Natura 2000 Seminars

Alpine Region

Background Document

Forests - Draft 4
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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 contained 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]. MS were then invited to ask their habitat experts to complete an Expert Input Form to collect additional knowledge about the different habitat types. This was integrated into the first draft and a summary of the results was provided for each habitat group. This gave rise to a second draft. MSs were then given an opportunity to correct any factual inaccuracies or clarify information that had already been submitted. A third draft was then produced to inform the workshop and provide material to be uploaded to the Communication Platform. The information that was collected in the pre-scoping document and from experts will be complemented by a selection of case studies that will illustrate specific issues. These will be highlighted in the relevant sections of the Background Document and the original Case Study Recording Forms will be uploaded to CIRCABC.

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

[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
3230	Alpine rivers and their ligneous vegetation with *Myricaria germanica*
3240	Alpine rivers and their ligneous vegetation with *Salix elaeagnos*
3260	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
91E0	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)
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
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/pressures 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. 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 linguistic 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 envisaged 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 pressures 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 judgement' 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 and only an empty expert input form from 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 Forests

Summary

Process participation and representation

	AT	BG	DE	ES	FI	FR	IT	PL	RO	SE	SI	SK
Number of habitats considered	2	1	3	0	0	2	5	3	4	0	1	0
Number of participating experts	2	1	5	0	0	1[@]	1	3	2	0	1*	0
Total area (1000s ha)	82.5	299.9	33.9	5.7	0	38.9	150.3	169.2	365.8	0	3.6	210.3
Habitats considered	9130 9180	9410	9130 9180 9410	n/a	n/a	9180 9410	all	9410 9130 9170	9130 9410 9170 9180	n/a	9170	n/a
[@] indicates a single submission from FNE and * indicates a single submission from BCE												

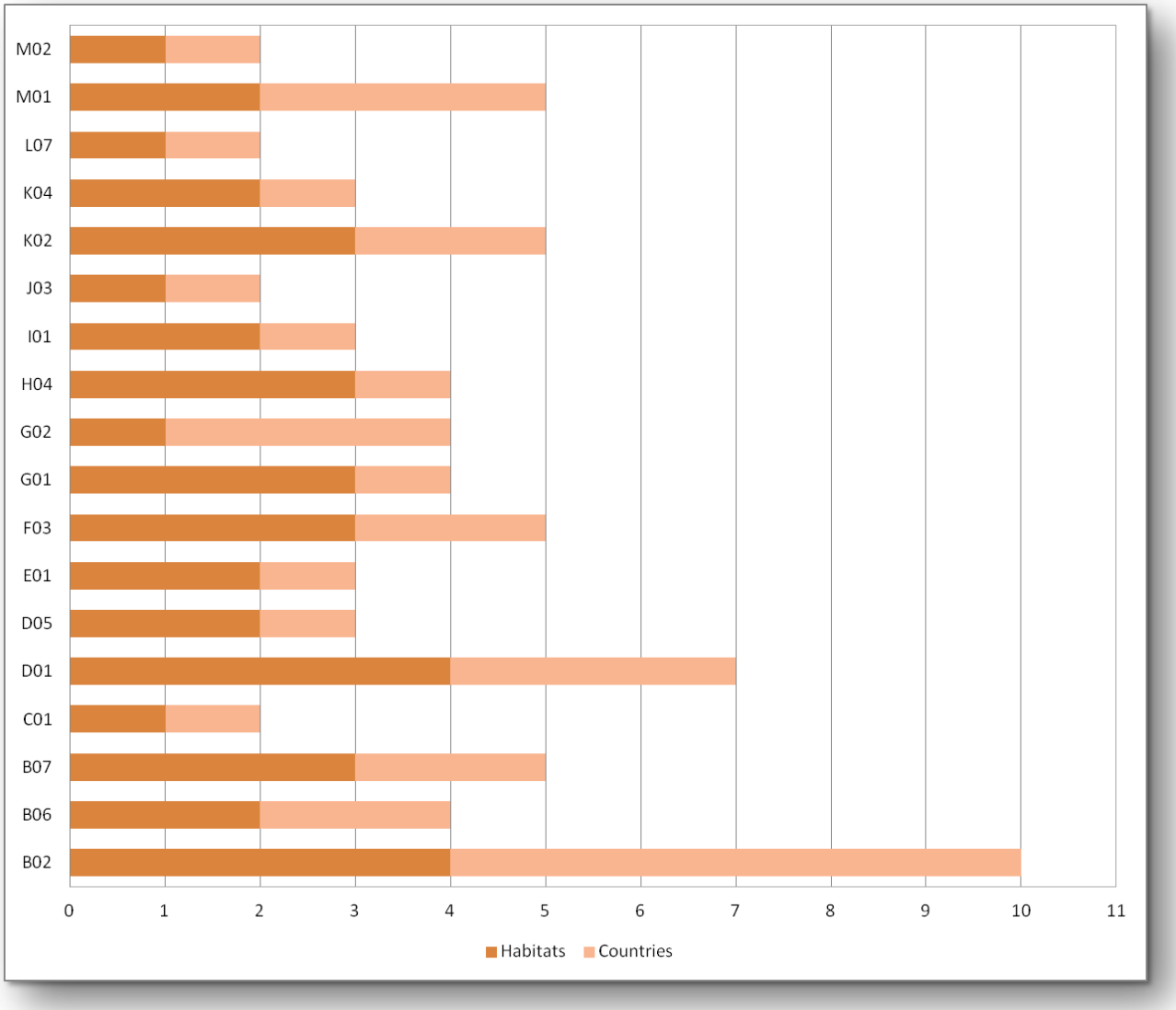
The following figures summarise the input that was provided by the country experts for the forest habitat group that consisted of: Asperulo-Fagetum beech forests (9130); Galio-Carpinetum oak hornbeam forests (9170); Tilio-Acerion forests of slopes, screes and ravines (9180); and the Vaccinio-Piceetea acidophilous *Picea* forests of the montane to alpine levels (9410). No submissions were received for *Castania sativa* woodlands (9260).

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

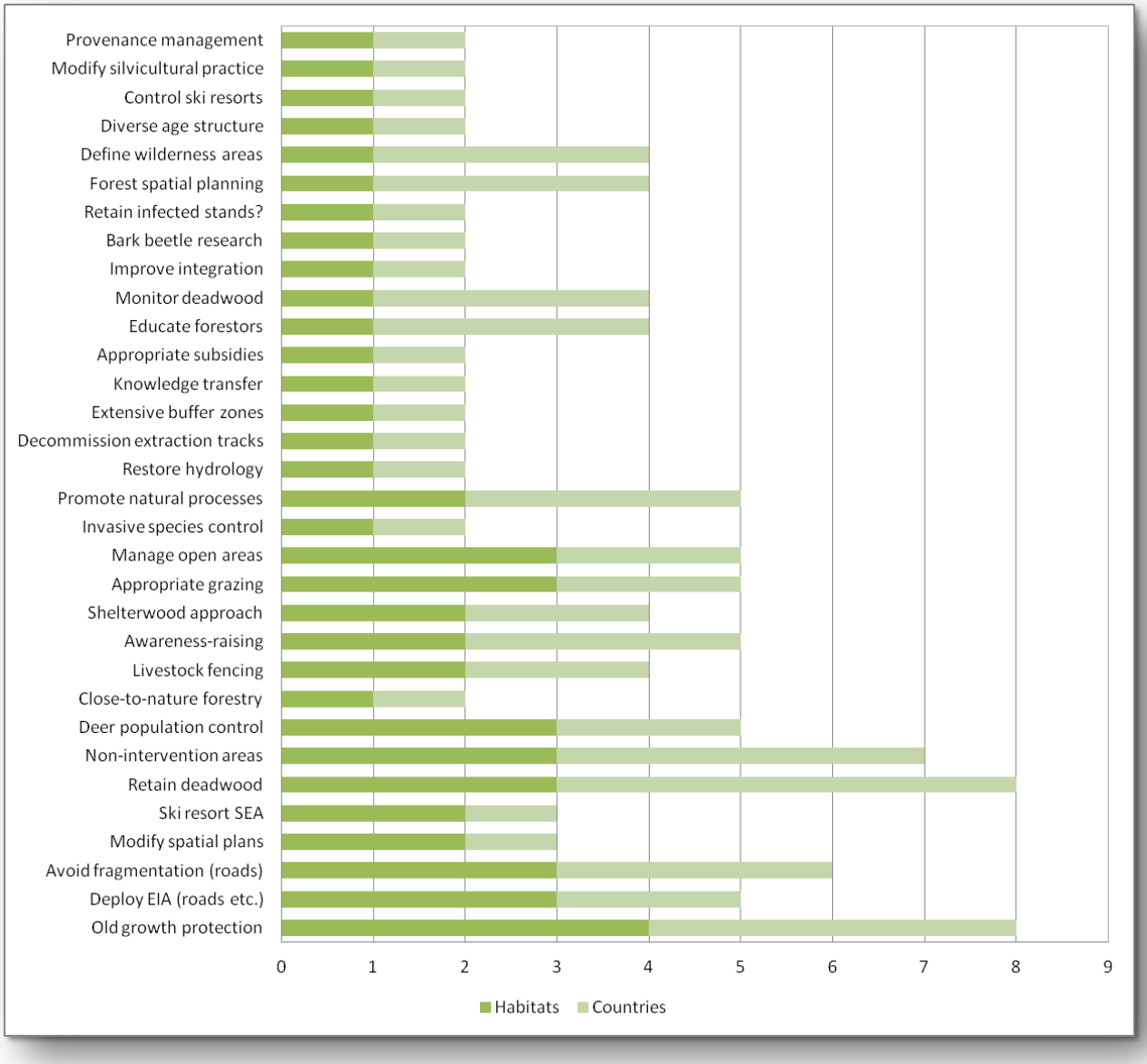


Forest or plantation management & use (**B02**); Grazing in forests/woodland (**B06**); Forestry activities not referred to above (**B07**); Mining & quarrying (**C01**); Roads, paths and railroad (**D01**); Improved access to site (**D05**); Cultivation (**E01**); Hunting & collection of wild animals (**F03**); Outdoor sports & leisure activities (**G01**); Sport and leisure structures (**G02**); Air pollution, air-borne pollutants (**H04**) Invasive non-native species (**I01**); Other ecosystem modifications (**J03**); Biocenotic evolution, succession (**K02**); Interspecific floral relations (**K04**); Storm, cyclone (**L07**); Changes in abiotic conditions (**M01**); Changes in biotic conditions (**M02**).

The threat that affects all habitats and which is most widespread comes from the forestry sector where inappropriate management by both state institutions and private individuals was identified as a significant issue. The removal of dead and dying trees, leading to significant reductions in the volume of deadwood, was the most common issue. The management of bark beetle outbreaks in Germany, Poland and Bulgaria was viewed as a 'missed opportunity' to increase deadwood volume in acidophilus *Picea* forests because infected stands are usually subject to clear felling and replanting. In Poland this was viewed as particularly damaging to the wider forest ecosystem. The loss of genetic provenances that are suitably adapted to montane conditions was also noted in relation to this activity. The protection of old growth forests and their increasing isolation, resulting from intensive forestry practices in surrounding areas, was identified as an issue in Poland. Intensive, clear-fell systems with

short rotation times was also an issue in Austria and Germany[2]. The internal fragmentation of habitat arising from the construction of logging extraction roads and hiking trails was the next most widespread issue in joint place with climate change. Both roads and tracks cause disturbance to a number of species, such as capercaille (*Tetrao urogallus*) as well as the direct destruction of habitat and the spread of invasive alien species. Climate change was identified as a pressure that would not only lead to species reassortment and changes in the dominant canopy type but also the zonation of commercial forestry practices. This last issue was noted by Austria but will apply to the whole biogeographical region making future FCS reporting an interesting challenge. Although the impact of high deer population densities on regeneration was noted in a number of commentaries it was only actually noted in the feedback as an issue in two countries, Germany and Austria.

Management requirements identified by country experts

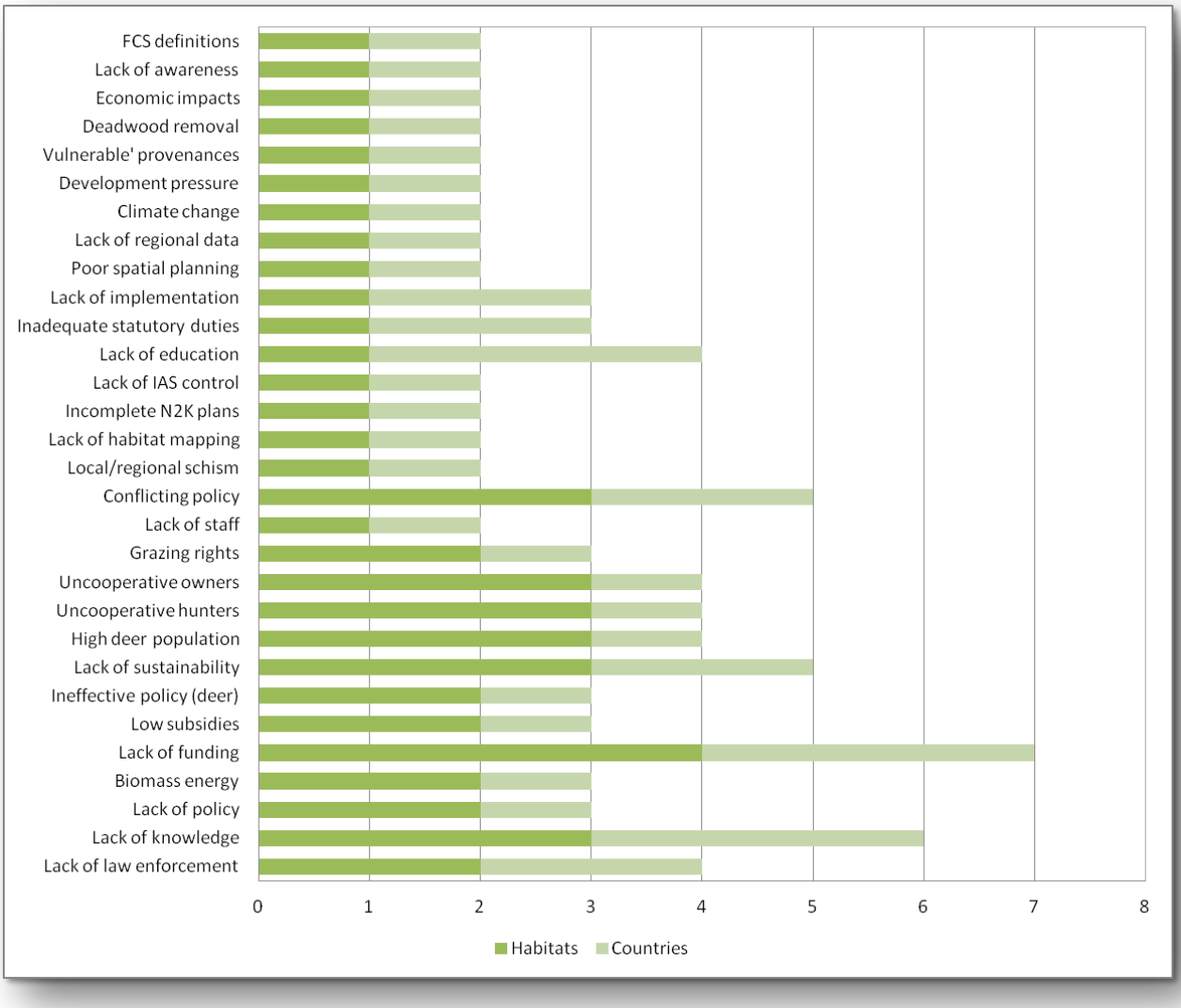


The management practices that applied to the most habitats and countries were the protection of old-growth forest and deadwood retention. This was not only an issue in relation to commercial forestry but also ski resort construction and general development in alpine areas. Ski resorts appeared to be a particular problem in Bulgaria and Poland that not only threatened more mature stands of this habitat

[2] Statement was contested by one contributor.

type but also seemed to pose a direct threat to N2K sites themselves in the former country. The need to retain both standing and fallen deadwood was widely noted. Veteran or wolf trees were seen as a particularly important feature because they provided habitat for other species. In Poland a volume of 40m^3/ha was recommended for *Asperulo-Fagetum* beech forests. Active deadwood monitoring was also identified as a management requirement in Bulgaria. The establishment of 'non-intervention' areas was the next most widespread recommendation. The use of strict forest protection zones and core non-intervention areas was suggested as a requirement in Germany for example. It was noted by one contributor that 10% of total forest area should be designated for non-intervention. In Poland the identification and management of 'biodiversity hotspots' at smaller scales in managed forests was seen as important, as was the promotion and tolerance of natural dynamics, especially in FCS reporting.

