

E1.2a Semi-dry perennial calcareous grassland

Summary

This habitat comprises semi-natural grasslands developed on deeper and not so drought-prone, nutrient-poor, base-rich soils over limestones throughout the lowlands and sub-montane levels of submediterranean to hemiboreal Europe. Generally closed and dominated by mixtures of graminoids and forbs, they can be extremely species rich, with many rare plants and sometimes striking contingents of orchids. They also vary considerably across the large range with different sets of continental or sub-mediterranean companions. Dependent on extensive grazing, usually with sheep, or on an annual mowing, abandonment has been a widespread threat, with ready progression to rank grassland, scrub and woodland; or the deeper soils have been appealing for shifts to more intensive farming with fertilising and re-seeding. Developed over centuries, maybe even longer, and contributing to some striking cultural landscapes, this habitat has seen widespread and substantial losses in both extent and quality, especially in northern and western Europe. Recovery of the full flora after much neglect is problematic and recovery always demands restoration of traditional pastoral management.

Synthesis

Based on a reduction in quantity over the past 50 years (> 30%) and in the longer term (> 50%) this habitat type is vulnerable both in EU28 and EU28+ (VU). Furthermore, a significant reduction in biotic and abiotic quality results in a near-threat status (NT).

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Vulnerable	A1, A3	Vulnerable	A1, A3

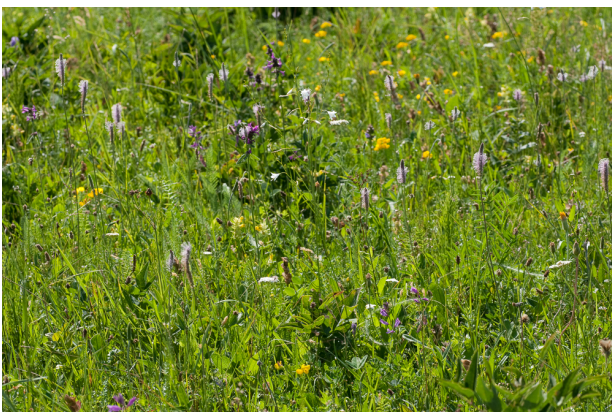
Sub-habitat types that may require further examination

Although the threats to this habitat are more or less universal throughout its range, regional sub-types may be more endangered.

Habitat Type

Code and name

E1.2a Semi-dry perennial calcareous grassland



Stand of the alliance *Cirsio-Brachypodium pinnati* in Transylvania, Romania. With 98 vascular plant species on 10 m², this stand is the most species-rich plant community ever documented at that spatial grain size. Natura 2000 site "Dealurile Clujului de Est" near Cluj-Napoca (Photo: Jürgen Dengler).



In the hemiboreal zone of southern Fennoscandia, the Baltic states and adjacent parts of Russia, the habitat type is represented by the alliance *Filipendulo vulgaris-Helictotrichion pratensis*, typically over alvars with limestone bedrock close to the surface, but among these on the better developed soils of typically 20-50 cm depth. Natura 2000 site "Viita Wooded Meadow" in western Estonia (Photo: Jürgen)

Habitat description

These grasslands generally dominated by broad-leaved graminoids (especially *Brachypodium pinnatum* agg. and *Bromus erectus*) are typical of traditionally-managed pastures and meadows developed on relatively deep, nutrient-poor, usually calcareous soils from sea-level to the montane belt throughout temperate Europe. The swards are generally closed, with a plant cover of more than 80% and often are very rich in species, for which reason they are of high interest for nature conservation. Sites that harbour a conspicuous orchid flora – both in number of species and in number of individual plants – are given a priority status by Natura 2000. The centre of distribution is in suboceanic and submediterranean regions, and outside this range, the communities can be found only under specific conditions: towards northwestern Europe where they are more confined to relatively warm and dry, southern exposed calcareous slopes or, as in the Baltic islands of Öland and Gotland, on low altitude limestone pavement (alvar). The species composition varies over the geographical range, reflected by different sets of companions: in southern Europe, there are many sub-mediterranean species, whereas in Eastern Europe continental species are of more importance.

Syntaxonomically, the semi-dry perennial calcareous grasslands form a separate order (*Brachypodietalia pinnati*) within the class *Festuco-Brometea*. Here we also include the remaining meso-xeric types that are currently still placed in other *Festuco-Brometea* orders, namely most of the East-European meso-xeric order *Galietaalia veri* as well as the alliance *Brachypodion phoenicoidis* from North Iberia and South France (traditionally in the order *Brachypodietalia phoenicoidis*) and the Illyrian *Scorzonerion villosae* (traditionally placed in the order *Scorzonero villosae-Chrysopogenetalia grylli*). The specific characteristics of mostly closed swards, deep soils, semi-natural character and temperate climate help delineate this habitat type from similar vegetation types on rocky calcareous soils (E1.1g) or under drier conditions in Eastern Europe (E1.2b), both of which are generally dominated by narrow-leaved graminoids.

