Binevenagh Area of Special Scientific Interest (ASSI) Condition Assessment Report

Terrestrial Bryophyte Features 2024

Cite as:

Northern Ireland Environment Agency (NIEA). 2026. Binevenagh Area of Special Scientific Interest (ASSI) - Bryophyte *Condition Assessment Report.* Hodd, R.L. 2024, NIEA, DAERA.

Acknowledgements

The continued stewardship of the special lands within the ASSI, and access permission to undertake monitoring, is acknowledged. Many protected areas in Northern Ireland are owned and managed by private landowners and farmers and are not accessible to the public.

Summary

Using JNCC Common Standards Monitoring methodology (JNCC 2005), the Terrestrial bryophyte features of Binevenagh ASSI are currently defined as:

Bryophyte species of scree (Special habitat 20): Favourable.

Bryophyte species of basic montane cliffs (Special habitat 26): Favourable.

Overall, Binevenagh ASSI retains much of its naturalness and diversity, and remains a special place.

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1. Condition Statement

The interest features of Binevenagh ASSI and their condition status are summarised in Table 1 below.

It is important to note that under the Common Standards Monitoring methodology, a site is classified as unfavourable if any primary attribute is failing. In many cases, these sites continue to represent excellent examples of Northern Ireland's best natural assets.

Table 1: Binevenagh ASSI Interest Features summary results

ASSI Features	Reporting responsibility	Condition Assessment			
		2020-2025	2014-2019	2008-2013	2002-2007
Bryophyte species of scree (Special habitat 20)	Species - Flora	Favourable 3 favourable attributes 0 unfavourable attributes	Unassessed	Unassessed	Favourable
Bryophyte species of basic montane cliffs (Special habitat 26)	Species - Flora	Favourable Favourable 3 favourable attributes 0 unfavourable attributes	Unassessed	Unassessed	Favourable

*More detailed information on attribute breakdown is available in Section 7 and Appendix 1 of this report.

2. Background

The Department of Agriculture, Environment and Rural Affairs (hereafter referred to as the Department) in its role as the Statutory Nature Conservation Body, undertakes regular monitoring of the special assets, or features, contained within specially protected sites across Northern Ireland. These sites include Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Areas of Special Scientific Interest (ASSIs). Further details can be found at https://www.daerani.gov.uk/landing-pages/protected-areas.

This monitoring enables reporting on the status of the special features which are protected, enables objective feedback on current management measures and can inform any subsequent management intentions. Results can also contribute to the assessment of relevant policies in place, and also inform future policy development. In addition, the results inform the implementation of a range of obligations under both national and international policy and legislation. These include: the Convention on Biological Diversity (CBD), the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR), the Bern Convention, the Marine Strategy Framework Directive (MSFD), and the Water Framework Directive (WFD).

The monitoring undertaken is called Condition Assessment, as it is the condition of the special features that is being assessed. The approach is also known as Common Standards Monitoring, because the methodology aims to result in a *common standard* being reported across sites in NI and the rest of the UK. The Department aims to complete a rolling programme of ASSI Condition Assessment and reporting every six years.

The monitoring is focused, as outlined in the Joint Nature Conservation Committee (JNCC) guidance (JNCC, 2004), primarily on the interest features for which the site has been notified or designated. They include habitat types, species and earth science features, as well as complex features such as habitat mosaics and species assemblages. Each interest feature must be identified, monitored, assessed and reported upon separately.

Monitoring and assessment of the condition of the interest features of individual sites enables relevant authorities, agencies and landowners to adapt management measures accordingly to ensure conservation objectives are achieved.

The Conservation Objectives for each site contain details of the attributes (measurable targets) for each interest feature within the site: the condition assessment determines the condition status of each interest feature when compared against relevant feature attributes.

The JNCC Statement on Common Standards Monitoring (JNCC, 2022) assesses interest features using one of the following four condition categories. These are all common standards:

- **Favourable**: Condition objectives are being met
- **Unfavourable**: Condition objectives are not being met
- **Partially destroyed**: The feature, habitat or processes essential to support it have been removed or irretrievably altered. A condition assessment should be carried out on the remaining, intact feature.
- **Destroyed**: The interest feature, its supporting habitat or processes, have been affected (completely or partially) to such an extent that there is no hope of recovery.

The JNCC has listed the following trend qualifiers which were previously considered part of the common standards as optional, which the Department may choose to use as required:

- **Favourable – maintained**: The conservation objectives which were met at the previous assessment are still being met.
- **Favourable – recovered**: The interest feature has gained favourable condition, having been previously recorded as unfavourable.
- **Favourable – declining**: All targets are being met, but identified pressures indicate that unfavourable condition will result if these pressures are left unaddressed.
- **Unfavourable – recovering:** The interest feature has begun to show, or is continuing to show, a trend towards favourable condition.
- **Unfavourable - no change**. The interest feature is unfavourable but neither declining nor recovering.
- **Unfavourable - declining**. The interest feature is declining as a consequence of damaging activity, but where recovery is possible, either spontaneously or if suitable management input is made.

3. ASSI Overview

Binevenagh ASSI is situated along a basalt escarpment to the southeast of the mouth of Lough Foyle, backed by an upland moorland plateau, much of which is covered by commercial coniferous forestry. The escarpment runs roughly northeast-southwest for ca. 2km and is topped by a sheer

line of northwest to west-facing cliffs of up to 100m tall. Below the main cliffs, where slippage has occurred in the past, a lower band of cliffs and pinnacles occur, with areas of grassland and scree on steep slopes below both the upper and lower areas of crags, and in the sheltered valleys between the crags. The cliffs are generally calcareous in composition, with the screes and grassland ranging from calcareous to acidic, due to the complex underlying geology. A humid microclimate occurs at the base of the cliffs, due to the local topography and proximity to the sea. Below the lower cliffs a mixture of heathland, grassland and scrub occurs on gentler slopes and on moraines, sloping down to surrounding forestry below. The slopes below the cliffs are grazed by a mixture of grazing animals, with cattle and horses observed, within various fenced compartments. The bryophyte interest is associated primarily with the cliffs, both upper and lower, and the adjacent humid screes and scattered boulders.

