European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC)

Fourth Report by the United Kingdom under Article 17

on the implementation of the Directive
from January 2013 to December 2018

Supporting documentation for the
conservation status assessment for the habitat:

H6150 - Siliceous alpine and boreal grasslands

NORTHERN IRELAND

IMPORTANT NOTE - PLEASE READ

- The information in this document is a country-level contribution to the UK Report on the conservation status of this habitat, submitted to the European Commission as part of the 2019 UK Reporting under Article 17 of the EU Habitats Directive.
- The 2019 Article 17 UK Approach document provides details on how this supporting information was used to produce the UK Report.
- The UK Report on the conservation status of this habitat is provided in a separate document.
- The reporting fields and options used are aligned to those set out in the European Commission guidance.
- Explanatory notes (where provided) by the country are included at the end. These provide an audit trail of relevant supporting information.
- Some of the reporting fields have been left blank because either: (i) there was insufficient information to complete the field; (ii) completion of the field was not obligatory; and/or (iii) the field was only relevant at UK-level (sections 10 Future prospects and 11 Conclusions).
- For technical reasons, the country-level future trends for Range, Area covered by habitat and Structure and functions are only available in a separate spreadsheet that contains all the country-level supporting information.
- The country-level reporting information for all habitats and species is also available in spreadsheet format.

Visit the JNCC website, https://jncc.gov.uk/article17, for further information on UK Article 17 reporting.

Report on the main results of the surveillance under Article 17 for Annex I habitat types (Annex D)

NATIONAL LEVEL

1. General information

1.1 Member State	**UK (Northern Ireland information only)**
1.2 Habitat code	**6150 - Siliceous alpine and boreal grasslands**

2. Maps

2.1 Year or period	2013-2018
2.3 Distribution map	Yes
2.3 Distribution map Method used	Complete survey or a statistically robust estimate
2.4 Additional maps	No

BIOGEOGRAPHICAL LEVEL

3. Biogeographical and marine regions

3.1 Biogeographical or marine region where the habitat occurs	**Atlantic (ATL)**
3.2 Sources of information	Allison, N. (1994). Erosion Profile - High Mournes. Environment and Heritage Service. Belfast. Armstrong, J. I., Calvert, J. & Ingold, C. T. (1930). The Ecology of the Mountains of Mourne with Special Reference to Slieve Donard. Proceeding of the Royal Irish Academy, XX, 440-452. Cooper, A. & McCann, T. (2001). The Northern Ireland Countryside Survey 2000. Environment and Heritage Service, Belfast Cooper, A., McCann, T. and Rogers, D. (2009) Northern Ireland Countryside Survey 2007: Broad Habitat Change 1998-2007. Northern Ireland Environment Agency. Northern Ireland Environment Agency Research and Development Series No. 09/06. Belfast. 58 pp. McCann, T., Rogers, D. and Cooper, A. (2009) Northern Ireland Countryside Survey 2007: Field methods and technical manual. Northern Ireland Environment Agency. Northern Ireland Environment Agency, Research and Development Series No 09/07. Belfast. Murray, R., McCann, T. and Cooper, A. (1992). A Land Classification and Landscape Ecological Study of Northern Ireland. Department of the Environment NI and Department of Environmental Studies, University of Ulster, Coleraine. Rodwell, J.S. (1992). British Plant Communities. Volume 3, Grasslands amd montane communities. Cambridge: Cambridge University Press NIEA. Internal Condition Assessment Reports (various sites and years). Rodwell, J.S., Dring, J.C., Averis, A.B.V., Proctor, M.C.F., Malloch, A.J.C., Schaminee, J.H.J & Dargie, T.C.D. 1998. Review of Coverage of the National Vegetation Classification. Lancaster: Unit of Vegetation Science report to the Joint Nature Conservation Committee. Data on aerial Nitrogen deposition taken from Air Pollution Information System website - http://www.apis.ac.uk/ NIEA. Internal Survey Reports (various sites and years). Warnock, J. (2000) Heathland Productivity and the Determination of Stocking Densities in the Eastern Mournes Area of Special Scientific Interest. PhD thesis, The Queen's University of Belfast. Wilson, C. (1992) A vegetation survey of the Mourne uplands 1990 - 1992, Final Report. Mournes Advisory Council, Newcastle. Ferris, C. (1994). The management of recreation induced erosion in a granite

