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Habitat Assessment

The ASCENT Site

Slieve Gullion Co Down, Northern Ireland

T1.1

Research on the Impact of Unregulated Access to Upland Sites

by Newry Mourne and Down District Council and Mourne Heritage Trust and researcher Marc Vinas, Ecologist

ASCENT
Promoting Sustainable Access to Uplands & Natural Environments

Northern Periphery and Arctic Programme 2014–2020

EUROPEAN UNION
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Contents

Executive Summary

Upland paths on Slieve Gullion have deteriorated due to increased use and other disturbances and this is having a detrimental impact on the Natura 2000 (Special Areas of Conservation) designated habitats.

A Phase 2 National Vegetation Classification (NVC) survey has been undertaken in order to determine the condition of the habitat within the main access corridors and to provide a baseline to inform management proposals and monitor change.

A combination of aerial imagery, existing survey data and ground truthing, has been used to paint a picture of the upland vegetation within the main access corridors and immediate surroundings (100m buffer in respect to the main path line), capturing 14 different habitats and landscape features along it.

Fourteen quadrats (2x2m) have been placed along the main access corridor, covering a general surveying area of 17ha and a distance of 4km.

The assessment locations have been placed in immediate contact with the main path line in order to determine the baseline condition from the point of view of the recreational impact, enabling future long-term change monitoring (e.g., widening erosion and habitat loss, or recovery), setting strategic and representative assessment locations along the corridor.

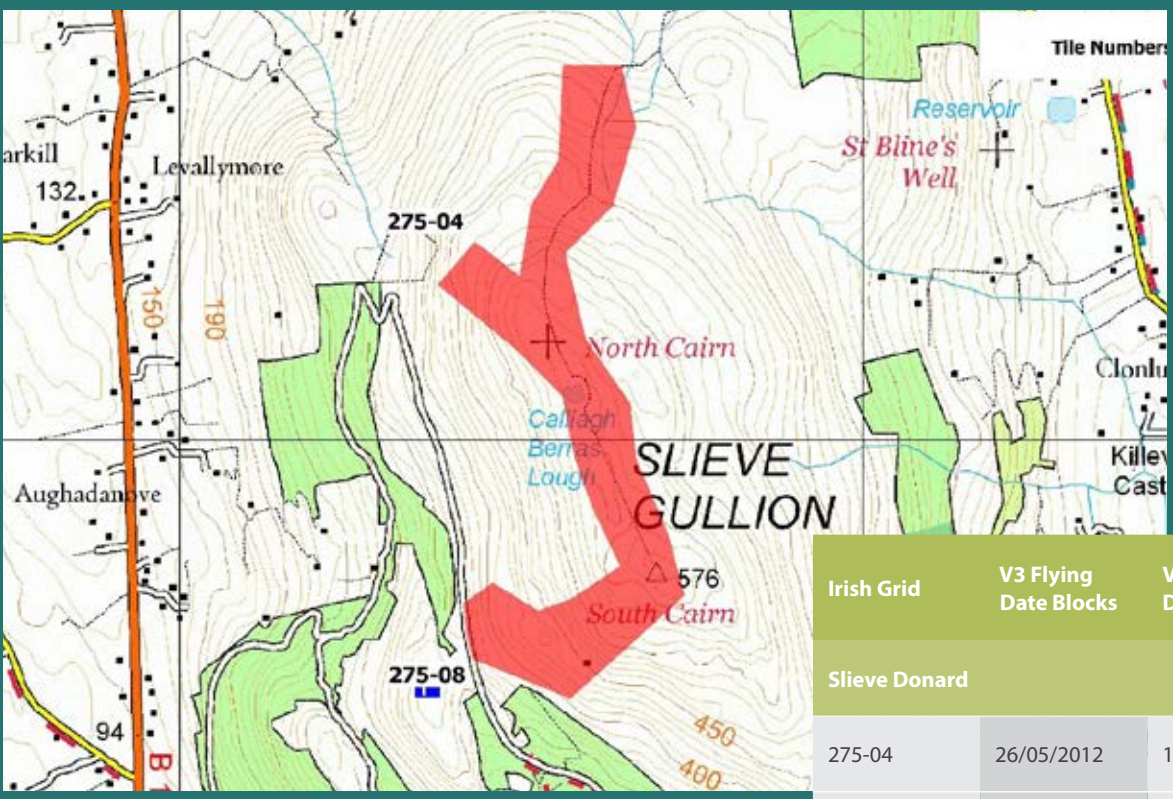
The assessment locations consisted of three different NVC Phase 2 communities including H10 Calluna vulgaris-Erica cinerea heath (four locations), H12 Calluna vulgaris-Vaccinium myrtillus heath (nine locations) and U4 Festuca ovina-Agrostis capillaries-Galium saxatile grassland (one location).

None of the plants species recorded as present were listed as Schedule 8 species or Northern Ireland Priority Species.

1.0

Materials and Methods

1.1 Aerial Imagery Resources



Irish Grid	V3 Flying Date Blocks	V4 Flying Date Blocks	V5 Flying Date Blocks
Slieve Donard			
275-04	26/05/2012	12/07/2013	13/08/2015
275-08	26/05/2012	12/07/2013	13/08/2015

1.2 Existing Habitat Survey Data

Document	Source	Year
Slieve Gullion ASSI Condition Assessment Report	NIEA	2006
Slieve Gullion ASSI Condition Assessment Report	NIEA	2012
Slieve Gullion SAC: Wildfire risk, goat and grazing project	RGLP	2016

1.3
National Vegetation Classification

The National Vegetation Classification (NVC) classifies British natural and semi-natural plant communities, and also agriculturally-improved grasslands (Rodwell 1991, 1992, 1995 & 2000). The communities are usually referred to by the Latin names of the most frequent species they contain.

From the point of view of a wider European context, analogist classical phytosociological data, which exists in very large quantities in many EU states and other European countries, provides a substantial basis for comparing plant communities and gaining an overview of variation among vegetation types across Europe. The standard NVC sample is essentially the same as the relevé (or Aufnahme) of the phytosociologist, and the plant communities defined by the scheme are roughly equivalent to the Braun-Blanquet Association used in phytosociological hierarchy. Also, in the descriptions in British Plant Communities, the affinities of each vegetation type to the most appropriate phytosociological alliance are discussed. Such comparisons are summarised in a phytosociological conspectus of all the NVC vegetation types, which is included in Volume 5 of British Plant Communities (Rodwell 2000) and reviewed further in Rodwell et al. (2000).

Meanwhile, one of the benefits of publication of the NVC has been to stimulate contacts between British vegetation scientists and their European colleagues in joint excursions, training and collaborative research. A variety of projects are now attempting to build a clearer picture of the vegetation of Europe and its vulnerability to environmental change. These are linked through a European Vegetation Survey (EVS) network that develops common survey standards and analytical software (Mucina et al. 1993, Rodwell et al. 1995), and produced an updated overview of phytosociological alliances in Europe (Rodwell et al 2002). Through this network, NVC users will be able to make a substantial contribution to our understanding of the European landscape.