Many protected areas in Northern Ireland are owned and managed by private landowners and farmers and are not accessible to the public.

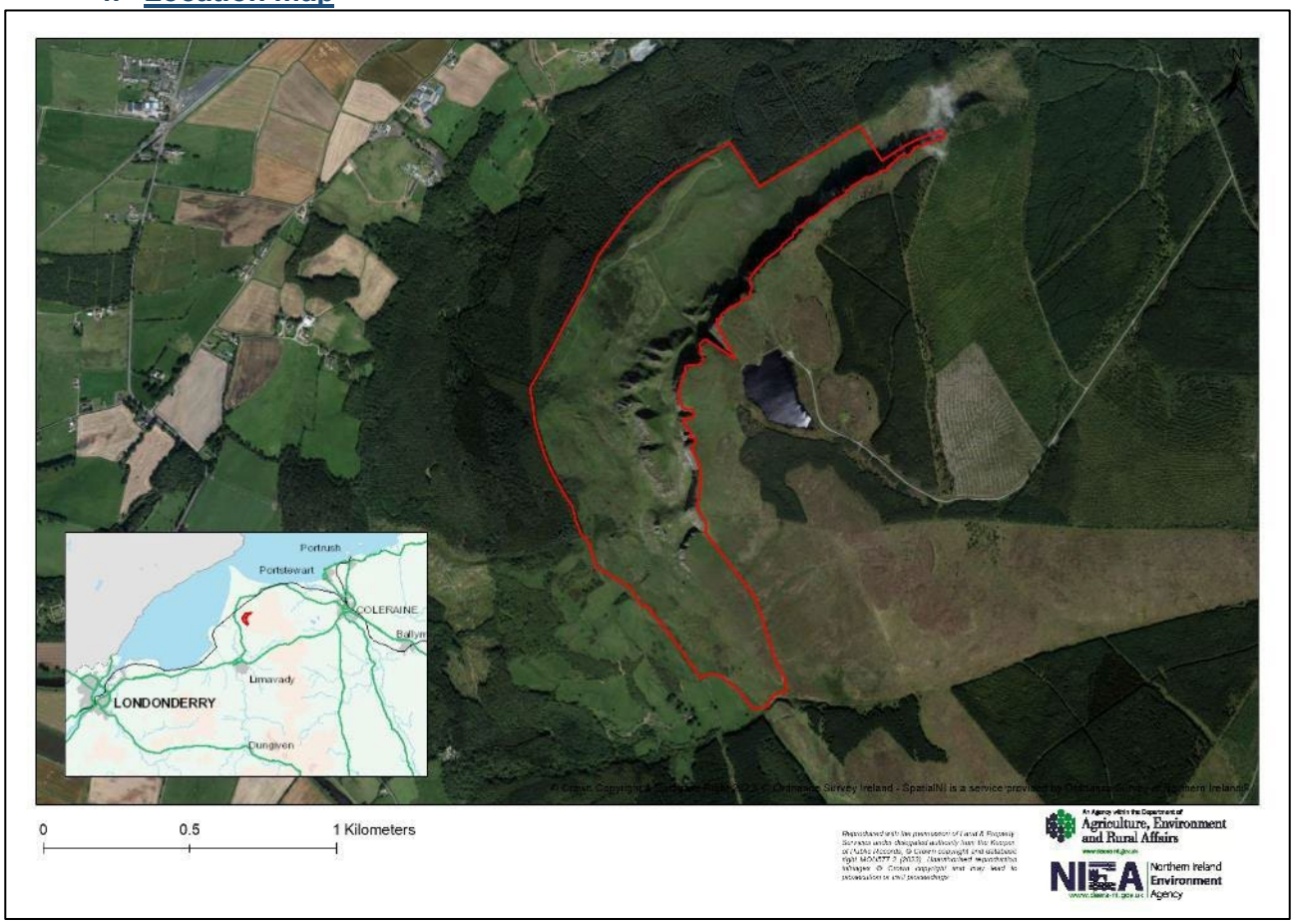
Table 2: ASSI details

ASSI name	Binevenagh
ASSI code	212
Council Area (s)	Causeway Coast and Glens Borough Council
Irish Grid Reference	C686309
Landowner details	Public and Private
ASSI size	90.79 ha
Date declared	24/07/2000

Further information on Binevenagh ASSI is available via:

- DAERA website;
- NIEA map viewer;
- NBN (National Biodiversity Network) Atlas NI

4. Location map



5. Feature description

Binevenagh has long been known for its rich bryophyte flora, associated primarily with the baserich basalt cliffs. The most notable species of these cliffs is the moss *Syntrichia princeps* (Brown Screw-moss), which is listed as Regionally Extinct in Ireland by Lockhart *et al.* 2012, but was refound in Antrim in 2012, and at this site in 2019, so would now more appropriately be regarded as Critically Endangered. Other threatened or Near Threatened bryophytes recorded on these crags include *Bartramia ithyphylla* (Straight-leave Apple-moss), *Rhabdoweisia fugax* (Dwarf Streak-moss), *Rhodobryum roseum* (Rose-moss) and *Eremonotus myriocarpus* (Clubwort). The uncommon liverwort *Reboulia hemisphaerica* (Hemisphaeric Liverwort) has also been recorded on these cliffs in the past, as has *Bryum concinnatum* (Neat Silver-moss).

The slopes below the cliffs are also of significant bryological interest, with a number of notable species associated with scree and loose rock. Numerous records exist for the Near Threatened moss *Antitrichia curtipendula* (Penulous Wing-moss), alongside other notable species including *Lewinskya rupestris* (Rock Bristle-moss), *Grimmia hartmanii* (Hartman's Grimmia) and *Schistidium strictum* (Upright Brown Grimmia). A number of liverworts indicative of oceanic climatic conditions have been found amongst the scree, the most notable of which is the locally rare *Pseudomarsupidium decipiens* (Deceptive Featherwort). Previous records of the Vulnerable calcicole moss *Rhytidium rugosum* (Wrinle-leaved Feather-moss) exist from this site, but it is not clear what habitat this species was recorded from, as the records are vague and unlocalised, and it was not recorded during two previous visits by expert bryologists in the past 25 years. This is often a species of calcareous grassland, but is equally at home on grassy ledges on calcareous rocky slopes. It is also possible that vaguely localised records attributed as 'Binevenagh area' may in fact be from the nearby Magilligan SSSI, where a large population of this species occurs.