upland - the Mourne Mountains. PhD thesis, The Queen's University of Belfast
Smith, B. J., Thomas, M. & Bloomfield, C. (1998). Erosion hazard and footpath condition survey of the High Mourne Mountains. Environment and Heritage Service. Belfast.

4. Range

4.1 Surface area (in km²)			
4.2 Short-term trend Period			
4.3 Short-term trend Direction	Stable (0)		
4.4 Short-term trend Magnitude	a) Minimum	b) Maximum	
4.5 Short-term trend Method used			
4.6 Long-term trend Period			
4.7 Long-term trend Direction			
4.8 Long-term trend Magnitude	a) Minimum	b) Maximum	
4.9 Long-term trend Method used			
4.10 Favourable reference range	a) Area (km²) b) Operator c) Unknown No d) Method		
4.11 Change and reason for change in surface area of range	No change The change is mainly due to:		
4.12 Additional information			

5. Area covered by habitat

5.1 Year or period	2013-2018			
5.2 Surface area (in km²)	a) Minimum	b) Maximum	c) Best single value	0.6
5.3 Type of estimate	Best estimate			
5.4 Surface area Method used	Based mainly on extrapolation from a limited amount of data			
5.5 Short-term trend Period	2007-2018			
5.6 Short-term trend Direction	Stable (0)			
5.7 Short-term trend Magnitude	a) Minimum	b) Maximum	c) Confidence interval	
5.8 Short-term trend Method used	Based mainly on extrapolation from a limited amount of data			
5.9 Long-term trend Period	1994-2018			
5.10 Long-term trend Direction	Stable (0)			
5.11 Long-term trend Magnitude	a) Minimum	b) Maximum	c) Confidence interval	
5.12 Long-term trend Method used	Based mainly on expert opinion with very limited data			
5.13 Favourable reference area	a) Area (km²) b) Operator c) Unknown No d) Method			
5.14 Change and reason for change in surface area of range	No change The change is mainly due to:			
5.15 Additional information				

Report on the main results of the surveillance under Article 17 for Annex I habitat types (Annex D)

6. Structure and functions

6.1 Condition of habitat	a) Area in good condition (km^2)	Minimum	0	Maximum	0
	b) Area in not-good condition (km^2)	Minimum	0.32	Maximum	0.32
	c) Area where condition is not known (km^2)	Minimum	0.28	Maximum	0.28
6.2 Condition of habitat Method used	Based mainly on extrapolation from a limited amount of data				
6.3 Short-term trend of habitat area in good condition Period	2007-2018				
6.4 Short-term trend of habitat area in good condition Direction	Increasing (+)				
6.5 Short-term trend of habitat area in good condition Method used	Based mainly on extrapolation from a limited amount of data				
6.6 Typical species	Has the list of typical species changed in comparison to the previous reporting period?	No			
6.7 Typical species Method used					
6.8 Additional information					

7. Main pressures and threats

7.1 Characterisation of pressures/threats

Pressure	Ranking
Intensive grazing or overgrazing by livestock (A09)	H
Burning for agriculture (A11)	M
Mixed source air pollution, air-borne pollutants (J03)	H
Droughts and decreases in precipitation due to climate change (N02)	M
Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01)	M
Sports, tourism and leisure activities (F07)	H

Threat	Ranking
Intensive grazing or overgrazing by livestock (A09)	M
Burning for agriculture (A11)	M
Mixed source air pollution, air-borne pollutants (J03)	H
Droughts and decreases in precipitation due to climate change (N02)	H
Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01)	H
Sports, tourism and leisure activities (F07)	H

