# **National Parks and Wildlife Service**

## **Conservation Objectives Series**

## Blackstairs Mountains SAC 000770



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#### Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

#### **Notes/Guidelines:**

- 1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
- 2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
- 3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
- 4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
- 5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

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## Qualifying Interests

\* indicates a priority habitat under the Habitats Directive

000770	Blackstairs Mountains SAC
4010	Northern Atlantic wet heaths with Erica tetralix
4030	European dry heaths

Please note that this SAC is adjacent to Slaney River Valley SAC (000781) and River Barrow and River Nore SAC (002162). See map 2. The conservation objectives for this site should be used in conjunction with those for the adjacent site as appropriate.

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## Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

#### **NPWS Documents**

Year: 2006

Title: Conservation Plan for 2006-2011. Blackstairs Mountains cSAC Site Code 000770 Cos Carlow

and Wexford

Author: NPWS

Series: Conservation Plan

Year: 2009

Title: Ireland Red List No. 2: Non-marine molluscs

Author: Byrne, A.; Moorkens, E.A.; Anderson, R.; Killeen, I.J.; Regan, E.C.

Series: Ireland Red List series, NPWS

Year: 2010

Title: Ireland Red List No. 4: Butterflies

Author: Regan, E.C.; Nelson, B.; Aldwell, B.; Bertrand, C.; Bond, K.; Harding, J.; Nash, D.; Nixon, D.;

Wilson, C.J.

Series: Ireland Red List series, NPWS

**Year:** 2012

Title: Ireland Red List No. 8: Bryophytes

Author: Lockhart, N.; Hodgetts, N.; Holyoak, D.

Series: Ireland Red List series, NPWS

Year: 2013

Title: The status of EU protected habitats and species in Ireland. Volume 2. Habitats assessments

Author: NPWS

Series: Conservation assessments

Year: 2014

Title: Guidelines for a national survey and conservation assessment of upland vegetation and

habitats in Ireland, Version 2.0

Author: Perrin, P.M.; Barron, S.J.; Roche, J.R.; O'Hanrahan, B.

Series: Irish Wildlife Manuals, No. 79

Year: 2016

Title: Ireland Red List No. 10: Vascular Plants

Author: Wyse Jackson, M.; FitzPatrick, Ú.; Cole, E.; Jebb, M.; McFerran, D.; Sheehy Skeffington, M.;

Wright, M.

Series: Ireland Red List Series, NPWS

**Year:** 2019

Title: The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments

Author: NPWS

Series: Conservation assessments

#### **Other References**

**Year:** 2009

Title: Common Standards Monitoring guidance for upland habitats

Author: JNCC

Series: Joint Nature Conservation Committee, Peterborough

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**Year**: 2012

Title: Rare and threatened bryophytes of Ireland

Author: Lockhart, N.; Hodgetts, N.; Holyoak, D.

Series: National Museums Northern Ireland

Year: 2013

Title: Interpretation manual of European Union habitats- Eur 28

Author: European Commission- DG Environment

Series: European Commission

Year: 2015

Title: Blackstairs habitat mapping and biodiversity audit 2015

Author: Tubridy, M.; Iremonger, S.; Hickey, B.; O'Hanrahan, B.

Series: A report for the Blackstairs Farming Group

**Year:** 2015

Title: Blackstairs biodiversity inventory

Author: Smith, G.F.

Series: Unpublished report for the Blackstairs Farming Group

Year: 2015

Title: Developing a case for a Locally Led Agri-Environment Scheme for the Blackstairs

Author: Tubridy, M.; Gallagher, C.

Series: A report for the Blackstairs Farming Group

Year: 2015

Title: A proposal for a Locally Led, Results-based, Agri-Environment Payment Scheme (RBAPS) for

the Blackstairs Mountains

**Author:** Gallagher, C.; Jones, G.; Tubridy, M.

Series: A report for the Blackstairs Farming Group

**Year**: 2017

Title: Irish Vegetation Classification: Technical Progress Report No. 3

Author: Perrin, P.

Series: Report submitted to National Biodiversity Data Centre

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## Conservation Objectives for: Blackstairs Mountains SAC [000770]

