

E1.1b Cryptogam- and annual-dominated vegetation on siliceous rock outcrops

Summary

These open pioneer grasslands are dominated by perennial succulents and annuals, with subordinate small tussock grasses, sometimes geophytes and often with a prominent contingent of cryptogams. They are typical of very shallow and skeletal, impoverished, acid soils on siliceous rock outcrops, eroded slopes and equivalent disturbed or artificial habitats like soil heaps and wall tops. They occur throughout temperate and boreal Europe, across the lowlands and up to the sub-alpine level, in situations where the permeable soils dry quickly in summer, but where spring rains can permit a quick flush of growth by the annuals. Natural stands are dependent upon environmental stress rather than grazing, so the vegetation can remain stable without intervention but where in semi-natural situations, intervention may be needed to prevent sward closure and encroachment by shrubs and trees. Though still widespread, there have been substantial losses in extent and quality and stands are often small and vulnerable.

Synthesis

Based on both the short-term reduction in quantity of 37% and the long-term reduction of 51%, the habitat is assessed as vulnerable (VU) in both EU28 and EU28+.

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

Boreal examples may belong to a different phytosociological order and in that case may have to be distinguished as a separate habitat.

Habitat Type

Code and name

E1.1b Cryptogam- and annual-dominated vegetation on siliceous rock outcrops



Stand of the *Sedo albi-Veronicion dillenii* on a volcanic outcrop in Rheinhesse, Germany. Lichens and bryophytes are dominating; the main vascular plant is *Hieracium pilosella* (Photo: Jürgen Dengler).



Close-up of a *Sedo-Scleranthon* stand on an outcrop in the Lower Engadine, Grisons, Switzerland. The picture features the two succulent species *Sempervivum arachnoideum* and *Sedum album* (Photo: Milan Chytrý).

Habitat description

These open pioneer grasslands occur on shallow soils (Leptosols) at rock outcrops, on eroded slopes, or in disturbed patches within dry or mesic grasslands. Stands are usually of limited extent, in many cases occupying just a few square metres. This vegetation is dominated by vernal therophytes of the genera *Cerastium*, *Myosotis*, *Veronica* and others and succulent plants of the genera *Sedum* or *Sempervivum* (inclusive *Jovibarba*). Hemicryptophytes are also common, especially the narrow-leaved tussock-forming species of *Festuca* and several xerophilous *Poa* species, but they are not the dominant component of this vegetation, except for some short-growing species such as *Scleranthus perennis*. Geophytes such as *Gagea* sp. pl. also occur in places. The richness of therophytes and geophytes increases when moving from northern and western to southeastern Europe. Bryophytes and lichens are also common and they can attain a very high cover in some places. Mosses are represented for example by *Ceratodon purpureus*, *Polytrichum piliferum* and *Syntrichia ruralis* agg., lichens by *Cetraria aculeata*, *Cladonia* sp. pl. and *Xanthoparmelia* sp. pl.

Shallow soils supporting this vegetation are well drained and dry out quickly, especially during summer periods of warm weather. Therefore vegetation has its phenological optimum in spring when moisture is still available due to lower evaporation rates. Most therophytes complete their life cycle within a short period of a few weeks prior to the peak of the seasonal development of hemicryptophytes, which helps them avoid competition for light. In contrast, most succulents are perennial and adapted to enduring summer drought period. However, they are more sensitive to disturbance, therefore more disturbed sites tend to contain more therophytes and less disturbed sites more succulents.

This vegetation is distributed throughout temperate and boreal Europe, but it is rarely found in extensive stands. It occurs across a broad altitudinal range from the lowlands to the subalpine belt. The type corresponds to the phytosociological order *Sedo-Scleranthetalia*, including the *Sedo-Poetalia glaucae*, which is by some authors separated as an order that occurs from the middle boreal to the arctic zone. Phytosociological literature distinguishes several alliances confined to different European regions, which are geographical vicariants with distinct species composition. A specific subtype of this habitat is found in the supratemperate, very humid belt of Madeira (over 1400 m a.s.l.), where *Thymus micans* dominates open pioneer communities on shallow soils and rocks, derived from hard volcanic substrate. Another specific subtype occurs on and around acidic outcrops in middle and northern Fennoscandia and Iceland (the *Veronico-Poion glaucae*).