Being mostly semi-natural and needing management, i.e. grazing by sheep and/or cattle and hay-making, where these practices have ceased for economic reasons throughout Europe, abandonment is one of the main threats when tall grasses (e.g. *Brachypodium pinnatum* agg., *Calamagrostis epigejos*) and tall forbs will take over the vegetation within a couple of years, and eventual encroachment of woody species will transform the community first into scrub, then forest. Sometimes, the stands are burned in spring time to destroy standing dead material, which encourages the growth of grasses and so helps prevent any further development of shrubs and trees. Another serious risk is intensification, as deeper calcareous soils can be rather easily transformed into productive agricultural land when competitive grasses like *Lolium perenne*, *Dactylis glomerata* and *Poa trivialis* can outcompete the characteristic grasses and herbs. Nowadays, many sites are managed in the traditional way for the sake of nature conservation.

Indicators of good quality:

- High species richness
- Absence of nutrient-demanding and ruderal species
- Long-term habitat stability
- Generally closed sward with low vegetation structure
- Traditional grazing/mowing regime
- Low cover of encroaching tall grasses, shrubs and trees.

Characteristic species:

Flora

Vascular plants: *Adonis vernalis*, *Anacamptis pyramidalis*, *Anthyllis vulneraria*, *Arabis hirsuta*, *Brachypodium pinnatum*, *Brachypodium phoenicoides*, *Brachypodium rupestre*, *Briza media*, *Bromus*

erectus, *Campanula glomerata*, *Carex caryophylla*, *Carex flacca*, *Carlina acaulis*, *Carlina vulgaris*, *Centaurea scabiosa*, *Chrysopogon gryllus*, *Danthonia alpina*, *Dianthus carthusianorum*, *Eryngium campestre*, *Euphorbia cyparissias*, *Festuca guestfalica*, *Festuca rupicola*, *Filipendula vulgaris*, *Fragaria viridis*, *Galium pumilum*, *Galium verum*, *Gentiana cruciata*, *Gentianella ciliata*, *Gentianella germanica*, *Gymnadenia conopsea*, *Helianthemum nummularium* subsp. *ovatum*, *Helictotrichon pratense*, *Hypochoeris maculata*, *Knautia illyrica*, *Koeleria pyramidata*, *Leontodon hispidus*, *Linum catharticum*, *Lotus corniculatus*, *Medicago sativa* subsp. *falcata*, *Neotinea ustulata*, *Onobrychis viciifolia*, *Ononis spinosa*, *Ophrys apifera*, *Ophrys insectifera*, *Orchis mascula*, *Orchis militaris*, *Orchis morio*, *Orchis purpurea*, *Orchis ustulata*, *Plantago media*, *Polygala comosa*, *Potentilla heptaphylla*, *Primula veris*, *Ranunculus bulbosus*, *Salvia pratensis*, *Sanguisorba minor*, *Scabiosa columbaria*, *Scorzonera villosa*, *Thesium linophyllum*, *Thymus pulegioides*, *Trifolium montanum*, *Veronica prostrata*, *Veronica teucrium*.

Bryophytes: *Ctenidium molluscum*, *Entodon concinnus*, *Homalothecium lutescens*, *Hypnum cupressiforme* var. *lacunosum*, *Thuidium philibertii*.

Fauna

Birds: *Lanius collurio*.

Reptiles: *Lacerta agilis*.

Insects: *Papilio machaon*

Classification

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

EUNIS:

E1.2 Perennial calcareous grassland and basic steppes

EuroVegChecklist:

Brachypodium phoenicoidis Br.-Bl. ex Molinier 1934

Bromion erecti Koch 1926

Chrysopogono-Danthonion Kojic 1957

Cirsio-Brachypodium pinnati Hadac et Klika in Klika et Hadac ex Klika 1951

Filipendulo vulgaris-Helictotrichion pratensis Dengler et Löbel in Dengler et al. 2003

Gentianello amarellae-Helictotrichion pratensis Royer ex Dengler in Mucina et al. 2009

Polygalo mediterraneae-Bromion erecti (Biondi et al. 2005) Di Pietro et al. 2013

Potentillo splendentis-Brachypodium pinnati Br.-Bl. 1967

Scorzonerion villosae Horvatic 1963

Annex 1:

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

62A0 Eastern sub-mediterranean dry grasslands (*Scorzoneretalia villosae*) p.p. (meso-xeric types = *Scorzonerion villosae*)

6240 Sub-Pannonic steppic grasslands p.p. (meso-xeric types = *Cirsio-Brachypodium pinnati*)

6270 Fennoscandian lowland species-rich dry to mesic grasslands p.p. (dry basiphilous types = Filipendulo vulgaris-Helictotrichion pratensis)

Emerald:

E1.2 Perennial calcareous grassland and basic steppes

MAES-2:

Grassland

IUCN:

4.4 Temperate grassland

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

No

Justification

The habitat is widespread in Europe, occurring in many regions.

