

H3.1b Temperate high mountain siliceous inland cliff

Summary

These are siliceous cliffs and rock faces of acid various mostly Palaeozoic rocks in the high mountains of the nemoral biogeographical zone. Slow weathering of these resistant rocks creates fewer niches for colonisation and the vascular flora of the crevices and on ledges here is rather species-poor but rich in epilithic lichens. Quarrying, the construction of skiing complexes and infrastructure facilities and tourism, particular climbing, continue to threaten. As far as conservation is concerned, no specific management measures are required except avoiding disturbance and destruction of sites, which is achieved best by establishment of large-scale protected areas.

Synthesis

As the habitat is widespread in high mountain areas and hence the impact of human activities is limited, reductions in quantity and quality occur mainly at a local scale. All calculated trends qualify for a Least Concern status. Although territorial data were not provided from all countries, the assessment has a high degree of reliability.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Least Concern	-	Least Concern	-

Sub-habitat types that may require further examination

Endemic, species-rich forms may be distinguished for different mountain ranges, like the Pyrenees, the Alps, the Carpathians and the Balkan.

Habitat Type

Code and name

H3.1b Temperate high mountain siliceous inland cliff



Temperate high-mountain siliceous inland cliffs in the Central Balkan National Park of Bulgaria (Photo: Rossen Tzonev).



Asplenium septentrionale on siliceous cliff in Ibones de Las Negras, Canal Roya, Pyrenees, Huesca, Spain (Photo: José Luis Benito).

Habitat description

Siliceous (rich in quartz and silicate minerals such as mica, feldspar, biotite and hornblende) cliffs and walls of acid rock in the high mountains of the nemoral biogeographical zone. The most common kinds of

siliceous rock are granite, gneiss and crystal schist, mostly of Palaeozoic age. Younger igneous-volcanic acid rocks such as quartz-porphry also occur, for instance in the western central Alps. As gneiss and granitic rocks weather more slowly than calcareous rock, the vegetation of vascular plants in crevices and on ledges in the high mountains is less species-rich. Siliceous rock-faces, on the other hand, are richer in epilithic lichens. Lichens of crustose (*Acarospora*, *Haematomma*, *Lecanora*, *Lecidea* s.l., *Rhizocarpon*, *Sarcogyna*, *Schaereria*, *Sporastatia*) and foliose (*Parmelia* s.l., *Physcia*, *Umbilicaria*) growth form prevail. Endolithic lichens and micro-algae are other important components of siliceous rock biota. Siliceous rock-dwelling bryophytes of the temperate high mountains include chiefly acrocarpic mosses and hepatics, among others many species of *Grimmia*, *Racomitrium*, *Schistidium*, *Andreaea* and *Marsupella*. Bryophyte diversity and abundance is highest in fissures of wet rocks and on ledges with a thin humus layer. Among the vascular plants tufted or matted perennial herbs prevail; plants of rosulate or succulent growth form may be prominent. Species-rich genera of silicolous chasmophytes are *Saxifraga*, *Sempervivum*, *Primula*, *Phyteuma* and *Artemisia*. Alpine siliceous cliffs are generally less species-rich than calcareous cliffs of the high mountains. Nevertheless, several range-restricted taxa are confined to siliceous inland cliffs.

The habitat type occurs in the high mountains of nemoral Europe, chiefly in the Pyrenees, the Alps, the Carpathians and the Balkanic mountain ranges of Stara Planina (Balkan range), Rila and Rhodopes, and further east in the Caucasus.

Indicators of good quality:

High-mountain siliceous cliffs of the temperate zone are particularly rich in lichens and bryophytes, less so in vascular plants. It is therefore advisable to take cryptogram diversity into consideration when assessing the habitat quality of siliceous cliffs. Relict arcto-alpine and range-restricted taxa among both phanerogams and cryptogams are the most significant biological quality indicators.

The following characteristics may be used as indicators of favourable quality:

- Occurrence of rare species of lichens, bryophytes and phytogeographically significant vascular plant taxa,
- Presence of sizable cliffs and large boulders with species-rich lichen crusts and bryophyte assemblages, with different aspects of rock-faces, different exposure, moisture and rock structures such as vertical rock faces, overhangs, cavities, rock shelters, and ledges
- Contact with natural habitats such as screes, boulder fields and alpine grasslands
- Absence of rock climbing facilities

Characteristic species:

Vascular plants: *Agrostis* (*rupestris*, *schraderiana*), *Alyssum repens*, *Androsace* (*alpina*, *vandellii*, *wulfeniana*), *Anthemis pindicola*, *Artemisia* (*genipi*, *glacialis*, *umbelliformis* subsp. *eriantha*, *umbelliformis* subsp. *umbelliformis*), *Asplenium septentrionale*, *Bupleurum stellatum*, *Campanula wanneri*, *Centaurea deustiformis*, *Dianthus* (*sylvestris*, *tristis*), *Draba dubia*, *Erigeron schleicheri*, *Eritrichium nanum*, *Erysimum rhaeticum*, *Hylotelephium anacampseros*, *Jacobaea incana* subsp. *carniolica*, *Minuartia cherlerioides* subsp. *rationii*, *Phyteuma* (*hemisphaericum*, *humile*, *scheuchzeri* subsp. *scheuchzeri*), *Poa laxa*, *Potentilla* (*doerfleri*, *haynaldiana*), *Primula* (*hirsuta*, *minima*), *Saxifraga* (*aspera*, *bryoides*, *cotyledon*, *exarata*, *florulenta*, *juniperifolia*, *muscoides*, *pedemontana* subsp. *cymosa*, *pedemontana* subsp. *pedemontana*), *Sempervivum* (*arachnoideum*, *grandiflorum*, *marmoreum*, *montanum*, *wulfenii*), *Silene* (*acaulis*, *dinarica*, *lerchenfeldiana*), *Veronica baumgartenii*, *Woodsia alpina*

Bryophytes: *Andreaea* (*rothii*, *rupestris*), *Diplophyllum taxifolium*, *Ditrichum zonatum*, *Dryptodon patens*, *Grimmia* (*affinis*, *alpestris*, *anomala*, *arenaria*, *caespiticia*, *curvata*, *donniana*, *elatior*, *elongata*, *funalis*, *incurva*, *muehlenbeckii*, *torquata*, *unicolor*), *Gymnomitrium concinatum*, *Lophozia sudetica*, *Racomitrium* (*aquaticum*, *fasciculare*, *heterostichum*, *microcarpon*, *sudeticum*)

Lichens: *Acarospora* (*chlorophana*, *peliscypha*), *Catolechia wahlenbergii*, *Cornicularia normoerica*, *Dimelaena oreina*, *Ephebe lanata*, *Haematomma* (*ochroleucum*, *ventosum*), *Lecanora* (*bicincta*, *cenisia*, *frustulosa*, *intricata*, *lojkaeana*, *orosthea*, *polytropa*, *reagens*, *subcarnea*, *subplanata*, *swartzii*), *Lecidea* s.l. (*confluens*, *distans*, *garovaglii*, *griseoatra*, *leucophaea*, *mosigii*, *nigroleprosa*, *silacea*, *speirodes*, *umbonella*, *umbonata*), *Lepraria* (*latebrarum*, *membranacea*, *neglecta*), *Massalongia carnosa*, *Ophioparma ventosa*, *Orphiniospora moriopsis*, *Parmelia* s.l. (*conspersa*, *disjuncta*, *incurva*, *loxodes*, *mougeotii*, *omphalodes*, *panniformis*, *pulla*, *somloensis*, *sorediosa*, *stygia*, *verrucilifera*), *Placopsis* (*gelida*, *lambii*), *Pseudephebe* (*minuscula*, *pubescens*), *Ramalina capitata*, *Rhizocarpon* (*alpicola*, *atroflavescens*, *badioatrum*, *caeruleoalbum*, *carpaticum*, *distinctum*, *eupetraeum*, *geographicum*, *leptolepis*, *obscuratum*, *oederi*, *polycarpum*), *Sarcogyne clavus*, *Schaereria* (*cinereorufa*, *tenebrosa*), *Sphaeroporus fragilis*, *Sporastatia* (*polyspora*, *testudinea*), *Tremolecia atrata*, *Umbilicaria* (*cylindrica*, *crustulosa*, *hirsuta*, *polyphylla*, *polyrrhiza*, *subglabra*, *torrefacta*, *vellea*)

Classification

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

EUNIS:

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EuroVegChecklist:

Androsacion vandellii Br.-Bl. in Br.-Bl. et Jenny 1926 nom. corr.

Saxifragion cymosae Lakušić 1970

Saxifragion pedemontanae Barbero et Bono 1967

Silenion lerchenfeldiana Simon 1958

Annex 1:

8220 Siliceous rocky slopes with chasmophytic vegetation (This Annex 1 habitat type applies to a geographically and altitudinally wider range of European siliceous cliff habitats)

Emerald:

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MAES-2:

Sparsely vegetated land

IUCN:

6. Rocky areas

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

Yes

Regions

Alpine

Justification

The habitat type occurs predominantly on siliceous cliffs and acidic rocks in the high mountains of nemoral Europe, chiefly in the Alps, the Pyrenees, the Carpathians and the Balkanic mountain ranges of Stara Planina (Balkan range), Rila and Rhodopes.