6. Common Standards Monitoring Methodology

The condition of the terrestrial habitat feature of Binevenagh ASSI has been assessed following the Common Standards Monitoring (CSM) guidance (JNCC 2004; 2005; 2022) for bryophytes.

The attributes to be measured are dependant on the specific interest features and are derived from a combination of direct and indirect attributes from the tables in the CSM guidance.

Site specific methodology

The assessment was undertaken by Rory Hodd on behalf of DAERA on 22nd and 23rd January 2024. Despite difficult weather conditions, with the survey carried out in a short window of relatively calmer weather between two storms, a large area of the cliffs, as well as slopes below the cliffs, were explored, ensuring that the locations of previous well-localised records of notable species were visited. However, the area of potentially important bryophyte habitat is extensive, and it was not possible to survey it all in the time available, so many populations of rare and notable bryophytes are undoubtedly still unrecorded. The survey was focused on previously identified important bryophyte habitats (Corbett, 2008), which are the calcareous cliffs, screes and grasslands. However, no significant bryophyte interest was located within the grassland area below the cliffs, and proof does not exist that it was ever of importance for bryophytes, so its condition was not assessed. The scree habitat was not assessed on the criterion of 'Negative indicators: Fire', as dwarf shrubs are not present in association with the scree habitat and fire is not a factor that would impact the scree habitat at this site.

All bryophytes encountered were recorded on a Biological Records Centre card adapted for Ireland. Target notes were recorded and digital photographs taken where bryophytes of note were located and to inform assessment of the condition of the feature (see map in Appendix 2). Condition assessment plots were carried out at important bryophyte locations in both the calcareous rocky slope and scree habitats. Specimens of some bryophyte species were collected for later microscopic identification or confirmation. Bryophyte nomenclature follows the current British and Irish bryophyte checklist (Blockeel *et al.* 2021), species status is according to the bryophyte Red List for the island of Ireland (Lockhart *et al.* 2012) and rarity status is as per Hodgetts & Lockhart (2013). A complete species list is provided in Appendix 7.

7. Results

Bryophyte species of scree (Special habitat 20)

At Binevenagh ASSI, nine Condition Assessment plots were assessed against three attributes in 2024 (Map 1).

The detailed condition assessment attributes are displayed in the Bryophyte species of scree (Special habitat 20) Attribute Table, where they are measured against set condition assessment targets.

Table 3: Summary table of all attributes assessed against set criteria

One Direct Attribute assessed	1 Favourable
	0 Unfavourable
Two Indirect Attributes assessed	2 Favourable
	0 Unfavourable

Binevenagh ASSI failed on **zero** attributes and was therefore assessed as **Favourable.**

Bryophyte species of basic montane cliffs (Special habitat 26)

At Binevenagh ASSI, eight Condition Assessment plots were assessed against three attributes in 2024 (Map 1).

The detailed condition assessment attributes are displayed in the Bryophyte species of basic montane cliffs (Special habitat 26) Attribute Table, where they are measured against set condition assessment targets.

Table 4: Summary table of all attributes assessed against set criteria

One Direct Attribute assessed	1 Favourable
	0 Unfavourable
Two Indirect Attributes assessed	2 Favourable
	0 Unfavourable

Binevenagh ASSI failed on **zero** attributes and was therefore assessed as **Favourable.**

8. Discussion

Bryophyte species of scree (Special habitat 20)

The Bryophyte species of scree (Special habitat 20) of Binevenagh ASSI is in **Favourable** condition.

- Species presence & condition

Areas of scree and scattered boulders across the area below the cliffs continue to support a rich and varied bryophyte flora, with a mix of species of base-rich and acidic conditions growing on most rocks. Typical species of this habitat include *Ptychomitrium polyphyllum, Grimmia trichophylla, Isothecium interludens, Hypnum cupressiforme* var. *resupinatum, Racomitrium* spp., *Bryum capillare, Schistidium apocarpum* and *Hedwigia stellata*. The humid conditions created between rocks in the scree facilitates the growth of a mix of oceanic liverwort species, the most notable of which is *Pseudomarsupidium decipiens*, which was observed in a number of locations at the northern end of the site (Target notes 2-4; Figs. 2-5), where the scree appears to be less baserich that it is further south. Other oceanic species also grow within the shelter of the scree, including *Plagiochila bifaria, Plagiochila punctata, Plagiochila spinulosa, Scapania gracilis, Frullania fragilifolia* and *Saccogyna viticulosa*. The Nationally Rare moss *Schidtidium pruinosum* was noted on one boulder in scree towards the north of the site (Target note 1; Figure 1). The Nationally Scarce liverwort *Orthocaulis attenuatus* was observed on the top of one rock (Target note 5). *Antitrichia curtipendula* is locally frequent in scree patches close to the base of the cliffs below both sets of cliffs (Target notes 7-10, 14; Figs. 11, 14-16, 23) and *Lewinskya rupestris* occurs on tops of rocks in the valley behind the outer row of pinnacles (Target notes 9, 12; Figs. 12, 13, 20). *Grimmia hartmanii* was not seen, but is likely to still be present in small amounts.

- Niche availability

Although there are no large, extensive scree slopes present, patches of scree are scattered across the site on the slopes below both the upper and lower cliffs on moderately steep slopes and in the hanging valleys behind the lower cliffs where slippage of the cliff has occurred in the past. Scattered boulders across the site also provide an important habitat for saxicolous bryophytes and

are frequent across the slopes beneath the cliffs. This scree is composed of large, well-established blocks and its area is likely to be stable.

- Negative indicators: Disturbance

No disturbance was observed to the scree habitat at this site. As the rocks are mostly large and well embedded in the substrate, this scree is stable and slippage and erosion are not significant issues. Grazing animals do walk through and around many of the scree patches, and there are significant muddy animal paths close to a number of scree patches, but there is no visible direct impact to the scree habitat or its bryophyte flora.