Geographic occurrence and trends

EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Austria</i>	Present	48 Km ²	Decreasing	Decreasing
<i>Belgium</i>	Present	4.3 Km ²	Unknown	Decreasing
<i>Bulgaria</i>	Present	1611 Km ²	Decreasing	Decreasing
<i>Croatia</i>	Present	702 Km ²	Decreasing	Decreasing
<i>Czech Republic</i>	Present	120 Km ²	Decreasing	Decreasing
<i>Denmark</i>	Present	Unknown Km ²	Unknown	Unknown
<i>Estonia</i>	Present	90 Km ²	Decreasing	Decreasing
<i>Finland</i>	Aland Islands: Present Finland mainland: Uncertain	1.2 Km ²	Decreasing	Decreasing
<i>France</i>	Corsica: Uncertain France mainland: Present	1750 Km ²	Decreasing	Decreasing
<i>Germany</i>	Present	380 Km ²	Decreasing	Decreasing
<i>Greece</i>	Greece (mainland and other islands): Uncertain	Unknown Km ²	Unknown	Unknown
<i>Hungary</i>	Present	120 Km ²	Decreasing	Decreasing
<i>Ireland</i>	Present	21 Km ²	Unknown	Decreasing
<i>Italy</i>	Sardinia: Uncertain Sicily: Uncertain	3095 Km ²	Decreasing	Decreasing
<i>Latvia</i>	Present	10 Km ²	Decreasing	Decreasing
<i>Lithuania</i>	Present	27 Km ²	Decreasing	Decreasing
<i>Luxembourg</i>	Present	Unknown Km ²	Unknown	Unknown
<i>Netherlands</i>	Present	0.5 Km ²	Decreasing	Decreasing
<i>Poland</i>	Present	65 Km ²	Decreasing	Decreasing