Geographic occurrence and trends

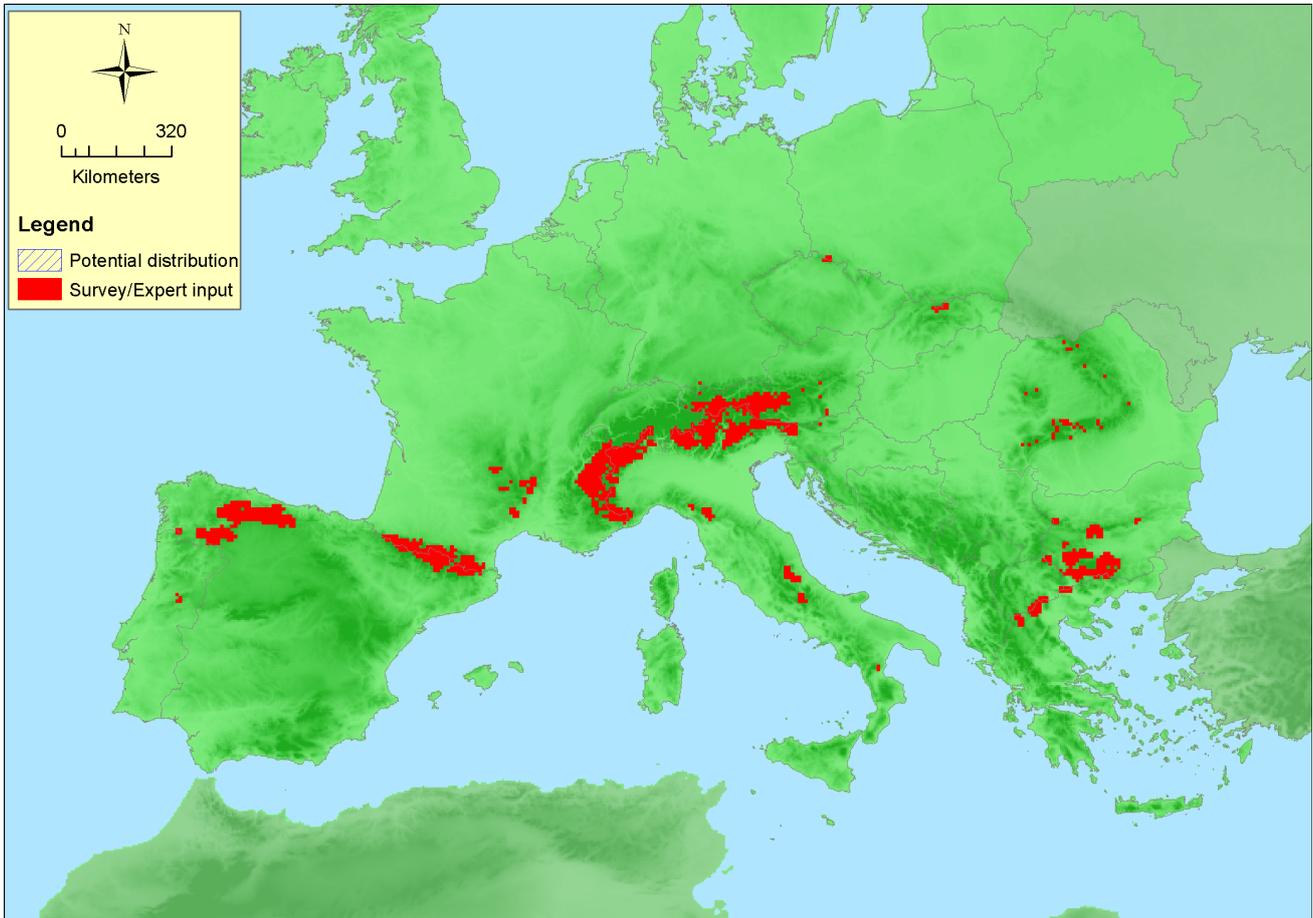
EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Austria</i>	Present	55 Km ²	Stable	Stable
<i>Bulgaria</i>	Present	125 Km ²	Decreasing	Decreasing
<i>Czech Republic</i>	Present	1 Km ²	Stable	Decreasing
<i>France</i>	France mainland: Present	200 Km ²	Decreasing	Decreasing
<i>Germany</i>	Present	2 Km ²	Stable	Decreasing
<i>Greece</i>	Greece (mainland and other islands): Present	20 Km ²	Unknown	Decreasing
<i>Italy</i>	Italy mainland: Present Sardinia: Present	1474 Km ²	Stable	Decreasing
<i>Poland</i>	Present	0.6 Km ²	Stable	Decreasing
<i>Romania</i>	Present	0.5 Km ²	Stable	Stable
<i>Slovakia</i>	Present	28 Km ²	Decreasing	Unknown
<i>Slovenia</i>	Present	3 Km ²	Stable	Stable
<i>Spain</i>	Spain mainland: Present	76 Km ²	Stable	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	Km ²	-	-
<i>Bosnia and Herzegovina</i>	Present	2 Km ²	Stable	Decreasing
<i>Former Yugoslavian Republic of Macedonia (FYROM)</i>	Present	Unknown Km ²	Unknown	Unknown
<i>Kosovo</i>	Present	Unknown Km ²	Stable	Stable
<i>Montenegro</i>	Uncertain	Km ²	-	-
<i>Serbia</i>	Uncertain	Km ²	-	-
<i>Switzerland</i>	Present	800 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>	2208450 Km ²	1114	1986 Km ²	
<i>EU 28+</i>	2208450 Km ²	1117	2788 Km ²	no data from Albania, Montenegro, Serbia

