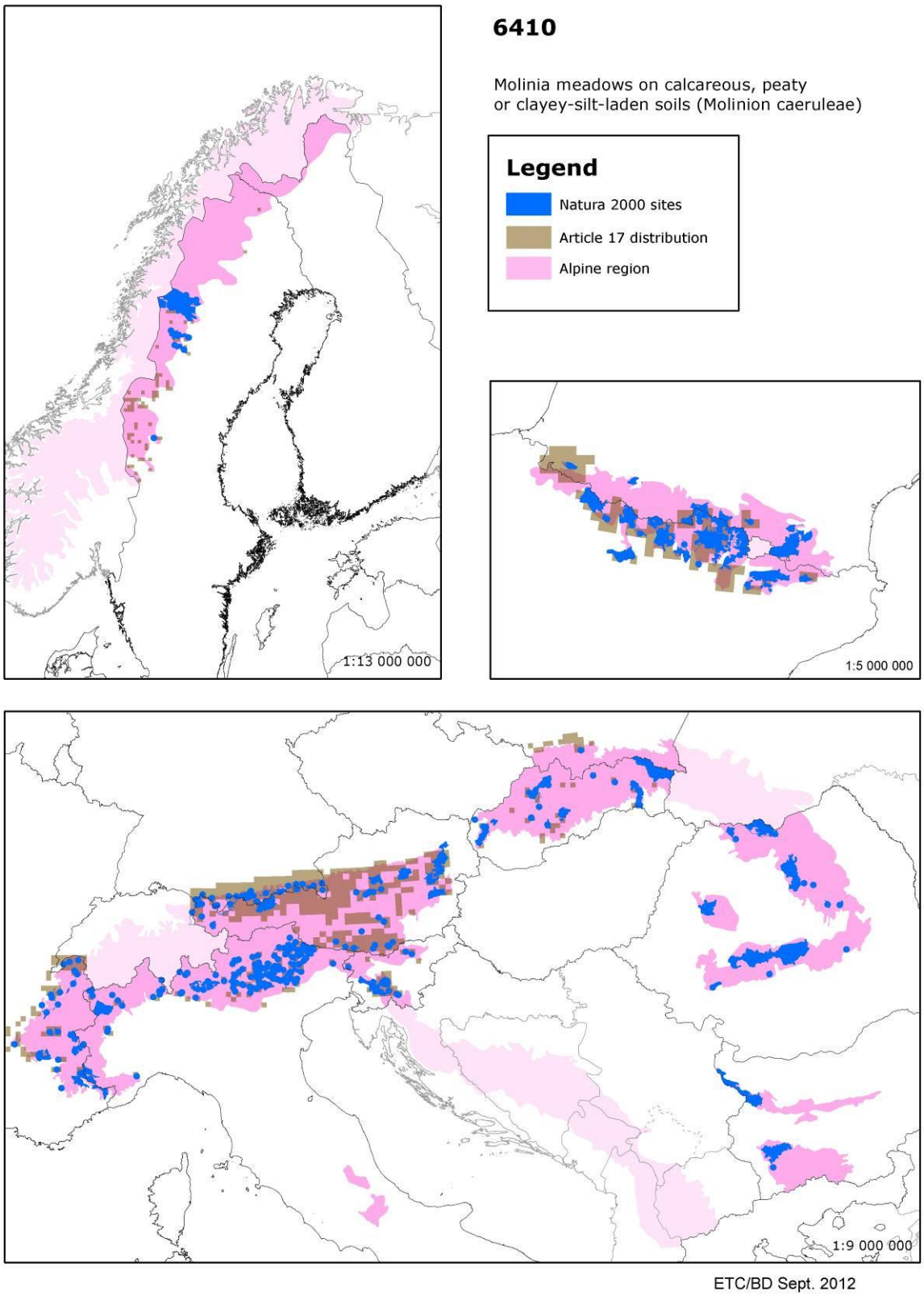
According to the ETC/BD calculations 76-100% of the area of this habitat type are within SCIs. This means that Natura 2000 network provides an important framework for the management of this habitat type.

Number of SCIs and habitat area (ha) within SCIs per Member State in the Alpine biogeographical region

	AT	BG	DE	ES	FR	IT	PL	RO	SE	SI	SK
Number of sites	33	4	21	24	34	100	1	15	5	12	13
Habitat area (ha)	1421	69	432	1821	4403	4211	14	873	854	2301	84

The figures include all SCIs where the habitat type is mentioned including sites coded as D.

Map of SCIs proposed for *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) & Article 17 distribution



2.4 6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

Habitats Manual (2007) Extract

- Wet and nitrophilous tall herb edge communities, along water courses and woodland borders belonging to the *Glechometalia hederaceae* and the *Convolvuletalia sepium* orders (*Senecion fluviatilis*, *Aegopodion podagrariae*, *Convolvulion sepium*, *Filipendulion*) (37.7.)
- Hygrophilous perennial tall herb communities of montane to alpine levels of the *Betulo-Adenostyletea* class (37.8.).

Similar communities to 37.8, with a weak development, occur at lower altitude along rivers and forest borders (in Wallonia-Belgium for example). Nitrophilous edge communities comprising only basal, common species in the region have no conservation priority. These tall herb communities could also develop in wet meadows, let lie fallow, without any cutting. Large areas of wet meadows let lie fallow and neophyte communities with *Helianthus tuberosus*, *Impatiens glandulifera*, should not be taken into account.

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Conservation status (CS) assessed at the Alpine region and MS level:

N2K code	Habitat name		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK	REGION
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	range	XX		FV	XX	FV	FV	FV	FV		FV	FV	FV	FV
		area	XX		FV	XX	XX	XX	FV	FV		FV	XX	FV	XX
		structure	XX		FV	XX	FV	FV	FV	FV		FV	U1	U1	U1
		future	FV		FV	XX	FV	FV	FV	FV		FV	XX	FV	FV
		overall	XX		FV	XX	FV	FV	FV	FV		FV	U1	U1	U1

This habitat is formed by tall herbs (sometimes known as 'megaforbs') typical of wet, fertile soils often on cliff ledges, woodland margins and riverbanks. The habitat is widespread throughout Europe although restricted to mountains in some countries.

Assessed as 'unfavourable-inadequate' in Alpine, Boreal and Continental regions. In the Alpine region this is due to 'structure and function' in Slovenia and Slovakia. All other countries in the Alpine region assessed this habitat as 'favourable ' except Spain where all parameters were reported as 'unknown'.

In the Boreal region the assessment is a result of poor 'structure and function' and 'future prospects' in Finland and Lithuania, elsewhere the habitat has been assessed as 'favourable' except for Sweden where it is 'unknown'. Countries in the Continental region reported a range of assessments, including 'unfavourable-bad' (Czech Republic), 'favourable ' (Germany, Italy) and 'unknown' (Austria, Denmark, Luxembourg). Assessed as 'unfavourable-bad' for the Atlantic and Pannonian regions due to 'structure and functions' in Belgium, France and the United Kingdom (Atlantic) and all parameters in Hungary. No country in these regions has assessed this habitat as 'favourable'. Assessed as 'unknown but not favourable ' in the Mediterranean region due to all parameters in Spain being reported as 'unknown'. Assessed as 'favourable' by Italy and 'unfavourable-inadequate' elsewhere in the region, excluding Spain would lead to a regional assessment as 'unfavourable-inadequate'. Better information required.

This is a key habitat for foraging of adult butterflies, especially during dry summers, at low and medium altitudes. Furthermore, this habitat contains meadow species like *Sanguisorba officinalis* (host plant of *Maculinea teleius* and *M. nausithous*, HD annex II&IV). This habitat facilitates connectivity across a landscape between semi-natural habitats and the habitat destruction increases the effect of fragmentation.

Species associated with this habitat and their CS at the Alpine region and MS level

N2K code	Species name	Group		AT	BG	DE	ES	FR	IT	PL	RO	SE	SI	SK	REGION
1604	*Eryngium alpinum*	Vascular plants	range	FV				FV	U1				U1		U1
			population	XX				FV	U1				U1		U1
			habitat	XX				U1	XX				U1		XX
			future	XX				U1	U1				U1		U1
			overall	XX				U1	U1				U1		U1
1758	*Ligularia sibirica*	Vascular plants	range	FV				FV		XX				FV	U2
			population	U1				FV		U1				FV	U1
			habitat	U1				FV		U1				U1	U1
			future	U2				U1		XX				U1	U2
			overall	U2				U1		U1				U1	U2
4116	*Tozzia carpathica*	Vascular plants	range							FV				FV	FV
			population							FV				FV	FV
			habitat							FV				FV	FV
			future							FV				XX	XX
			overall							FV				FV	FV

Reported pressures on habitat and their importance to associated species

Pressure description (2nd level)	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	*Eryngium alpinum*	*Ligularia sibirica*	*Tozzia carpathica*
Drainage	x		x	x
Modification of hydrographic functioning	x		x	
Biocenotic evolution	x			x

Reported threats to habitat and their importance to associated species

Threats description (2nd level)	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	*Eryngium alpinum*	*Ligularia sibirica*	*Tozzia carpathica*
Drainage	x		x	x
Modification of hydrographic functioning	x		x	
Biocenotic evolution	x		x	x

Threats and Pressures Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1)	A04.03 Abandonment of pastoral systems, lack of grazing/lack of mowing										1		
2)	B01 Forest planting on open ground			1							1		
3)	J02.05 Modification of hydrographic functioning, general										1		
4)	K02 Biocenotic evolution, succession or K02.01 Species composition change (succession)								2				
5)	I01 Invasive non-native species	1							1				
6)	No threats or pressures					1							
7)	A08 Fertilisation	1		1			1						
8)	A04.01 Intensive grazing			1									
9)	J02 Human induced changes in hydraulic conditions	1		1									
10)	A03 Mowing / cutting of grassland			1									
11)	A03.03 Abandonment/lack of mowing			1									
12)	A03.01 Intensive mowing or intensification			1									
13)	E01 Urbanised areas, human habitation			1									
14)	A10.01 Removal of hedges and copses or scrub						1						
Habitat Impacts: In **Sweden**, there are few obvious threats to this habitat in the alpine region.													