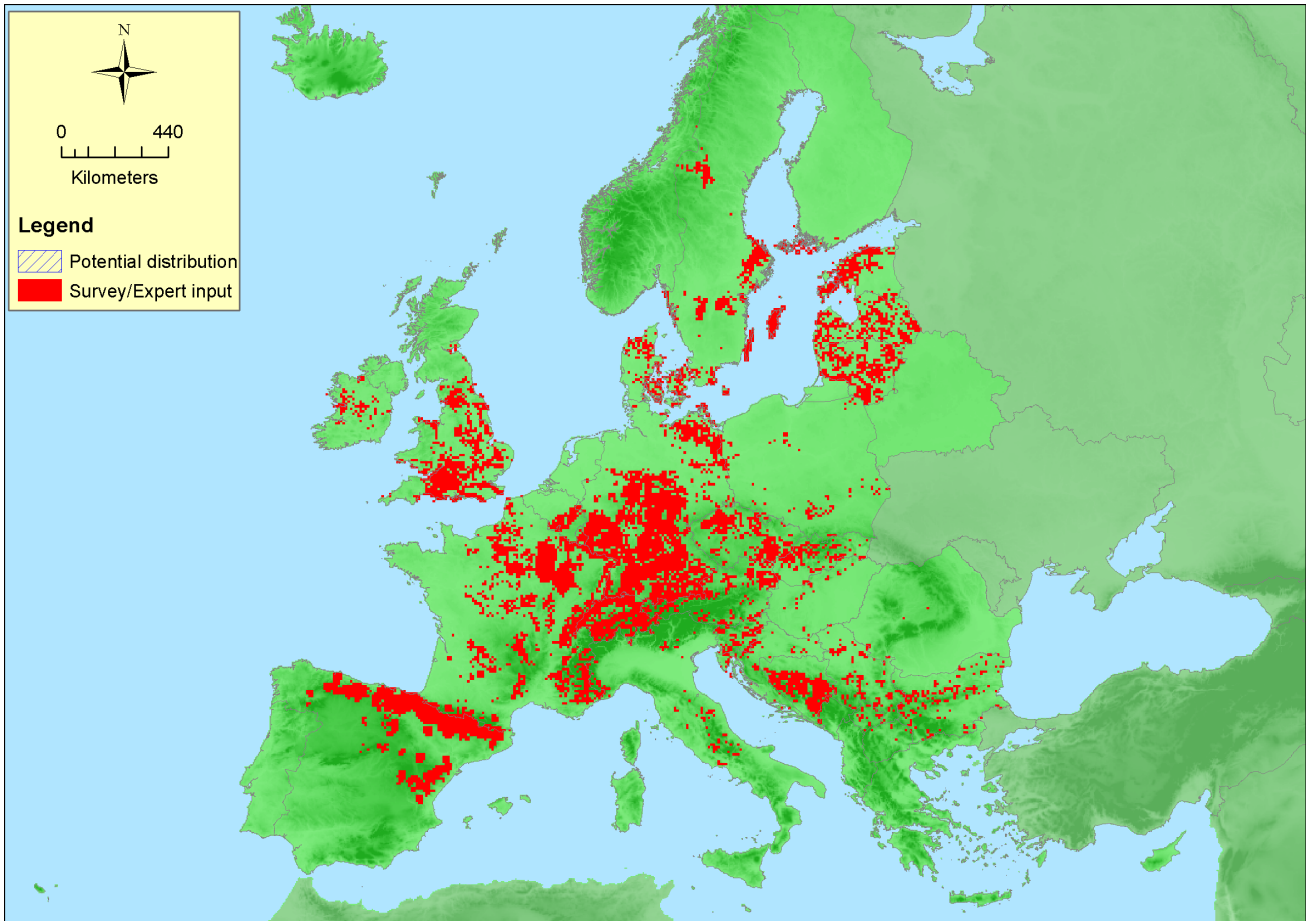
EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Romania</i>	Present	1850 Km ²	Stable	Decreasing
<i>Slovakia</i>	Present	198 Km ²	Decreasing	Decreasing
<i>Slovenia</i>	Present	80 Km ²	Decreasing	Decreasing
<i>Spain</i>	Spain mainland: Present	1345 Km ²	Decreasing	Unknown
<i>Sweden</i>	Present	Unknown Km ²	Unknown	Unknown
<i>UK</i>	Northern Island: Uncertain United Kingdom: Present	410 Km ²	Decreasing	Decreasing

EU 28 +	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Albania</i>	Uncertain	Unknown Km ²	Unknown	Unknown
<i>Bosnia and Herzegovina</i>	Present	1370 Km ²	Decreasing	Decreasing
<i>Former Yugoslavian Republic of Macedonia (FYROM)</i>	Uncertain	Unknown Km ²	Unknown	Unknown
<i>Kaliningrad</i>	Uncertain	Unknown Km ²	Unknown	Unknown
<i>Kosovo</i>	Uncertain	Unknown Km ²	Unknown	Unknown
<i>Montenegro</i>	Uncertain	Unknown Km ²	Unknown	Unknown
<i>Norway</i>	Norway Mainland: Present	Unknown Km ²	Unknown	Unknown
<i>Serbia</i>	Present	Unknown Km ²	Unknown	Unknown
<i>Switzerland</i>	Present	400 Km ²	Decreasing	Decreasing

Extent of Occurrence, Area of Occupancy and habitat area

	Extent of Occurrence (EOO)	Area of Occupancy (AOO)	Current estimated Total Area	Comment
<i>EU 28</i>	5782200 Km ²	7076	11000 Km ²	Calculated with 1850 km ² instead of 5.5 km ² for Romania, which is still a low estimate
<i>EU 28+</i>	5782200 Km ²	7738	14000 Km ²	

Distribution map



Map is rather complete, but partly over-estimated because of the data from the broader defined Annex I type 6210. Data sources: Art17, EVA, GBIF, NAT.

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

50%

Trends in quantity

Recent trend EU28: -40% - EU28+: -39% (based on 99.8% of the total area reported). Long-term trend EU28: -58% - EU28+: -55% (based on 42% of the total area reported). However, there are big differences among countries. Recent decrease reaches as high as 96% (Latvia) and long-term decrease as high as 97% (United Kingdom). For the future, most countries expect further decreases, but some also stable to increasing areas.

- Average current trend in quantity (extent)
EU 28: Decreasing
EU 28+: Decreasing
- Does the habitat type have a small natural range following regression?
No
Justification
EEO is >> 50,000 km².
- Does the habitat have a small natural range by reason of its intrinsically restricted area?
No
Justification
EEO is >> 50,000 km² and the habitat may occur in large stands.