7.2 Sources of information

7.3 Additional information

8. Conservation measures

Report on the main results of the surveillance under Article 17 for Annex I habitat types (Annex D)

8.1 Status of measures	a) Are measures needed?	Yes
	b) Indicate the status of measures	Measures identified and taken
8.2 Main purpose of the measures taken		Restore the habitat of the species (related to 'Habitat for the species')
8.3 Location of the measures taken		Both inside and outside Natura 2000
8.4 Response to the measures		Medium-term results (within the next two reporting periods, 2019-2030)
8.5 List of main conservation measures		

Adapt mowing, grazing and other equivalent agricultural activities (CA05)

Reduce impact of mixed source pollution (CJ01)

Implement climate change adaptation measures (CN02)

Reduce impact of outdoor sports, leisure and recreational activities (CF03)

8.6 Additional information

9. Future prospects

9.1 Future prospects of parameters	a) Range b) Area c) Structure and functions
9.2 Additional information	

10. Conclusions

10.1. Range	
10.2. Area	
10.3. Specific structure and functions (incl. typical species)	
10.4. Future prospects	
10.5 Overall assessment of Conservation Status	
10.6 Overall trend in Conservation Status	
10.7 Change and reasons for change in conservation status and conservation status trend	a) Overall assessment of conservation status No change The change is mainly due to: b) Overall trend in conservation status No change The change is mainly due to:
10.8 Additional information	

11. Natura 2000 (pSCIs, SCIs, SACs) coverage for Annex I habitat types

Report on the main results of the surveillance under Article 17 for Annex I habitat types (Annex D)

11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network (in km² in biogeographical/ marine region)	a) Minimum b) Maximum c) Best single value	0.32
11.2 Type of estimate		Best estimate
11.3 Surface area of the habitat type inside the network Method used		Complete survey or a statistically robust estimate
11.4 Short-term trend of habitat area in good condition within the network Direction		Increasing (+)
11.5 Short-term trend of habitat area in good condition within network Method used		Complete survey or a statistically robust estimate
11.6 Additional information		