However, at least at lower altitudes this habitat has benefited from the open landscape created by farming. Furthermore, its area also increases in initial phases of land abandonment. But in the long run these areas will change to forest and abandonment is thus negative for the habitat. On higher altitudes and in areas with regular natural processes or disturbances that keep forest and bushes away there is no obvious threat to the habitat (e.g. ice-scraped riversides, avalanche areas, high-altitude nutrient-rich moist soils etc.). *Forest planting on open ground* is connected to abandonment and changes of agricultural practices. In Sweden most abandoned farm land will soon be planted with trees and used for forestry. Forest planting is only a problem in areas at lower altitudes. Modification of rivers for hydropower (dams, regulation of waterflow, etc.) is a problem for this habitat at the edges of some rivers (Jacobson). In **Austria**, the ecological conditions of hydrophilous tall herb fringe communities in the plains and lowlands are very different from those of the montane and alpine levels. In the mountain and alpine zone invaders normally don't play the same *invasive* role (exception: Impatiens glandulifera!) as they do in the plains and lowlands. Invasive non-native plants are replacing the indigenous flora. Tall plants are displacing smaller, less competitive plants. The *changes in hydrology* leads to more or less heavy degradation or even destruction of the habitat. Due to water abstractions by hydro-energy and for producing artificial snow, the situation of hydrophilous tall herb fringe communities also has declined at higher elevations, especially during the very last years (Schratt-Ehrendorfer). In **Finland** this habitat in the Alpine region contains natural vegetation which does not need traditional land use such as grazing or mowing. Most of the sites of this type in the alpine region are within Natura 2000 areas. Theoretically the potential high pressure of reindeer grazing can cause negative changes in species composition. The grazing is now occasional (Lehtomaa). **Germany:** The *abandonment* leads first of all to a species-poor predomination of a few tall herbs and grasses (e. g. Filipendula ulmaria, Phragmites) and later on to a colonisation with shrubs and trees. The succession ends with a more or less shady woodland (Kraus). Especially habitats that are difficult to reach are still afforested or abandoned and face succession (Dolek). The habitat becomes gradually destroyed also by regular *mowing*, because the characteristic species of these plant-communities are sensitive to regular mowing (especially more than once a year). In case of additional fertilization, the typical vegetation becomes replaced by more or less species-poor grassland-vegetation (Kraus). The nutrient input from neighbouring agriculture (esp. in lower altitudes) and deposition from the air is a general problem of all nutrient-poor habitats. The sites included in mountain grazing areas may face too heavy *grazing*, to which this habitat is sensitive (Dolek). The construction of *urbanised areas* causes a complete destruction of the concerned habitats (Kraus). **France:** The *removal of hedges* and copses or scrub has adverse effect to butterflies. This is a key habitat for foraging of adult butterflies, especially during dry summers, at low and medium altitudes. Furthermore, this habitat contains meadow species like Sanguisorba officinalis (host plant of Maculinea teleius and M. nausithous, an. II of the Habitats Directive). This habitat facilitates connectivity across a landscape between semi-natural habitats and the habitat destruction increases the effect of fragmentation. Also the *fertilization* alters floristic diversity and reduces the trophic resources for butterflies (Dupont).

Management Requirements Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1.1)	Grazing										1		
1.2)	Clearing of bushes and trees								2		1		
2)	Do not permit afforestation on habitats			1									
5)	Control of invasive alien species	1							1				
6.1)	Establish protected areas					1							
6.2)	Establish wilderness areas/allowing succession					1							
8)	Fencing of grazing susceptible habitats.			1									
9)	Avoidance of the modification of all hydraulic conditions	1											
10.1)	Always leave some parts fallow (e.g. 20-30%; esp. if productivity is low), adjust financial support to permit this			1									
10.2)	Develop more flexible possibilities to support different, late, and variable mowing dates; increase support if dates are difficult.			1									
11)	Mowing approximately once in 3 – 5 years in autumn			1									
14)	Maintain a network of tall herb as efficient as possible across the landscape.						1						
	Avoid eutrophication – build wastewater treatment plants	1											

Additional information: Sweden: This habitat needs relatively nutrient rich, moist soils on open ground what is created either by human impact, often in connection with farms (e.g. very extensive mowing, clearance of trees and bushes) or by natural processes such as flooding, ice-scraping, avalanches, landslides or harsh climate (Jacobson).

Current Management Practices Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1.1)	CAP subsidies			1							1		
1.2)	Farmers education										1		
1.3)	Restoration										1		
2)	Permission for planting trees needed										1		
4)	Periodic removal of excessive shrubs								1				
5)	Elimination of invasive alien species								1				
6.1)	Establishment of protected areas					1							
6.2)	Establishment of wilderness areas/allowing succession					1							
7)	Wastewater treatment plants	1											
11)	Keeping the extensive mowing			1									
14)	Maintaining habitat						1						
	Improvement of hydraulic conditions	1											
	Control of invasive species	1											

Additional information: Sweden: Subsidies within the Swedish CAP are addressed to support farming in rural areas (e.g. for summer farms, keeping of animals etc.) and also traditional management of valuable areas and habitats. The County Administrative Boards inform farmers on how to manage valuable habitats. Several restoration projects of grasslands and farms, partly financed by LIFE+ money, have been carried out in the alpine region (Jacobson). **Austria:** There are only few cases with improvement of the hydraulic situation - up to now it is doubtful, whether the measures will be successful. There are only very few cases where invasive plants are controlled (Schratt-Ehrendorfer). **Germany**: The actual management measures are generally identical as explained above in the management requirements part. Most of these measures are financially supported by Bavarian government and EU (special subsidies to land owners/farmers). Only relatively few areas of the habitat are abandoned (Kraus).

Barriers and Bottlenecks Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1.1)	Insufficient CAP subsidies										1		
1.2)	Low profitability			1							1		
1.3)	Too few farmers										1		
1.4)	Private ownership								1				
1.5)	Financial support is not high enough for difficult situations			1									
2)	Legislation allowing afforestation of grasslands										1		
3)	Water regulation legislation										1		
5)	Regenerative ability of invasive species								1				
	Climate change compromising management efforts					1							
9)	Restoration of the original hydraulic situation is very expensive and often impossible	1											
10)	Permit in schemes more flexible inclusion of fallow years, (groups of) trees/shrubs, etc.			1									
11.1)	Difficult land use conditions (especially too wet or too steep)			1									
11.2)	Getting financially support is relatively complicated for farmers			1									
	Lack of policy	1											
	Non-cooperating landowners			1		1							
	Lack of communication between conservationist and farmers						1						

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
	Lack of knowledge						1						
	Opposite economic interests (winter tourism, hydraulic power stations etc.)	1											

Additional information: Sweden: The current subsidies within the Swedish CAP are not sufficient to prevent the disappearance of farms in this region. Not all farmers are connected to the Swedish CAP. Partly because the subsidies are relatively low, many farmers think that the applications are complicated and they have a feeling of being insecure and supervised. The economic reality of some farmers is that they can't accept being tied into long-lasting agreements concerning subsidies, when an unexpected situation can force them to break the agreement and have to be pay back subsidies from the previous year. Furthermore, during the last periods of CAP the subsidies have been reduced leading to a decreased incentive for the farmers. The co-financing of restoration projects is unfortunately not always corresponding to the possibilities for increased profit to the farmer's business, i.e. there are sometimes no economic incentives for the agricultural company to restore these kinds of areas. Consequently, some objects of value will not be restored even if there are available subsidies. The resources at the County Administrative Boards are not sufficient to inform adequately and to reach all farmers. There are problems concerning living in rural areas in the alpine region of Sweden with harsh climate, large distances, low population density and a general lack of social functions. The profitability of farming in these regions is also low compared to lowlands and more southern areas in Sweden. This forces the farmers to have other sources of income besides farming, consequently leading to increased travelling and costs. When the number of farms is too low the dairy companies stop collecting milk (too high costs), making animal husbandry even more unprofitable in the region. The applications for planting of trees on open farm land are mostly formalities and you normally get permission quite easily. Furthermore, after 3 years abandoned farm land automatically becomes forest land in legal sense and can then be planted with trees without permission. There are old and very strong water regulations in the Swedish Act, which are not adapted to nature conservation issues. There are also strong economical interests for keeping the present water regulations in rivers used for hydroelectric power (Jacobson). **Finland:** It is difficult to avoid occasional grazing by reindeer due to non-cooperating owners or other stakeholders. Climate change is a threat to most of the Alpine Habitat types. It will compromise the results of most measures taken to manage the habitat types, including the most important measure 'establishing nature conservation areas' (Lehtomaa).

Potential Solutions Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1.1)	More efficient and adapted subsidies			2							1		
1.2)	Less complicated conditions (no bureaucratism) for the farmers/land owners to get subsidies			1									
1.3)	Demand for locally produced products and services										1		
1.4)	Land purchase or lease								1				
1.5)	Contracts for land management								1				
2)	Regulation on tree planting on farm land adaptation										1		
3)	Drainage and river regulation adaptation										1		
5)	Effective methods for elimination of invasive alien species								1				
6)	Communication, Awareness rising among stakeholders and landowners.	1				1	1						
	Influencing policies that promote the maintenance of habitat within agricultural parcels	1					1						
	Alternative (not hydraulic) energy stations	1											

Additional information: Sweden: Increase the demand for locally produced products and services (e.g. eco-tourism). There is however a potential conflict between agricultural tourism and carnivore tourism that has not been fully addressed. Regulations better adapted to nature conservation in the Swedish Act concerning drainage and river regulations. Better adapted water regulation in rivers used for hydroelectric power. Regulations better adapted to nature conservation in the Swedish Act concerning tree planting on previously open farm land (Jacobson). **Germany:** A better financial support for the management measures combined with less complicated conditions (no bureaucratism) for the farmers/land owners to get this money (Kraus).

Species Management Requirements Identified by Country Experts

	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
Eryngium alpinum (1604): late mowing or pluriannual mowing in combination with autumn grazing; as the species is cultivated as well, it is desirable to produce a code of conduct to prevent mixing with native populations or at least to assess associated risks (FNE).						✓						
Lycaena helle, Proclossiana eunomia: to avoid mowing of complete sites, leaving fallow areas is favourable for these species (Dolek.			✓									
Coenonympha tullia. Litter mowing in end of august might be a problem for this species. There is a lack of knowledge for recent declines (Dolek)			✓									
Widespread mowing at beginning of September (co-funded by EU) is in certain cases too early (e.g. *Maculinea alcon* on localities depending on *Gentiana asclepiadea*). *Maculinea alcon* needs very late mowing (Dolek).			✓									
Euphydryas aurina is susceptible against complete mowing and early mowing dates (Dolek).			✓									
Minois dryas, Carcharodes flocciferus are further important species with specific requirements (Dolek)			✓									
Parnassius mnemosyne is susceptible against (regular) mowing and grazing (Dolek).			✓									
If *Maculinea teleius* or *M. nausithous* are present at the landscape scale, it's recommended to mow areas of tall herb (along ditches, roadsides), once every second or third year (Dupont).						✓						

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Wastenson L., Aspenberg P., Arnberg U., Cramér M. (eds.) 2011. *Agriculture and Forestry in Sweden since 1900.* National Atlas of Sweden. Nordstedts Förlagsgrupp AB, Stockholm

Case Studies Identified by Country Experts

	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
Management models for grassland habitats: *http://www.daphne.sk/sites/daphne.sk/files/uploads/MM20_vysokohorske_vysokobylinne_2.pdf; http://www.daphne.sk/sites/daphne.sk/files/uploads/MM11_Filipendulenion.pdf*												✓