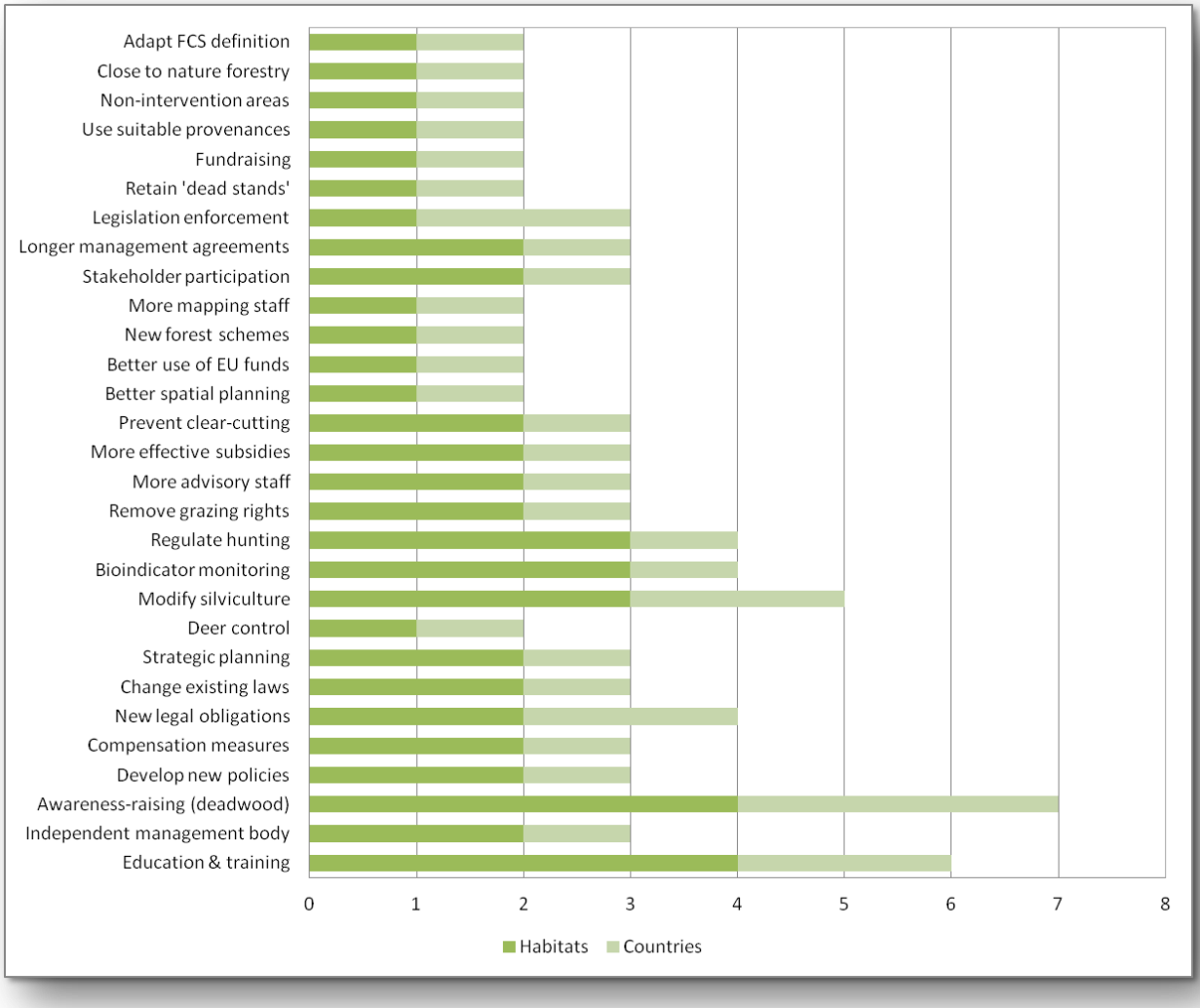
Barriers and bottlenecks identified by country experts



The most widespread barrier, affecting all the habitats for which information was provided, was a lack of funding. Although the details were not specific in most instances, it was noted by one contributor that the "Environmental Contracting Program - Forests" fails to provide a sufficient level of subsidy in Germany - another contributor disagreed with this statement. It was also noted that municipal authorities in Poland had insufficient funds to create urban spatial plans to regulate development that is threatening old-growth forest. Two other barriers are, however, connected to this in the form of a lack of enforcement of existing regulations and insufficient staff. The next most widespread barrier was a lack of knowledge. This either appeared to be in relation to the knowledge of individual citizens, e.g. impact of recreational activities in Poland, or related to the professional knowledge of foresters. For

example in Germany it was noted by one contributor that essential forest structures and functions, like distinct group structures ("Rottenstrukturen") and fallen logs ("Rannen"), did not have a recognised function as snow barriers, tree regeneration or nutrient recycling. This may be linked to the lack of education and training that was noted. Some quite specific gaps in knowledge were identified by another contributor in relation to the mapping of Tilio-acerion forests in Germany as it was felt that the location of specific habitats was needed to zone forestry operations and to carry out monitoring. However, another contributor from Germany contested this statement.

Solutions identified by country experts



Awareness-raising, education and training were identified as the most widespread solutions for this habitat grouping. Awareness-raising was associated with explaining the value and function of deadwood whereas education and training appeared to be more targeted towards technical issues associated with forest managers. For example in Germany it was suggested that changes in silvicultural systems were needed for acidophilous *Picea* forests and in Italy the direct training of Forest Service staff was suggested for all habitats. Not many suggestions were made to address the funding issue however, even though it was widely identified as a barrier for this habitat grouping. Austria noted that better use might be made of EU regional funds and that new forest management schemes could be initiated. The withdrawal of existing subsidies that promote clear-felling was also suggested by one contributor from Germany but contested by another. Interestingly no suggestions were made about using ecosystem service reasoning to highlight their potentially greater value as 'protection forests' in comparison with their value as commercial forestry. Such arguments could potentially fund the establishment of non-intervention areas and old growth protection zones, even in the face of ski resort developments. Although beyond the scope of the New Biogeographical Process, a need for new

legislation and the enforcement of existing regulations in Poland and Bulgaria was highlighted. The extent to which N2K sites were affected, as opposed to forest habitats in the wider environment, was unclear. The main case study that was submitted for this habitat grouping was a project to identify and secure habitat areas for the brown bear in the Polish Carpathians within the context of the preparation of a national management plan for Poland. See: http://gatunki.sggw.pl/ & www.carpathianbear.pl for further details.

A number of species, listed in the following table, that require special management consideration were identified by experts for this habitat grouping. The list includes higher and lower plants, birds and mammals. The specific habitats with which these species were associated has also been shown. Butterflies were not identified in the relevant section of the Expert Input Forms that were received but comments on this group have been captured from BCE input to the background document text and subsequently added to this list.

Species requiring special management measures

	9130	9170	9180	9410
White-backed woodpecker (*Dendrocopos leucotos*)	X		X	
Grouse spp (Galliformes)	X			
Eurasian wolf (*Canis lupus*)		X		
Brown bear (*Ursus arctos*)		X		
Eurasian eagle-owl (*Bubo bubo*)			X	
Lady's slipper orchid (*Cypripedium calceolus*)			X	
Green shield moss (*Buxbaumia viridis*)			X	
Three-toed woodpecker (*Picoides tridactylus*)				X
Capercaillie (*Tetrao urogallus*)				X
Hazel grouse (*Bonasia bonasia*)				X
Red-breasted flycatcher (*Ficedula parva*)	X			X
Pygmy owl (*Glaucidium passerinum*)				X
Woodland brown (*Lopinga achine*)	X		X	X
Clouded Apollo (*Parnassius mnemosyne*)	X		X	X
Niobe Fritillary (*Argynnis niobe*)	X		X	X

Relevant LIFE projects

LIFE11 NAT/RO/000825 (2012-2017) Conservative management for 4070 and 9260 habitats of ROSCI0129 North of Western Gorj. Juveloiu Elisabeta.

LIFE11 NAT/IT/000213 (2012-2015) Habitat conservation and improvement of *Carabus olympiae* populations in Val Sessera. Massimo Curtarello.

LIFE08 NAT/RO/000502 (2010-2013) Securing favourable conservation status for priority habitats from SCI Calimani-Gurghiu. Calin Cengher.

LIFE08 NAT/S/000264 (2010-2014) Demonstration of an integrated North-European system for monitoring terrestrial habitats. Hans Gardfjell.

Best practice

AlpNaTour; Carpathian Brown Bear Project; HCV Resource Network; IUFROU and INTEGRATE.

Toolkits

HCVF; WWF MIV Toolkit; and WWF Pyramid Toolkit.

2.1 9130 - *Asperulo-Fagetum* beech forests

Habitats Manual 2007 Extract

Fagus sylvatica and, in higher mountains, *Fagus sylvatica-Abies alba* or *Fagus sylvatica-Abies alba-Picea abies* forests developed on neutral or near-neutral soils[3], with mild humus (mull), of the medio-European and Atlantic domains of Western Europe and of central and northern Central Europe, characterised by a strong representation of species belonging to the ecological groups of *Anemone nemorosa*, of *Lamiastrum* (*Lamium*) *galeobdolon*, of *Galium odoratum* and *Melica uniflora* and, in mountains, various *Dentaria* spp., forming a richer and more abundant herb layer than in the forests of 9110 and 9120.

Sub-types include: 41.131 - Medio-European collinar neutrophilous beech forests Neutrocline or basicline *Fagus sylvatica* and *Fagus sylvatica-Quercus petraea-Quercus robur* forests of hills, low mountains and plateaux of the Hercynian arc and its peripheral regions, of the Jura, Lorraine, the Paris basin, Burgundy, the Alpine piedmont, the Carpathians and a few localities of the North Sea-Baltic plain; 41.132 - Atlantic neutrophile beech forests Atlantic beech and beech-oak forests with *Hyacinthoides non-scripta*, of southern England, the Boulonnais, Picardy, the Oise, Lys and Schelde basins; 41.133 - Medio-European montane neutrophilous beech forests Neutrophile forests of *Fagus sylvatica*, *Fagus sylvatica* and *Abies alba*, *Fagus sylvatica* and *Picea abies*, or *Fagus sylvatica*, *Abies alba* and *Picea abies* of the montane and high-montane levels of the Jura, the northern and eastern Alps, the western Carpathians and the great Hercynian ranges; 41.134 - Bohemian lime-beech forests *Fagus sylvatica* or *Fagus sylvatica-Abies alba* forests rich in *Tilia* spp., of the Bohemian basin; and 41.135 - Pannonic neutrophile beech forests Neutrophilous beech forests of medio-European affinities of the hills of the Pannonic plain and its western periphery.

Relict stands of collinar neutrophilous beech forests of the Macin Mountains of Dobrogea, Romania are the priority habitat 91X0*Dobrogean Beech forests.

Bergendorff, C., larsson, A. & Nihlgård, B. (1979) *Sydliga lövskogsbestånd i Sverige. Statens naturvårdsverk*. Rapport. SNV PM 1278, Solna, 68 pp.

This type of beech (*Fagus sylvatica*) forest represents the climax vegetation on neutral or near-neutral soils of Western Europe, of central and northern Central Europe, and of mountainous regions of southern Europe. Beech dominates the tree layer, together with spruce (*Picea abies*) and European silver fir (*Abies alba*) in the mountains. The herb layer is more diverse and abundant than with habitat type 9110, and is composed mainly of typical beech forest species.

The conservation status was assessed as favourable only in the Mediterranean region, where the habitat is present mainly in mountainous areas. The conservation status in the Pannonian and in the Boreal regions, where the climatic conditions are in general inappropriate, the status of the habitat was assessed as 'unfavourable bad'. The conservation status in other regions is 'unfavourable inadequate'. However the range and habitat area are stable or increasing and sufficient in most of the countries except UK, Austria and Sweden. Unfavourable status of structure and function reflecting inappropriate forest management is usually responsible for unfavourable overall assessment (Summary sheet of the online report on Article 17 of the Habitats Directive).

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

N2K code	Habitat name		AT	BG	DE	ES	IT	PL	RO	SK	REGION
9130	*Asperulo-Fagetum* beech forests	range	FV		FV	FV	FV	FV		FV	FV
		area	U1		FV	FV	FV	FV		FV	U1
		structure	U1		FV	U1	FV	FV		FV	U1
		future	U1		FV	FV	FV	XX		FV	U1
		overall	U1		FV	U1	FV	FV		FV	U1

[3] One contributor suggested that the pH can be as low as 4-5, however, high base saturation occurs within the trees' rooting zone.

Species associated with this habitat and their CS at the Alpine region and MS level (NB added by Steering Committee as an associated species of interest)

N2K code	Species name	Group		AT	BG	DE	ES	FR	IT	PL	RO	SI	SK	REGION
1087	*Rosalia alpina*	Invertebrates	range	U1		FV	XX	FV	U2	XX		FV	FV	U1
			population	U1		FV	XX	XX	U2	XX		XX	FV	XX
			habitat	U1		FV	XX	FV	FV	XX		U1	FV	U1
			future	U1		FV	XX	FV	U1	XX		U1	FV	U1
			overall	U1		FV	XX	FV	U2	XX		U1	FV	U1

The rosalia longicorn is a beetle that is widespread across Europe. Its preferred habitat is beech forest wherein it lays its eggs. In all geographical regions (Alpine, Atlantic, Continental, Mediterranean and Pannonian) its overall assessment is 'inadequate' or 'unknown'. However, in the Atlantic region its range is assessed to be 'favourable' and in the Pannonian region its range and future prospects are reported as 'favourable'. The overall assessments differ among the countries, but most countries assessed its status as 'inadequate' or 'unknown but not favourable'. Since numbers of this species are declining it has a protected status in several countries (Summary sheet of the online report on Article 17 of the Habitats Directive[4]). The IUCN conservation status is of Least Concern at European level[5].