#### 4010 Northern Atlantic wet heaths with *Erica tetralix*

To maintain the favourable conservation condition of Northern Atlantic wet heaths with *Erica tetralix* in Blackstairs Mountains SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	In Blackstairs Mountains SAC, wet heath occurs in mosaic with dry heaths (see the conservation objective for habitat 4030 in this volume) at the bases of some of the steeper slopes, and at lower levels where deeper peat has developed, but can be found on peat as shallow as 5cm (Tubridy et al., 2015; NPWS internal files). Tubridy et al. (2015) estimated the area of wet heath in the SAC to be c.356ha. See also Tubridy and Gallagher (2015), Gallagher et al. (2015) and Smith (2015) for further details
Habitat distribution	Occurrence	No decline, subject to natural processes	See the notes on Habitat area above
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil pH and nutrient status within natural ranges	Relevant nutrients and their natural ranges are yet to be defined. However, nitrogen deposition is noted as being relevant to this habitat (NPWS, 2013)
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	See Tubridy et al. (2015) for information on the wet heath vegetation communities recorded in the habitat in the SAC. Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014). See also the Irish Vegetation Classification (Perrin, 2017; www.biodiversityireland.ie/projects/national-vegetation-database/irish-vegetation-classification)
Vegetation composition: cross-leaved heath	Occurrence within 20m of a representative number of monitoring stops	Cross-leaved heath ( <i>Erica tetralix</i> ) present within a 20m radius of each monitoring stop	Attribute and target based on Perrin et al. (2014). Cross-leaved heath is the only characteristic species of the habitat listed in European Commission (2013). Whilst it is seldom abundant in wet heaths, its presence at high frequencies is considered one of the few characteristics common between the varied communities of this habitat (JNCC, 2009)
Vegetation composition: positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 50%	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented. Positive indicator species recorded in the habitat in the SAC include ling (Calluna vulgaris), cross-leaved heath (Erica tetralix), tormentil (Potentilla erecta), bog asphodel (Narthecium ossifragum), common cottongrass (Eriophorum angustifolium) and heath milkwort (Polygala serpyllifolia). In some places, the wet heath is flushed, with a dominance of sedges, such as carnation sedge (Carex panicea), star sedge (C. echinata), green-ribbed sedge (C. binervis), common yellow-sedge (C. demissa), with other species including bog asphodel and deergrass (Trichophorum cespitosum) (NPWS, 2006; Tubridy et al., 2015; NPWS internal files)
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of <i>Cladonia</i> and <i>Sphagnum</i> species, <i>Racomitrium lanuginosum</i> and pleurocarpous mosses at least 10%	Attribute and target based on Perrin et al. (2014). A plentiful lichen/bryophyte layer is characteristic of this habitat. Bryophytes recorded in the habitat in the SAC, particularly in flushed areas, include Racomitrium lanuginosum, Sphagnum cuspidatum, S. denticulatum, S. palustre, S papillosum, S. subnitens, Rhytidiadelphus squarrosus and Hylocomium splendens (NPWS, 2006; Tubridy et al., 2015; NPWS internal files)

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Vegetation composition: ericoid species and crowberry	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of ericoid species and crowberry ( <i>Empetrum</i> <i>nigrum</i> ) at least 15%	Attribute and target based on Perrin et al. (2014). A dwarf shrub layer with ericoid species is characteristic of this habitat (crowberry is only rarely present). Low cover of these species would be indicative of chronic overgrazing, burning, etc.
Vegetation composition: dwarf shrub species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of dwarf shrubs less than 75%	Attribute and target based on Perrin et al. (2014). A dwarf shrub layer is characteristic of wet heaths, but the vegetation should be a mixture of dwarf shrub and graminoid species with higher cover of dwarf shrubs being potentially indicative of drainage
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented
Vegetation composition: non- native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). Non-native species can be invasive and have deleterious effects on native vegetation. A low target is set as non-native species can spread rapidly and are most easily dealt with when still at lower abundances
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 20%	Attribute and target based on Perrin et al. (2014). High cover of native trees and shrubs would indicate that the habitat may be succeeding towards scrub or woodland due to lack of grazing or due to the habitat drying out
Vegetation composition: bracken	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of bracken ( <i>Pteridium aquilinum</i> ) less than 10%	Attribute and target based on Perrin et al. (2014). High cover of bracken would indicate that the habitat may be succeeding towards a dense bracken community
Vegetation composition: soft rush	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of soft rush ( <i>Juncus effusus</i> ) less than 10%	Attribute and target based on Perrin et al. (2014). High cover of soft rush would suggest undesirable hydrological conditions. Note, however, that poor flushes dominated by soft rush can naturally occur in mosaic with this habitat. Discrete areas of this separate habitat should not be considered here
Vegetation structure: <i>Sphagnum</i> condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the Sphagnum cover is crushed, broken and/or pulled up	Attribute and target based on Perrin et al. (2014). High levels of disturbed <i>Sphagnum</i> would indicate undesirable levels of grazers
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids, crowberry ( <i>Empetrum nigrum</i> ) and bog-myrtle ( <i>Myrica gale</i> ) showing signs of browsing	Attribute and target based on Perrin et al. (2014)
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas for this habitat is also presented
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014). Disturbance can include hoof marks, wallows, human footprints and vehicle and machinery tracks. Excessive disturbance can result in loss of characteristic species and presage erosion for heaths and peatlands
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Attribute and target based on Perrin et al. (2014). Drainage can result in loss of characteristic species and transition to drier habitats
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat and no decline in status of hepatic mats associated with this habitat	