The NVC was conceived originally as a classification scheme to help identify and understand vegetation types encountered in the field. Together with the survey methodology designed for the project, the classification is now very widely used by the UK conservation agencies and many other organisations to produce inventories and maps of plant communities on designated or threatened sites.

In addition to such basic applications, however, the NVC is also widely used now as a framework for scientific research into the relationships between plant communities and the environmental factors, which influence their composition and distribution. Some such studies have been pursued for their intrinsic ecological interest; in other cases, the NVC has been employed to help devise programmes for managing vegetation types or individual plant species under threat. Investigations of other biota in particular habitats, such as fungi, soil bacteria and invertebrates, are also making use of the NVC as a framework for sampling, description and experimentation.

Although the NVC itself is not a monitoring tool, it is being used to help furnish protocols for particular monitoring programmes and to develop a conceptual basis for understanding the purpose and practice of monitoring. The predictive capacity of the NVC means that it can also serve as a basis for developing management options for sites or landscapes and as a framework for restoration and design guidelines.

Regarding the present habitat assessment in Slieve Gullion, the latest Landcover Map 2007 (Morton et al. 2011) was used to examine the likely habitats present on the site using ArcGIS 10.4 (ESRI, California, USA). An initial site visit was also made to both sites, determining suitable locations for the placing of the habitat assessment quadrats, and providing field truthing along the corridor area for the identification of broad habitat patches using a handheld GPS unit.

After that initial field assessment, several 2x2m quadrat locations were definitely placed along the path corridors, all located strategically with respect to the main path lines to provide effective monitoring of possible recreational pressure changes. In this way it will be possible to quantify the effects of an eventual increase in visitors' and recreational pressure, based on possible changes in the condition (bare soil cover) and/or in the vegetation community (species composition and % cover) in the sample quadrats. As far as possible, all quadrats were located ensuring representativeness of the surrounding vegetation composition and habitats. Each quadrat was surveyed using standard NVC Phase 2 survey methodology (Rodwell, 2006), recording all plant species present and their percentage cover (converted to the Domin scale). It was very helpful to use a standardised record sheet for NVC sampling. These served as a prompt to ensure that all relevant information stet recorded and can greatly assist data coding and analysis. The sheet used in the NVC survey is shown in Figure 1.

Cover	Domin
91–100%	10
76–90%	9
51–75%	8
34–50%	7
26–33%	6
11–25%	5
4–10%	4
<4% (many individuals)	3
<4% (several individuals)	2
<4% (few individuals)	1

For every species recorded in the sample, an estimate should be made of its quantitative contribution to the vegetation. Cover/abundance is a measure of the vertical projection on to the ground of the extent of the living parts of a species (see Figure 2). In the NVC, this is estimated using the Domin scale (sensu Dahl and Hadac 1941):

A full species list including relative abundance and NVC classes was recorded. The species inventory list was compared with the Schedule 8 and the Northern Ireland Priority Species list to flag those species of conservation concern. Soil depth was measured with a penetrometer at five locations in each quadrat and the mean calculated. Shrub height was measured at five locations in each quadrat and the mean calculated.

Together with the measurement of the quadrat aspect using a compass (see Figure 2), fixed-point photographs (Pentax istDL with Sigma panoramic lens 10-20 mm F4-5.6 EX DC) were taken on a standardised aspect pattern in all the sample quadrat locations (see Figure 3). Finally, a dichotomous key to upland vegetation types (Averis et al. 2004) was used to establish which NVC community and sub-community represented each quadrat best.

NVC record sheet:

Location	**Coordinates [•] X,Y**	**Region**	**Author**

Site and vegetation description	**Date**	**Sampling position*1**
Path corridor section Phase I habitat Map		LS / M / RS
	Altitude	**Slope**
	GPS data	%
	Aspect	**Soil depth**
	(x,y)	X mean
	Stand area	**Sample area**
	Stand patch	2 m x 2 m
	Mean height	**Layers cover*2**
	X mean	% % %
	Fixed point photography nº	
	File name (aspect related)	

Species list: Domin scale value based on % cover

*1 Left side / Middle / Right side position of the quadrate respect (aspect specification) to the main line of the path.

*2 trees, shrubs/grasses and bryophites layers cover.

Figure 1: NVC survey sheet.