Bryophyte species of basic montane cliffs (Special habitat 26)

The Bryophyte species of basic montane cliffs (Special habitat 26) of Binevenagh ASSI is in **Favourable** condition.

- Species presence & condition

A rich calcicole flora occurs across the cliffs at this site. Common species on these cliffs include *Homalothecium sericeum, Bryum capillare, Weissia controversa, Amphidium mougeotii, Tortella tortuosa* and *Trichostomum brachydontium*, with other specialist species of calcareous rocky habitats including *Porella arboris-vitae, Scapania aspera* and *Flexitrichum gracile* occasional. *Syntrichia princeps* was observed in four locations (Target notes 6, 7, 15, 17; Figs. 8-10, 24-26, 29, 30), forming strong patches over multiple square metres, with frequent sporophytes. Two populations occur on the main, upper rockface in the central part of the site, while two more strong populations grow on the lower rockface, towards the southern end of the site. *Anomodon viticulosus*, which has not been recorded from the Vice-county of Derry for over 50 years, occurs with the southernmost of these populations (Target note 17). *Reboulia hemisphaerica* was found in one location towards the southern end of the upper cliff, forming a strong colony on soil accumulated over the rockface (Target note 11; Figs. 17-19). This species was last recorded at this site, and within the Vice-county, in 1836. *Rhodobryum roseum* occurs as a small patch in one location at the base of the lower cliff (Target note 16; Figs. 27, 28). A larger patch of this species was also seen on a bank in forestry, outside of the boundary of the site. A strong colony of *Schistidium strictum* grows on sloping damp rocks at the base of the main cliff (Target note 5; Figs. 6, 7), while Schistidium pruinosum (Target notes 6, 13; Figs. 8, 21, 22) was found in two locations on rock ledges in the centre and south of the site. The liverwort *Scapania aequiloba* was observed at one location on a mossy ledge (Target note 6; Figs. 8). A number of species previously recorded from these cliffs were not refound but are likely to still be present in locations not visited during this survey. It is possible that *Rhabdoweisia fugax* was never present in this site, but was actually recorded elsewhere in the local area, as the records are not accurately localised, and this is a strongly calcifuge species, which would not be likely to grow on the slopes visited during this survey.

- Niche availability.

The main, west to northwest-facing, cliff of Binevenagh runs continuously for ca. 2km, and is about 100m tall at its highest point in the central area of the scarp, stretching from ca. 270m altitude to 370m altitude. The cliff is lower at the northern and southern end of the scarp. In the central and southern sections of the scarp, where slippage of the rock has occurred in the past, there are a number of pinnacles, with small cliffs behind them, facing the main cliff, and a larger row of cliffs facing west below the cliffs, forming large, buttressed crags in parts. A small landslide has occurred at one location on the main cliff, but this will have resulted in only negligible damage to the cliff habitat overall, and no important bryophyte populations are known to have been impacted. Overall, the area of this habitat is stable.

- Negative indicators: disturbance.

The slopes below these crags are extensively grazed by livestock, with a clear path along the base of the rockface in places. This grazing is at moderate and sustainable levels and is having no impact on the communities of the rocky habitats.

Abrasion and related physical disturbance is not an issue at this site. Due to the steepness of the rockfaces, it is not possible for livestock to access the niche occupied by the important bryophyte communities. There is no evidence of climbing, scrambling or other human activities on the rockfaces.

9. Feature Recommendations

The bryophyte features of this site are in favourable condition and should be maintained as is. Grazing animals are currently having little impact on the bryophyte features, but if the grazing intensity were increased, or if a switch was to take place to predominantly sheep grazing, then it is likely that the bryophyte features would be negatively impacted. Although they were not assessed, the grasslands should still be visited and searched during future monitoring visits, particularly those that show strong calcareous influence. This is in case *Rhytidium rugosum* does in fact occur within these grasslands, and has been missed during this survey, and during previous visits by other expert bryologists. If *R. rugosum* is found to be present in the grassland habitat, then the condition of the grassland bryophyte feature should be fully assessed.

10. References

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11. Appendix 1 – Attribute tables

Table 5: Bryophyte species of scree (Special habitat 20) Attribute Table

Attribute	Target	Method of Assessment	Monitoring Results 2023	Assessment	Previous Monitoring Results 2007
Direct Attributes					
Presence and condition of key species	All or most key species present and in good condition	Visual assessment	Good cover of bryophytes in scree habitat and on boulders, with most key species refound, with strong populations of some key species, such as *Antitrichia curtipendula*	**Favourable**	Attributes not directly assessed, but overall condition assessed as favourable, as habitat in favourable condition
Indirect Attributes					
Niche availability	No loss of area of block scree supporting feature of interest	Visual assessment	No loss of area detected, with sufficient area of habitat present	**Favourable**	Attributes not directly assessed, but overall condition assessed as favourable, as habitat in favourable condition
Negative indicators: fire	No evidence of burning	Visual assessment	Not assessed, as fire is not a factor at this site or in this type of scree habitat	**Not assessed**	Attributes not directly assessed, but overall condition assessed as favourable, as habitat in favourable condition
Negative indicators: disturbance	No disturbance observable in the form of abrasion or damage to the vegetation	Visual assessment	Although these slopes are grazed, with eroded paths close to scree habitat, no direct negative impact was observed	**Favourable**	Attributes not directly assessed, but overall condition assessed as favourable, as habitat in favourable condition