Indicators of good quality:

These grasslands are confined to stressed or disturbed sites. Due to their small spatial extent, individual stands can be entirely destroyed, but they can regenerate if suitable conditions return. Sites on the rock outcrops near lookout points can be negatively affected through frequent trampling by tourists. On the other hand, disturbance-dependent stands occurring in patches among closed grasslands may become overgrown by tall perennial species if disturbance (e.g. grazing) ceases. Therophytes typical of this vegetation can also occur in human-made habitats such as roadsides, railway banks or quarries, where they form communities with ruderal and nutrient demanding species; such sites are not included in this habitat type and are of lower conservation interest.

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

- Long-term habitat stability
- High species richness of therophytes and succulents
- Occurrence of rare species
- Dependence on naturally stressful conditions or natural disturbance rather than human-induced disturbance
- Absence of tall, nutrient-demanding and ruderal species

Characteristic species:

Flora

Vascular plants: *Aira caryophyllaea*, *Aira praecox*, *Anthoxanthum odoratum*, *Anthyllis vulneraria*, *Arabidopsis thaliana*, *Arenaria serpyllifolia* agg., *Campanula rotundifolia*, *Cardaminopsis petraea*, *Cerastium glutinosum*, *Deschampsia flexuosa*, *Dianthus deltoides*, *Dianthus pinifolius*, *Draba daurica*, *Echium vulgare*, *Erigeron politus*, *Erophila verna*, *Erysimum hieracifolium*, *Festuca nigrescens* subsp. *microphylla*, *Festuca ovina*, *Gagea bohemica*, *Galeopsis bifida*, *Galium normanii*, *Hieracium alpinum* agg., *Hieracium pilosella*, *Hypericum perforatum*, *Jasione heldreichii*, *Jasione montana*, *Lappula deflexa*, *Lotus corniculatus*, *Lychnis alpina*, *Micropyrum tenellum*, *Minuartia greuteriana*, *Myosotis ramosissima*, *Myosotis stricta*, *Poa alpina*, *Poa bulbosa*, *Poa glauca*, *Poa nemoralis*, *Poa perconcinna*, *Poa xerophila*, *Potentilla argentea* agg., *Potentilla crantzii*, *Potentilla nivea*, *Potentilla tabernaemontani*, *Roegneria borealis*, *Rumex acetosella*, *Saxifraga adscendens*, *Saxifraga oppositifolia*, *Scleranthus annuus* agg., *Scleranthus perennis*, *Sedum acre*, *Sedum album*, *Sedum anglicum*, *Sedum annuum*, *Sedum brevifolium*, *Sedum pyrenaicum*, *Sedum rupestre*, *Sedum sexangulare*, *Sempervivum arachnoideum*, *Sempervivum montanum*, *Silene rupestris*, *Silene uniflora* subsp. *uniflora*, *Solidago virgaurea*, *Thymus micans*, *Trifolium arvense*, *Veronica dillenii*, *Veronica fruticans*, *Veronica verna*

Bryophytes: *Ceratodon purpureus*, *Dicranum sp. pl.*, *Hypnum cupressiforme*, *Pleurozium schreberi*, *Pohlia nutans*, *Polytrichum juniperinum*, *Polytrichum piliferum*, *Racomitrium canescens* agg., *Syntrichia ruralis* agg.

Lichens: *Alectoria sp. pl.*, *Cetraria aculeata*, *Cladonia arbuscula* agg., *Cladonia foliacea*, *Cladonia furcata*, *Cladonia pyxidata*, *Nephroma sp. pl.*, *Peltigera rufescens*, *Thamnolia vermicularis*, *Xanthoparmelia conspersa*.