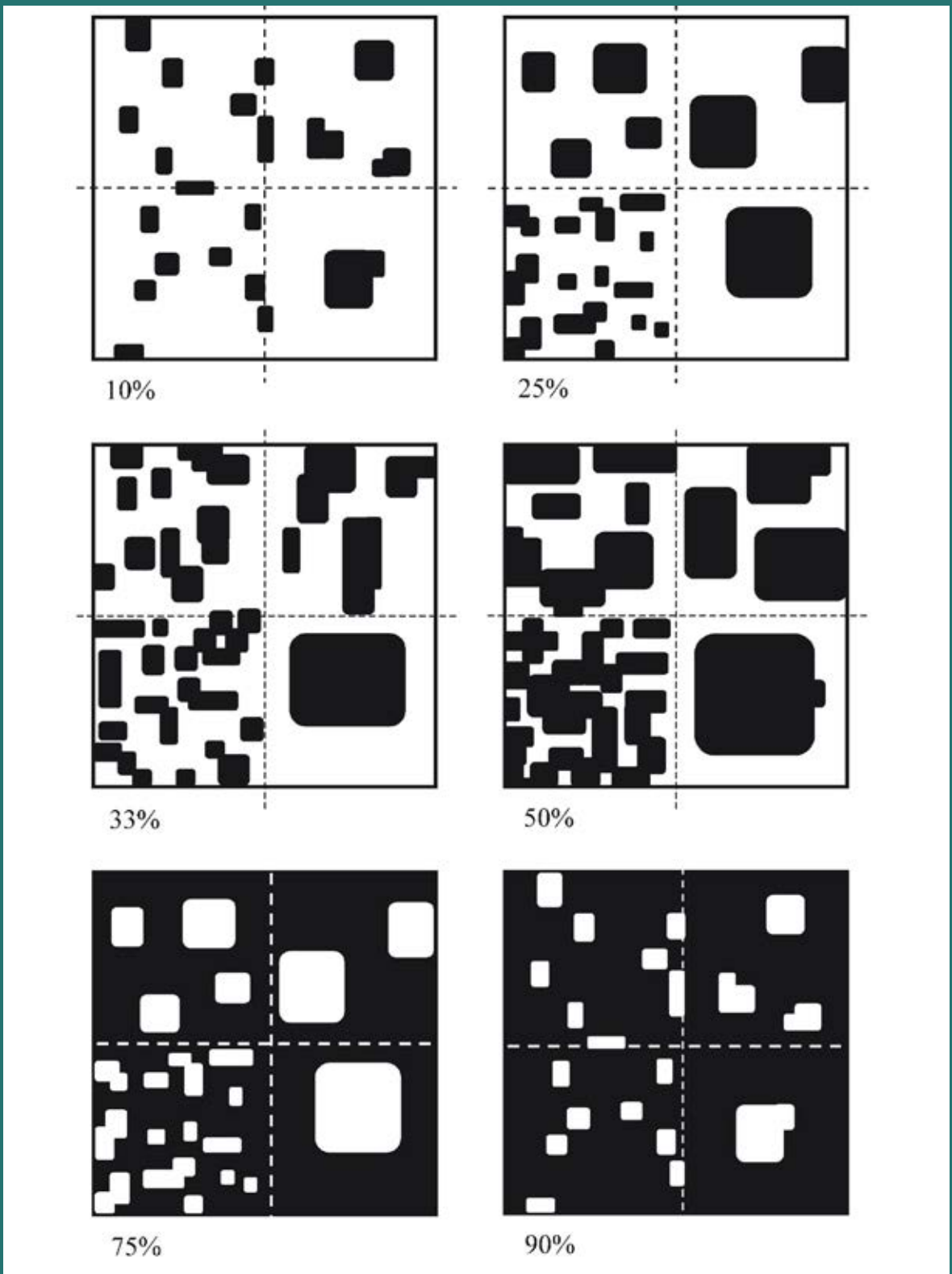


Figure 11 A visual interpretation of Domin cover/abundance thresholds. In the diagrams, each sub-square has the same total area of black: the top left diagram, for example, has 10% black in each sub-square.

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Figure 2. A visual interpretation of Domin cover/abundance thresholds. In the diagrams, each sub-square has the same total area of black: the top left diagram, for example, has 10% black in each sub-square.

2.0

Upland Vegetation Description

Slieve Gullion is a compact upland formed by volcanic activity in Tertiary times, some 60 million years ago. It is situated in south Armagh about five miles south-west of Newry, and, at a height of 576m, it represents a prominent landscape feature. The area is important geologically, representing the finest example of a Tertiary igneous centre in Ireland and it is also among the best topographic expressions of a ring-dyke system in the British Isles.

The area supports a wide range of upland habitats and associated transitional communities, where the upland heath grades downslope into lowland heaths and acid grasslands.

The key features and species of nature conservation interest (Northern Ireland Priority Habitats) are:

- Extensive areas of upland heathland, especially along the mid-slopes and the summit plateau, with good dwarf shrub development.
- Blanket bog: localised on the summit and upper flat slopes of Slieve Gullion, this habitat shows evidence of having been cut-over in the past and is now part of the larger area of upland heath.
- A different heathland community occurs around the lower slopes, a lowland heathland community where western gorse is prominent.

The heathland communities are very variable and depend on local environmental conditions such as slope, aspect, wetness and altitude. The most extensive heath community occurs on the free-draining upper slopes, with shallow acid soils dominated by heather. On the lower slopes, the heath is characterised by bell heather and the notable western gorse, which is an oceanic species associated with sheltered slopes.

This poses problems when trying to map the vegetation, particularly when using the Phase I Habitat Classification. As a result, a Phase I Habitat map which accompanies the corridor map of this report, should be seen as a very simplified overview of the vegetation produced under the limitations of the Phase I habitat mapping system.

Slieve Gullion SAC was designated in 2005 as it contains one of the largest expanses of European Dry Heath, an Annex 1 habitat type on the European Union's [should this be EC?] Habitats Directive, in Northern Ireland. At present, the site is 612.7ha in size and contains approximately 490ha of dry heath.

Annex I habitats that are a primary reason for selection of the site:

- European dry heaths.

Annex I Habitats present as a qualifying feature, but not a primary reason for selection at the site:

- Northern Atlantic heaths with Erica tetralix.
- Active blanket bogs.
- Transition mires and quaking bogs.

Annex I of the EC Habitats Directive is a list of habitat types which Member States of the European Union are required to protect through designation of Special Areas of Conservation. This list was initially derived from an unpublished version of the CORINE Biotopes Classification produced in 1988, which differs from the published version of the CORINE Biotopes Classification. Member States have found difficulty in relating the Annex I list to the published version of the CORINE Biotopes Classification. An Interpretation Manual of European Union Habitats containing definitions of each of the Annex I habitat types has been prepared and published by the European Commission (European Commission DG Environment 2003) to allow experts in the EU Member States to identify individual Annex I habitats on a consistent basis. Where relevant, this manual contains details of those NVC types which correspond to given Annex I habitat types. A more comprehensive review of the correspondence between the NVC and Annex I types is provided via the National Biodiversity Network Habitats Dictionary http://www.nbn.org.uk/habitats and in Appendix 2 of Jackson and McLeod (2000).

Numerous NVC communities are represented at Slieve Gullion, often forming complex mosaics and transitions. The dry heath is extensive over the area and represents one of the largest expanses of this habitat in Northern Ireland outside the Mourne Mountains. The community is mostly of the NVC H10 Calluna vulgaris/Erica cinerea and H12 Calluna vulgaris/Vaccinium myrtillus types, but includes H8 Ulex gallii/Erica cinerea dry heath on the lower slopes. The area supports a number of other vegetation communities, including wet heath NVC M15 deergrass – cross-leaved heath community at lower altitudes and the blanket bog vegetation on the summit and upper slopes (on deep peat and receiving water only from rainfall) is mainly of the NVC M17 deer-grass-hare's tail cottongrass type. There are wet and dry grassland communities showing closest affinity to NVC U4 Festuca ovina-Agrostis capillaris-Gallium saxatile grassland.

3.0

Summary of Results

- The recreational pressure, combined with the effects of local increased grazing pressure, is contributing to the loss and fragmentation of several habitats around Slieve Gullion's main access corridor.
- This combination results in advancing fronts of acid grassland and rush pasture patches along the recreational corridor that are replacing the previous heath surrounding communities. It is evidence of the grass dominance pattern recorded in several assessing quadrats, especially along the initial sections of the South Cairn path.
- The digitising of the main access corridor – based on the last set of aerial images (2013-2015) – has revealed areas where the corridor has become progressively wider, with severe path braiding the result of abundance of deep peat-exposed areas, especially on the blanket peat along the plateau corridor, and which is severely complicating walkers' navigation in that section.
- The strategic placement of the 14 surveying quadrats along the recreational corridor has provided an accurate baseline condition. They have been placed on the side of main paths or braiding scars, which are predicted to be more damaged in the short term if the recreational pressure continues – or increases – in coming years. The features recorded (species content, percentage cover, best represented community, percentage bare peat, average height), together with the fixed-point photography, will enable detection of possible future changes due to recreational pressure.
- Further combined analysis of the habitat mapping and the 14 NVC baseline survey results will provide decision making and inform management proposals for the different sections along the recreational corridor. where the corridor has become dramatically wider, with severe braiding areas sections and frequent scars produced within sensitive habitats such as Racomitrium heath (Donard summit and slopes) and wet heath (Bloody Bridge and Bog of Donard) presents along the corridor.
- The strategic placement of the 20 surveying quadrats along the recreational corridor has provided an accurate baseline condition. They have been placed on the side of main paths or braiding scars, and are predicted to be damaged in the short term if the recreational pressure increases in coming years. The features recorded (species content, percentage cover, best-represented community, percentage bare peat, average height), together with the fixed-point photography, will enable the detection of possible future changes due to recreational pressure.
- Further combined analysis of the habitat mapping and the 20 NVC baseline survey results will provide decision making and inform management proposals for the different sections along the recreational corridor.