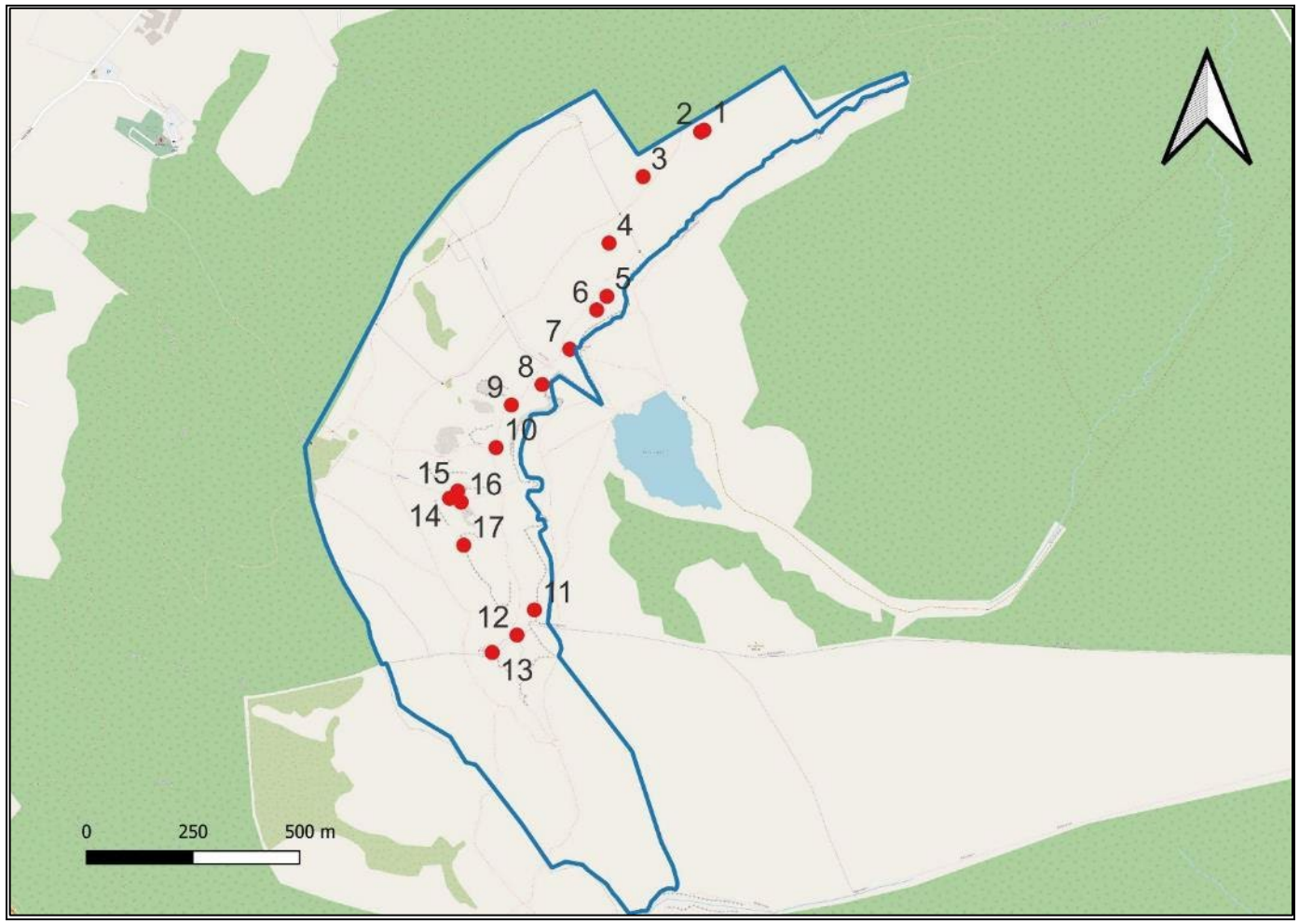
Table 6: Bryophyte species of basic montane cliffs (Special habitat 26) Attribute Table

Attribute	Target	Method of Assessment	Monitoring Results 2023	Assessment	Previous Monitoring Results 2007
Direct Attributes					
Presence and condition of key species	All or most key species present and in good condition	Visual assessment	The majority of previously recorded rare, scarce and threatened species were refound, with strong populations of key species, such as *Syntrichia princeps*, present	**Favourable**	Attributes not directly assessed, but overall condition assessed as favourable, as habitat in favourable condition
Indirect Attributes					
Niche availability	No loss in area of rock outcrop	Visual assessment	Habitat widespread across the site	**Favourable**	Attributes not directly assessed, but overall condition assessed as favourable, as habitat in favourable condition
Negative indicators: disturbance	No evidence of grazing	Visual assessment	Grazing occurs on the surrounding slopes below the cliffs, but is not impacting the rocky habitats	**Favourable**	Attributes not directly assessed, but overall condition assessed as favourable, as habitat in favourable condition
	No obvious evidence of abrasion	Visual assessment	Evidence of abrasion was not observed	**Favourable**	Attributes not directly assessed, but overall condition assessed as favourable, as habitat in favourable condition

12. Appendix 2 – Maps

Map 1 – Binevenagh ASSI target note locations

Back



13. Appendix 3 – Target notes

Table 7: Target notes recorded within Binevenagh ASSI and its surrounds

Target Note Number	Comments
1	C6907531400. *Schistidium pruinosum* on boulder in scree, with T*richostomum brachydontium, Ptychomitrium polyphyllumy, Weissia controversa, Isothecium interludens, Tritomaria quinquedentata, Frullania tamarisci, Grimmia pulvinata.*
2	C6906731396. *Pseudomarsupidium decipiens* covering shaded rock, 50x50cm, other oceanic species in vicinity are *Plagiochila spinulosa, Plagiochila punctata, Scapania gracilis, Isothecium interludens* and *Plagiochila bifaria.*
3	C6893231291. *Pseudomarsupidium decipiens* on rock in scree, over 30x30cm.
4	C6885231135. *Pseudomarsupidium decipiens* over multiple boulders.
5	C6884731010. *Schistidium strictum* forming frequent cushions on sloping rock at base of main rock face. Landslip adjacent to this from water running down cliff. *Orthocaulis attenuatus* occurs on top of rock on slope below this.
6	C6882330978. *Syntrichia princeps* on small ledge at base of rockface, with numerous sporophytes, over 20x5cm occupying most of area, with *Hypnum resupinatum, Homalothecium sericeum* and *Tortella tortuosa*. Another patch in crevice 1.5m to right, over 50x10cm, very healthy. *Scapania aequiloba* and *Schistidium pruinosum* also present on ledges at this location
7	C6876030886. *Syntrichia princeps* at base of rockface over 20x5cm, another patch 1.5m above and to right.
8	C6869530803. *Antitrichia curtipendula* on top of boulder, scattered over 1x1m, with *Hypnum resupinatum, Dicranum scoparium, Racomitirum heterostichum, Bryum capillare.*
9	C6862330755. *Lewinskya rupestris* forming two spreading patches on top of boulder, dead in middle but healthy at edges, with capsules, another three fruiting cushions on boulder ca 5m to west. large patches of *Antitrichia curtipendula* on top of boulders in vicinity, occasional over 20x10m area.
10	C6858730655. *Antitrichia curtipendula* forming scattered cushions in scree.
11	C6867730274. *Reboulia hemisphaerica* growing on soil on rockface, large mats over 1m x 50cm, with *Weissia controversa, Thymus polytrichus, Festuca rubra, Hypochaeris radicata, Cladonia* sp. Another small patch ca. 5m to right.

