

## E1.5a Iberian oromediterranean siliceous dry grassland

### Summary

This habitat comprises grasslands of base-poor soils over siliceous bedrocks on the slopes and crests of high mountains in the Iberian Peninsula. There, the growing season is short, with harsh winters when strong winds blow the ground free of snow and leave the surface subject to deep cold which encourages the development of freeze-thaw features. The cover of vegetation is intermediate to complete, dominated by prostrate or dwarf grasses and forbs, and includes many endemics. Extreme conditions prevent succession and grazing, generally by sheep, is restricted to the brief summer and has little impact. Loss of extent is small but there has been some decline in quality due to leisure infrastructure. The establishment of protected areas with restriction of damaging activities has been essential for the conservation of the habitat, which once destroyed is very difficult to recover.

### Synthesis

The habitat is assigned to the category Near Threatened (NT). Over the last 50 years it has not substantially decreased in quantity nor in quality and its AOO and EOO are quite large. However, being restricted to the highest summits of siliceous mountains on the Iberian peninsula, it is assumed to suffer from climate change, and therefore the corresponding Annex 1 habitat 6160 has been assessed as Unfavourable Bad (U2) for its "future prospects". It means that a large part of the habitat (80-100%) will have at least a slight to moderate severe quality decline in the near future. For this reason, the habitat is considered (at least) Near Threatened under criterion C/D2.

| Overall Category & Criteria |                   |                   |                   |
|-----------------------------|-------------------|-------------------|-------------------|
| EU 28                       |                   | EU 28+            |                   |
| Red List Category           | Red List Criteria | Red List Category | Red List Criteria |
| Near Threatened             | C/D2              | Near Threatened   | C/D2              |

### Sub-habitat types that may require further examination

No sub-habitats have been distinguished for further analysis.

### Habitat Type

#### Code and name

E1.5a Iberian oromediterranean siliceous dry grassland



*Festuca curvifolia* grasslands in Sierra de Guadarrama, Central Range, Spain (Photo: Borja Jiménez-Alfaro).



Grassland of the association *Arenario frigidae-Festucetum indigestae* in Sierra Nevada, Spain (Photo: J. Molero).

## Habitat description

Dwarf grasslands growing in alpine (crioro) and upper subalpine (oro) environment at elevations above 1900 m in siliceous mountains in Mediterranean Iberian Peninsula, from the Cantabrian range in the NW to Sierra Nevada in the SE. Conditions are extreme in such altitudes, and include low temperatures, a short growing season in which solar irradiation is very high and rainfall can be low, combined with a high wind exposure. Strong wind sweeps the snow preventing from being accumulated. The removal of the protective snow layer in winter exacerbates drought by enhancing evaporation and also entails an important abrasion and mechanical pressure. Due to the extreme cold and dryness, those grasslands have been qualified as psychro-xerophilous. They occupy crests and slopes in which snow cover is shallow, avoiding depressions where it accumulates. Phenomena of cryoturbation and solifluxion are common in the soils, which are leptosols, lithosols or distric cambisols without histic, gleic and hydromorphic properties. The plants are dwarf or prostrated, with hard tissues to endure wind abrasion and drought. The grasses, particularly the *Festuca* species, have hard leaves with sclerenchyma bundles that give way to a low palatable or even indigestive pasture (revientabarrigas). Cover can be complete (ca 100%) to intermediate (40-50%) or low depending on extreme conditions, slope and solifluxion incidence. Succession towards tall vegetation types is prevented by extreme environmental conditions in the higher altitudes, where those grasslands are the Potential Natural Vegetation. Grazing, usually by sheep, is restricted to a short growing season and its impact used to be low.

The majority of the species are Iberian endemics, often restricted to one of the mountain groups and particularly abundant in Sierra Nevada.

Indicators of good quality:

- The grassland should be dominated by grasses (*Festuca* sp. pl.), grass-like species (*Luzula* sp. pl.) and other herbaceous plants, having few ligneous plants.
- A medium to high vegetation cover
- Absence of nitrophilic species linked to human activities
- No visible anthropic disturbances due to building activities, skying or intensive trampling

Characteristic species:

Vascular plants: *Agrostis tileni*, *Androsace rioxana*, *Arenaria imbricata*, *Armeria bigerrensis*, *Armeria duriaei*, *Armeria losae*, *Armeria microcephala*, *Armeria caespitosa*, *Artemisia granatensis*, *Dianthus langeanus*, *Erigeron frigidus*, *Eryngium glaciale*, *Festuca aragonensis*, *Festuca clementei*, *Festuca curvifolia*, *Festuca pseudeskia*, *Herniaria boissieri*, *Hieracium myriadenum*, *Hieracium vahlii*, *Jasione amethystina*, *Jasione brevisepala*, *Jasione centralis*, *Koeleria caudata* subsp. *crassipes*, *Leontodon cantabricus*, *Leucanthemopsis flaveola*, *Leucanthemopsis cuneata*, *Leucanthemopsis pectinata*, *Luzula caespitosa*, *Luzula caespitosa* subsp. *iberica*, *Luzula hispanica*, *Minuartia bigerrensis*, *Minuartia juresii*, *Nevadensia purpurea*, *Potentilla nevadensis*, *Senecio boissieri*, *Sideritis glacialis*, *Silene elegans*, *Trisetum antoni-josephii*, *Trisetum glaciale*, *Silene elegans*, *Teesdaliopsis conferta*, *Veronica cantabrica*.