Trends in quality

Within EU28, 41% of the remaining area are degraded with 54% severity, while within EU28+ 41% of the remaining area are degraded with 58% severity.

- Average current trend in quality

EU 28: Decreasing

EU 28+: Decreasing

Pressures and threats

This habitat type is overwhelmingly semi-natural in the territories considered, depending on low-intensity agriculture, either mowing or grazing without fertilisation other than from the dung of stock. Such low-intensity systems are not profitable any more under present socio-economic conditions and therefore there is a strong trend either to intensify to increase the fodder production or to abandon the traditional agricultural practice, so as not to have the costs. Throughout Europe, such low productivity grassland habitats are also subject to afforestation, often with non-native trees. Other threats mentioned in some countries are mining (usually for limestone), urbanisation, air-borne eutrophication and climate change.

List of pressures and threats

Agriculture

Intensive mowing or intensification

Abandonment / Lack of mowing

Intensive grazing

Abandonment of pastoral systems, lack of grazing

Sylviculture, forestry

Forest planting on open ground

Conservation and management

The current main approach to maintain this enigmatic habitat type (because of its species richness and particularly its often many orchids) is to put it under legal protection as nature reserves. However, this alone does not help because E1.2a as a semi-natural habitat type needs regular low-intensity agricultural management, which is not automatically guaranteed through legal protection, indeed it is often even harder to manage areas by mowing or grazing when they are part of nature reserves. Maintaining or re-establishing low-intensity management of such low-productivity grasslands can be done by conservation NGOs (mowing) or subsidised shepherds, but probably this is realistic only on a small fraction of the remaining area. To retain bigger amounts of this habitat type, one probably has to think about other measures to halt succession that deviate from the traditional management of the region. Large-scale pasture landscapes with year-round multispecies grazing might offer an economically feasible solution. One also should take into account prescribed burning as a possible method, though more knowledge is needed here to decide under which conditions it is positive rather than counterproductive.

List of conservation and management needs

Measures related to agriculture and open habitats

Maintaining grasslands and other open habitats

Measures related to spatial planning

Establish protected areas/sites

Conservation status

Annex I:

6210 ALP U1, ATL U2, BLS 6210, BOR U2, CON U2, MED U2, PAN U1

6240 ALP U2, ATL U1, BLS U1, CON U1, PAN U1

6270 ALP U2, BOR U2, CON U2

62A0 ALP U2, BLS U1, CON U2, MED U1

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

Restoration of semi-dry calcareous grasslands from afforested sites is possible if there is still a seedbank available. Even arable fields can be reconverted to this habitat type under certain conditions (if they were hardly fertilized); this can be facilitated by hay transfer or other means of diaspore input of target species.

Effort required

10 years	20 years	50+ years	200+ years
Naturally and through intervention	Through intervention	Through intervention	Through intervention

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-40 %	Unknown %	Unknown %	-58 %
EU 28+	-39 %	Unknown %	Unknown %	-55 %

The values for A1 are calculated from the territorial data sheets, which were available for 24 countries. The provided data were far too incomplete to allow assessment of A2a and A2b.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	>50000 Km ²	Yes	Yes		>50	Yes	Yes		no
EU 28+	>50000 Km ²	Yes	Yes		>50	Yes	Yes		no

EOO and AOO are far larger than the thresholds for the criteria B1 and B2. The habitat type has many occurrences throughout large parts of Europe.

Criterion C and D: Reduction in abiotic and/or biotic quality

Criteria C/D	C/D1		C/D2		C/D3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	41 %	54 %	Unknown %	Unknown %	Unknown %	Unknown %
EU 28+	41 %	58 %	Unknown %	Unknown %	Unknown %	Unknown %

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

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

The data for C/D1 were calculated from the territorial data sheets, which provided assessments for 20 countries. No data were available for C/D2 and C/D3. The degradation quality refers to both biotic features and abiotic circumstances.

Criterion E: Quantitative analysis to evaluate risk of habitat collapse

Criterion E	Probability of collapse
EU 28	Unknown
EU 28+	Unknown

There is no quantitative analysis available that estimates the probability of collapse of this habitat type.

Overall assessment "Balance sheet" for EU 28 and EU 28+

	A1	A2a	A2b	A3	B1	B2	B3	C/D1	C/D2	C/D3	C1	C2	C3	D1	D2	D3	E
EU28	VU	DD	DD	VU	LC	LC	LC	NT	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	VU	DD	DD	VU	LC	LC	LC	NT	DD	DD	DD	DD	DD	DD	DD	DD	DD

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Vulnerable	A1, A3	Vulnerable	A1, A3

Confidence in the assessment

High (mainly based on quantitative data sources and/or scientific literature)

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