Other information

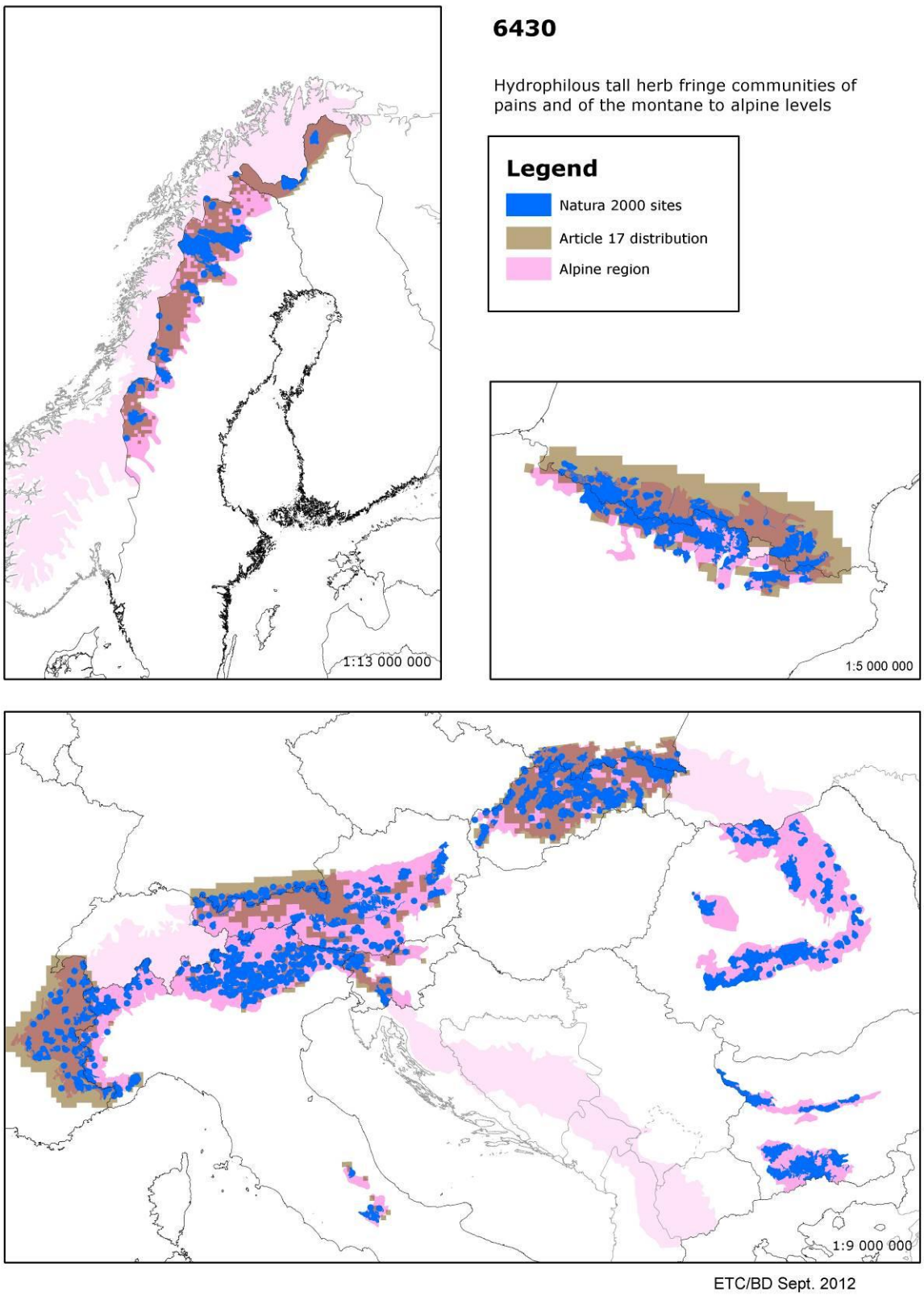
According to the ETC/BD calculations 76-100% of the area of this habitat type are within SCIs. This means that Natura 2000 network provides an important framework for the management of this habitat type.

Number of SCIs and habitat area (ha) within SCIs per Member State in the Alpine biogeographical region

	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
Number of sites	60	12	38	23	4	85	212	18	48	26	9	97
Habitat area (ha)	3608	4327	4143	1687	776	9408	17095	918	12811	5327	1756	1507

The figures include all SCIs where the habitat type is mentioned including sites coded as D.

Map of SCIs proposed for Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels & Article 17 distribution



2.5 6510 - Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*)

Habitats Manual (2007) Extract

Species-rich hay meadows on lightly to moderately fertilised soils of the plain to submontane levels, belonging to the *Arrhenatherion* and the *Brachypodio-Centaureion nemoralis* alliances. These extensive grasslands are rich in flowers and are not cut before the grasses flower and then only one or two times per year.
Wet to dry sub-types occur. If management practices become intensive with heavy applications of fertiliser, the species diversity rapidly declines.

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Conservation status (CS) assessed at the Alpine region and MS level:

N2K code	Habitat name		AT	BG	DE	ES	FR	IT	PL	RO	SI	SK	REGION
6510	Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*)	Range	U1		U1	XX	FV	FV	FV		FV	FV	FV
		Area	U1		U2	XX	U1	U1	U1		U1	FV	U1
		Structure	XX		XX	XX	U1	FV	U1		U1	FV	U1
		Future	U2		U1	XX	U1	FV	U1		U2	FV	U1
		Overall	U2		U2	XX	U1	U1	U1		U2	FV	U1

Hay meadows at low altitudes which are mown after most of the plants have flowered, they maybe lightly fertilised but frequent or heavy fertilisation quickly reduces the species diversity. These meadows are important for a wide range of invertebrates as well as plants. This habitat is wide spread in central and northern Europe, also occurring, but more rarely, in the Mediterranean region.

Unfavourable-inadequate' in the Alpine and Continental regions where the habitat is most abundant with only 'range' assessed as 'favourable'. Only Slovakia (Alpine) has assessed this habitat as 'favourable' for these two regions although Spain reported all parameters as 'unknown' for the Alpine region. Overall conclusion is "inadequate" in the Alpine region due to habitat area, structure-functions and future prospects in several countries that do not allow to reach limits necessary for other conclusions.

Assessed as 'unfavourable-bad' in the Atlantic and Pannonian regions with no country reporting 'favourable' although Spain reported all parameters as 'unknown'. The United Kingdom reported 'unfavourable-bad but improving'. Assessed as 'unknown but not favourable' for the Mediterranean region as Spain reported all parameters as 'unknown'.

Excluding Spain from the regional assessment would lead to 'unfavourable-bad' due to the French assessment although reported as 'favourable' by Italy. The threats and pressures reported by the countries are varied but most note changes to agricultural practice. Better information required, especially from Spain (Summary sheet of the online report on Article 17 of the Habitats Directive).

Species associated with this habitat and their CS at the Alpine region and MS level

N2K code	Species name	Group		AT	DE	ES	FI	FR	IT	PL	SE	SI	SK	REGION
1058	*Maculinea arion*	Invertebrates	range	FV	FV	XX		FV	U2	XX		FV	FV	U1
			population	FV	FV	XX		XX	U2	U2		U1	U1	U2
			habitat	U1	FV	XX		FV	U1	U1		U1	U1	U1
			future	U1	FV	XX		FV	U1	U1		U1	U1	U1
			overall	U1	FV	XX		FV	U2	U2		U1	U1	U2
1059	*Maculinea teleius*	Invertebrates	range	FV	U1 [12]			U1	U2	XX		U2	FV	U1
			population	FV	U1			XX	U2	XX		U2	FV	U1
			habitat	U1	U1			U2	U2	XX		U2	FV	U2
			future	U1	U1			XX	U2	XX		U2	FV	U1
			overall	U1	U1			U2	U2	XX		U2	FV	U2
1061	*Maculinea nausithous*	Invertebrates	range	FV	FV			U1		XX			U2	FV
			population	FV	FV			XX		XX			U1	FV
			habitat	U1	FV			U1		XX			XX	U1
			future	U1	FV			U2		XX			XX	U1
			overall	U1	FV [13]			U2		XX			U2	U1
4038	*Lycaena helle*	Invertebrates	range		U2			FV			XX			U2
			population		U1			XX			XX			XX
			habitat		U1			FV			XX			U1
			future		U1			FV			XX			U1
			overall		U2 [14]			FV			XX			U2

Reported pressures on habitat and their importance to associated species

Pressure description (2nd level)	Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*)	*Maculinea arion*	*Maculinea teleius*	*Maculinea nausithous*	*Lycaena helle*
Cultivation		x			
Fertilisation	x		x	x	
Grazing	x		x	x	
Restructuring agricultural land holding	x				
General Forestry management	x	x	x	x	
Urbanised areas, human habitation	x	x		x	

Reported threats to habitat and their importance to associated species

Threats description (2nd level)	Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*)	*Maculinea arion*	*Maculinea teleius*	*Maculinea nausithous*	*Lycaena helle*
Cultivation					
Fertilisation	x		x	x	
Grazing	x		x	x	
Restructuring agricultural land holding	x			x	
General Forestry management	x	x	x	x	
Urbanised areas, human habitation	x	x		x	
Biocenotic evolution	x		x	x	

[12] According to the current draft Art. 17 report assessment: FV
[13] Current draft Art. 17 report assessment = FV/U1/U1/U1
[14] Current draft Art. 17 report assessment = U1/U1/U1/U1

Threats and Pressures Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1)	A03.01 Intensive mowing or intensification	3		1			1		1			1	
2)	A03.03 Abandonment/lack of mowing	3		3				1	2				
3)	A04.01 Intensive grazing	1		1			1	1	1			1	
4)	A04.03 Abandonment of pastoral systems, lack of grazing	1						1	1				
5)	K02 Biocenotic evolution, succession	2							2				
6)	A02 Modification of cultivation practices	3		1			2	1	1			1	
7)	B01 forest planting on open ground	1											
8)	J02.01 (Landfill, land reclamation and) drying out, general	1										1	
9)	A08 Fertilisation	3		1			3	1				1	
10)	A01 Cultivation	1					1						
11)	J02.12.02 dykes and flooding defence in inland water systems											1	
12)	G01 Outdoor sports and leisure activities, recreational activities							1					
13)	A06.02 Perennial non-timber crops (orchards)							1					
14)	E01 Urbanised areas, human habitation			1				1					
15)	J03.02 Anthropogenic reduction of habitat connectivity			1			1						
16)	A07 Use of biocides, hormones and chemicals						1						
17)	E04 Structures, buildings in the landscape			1									
19)	A02.03 grassland removal for arable land											1	

Habitat Impacts: In **Austria**, *intensive mowing* or intensification lead to decrease in species richness and decline of light-demanding plants. Competitive plants suppress stress tolerant species. Mowing more than two times a year (and simultaneously using more fertilizers) pushes away the characteristic species of the lowland hay meadows and leads to a species-poor grassland vegetation dominated by more or less nitrophilous grasses and herbs (e. g. *Phleum pratense, Anthriscus sylvestris*). *Abandonment/lack of mowing and grazing* results in increased abundance of tall grasses and herbs, encroachment of shrubs, trees. It alters the species composition, also the litter layer decreases the biodiversity, the increase of nitrophilous species and tall-herb species that leads to natural eutrophication by accumulation of organic material. *Early mowing*: Many species need to produce mature seeds to maintain stable populations. If the plants are cut before seed set, these species will vanish in the long term. Highest diversities are reached, if the cutting date varies annually (Bassler). Mulching promoted by the EU – leaving cut biomass on the ground is influencing the vegetation, it alters the species composition (Koschuh). Fertilizers coming from neighbouring fields (Gepp). In **Poland** *intensive mowing* or intensification lead to decrease in species richness and decline of light-demanding plants. Competitive plants suppress stress tolerant species. Mowing more than two times a year (and simultaneously using more fertilizers) pushes away the characteristic species of the lowland respectively mountain hay meadows and leads to a species-poor grassland-vegetation dominated by more or less nitrophilous grasses and herbs (e. g. Phleum pratense, Anthriscus sylvestris). *Intensive grazing* poses a threat by changing species composition from meadow type to pasture type. *Abandonment/lack of mowing and grazing* results in increased abundance of tall grasses and herbs, encroachment of shrubs, trees. It alters the species composition, also the litter layer decreases the biodiversity, the increase of nitrophilous species & tall-herb species that leads to natural eutrophication by accumulation of organic material. The *lack of grazing*, restricts species dispersal and share of small, shade-intolerant plants. *Abandonment of farming practices* on less productive areas at higher altitudes and establishment of species poor, cultivated grasslands on former arable lands near villages represent current trend of polarization of the agricultural landscape. Extensive traditional farming is replaced with intensive practices (fodder based on maize, earlier harvesting times for hay for silage) (Korzeniak, Kucharzyk). In **Italy** (*over)gazing* could induce as much as a 55% decrease in both species richness and total density. This trend appeared to be fairly general and was not influenced by substrate type, or elevation. Nowadays it is still quite a serious problem in Apennines, while it is localized in the Alps, but it has still a very strong negative impact on some places. Overgrazing could determine an increase in eutrophication that alters vegetation composition, with an increase in nitrophilous species (e.g., *Rumex* sp., *Urtica* sp.) and a simplification of vegetation communities. Such altered vegetation composition could strongly impact butterflies communities, reducing the availability of different kind of larval host plants and nectar sources. Moreover, excess of overgrazing can also determine the local complete disappearance of vegetation (e.g., dung storage, excess of trampling) with even more impacting consequences. The pressures linked to *recreation activities* are concentrated mainly in the Apennines.