12. Complementary information

12.1 Justification of % thresholds for trends	
12.2 Other relevant information	

Distribution Map

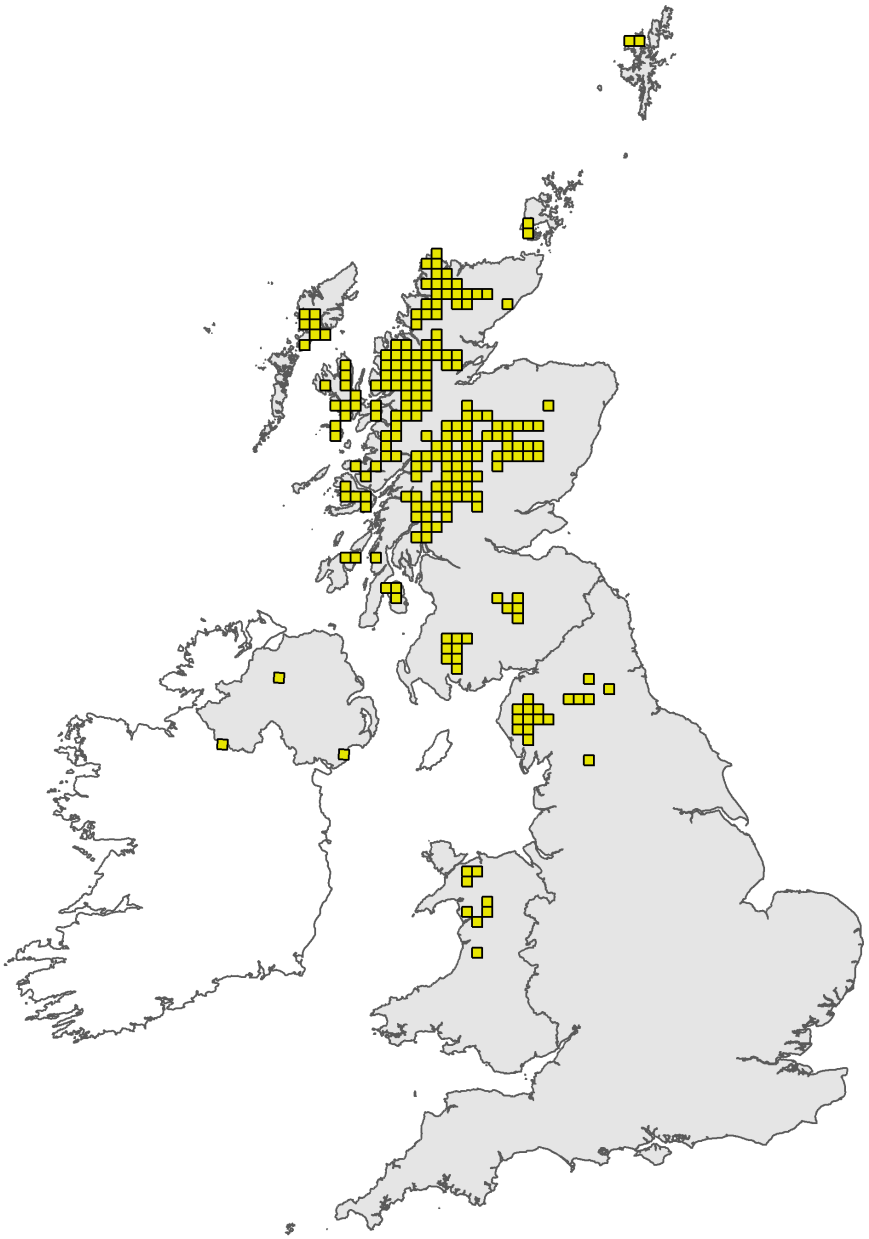

Figure 1: UK distribution map for H6150 - Siliceous alpine and boreal grasslands. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The 10km grid square distribution map is based on available habitat records which are considered to be representative of the distribution within the current reporting period. For further details see the 2019 Article17 UK Approach document.