Conservation and forestry is too focused on forest habitats that are dominated by dense tree stands neglecting the fact that (very) light forest structures are necessary for typical and endangered forest butterflies (and other insects). The situation in the Alps concerning light forest stands is still better than in other regions, but the same trend is still present and will eventually destroy habitats for forest butterflies. The main features of these butterfly habitats are not described in annex I and may thus disappear unobserved or with little attention. These kinds of habitats are neither open grasslands (typically grazed as mountain pastures) nor dense forests (typically maintained by forestry), but they are somewhere in between, which makes their persistence under modern categorization difficult (see also grassland habitats). Attention: The described habitat structures are neglected, but this does not mean that forests in general should be light forests! Dense forests may be valuable habitats as well!
Characteristic butterfly species includes *Lopinga achine* (annex IV), which lives in light forest with dense (may be sparser in higher altitudes of distribution) grass cover, egg-laying optimum mostly at approximately 30% tree cover. Additionally, *Parnassius mnemosyne* (annex II & IV) and *Argynnis niobe* occur in very open habitats, which are fringed with trees/shrubs. Apart from butterflies, *Rosalia alpina* and flat bugs *Aradus* spp. (Aradidae) are further examples. They require dead wood and dying trees that are exposed to the sun.

Threats and Pressures Identified by Country Experts

		LIFE	AT	BG	DE	ES	FR	IT	PL	RO	SK
1)	Forest and Plantation management & use (B02)	✓	1		1				2		
2)	Roads, paths and railroads (D01)		1						2		
3)	Improved access to site (D05)								1		
4)	Urbanised areas, human habitation (E01)								1		
5)	Outdoor sports and leisure activities, recreational activities (G01)								1		
6)	Removal of dead and dying trees (B02.04)	✓	1		3					1	
7)	Damage by herbivores (including game species) (K04.05)				1						
8)	Acid rain (H04.01)				1						
9)	Nitrogen-input (H04.02)				1						
10)	Forestry activities not referred to above (B07)		1		2						

[4] http://forum.eionet.europa.eu/x_habitat-art17report/library/datasheets/species/invertebrates/invertebrates/rosalia_alpinapdf/download/1/Rosalia%20alpina.pdf?action=view

[5] Nieto, A. and Alexander, K.N.A. 2010. European Red List of Saproxylic Beetles. Luxembourg: Publications Office of the European Union.

11)	Air pollution, air-borne pollutants (H04)				1						
12)	Damage caused by game (excess population density) (F03.01.01)		1		2						
13)	Grazing in forests/ woodland (B06)				1			1			
14)	Forestry clearance (B02.02)				1						
15)	Eutrophication (natural) (K02.03)		1		1						
16)	Changes in abiotic conditions (M01)		1								
17)	Lack of natural, dynamic change and disturbance (?)		1		1						
18)	Skiing complex (G02.02)										

Habitat Impacts: In **Poland** logging is quite intensive and the machinery used is very destructive. It produces high erosion (even landslides) as well as a high sediment load in rivers and streams. Insufficient amounts of dead wood are retained. Forestry practice generally leads to the destruction of habitat and disappearance of old-growth forest. Forest roads can occur at high densities and provide access to previously remote areas, thus increasing human disturbance, promoting land use changes, increasing the risk of hunting, poaching and other extractive activities. They also facilitate the spread of invasive species. Large, disturbance-free areas that are needed by many species, are lacking. In practice, there are no limitations on building in remote and forest areas. Urban spatial plans are also not obligatory. Urban sprawl and dispersed building across the landscape is common in the Polish Carpathians and is increasing which has led to the direct loss and fragmentation of this habitat. The number of ski resorts is increasing, as well as activities like off-road motorized driving (snow-scooters, quad) which may disturb alpine fauna and flora, especially in winter which is a critical period for many animals (**Selva**). Forest management is generally the most important factor (but not always a threat) influencing this habitat. This is mostly with respect to the 'ecological quality' of the habitat, i.e. its capacity to support related biodiversity. In the Carpathians, high biodiversity is supported by this habitat that not only includes numerous populations of Annex II species, such as *Cucujus cinnaberinus, Rhysodes sulactus, Boros schneideri, Rosalia alpina, Buxbaumia viridis* but also other important rare species such as *Lobaria pulmonaria, Lacon lepidopterus, Eurythyrea austriaca and Sternodea baudii.* Although forest management should not be automatically considered a 'threat' some of the most important areas are threatened by specific silvicultural practices such as thinning and the removal of deadwood. Roads and ski resort infrastructure are the most important factors causing fragmenting of this habitat. This can lead to significant biodiversity impacts. For bigger animals, such as bears, roadless areas are crucial as 'high quality habitats'. For other important components of biodiversity (e.g. *Glis glis*) even forest tracks, creating permanent gap in the stand continuity, may create ecological barriers (**Pawlaczyk**). In **Germany**, from ca. 1800-1980, a combination of spruce-oriented silviculture and overstocking with red deer as well as chamois and roe deer was widespread. This led to a significant reduction of *Abies alba, Acer pseudoplatanus* and *Fagus sylvatica* through selective browsing and thinning. This continues to have an impact on the species composition of this habitat type. Local damage to *Abies alba* stands in the vicinity to coal-fed power stations (e.g. Penzberg) which causes dieback. Latent eutrophication from nitrogen emissions is also an issue (**Ewald**). The threats and pressures on forest habitats are estimated to be less sweeping than in the continental region, as indicated by the favourable conservation status of many forest habitats in the Bavarian Alps. Remoteness, inaccessibility, steepness, and harsh environmental conditions have led to a higher proportion of well-preserved woodland that has been spared from settlement, forest clearing and urban development. The ranking level "high" in the alpine region is not comparable with "high" in the continental region. Natural regeneration is the crucial weak link in mixed mountain forests, especially in the Alps with the climatic conditions and their role as "protection forests" (i.e. erosion, rock fall, avalanche etc.). Fir tree (*Abies alba*) is a key species and has serious regeneration problems. This is largely caused by the proportion of old fir trees and the damage caused by game. Shortened rotations and / or limitations of the growing stock volumes might have critical effects in view of isolation of essential structures of old-growth and over-mature stages, such as veteran trees and deadwood. In times of increasing demand for fuel wood and wood energy we have to keep an eye on that issue (**Kanold**). The threats and pressures in the alpine region are estimated to be generally in a lower level as in the continental region (except browsing by game), based on the favourable conservation status in the Bavarian Alps. Natural regeneration is really important in alpine forests because of their function as protection forests. Browsing by red and roe deer in mixed old stands often results in pure and unstable spruce rejuvenations, because silver fir (*Abies alba*) is usually preferred by the game. In some areas forests are still used as pasture for cattle and sheep and this can cause regeneration problems for several tree species (especially *Fagus sylvatica* and *Acer pseudoplatanus*). Boosted by the energy revolution, more and more deadwood and dying trees are used for energy, e.g. as wood chips or fire wood. In state forests, an increasing number of whole trees are processed – however, this statement was contested by one contributor .

Management can also have a significant impact with short rotation times tending to result in smaller percentages of ecologically valuable older stands. Especially in private-owned forests, some owners still manage their forests using clear fell techniques – even in mixed stands – one of the contributors disagreed. This tends to result in unstable, pure spruce plantations without important species like silver fir or beech (**Mittermeier**). In **Italy** the greatest pressure on this habitat is not the grazing by cows, but browsing by wild animals like deer! (**Unterthiner**). The **LIFE** Project identified the threats associated with this habitat as the cessation of traditional coppicing (IT); clearcutting of large areas but not in IT or RO; and insufficient deadwood.

Management Requirements Identified by Country Experts

		LIFE	AT	BG	DE	ES	FR	IT	PL	RO	SK
1.1)	Adapt forest management to protect old-growths. Require Environmental Impact Assessment of all forest management plans.								1		
1.2)	Habitat should be managed at a landscape scale by creating either in the N2K site or more widely, using N2K sites as core areas, a varied mosaic structure of key elements (see below).								1		
2)	Require Environmental Impact Assessment for all new forest roads. Restore habitat and decommission/remove forest roads once the logging activity has ceased.								1		
3)	Avoid road building in large unfragmented forest patches and any increases in traffic volume in forest areas.								2		
4)	Implement urban spatial plans in municipalities with N2000 sites, with the corresponding Environmental Impact Assessment.								1		
5)	Require Environmental Impact Assessment for all new ski resort, and undertake a Strategic Environmental Assessment for the whole Polish Carpathians or at least in Voivodships.								1		
6.1)	Stop removing dead and dying trees from the forest.									1	
6.2)	**a)** Maintenance or enrichment of an adequate supply of veteran "wolf trees", with different types and qualities of deadwood, as well as cavity trees and nesting trees as part of an integrated forest management system; and **b)** Conservation of stands without any intervention by humans within strict forest reserves and core areas of Biosphere Reserves and National parks.				2				1		
7)	Game management to reduce deer populations to a level that allows the natural regeneration of characteristic tree species.				1						
10)	**a)** Special conditions placed on mountain forest silviculture systems that consider dynamics, structures and functions under harsh environmental conditions, e.g. close-to-nature forestry; **b)** Targeted promotion of silver fir (*Abies alba*) by suitable silvicultural practices; and **c)** Retain a fixed percentage of old-growth forest.				1						
12)	Minimize deer damage through population control, particularly with respect to browse-sensitive silver fir (*Abies alba*).				2						
13)	Installation of fences to avoid trespassing of cattle and sheep in forest habitats.				1						
14)	Awareness raising and promotion of shelter wood techniques.				1						
	Close-to-nature silvicultural regime with single tree selection, extended harvesting cycles and long-term tree retention.	✓			1						
	Habitat maintenance or restoration.								1		
	Cutting of trees, long term management, forest grazing and		1		1						

	the development of regulations/methods that support "in between" habitats for gap phase species.										
	a) Establishing wilderness areas/ allowing succession; **b)** Restoration measures (habitat and natural process restoration); **c)** Invasive/ problematic species control; **d)** Site/area management; **e)** Adapt forest management; **f)** Invasive/problematic species control; **g)** Restoring/improving forest habitats; **h)** Restoring/improving the hydrological regime; **i)** Establish protected areas/sites; **j)** Manage landscape features; and **k)** Awareness and communications etc.		1							
	Restoration of coppice management rotations or the selective thinning of previously coppiced stands to create a more open character.	✓									

Additional Information: In **Poland** key elements of landscape-scale mosaics should include examples of 'natural forests' or forests where active forestry management is abandoned and they are allowed to 'renaturalise'. These could be managed through non-intervention management that allows more natural forest dynamics to occur at larger scales (patches 100-1000 ha or more). This could be done in national parks, nature reserves etc. The national protected area system could be used as 'internal zonation' area in the bigger N2K sites. Smaller areas (1-100 ha) should be managed as 'biodiversity hotspots' that would be analogous to small islands in the general matrix of managed forest. This could be achieved through retention tree-groups, microreserves, belts along forest streams excluded from harvesting etc. This would provide the potential to maintain/restore a wider biodiversity presence in the landscape and encourage functioning metapopulations of critical species. This would require a matrix of sustainably managed forest, without clearcuts, supported by more sympathetic management schemes. Differentiation is appreciated and recommended such as variation from shelterwood schemes to 'continuous management' schemes. Nevertheless, the natural pattern of Carpathian beech forest ecology (i.e. small-scale gap dynamics and reciprocal replacement between fir and beech) should be allowed if possible. A varied age structure with the preservation of old growth stands must be maintained, although in the 'managed matrix' this may be managed in a more dynamic manner. Nevertheless even in these areas it must be taken into consideration that stands >160-200 years old are necessary and critical for maintaining the full spectrum of forest biodiversity (Moning & Mueller 2009). Maintaining a healthy environment that supports key ecosystem services such as biodiversity, clean water and climate regulation should also be an important consideration. The proportion of the different mosaic elements in a given area must be considered and discussed on a site-by-site basis. This should take individual biodiversity needs and its importance into account. This could be achieved using different tools such as landscape plans; forest management plans (including spatial and protective components); national protected areas; protective regulations; species protection zones; and protected zones for FSC forest certification. Deadwood quality and quantity is extremely important for supporting the biodiversity associated with Carpathian beech forests. In the Carpathians the optimal threshold for 9130 should be no less than 40m^3/ha on average. This should be applied to all N2K sites as a minimum requirement but localised areas (normally managed as non-intervention zones) should contain much larger volumes. An acceptable threshold for this habitat outside N2K sites should be no less than 20-30m^3/ha on average although areas with much higher volumes should be encouraged in these areas as well. This is achievable, for example in Krosno RDLP (eastern part of Polish Carpathians) the average for all forests (not necessarily just N2K habitats) is ca 20m^3/ha and the average in at least in some N2K sites (such as Ostoja Jaśliska PLH180014) in estimated to be as high as 35-40m^3/ha. Volume is not the only issue, however, as other aspects are also important such as the presence of coarse woody debris and the 'continuity' of deadwood. For some associated saproxylic species, such as *Buxbaumia viridis*, only certain decay stages are relevant. The presence of the species at any given location will require the continuity of specific types of deadwood that are normally delivered through natural processes. Many saproxylic species have very limited dispersal ability and once lost from an area they can become locally extinct because recolonisation is not possible. This must be taken into consideration in silvicultural management. For some shade-requiring species, such as *Buxbaumia viridis* and other relicts of natural, old-growth forests, the shelterwood forest management scheme (and of course clearcut schemes) should not be applied. In the wider forest mosaic, a permanent presence of dense old growth stands (150-220 year old) should be maintained wherever possible. For some habitat-related birds, such as white-backed woodpecker (*Dendrocopos leucotos*), deadwood is also crucial factor (**Pawlaczyk**).

Current Management Practices Identified by Country Experts

		AT	BG	DE	ES	FR	IT	PL	RO	SK
1)	Sustainable forestry schemes and, generally practiced in Poland, especially in state forests, with some 'biodiversity-supporting elements', as savings some trees for old age and creating deadwood in future, maintaining forest reserves and habitats in national parks with non-intervention management and care for deadwood resources. The main problem is scale and proportion (how much deadwood is necessary?) and a lack of understanding of the ecological requirements of some species.							1		
6)	**a)** Preservation of characteristic tree species, deadwood and abandonment of forestry. Municipal and private owned forests eligible for grants through the "Environmental Contracting Program Forests" (VNP Wald); **c)** The Bavarian state forest company (public-law institution) has fixed suitable measures in its "nature conservation concept" (based on the "key values in mixed mountains forests" - Moning et al. 2009).			2						
10)	Close-to-nature forest management including natural regeneration ("integrative approach").			1						
12)	Every third year a vegetation report from the Bavarian Forest Administration is used as a basis for the development of new cull plans for red and roe deer. This is often done in conjunction with fences to prevent browsing in regenerating areas.			2						
14)	Consultation with the Bavarian forest administration occurs and sylvicultural subsidies are available to promote typical forest species like *Abies alba* or *Fagus sylvatica*.			1						
	Strict protection and forestry practice works towards the restoration of typical tree species composition (the impact on specific structure and functions parameters).							1		
Additional Information: In **Italy** the Forest Service in the Autonomous Province of Bolzano is responsible for the "tree marking". We hope that this procedure will not change! (**Unterthiner**).										