Activities like picnic areas and open areas games are quite common in the summer. If not properly controlled, tourist pressure can alter habitats in way similar to what is observed for overgrazing (i.e., excess of trampling). Indeed, usually recreation activities are localized in small areas and along selected pathways. High levels of touristic pressure could also increase the impact of collectors, more difficult to be controlled by local rangers (with potentially strong impacts on small localized populations, e.g. some *Erebia* butterfly species). The Apennines, Pollino Mountain for example, suffers strongly from uncontrolled fires, but in general the alpine region is only marginally affected by them (Bonelli, Cerrato). In **Slovenia** this habitat is very local in the Alpine region. Main threat is *drainage* followed by *intensification* of grasslands and *conversion to arable* land causing local extinction or additional fragmentation of the habitat of the threatened species (Verovnik). The groundwater level changes result in changes in vegetation structure and species composition, microclimatic changes, disappearing of food-plants (larvae, adults) etc. (Čelik). **Germany.** The *intensive mowing* (mowing more than two times a year and simultaneously using more fertilizers) pushes away the characteristic species of the lowland hay meadows and leads to a species-poor grassland-vegetation, dominated by more or less nitrophilous grasses and herbs (e. g. Phleum pratense, Anthriscus sylvestris). The *abandonment* leads first of all to a thick, nutrient-rich and species-poor fallow land and later on to a colonisation with shrubs and trees. The succession ends with more or less shady woodland without species of the former habitat (Kraus). Habitats of butterflies are in this way destroyed, the abandonment quickly destroys habitats for Maculinea telejus, a little bit slower for M. nausithous. These meadows are usually not nutrient-poor and they are thus easily disturbed by *nutrient input*, from neighbouring agriculture, deposition from the air, or *fertilisation* (Dolek). The *construction of urbanised areas* causes a complete destruction of the concerned habitat (Kraus). The loss of habitats due to leisure and –locally- changes to arable land (Albert Lang). **France:** In lowland areas, *cultivation* played most important role in the past and many hay meadows have been replaced by crop fields over the last decades. General trend of *fertilisation* and *intensification* (artificial meadows) took place here (Mikolajczak). Also the fertilizers coming from neighbouring arable fields alter the species composition. *The increased mowing* impacts monovoltine butterfly species. For some endangered species such as Maculinea nausithous and M. teleius, these practices are positive in short-term (increase the density of the host plant Sanguisorba officinalis), but harmful if done for several consecutive years (to species population dynamics, density-dependent). The currently operating pressures to this habitat lead to gradual disappearance of some butterfly host plants and a progressive loss of floral resource availability for adult feeding (Dupont). In lowland areas, many hay meadows have been replaced by crop fields over the last decades (Mikolajczak).

Management Requirements Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1,3,4	Maintain (regular) mowing - mostly extensive	2		2			2	2	2			2	
1,3,4	Moderate grazing						2	1					
3	No grazing	1											
1, 6)	Mosaic mowing, find the proper timing	2		1			2					1	
1)	No or very little fertilising (using natural solid fertilisers - moderate grazing)	2					1	2				1	
6)	Forbid mulching	1											
8)	Eliminate / avoid drainage ditches	2										1	
9)	Create buffer zones	1											
1-9)	Establish protected areas/sites	1					1						
9)	Keep or re-install adequate nutrient level			1									
17)	More staff for the approving authorities for consulting and controlling			1									
	Grassland restoration							1					
	Controlled distribution of tourists on pathways							1					

Additional information: Austria: First cuts should be done in June, mostly two cuts per year (Bassler). No cutting from July to mid of August, no fertilizers or using only natural solid fertilizers (produced in the farm) in a very restricted scale (Koschuh). **Poland:** Maintain an extensive mowing is crucial for grassland habitat 6510 as a way of decreasing soil fertility and protecting against overshading (Korzeniak). **Italy:** An optimal management provides 2-3 annual cuts (according to the altitude) with regular fertilization (but not excessive) (Lasen). Correct conservation policy should begin with stopping urbanization and intensive agriculture and with revitalising traditional agro-pastoral activities. Phyto-depuration could be an important management practice to restore

overgrazed habitats. Using local plant species, it is possible to create semi-natural ecosystem, able to sustain high biodiversity levels (Bonelli, Cerrato). **Slovenia:** Rotational mowing once a year (in late autumn). The grassland conversion to arable land is acceptable only as an extensive management, i.e. in the case that mosaic and diverse landscape is preserved which means that degree of habitat fragmentation enables genetic exchange (Čelik). **Germany.** Mowing two times a year (and occasionally a little fertilization) (Kraus). Depending on productivity 1-2 cuts per year, adjusted to local flight periods (large differences may occur!) and larval development of *Maculinea* species; mostly for 2 cuts early June and September are OK. These specialities should be reflected in funding programmes (Dolek). **France:** Adapt mowing dates to local threats and apply rotation of mowing from the inner side of the meadow, leaving strips non-mown or mown pluriannually. Guided herding, based on local action plans for grazing, assist the herder's work. Apply grazing in areas with fixed fencing and reduce animal load by reducing herd size or grazing duration. Apply evidence-based approaches, adapt land use of parcels on basis of actual threats or based on presence of species; keep non-intervention zones (30% annually). Put sensitive grazing areas under permanent or temporary protection. Abolish veterinary treatments that are most hazardous to the environment and health. These measures can be integrated into AEM, grazing contracts between municipalities and livestock breeders and in support to mountain farming (FNE).

Current Management Practices Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1)	Controlling the nutrient level by characteristic plants and grass species	1											
1-2)	Extensive mowing kept			1									
1-5)	Nature conservation programme	1		1									
1-9)	Managed (mown, grazed); with application of agri-environmental programs	2		1			1	2	1			1	
1-9)	Site/area protection (often with many legal exceptions)	1											
9)	Farmers awareness about conservation issues						1						
3)	Restoration of vegetation in overgrazed habitats							1					
12)	Controlled distribution of tourists on pathways							1					
	Cooperation between nature conservation and farming authorities			1									
	Assessment of the conservation status						1						

Additional information: Austria: Special management projects (e. g. LIFE) for the sites of very high nature conservation value are implemented (Bassler). Agri-environmental programs like ÖPUL (cf. http://www.lebensministerium.at/land/laendl_entwicklung/agrar-programm.html) (Lazowski). **Italy:** CAP measures ensure correct number of animals for each meadow in order to avoid overgrazing effect. Unfortunately the extension (numbers of hectares) and the number of farmers that ask and use this money is absolutely insufficient to have a positive impact. Phyto-depuration is occasionally applied to restore overgrazed habitats. Using local plant species, it is possible to create semi-natural ecosystem, able to sustain high biodiversity levels (Bonelli, Cerrato). **Slovenia:** At present, there are no active measures that take butterflies into account, even in protected areas (e.g. Nature Parks) and Natura 2000 sites (Čelik). **Germany:** The actual management measures are generally identical as explained above in the management requirements part. Most of these measures are financially supported by Bavarian government and EU (special subsidies to land owners/farmers). Only relatively few areas of the habitat are abandoned (Kraus). The Bavarian Nature Conservation Programme. Projects like Econnect for clearing former open land. Intensive cooperation between nature conservation and farming authorities within the management planning for Special Areas of Conservation (Albert Lang). **France:** These meadows are exclusively managed by farmers for their own needs (Mikolajczak). We have developed a pragmatic approach to the assessment of the conservation status of this habitat with a criterion related to butterflies (see comments for Habitat 6210, MACIEJEWSKI, 2012a, MACIEJEWSKI, 2012b) (Dupont).

Barriers and Bottlenecks Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
2, 4)	Insufficient CAP subsidies (also for specific measures)	1		2				2	1			1	
1-4	Inflexibility of conservation programme prescriptions			2									
1-4, 6)	Missing skills to access the CAP subsidies, complicated procedures			2				1	1				
2, 4)	Low profitability (demanding work for high costs)	1						1	1				
2, 4)	Difficult land use conditions (especially too wet or too steep)			1									
4	Long-term grazing requirements also require contractual measures to be of longer duration						1						
	Missing vegetation mapping and knowledge of potential habitats of protected butterflies	1											
	Conflicts between bird and butterfly protection (e.g. late mowing is not suitable for butterflies)	1											
	Low valuation of biodiversity against forage production	1											
9)	Unsuitable practices of farmers	1											
6)	Missing knowledge/awareness	1		1					1			1	
6)	Wrong legislation or lack of its implementation	1										2	
1-9)	Lack of local/regional cooperation	1		3			1	2	1				
1-9)	Lack of or difficult communication (conservationists vs. farmers)	1		1			2					1	
	Lack of land management supervisors and project managers							1					
	Excessive European and national bureaucracy							1					
	Incentives for grassland forage production							1					
	Difficulties in the organization of cutting in some areas								1				

Additional information: Austria: The management of wet, small or steep slopes often depends on very time-consuming and demanding handwork (Bassler). **Poland:** Low effectiveness of agri-environmental subsidies due to land fragmentation in mountainous area. Funding system not suitable for small farms. Lack of economical reason to maintain grasslands or pastures (lack of animals). All barriers and bottlenecks are directly or indirectly connected with low economical profitability of extensive farming in Poland. Present solutions, including funds, are insufficient for maintain grasslands of high natural value in a large spatial scale (Korzeniak). **Italy:** Excessive bureaucracy: European and national standards, even more than those of the Autonomous Province itself, impose onerous obligations on private citizens. They also make sure that long time is needed for the approval of environmental plans. Difficult relationships with owners: it's always difficult to explain that to preserve nature values (species and habitats) some renouncement is necessary, unless you are able to be more convincing in terms of cost-effectiveness. In the past decades, the productivity of grasslands has been incentivized, while the measures to support mountain farming lead to an increased forage production at the expense of environmental quality (Lasen). **Slovenia:** The important bottlenecks in policy are: (i) lack of skills and knowledge in policy because of its insufficient or inappropriate communication with scientist and experts. This results also in inappropriate AEMs; (ii) very weak inspection/control over the performance of prescribed management; (iii) sometimes any policy measures are taken although the policy was acquainted with inappropriate management actions observed in the field. The lack of knowledge about species ecology and ecosystem functioning meaning that there is a lack of skills for proposing suitable conservation management in such cases Čelik). **Germany:** Inflexibility of conservation programme prescriptions; lack of cooperation between nature conservation and farming authorities, farmers and landowners (Albert Lang). **France:** These meadows are exclusively managed by farmers for their own needs. Agricultural policy strongly affects the way they are managed (Mikolajczak).