Range Map

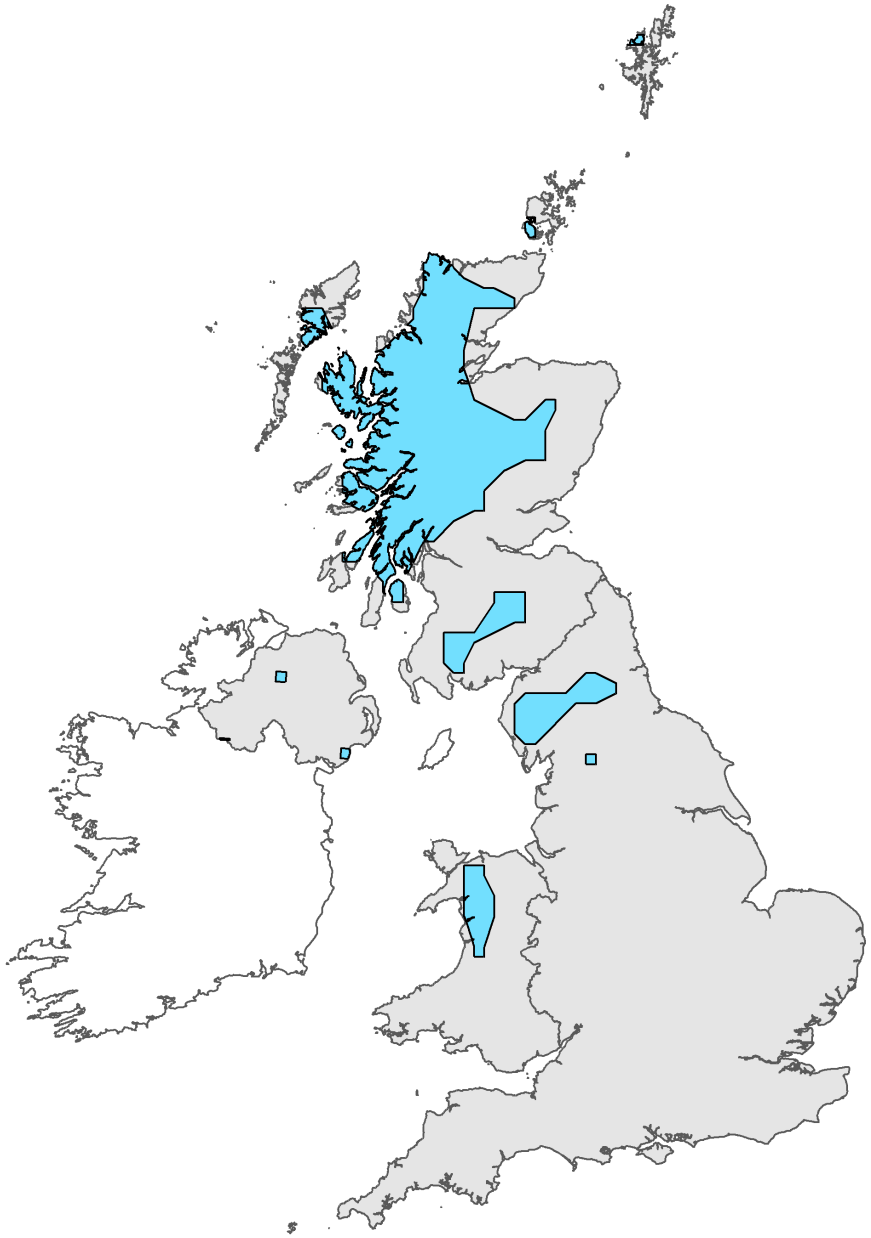

Figure 2: UK range map for H6150 - Siliceous alpine and boreal grasslands. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The range map has been produced by applying a bespoke range mapping tool for Article 17 reporting (produced by JNCC) to the 10km grid square distribution map presented in Figure 1. The alpha value for this habitat was 25km. For further details see the 2019 Article 17 UK Approach document.

Explanatory Notes

Habitat code: 6150

Field label	Note
2.2 Distribution map	The UK and Ireland support the only examples of this vegetation within the Atlantic Biogeographic Region. In the UK extensive areas of the habitat type occur chiefly in Scotland. Siliceous alpine and boreal grassland is found in the high mountain zone, i.e. above an altitude of about 750 m. There are four main sub-types recognised by the NVC, although these are referred to as 'heath'. These are: U7 Nardus stricta-Carex bigelowii grass-heath, U8 Carex bigelowii-Polytrichum alpinum sedge-heath, U9 Juncus trifidus-Racomitrium lanuginosum rush-heathand U10 Carex bigelowii-Racomitrium lanuginosum moss-heath. U10 Carex bigelowii-Racomitrium lanuginosum moss-heath is the most common sub-type and occurs on wind-swept ground blown clear of snow during the winter. Where snow-lie builds up, such moss-heath gives way to U7 Nardus stricta-Carex bigelowii grass-heath, and then to U8 Carex bigelowii-Polytrichum alpinum sedge-heath where snow-lie is more prolonged. U9 Juncus trifidus-Racomitrium lanuginosum rush-heath is found where exposure is more severe or the substrate more unstable, and the latter represents the habitat type at its highest altitude. The habitat is important for a wide range of montane vascular plants, mosses and liverworts. Since the habitat is generally confined in the UK to altitudes above 750m, there are few examples in NI. It has not been well sampled, but we believe that U10 occurs on the higher summits of the Mourne Mountains (e.g. Slieves Donard and Commedagh), Dart and Sawel Mountains in the Sperrin Mountain range, and possibly in a few places on the summit of Cuilcagh Mountain. Like other high altitude habitats in NI, individual stands are small and fragmented. Furthermore, NI lacks many of the species, particularly arctic-alpine elements, that are characteristic of better-developed stands from the remainder of the United Kingdom. Note that this habitat and H4060 Alpine and Boreal Heaths form the Priority habitat Montane Heath - and the two communities share many characteristics.
2.3 Distribution map; Method used	Map based upon fieldwork by NIEA staff at SACs and other locations. During the reporting period, NIEA staff have generally visited SACs; the habitat is very rare outside of these areas.