Barriers and Bottlenecks Identified by Country Experts

		LIFE	AT	BG	DE	ES	FR	IT	PL	RO	SK
1.1)	Lack of law enforcement; lack of cooperation from key stakeholders; lack of knowledge.				1				1		
1.2)	Economic: creating non-intervention zones and deadwood restoration leads to decreasing forestry income.								1		
2)	Lack of knowledge, law enforcement and policy.								2		
3)	Lack of policy.								1		
4)	Insufficient funds for municipalities making urban plans and inappropriate laws.								1		
5)	Lack of law enforcement and policy.								1		
6)	**a)** Uncooperative private forest owners; **b)** Increase of wood biomass energy systems; **c)** and the subsidies of the "Environmental Contracting Program Forests" are too low.				2						
7)	Inappropriate policy framework that poses obstacles to adequate game management (efficient population control).				1						
10)	Lack of knowledge, unsustainable economic thinking and a lack of sufficient state subsidy for alternative management practices.				2						
12)	Game densities are too high, hunters do not cooperate and there is a lack of natural predators				2						

13)	Existing rights for pasturing in woodlands, agricultural funds to support alpine farming (INVEKOS).				1						
14)	Uncooperative landowners and a lack of staff.				1						
	Insufficient funds, lack of knowledge and existing policy frameworks.		1		1						
	Lack of site/area management, lack of local/regional cooperation and a lack of awareness and communication.		1								
	Lack of sustainable economic benefits from coppiced woodlands.	✓									
	Owners struggle to implement active management schemes on small plots (~ 3-5 ha).	✓									
Additional Information: In **Italy** in the sylvicultural management of forest it's always necessary to find a compromise between the (economic) benefits to the owner and the benefits to the general public (**Unterthiner**).											

Potential Solutions Identified by Country Experts

		LIFE	AT	BG	DE	ES	FR	IT	PL	RO	SK
1.1)	Education; training; law enforcement; establishment of an independent body for controlling forest exploitation; and management.								1		
1.2)	Completing and expanding the network of non-intervention areas and biodiversity hotspots to act as an 'ecological skeleton' of sustainably managed habitat at the landscape scale.								1		
1.3)	Developing and disseminating good, 'close to nature' forest management schemes that promote the retention of structural elements crucial for biodiversity, such as deadwood, through forest-environment payments and N2K forest payments via CAP.								1		
2)	Raising awareness; implementing new policies avoiding further fragmentation of forest; and compensation measures to ensure 'No Net Loss' of unfragmented lands.								2		
3)	Raising awareness and influencing policies.								1		
4)	Change of the current law and new legal obligations placed on spatial urban plans created by municipalities.								1		
5)	Law enforcement; strategic plans; and influencing policies.								1		
6)	Awareness-raising about the essential role that deadwood plays in mountainous forests and why it should be left and better financed subsidies.				2				1		
7)	Legal framework for efficient control of deer populations and more cooperative approaches to wildlife population management.				1						
10)	Implementation of a revised silviculture system in mountainous regions, that takes account of all aspects of genetic and species diversity and well as key structures and functions. This should include targeted promotion of silver fir through suitable silvicultural measures, subsidies to protect old-growth forest and the implementation of a success monitoring system, based on a set of meaningful bioindicators.				2						
11)	Requires a global solution but monitoring of sensitive bioindicators should be carried out to determine impact (e.g. lichen genera of *Bryoria, Evernia, Pseudevernia, Hypogymnia* and *Usnea* require high air quality).				1						
12)	Regulate hunting to ensure continuity of rejuvenation silver fir and other species sensitive to browsing and undertake awareness-raising.				2						
13)	Exchange or dissolution of pasturing rights and stop				1						

	providing agricultural subsidies in forest habitats.										
14)	More staff to provide advice, financial subsidies to prevent clear cuts and increasing public awareness.				1						
	Increase further education (owners) and further training (Forest Service).							1			
	a) Better implication of European regional funds (Natura 2000); **b)** Application of forestry-environmental programs comparable with ÖPUL; and **c)** Coordinated measures related to spatial planning awareness raising, influencing policies.		1								
	In Romania, favourable condition is generally achieved through the current statutory management system that prevents clear-cutting of larger areas. A rolling (selective) cutting system results in areas with a mixed age structure of average 80 y age, with max up to 180 y. Deadwood, estimated at 20m^3/ha is created from seed trees and other leftovers. If a new approach to the management of coppiced stands, being developed through an Italian LIFE project, is successful it will result in a high quality product that would pay for the management costs.	✓									

Additional Information: In **Poland** common standards need to be developed in relation to the understanding of Favourable Conservation Status that embraces the 'ecosystem approach" (i.e. not only based on higher plants), especially in relation to: **a)** 'ecosystem quality indicators' such as insect, mosses, lichens and birds typical for natural beech forest (e.g. *Cucujus cinnaberinus* is a good candidate for this habitat in the Polish Carpathians); **b)** ambitious deadwood thresholds; **c)** presence of old trees and stands (>160-200 years) as a structural indicator; and **d)** acceptance of natural forest dynamics as a 'favourable' condition. Building an awareness and understanding of the ecological & biodiversity value of Carpathian beech forests is also important. More specifically this should include: **a)** awareness of natural patterns of forest dynamics and the importance of natural forests in forest reserves as reference examples for 'close to natural' forest management; **b)** benefits provided by 'close to nature' forest management schemes in contrast with clearcuts and shelterwoods systems especially in relation to ecosystem services, forest stability and management cost savings; **c)** international recognition of the biodiversity, ecological & cultural value of Carpathian beech forests, especially in relation to old growth stands (WWF Global 200, UNESCO Human Heritage Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany) (**Pawlaczyk**).

Species Management Requirements Identified by Country Experts

	AT	BG	DE	ES	FR	IT	PL	RO	SK
The real protection of large carnivores requires keeping road-free (or unfragmented) large forest areas, e.g. for wintering bears and cub-raising. These large unfragmented forest patches should be protected for further road developments. Compensation for the same amount of unfragmented land and mitigation measures that include road closure and restoration once the activity ceased should be more generally adopted (Selva).							1		
The white-backed woodpecker (*Dendrocopos leucotos*) and the red-breasted flycatcher (*Ficedula parva*) are important species in the beech forests. They need more deadwood than is normally present. The alpine forests are attractive for outdoor activity and tourism. Therefore across all areas it's important for species to have disturbance-free zones, e.g. grouse (Tetraoninae) (Kanold).			2						

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Case Studies Identified by Country Experts

	AT	BG	DE	ES	FR	IT	PL	RO	SK
Identification of secure habitat areas for the brown bear in the Polish Carpathians (within the preparation of the brown bear management plan for Poland). See: http://gatunki.sggw.pl/ & www.carpathianbear.pl							✓		
Some actions for habitat maintenance have been undertaken in Pieniński National Park between 1993 and 2012 (National Fund of Environmental Protection and Water Management - two grants: *Protection of land ecosystems in Pieniński National Park* and *Protection of non-forest ecosystems in Pieniński National Park*)							✓		

Other Information

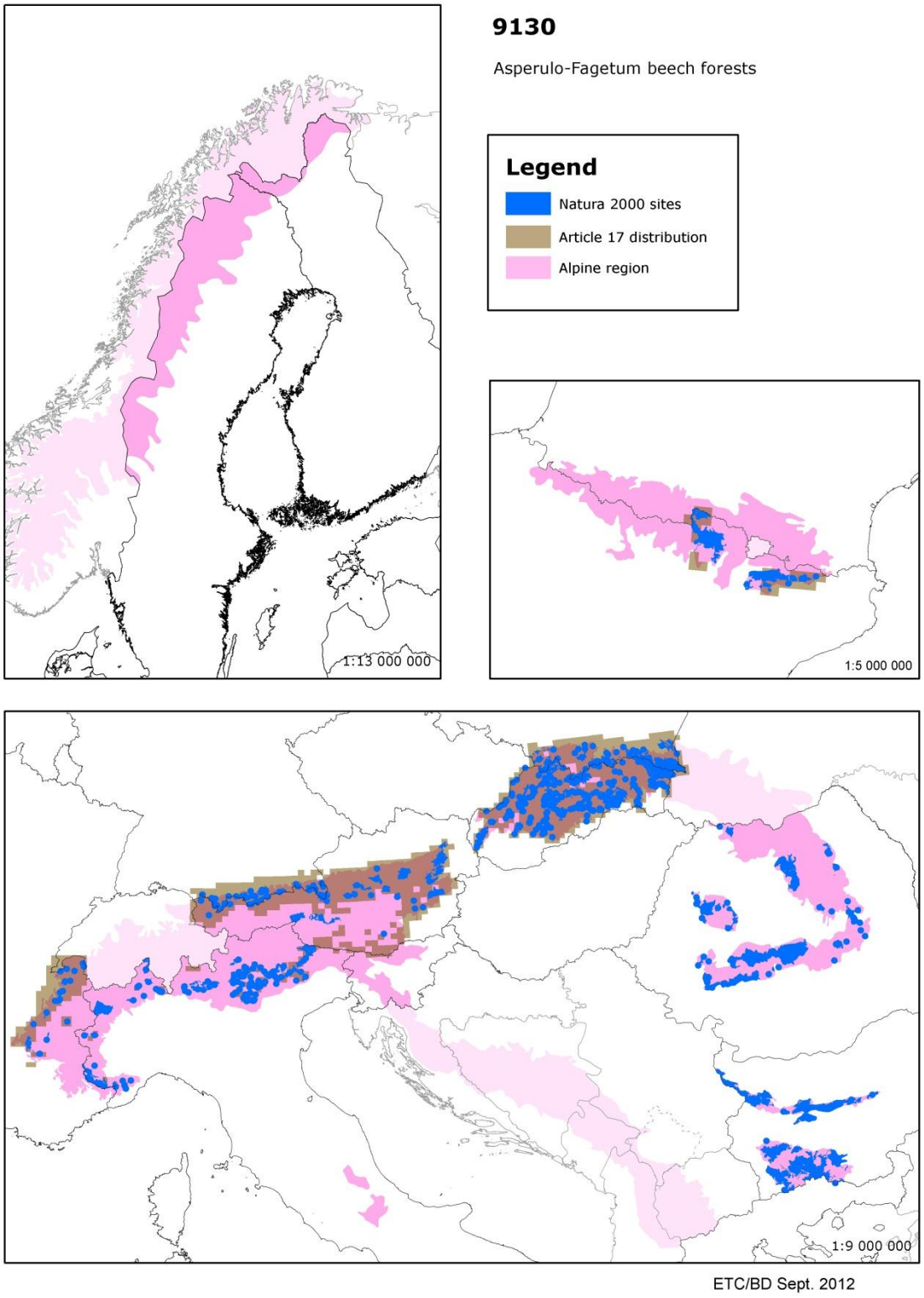
According to the ETC/BD calculations 51-75 % of the area of this habitat type are within SCIs.
This means that Natura 2000 network provides an important framework for the management of this habitat type.

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	SK
Number of sites	23	20	28	8	17	69	26	44	145
Habitat area (ha)	51016	136210	28677	2313	11679	25850	142796	72554	163212

The figures include all SCIs where the habitat type is mentioned including sites coded as D. Data source ETC/BD.

Map of SCIs proposed for *Asperulo-Fagetum* beech forests (9130) & Article 17 distribution



2.2 9170 - *Galio-Carpinetum* oak-hornbeam forests

Habitats Manual 2007 Extract

Quercus petraea-Carpinus betulus forests of regions with sub-continental climate within the central European range of *Fagus sylvatica*, dominated by *Quercus petraea* (41.261). Also included are related lime-oak forests of eastern and eastern-central European regions with a continental climate, east of the range of *F. sylvatica* (41.262).

Mixed oak-hornbeam (*Quercus* spp-*Carpinus betulus*) forests of central Europe occurring mostly in the areas with a sub-continental climate on various types of soil. The conservation status in the Atlantic region, where the habitat occurs only in Germany and in the Pannonian region, where the species occurs only in the Czech Republic is 'unfavourable bad'. The status in the Atlantic and Continental regions is 'unfavourable inadequate' (Summary sheet of the online report on Article 17 of the Habitats Directive).

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

N2K code	Habitat name		AT	BG	PL	RO	SK	REGION
9170	*Galio-Carpinetum* oak-hornbeam forests	range	FV		FV		U1	FV
		area	FV		U1		U1	U1
		structure	XX		U1		U2	XX
		future	U1		U1		U2	U1
		overall	U1		U1		U2	U1

Threats and Pressures Identified by Country Experts

		AT	BG	IT	PL	RO	SK
1)	Forest and Plantation management & use (B02)				1		
2)	Roads, paths and railroads (D01)				1		
3)	Improved access to site (D05)				1		
4)	Urbanised areas, human habitation (E01)				1		
5)	Outdoor sports and leisure activities, recreational activities (G01)				1		

Habitat Impacts: In **Poland** logging is quite intensive and the machinery used is very destructive. It produces high erosion (even landslides) as well as a high sediment load in rivers and streams. Insufficient amounts of dead wood are retained. Forestry practice generally leads to the destruction of habitat and disappearance of old-growth forest. Forest roads can occur at high densities and provide access to previously remote areas, thus increasing human disturbance, promoting land use changes, increasing the risk of hunting, poaching and other extractive activities. They also facilitate the spread of invasive species. Large free-disturbance areas that are needed by many species, are lacking. In practice, there are no limitations on building in remote and forest areas. Urban spatial plans are also not obligatory. Urban sprawl and dispersed building across the landscape is common in the Polish Carpathians and is increasing which has led to the direct loss and fragmentation of this habitat. The number of ski resorts is increasing, as well as activities like off-road motorized driving (snow-scooters, quad) which may disturb alpine fauna and flora, especially in winter which is a critical period for many animals (**Selva**).