Annex I:

NVC Survey Record Sheets

NVC record sheet: G 01

Location	Coordinates [•] X,Y		Region	Author
South Cairn path	301872	320149	Before the fence gate	MVA

Site and vegetation description
The quadrat has been placed in a downslope transition grassland patch beside the stone pitch steps. Walkers mainly on the way down not willing to use the steps, divert along that grassy patch creating a scar, slightly marked but with punctual areas of exposed soil due to intense trampling.
The vegetation here consists in a mix of grasses progressing in the path surroundings due to the combined effect of grazing and trampling pressure, pushing the heathland vegetation towards acid grassland.

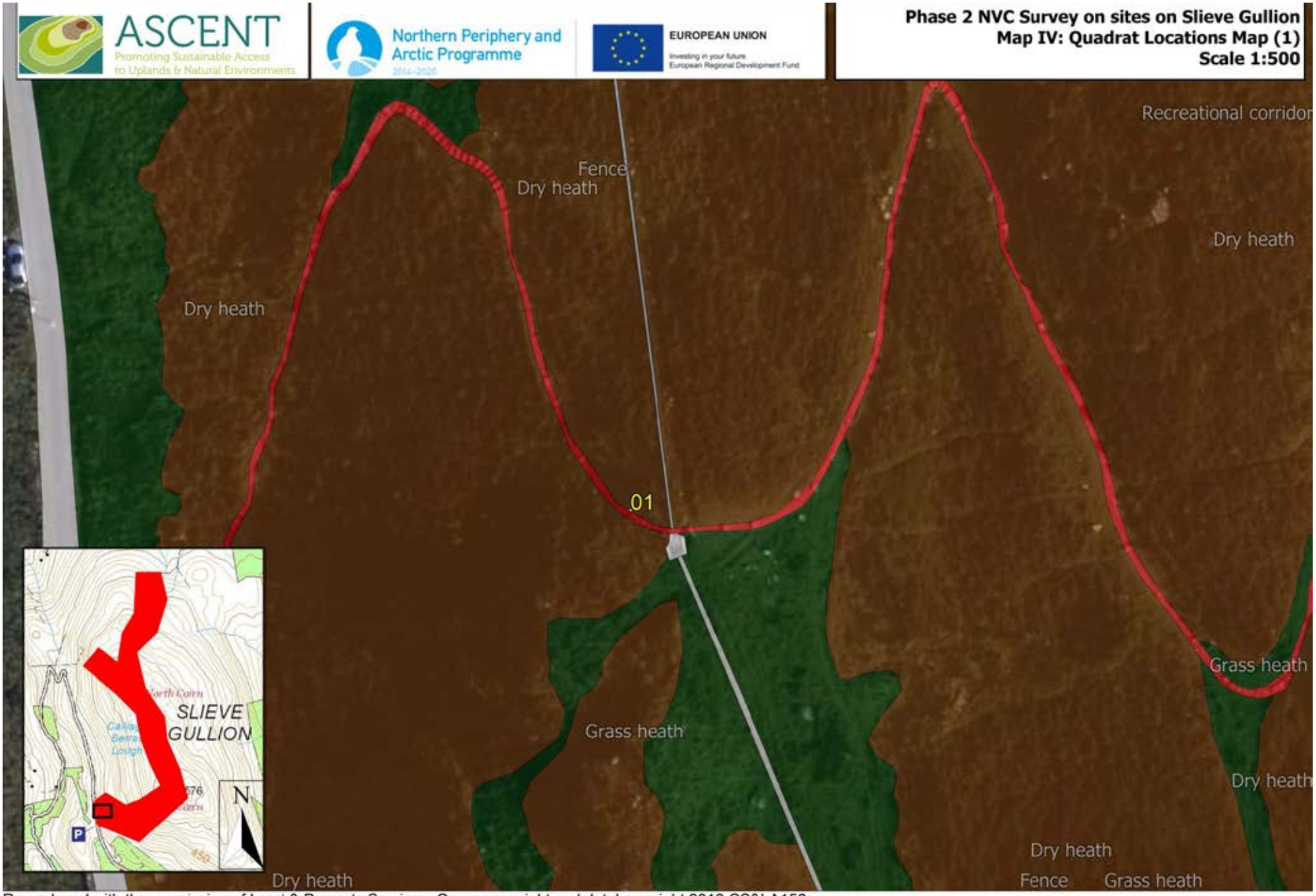
Date 15/12/2017	**Sampling position** LS (SE)
Altitude 392 m	**Slope** 15%
Aspect Y 120º SE X 20º NE	**$\bar{X}$ Soil depth** 14,55 cm
Bare rock 10% / **Bare soil** 10%	**Sample area** 2 m x 2 m
$\bar{X}$ Vegetation height 15,27 cm	**Layers cover** - / 80% / 55%
Fixed point photography nº IMGGQ01	

Species list:

Hypnum spp.	7
Agrostis spp.	6
Nardus stricta	6
Galium saxatile	5
Erica cinerea	2
Potentilla erecta	2
Calluna vulgaris	1

NVC classification: ~U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland


SE
NE



NVC record sheet: G 02

Location	**Coordinates [●] X,Y**		**Region**	**Author**
South Cairn path	301965	320182	Second path turn after fence gate	MVA

Site and vegetation description
The quadrat has been placed immediately next to a diversion trampling scar over a grassy patch beside the stone pitch remaining surface.
The vegetation here is dominated by heather interspersed by wide grassy patches with signs of frequent grazing to the point of reversion to rough-rush grassland in some areas. The young heather bushes are also frequently grazed, with a carpet look surface, but also frequent mature and senescent forms.