Habitat code: 6150 Region code: ATL

Field label	Note
10.6 Overal trend in Conservation Status	Deteriorating assessment based upon the impacts of aerial Nitrogen deposition and unknown condition of resource outside protected sites network, despite improving condition at Eastern Mournes SAC.
4.1 Surface area	Survey work has covered the main areas of Silceous alpine grassland in NI. The habitat is rare and restricted to a very narrow environmental range in NI. There is no reason to believe that there has been a loss in range; certainly no loss in range has been recorded in the habitat on SACs since the condition assessment programme was introduced in 2002.
4.5 Short term trend; Method used	Based upon regular condition monitoring of the habitat in the Eastern Mournes SAC. It is believed that this represents the most extensive area of the habitat in NI.
5.2 Surface area	The figure for NI of 60 ha of Siliceous Alpine grassland is an estimate based upon survey work by NIEA staff.
5.4 Surface area; Method used	The figure for NI of 60 ha of Siliceous alpine grassland is an estimate based upon fieldwork by NIEA staff.

5.6 Short term trend; Direction	Assessment of stable based upon recent condition assessment work undertaken by NIEA staff at Siliceous alpine grassland sites in the Eastern Mournes SAC. No change in extent noted.
5.8 Short term trend; Method used	Assessment of stable based upon recent condition assessment work undertaken by NIEA staff at Siliceous alpine grassland sites in the Eastern Mournes SAC. No change in extent noted.
5.10 Long term trend; Direction	Long term trend believed to be stable.
5.12 Long term trend; Method used	Long term trend believed to be stable - based upon fieldwork at the main site for the habitat, Eastern Mournes SAC. Extent at other sites not well surveyed - hence method assessed as Based mainly on expert opinion with very limited data.
6.1 Condition of habitat	Recent condition assessment data for SACs show that the Siliceous alpine grasslands habitat on the Eastern Mournes is unfavourable. This represents over half the estimated area of the habitat in NI, while the condition of the remainder is currently unknown. However, there are signs of improvement in the condition of the heath on the Eastern Mournes, and it is hoped that there will soon be more favourable management regimes in place on this and other sites through current Interreg Va and RDP programmes.
6.2 Condition of habitat; Method used	Condition has been largely assessed from data taken from the most recent Common Standards Monitoring of Siliceous alpine grassland at Eastern Mournes SAC. This represents over half of the estimated resource resource in NI. Extrapolating the evidence from the protected sites network to the wider resource of Siliceous alpine grassland would suggest that a high proportion of the overall resource is likely to be in unfavourable condition, although showing signs of improvement.
6.4 Short term trend of habitat area in good condition; Direction	Increasing assessment based upon Condition Assessment of the habitat at the Eastern Mournes where, although still in unfavourable condition, the habitat is showing signs of recovery.