Management Requirements Identified by Country Experts

		AT	BG	IT	PL	RO	SK
1)	Adapt forest management to protect old-growths. Require Environmental Impact Assessment of all forest management plans.				1		
2)	Require Environmental Impact Assessment for all new forest roads. Restore habitat and decommission/remove forest roads once the logging activity has				1		

	ceased.						
3)	Avoid road building in large unfragmented forest patches and any increases in traffic volume in forest areas. See point above.				1		
4)	Implement urban spatial plans in municipalities with N2000 sites, with the corresponding Environmental Impact Assessment.				1		
5)	Require Environmental Impact Assessment for all new ski resort, and undertake a Strategic Environmental Assessment for the whole Polish Carpathians or at least in Voivodships.				1		

Current Management Practices Identified by Country Experts

		AT	BG	IT	PL	RO	SK
	No suggestions						

Barriers and Bottlenecks Identified by Country Experts

		AT	BG	IT	PL	RO	SK
1)	Lack of law enforcement; lack of cooperation from principal stakeholder (State Forest); lack of knowledge.				1		
2)	Lack of knowledge, law enforcement and policy.				1		
3)	Lack of policy.				1		
4)	Insufficient funds for municipalities making urban plans and inappropriate laws.				1		
5)	Lack of law enforcement and lack of policy.				1		

Potential Solutions Identified by Country Experts

		AT	BG	IT	PL	RO	SK
1)	Education; training; law enforcement; establishment of an independent body for controlling forest exploitation; and management.				1		
2)	Raising awareness; implementing new policies avoiding further fragmentation of forest; and compensation measures to ensure 'No Net Loss' of unfragmented lands.				1		
3)	Raising awareness and influencing policies.				1		
4)	Change of the current law and new legal obligations placed on spatial urban plans created by municipalities.				1		
5)	Law enforcement; strategic plans; and influencing policies.				1		

Species Management Requirements Identified by Country Experts

	AT	BG	IT	PL	RO	SK
The real protection of large carnivores requires keeping road-free (or unfragmented) large forest areas, e.g. for wintering bears and cub-raising. These large unfragmented forest patches should be protected for further road developments. Compensation for the same amount of unfragmented land and mitigation measures that include road closure and restoration once the activity ceased should be more generally adopted (**Selva**).				1		

References Identified by Country Experts

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Selva N., Sergiel A., Olszańska A., Berezowska T., Zwijacz-Kozica T. & Zięba F. (2011) Warsztaty jako narzędzie do opracowania strategii zarządzania populacją niedźwiedzia brunatnego w Polsce. Chrońmy Przyrodę Ojczystą 67 (6): 494-503. [in Polish with English summary]

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Switalski T.A., Bissonette J.A., DeLuca T.H., Luce C.H. & Madej M.A. (2004) Benefits and impacts of road removal. Frontiers in Ecology and the Environment 2(1): 21-28.

Case Studies Identified by Country Experts

	AT	BG	IT	PL	RO	SK
Identification of secure habitat areas for the brown bear in the Polish Carpathians (within the preparation of the brown bear management plan for Poland). See: http://gatunki.sggw.pl/ & www.carpathianbear.pl				✓		

Other Information

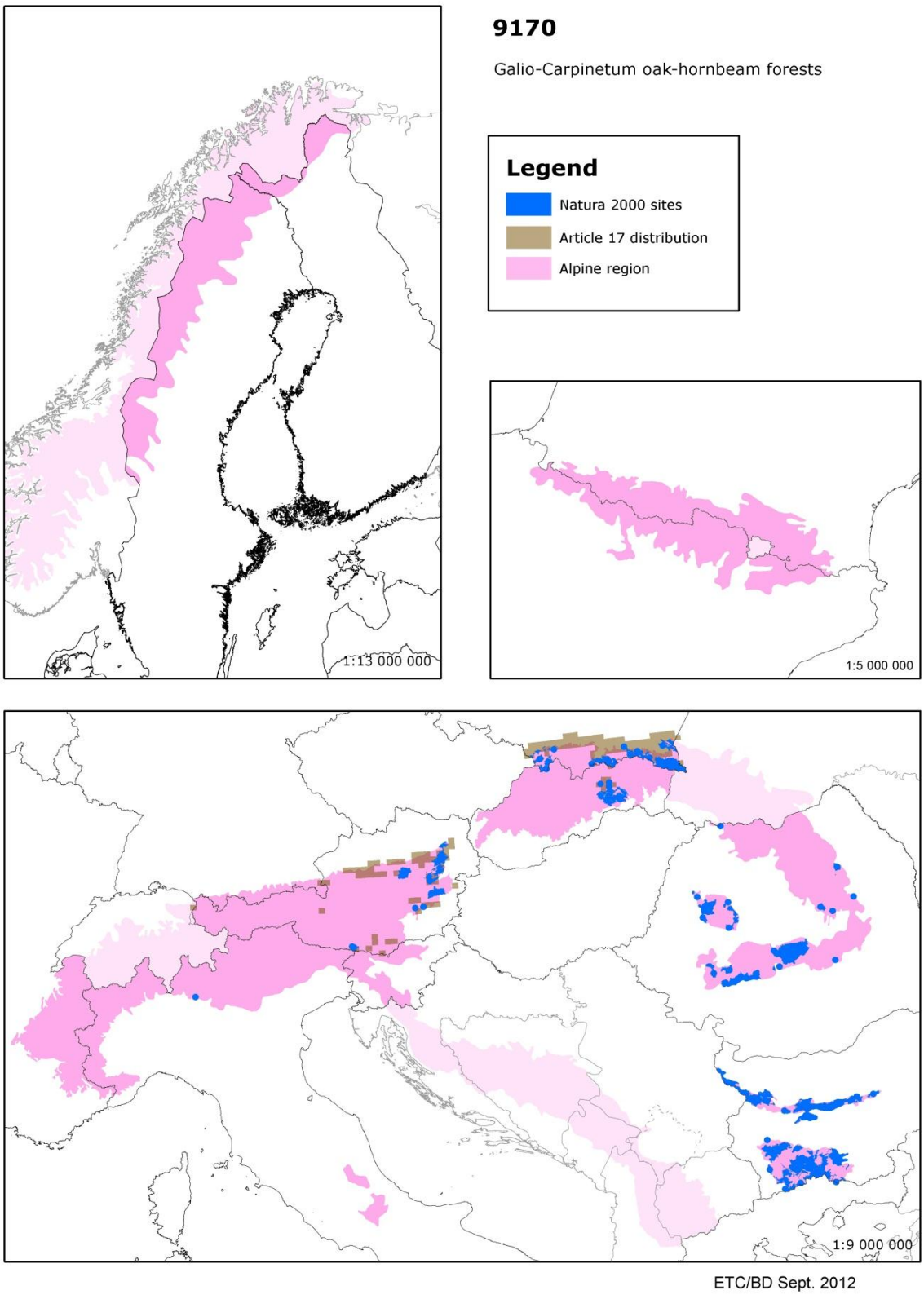
According to the ETC/BD calculations 76-100 % of the area of this habitat type are within SCIs. This means that Natura 2000 network provides an important framework for the management of this habitat type.

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

	AT	BG	IT	PL	RO	SK
Number of sites	7	21	1	11	22	4
Habitat area (ha)	1619	89237	123	3022	10079	703

The figures include all SCIs where the habitat type is mentioned including sites coded as D. Data source ETC/BD.

Map of SCIs proposed for *Galio-Carpinetum* oak-hornbeam forests (9170) & Article 17 distribution



2.3 9180 - *Tilio-Acerion* forests of slopes, screes and ravines

Habitats Manual 2007 Extract

Mixed forests of secondary species (*Acer pseudoplatanus, Fraxinus excelsior, Ulmus glabra, Tilia cordata*) of coarse scree, abrupt rocky slopes or coarse colluvions of slopes, particularly on calcareous, but also on siliceous, substrates (*Tilio-Acerion* Klika 55). A distinction can be made between one grouping which is typical of cool and humid environments (hygroscopic and shade tolerant forests), generally dominated by the sycamore maple (*Acer pseudoplatanus*) - sub-alliance *Lunario-Acerenion*, and another which is typical of dry, warm screes (xerothermophile forests), generally dominated by limes (*Tilia cordata, T. platyphyllos*) - sub-alliance *Tilio-Acerenion*. The habitat types belonging to the *Carpinion* should not be included here.

Bergendorff, C., Larsson, A. & Nihlgård, B. (1979) *Sydliga lövskogsbestånd i Sverige. Statens naturvårdsverk.* Rapport. SNV PM 1278, Solna, 68 pp.

Mixed forests composed of secondary species such as sycamore (*Acer pseudoplatanus*), ash (*Fraxinus excelsior*), elm (*Ulmus glabra*), and limes (*Tilia* spp) occurring on coarse scree, coarse sediments at the base of slopes or weathered, rocky slopes. Depending on the local climatic conditions, two subtypes can be recognised, a subtype with sycamore dominating in cooler and more humid environments and a second subtype with limes dominating in warm and dry situations.

The conservation status in the Pannonian and in the Atlantic region was assessed as 'unfavourable bad', in the other regions it was assessed as 'unfavourable inadequate' (Summary sheet of the online report on Article 17 of the Habitats Directive).

Conservation and forestry is too focused on forest habitats that are dominated by dense tree stands neglecting the fact that (very) light forest structures are necessary for typical and endangered forest butterflies (and other insects). The situation in the Alps concerning light forest stands is still better than in other regions, but the same trend is still present and will eventually destroy habitats for forest butterflies. The main features of these butterfly habitats are not described in annex I and may thus disappear unobserved or with little attention. These kinds of habitats are neither open grasslands (typically grazed as mountain pastures) nor dense forests (typically maintained by forestry), but they are somewhere in between, which makes their persistence under modern categorization difficult (see also grassland habitats). Attention: The described habitat structures are neglected, but this does not mean that forests in general should be light forests! Dense forests may be valuable habitats as well!
Characteristic butterfly species includes *Lopinga achine* (annex IV), which lives in light forest with dense (may be sparser in higher altitudes of distribution) grass cover, egg-laying optimum mostly at approximately 30% tree cover. Additionally, *Parnassius mnemosyne* (annex II) and *Argynnis niobe* occur in very open habitats, which are fringed with trees/shrubs. Apart from butterflies, *Rosalia alpine* and flat bugs *Aradus* spp. (Aradidae) are further examples. They require dead wood and dying trees that are exposed to the sun.

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
9180	***Tilio-Acerion* forests of slopes, screes and ravines**	range	FV		FV	XX	FV	FV	FV		FV	U1	U1
		area	FV		FV	XX	U1	FV	FV		FV	FV	FV
		structure	U1		FV	XX	XX	FV	FV		FV	FV	U1
		future	U1		FV[6]	XX	U1	FV	FV		FV	FV	U1
		overall	U1		FV	XX	U1	FV	FV		FV	U1	U1

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

[6] Need to consider loss of old trees due to epidemic fungal infection of *Ulmus glabra* and *Fraxinus excelsior*! (threats K04.02/.03) (Ewald).

N2K code	Species name	Group		AT	BG	DE	ES	FR	IT	PL	RO	SE	SI	SK	REGION
1381	*Dicranum viride*	Non-vascular plants	range	U1		FV	XX	XX	U1	FV			FV	XX	U1
			population	XX		FV	XX	XX	U1	U1			XX	XX	XX
			habitat	U1		FV	U2	XX	XX	U1			U1	XX	U1
			future	U1		FV	U2	XX	XX	U1			U1	XX	U1
			overall	U1		FV	U2	XX	U1	U1			U1	XX	U1
1386	*Buxbaumia viridis*	Non-vascular plants	range	U2		XX	U2	FV	FV	U1			FV	XX	U2
			population	U2		XX	XX	FV	FV	U2			XX	XX	U2
			habitat	U1		XX[7]	XX	FV	XX	U1			FV	XX	XX
			future	U2		XX	U2	XX	FV	U2			XX	XX	U2
			overall	U2		XX	U2	FV	FV	U2			XX	XX	U2
1902	*Cypripedium calceolus*	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

Reported pressures on habitat and their importance to associated species

Pressure description (2nd level)	*Tilio-Acerion* forests of slopes, screes and ravines	*Dicranum viride*	*Buxbaumia viridis*	*Cypripedium calceolus*
General Forestry management	x	x		
Communication networks	x			

Reported threats to habitat and their importance to associated species

Threats description (2nd level)[8]	*Tilio-Acerion* forests of slopes, screes and ravines	*Dicranum viride*	*Buxbaumia viridis*	*Cypripedium calceolus*
General Forestry management	x			x

Threats and Pressures Identified by Country Experts

		LIFE	AT	BG	DE	ES	FR	IT	PL	RO	SI	SK
1)	Introduction of disease (microbial pathogens) (K04.03)				1							
2)	Damage by herbivores (including game species) (K04.05)				1							
3)	Mining and extraction activities not referred to above (C01.07)	✓			1							
4)	Air pollution, air-borne pollutants (H04)				1							
5)	Damage caused by game (excess population density) (F03.01.01)				2							
6)	Removal of dead and dying trees (B02.04)		1		2							
7)	Forestry activities not referred to above (B07)		2		2							
8)	Paths, tracks, cycling tracks (D01.01)				2							
9)	Forest and plantation management & use (B02)		1				1		1			
10)	Forest replanting (non native trees) (B02.01.02)		1									
11)	Reduction or loss of specific habitat features (J03.01)		1									
12)	Invasive non-native species - *Impatiens parviflora* (I01)								1			
13)	Eutrophication (natural) (K02.03)		1		1							
14)	Lack of natural, dynamic change and disturbance (?)		1		1							
15)	Accidental fires caused by campers in RO (J01.01)	✓										

Habitat Impacts: In **Germany** significant mortality of *Ulmus glabra* stands has occurred through *Ophiostoma* infection. More recently a widespread epidemic of *Hymenoscyphus pseudoalbidus* has occurred that infects *Fraxinus excelsior,* causing significant mortality. This could change canopy

[7] Now FV (Rehklau).
[8] Impact present from B07 for everything apart from *Cypripedium* (Kudrnovsky).

composition and lead to a loss of more light demanding species in the shrub and field layers of these forests. The selective browsing by different deer species of broadleaved tree saplings associated with this habitat is a common problem. This leads to a reduction in generation potential which, over time, can lead to an even age structure and changes in canopy composition as less palatable species colonise gaps. Local limestone quarries also occur in these areas and leads to habitat loss (**Ewald**). The threats and pressures on forest habitats are estimated to be less sweeping than in the continental region, as indicated by the favourable conservation status of many forest habitats in the Bavarian Alps. Remoteness, inaccessibility, steepness, and harsh environmental conditions have led to a higher proportion of well-preserved woodland that has been spared from settlement, forest clearing and urban development. The ranking level "high" in the alpine region is not comparable with "high" in the continental region. Regeneration is the crucial weak link in mixed montane forests, especially in the Alpine region where serious obstacles are present such as snow pressure, frosts, tall herbs and grasses. The principal tree genera of this habitat type (*Acer, Fraxinus, Tilia, Ulmus*) are particularly sensitive to browsing. Because of the high potential of natural hazards these forests have to function as "protection forests". Shortened rotations and / or limitations of the growing stock volumes might have critical effects in view of isolation of essential structures of old-growth and over-mature stages, such as veteran trees and deadwood. In times of increasing demand for fuel wood and wood energy we have to focus on that issue (**Kanold**). Natural regeneration is really important in alpine forests because of their function as "protection forests" and their retarded growth. Browsing by red and roe deer in mixed old stands often results in a changed pattern of natural regeneration. Sensitive species like *Acer pseudoplatanus* and *Fraxinus excelsior* often fail to regenerate and spruce (*Picea abies*) then becomes more dominant. Boosted by the energy revolution, more and more deadwood and dying trees are used for energy, e.g. as wood chips or fire wood. In state forests, an increasing number of whole trees are processed – one contributor contested this statement. In some sites the construction of new forest tracks or skidder trails can fragment these forest habitats and disturb their sensitive soil conditions (**Mittermeier**). In **Austria** mixed forests of this type, composed of secondary species such as sycamore (*Acer pseudoplatanus*), ash (*Fraxinus excelsior*), elm (*Ulmus glabra*) and lime (*Tilia* spp), occur on coarse scree, coarse sediments at the base of slopes or weathered, rocky slopes. Depending on the local climatic conditions, two sub-types can be recognised, a subtype with sycamore dominating in cooler and more humid environments and a second sub-type with limes dominating in warm and dry situations. Climate change will alter the zonation of different habitat types (e.g. too dry/warm seasons for *Picea abies* forests in lower altitudes). Sites with more humid and cooler local climatic conditions may become more suitable for intensive forestry management as species composition and forest structure changes (**Kudrnovsky**).