Fauna

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Classification

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

EUNIS:

E1.1 Pioneer and open perennial grasslands of inland sands and rocky terrain

EuroVegChecklist (alliances)

- *Hyperico perforati-Scleranthion perennis* Moravec 1967 p.p. (in the delimitation of some authors, the most open types only)
- *Veronico-Poion glaucae* Nordhagen 1943
- *Sedo-Scleranthion* Br.-Bl. 1950
- *Sedion anglici* Br.-Bl. in Br.-Bl. & Tx. 1952
- *Sedion pyrenaici* Tx. in Rivas-Mart. & al. 2011
- *Sedo albi-Veronicion dillenii* Korneck 1974
- *Scabioso-Trifolion dalmatici* Horvatic et N. Randelovic in N. Randelovic 1977
- *Thymion micantis* J.C. Costa et al. 2005

Annex 1:

8230 Siliceous rock with pioneer vegetation of the *Sedo-Scleranthion* or of the *Sedo albi-Veronicion dillenii*

Emerald:

E1.11 Euro-Siberian rock debris swards

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

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	10 Km ²	Decreasing	Decreasing
<i>Bulgaria</i>	Present	88 Km ²	Stable	Decreasing
<i>Croatia</i>	Uncertain	Unknown Km ²	Unknown	Unknown
<i>Czech Republic</i>	Present	19 Km ²	Decreasing	Decreasing
<i>Finland</i>	Aland Islands: Uncertain Finland mainland: Present	5 Km ²	Decreasing	Decreasing
<i>France</i>	Corsica: Uncertain France mainland: Present	125 Km ²	Decreasing	Decreasing
<i>Germany</i>	Present	7 Km ²	Decreasing	Decreasing
<i>Greece</i>	Greece (mainland and other islands): Uncertain	Unknown Km ²	Unknown	Unknown
<i>Hungary</i>	Uncertain	Unknown Km ²	Unknown	Unknown
<i>Ireland</i>	Present	Unknown Km ²	Unknown	Unknown
<i>Italy</i>	Italy mainland: Present Sardinia: Uncertain Sicily: Uncertain	141 Km ²	Stable	Decreasing
<i>Lithuania</i>	Present	2 Km ²	Decreasing	Decreasing
<i>Luxembourg</i>	Uncertain	Unknown Km ²	Unknown	Unknown
<i>Poland</i>	Present	Unknown Km ²	Decreasing	Stable
<i>Portugal</i>	Madeira: Present Portugal Azores: Uncertain Portugal mainland: Present	0.34 Km ²	Decreasing	Unknown
<i>Romania</i>	Present	0.2 Km ²	Stable	Stable
<i>Slovakia</i>	Present	0.45 Km ²	Stable	Decreasing
<i>Slovenia</i>	Present	0.05 Km ²	Stable	Stable