Distribution map



The map is rather complete, except for the Balkan and Switzerland. Data sources: Art17, NAT.

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

60%. The habitat type occurs in the high mountains of nemoral Europe (incl. Switzerland and the Balkan outside the EU28+) and further east in the Caucasus.

Trends in quantity

The present past trend in quantity (extent) over the last approximately 50 years is stable to slightly decreasing (EU28: -0.4%; EU28+: -1.7%). As the habitat occurs in high mountain areas it is weakly affected by human activities. The very slight decrease was due to local construction of ski resorts and roads as well as quarrying operations. The extent of the habitat type is supposed to remain stable in the near future.

- Average current trend in quantity (extent)

EU 28: Stable

EU 28+: Stable

- Does the habitat type have a small natural range following regression?

No

Justification

The habitat is widespread across nemoral high-mountain regions in Europe. The EOO is > 50000 km².

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

No

Justification

The habitat is widespread across nemoral high-mountain regions in Europe.

Trends in quality

The decrease in quality over the last 50 years has occurred more or less locally, affecting less than 10% of the total area. The calculated severity of degradation is below 40%. The reduction in quality is mainly related to rock climbing (removal of vegetation, disturbances to the local fauna) and proximity to human infrastructures (disturbances to the local fauna and flora) though the impacts have to be estimated as minor on the whole. The quality of the habitats will probably be affected by climate change and higher temperatures in the future.

- Average current trend in quality

EU 28: Stable

EU 28+: Stable

Pressures and threats

As the habitat is restricted to high mountain areas it is in general weakly affected by human activities. Major threats are related to outdoor sports. More precisely, rock climbing or via ferrata cause disturbances to the local fauna and flora, especially to birds. Further disturbances come from nearby human infrastructures like ski resorts or roads. At lower altitudes quarrying is also a source of threats. As far as future threats are concerned, the habitats are probably affected by the impacts of climate change.

List of pressures and threats

Mining, extraction of materials and energy production

Mining and quarrying

Human intrusions and disturbances

Outdoor sports and leisure activities, recreational activities

Mountaineering, rock climbing, speleology

Natural biotic and abiotic processes (without catastrophes)

Biocenotic evolution, succession

Climate change

Changes in abiotic conditions

Conservation and management

Cliffs are crucial features of high mountain environments. As they are natural habitats, no specific management measures are required except avoiding disturbance and destruction of sites. The protection of those habitats and corresponding species is realised best by the establishment of large-scale protected areas, where natural processes are allowed without any restrictions.

List of conservation and management needs

Measures related to spatial planning

Other spatial measures

Establish protected areas/sites

Legal protection of habitats and species

Measures related to special resource use

Regulating/Management exploitation of natural resources on land

Conservation status

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

Once completely destroyed the habitat has almost no capacity to recover, as it is dependent on geomorphological processes (orogenesis). In the case of damage without destruction of sites, at least for plants capable of dispersal, the natural recovery of this habitat is rather fast when it is not isolated from similar habitats. The recolonization of sites by breeding birds after strong disturbances may take longer.

Effort required

50+ years	200+ years
Naturally	Naturally

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-0.4 %	unknown %	unknown %	unknown %
EU 28+	-1.7 %	unknown %	unknown %	unknown %

The values for A1 were calculated by using the territorial data sheets. The calculated trend in the last 50 years is a reduction of about 0.4% (EU28) and 1.7% (EU28+), respectively (resulting in category Least Concern). No data (%) available or insufficient data for A2a, A2b and A3.

Criterion B: Restricted geographic distribution

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

EOO, AOO and number of locations are much larger than the thresholds for criteria under B.

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	8.5 %	38 %	unknown %	unknown %	unknown %	unknown %
EU 28+	8.9 %	36 %	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 values for C/D1 were calculated by using the territorial data sheets. The calculated figures result in a Least Concern category. No reliable data (%) available for C/D2, C/D3, C1, C2, C3, D1, D2 and D3.

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	LC	DD	DD	DD	LC	LC	LC	LC	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	LC	DD	DD	DD	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
Least Concern	-	Least Concern	-

Confidence in the assessment

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

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