Management Requirements Identified by Country Experts

		LIFE	AT	BG	DE	ES	FR	IT	PL	RO	SI	SK
2)	Minimize game damage to a level that allows the natural regeneration of all tree species.				1							
3)	Consideration of habitat type in Environmental Impact Assessments for all new limestone extraction.	✓			1							
5)	Minimize deer damage through active population control, particularly with respect to browse-sensitive genera such as *Acer, Fraxinus, Tilia* and *Ulmus.*				2							
6)	**a)** Maintenance or enrichment of an adequate supply of veteran "wolf trees", with different types and qualities of deadwood, as well as cavity trees and nesting trees as part of an integrated forest management system; **b)** Conservation of stands without any intervention by humans within strict forest reserves and core areas of Biosphere Reserves and National parks.				2							
7)	Due to their non-zonal character as isolated habitat patches most occurrences are not regularly harvested ("a.r.B") and function as "protection forests" (i.e. soil protection, rock fall protection etc.). Adjacent forests need to be managed appropriately through "close-to-nature" forestry practices and managers need to avoid adverse impacts from timber harvesting and extraction in these areas.				1							
8)	Avoid dissecting (fragmenting) sites by forest road				2							

	construction or the construction of any other paths or tracks.											
	Sustainable forest management knowledge.		1									
	Subsidies limited to sustainable forest management.		1									
	Habitat maintenance or restoration.								1			
	Cutting of trees, long term management, forest grazing and the development of regulations/methods that support "in between" habitats for gap phase species.		1		1							
	a) Prevent creation of inappropriate plantations and lanes (pistes?); **b)** Respect the soil; **c)** Maintain/create islets of ageing stands with old trees; **d)** Increase fallen and standing dead wood; **e)** Consider non-intervention; and **f)** Make a link between forest conservation and prevention of natural hazards, e.g. avalanche.						1					
	Fire prevention	✓										

Additional Information: In **Germany** this habitat type is protected by the Federal Nature Conservation Act (Article 30, Legally Protected Biotopes). Measures that may lead to the destruction or any other significant or lasting adverse impact (e.g. by forest road construction or any other paths or tracks) are prohibited (**Kanold**). In **Italy** it's very important that experts decide which silvicultural measures need to be taken to maintain this habitat. A procedure of "tree marking" by forest experts (forest engineers, Forest Service) is very important. It is also very important to have well prepared documents (e.g. "le tipologie forestali") in order to do the "tree marking" in the best way (**Unterthiner**).

Current Management Practices Identified by Country Experts

		AT	BG	DE	ES	FR	IT	PL	RO	SI	SK
5)	Every third year a vegetation report from the Bavarian Forest Administration is used as a basis for the development of new cull plans for red and roe deer. This is often done in conjunction with fences to prevent browsing in regenerating areas.			2							
6)	**a)** Preservation of characteristic tree species, deadwood and abandonment of forestry. Municipal and private owned forests eligible for grants through the "Environmental Contracting Program Forests" (VNP Wald); **c)** The Bavarian state forest company (public-law institution) has fixed suitable measures in its "nature conservation concept" (based on the "key values in mixed mountains forests" - Moning et al. 2009).			2							
7)	Production forest is taken out of regular management ("a.r.B") which is a long-term treatment.			1							
8.1)	This habitat type is protected by the Federal Nature Conservation Act (Article 30, Legally Protected Biotopes). Measures that may lead to the destruction or any other significant or lasting adverse impact (e.g. by forest road construction or any other paths or tracks) are prohibited.			1							
8.2)	Habitat mapping so that constraints maps can be produced to help guide construction.			1							
	Sustainable forest management.	1									
	Abandoning the commercial use of 9180 stands.	1									
	Strict protection.							1			

Additional Information: In **Italy** the Forest Service in the Autonomous Province of Bolzano is responsible for the "tree marking". We hope that this procedure will not change! (**Unterthiner**).

Barriers and Bottlenecks Identified by Country Experts

		AT	BG	DE	ES	FR	IT	PL	RO	SI	SK
2)	Inappropriate policy framework that poses obstacles to adequate game management (efficient population control) and a lack of co-operation with hunters.			1							
3)	Limited knowledge of habitat distribution (i.e. fine-scale maps			1							

	of forest biotopes are lacking in some regions).										
5)	Game densities are too high, natural predators are not present and hunters do not cooperate.			2							
6)	**a)** Uncooperative private forest owners; **b)** Increase of wood biomass energy systems; **c)** and the subsidies of the "Environmental Contracting Program Forests" are too low.			2							
7)	Lack of knowledge, unsustainable economic thinking and a lack of sufficient state subsidy for alternative management practices.			1							
8.1)	Uncooperative land owners.			1							
8.2)	Most N2K-Management plans (with mapped habitats) are not completed yet.			1							
12)	Lack of effective solutions for elimination invasive alien species - *Impatiens parviflora.*							1			
	Lack of knowledge, insufficient funds, conflict between different policies and uncooperative stakeholders.	2		1							
Additional Information: In **Italy** in the silvicultural management of forest it's always necessary to find a compromise between the (economic) benefits to the owner and the benefits to the general public (**Unterthiner**).											

Potential Solutions Identified by Country Experts

		LIFE	AT	BG	DE	ES	FR	IT	PL	RO	SI	SK
5)	Regulate hunting to ensure continuity of rejuvenation of species sensitive to browsing (*Acer, Fraxinus, Tilia, Ulmus*) and undertake awareness-raising.				2							
6)	Awareness-raising about the essential role that deadwood plays in these forests on the slopes, screes and in the ravines (e.g. refuge habitats for relict species) and better financed subsidies.				2							
7)	Implementation of a successful monitoring system, based on a set of meaningful bioindicators (narrow niche species).				1							
8.1)	Awareness-raising.				1							
8.2)	More personnel for habitat mapping teams.				1							
	Increase further education (owners) and further training (Forest Service).							1				
	Education, influencing policies, awareness raising and sustainable development.		1									
	a) Ensuring good group cooperation between DOCOB (action plans) and relevant stakeholders and ensuring that these stakeholders sign the contract; **b)** Measures that can be contracted out should be more ambitious and better remunerated. Long-term forest management requirements also require contractual measures to be of longer duration; **c)** After Natura 2000 contracts come to an end, perhaps the measures should be rendered perennial by inclusion into documents on sylvicultural management.						1					
15)	Use NP management planning to regulate camping activities, provide information for tourists, and organise safer campsites with fireplaces.	✓										

Species Management Requirements Identified by Country Experts

	AT	BG	DE	ES	FR	IT	PL	RO	SI	SK
The Alps are attractive for outdoor activity and tourism (Interreg III B Project AlpNaTour). Isolated refuge habitats of stenoecious relict species (e.g. epilithic and epiphytic mosses and lichens sensitive to disturbance) need sufficient undisturbed refugia. For that purpose,			1							

recreational use of the landscape may be restricted for which information and justified regulations are required (**Kanold**).										
Typical species of this habitat like *Bubo bubo* or *Dendrocopos leucotos* urgently need undisturbed zones, which are vanishing because of pressures from increasing tourism, outdoor activities and forestry.			1							
For *Cypripedium calceolus* (1902) their populations should be taken into account in forest management and by forestry operations. 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). Sylvicultural management should be added as threat-pressure for both *Cypripedium calceolus* and *Buxbaumia viridis* (1386) in the Article 17 reporting for this habitat.					1					

References Identified by Country Experts

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Case Studies Identified by Country Experts

	AT	BG	DE	ES	FR	IT	PL	RO	SI	SK
Eberstaller Zauner Büros (2006) Vorarbeiten zur Erstellung eines Landschaftspflegeplans für das Europaschutzgebiet "Oberes Donauund Aschachtal"	✓									

Other information

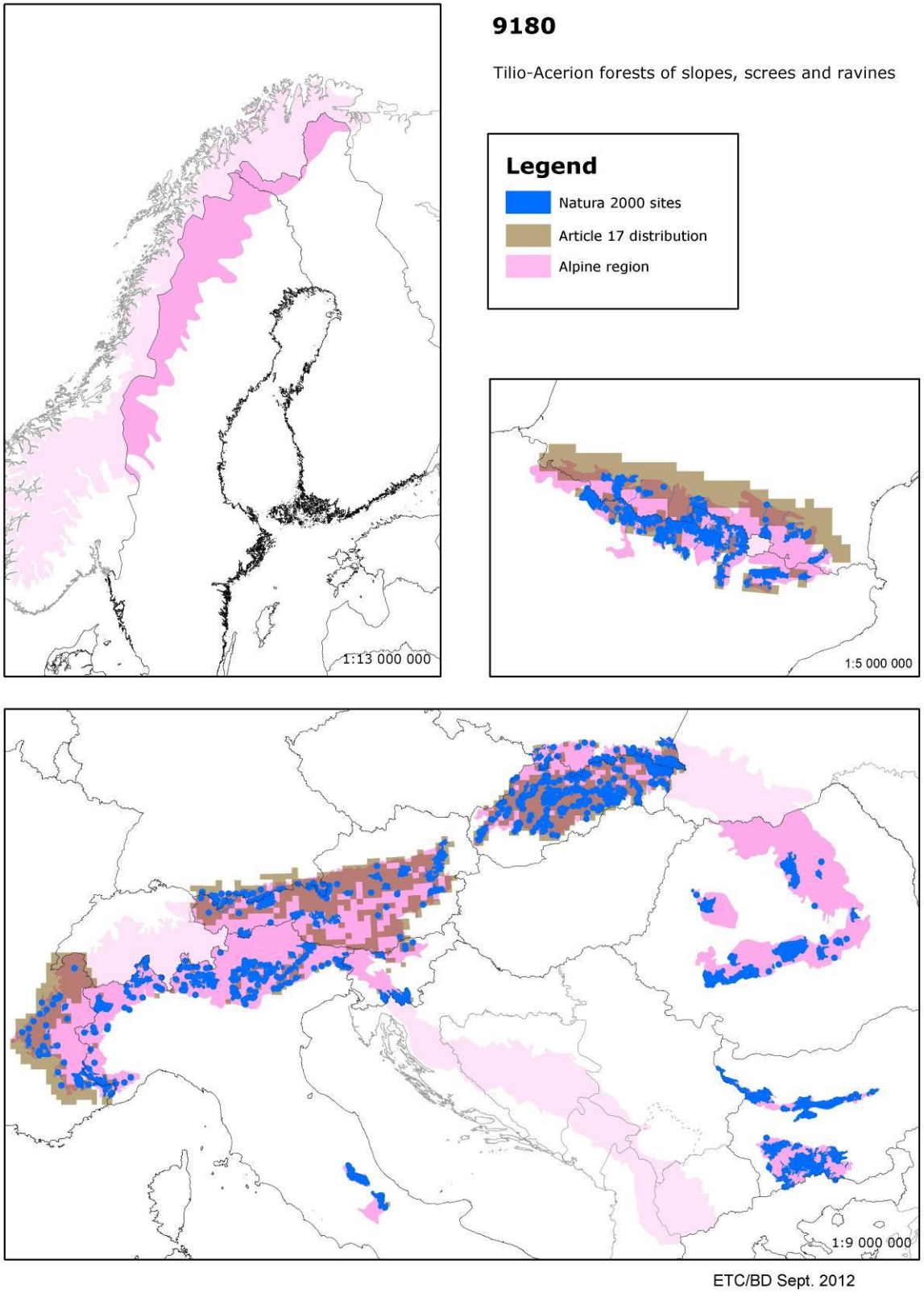
According to the ETC/BD calculations 51-75 % of the area of this habitat type are within SCIs. This means that Natura 2000 network provides an important framework for the management of this habitat type.

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	20	22	29	45	110	16	28	6	110
Habitat area (ha)	3890	11584	1044	3184	5075	9647	630	4223	1706	17060

The figures include all SCIs where the habitat type is mentioned including sites coded as D. Data source ETC/BD.

Map of SCIs proposed for *Tilio-Acerion* forests of slopes, screees and ravines & Article 17 distribution



2.4 9260 - *Castanea sativa* woods

Habitats Manual 2007 Extract

Supra-Mediterranean and sub-Mediterranean *Castanea sativa*-dominated forests and old established plantations with semi-natural undergrowth.

Natural forests and old established plantations of chestnut (*Castanea sativa*) with semi-natural undergrowth of Mediterranean mountains and the area to their north.

The conservation status in the Alpine and Continental regions is 'unfavourable -bad'. In both regions this assessment results from the situation in France, where the habitat area has declined. Chestnut is subject to several diseases which decrease its competitivity with other trees such as oaks (*Quercus* spp). The conservation status in the Atlantic and in the Mediterranean regions is 'unknown' due to the incomplete reports from Spain. However, for the Mediterranean regions, where there is a high proportion of the habitat reported as 'unfavourable-inadequate', it cannot be not be 'favourable' (Summary sheet of the online report on Article 17 of the Habitats Directive).

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

N2K code	Habitat name		AT	BG	FR	IT	RO	REGION
9260	*Castanea sativa* woods	range	FV		FV	FV		FV
		area	XX		U2	FV		U2
		structure	XX		U2	FV		U2
		future	U1		U2	FV		U2
		overall	U1		U2	FV		U2

Threats and Pressures Identified by Country Experts

		LIFE	BG	DE	ES	FR	IT	RO
1)	Introduction of disease (microbial pathogens) (KO4.03)	✓						
2)	Invasive non-native species (I01)	✓						
3)	Forestry activities not referred to above (B07)	✓						
Habitat Impacts: The **LIFE** Project identified the main threats associated with this habitat as chestnut blight (although mostly eradicated from natural and commercial stands in RO); invasive species such as a Chinese wasp *Triocosmus karufilus* (IT) and the black locust tree (*Robinia pseudoacacia*); and a lack of traditional coppice management.								

Management Requirements Identified by Country Experts

		LIFE	BG	DE	ES	FR	IT	RO
1)	Biological control of the disease and habitat restoration through replanting.	✓						
2)	Removal of black locust (Robinia pseudoacacia) and combating of *Triocosmus karufilus.*	✓						
3)	Maintaining coppiced stands which constitute approximately of 77 % of this habitat (in ?). A lack of traditional management practice is resulting in a closed structure of low biological variation. If coppice rotation is not restored then these forests need to be thinned so they can develop into high growth stands.	✓						
Additional Information: In **Italy** it's very important that experts decide which silvicultural								

measures need to be taken to maintain this habitat. A procedure of "tree marking" by forest experts (forest engineers, Forest Service) is very important. It is also very important to have well prepared documents (e.g. "le tipologie forestali") in order to do the "tree marking" in the best way (**Unterthiner**).