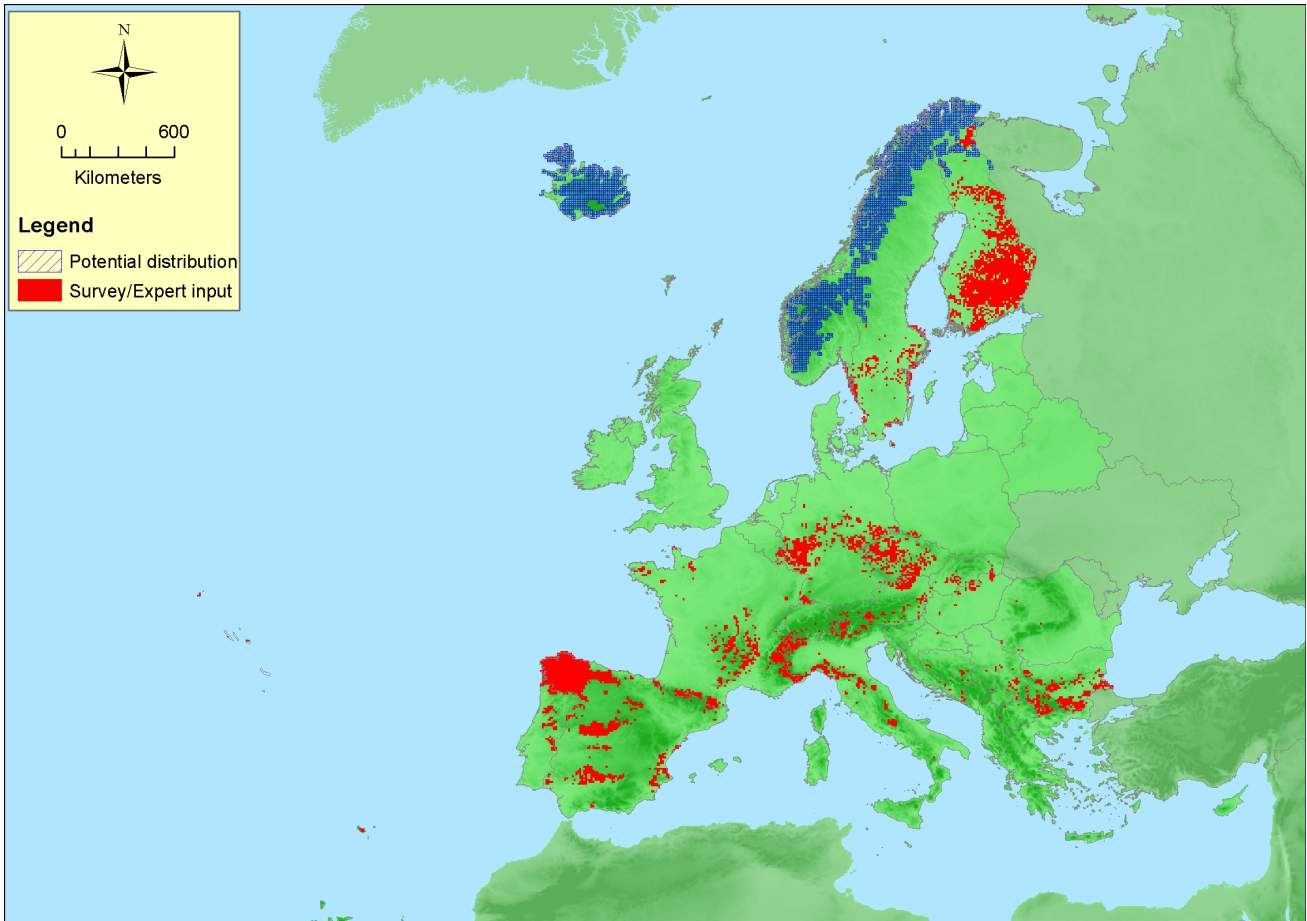
EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Spain</i>	Balearic Islands: Uncertain Spain mainland: Present	647 Km ²	Stable	Unknown
<i>Sweden</i>	Present	80 Km ²	Decreasing	Decreasing
<i>UK</i>	Northern Island: Uncertain United Kingdom: Present	120 Km ²	Unknown	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>Andorra</i>	Uncertain	Unknown Km ²	Unknown	Unknown
<i>Bosnia and Herzegovina</i>	Present	5 Km ²	Decreasing	Decreasing
<i>Faroe Islands</i>	Uncertain	Unknown Km ²	Unknown	Unknown
<i>Former Yugoslavian Republic of Macedonia (FYROM)</i>	Uncertain	Unknown Km ²	Unknown	Unknown
<i>Guernsey</i>	Uncertain	Unknown Km ²	Unknown	Unknown
<i>Iceland</i>	Present	Unknown Km ²	Unknown	Unknown
<i>Isle of Man</i>	Uncertain	Unknown Km ²	Unknown	Unknown
<i>Jersey</i>	Uncertain	Unknown Km ²	Unknown	Unknown
<i>Kosovo</i>	Present	Unknown Km ²	Stable	Decreasing
<i>Monaco</i>	Uncertain	Unknown Km ²	Unknown	Unknown
<i>Montenegro</i>	Uncertain	Unknown Km ²	Unknown	Unknown
<i>Norway</i>	Jan Mayen: Uncertain Norway Mainland: Present Svalbard: Uncertain	Unknown Km ²	Unknown	Unknown
<i>San Marino</i>	Uncertain	Unknown Km ²	Unknown	Unknown
<i>Serbia</i>	Uncertain	Unknown Km ²	Unknown	Unknown
<i>Switzerland</i>	Present	5 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>	10876150 Km ²	5568	650 Km ²	
<i>EU 28+</i>	13455300 Km ²	8319	800 Km ²	