7.1 Characterisation of pressures/ threats	Condition Assessment data for SACs suggest that a high proportion of Siliceous alpine grassland is in unfavourable condition. Previously, heavy grazing was responsible for much of this poor condition. Excessive grazing, trampling and nutrient inputs from dunging and urination results in a reduction in cover and eventual elimination of characteristic species. This can lead to the replacement of thick swards of Racomitrium lanuginosum with thin grassy swards. In extreme cases, very heavy grazing and trampling can lead to exposure of bare soil and erosion. However, recent condition assessments suggest that grazing intensity has been reduced. In contrats to H4060 Alpine and Boreal Heaths, accidental burning is unlikely to be an issue. Recreational pressures in the form of hill walking are a localised but significant pressure in some locations. Many popular walking routes traverse areas of upland habitats to the mountain summits. The effects of recreational pressure therefore tend to be concentrated on montane heaths (i.e. both Siliceous alpine grasslands and H4060), which occupy such a small area on the mountain tops and are especially sensitive to disturbance. The annual 'Mourne Wall Walk' was stopped in the 1983 due to erosion and the effect it was having on plant communities (Smith, Thomas & Bloomfield, 1998). Since 1990, a perceived upsurge in recreational use initiated a number of studies on path erosion in the High Mournes (the area enclosed within the Mourne Wall) (Allinson, 1994; Ferris 1994; Smith et al, 1998). However, no reliable data exists on current use in the High Mournes, either in terms of overall numbers of walkers and other recreational users or the pattern of use in space and time (Smith et al, 1998). It is therefore difficult to forecast the future, but based on the trends in other upland areas in Great Britain, there is a prediction that recreational use of upland areas in Northern Ireland, especially the High Mournes is likely to increase significantly. Climate change will inevitably have some effects on the habitat, through changing patterns of rainfall and temperature. It is difficult to predict what the long-term effects of this will be. The habitat is very sensitive to aerial Nitrogen deposition, with a critical load range listed in the APIS website as 5 -10 kg N /ha/yr. Most of NI receives above this rate - in some cases considerably higher than this, and the main area for the habitat - the Eastern Mournes SAC - has a predicted annual rate of 21.8 kg/N/ha/year (average figure), well above the upper threshold.
7.2 Sources of information	Threats and pressures assessed from the most recent Common Standards Monitoring of montane heath (H4060 and H6150) at protected sites (SACs and ASSIs), in addition to expert judgement to assess pressures in the wider countryside. Threats based upon current pressures and expert judgement on future trends.
8.1 Status of measures	As discussed above, recent monitoring of Siliceous alpine grassland on SACs has shown that much of the habitat is in unfavourable condition. However, measures have been put in place at the Eastern Mournes SAC - the most extensive area of Siliceous alpine grassland in NI - to improve condition. Here NIEA's Environment Fund has been used to develop conservation management plans and initiate a programme of wildfire management measures. Although some of these measures are primarily aimed at the other, more extensive upland habitats present such as dry and wet heaths, there will also be beneficial effects for Siliceous alpine grassland. It is hoped that further measures for the habitat will be put in place under the Environmental Farming Scheme (EFS).