Current Management Practices Identified by Country Experts

		BG	DE	ES	FR	IT	RO
	No suggestions						
Additional Information: In **Italy** the Forest Service in the Autonomous Province of Bolzano is responsible for the "tree marking". We hope that this procedure will not change! (**Unterthiner**).							

Barriers and Bottlenecks Identified by Country Experts

		LIFE	BG	DE	ES	FR	IT	RO
1 + 2)	Lack of knowledge of proper effective methods for the control of diseases and invasive parasites.	✓						
Additional Information: In **Italy** in the silvicultural management of forest it's always necessary to find a compromise between the (economic) benefits to the owner and the benefits to the general public (**Unterthiner**).								

Potential Solutions Identified by Country Experts

		LIFE	BG	DE	ES	FR	IT	RO
1)	LIFE11 NAT/RO/000825 and a number of unspecified Italian projects	✓						
2)	Allow black locust (*Robinia pseudoacacia*) to reach maturity (~80 years) before attempting to control because regrowth (suckering) will not occur.	✓						
3)	Management of forest stand structure could follow guidelines developed for coppiced beech forest (IT)	✓						
	Increase further education (owners) and further training (Forest Service)						1	

Species Management Requirements Identified by Country Experts

	BG	DE	ES	FR	IT	RO
No suggestions						

References Identified by Country Experts

No references provided

Case Studies Identified by Country Experts

	BG	DE	ES	FR	IT	RO
No suggestions						

Other Information

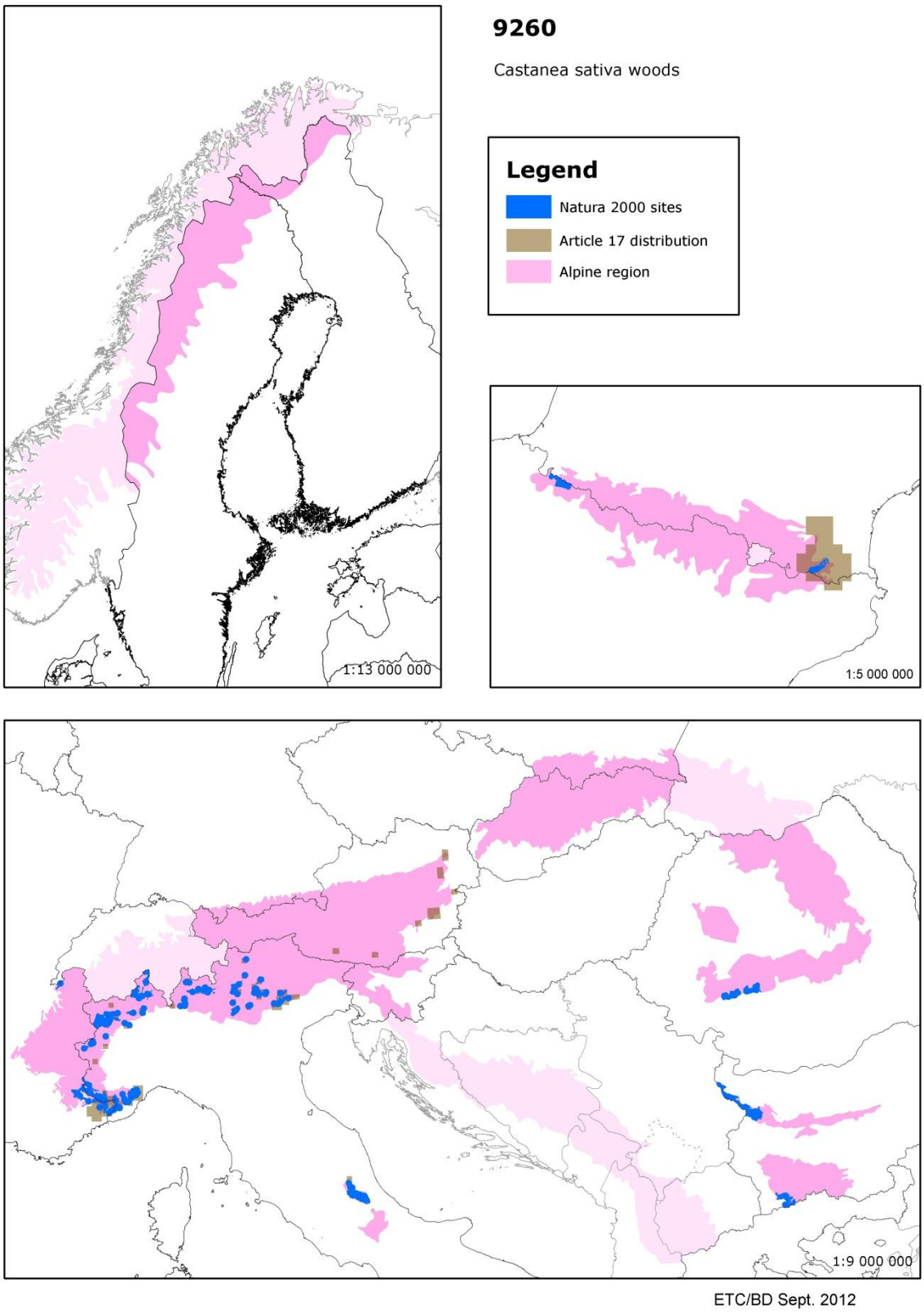
According to the ETC/BD calculations 76-100% of the area of this habitat type are within SCIs. This means that Natura 2000 network provides an important framework for the management of this habitat type.

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

	AT	BG	ES	FR	IT	RO
Number of sites		2	1	7	63	3
Habitat area (ha)		150	170	1195	19905	1883

The figures include all SCIs where the habitat type is mentioned including sites coded as D. Data source ETC/BD.

Map of SCIs proposed for *Castanea sativa* woods (9260) & Article 17 distribution



2.5 9410 - Acidophilous *Picea* forests of the montane to alpine levels (*Vaccinio-Piceetea*)

Habitats Manual 2007 Extract

Sub-alpine and alpine conifer forests (dominated by *Picea abies* and *Picea orientalis)*. Sub-types include: 42.21 - Alpine and Carpathian sub-alpine spruce forests. *Piceetum subalpinum. Picea abies* forests of the lower sub-alpine level, and of anomalous stations in the montane level, of the outer, intermediate and inner Alps; in the latter, they are often in continuity with the montane spruce forests of 42.22. The spruces are often stunted or columnar; they are accompanied by an undergrowth of decidedly sub-alpine affinities. *Picea abies* forests of the lower sub-alpine level of the Carpathians; 42.22 - Inner range montane spruce forests. *Piceetum montanum. Picea abies* forests of the montane level of the inner Alps, characteristic of regions climatically unfavourable to both beech and fir. Analogous *Picea abies* forests of the montane and collinear levels of the inner basin of the Slovakian Carpathians subjected to a climate of high continentality; 42.23 - Hercynian sub-alpine spruce forests Sub-alpine *Picea abies* forests of high Hercynian ranges 21; 42.24 Southern European Norway spruce forests Outlying *Picea abies* formations of the Apennines, the southern Dinarides, the Balkan Range and the Rhodopides, at the southern limit of the range of the species and mostly south of its continuous range; and 42.25 - Peri-Alpine spruce forests Spontaneous *Picea abies* formations occupying outlying altitudinal or edaphic enclaves within the range of more predominant vegetation types of the montane levels of the outer Alps, the Carpathians, the Dinarides, the Jura, the Hercynian ranges, the subalpine levels of the Jura, the western Hercynian ranges and the Dinarides.

Sub-alpine and alpine coniferous forests dominated by Norway spruce (*Picea abies*) and oriental spruce (*Picea orientalis*). This habitat is wide spread in the Alps, Carpathians and Hercynian ranges. These forests also occur in the montane zone of the inner Alps and inner Carpathian basins in areas with a climate unfavourable to both beech (*Fagus sylvatica*) and fir (*Abies alba*). Outlying Norway spruce formations can also be found in the mountain ranges of southern and south-eastern Europe and locally within the montane level of above mentioned mountain ranges.

Although at the national level in the Alpine region 'favourable' assessments are widespread, the biogeographical assessment is 'unfavourable-inadequate' as a result of assessments by Austria and Slovakia. In the Continental region, the status is 'unfavourable-bad' and this conclusion was provided by all the countries of the Hercynian mountain range. In the Mediterranean region the habitat is present only in Greece, where the conservation status is 'favourable'.

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

N2K code	Habitat name		AT	BG	DE	FR	IT	PL	RO	SI	SK	REGION
9410	Acidophilous *Picea forests* of the montane to alpine levels (*Vaccinio-Piceetea*)	range	FV		FV	FV	FV	FV		FV	FV	FV
		area	FV		FV	FV	FV	FV		FV	U1	FV
		structure	U1		FV	XX	FV	FV		FV	FV	U1
		future	FV		XX[9]	FV	FV	FV		FV	FV	FV
		overall	U1		FV	FV	FV	FV		FV	U1	U1

The major threats to this habitat include inappropriate forestry management, air pollution and at the higher altitudes development of resorts for winter sports (Summary sheet of the online report on Article 17 of the Habitats Directive).

Conservation and forestry is too focused on forest habitats that are dominated by dense tree stands neglecting the fact that (very) light forest structures are necessary for typical and endangered forest butterflies (and other insects). The situation in the Alps concerning light forest stands is still better than in other regions, but the same trend is still present and will eventually destroy habitats for forest butterflies. The main features of these butterfly habitats are not described in annex I and may thus disappear unobserved or with little attention. These kinds of habitats are neither open grasslands

[9] Currently FV (Rehklau).

(typically grazed as mountain pastures) nor dense forests (typically maintained by forestry), but they are somewhere in between, which makes their persistence under modern categorization difficult (see also grassland habitats). Attention: The described habitat structures are neglected, but this does not mean that forests in general should be light forests! Dense forests may be valuable habitats as well! Characteristic butterfly species includes *Lopinga achine* (annex IV), which lives in light forest with dense (may be sparser in higher altitudes of distribution) grass cover, egg-laying optimum mostly at approximately 30% tree cover. Additionally, *Parnassius mnemosyne* (annex II & IV) and *Argynnis niobe* occur in very open habitats, which are fringed with trees/shrubs. Apart from butterflies, *Rosalia alpina* and flat bugs *Aradus* spp. (Aradidae) are further examples. They require dead wood and dying trees that are exposed to the sun.

In an Italian study on the pattern of butterfly extinction it was observed that hygrophilous and woodland species were most likely to experience population losses and most prone to disappear, even when their habitats remained apparently unchanged. This trait affects all alpine habitats.

Threats and Pressures Identified by Country Experts

		LIFE	AT	BG	DE	FR	IT	PL	RO	SI	SK
1)	Removal of dead and dying trees (B02.04)			1	2			2	1		
2)	Forest replanting (native trees) (B02.01.01)							1			
3)	Roads, paths and railroads (D01)							1			
4)	Outdoor sports and leisure activities, recreational activities (G01)							1			
5)	Habitat shifting and alteration (M02.01)							1			
6)	Skiing complex (G02.02)			1	1						
7)	Grazing in forests/ woodland (B06)	✓			2						
8)	Paths, tracks, cycling tracks (D01.01)				1						
9)	Temperature changes (e.g. rise of temperature & extremes) (M01.01)				2			2			
10)	Species composition change (succession) (K02.01)				1						
11)	Forestry activities not referred to above (B07)		1		2						
12)	Air pollution, air-borne pollutants (H04)				1						
13)	Damage caused by game (excess population density) (F03.01.01)				2						
15)	Droughts and less precipitations (M01.02)				1						
16)	Forestry clearance (B02.02)				1						
17)	Storm, cyclone (L07)							1			
18)	Invasive, other problematic species and genes (I)							1			
19)	Eutrophication (natural) (K02.03)		1		1						
20)	Forest and Plantation management & use (B02)					1					
21)	Lack of natural, dynamic change and disturbance (?) - species		1		1						

Habitat Impacts: The main issue in **Poland** is related to the conservation of a *Picea* forests at montane to alpine levels as a breeding place of three-toed woodpecker and capercaillie (as a cross-cutting issue). The first two threats relate to forestry practices. Forest replanting is taking place in Polish Carpathians, where some large-scale replanting of the *Picea* forest has been infected by the bark beetle. The second pressure operating at a smaller scale is the removal of dead, old trees from the forests, which is reducing the optimal breeding areas, both for capercaillie and three-toed woodpecker. The next threat, related to human pressure (D01, G01), are relevant especially for capercaillie, which is recognized as a species sensitive to human disturbance. Human infrastructure and human presence are also causing a reduction in the area of the optimal habitat for this species. Another potential threat for *Picea* forest is also linked with climate change, which might shift and reduce the area of this montane habitat (Wilk). During a 15 year period (1992-2007) the occurrence of Norway spruce in the Gorce National Park tree stands has decreased by 13% whilst the proportion of silver fir has increased by 10%. Continuous, intensive forest regeneration has occurred in tree stands (**Loch**). The alpine spruce forests have natural, large-scale disturbance dynamics. Large disturbances, such as sawfly and bark beetle outbreaks as well as windthrow, are common and may destroy stands over large areas. Although negative from a forestry perspective, this should be considered a natural process which is part of natural dynamics of this habitat. Some large-scale disturbances may also be increased by climatic factors (e.g. bark beetle outbreak

intensity may be increased in a warmer climate) (**Pawlaczyk**). In **Bulgaria** the mass removal of dead and dying trees affected by bark beetle outbreaks can also significantly influence habitat which is important for many species such as three-toed woodpecker, pygmy owl, etc. The building of ski resorts also threatens a few of the last Bulgarian old-growth spruce forests. The ski lifts and facilities not only require clear cuts of the old-growth forests but they also lead to fragmentation of the habitat of the brown bear, capercaillie, three-toed woodpecker, etc. (**Avramov**). In **Germany** the mass removal of bark-beetle infested trees (e.g. by helicopter logging) is a significant issue. Localised clearing of tree stands for pasture improvement leads to disturbance of the ground flora by cattle. This may affect topsoil condition and promote spread of pasture plants at the expense of habitat-specific acidophilous plants. Hiking trails also have an impact on the ground flora through direct destruction and proximal trampling/erosion. Skiing affects overwintering grouse species through direct disturbance. In the longer term, *Fagus sylvatica* is expected to spread into this habitat as a result of climate warming (**Ewald**). The threats and pressures on forest habitats are estimated to be less sweeping than in the continental region, as indicated by the favourable conservation status of many forest habitats in the Bavarian Alps. Remoteness, inaccessibility, steepness, and harsh environmental conditions have led to a higher proportion of well-preserved woodland that has been spared from settlement, forest clearing and urban development. The ranking level "high" in the alpine region is not comparable with "high" in the continental region. Shortened rotations and / or limitations of the growing stock volumes might have critical effects in view of isolation of essential structures of old-growth and over-mature stages, such as veteran trees and deadwood. In times of increasing demand for fuel wood and wood energy we have to focus on that issue. The forest habitat types of the Habitats Directive were grouped according to distribution, threats and management needs under climate change in Germany by Ewald (2009). As a result the future of this habitat type and mire forests (91D0) emerged as a critical issue (**Kanold**). The threats and pressures in the alpine region are estimated to be generally in a lower level as in the continental region (except browsing by game), based on the favourable conservation status in the Bavarian Alps. Natural regeneration is really important in alpine forests because of their function as "protection forests". Browsing by red and roe deer in this habitat often tends to result in senescent stands without any regeneration. In some alpine areas forests are still used as pasture for cattle and sheep which causes regeneration problems in some cases. Boosted by the energy revolution, more and more deadwood and dying trees are used for energy, e.g. as wood chips or fire wood. In state forests an increasing number of whole trees are processed. Only time can tell if the climate change can reduce the area of this habitat in favour of beech forests. Especially in private owned forests some owners still manage their forests using clear cuts techniques, even in steep terrain. This tends to result in large clearings and causes erosion (**Mittermeier**). The **LIFE** Project identified that ungulate grazing pressure is increasing in Italy which would be a threat to both the regeneration of *Abies alba* and broadleaved species.