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## Conservation Objectives for: Blackstairs Mountains SAC [000770]

#### 4030 European dry heaths

To maintain the favourable conservation condition of European dry heaths in Blackstairs Mountains SAC, which is defined by the following list of attributes and targets:

Measure	Target	Notes
Hectares	Area stable or increasing, subject to natural processes	Dry heath is the dominant habitat in Blackstairs Mountain SAC and is characterised by ling heather ( <i>Calluna vulgaris</i> ) dominance. The amount of ling cover in a particular area depends on the burning history. In places, the habitat occurs in mosaic with other habitats, including exposed rock outcrops and upland grassland and, in places, wet heath (see the conservation objective for habitat 4010 in this volume). Tubridy et al. (2015) estimated the area of dry heath in the SAC to be c.2,745ha. See also Tubridy and Gallagher (2015), Gallagher et al. (2015) and Smith (2015) for further details
Occurrence	No decline, subject to natural processes	See the notes for Habitat area above
Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil pH and nutrient status within natural ranges	Relevant nutrients and their natural ranges are yet to be defined. However, nitrogen deposition is noted as being relevant to this habitat (NPWS, 2013)
		See Tubridy et al. (2015) for information on the dry heath vegetation communities recorded in the habitat in the SAC. Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014). See also the Irish Vegetation Classification (Perrin, 2017; www.biodiversityireland.ie/projects/national-vegetation-database/irish-vegetation-classification)
Number of species at a representative number of 2m x 2m monitoring stops	Number of bryophyte or non-crustose lichen species present at each monitoring stop is at least three, excluding <i>Campylopus</i> and <i>Polytrichum</i> mosses	Attribute and target based on Perrin et al. (2014). Dry heath is not necessarily rich in lichen and bryophyte species, but a minimum amount should still be present. Abundant bryophyte cover has beer recorded in the habitat in the SAC, particularly in areas that have escaped burning, including the species <i>Hylocomium splendens, Hypnum cupressiforme, Pleurozium schreberi, Racomitrium lanuginosum</i> and <i>Rhytidiadelphus squarrosus</i> (NPWS, 2006; Tubridy et al., 2015; NPWS internal files)
Number of species at a representative number of 2m x 2m monitoring stops	Number of positive indicator species present at each monitoring stop is at least two	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat, which is composed of dwarf shrubs, is also presented. See also the Article 17 habitat assessment for 4030 (NPWS, 2013, 2019). Positive indicator species recorded in the habitat in the SAC include ling ( <i>Calluna vulgaris</i> ), bell heather ( <i>Erica cinerea</i> ), western gorse ( <i>Ulex gallii</i> ), crowberry ( <i>Empetrum nigrum</i> ), bilberry ( <i>Vaccinium myrtillus</i> ) and cowberry ( <i>V. vitis-idaea</i> ) (NPWS, 2006; Tubridy et al., 2015; NPWS internal files)
Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 50% for siliceous dry heath and 50- 75% for calcareous dry heath	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat, which is composed of dwarf shrubs, is also presented. See also the Article 17 habitat assessment for 4030 (NPWS, 2013, 2019)
Percentage cover at a representative number of 2m x 2m monitoring stops	Proportion of dwarf shrub cover composed collectively of bog-myrtle ( <i>Myrica gale</i> ), creeping willow ( <i>Salix repens</i> ) and western gorse ( <i>Ulex gallii</i> ) is less than 50%	Attribute and target based on Perrin et al. (2014). Bog-myrtle is indicative of flushed conditions and is more characteristic of wet heaths and blanket bogs. Creeping willow is more characteristic of dune heaths. Western gorse is a component of dry heath, but high proportions of it may indicate a history of undesirable levels of grazing
	Occurrence  Soil pH and appropriate nutrient levels at a representative number of monitoring stops  Abundance of variety of vegetation communities  Number of species at a representative number of 2m x 2m monitoring stops  Number of species at a representative number of 2m x 2m monitoring stops  Percentage cover at a representative number of 2m x 2m monitoring stops  Percentage cover at a representative number of 2m x 2m monitoring stops	Area stable or increasing, subject to natural processes  Soil pH and appropriate nutrient levels at a representative number of monitoring stops  Abundance of variety of vegetation communities, subject to natural processes  Number of species at a representative number of 2m x 2m monitoring stops  Number of species at a representative number of 2m x 2m monitoring stops  Number of species at a representative number of 2m x 2m monitoring stops  Percentage cover at a representative number of 2m x 2m monitoring stops  Percentage cover at a representative number of 2m x 2m monitoring stops  Percentage cover at a representative number of 2m x 2m monitoring stops  Percentage cover at a representative number of 2m x 2m monitoring stops  Cover of positive indicator species at least 50% for siliceous dry heath and 50-75% for calcareous dry heath  Percentage cover at a representative number of 2m x 2m monitoring stops  Cover of positive indicator species at least 50% for siliceous dry heath and 50-75% for calcareous dry heath  Percentage cover at a representative number of 2m x 2m monitoring stops  Cover of positive indicator species at least 50% for siliceous dry heath and 50-75% for calcareous dry heath  Percentage cover at a representative number of 2m x 2m monitoring stops  Cover of positive indicator species at least 50% for siliceous dry heath and 50-75% for calcareous dry heath  Percentage cover at a representative number of 2m x 2m monitoring stops  Cover of positive indicator species at least 50% for siliceous dry heath and 50-75% for calcareous dry heath  Percentage cover at a representative number of 2m x 2m monitoring stops  Cover of positive indicator species at least 50% for siliceous dry heath and 50-75% for calcareous dry heath