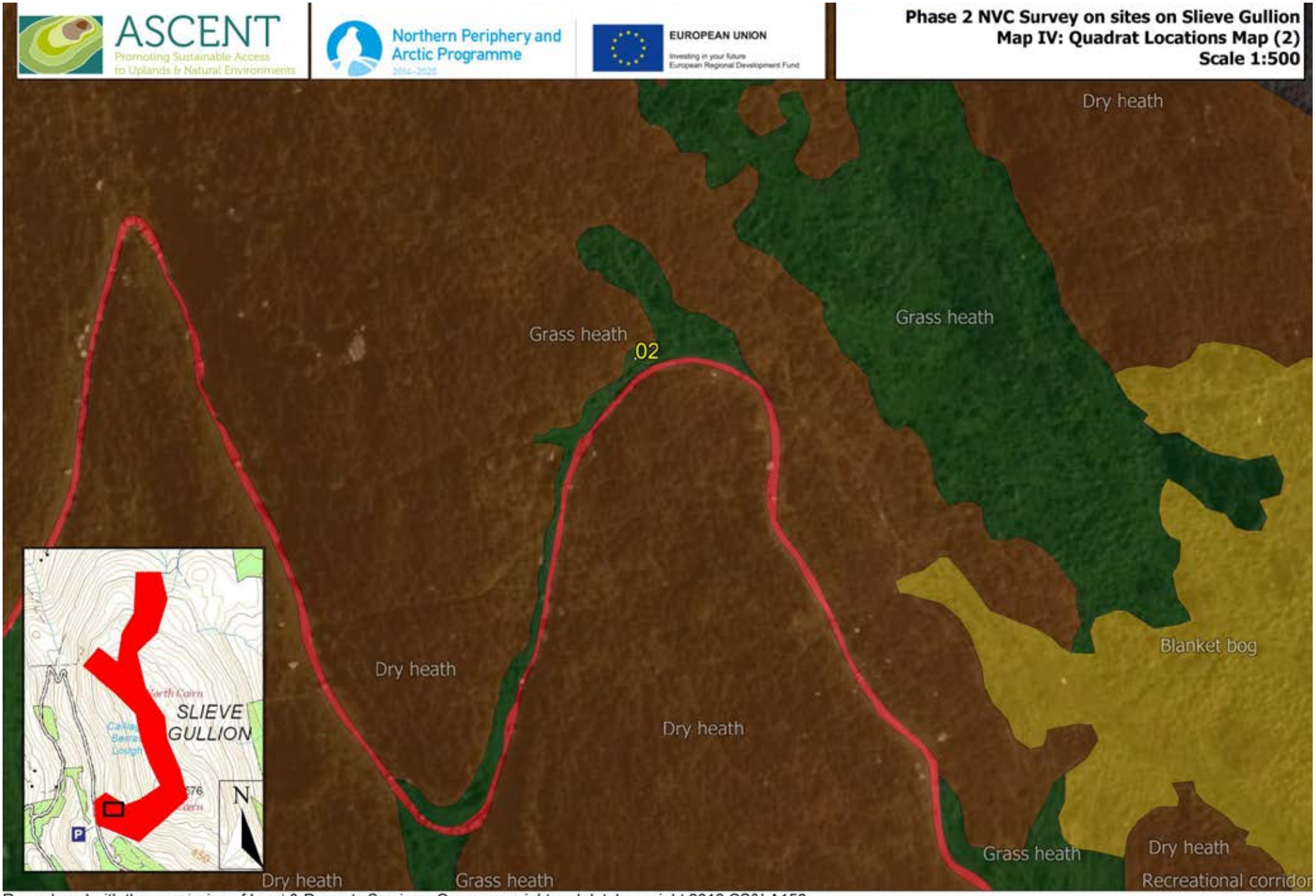
Date	**Sampling position**
30/01/2018	LS (NE)
Altitude	**Slope**
426 m	5%
Aspect	**$\bar{X}$ Soil depth**
Y 55º NE X 300º NW	12,57 cm
Bare rock / **Bare soil**	**Sample area**
0% / 0%	2 m x 2 m
$\bar{X}$ Vegetation height	**Layers cover**
33,87 cm	- / 40% / 60%
Fixed point photography nº	
IMGGQ02	

Species list:

Tuidum tamariscum	8
Calluna vulgaris	6
Erica cinerea	4
Nardus stricta	4
Hypnum spp.	4
Agrostris spp.	3

NVC classification: ~H10 *Calluna vulgaris – Erica cinerea* heath

NE



NVC record sheet: G 03

Location	**Coordinates [●] X,Y**		**Region**	**Author**
South Cairn path	302113	320036	Final section before the shelter	MVA

Site and vegetation description
The quadrat has been placed immediately next to a bare soil scar running parallel to the stone pitch surface, over a pocket of big tussocks of deer grass surrounded by heath vegetation.
The vegetation here is dominated by heather with interspersed pockets of blanket bog with scarce cotton grass.

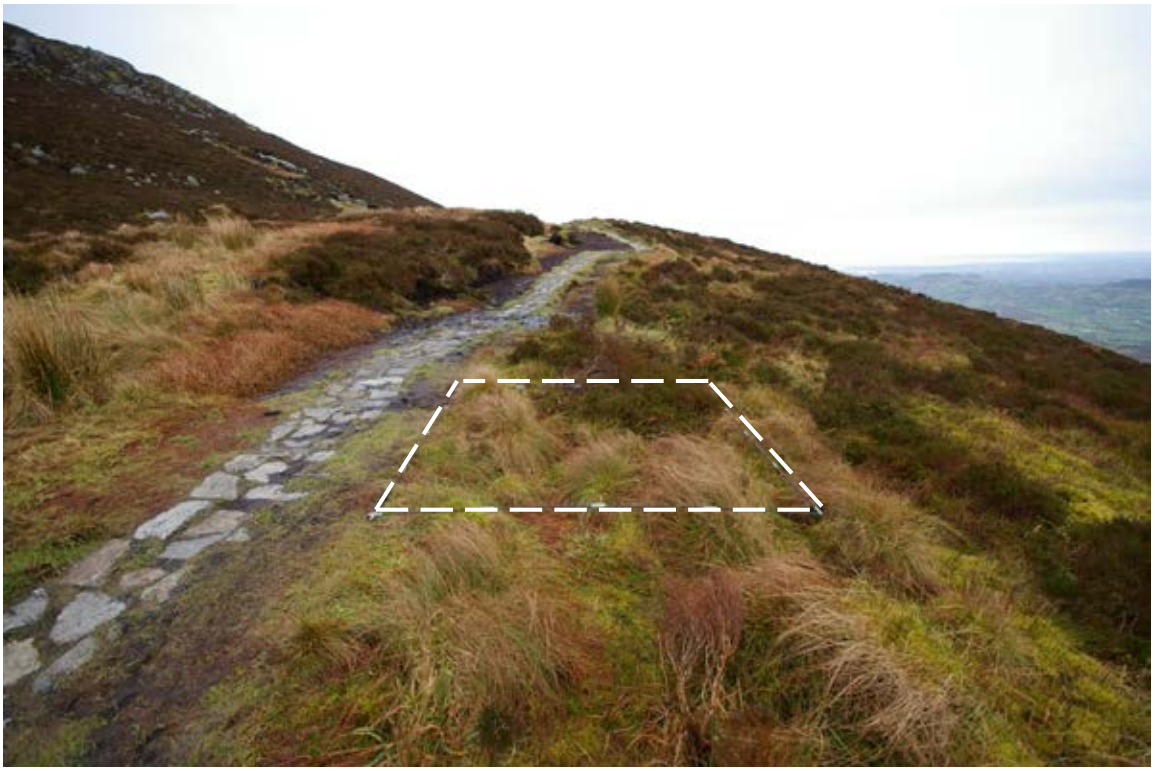
Date 30/01/2018	**Sampling position** RS (E)
Altitude 440 m	**Slope** 1%
Aspect Y 90º E X 45º NE	$\bar{X}$ **Soil depth** 42,88 cm
Bare rock 0% / **Bare soil** 0%	**Sample area** 2 m x 2 m
$\bar{X}$ **Vegetation height** 34,45 cm	**Layers cover** - / 100% / 15%
Fixed point photography nº IMGGQ03	