## Classification

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

EUNIS:

E1.1 Mediterranean-montane grassland.

EuroVegChecklist (alliances):

*Nevadensia purpureae* Quézel 1953

*Minuartio bigerrensis-Festucion curvifoliae* Rivas-Martínez corr. Rivas-Martínez et al. 1999

*Teesdaliopsis confertae-Luzulion caespitosae* Rivas-Martínez 1987

Annex 1:

6160 Oro-Iberian *Festuca indigesta* grassland.

Emerald:

E4.3 Acid alpine and subalpine grassland

MAES:

Terrestrial - grassland

IUCN:

4.4 Temperate grassland

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

Yes

Regions

Mediterranean

Justification

The most genuine high mountain silicicolous mediterranean habitat, although it is also present in Cantabrian Range, which belongs to Atlantic region, but it represents a minimum proportion of the total area of this region.

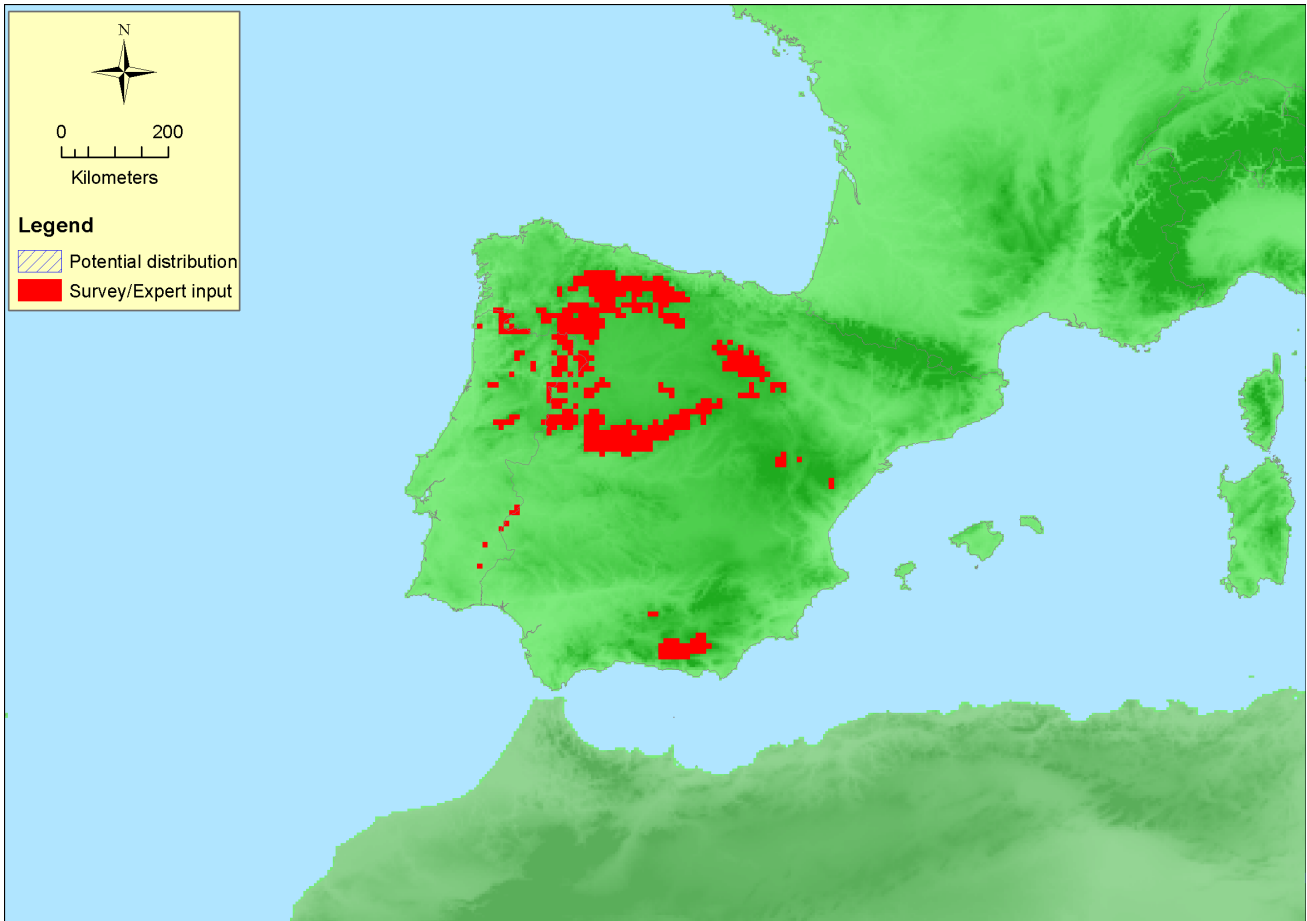
**Geographic occurrence and trends**

| 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>Portugal</i> | Portugal mainland: Present    | 3.8 Km <sup>2</sup>     | Decreasing                             | Unknown                               |
| <i>Spain</i>    | Spain mainland: Present       | 374 Km <sup>2</sup>     | Stable                                 | Decreasing                            |

**Extent of Occurrence, Area of Occupancy and habitat area**

|        | Extent of Occurrence (EOO) | Area of Occupancy (AOO) | Current estimated Total Area | Comment |
|--------|----------------------------|-------------------------|------------------------------|---------|
| EU 28  | 360700 Km <sup>2</sup>     | 500                     | 378 Km <sup>2</sup>          |         |
| EU 28+ | 360700 Km <sup>2</sup>     | 500                     | 378 Km <sup>2</sup>          |         |

**Distribution map**



Map is complete, but may give an overestimation. Data sources: Art17, NAT.

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

The habitat only occurs in the Iberian Peninsula, as its names indicates, although other oromediterranean communities of the same class Festucetea indigestae are also present in North African Rif mountains. So, 100% of the current distribution lies within the EU28.

### Trends in quantity

Average Trend EU28: -0.3% over the last decades (since 1960-1974)

Average Trend EU28+: -0.3% over the last decades (since 1960-1974)

The surface of this habitat has only slightly decreased since the middle of the 20th century, from 379 km<sup>2</sup> to 378 km<sup>2</sup>. Over the last 50 years a relative loss of area of less than 1% has been reported. Nevertheless, this decline could be higher, as Spain, that accounts for 99% of the total extent, has estimated that the area has remained stable in the last decades, but without any quantitative data, while Portugal has reported a decreasing trend of 24%. We have not data on historical trends, but we think that the decrease has mainly happened in recent times, due to leisure activities in these Iberian high mountains. Regarding future trends, no data have been reported, although it is expected that the habitat will have at least slight if not moderate decline in the 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 EOO is larger than 50000 km<sup>2</sup>, and the habitat has not undergone an important decline during the