12	C6863630215. *Lewinskya rupestris*, two fruiting tufts on boulder.
13	C6857830174. *Schistidium pruinosum* on rock on back of pinnacle, numerous cushions over 50x50cm.
14	C6847830536. *Antitrichia curtipendula* abundant over 10x5m area amongst scree, forming large pure patches.
15	C6849730553. *Syntrichia princeps* in slight recess of cliff, more than 10 patches over 1.5 x 1m area, pure and fruiting well, in good health.
16	C6850530527. *Rhodobryum roseum*, small patch on soil at base of cliff, with *Weissia controversa* and *Campylopus fragilis*, 8 plants over 5x2cm.
17	C6851130426. *Syntrichia princeps* on mossy rockface dominated by *Homalothecium sericeum*, four large cushions over 50x50cm. Two more small cushions at base of rockface ca 8m to right, which also has large patch of *Anomodon viticulosus.*

14. Appendix 4 – Photographs

Figure 1. Boulder scree on grassy slope, with *Schistidium pruinosum* growing on the nearest boulder (target note 1).



Figure 2. Boulder scree on grassy slope, rich in oceanic bryophytes, including *Pseudomarsupidium decipiens* (target note 2).



Figure 3. Strong patch of *Pseudomarsupidium decipiens* in block scree (target note 2).



Figure 4. Location of patch of *Pseudomarsupidium decipiens* on scattered scree on slopes below cliffs (target note 3).



Figure 5. Boulder scree with strong patches of *Pseudomarsupidium decipiens* (target note 4).



Figure 6. Location of frequent cushions of *Schistidium strictum* on sloping rock at cliff base, with a minor landslip visible on the left (target note 5).



Figure 7. Frequent cushions of *Schistidium strictum* on sloping rock at base of main cliff (target note 5).



Figure 8. Base of upper cliff, where a strong population of *Syntrichia princeps* grows, alongside *Schistidium pruinosum* and *Scapania aequiloba* (target note 6).



Figure 9. Ledge with strong population of *Syntrichia princeps* (target note 6).



Figure 10. Rockface where small patches of *Syntrichia princeps* grow in cracks (target note 7).

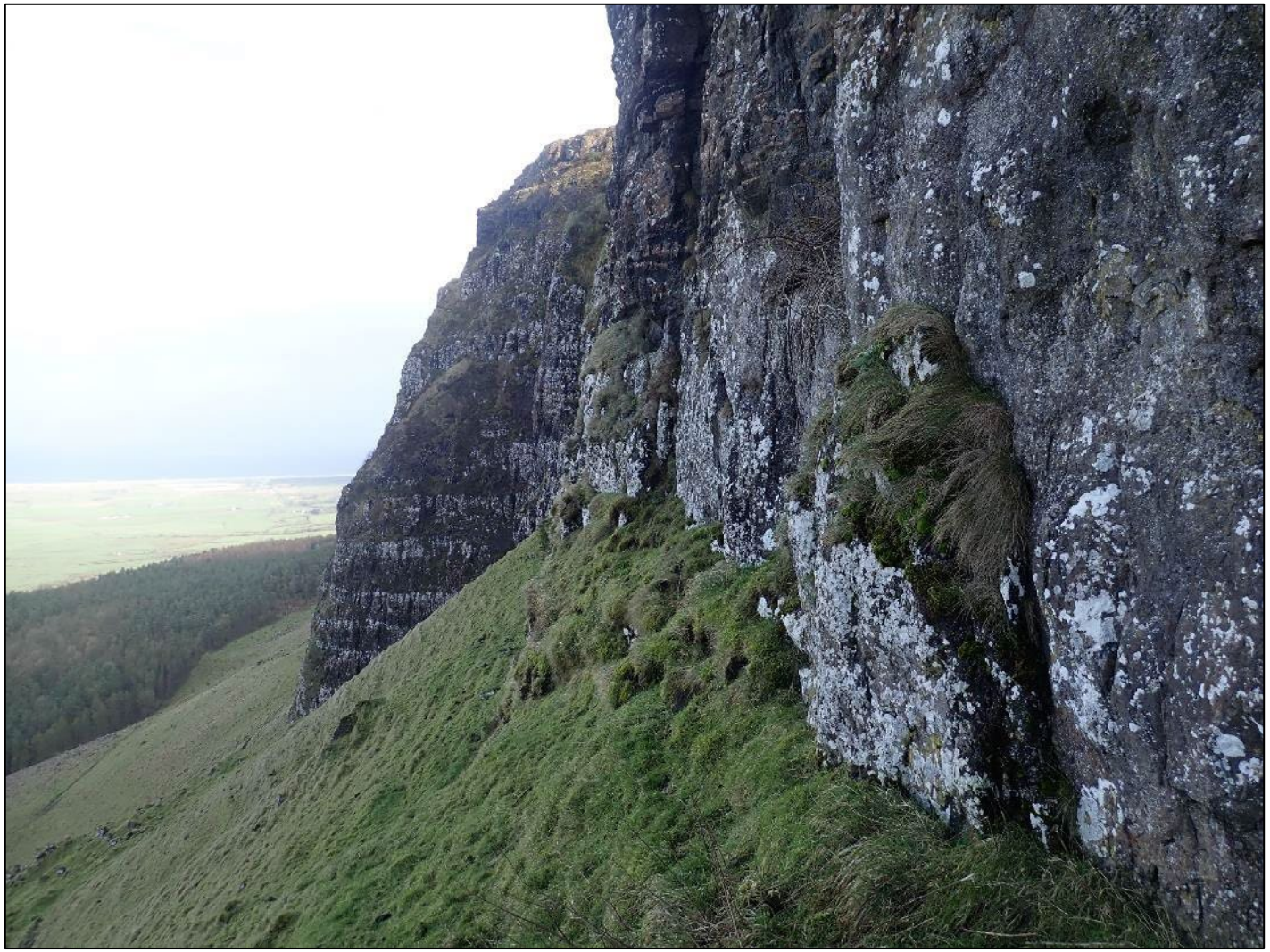


Figure 11. Large boulder in scree that supports a population of *Antitrichia curtipendula* (target note 8).