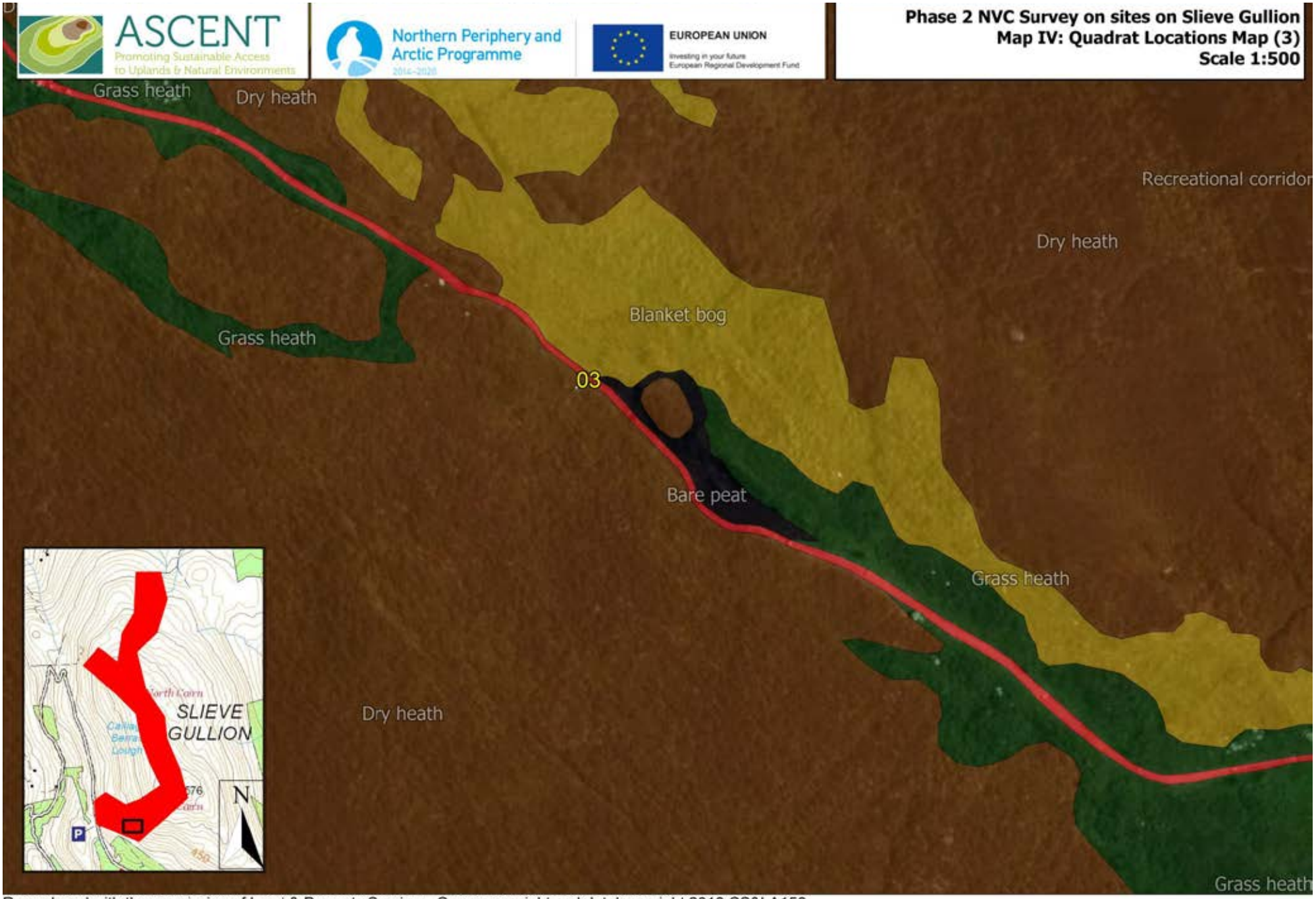
Species list:

Trichophorum cespitosum	7
Calluna vulgaris	5
Galium saxatile	5
Erica cinerea	4
Agrostis spp.	4
Polytrichum spp.	4
Vaccinium myrtilus	4
Hypnum spp.	4
Nardus stricta	3

NVC classification: ~H12 *Calluna vulgaris – Vaccinium myrtillus* heath

E





NVC record sheet: G 04

Location	Coordinates [•] X,Y		Region	Author
South Cairn path	302228	320055	Section after the shelter	MVA

Site and vegetation description
The quadrat has been placed setting a heavy trampled bare peat scar in the middle. Walkers mainly on the way down are avoiding the remaining stone pitch surface diverting over the side grass.
The vegetation here is dominated by a mix of heather and bell heather over an abundant moss carpet.

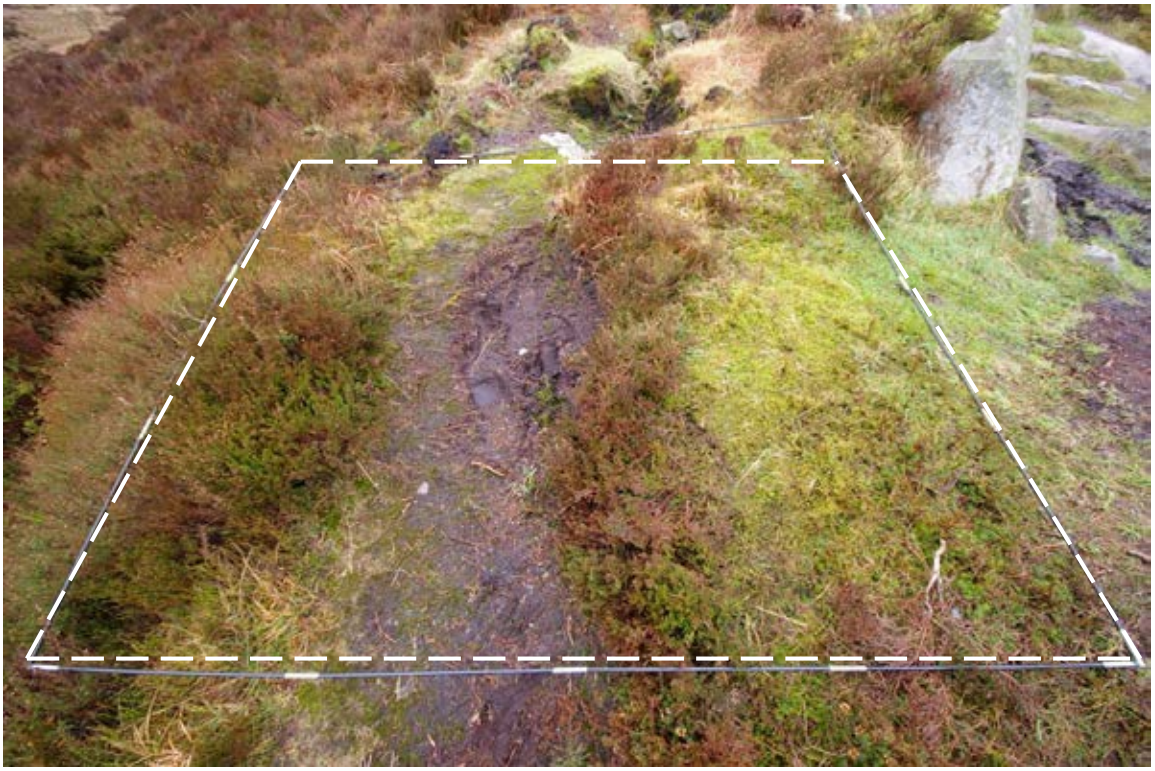
Date 30/01/2018	**Sampling position** LS (NW)
Altitude 471 m	**Slope** 5%
Aspect Y 350º NW X 250º SW	**$\bar{X}$ Soil depth** 31,45 cm
Bare rock 0% / **Bare soil** 20%	**Sample area** 2 m x 2 m
$\bar{X}$ Vegetation height 16,76 cm	**Layers cover** - / 40% / 45%
Fixed point photography nº IMGGQ04	