last 50 years.

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

Yes

#### *Justification*

The range of this habitat is limited to the high summits (over 1900 m) of Iberian siliceous mountains, with a current estimated total area of 378 km<sup>2</sup>. So, although its EOO is quite large, 360700 km<sup>2</sup>, it has to be considered that in this perimeter it only occupies quite small areas.

### **Trends in quality**

The area that has been subjected to degradation over the last decades (since 1960) is quite small, with a slight to moderate decrease in quality. The trends over larger historical periods are not known, neither the future trends. Recent degradation is related to leisure activities and climate change. The calculated extent of degradation in EU28 (and EU28+) is 3% with 40% severity of degradation. As regards future trends, it is expected a slight to moderate decrease in quality, according to the European assessment of Annex I habitat 6160 as U2.

- Average current trend in quality

EU 28: Stable

EU 28+: Stable

### **Pressures and threats**

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Grasslands included in this habitat are mainly threatened by leisure activities such as skiing and mountaineering, which involve the construction of infrastructures and intensive trampling, which can increase erosion. Grazing, usually by sheep, is restricted to a short growing season and has not high impact.

Climate change is another major threat, as higher temperatures involve the invasion of more competitive species from lower altitudes which replace the cold-adapted species typical of these oromediterranean grasslands.

### **List of pressures and threats**

#### **Human intrusions and disturbances**

Mountaineering, rock climbing, speleology  
Skiing, off-piste  
Skiing complex

#### **Climate change**

Changes in abiotic conditions  
Changes in biotic conditions

### **Conservation and management**

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The conservation of this habitat involves the minimization of the impact of leisure activities and the disturbance they create in the ecosystem, as this disturbance can facilitate the arrival of ruderal species, which is also possible due to changing climatic conditions.

### **List of conservation and management needs**

#### **Measures related to spatial planning**

Establish protected areas/sites  
Legal protection of habitats and species

## Conservation status

Annex 1 types:

6160: ATL U2, MED U2

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

The extreme climatic conditions, with low temperatures and very dry conditions, make it very difficult the recovery of the habitat once it has been seriously damaged. If damage is related to soil erosion due to intense trampling, the habitat needs a long time to recover, which can be facilitated through human intervention. If damage is related to climate change and consequent invasion of species from lower altitudes, the diagnostic species will disappear in the long term and thus future recovery of the habitat will not be possible.