Potential Solutions Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1)	Improve identification of protected butterfly habitats	1											
1,3, 4)	Strengthening the nature conservation programme			1									
1,3, 4)	Strengthening of the relatively small sized farming by greening			1									
3)	Contracts for habitat management						1						
9)	Communication (with farmers); awareness raising	2		1			1	1				1	
	Better cooperation between policy and owners or other stakeholders, including scientists			1								1	
	Better funding, better channelling of funding (e.g. application of European regional funds - Natura 2000; CAP reform; compensation to farmers)	3		3					1			2	
	Re-establish profit from bio-farming (e.g. biodiversity-friendly certified cheese)							1				1	
	Education							1					
	Fund raising	1										1	
	Coordination between different sectors of provincial administration							1					
	Legislation favouring a more natural, less intensive management	1						1					
	Increase of knowledge about high nature value areas (HNV) which should be connected by an ecological network							1					
	More finances for enhancing the territory quality (from research to quality management awards)							1					

Additional information: Poland: It seems that additional form of subsidies focused on particular conservation objectives should be created, especially on areas where grasslands are still well preserved (Korzeniak). **Italy:** To improve instruction through a constant ecological education starting from compulsory schooling. In order to obtain some result and to refer to adults as well, it is necessary to involve the productive categories (Lasen). **Germany:** A better financial support for the management measures combined with less complicated conditions (no bureaucratism) for the farmers/land owners to get this money (Kraus). Intensive cooperation between the different authorities, landowners and farmers. Strengthening the nature conservation programme. More flexible implementation of programme. Strengthening of the relatively small sized farming in upper Bavaria by greening, e.g. nature conservation programme and consulting of landowners and farmers. More staff for the approving authorities (e.g. three for each county) for consulting and controlling (Albert Lang). **France:** Ensuring good group cooperation between DOCOB (action plans) and relevant stakeholders and ensuring that these stakeholders sign the contract. Long-term grazing contractual measures to be signed for longer duration (FNE).

Species Management Requirements Identified by Country Experts

	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
Adapt the mowing regime - for the benefit of certain species (e.g. on localities suitable for protected butterflies) (Bassler, Koschuh, Gepp, Verovnik) and to suppress weeds on grasslands (e. g. weeds like *Senecio* sp., *Colchicum autumnale* and invasive species) in order to ensure agricultural usage of the forage (Bassler).	✓		✓			✓					✓	
Butterfly species to consider are *Euphydryas aurinia, Parnassius mnemosyne, Maculinea nausithous* and *M. telejus*			✓									
If *Maculinea teleius* or *M. nausithous* (Annex II of the Habitat Directive) are present, it is recommended to mow at the end of the floral period of *Sanguisorba officinalis* (Dupont). Because of their specific ecology (presence of host plants and host ants), species of *Maculinea* (especially *M. nausithous* and *M. teleius*) can benefit of criteria proposed in the national action plan for						✓						

	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
establishing their conservation status. These criteria can help determine mowing dates that are customized by Natura 2000 site and population locality (FNE).												
Maculinea nausithous and *M. telejus* need a good adjustment of mowing frequency and dates. Under higher productivity 2 cuts are necessary, widely spaced to allow plant and larval development in between. Mostly for 2 cuts early June and September are OK. Under lower productivity 1 cut may be sufficient (Dolek).			✓									
For the butterfly species *Lycaena helle* (4038), *Maculinea arion* (1058), *M. nausithous* (1061) and *M. teleius* (1059) a number of measures at the landscape level are required to support metapopulations (mosaic of suitable habitat patches, corridors).						✓						

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Case Studies Identified by Country Experts

	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
LIFE03NAT/S/000070 project Natural pastures and hay meadows in Jämtland/Härjedalen http://www2.z.lst.se/naturvard/life/index.html										✓		
Management models for grassland habitats: http://www.daphne.sk/mm/manazmentove-modely												✓

Other information

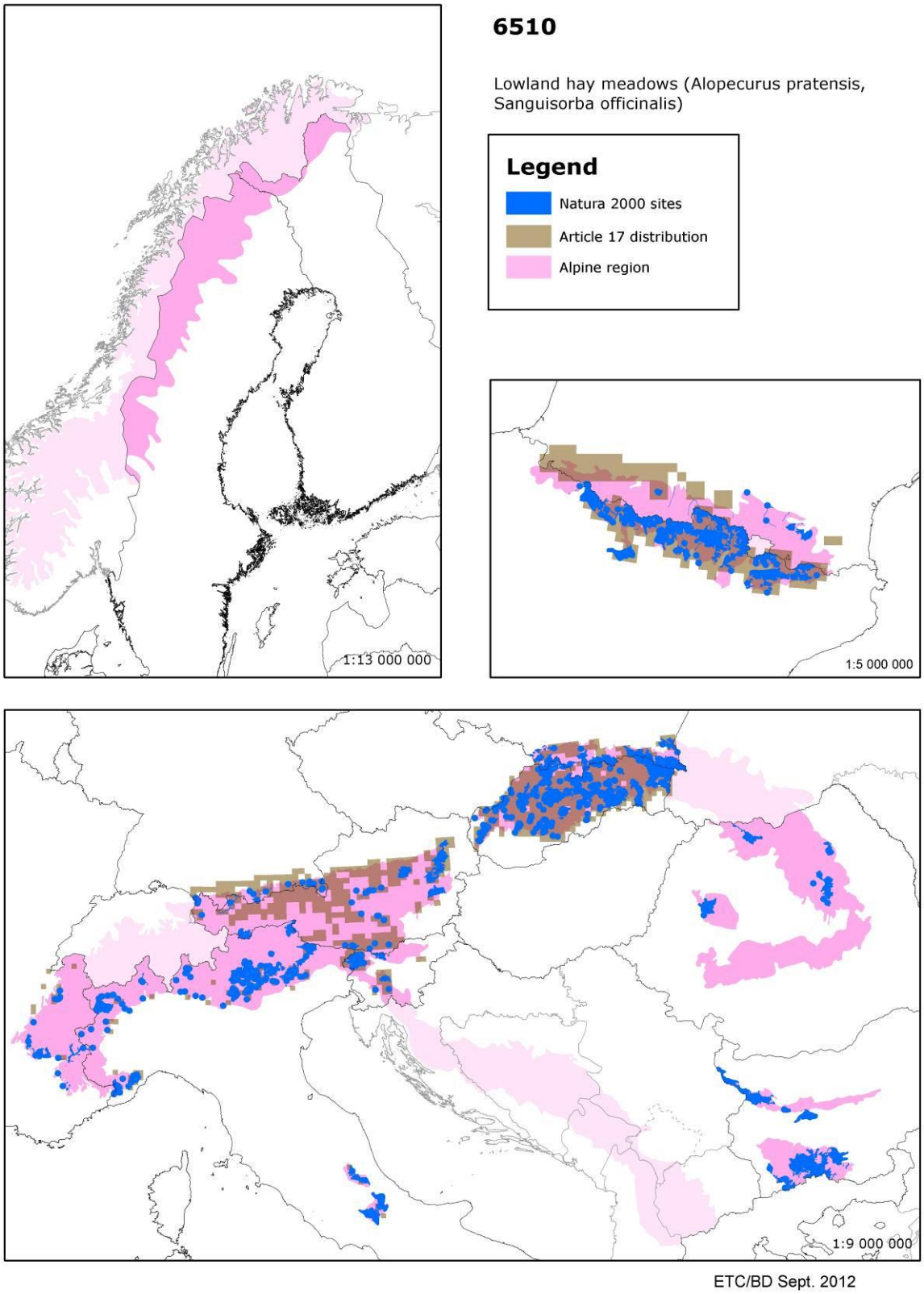
According to the ETC/BD calculations 0-50% of the area of this habitat type are within SCIs. This means that potentially important part of the management needs of this habitat types occurs outside Natura 2000 network.

Number of SCIs and habitat area (ha) within SCIs per Member State in the Alpine biogeographical region

	AT	BG	DE	ES	FR	IT	PL	RO	SI	SK
Number of sites	27	8	11	47	18	107	16	8	7	135
Habitat area (ha)	1444	327	240	8953	2583	7269	17480	1598	10274	9248

The figures include all SCIs where the habitat type is mentioned including sites coded as D.

Map of SCIs proposed for Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) & Article 17 distribution



2.6 6520 - Mountain hay meadows

Habitats Manual (2007) Extract

Species-rich mesophile hay meadows of the montane and sub-alpine levels (mostly above 600 metres) usually dominated by *Trisetum flavescens* and with *Heracleum sphondylium*, *Viola cornuta*, *Astrantia major*, *Carum carvi*, *Crepis mollis*, *C. pyrenaica*, *Bistorta major,* (*Polygonum bistorta*), *Silene dioica*, *S. vulgaris*, *Campanula glomerata*, *Salvia pratensis*, *Centaurea nemoralis*, *Anthoxanthum odoratum*, *Crocus albiflorus*, *Geranium phaeum*, *G. sylvaticum*, *Narcissus poeticus*, *Malva moschata*, *Valeriana repens*, *Trollius europaeus*, *Pimpinella major*, *Muscari botryoides*, *Lilium bulbiferum*, *Thlaspi caerulescens*, *Viola tricolor* ssp. *subalpina*, *Phyteuma halleri*, *P. orbiculare*, *Primula elatior*, *Chaerophyllum hirsutum* and many others.

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Conservation status (CS) assessed at the Alpine region and MS level:

N2K code	Habitat name		AT	BG	DE	ES	FR	IT	PL	RO	SE	SI	SK	REGION
6520	Mountain hay meadows	range	U1		FV	XX	FV	FV	FV		FV	FV	U1	FV
		area	U2		U1	XX	U2	U1	U2		U2	U1	U1	U2
		structure	XX		XX	XX	U1	FV	U2		U2	U1	U1	U1
		future	U2		U1	XX	U2	FV	U1		U2	U1	FV	U2
		overall	U2		U1	XX	U2	U1	U2		U2	U1	U1	U2

Hay meadows at higher altitudes (usually 600m or higher), often in mountain valleys. These meadows are traditionally managed for hay production and are often very species-rich. Most wide spread in the hills and mountains of central Europe, this habitat also occurs in other mountain ranges such as the Pyrenees, Massif Central and the hills of Great Britain and Fenno-Scandinavia.

Assessed as 'unfavourable-bad' in all regions except for the Continental region where it has been assessed as 'unfavourable-inadequate. No country has assessed this habitat as 'favourable' although Spain has reported 'unknown' for the Alpine region. The United Kingdom (Atlantic) reported 'unfavourable-bad but improving' while in the Boreal region, both Finland and Sweden reported 'unfavourable-bad and deteriorating'. A variety of threats and pressures have been reported, most countries note changes in agricultural and several ski developments.

In the Alpine region, almost a half of the habitat area is in 'bad' status and more than a quarter has 'bad' future prospects (whole quarter for both parameters is reported from France) what moves the overall conclusion to 'bad'. Only the range is favourable. This habitat depends on mowing and its lower accessibility in mountains, thus the intensity of management determines the future prospects of this habitat (Summary sheet of the online report on Article 17 of the Habitats Directive).