Figure 12. Boulder in scree with two cushions of *Lewinskya rupestris* on sloping left-hand surface (target note 9).



Figure 13. *Lewinskya rupestris* on sloping surface of boulder in scree (target note 9).



Figure 14. Strong patches of *Antitrichia curtipenudula,* covering rocks in scree (target note 9).



Figure 15. Strong, pure patch of *Antitrichia curtipendula* (with *Saxifraga hypnoides*) covering rock in scree (target note 9).



Figure 16. Scree in valley behind pinnacles with scattered healthy patches of *Antitrichia curtipendula* (target note 10).



Figure 17. Cliff face on which *Reboulia hemisphaerica* grows (target note 11).



Figure 18. View of main population of *Reboulia hemisphaerica*, on thin soil over rockface (target note 11).



Figure 19. Close-up of *Reboulia hemisphaerica*, showing both female and male receptacles (target note 11).



Figure 20. Boulder on grassy slope, which supports a small population of *Lewinskya rupestris* (target note 12).



Figure 21. Ledge at back of pinnacle, which has numerous cushions of *Schistidium pruinosum* (target note 13).



Figure 22. Fruiting *Schistidium pruinosum* on basalt ledge (target note 13).



Figure 23. Grassy scree in depression below lower cliffs, which supports frequent cushions of *Antitrichia curtipendula* (target note 14).



Figure 24. Sheltered recess at base of lower cliff, which contains a large population of *Syntrichia princeps* (target note 15).



Figure 25. Ledge in recess of lower cliffs, with numerous cushions of *Syntrichia princeps* (target note 15).



Figure 26. Close up of fruiting cushion of *Syntrichia princeps* (target note 15).



Figure 27. Location of population of *Rhodobryum roseum*, on soil below lower cliff (target note 16).



Figure 28. Close-up of *Rhodobryum roseum* on small patch of bare soil (target note 16).



Figure 29. Mossy rockface on lower cliff, which supports multiple cushions of *Syntrichia princeps* (target note 17).



Figure 30. Cushions of *Syntrichia princeps*, with *Homalothecium sericeum*, on dry mossy rockface (target note 17).



15. Appendix 5 – Survey dates

Table 6: Survey dates and locations monitored

Survey dates	Survey Staff	Total	Locations Monitored
22.01.2024	Rory Hodd	1	Binevenagh ASSI
23.01.2024	Rory Hodd	1	Binevenagh ASSI

16. Appendix 6 - Species list

Table 7: Bryophyte species recorded from Binevenagh ASSI, 22-23rd January 2024

Nomenclature is according to Blockeel *et al.* (2021) with the old names in brackets where they differ from the previous checklist (Hill *et al.* 2008).
Frequency on DAFOR scale: D = dominant, A = abundant, F = frequent, O = occasional, R = rare.
Red List status is according to Lockhart *et al.* (2012) and rarity status according to Hodgetts & Lockhart (2013).

Species	Habitat	Frequency	Status
Liverworts			
Aneura pinguis	Basic cliffs	R	Least Concern
Cephaloziella sp	Scree	R	Least Concern
Fossombronia sp	Bare soil	R	Least Concern
Frullania dilatata	Isolated small trees	O	Least Concern
Frullania fragilifolia	Scree	R	Least Concern
Frullania tamarisci	Scree and cliffs	F	Least Concern
Frullania teneriffae	Scree	O	Least Concern
Lejeunea lamacerina	Basic cliffs	R	Least Concern
Lejeunea patens	Basic cliffs	R	Least Concern
Lophocolea bidentata	Cliffs, rocks and grassland	O	Least Concern
Lophozia ventricosa	Rocks and scree	F	Least Concern
Marsupella emarginata	Scree	R	Least Concern
Metzgeria conjugata	Basic cliffs	R	Least Concern
Metzgeria furcata	Basic cliffs	R	Least Concern
Orthocaulis attenuatus (*Barbilophozia attenuata*)	Top of rock	R	Least Concern/Nationally Scarce
Orthocaulis floerkei (*Barbilophozia floerkei*)	Top of rock	R	Least Concern
Plagiochila bifaria	Scree	O	Least Concern
Plagiochila porelloides	Scree and cliffs	O	Least Concern
Plagiochila punctata	Scree	R	Least Concern
Plagiochila spinulosa	Scree	O	Least Concern
Porella arboris-vitae	Basic cliffs and scree	O	Least Concern
Pseudomarsupidium decipiens (*Adelanthus decipiens*)	Scree	O	Least Concern
Radula complanata	Isolated small trees	R	Least Concern
Reboulia hemisphaerica	Soil on basic cliff	R	Least Concern/Nationally Scarce
Saccogyna viticulosa	Scree and cliffs	O	Least Concern
Scapania aequiloba	Basic cliffs	R	Least Concern/Nationally Scarce
Scapania aspera	Basic cliffs	O	Least Concern
Scapania gracilis	Rocks and scree	O	Least Concern
Tritomaria quinquedentata	Scree and cliffs	O	Least Concern