Habitat Management Requirements Identified by Country Experts

		LIFE	AT	BG	DE	FR	IT	PL	RO	SI	SK
1.1)	Conservation measures should include: **a)** lobbying for specific legal requirements for living proper amount of dead wood in the forest; **b)** educational activities for foresters, aiming at showing how, how much and where the dead wood should be left, and how it is important for wildlife; **c)** create a system of monitoring of dead wood volume left in the forest; and **d)** leave all dead and dying trees in protected areas and strict zones inside Natura 2000.	✓		1				1	1		
1.2)	**a)** Maintenance or enrichment of an adequate supply of veteran trees, with different types and qualities of deadwood, as well as cavity trees and nesting trees as part of an integrated forest management system; and **b)** Conservation of stands without any intervention by humans within strict forest reserves and core areas of Biosphere Reserves and National parks.				2			1			
2)	Conservation measures should include: **a)** establishing zones with different regimes, regarding replanting *Picea* forests infected with bark beetle (with zones where forest should be left to the natural death); **b)** gathering scientific proof that if							1			

	Picea forest is infected by bark beetles they jeopardise neighbouring forests (argument often used by foresters); and **c)** educational activities for foresters, aiming at showing importance of dying forest areas.										
3)	Proper spatial planning, proposing different "forestry intensity" zones (including "no-go" zones, where development of new roads / infrastructure should not be allowed) and human intrusion should be minimized, i.e. strict forest reserves. Some scientific sources are saying that leaving ca. 10% of total forest area as non-intervention areas is a safe minimum. This idea, crucial especially for capercaillie, also refers to the "roadless areas" concept for preserving large carnivores.			1				1			
5)	Conservation measures should include improving of quality of this habitat (by favouring natural processes, old stands, diverse structure of the forest, natural regeneration), which should make this habitat more resistant to climate change impacts. Also preparing modelling to show the potential geographical shifts of this habitat could be important, in order to identify which areas might be occupied in the future so their continued protection can be ensured.	✓						1			
6)	Do not allow any new ski resorts or expansion of existing resorts inside old-growth forests.			1							
7)	Installation of fences to avoid trespassing of cattle and sheep in forest habitats.			1							
9)	Silvicultural measures that minimize vulnerability and optimize resilience, carbon sequestration and carbon sink function.			1							
11)	Special conditions placed on mountain forest silviculture systems that consider dynamics, structures and functions under harsh environmental conditions. This should ensure the delivery of soil/avalanche protection functions and special consideration should be given to forest genetics (snow-adapted, high elevation provenances).			1							
13)	Minimize damage from roe and red deer browsing by controlling populations to a level that allows the natural regeneration of characteristic tree species.			2							
15)	Awareness-raising and promotion of shelter wood techniques.			1							
	Strict protection of habitat in the Gorce National Park.							1			
	Cutting of trees, long term management, forest grazing and the development of regulations/methods that support "in between" habitats for gap phase species.		1		1						
	a) Prevent creation of inappropriate plantations and lanes (pistes?); **b)** Respect the soil; **c)** Maintain/create islets of ageing stands with old trees; **d)** Increase fallen and standing dead wood; **e)** Consider non-intervention; and **f)** Make a link between forest conservation and prevention of natural hazards, e.g. avalanche.					1					

Additional Information: In **Italy** it's very important that experts decide which silvicultural measures need to be taken to maintain this habitat. A procedure of "tree marking" by forest experts (forest engineers, Forest Service) is very important. It is also very important to have well prepared documents (e.g. "le tipologie forestali") in order to do the "tree marking" in the best way (**Unterthiner**). In **Poland** even in case of large-scale disturbances, non-intervention management seems to be the best management option. There are no effective methods of preventing disturbances in high montane areas. There is evidence from different sites (Carpathians in ALP region, but also other ecologically similar places, such as Bayerishe Wald) that spruce montane forests can easily regenerate after dieback (using fallen dead trees as 'nurse logs', which is typical for spruce ecology). In relation to ecological services and biodiversity, natural dieback and regeneration is much better option than any artificial intervention. In fact, in the case of bark beetle dieback, the 'fight against bark beetle' can destroy forest ecosystems much more readily than the bark beetle itself. A non-intervention approach in montane spruce forests, even in case of large

disturbances, is also supported by the scientific literature in relation to key species such as three-toed woodpecker (*Picoides tridactulus*), capercaille (*Tetrao urogallus*) and Eurasian lynx (*Lynx lynx*). Even in case of climatically-induced disturbances, non-intervention management seems to be the best available option (**Pawlaczyk**).

Current Management Practices Identified by Country Experts

		AT	BG	DE	FR	IT	PL	RO	SI	SK
1.1)	Some legal requirements regarding leaving dead wood (5% of the total stand volume) exist, but this obligation is not satisfactory in Carpathian forests, and it is not known if the 5% threshold is really applied by foresters. Also some educational work regarding the importance of dead wood is being carried out e.g. by Polish Society for the Protection of Birds, but this is not enough. In Management Plans for the Natura 2000 sites, some suggestions regarding dead wood and the structure of the forest are included, but it is not clear if and how they will be implemented by the foresters.						1			
1.2)	The removal of dead and dying wood in the nature reserves is partially forbidden by the Protected Areas Act in Bulgaria. There was no removal of dead and dying trees from the Bulgarian nature reserves until now. The removal of dead and dying trees is prohibited in the Bulgarian National Parks. The removal of dead and dying trees in the Bulgarian Natura 2000 network is regulated by the Bulgarian forest legislation. Officially 10% of the habitat has to be protected as non intervention zone and the dead wood has to be at least 10% of the wood mass of the forest. But the last guidelines exist mainly in the theory and in the practice majority of the dead wood is removed.		1							
1.3)	**a)** Preservation of characteristic tree species, deadwood and abandonment of forestry. Municipal and private owned forests eligible for grants through the "Environmental Contracting Program Forests" (VNP Wald); and **b)** The Bavarian state forest company (public-law institution) has fixed suitable measures in its "nature conservation concept" (based on the "key values in mixed mountains forests" - Moning et al. 2009).			2						
1.4)	Evolution towards non-intervention approach can be seen in Poland. In montane national parks in Carpathians, the upper-zone spruce forests are in fact declared as a 'strict protection zone', with no intervention allowed. Even in managed forests, such as the Beskid Zywiecki Mountains, such an approach for the forests in the upper montane zone has been proposed and will probably be adopted in the N2K site management plan. From an economic perspective intervention in the upper montane zone is normally expensive, technically difficult and not very effective which means that this solution is likely to be more widely supported.						1			
3)	No conservation measures applied at the moment. The roadless areas concept, together with core areas map for the Polish Carpathians, was being created for the conservation of large carnivores, which may also help to protect the capercaillie. But it is not clear whether this concept will be implemented in Poland.						1			
5)	No conservation measures applied at the moment.						1			
6)	No conservation measures suggested as strict prohibition is required.			1						
7)	Exchange or dissolution of grazing rights in forest habitats.			1						
11)	Close-to-nature forest management ("integrative approach").			1						
13)	Every third year a vegetation report from the Bavarian Forest Administration is used as a basis for the development of new cull plans for red and roe deer. This is often done in conjunction with fences to prevent browsing in regenerating areas.			2						
15)	Consultation with the Bavarian forest administration occurs and			1						

	sylvicultural subsidies are available to promote shelter wood techniques.									
18)	In combination with active protection – the cutting and removal trees with insect infestations (e.g. *Ips typographus*).						1			
	Extensive management is already widespread.			1						
Additional Information: In **Italy** the Forest Service in the Autonomous Province of Bolzano is responsible for the "tree marking". We hope that this procedure will not change! (**Unterthiner**).										

Barriers and Bottlenecks Identified by Country Experts

		LIFE	AT	BG	DE	FR	IT	PL	RO	SI	SK
1.1)	Main factors are inadequate legal obligations, low implementation enforcement and a lack of proper knowledge among foresters (lack of education).			1				1			
1.2)	**a)** Uncooperative private forest owners; **b)** Increase of wood biomass energy systems; **c)** and the subsidies of the "Environmental Contracting Program Forests" are too low.				2						
1.3)	Formal (re)interpretation of 'favourable conservation status' definition – current perception is that large scale disturbance is 'unfavourable', followed by a wish to improve situation…							1			
1.4)	Lack of awareness of natural spruce montane forest ecology and the results of non-intervention approaches to managing disturbances.							1			
3)	The main barrier is that local authorities are not inclined to prepare local spatial planning documents because they do not have funds. Even when they do, they may not incorporate nature-friendly solutions into these documents. This might be linked with inadequate education among local stakeholders. Regional environmental authorities sometimes do not have legal instruments or scientific data to stop this kind of infrastructure in areas important for biodiversity.							1			
4)	Too little education on "sustainable tourism" among people. Too little evidence how human presence affects sensitive species of wildlife.							1			
5)	Too small recognition of climate change as an important factor threatening biodiversity amongst policy makers.							1			
6)	There is significant pressure to build new ski resorts in a few Natura 2000 sites in order to sell hotels and real estate.			1							
7)	Existing rights for pasturing in woodlands, agricultural funds to support alpine farming (INVEKOS).				1						
11)	**a)** Non-adapted tree provenances that are used for planting stock are vulnerable to diseases; **b)** Ignorance of essential forest structures and functions, like distinct group structures ("Rottenstrukturen"); **c)** Removal of fallen logs ("Rannen") which have essential functions (e.g. snow barriers, tree rejuvenation and nutrient supply).				1						
13)	Game densities are too high, there's a lack of natural predators and hunters do not cooperate.	✓			2						
15)	Uncooperative land owners.				1						
	Insufficient funds, lack of knowledge and existing policy frameworks.		1		1						
Additional Information: In **Italy** in the silvicultural management of forest it's always necessary to find a compromise between the (economic) benefits to the owner and the benefits to the general public (**Unterthiner**).											

Potential Solutions Identified by Country Experts

	LI	AT	BG	DE	FR	IT	PL	RO	SI	SK

		FE									
1.1)	Legal obligation enforcement. Education and awareness-raising.			1				1			
1.2)	Subsidise adaptive management of spruce bark beetle outbreaks (preferably, decortication and leaving of logs).				1						
1.3)	Awareness-raising about the essential role that deadwood plays in mountain forests and higher subsidy premiums.				2						
1.4)	Common standards applied to FCS monitoring that includes the 'ecosystem approach" (not only higher plants) and the acceptance of large scale-disturbance with the FCS definition as a natural element of ecosystem ecology.							1			
3)	Legal obligation enforcement, funding securing, education for local authorities.							1			
4)	Legal obligation enforcement, education and awareness-raising.			1				1			
5)	Science-based data gathering on the impact of climate change on this habitat, awareness-raising, improving fundraising opportunities.							1			
7)	Exchange or dissolution of pasturing rights and withdrawal of agricultural subsidies in forest habitats.				1						
11)	Implementation of a revised silviculture system in mountainous regions, that takes account of all aspects of genetic and species diversity and well as key structures and functions. This should include targeted promotion of silver fir through suitable silvicultural measures, the retention of indigenous high-elevation provenances of spruce and the implementation of a successful monitoring system, based on a set of meaningful bioindicators.	✓			1						
12)	Requires a global solution but monitoring of sensitive bioindicators should be carried out to determine impact (e.g. lichen genera of *Bryoria, Evernia, Pseudevernia, Hypogymnia* and *Usnea* require high air quality).				1						
13)	Regulate hunting to ensure continuity of rejuvenation silver fir and other species sensitive to browsing and undertake awareness-raising.	✓			2						
15)	More advisory staff, financial subsidies to prevent clear cuts and increasing public awareness.				1						
	Increase further education (owners) and further training (Forest Service).						1	1			
	a) Ensuring good group cooperation between DOCOB (action plans) and relevant stakeholders and ensuring that these stakeholders sign the contract; **b)** Measures that can be contracted out should be more ambitious and better remunerated. Long-term forest management requirements also require contractual measures to be of longer duration; **c)** After Natura 2000 contracts come to an end, perhaps the measures should be rendered perennial by inclusion into documents on sylvicultural management.					1					
	Introduce large carnivores.	✓									

Species Management Requirements Identified by Country Experts

	AT	BG	DE	FR	IT	PL	RO	SI	SK
All input above should be treated as habitat management suggestions with a focus on conservation of capercaillie and three-toed woodpecker as a crosscutting issue (**Wilks**). Pygmy owl also identified as important in Bulgaria in addition to the previous two species (**Avramov**).						1			
Optimise grouse habitat and forest structures (optimise grazing and canopy cover) (**Ewald**).			1						
The three-toed woodpecker (*Picoides tridactylus*) is a important bird			2						

species in the Norway spruce forests of the montane to alpine levels claiming extraordinarily high quantities of deadwood. A number of ascertained bird species are specialized to habitat-typical variety in dynamics and structures, such as the capercaillie (*Tetrao urogallus*), the hazel grouse (*Bonasia bonasia*) and the red-throated flycatcher (*Ficedula parva*) which prefer forest margins because of higher occurrence of Vaccinium. Further indicators are discussed in Moning et al. (2009). The Alps are attractive for outdoor activity and tourism (Interreg III B Project AlpNaTour). Valuable rare species that are sensitive to disruption (e.g. grouse) need sufficient undisturbed refugia. For that purpose, recreational use of the landscape may be restricted for which information and justified regulations are required (**Kanold**).									
Creation of protection zones for Golden Eagle nests in Gorce National Park (**Loch**).						1			

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My (Tomasz Wilk) own data from the project "Birds of Carpathians", run by Polish Society for the Protection of Birds, www.ptakikarpat.pl

Case Studies Identified by Country Experts

	AT	BG	DE	FR	IT	PL	RO	SI	SK
The project "Active protection of forest grouse and their habitats in Polish Western Carpathians" was implemented in the years 2005-2009 using a subsidy from the Foundation EkoFundusz (Loch).						✓			

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	FR	IT	PL	RO	SI	SK
Number of sites	39	13	22	37	152	12	59	4	27
Habitat area (ha)	26010	62737	4195	20924	94736	22712	277029	1922	29313

The figures include all SCIs where the habitat type is mentioned including sites coded as D. Data source ETC/BD.

Map of SCIs proposed for Acidophilous *Picea* forests of the montane to alpine levels (9410) & Article 17 distribution