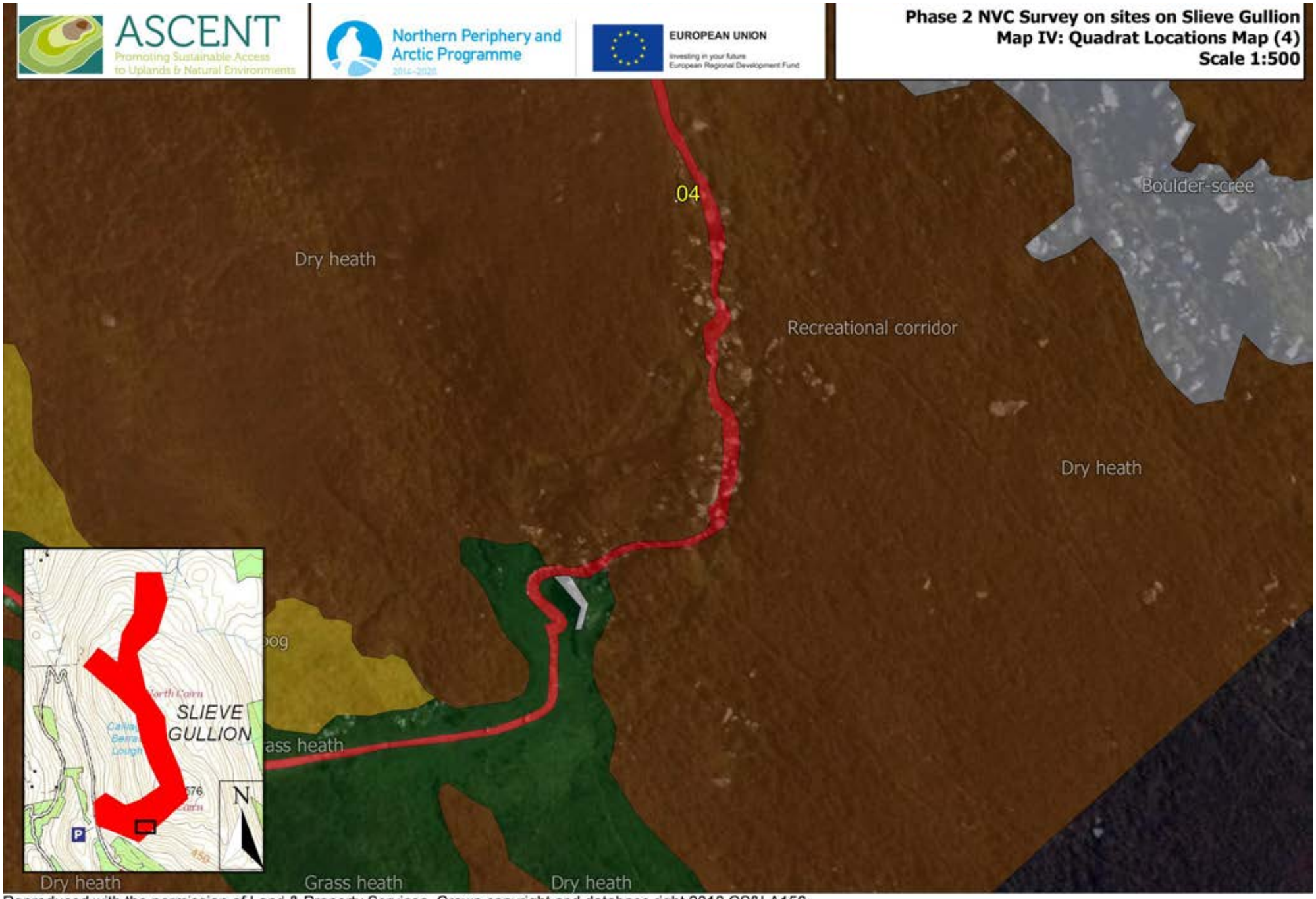
Species list:

Hypnum spp.	6
Calluna vulgaris	5
Vaccinium myrtilus	5
Polytrichum spp.	4
Erica cinerea	4
Galium saxatile	4
Campylopus introflexus	4
Agrostis spp.	3
Nardus stricta	2
Carex pilulifera	2

NVC classification: ~H12 *Calluna vulgaris – Vaccinium myrtillus* heath

NW





NVC record sheet: G 05

Location	**Coordinates [•] X,Y**		**Region**	**Author**
South Cairn path	302410	320308	Stone step section before the summit	MVA

Site and vegetation description
The quadrat has been placed on a grassy-mossy patch diversion on the side of the stoned step section. Different braiding lines are produced on the sides of the main path, with the deeper one included within the survey area.
The vegetation here, frequently grazed, is dominated by heather with frequent old and senescent growing forms, characteristic of an area less accessible for the grazing animals.