Mosses			
Amphidium mougeotii	Basic cliffs	O	Least Concern
Anomodon viticulosus	Basic cliffs	R	Least Concern
Antitrichia curtipendula	Scree and tops of rocks	O	Near Threatened/Nationally Scarce
Brachythecium rutabulum	Scree and grassland	O	Least Concern
Breutelia chrysocoma	Cliffs, rocks and grassland	F	Least Concern
Bryum alpinum	Damp cliff	R	Least Concern
Bryum capillare	Scree and cliffs	F	Least Concern
Bryum pallens	Basic cliffs	R	Least Concern
Calliergonella cuspidata	Damp cliffs and grassland	O	Least Concern

Species	Habitat	Frequency	Status
Campylopus flexuosus	Scree	O	Least Concern
Campylopus fragilis	Scree and cliffs	O	Least Concern
Campylopus introflexus	Scree	O	Least Concern
Cirriphyllum piliferum	Scree	R	Least Concern
Cratoneuron filicinum	Damp turf below cliff	R	Least Concern
Cryphaea heteromalla	Isolated small trees	R	Least Concern
Ctenidium molluscum	Scree and cliffs	O	Least Concern
Dicranum scoparium	Rocks and scree	F	Least Concern
Didymodon insulanus	Scree and cliffs	O	Least Concern
Diplophyllum albicans	Scree	O	Least Concern
Microeurhynchium pumilum (*Oxyrrhynchium pumilum*)	Crevice in cliff	R	Least Concern
Eurhynchium striatum	Scree	O	Least Concern
Fissidens adianthoides	Damp cliff	O	Least Concern
Fissidens bryoides var. *bryoides*	Bare soil	O	Least Concern
Fissidens dubius	Basic cliffs	O	Least Concern
Fissidens osmundoides	Damp cliff	R	Least Concern
Flexitrichum gracile (*Ditrichum gracile*)	Basic cliffs	O	Least Concern
Grimmia pulvinata	Scree and cliffs	F	Least Concern
Grimmia trichophylla	Rocks and scree	O	Least Concern
Gymnostomum aeruginosum	Basic cliffs	R	Least Concern
Hedwigia stellata	Rocks and scree	O	Least Concern
Heterocladium flaccidum (*Heterocladium heteropterum* var. *flaccidum*)	Scree	R	Least Concern
Homalothecium sericeum	Basic cliffs	F	Least Concern
Hylocomiadelphus triquetrus (*Rhytidiadelphus triquetrus*)	Grassland and scree	F	Least Concern

Hylocomium splendens	Grassland and scree	F	Least Concern
Hypnum cupressiforme var. *cupressiforme*	Rocks and scree	F	Least Concern
Hypnum cupressiforme var. *lacunosum*	Scree and cliffs	F	Least Concern
Hypnum cupressiforme var. *resupinatum*	Scree and cliffs	F	Least Concern
Hypnum jutlandicum	Scree	O	Least Concern
Isothecium alopecuroides	Scree	O	Least Concern
Isothecium interludens (*Isothecium myosuroides* var. *brachythecioides*)	Scree	O	Least Concern
Isothecium myosuroides	Scree	O	Least Concern
Kindbergia praelonga	Scree	O	Least Concern
Lewinskya rupestris (*Orthotrichum rupestre*)	Rocks and scree	R	Least Concern
Mnium hornum	Scree	O	Least Concern
Neckera complanata	Scree and cliffs	O	Least Concern
Neckera crispa	Basic cliffs	O	Least Concern
Plagiomnium undulatum	Cliffs, rocks and grassland	O	Least Concern
Plenogemma phyllantha (*Ulota phyllantha*)	Isolated small trees	O	Least Concern
Species	**Habitat**	**Frequency**	**Status**
Pleurozium schreberi	Grassland and scree	O	Least Concern
Pogonatum urnigerum	Rocks and scree	O	Least Concern
Polytrichum formosum (*Polytrichastrum formosum*)	Scree	O	Least Concern
Polytrichum juniperinum	Rocks and scree	O	Least Concern
Polytrichum piliferum	Rocks and scree	O	Least Concern
Pseudoscleropodium purum	Grassland and scree	F	Least Concern
Ptychomitrium polyphyllum	Rocks and scree	F	Least Concern
Racomitrium aciculare	Rocks and scree	F	Least Concern
Racomitrium fasciculare	Rocks and scree	O	Least Concern
Racomitrium heterostichum s.l.	Rocks and scree	O	Least Concern
Racomitrium lanuginosum	Rocks and scree	F	Least Concern
Rhodobryum roseum	Soil at base of cliff	R	Near Threatened/Nationally Scarce
Rhynchostegiella tenella	Basic cliffs	R	Least Concern
Rhytidiadelphus loreus	Grassland and scree	F	Least Concern
Rhytidiadelphus squarrosus	Grassland and scree	F	Least Concern
Schistidium apocarpum	Scree	F	Least Concern
Schistidium crassipilum	Scree	O	Least Concern
Schistidium pruinosum	Scree and cliffs	R	Data deficient/Nationally Rare

Schistidium strictum	Sloping rock at base of cliff	R	Near Threatened/Nationally Scarce
Sciuro-hypnum plumosum	Scree	O	Least Concern
Syntrichia princeps	Basic cliffs	O	Regionally Extinct (Critically Endangered)/Nationally Rare
Thamnobryum alopecurum	Basic cliffs	O	Least Concern
Thuidium tamariscinum	Grassland and scree	F	Least Concern
Tortella tortuosa	Scree and cliffs	F	Least Concern
Tortula muralis	Basic cliffs	O	Least Concern
Trichostomum brachydontium	Basic cliffs	F	Least Concern
Trichostomum crispulum	Basic cliffs	O	Least Concern
Weissia controversa var. *controversa*	Soil on basic cliff	F	Least Concern
Zygodon conoideus	Isolated small trees	R	Least Concern
Zygodon stirtonii (*Zygodon viridissimus* var. *stirtonii*)	Basic cliffs	R	Least Concern

Northern Ireland Environment Agency
Gníomhaireacht Comhshaoil Thuaisceart Éireann
Norlin Airlan Environment Agency
www.daera-ni.gov.uk

For further information:

Species Survey Team
Conservation Science
Clare House
303 Airport Rd W
Belfast
BT3 9ED

Tel: 028 9056 9558
Email: BCSGeneral@daera-ni.gov.uk
www.daera-ni.gov.uk

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