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Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented
Vegetation composition: non- native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). Non-native species can be invasive and have deleterious effects on native vegetation. A low target is set as non-native species can spread rapidly and are most easily dealt with when still at lower abundances
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 20%	Attribute and target based on Perrin et al. (2014). High cover of native trees and shrubs would indicate that the habitat may be succeeding towards scrub or woodland due to lack of grazing
Vegetation composition: bracken	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of bracken ( <i>Pteridium aquilinum</i> ) less than 10%	Attribute and target based on Perrin et al. (2014). High cover of bracken would indicate that the habitat may be succeeding towards a dense bracken community. In the habitat in this SAC, bracken has became more common in places that have been burnt often and intensively (Tubridy et al., 2015)
Vegetation composition: soft rush	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of soft rush ( <i>Juncus effusus</i> ) less than 10%	Attribute and target based on Perrin et al. (2014). High cover of soft rush would suggest undesirable hydrological conditions. Note, however, that poor flushes dominated by soft rush can naturally occur in mosaic with this habitat. Discrete areas of this separate habitat should not be considered here
Vegetation structure: senescent ling	Percentage cover at a representative number of 2m x 2m monitoring stops	Senescent proportion of ling ( <i>Calluna vulgaris</i> ) cover less than 50%	Attribute and target based on Perrin et al. (2014). Senescence is part of the natural cycle of ling, but a dominance of ling in the senescent phase would indicate a lack of management (appropriate grazing or burning) to promote ling regeneration
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids showing signs of browsing	Attribute and target based on Perrin et al. (2014)
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas is also presented. Fires can be part of the natural cycle of heaths and may, under carefully controlled circumstances, be used as an occasional management tool to promote regeneration of, or diversity of growth phases, in ling ( <i>Calluna vulgaris</i> ). However, currently most hill fires in Ireland are intentionally started to encourage grass growth for livestock. Fires which are too intense, too frequent, too extensive or which occur in sensitive areas are damaging to the habitat. In this SAC, some of the dry heath had been frequently and intensively burnt, sometimes leading to ling becoming the sole dwarf shrub present or sometimes leading to extensive exposure of bare peat or soil (Tubridy et al., 2015)
Vegetation structure: growth phases of ling	Percentage cover in local vicinity of a representative number of monitoring stops	Outside sensitive areas, all growth phases of ling ( <i>Calluna vulgaris</i> ) should occur throughout, with at least 10% of cover in the mature phase	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas is also presented. The growth phases of ling are pioneer (<10cm high), building (10-30cm high) and mature (<30cm high). As burning is undesirable in sensitive areas, it is not reasonable to require the stated diversity of growth phases within these areas
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014). Disturbance can include hoof marks, wallows, human footprints and vehicle and machinery tracks. Excessive disturbance can result in loss of characteristic species and presage erosion for heaths and peatlands

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Indicators of local Occurrence and No decline in distribution or This includes species on the Flora (Protection) distinctiveness population size population sizes of rare, threatened or scarce habitat and no decline in status of hepatic mats associated with this habitat

Order, 2015 and/or Red Lists (Byrne et al., 2009; Regan et al., 2010; Lockhart et al., 2012; Wyse species associated with the Jackson et al., 2016, etc.). The Near Threatened and Annex V listed stag's-horn clubmoss (Lycopodium clavatum) (Wyse Jackson et al., 2016) has been recorded associated with the habitat in the SAC (NPWS internal files). The Near Threatened bryophytes Gymnomitrion obtusum, Leptodontium flexifolium and Sphagnum russowii (Lockhart et al., 2012) have been recorded in the SAC but cannot be specifically assigned to this habitat. A depauperate variant of the Northern Atlantic hepatic mat, with only the most common species present, is present high in the east corrie of Mount Leinster (Lockhart et al., 2012)

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