### Effort required

| 50+ years            | 200+ years |
|----------------------|------------|
| Through intervention | Naturally  |

## Red List Assessment

### Criterion A: Reduction in quantity

| Criterion A | A1     | A2a       | A2b       | A3        |
|-------------|--------|-----------|-----------|-----------|
| EU 28       | -0.3 % | Unknown % | Unknown % | Unknown % |
| EU 28+      | -0.3 % | Unknown % | Unknown % | Unknown % |

The values for A1 were calculated from the territorial data sheets. Almost 99% of the area occupied by the habitat lies in Spain, which has reported a stable trend over the last decades, although without quantitative data, while Portugal has reported a negative trend of 24%. This high difference among both estimations can be due to Portuguese occurrence being limited to Serra da Estrela, where the habitat occupies a small area of less than 4 km<sup>2</sup> where many leisure activities concentrate. There is no information on longer historical trends neither in future trends. However the U2 assessment in future trends for EU under the Habitats Directive reports from 2013 suggests negative future trends, likely partly in quantity.

### Criterion B: Restricted geographic distribution

| Criterion B | B1                     |         |         |         | B2  |         |         |         | B3      |
|-------------|------------------------|---------|---------|---------|-----|---------|---------|---------|---------|
|             | EOO                    | a       | b       | c       | AOO | a       | b       | c       |         |
| EU 28       | >50000 Km <sup>2</sup> | Unknown | Unknown | Unknown | >50 | Unknown | Unknown | Unknown | Unknown |
| EU 28+      | >50000 Km <sup>2</sup> | Unknown | Unknown | Unknown | >50 | Unknown | Unknown | Unknown | Unknown |

Both EOO and AOO are quite large and do not meet criterion B. Sub-criteria were not evaluated because the values for EOO and AOO are well above the thresholds.

### 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        | 3 %             | 40 %              | 80-100 %        | >20 %             | Unknown %       | Unknown %         |

| Criteria C/D | C/D1            |                   | C/D2            |                   | C/D3            |                   |
|--------------|-----------------|-------------------|-----------------|-------------------|-----------------|-------------------|
|              | Extent affected | Relative severity | Extent affected | Relative severity | Extent affected | Relative severity |
| EU 28+       | 3 %             | 40 %              | 80-100 %        | >20 %             | Unknown %       | Unknown %         |

| Criterion C | C1              |                   | C2              |                   | C3              |                   |
|-------------|-----------------|-------------------|-----------------|-------------------|-----------------|-------------------|
|             | Extent affected | Relative severity | Extent affected | Relative severity | Extent affected | Relative severity |
| EU 28       | Unknown %       | Unknown %         | 80-100 %        | >20 %             | Unknown %       | Unknown %         |
| EU 28+      | Unknown %       | Unknown %         | 80-100 %        | >20 %             | 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 overall extent and severity of degradation are based on the data reported from Spain (98.9% of area in EU28), as quantitative data on trends in Portugal was missing. The changes in quality are both abiotic and biotic, so C/D1 has not been split into C1 and D1. The involved countries could not provide enough quantitative information on long historical or future trends in quality (C/D2, C/D3). However the U2 assessment in future trends in EU under the Habitats Directive reports from 2013 suggests negative future trends based on climate change, which at least can be considered as a negative future trend in abiotic conditions. We translate this to an assessment of C/D2 (and C2) of Near Threatened, as large areas (80-100%) will be effected with slight or higher severity (>20%). Possibly even the thresholds for Vulnerable (VU) may be met.

**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   | NT   | DD   | DD | NT | DD | DD | DD | DD | DD |
| EU28+ | LC | DD  | DD  | DD | LC | LC | LC | LC   | NT   | DD   | DD | NT | DD | DD | DD | DD | DD |

| Overall Category & Criteria |                   |                   |                   |
|-----------------------------|-------------------|-------------------|-------------------|
| EU 28                       |                   | EU 28+            |                   |
| Red List Category           | Red List Criteria | Red List Category | Red List Criteria |
| Near Threatened             | C/D2              | Near Threatened   | C/D2              |

**Confidence in the assessment**

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

**Assessors**

I. Biurrun

**Contributors**

Habitat definition: J. Loidi

Territorial experts: J. Capelo, D. Espírito-Santo, J. Loidi

Working Group Grasslands: I. Biurrun, J. Dengler, D. Gigante, Z. Molnar, D. Paternoster, J. Rodwell, J. Schaminée, R. Tzonev

**Reviewers**

A. Ssymank

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**References**

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