Distribution map



The map is incomplete for the Carpathians and Balkans, while potential distribution is given for Norway and Iceland. Data sources: Art17, EVA, BOHN.

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

80%

Trends in quantity

The recent trend in quantity is declining both for EU28 (-37%) and EU28+ (-37%), based on 80% of the total area reported. The long-term trend is even more pronouncedly declining, both in EU28 (-51%) and EU28+ (-51%), based on 60% of the total area reported. For the future, the data-providing countries assume developments that range from strong (rarely) through minor decrease to stability (mostly).

- 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

EOO is >> 50,000 km².

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

No

Justification

EOO is >> 50,000 km².

Trends in quality

Within EU28, 19% of the remaining area are degraded with 37% severity. Within EU28+, 20% of the

remaining area are degraded with 40% severity.

- Average current trend in quality

EU 28: Decreasing

EU 28+: Decreasing

Pressures and threats

As far as the territory of this habitat has been enlarged by clearing of forests and grazing, it suffers from natural succession following abandonment of such traditional pasture systems. To a smaller extent also eutrophication through atmospheric nitrogen input, direct destruction in case of quarries, urbanisation and road construction can have negative impacts. Specifically for Switzerland the extension of viticulture and negative effects of pesticides from adjacent agriculture are mentioned, but these threats might be more widespread across countries.

List of pressures and threats

Agriculture

Abandonment of pastoral systems, lack of grazing

Mining, extraction of materials and energy production

Mining and quarrying

Urbanisation, residential and commercial development

Urbanised areas, human habitation

Pollution

Nitrogen-input

Natural biotic and abiotic processes (without catastrophes)

Biocenotic evolution, succession

Conservation and management

Generally, continuation of low-intensity grazing is the recommended measure. However, the majority of stands is rather stable also without management.

List of conservation and management needs

No measures

No measures needed for the conservation of the habitat/species

Measures related to agriculture and open habitats

Maintaining grasslands and other open habitats

Conservation status

8230 ALP U1, ATL XX, BLS U1, BOR U2, CON U1, MAC XX, MED XX, PAN U1, STE FV

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

Degraded semi-natural (e.g. in former pasture systems) and anthropogenic stands (e.g. wall tops; railway gravel) can be restored by re-installing the former grazing system and/or cutting down woody encroachment inside the habitat (and in its surrounding, if it throws shadow on the site).

Natural and semi-natural sites that have been degraded by quarrying or leisure activities can recover themselves when the negative impact has stopped, but this will take considerable time.

Effort required

10 years	20 years	50+ years
Through intervention	Naturally	Naturally

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-37 %	Unknown %	Unknown %	51 %
EU 28+	-37 %	Unknown %	Unknown %	51 %

The values for Criteria A1 and A3 are calculated from the territorial data sheets, which provided trend data for 16 and 8 countries, for the 50 yr and long-term trend, respectively. However, the long-term trends are based on only about 2/5 of the territory. The provided data were far too incomplete to allow assessment based on Criteria 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	-		>50	Yes	-		no
EU 28+	>50000 Km ²	Yes	-		>50	Yes	-		no

EOO and AOO are far larger than the thresholds for the criteria B1 and B2. The habitat type has many occurrences in nearly all European countries.

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	19 %	37 %	Unknown %	Unknown %	Unknown %	Unknown %
EU 28+	20 %	40 %	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 19 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	LC	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	VU	DD	DD	VU	LC	LC	LC	LC	DD	DD	DD	DD	DD	DD	DD	DD	DD

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

Confidence in the assessment

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

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