Species associated with this habitat and their CS at the Alpine region and MS level

N2K code	Species name	Group		AT	BG	DE	ES	FR	IT	PL	RO	SE	SI	SK	REGION
1604	*Eryngium alpinum*	Vascular plants	range	FV				FV	U1				U1		U1
			population	XX				FV	U1				U1		U1
			habitat	XX				U1	XX				U1		XX
			future	XX				U1	U1				U1		U1
			overall	XX				U1	U1				U1		U1
4038	*Lycaena helle*	Invertebrates	range			U2		FV				XX			U2
			population			U1		XX				XX			XX
			habitat			U1		FV				XX			U1
			future			U1		FV				XX			U1
			overall			U2		FV				XX			U2
4070	*Campanula serrata*	Vascular plants	range							FV				FV	U1
			population							FV				FV	U1
			habitat							U1				FV	U1
			future							FV				XX	XX
			overall							U1				FV	U1

Reported pressures on habitat and their importance to associated species

Pressure description (2nd level)	Mountain hay meadows	*Eryngium alpinum*	*Lycaena helle*	*Campanula serrata*
Cultivation		x		x
Fertilisation	x			
Grazing		x		
Biocenotic evolution	x			

Reported threats to habitat and their importance to associated species

Threats description (2nd level)	Mountain hay meadows	*Eryngium alpinum*	*Lycaena helle*	*Campanula serrata*
Cultivation				x
Grazing	x			
Biocenotic evolution	x			

Threats and Pressures Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1)	A03.03 Abandonment/lack of mowing	3		2			1	1	5	1	1	1	
2)	B01 Forest planting on open ground	1							1		1		
3)	A08 Fertilisation	1					2	1			1	1	
4)	A04.03 Abandonment of pastoral systems, lack of grazing	1		1					3		1		
5)	A03.01 Intensive mowing or intensification	2		1			1		1				
6)	A04.01 Intensive grazing	2		2			1		1	1		1	
7)	K02 Biocenotic evolution, succession						1		4	1		1	
8)	A02.01 Agricultural intensification			1			2	1	2			1	
9)	I02 Problematic native species								1				
10)	J03.01 Reduction or loss of specific habitat features								1				
11)	A02.03 grassland removal for arable land						1						
13)	A04 Grazing						1	1					
14)	E01 Urbanised areas, human habitation			1				1					
15)	J03.02 Anthropogenic reduction of habitat connectivity			1			1						
16)	A07 Use of biocides, hormones and chemicals						1						
17)	E01.03 dispersed habitation								1				
18)	E04 Structures, buildings in the landscape			1									
19)	G02.02 skiing complexes			1									
20)	A01 Cultivation						1						
21)	A02 Modification of cultivation practices			1			1						
22)	B06 Grazing in forests/ woodland			1									
23	I01 Invasive non-native species			1									

Habitat Impacts: In **Sweden** *abandonment of pastoral systems* is undoubtedly the most important threat to this habitat in the alpine region. It is a more severe problem here than in the other regions due to depopulation. The process of overgrowing is very slow in the alpine region which means that an area can keep its biological grassland values for a long time after abandonment, but eventually it will become forest or scrubland. *Forest planting on open ground* is connected to abandonment and changes of agricultural practices. In Sweden most of the abandoned farmland will soon be planted with trees and used for forestry (Jacobson). In **Austria** *intensive mowing* or intensification lead to decrease in species richness and decline of light-demanding plants. The early mowing suppresses the plant diversity (not allowing some species to have seeds). The *biocenotic evolution, succession*, with natural eutrophication and accumulation of organic material, represents changes in the species composition and it is connected with decrease in the number of species typical for this habitat type (Bassler, Bohner). In **Poland** abandonment/lack of mowing causes encroachment of shrubs, trees, nitrophilous and tall-herb species and decrease of total area of grasslands (Korzeniak, Wilk). *Lack of grazing* results in increase of the tall grasses and herbs abundance; it restricts species dispersal and suppress small, shade-intolerant plants. *Abandonment of farming practices* on less productive areas at higher altitudes and establishment of species-poor, cultivated grasslands on former arable lands

near villages represent polarization of the agriculture. Extensive traditional farming is replaced with intensive practices (fodder based on maize, earlier harvesting times for hay for silage). Intensive mowing or intensification lead to decrease in species richness and decline of light demanding plants. The *intensive grazing* poses a threat to 6520 by changing species composition from meadow type to pasture type (Korzeniak). Poland reported also damages caused by wild boars (Pieniński National Park). In **Italy** (*over)gazing* could induce as much as a 55% decrease in both species richness and total density. This trend appeared to be fairly general and was not influenced by substrate type, or elevation. Nowadays it is still quite a serious problem in Apennines, while it is localized in the Alps, but it has still a very strong negative impact on some places. Overgrazing could determine an increase in eutrophication that alters vegetation composition, with an increase in nitrophilous species (e.g., *Rumex* sp., *Urtica* sp.) and a simplification of vegetation communities. Such altered vegetation composition could strongly impact butterflies communities, reducing the availability of different kind of larval host plants and nectar sources. Moreover, excess of overgrazing can also determine the local complete disappearance of vegetation (e.g., dung storage, excess of trampling) with even more impacting consequences. The pressures linked to *recreation activities* are concentrated mainly in the Apennines. Activities like picnic areas and open areas games are quite common in the summer. If not properly controlled, tourist pressure can alter habitats in way similar to what is observed for overgrazing (i.e., excess of trampling). Indeed, usually recreation activities are localized in small areas and along selected pathways. High levels of touristic pressure could also increase the impact of collectors, more difficult to be controlled by local rangers (with potentially strong impacts on small localized populations, e.g. some *Erebia* butterfly species). The Apennines, Pollino Mountain for example, suffers strongly from uncontrolled fires, but in general the alpine region is only marginally affected by them (Bonelli, Cerrato). In **Romania** the animal husbandry of small farmers declines strongly in the Carpathians. That means that hay meadows are *abandoned* since about 15 years and face quick succession with *Betula* and *Picea*. Overgrazing by large sheep herds that belong to few now rich owners is reported. In the Romanian Carpathians, important changes occurred over the last 5-7 years. Due to socio-economic changes and EU regulations, grazing intensity and timing over the year is changing with far-reaching consequences for biodiversity. Some parts are *heavily grazed*, in other parts (National Parks or Nature Parks) grazing is reduced or not permitted (Rakosy). In **Slovenia** the main threat in Alpine region is *abandonment* of traditional hay meadows and overgrowing as a consequence. Overgrazing and grazing with cattle is also damaging. *Intensification* is a minor issue; however manuring and mowing with heavy machines are also present at lower elevations and less steep slopes (Verovnik). **Germany:** The *intensive mowing* (mowing more than two times a year and simultaneously using more fertilizers) pushes away the characteristic species of the lowland hay meadows and leads to a species-poor grassland-vegetation, dominated by more or less nitrophilous grasses and herbs (e. g. Phleum pratense, Anthriscus sylvestris) (Kraus). This leads to a reduction in available habitats and food sources for butterfly species. Meadows in lower altitudes become intensified by more cattle and increased fertilisation, which leads to a reduction in available habitats and food sources for Lepidoptera species. Well accessible sites even in higher altitudes such as passes and skiing resorts often receive high livestock densities, and the *grazing intensification* and overgrazing in certain parts takes place, including fertilisation, removal of stones and other structures restricting agriculture (loss of structural heterogeneity), while other parts (steep slopes, difficult to access areas) are neglected and not grazed anymore. Additionally, grazing in the Alps is more and more concentrated on non-wooded areas, keeping cattle out of tree structured parts and removing trees in grazed parts. All mixed types of habitats between dense forests and open grasslands, which are extremely important as butterfly habitats, are reduced (Dolek). Switch from hay meadow management to grazing can affect flowering and host plants adversely, subsequently affecting Lepidoptera living from and on those plants. Forest edges tend to be included in grazing as shelter for cattle, intense grazing leads to a reduced quality of these specific edge habitats for butterflies (loss of nectar and host plants) (Andreas Lang). The *abandonment* leads first of all to a thick, nutrient-rich and species-poor fallow land and later on to a colonisation with shrubs and trees. The succession ends with more- or less shady woodland without species of the former habitat (Kraus). The open habitats important for butterflies are in this way destroyed. The changes in the habitat structure and management are often connected with the increased presence of invasive plants (Andreas Lang). The *construction of urbanised areas* causes a complete destruction of the concerned habitat (Kraus). The loss of habitats due to leisure and –locally- changes to arable land (Albert Lang). **France.** The most important threat to this habitat is its *abandonment.* Mowing in higher altitudes is most of the time not profitable for farmers (Dentant). The practice of cutting is declining in the Alpine region. Stop mowing promotes the dynamics of woody species (Dupont). *Intensification* of mowing may quickly lead to standardization in plant community and impoverishment of biodiversity (Dentant). In case of fertilisation, plant communities are changing with the gradual disappearance of some host plants and a progressive loss of floral resource availability for adult feeding (Dupont). *Grazing* often replaces mowing, but results are obviously not the same. Even extensive grazing may be damaging: for many

species, to be grazed too early in the season (that is spring and beginning of summer), can make them disappear (Dentant). General trend of fertilisation and intensification (artificial meadows), weaker in sub- and mountain areas (Mikolajczak). Much stronger effects have overgrazing by too large and unguarded free-ranging herds that is reported as well (FNE). This is a key habitat for food resources for adult butterflies in the Alpine region. Maintaining these habitats across the landscape is necessary to ensure a good conservation status of many species (e.g. Parnassius mnemosyne). Some species are associated with host plants that are common in these habitats – e.g. *Eumedonia eumedon* (Dupont).

Management Requirements Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1.1, 5)	Mowing	3		1			3	1	4		1	1	
1.2)	Clearing of bushes and trees (invasive)			1					2		1		
1.4)	Re-establishment of haying in abandoned grasslands											1	
2)	Avoid forest planting								1				
3.1)	No or low fertilisation	1						1	1		1	1	
6)	Maintain extensive grazing			2			1	1	3	1		1	
5,6)	Avoid intensification of agriculture			1									
8)	Promotion of extensification of agriculture practices								1				
17)	Spatial planning								1				
23)	Removal of invasive plant species			1									
	Protection of typical forest edge habitats			1									
	Protection against destruction by boars								1				

Additional information: Sweden: The traditional animal husbandry in this region has been a mixture of different activities, e.g. grazing, harvesting of fodder (grass and leaves) and firewood and burning to improve grazing. This habitat needs grazing animals (mainly cows, sheep, horses or goats) and sometimes clearing of bushes and trees to keep in good conservation status, or it will be overgrown. The process of overgrowing is very slow in the alpine region which means that an area can keep its biological grassland values for a long time after abandonment, but eventually it will become forest or scrubland. It is important that fertilisation is not present in this habitat. Otherwise it will deteriorate and lose much of its biodiversity (Jacobson). **Austria:** First cuts should be done in June, mostly two cuts per year (Bassler). Utilization in a traditional way (site-adapted, 1-3 cuts every year) (Bohner). Mosaic mowing, not the whole area at the same time, some parts should be mown only every third year (Koschuh). **Poland:** Maintaining of an extensive mowing is crucial as a way of decreasing soil fertility and protecting against overshading. To develop local initiatives connected with shepherding revitalization (like Owca Plus in the Silesia province). Possibility of agricultural use (grazing, mowing) should be checked before forest planting (Korzeniak). New version of agri-environmental schemes should make small-scale farmers more prone to participate in proper management, taking into account regional differences (e.g. in timing of mowing) and habitat requirements of different species. It should be more a 'landscape' approach. Proper spatial planning, classification of habitation possibilities into different "intensity" zones (including "no-go" zones, where habitation development is not allowed) (Wilk). **Italy:** In order to maintain this habitat under optimal conditions grass has to be cut regularly two-three times every year, but not too early. As long as not excessive, fertilization is compatible and useful. Mowing only once a year and some grazing in autumn may be tolerated (Lasen). **Romania:** In the alpine-subalpine-montane area the size of sheep herds and the duration of grazing must be reduced. These regulations must be controlled, especially in protected areas, and there should be consequences if regulations are not followed (Rakosy). **Slovenia.** Low intensity grazing with sheep or goats and sheep. Rotational haying or small scale haying in different time intervals to create mosaic habitats (Verovnik). **Germany:** Mowing two times a year (and occasionally a little fertilization) (Kraus). Keep or re-install low grazing intensity, including areas that are steep or for other reasons difficult to handle as well as grazing in wooded areas with a focus on wide ecoclines between forest and grassland. No agricultural improvements (removal of stones, fertilisation, etc.) (Dolek). Reduction mowing/ grazing intensity, adaptation of their date (Andreas Lang). **France:** Contracts can be signed with farmers to promote intensive and "usual" mowing system (Dentant). Guided herding, based on local action plans for grazing; assist the herder's work. Reduction of animal load by reducing herd size or grazing duration. Apply grazing in areas with fixed fencing. Apply evidence-based approaches, adapt land use of parcels on basis of actual threats or based on presence of species; keep non-intervention zones (30% annually).