8.2 Main purpose of the measures taken	Measures aimed at reducing damaging impacts from current pressures and future threats. Like H4060, the habitat is very rare in NI and restricted to a very narrow environmental range (i.e. mountain summits above around 600m altitude). There is therefore little opportunity to extend the range or extent of the habitat. There is little doubt that heavy grazing pressure in recent decades on the high mountain summits where it occurs has tended to reduce the distinctive features of this vegetation, favouring an increase in fine-leaved grasses and resistant herbs like Heath Bedstraw Galium saxatile at the expense of Racomitrium lanuginosum. These degraded montane communities are more akin to NVC classification U4 Festuca ovina-Agrostis capillaris-Galium saxatile grassland (Rodwell, 1991). Hence, this is reported as Restore the structure and functions, including the status of typical species (related to 'Specific structure and functions') - i.e. in particular to restore the former abundance of Racomitrium lanuginosum as one of the most characteristic species of this habitat type.
8.3 Location of the measures taken	Management measures have been taken at the Eastern Mournes SAC. It is hoped that other areas of Siliceous alpine grassland across NI will be entered into the Environment Farming Scheme (EFS), which aims to implement sympathetic management.
9.1 Future prospects of parameters	Condition Assessment data for SACs suggest that a high proportion of Siliceous Alpine grassland is in unfavourable condition. However, much of the habitat is in recovering condition and management measures are in place or proposed. Future Prospects for Structure and Function need to be assessed on the balance between improving condition and management measures in place or proposed on the one hand, against aerial Nitrogen deposition exceedance over much of the habitat. The habitat is very sensitive to aerial Nitrogen deposition, with a critical load range listed in the APIS website as 5 -10 kg N /ha/yr. Most of the habitat in NI receives above this. The main area for the habitat in NI, the Eastern Mournes, has a predicted annual rate of 21.8 kg/N/ha/year (average figure). Although the Department is developing a road map to reduce atmospheric Nitrogen from agricultural sources, until this initiative is implemented and its impacts evaluated, advice from JNCC is that the assessment of Future Prospects for Structure and Function should be assessed as Negative.
10.1 Range	In NI, Siliceous alpine grassland is a scarce habitat limited to the summits and exposed ridges of the highest mountains. NIEA staff have visited most - if not all - of the resource over the last few years and there is no evidence that the range of the habitat has declined; therefore the current range is judged to be equal to the Favourable Reference Range - therefore Favourable assessment.
10.2 Area	In NI, Siliceous alpine grassland is a scarce habitat limited to the summits and exposed ridges of the highest mountains. Over the short term, there has been no evidence of loss in extent, although there is little doubt that the habitat in NI - like the rest of the UK - has been in decline, as overgrazing has converted it to other forms of heath and upland grassland (see Armstrong, J. I., Calvert, J. & Ingold, C. T. (1930)). These degraded montane communities are more akin to NVC classification U4 Festuca ovina-Agrostis capillaris-Galium saxatile grassland (Rodwell, 1991). However, we believe that this reflects poor habitat condition, rather than a loss in extent. Hence extent reported as Favourable.
10.3 Specific structure and functions	The Siliceous alpine grassland resource is reported as not good for structure and function. At the Eastern Mournes SAC which is the main area for the habitat in NI, the habitat is in unfavourable condition, albeit showing signs of improvement, and the site as a whole appears to be moving towards more favourable management. In the longer term it is hoped that this should improve the condition. The condition of the remainder of the resource is not known. Hence an Unfavourable Bad assessment.

10.4 Future prospects	Despite some positive developments within the protected sites network as a result of conservation measures both already in place and planned for the future, the structure and function of the Siliceous alpine grassland habitat is currently bad. Future prospects are uncertain in the light of potential impacts of climate change, but the added impact of atmospheric Nitrogen deposition make this attribute Unfavourable Bad.
10.5 Overall assessment of Conservation Status	Range is Favourable; extent is Favourable; Structure and function is bad, although indications are that this is improving, at the Eastern Mournes SAC at least. Future prospects are bad despite improving management on designated sites, with climate change impacts currently unpredictable and atmospheric Nitrogen deposition still a major threat. Hence an overall Unfavourable bad assessment.
11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network	Siliceous alpine grassland is a feature on 1 SAC: Eastern Mournes, which covers an estimated 32 ha of the habitat.
11.3 Surface area of the habitat type inside the network; Method used	Extent of Siliceous alpine grassland habitat on SACs has been estimated by field survey. CSM of SACs is undertaken on a regular basis and no recent loss in extent has been recorded.
11.4 Short term trend of habitat area in good condition within the network; Direction	Assessment of increasing based upon recent condition assessment data and potential implementation of further management measures. Although the majority of the Siliceous alpine grassland habitat in the Eastern Mournes SAC is unfavourable, a significant amount here is showing signs of improvement.
11.5 Short term trend of habitat area in good condition within the network; Method used	Assessment of based upon recent condition assessment data, in addition to the potential introduction of management measures that should improve the condition of the Siliceous alpine grassland.