Put sensitive grazing areas under permanent or temporary protection. Abolish veterinary treatments that are most hazardous to the environment and health. Moderately nutrient rich soils: nor extensive, nor intensive grazing or mowing. Adapt mowing dates to local threats and apply rotation of mowing from the inner side of the meadow, leaving strips non-mown or mown pluriannually (FNE).

Current Management Practices Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1.1)	Regular mowing (CAP and other subsidies, funding)	1		1			1	1	3		1		
1.2)	Education of farmers how to manage this habitat						1				1		
1.3)	Shrub and trees removal (invasive)			1					2				
1.4)	Land purchase and lease								1				
1.5)	Nature conservation programme			1									
2)	Permission needed to plant trees on agricultural land.										1		
6)	Reduced grazing, low-intensity grazing			2					1			1	
9)	Reduction of wild boar population								1				
3)	Lower fertilizing			1									
23)	Invasive species elimination			1									
	Grassland edges excluded from cultivation			1									
	Better cooperation of stakeholders			1									

Additional information: Sweden: Subsidies within the Swedish CAP are addressed to support farming in rural areas (e.g. for summer farms, keeping of animals etc.) and also traditional management of valuable areas and habitats. The County Administrative Boards inform farmers on how to manage valuable habitats. Several restoration projects of grasslands and farms, partly financed by LIFE+ money, have been carried out in the alpine region (Jacobson). **Austria**: Also special management projects (e. g. LIFE) for the sites of very high nature conservation value are implemented (Bassler). **Poland**: Agri-environmental schemes are being implemented in this habitat in Polish part of Carpathian mountains. However they are not working very well for small parcel plots, which are very common in many places. The scheme is also dedicated to the conservation of corncrake, which requires late mowing (not favourable to the Golden Eagle) (Wilk). **Germany**: The actual management measures are generally identical as explained above in the management requirements part. Most of these measures are financially supported by Bavarian government and EU (special subsidies to land owners/farmers). Only relatively few areas of the habitat are abandoned (Kraus). The Bavarian Nature Conservation Programme. Projects like Econnect for clearing former open land. Intensive cooperation between nature conservation and farming authorities within the management planning for Special Areas of Conservation (Albert Lang). **France:** These meadows are exclusively managed by farmers for their own needs (Mikolajczak).

Barriers and Bottlenecks Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1.1, 17)	Insufficient CAP subsidies, funding	1		2			1	1	1	1	1	1	
1.2	Low profitability	2		2			1		1		1		
1.3	Lack of interest in maintaining extensive farming	1		1					1				
1.4	Private ownership – many private plots								2				
1.5, 17)	Inflexibility of conservation programme prescriptions			1					1				
1.6	Lack of local/regional cooperation (to organise mowing, long term mowing systems …)	1		2			2	1	1				
1.7	Getting financially support is relatively complicated for farmers			1					1				
1.8)	Difficult land use conditions (especially too wet or too steep)			1									
2	Legislation allowing afforestation of grasslands										1		
4.1	Too few farmers										1		

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
4.2	Large carnivores										1		
4.3	Large distances										1		
4.4	Transformation of summer farms to recreation facilities										1		
5)	Economic pressure to intensify agriculture			1									
	Low valuation of biodiversity and habitats against forage production	1		1			1	1					
	Communication with mountain farmers	1		1									
	Lack of knowledge, research (butterfly ecology)	1							2	1			
	Lack of land management supervisors and project managers							1		1			
	Excessive European and national bureaucracy							1					
	Incentives for grassland forage production							1					
	Difficulties in the organization of cutting in some areas								1				

Additional information: Sweden: The current subsidies within the Swedish CAP are not sufficient to prevent the disappearance of farms in this region. Not all farmers are connected to the Swedish CAP. Partly because the subsidies are relatively low, many farmers think that the applications are complicated and they have a feeling of being insecure and supervised. The economic reality of some farmers is that they can't accept being tied into long-lasting agreements concerning subsidies, when an unexpected situation can force them to break the agreement and have to pay back subsidies from the previous year. Furthermore, during the last periods of CAP the subsidies have been reduced leading to a decreased incentive for farmers. The co-financing of restoration projects is unfortunately not always corresponding to the possibilities for increased profit to the farmer's business, i.e. there are sometimes no economic incentives for the agricultural company to restore these kinds of areas. Consequently, some objects of value will not be restored even if there are available subsidies. The resources at the County Administrative Boards are not sufficient to inform adequately and to reach all farmers. There are problems concerning living in rural areas in the alpine region of Sweden with harsh climate, large distances, low population density and a general lack of social functions. The profitability of farming in these regions is also low compared to lowlands and more southern areas in Sweden. This forces the farmers to have other sources of income besides farming, consequently leading to increased travelling and costs. When the number of farms is too low the dairy companies stop collecting milk (too high cost), making animal husbandry even more unprofitable in the region. In some regions farmers have problems with large carnivores such as wolves and bears that make it more difficult to keep animals, especially sheep and goats. This gives rise of a potential for conflicting conservation goals, i.e. grazing of semi-natural grasslands or the presence of large carnivores. Carnivores induce direct damage through attacks, but can also cause indirect problems and costs by their mere presence. Few farms and large distances make it difficult to transport grazing animals and keep them in remote areas. Most of these habitat localities are connected to summer farms in the alpine region of which most have been abandoned during the past century and in many cases transformed into summer houses or different kind of tourist facilities which means that they will not become farms again (Jacobson). **Austria:** The management of wet, small or steep slopes often depends on very time-consuming and demanding handwork (Bassler). **Poland:** Low effectiveness of agri-environmental subsidies due to land fragmentation in mountainous area. Funding system not suitable for small farms, insufficient funds accompanied by complicated administrative procedures. Low interest in subsidies. Lack of economical reason to maintain grasslands or pastures (lack of animals). All barriers and bottlenecks are directly or indirectly connected with low economical profitability of extensive farming in Poland. Present solutions, including funds, are insufficient for maintain grasslands of high natural value in a large spatial scale (Korzeniak). Agri-environmental schemes planning did not take into account regional aspects of nature conservation (e.g. different time of mowing required in the mountains), habitat requirements of wider set of species (what is good for one species might not be for the other), and the fact that taking part in agri-environmental scheme will not be beneficial for small-scale farmers. The barriers might be lack of proper, open discussion on the vision of a new agri-environmental scheme, too little scientific evidence of how the agri-environmental schemes are really affecting biodiversity, lack of wider 'landscape' vision, while creating the system of subsidies for farmers. The local authorities are not prone to prepare local spatial planning documents, because they do not have funds, or even if they do they may not incorporate into these documents nature-friendly solutions. This might be linked with inadequate education among local

societies. Regional environmental authorities sometimes do not have legal instruments or scientific data to stop dispersed human settlement in areas important for biodiversity (Wilk).
Italy: Excessive bureaucracy: European and national standards, even more than those of the Autonomous Province itself, impose onerous obligations on private citizens. They also make sure that long time is needed for the approval of environmental plans. Difficult relationships with owners: it's always difficult to explain that to preserve nature values (species and habitats) some renouncement is necessary, unless you are able to be more convincing in terms of cost-effectiveness. In the past decades, the productivity of grasslands has been incentivized, while the measures to support mountain farming lead to an increased forage production at the expense of environmental quality (Lasen). **Germany:** Inflexibility of conservation programme prescriptions; lack of cooperation between nature conservation and farming authorities, farmers and landowners (Albert Lang). Economic pressure on farmers: intensification of agriculture may often be necessary for gaining an appropriate income; grazing management on mountain meadows is too costly and time-consuming. As a consequence, disappearances of traditionally managed, small farms run by single families, emigration of the younger people Lack of funds for active nature conservation projects (Andreas Lang). **France:** Mowing in altitude is most of the time not profitable for farmers. The bottleneck is the impossibility to make contract with every sheep breeder for proper management (Dentant).

Potential Solutions Identified by Country Experts

		AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
1.1)	More efficient and better adapted CAP subsidies, funding	2		4					1	1	1	1	
1.2)	Less complicated conditions (no bureaucratism) for the farmers/land owners to get subsidies			1									
1.3)	Communication and partnership between institutions			1			1	1					
1.4)	Land purchase or lease								2				
1.5)	Contracts for habitat management						1		1				
1,4)	Strengthening the nature conservation programme			1									
1,4)	Strengthening of the relatively small sized farming by greening			1									
2	Legislation on forest planting better adapted to nature conservation										1		
4.1)	Solutions for damages caused by carnivores										1		
4.2)	Demand for locally produced products and services, bio-farming										1	1	
18)	More staff for the approving authorities for consulting and controlling			1									
	Influencing policies	2							1				
	Improved research on butterfly ecology	1								1			
	Better communication/ awareness raising on values of habitats, on management	~~1~~		1				1	2	1			
	Legislation favouring a more natural, less intensive management							1					
	Increase of knowledge			1				1	1	1			
	Increase of knowledge about high nature value areas (HNV) which should be connected by an ecological network							1					
	More finances for enhancing the territory quality (from research to quality management awards)							1	1				
	Always keep some parts of the habitats unmanaged for short periods (1 to few years) and permit this in funding			1									
	Management plans prepared and controlled	1								1			

Additional information: Sweden: Better solutions for protection of animals and better subsidies to compensate for losses connected to the presence of large carnivores. There is a need for a faster and more simplified administrative handling of usual problems with carnivores. There should be a more forgiving attitude from the authorities towards those farmers who interrupts an on-going commitment within the Swedish CAP in connection with predator attacks. There are examples of farmers who have lost animals due to predator attacks and then they have to repay prior year's compensation since

they are unable to fulfil their commitments. Increase the demand for locally produced products and services (e.g. eco-tourism). There is however a potential conflict between agricultural tourism and carnivore tourism that has not been fully addressed. Regulations better adapted to nature conservation in the Swedish Act concerning forest planting on formerly open farmland (Jacobson). **Poland:** It seems that additional form of subsidies focused on particular conservation objectives should be created, especially on areas where grasslands are still well preserved (Korzeniak). Influencing policies related to agri-environmental schemes. Awareness raising on possibilities of participating in agri-environmental schemes. Gathering of science-based evidence on impact of agri-environmental schemes on biodiversity (Wilk). **Italy:** To improve instruction through a constant ecological education starting from compulsory schooling. In order to obtain some result and to refer to adults as well, it is necessary to involve the productive categories. Improve the state of knowledge in various sectors by identifying high nature value areas (HNV) which should be connected by an ecological network in order to avoid the fragmentation of habitats and to promote the restoration of areas (Lasen). **Romania:** It is urgently necessary to find solutions to insufficient funds, lack of adequate knowledge (there is also lack of experts and lay persons who deal with butterflies), regulations must be made better known and enforced (there are too few rangers to make control). Public and Media need more information that is well-prepared (Rakosy). **Slovenia:** CAP reform is a big opportunity that could provide financing for less intensive agriculture, which would provide proper management of grasslands (Verovnik). **Germany:** A better financial support for the management measures combined with less complicated conditions (no bureaucratism) for the farmers/land owners to get this money (Kraus). General "improvement" of the rural area for young farmer families. Research on the potential of combining an environment-friendly land use with sufficient economic income, and subsequent recommendation of land use guidelines. Change in land use from cattle grazing to wood utilisation, which also creates open habitats relevant for butterfly species. Fund raising for active management measures, e.g. removal of invasive plant species (Andreas Lang). Better funding and better channelling of funding, better communication of values of habitats, more detailed information on management influence on habitats and species, especially habitats between categories (mixed grassland-tree communities), always keep some parts of the habitats unmanaged for short periods (1 to few years) and permit this in funding - especially if productivity is low (Dolek). Intensive cooperation between the different authorities, landowners and farmers. Strengthening the nature conservation programme. Strengthening of the relatively small sized farming in upper Bavaria by greening, e.g. nature conservation programme and consulting of landowners and farmers. More staff for the approving authorities (e.g. three for each county) for consulting and controlling (Albert Lang). **France:** At least communication and partnership between institutions to promote intensive mowing. Contracts can be signed with farmers for mowing (Dentant). Guided herding, based on local action plans for grazing, assist the herder's work. Apply grazing in areas with fixed fencing and reduce animal load by reducing herd size or grazing duration. Apply evidence-based approaches, adapt land use of parcels on basis of actual threats or based on presence of species; keep non-intervention zones (30% annually). Put sensitive grazing areas under permanent or temporary protection. Abolish veterinary treatments that are most hazardous to the environment and health. These measures can be integrated into AEM, grazing contracts between municipalities and livestock breeders and in support to mountain farming. Ensuring good group cooperation between DOCOB (action plans) and relevant stakeholders and ensuring that these stakeholders sign the contract. Long-term grazing requirements also require contractual measures to be of longer duration (FNE).

Species Management Requirements Identified by Country Experts

	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
Eryngium alpinum (1604) is a plant that needs extensive mowing, and can tolerate late extensive grazing (from August to September). In case the management had been different, decrease and collapse of populations were observed. Same thing with forest management: this species needs open fields to survive. The late mowing or pluriannual mowing in combination with autumn grazing. As the species is cultivated as well, it is desirable to produce a code of conduct to prevent mixing with native populations or at least to assess associated risks (FNE)						✓						
6520 is an important habitat for rare plants such as *Gymnadenia nigra* and *Gentianella campestris* and might harbour several species of *Botrychium*. Also some species of rare insects occur in these habitats. The management measures										✓		

	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
should be adapted to benefit these species where they occur (Jacobson).												
Periodic protection for *Trollius europaeus* plant (prohibition of grazing sheep until its seed-dispersal time) (Loch).								✓				
Adapt the mowing regime - for the benefit of certain species (butterflies, plants) and to suppress weeds like *Senecio* sp., *Colchicum autumnale* and invasive species in order to ensure agricultural usage of the forage (Bassler, Verovnik).	✓					✓					✓	
Removal of invasive plant species, woody species (for butterflies)			✓									
Mosaic mowing. Mowing only once per year by leaving some areas without mowing in that kind of way, that some part are mown every third year (for butterflies). Find proper mowing system for *butterflies Euphydryas aurinia, Parnassius mnemosyne, Lycaena tityrus* (Koschuh)	✓		✓									
Proper grazing – respecting butterflies. Butterfly species to consider are *Erebia manto trajanus, E. pharte romaniae, E. sudetica radnaensis, E. gorge friedericikoenigi, E. epiphron transsylvanica, E. cassioides ssp., E. pronoe regalis, E. melas carpathicola, E. melas runcensis, Boloria phales carpatomeridionalis, Coenonympha tullia, Boloria titania transsylvanica, B. aquilionaris, Lycaena hippothoe, L. tityrus*, *Maculinea nausithuos and M. teleius, Euphydryas aurinia, Parnassius mnemosyne* (Rakosy).			✓						✓			
Maculinea arion (annex IV): Regularly associated with stones etc. with its larval food-plant Thymus sp. Suffers from removal of such structures.			✓									
For *Lycaena helle* (4038) a number of measures at the landscape level are required to support metapopulations (mosaic of suitable habitat patches, corridors) (FNE).					✓							
Golden Eagle (*Aquila chrysaetos*)- conservation of a mountain hay meadows as a feeding place. The main potential threat for the polish population of this species in the Carpathians is shrinking of the feeding areas, linked with the dispersed habitation of open areas in mountains (very intensive in recent years). This reduces functional area of a feeding places and is nowadays recognized as probably more important threat than availability of nesting places for this species. The abandonment (very common in Polish Carpathians) or intensification (more localised, but might be important threat in many places) of agriculture practices might also negatively affect area of feeding places of Golden Eagle. Abandonment causes vegetation succession and makes Golden Eagle unable to take prey because of too high vegetation (Wilk, Loch). As well for Lesser Spotted Eagle and Common Buzzard (Wilk).								✓				

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Case Studies Identified by Country Experts

	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
National Fund of Environmental Protection and Water Management - grant „Protection of land ecosystems in Pieniński National Park" and „Protection of non-forest ecosystems in Pieniński National Park, 1993-2012								✓				
Management practice in Gorce National Park – SCI PLH120018 (management plan + management practice)								✓				
LIFE03NAT/S/000070 project Natural pastures and hay meadows in Jämtland/Härjedalen http://www2.z.lst.se/naturvard/life/index.html										✓		
http://www.daphne.sk/sites/daphne.sk/files/uploads/MM08_trojstetove_0.pdf												✓

Other information

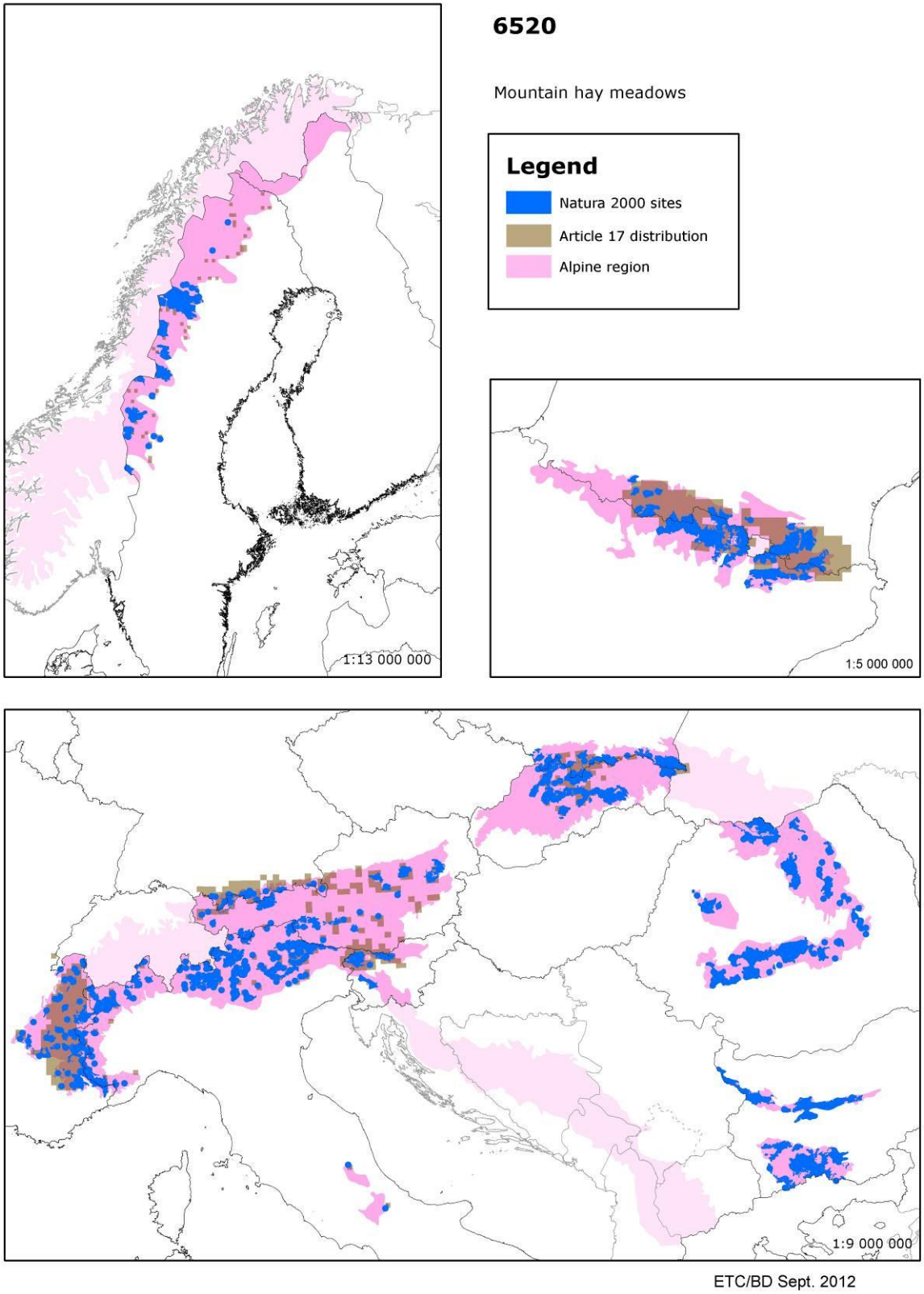
According to the ETC/BD calculations 76-100% of the area of this habitat type are within SCIs. This means that Natura 2000 network provides an important framework for the management of this habitat type.

Number of SCIs and habitat area (ha) within SCIs per Member State in the Alpine biogeographical region

	AT	BG	DE	ES	FR	IT	PL	RO	SE	SI	SK
Number of sites	18	14	15	12	59	132	13	43	28	5	17
Habitat area (ha)	3205	23822	761	976	14176	15039	2951	115936	101	2811	2027

The figures include all SCIs where the habitat type is mentioned including sites coded as D.

Map of SCIs proposed for Mountain hay meadows & Article 17 distribution



3 Annex 1: Expert Questionnaires

Austria (AT)

Bulgaria (BG)

Germany (DE)

Spain (ES)

France (FR)

Italy (IT)

Sweden (SE)

Slovenia (SI)

Slovakia (SK)