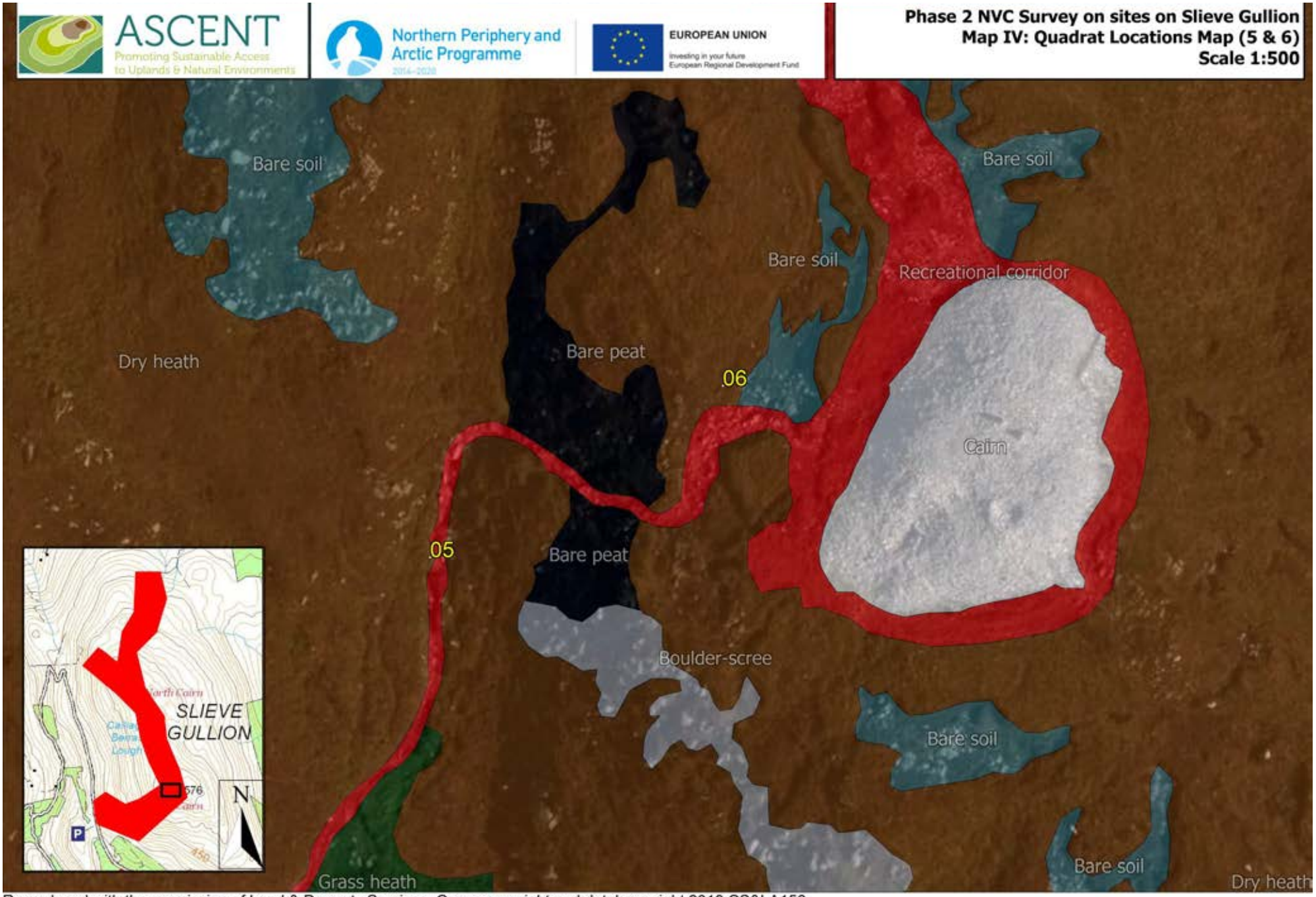
Date	**Sampling position**
30/01/2018	LS (NE)
Altitude	**Slope**
553 m	10%
Aspect Y 40º NE X 280º NW	**$\bar{X}$ Soil depth** 65,24 cm
Bare rock 0% / **Bare soil** 15%	**Sample area** 2 m x 2 m
$\bar{X}$ Vegetation height 31,66 cm	**Layers cover** - / 70% / 80%
Fixed point photography nº IMGGQ05	

Species list:

Hypnum spp.	8
Calluna vulgaris	7
Galium saxatile	5
Agrostis spp.	4
Vaccinium myrtilus	4
Polytrichum spp.	4
Nardus stricta	2
Juncus inflexus	1
Campylopus introflexus	1

NVC classification: ~H12 *Calluna vulgaris – Vaccinium myrtillus* heath

NE



NVC record sheet: G 06

Location	**Coordinates [●] X,Y**		**Region**	**Author**
South Cairn Path	335601	329044	Near the summit Cairn	MVA

Site and vegetation description
The quadrat has been placed on the middle of a trampled diversion area respect to the main stoned path line. Area trampled with heather and sedges recolonizing an area affected by 2012 wildfire, characterized by abundant *Campylopus* moss growing on the peat exposed areas.
The vegetation here is dominated by heather, interspersed abundantly in areas by pill sedge and deer grass.

Date	**Sampling position**
29/01/2018	LS (NE)
Altitude	**Slope**
570 m	1%
Aspect	**$\bar{X}$ Soil depth**
Y 40º NE X 310º NW	15,13 cm
Bare rock / **Bare soil**	**Sample area**
10% / 5%	2 m x 2 m
$\bar{X}$ Vegetation height	**Layers cover**
20,71 cm	- / 75% / 50%
Fixed point photography nº	
IMGGQ06	

Species list:

Calluna vulgaris

Trichophorum cespitosum

Carex pilulifera

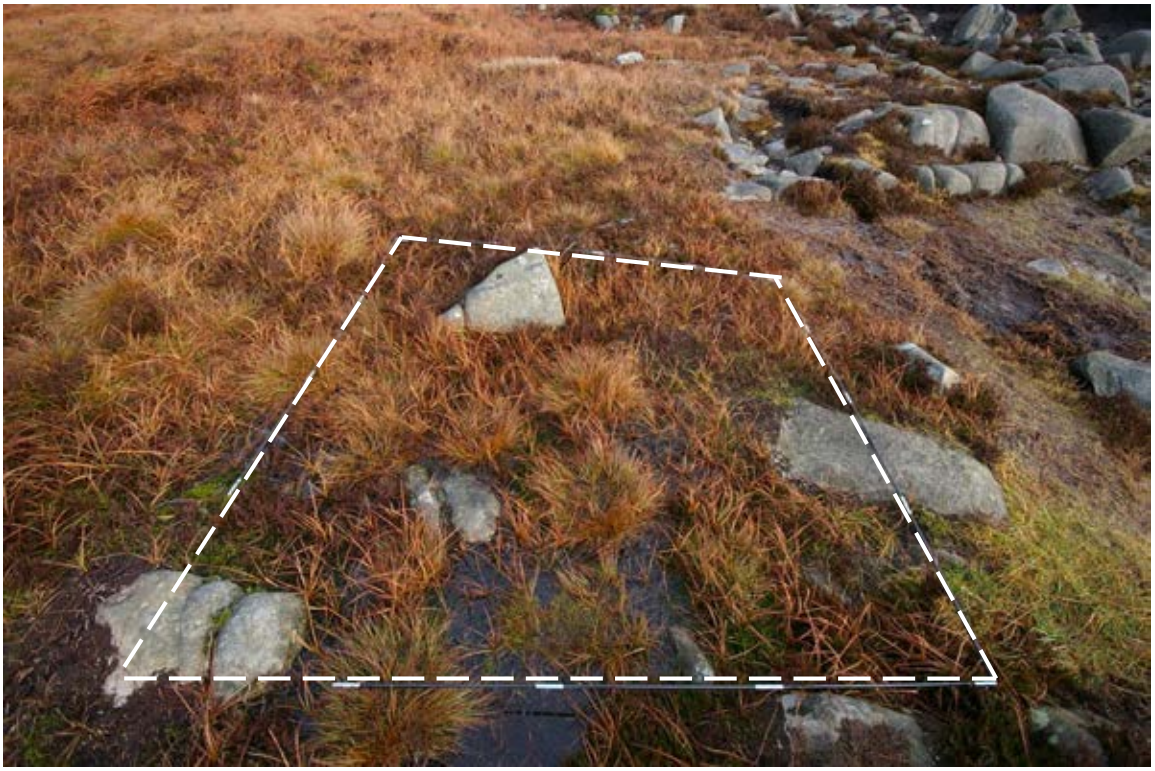
Hypnum spp.

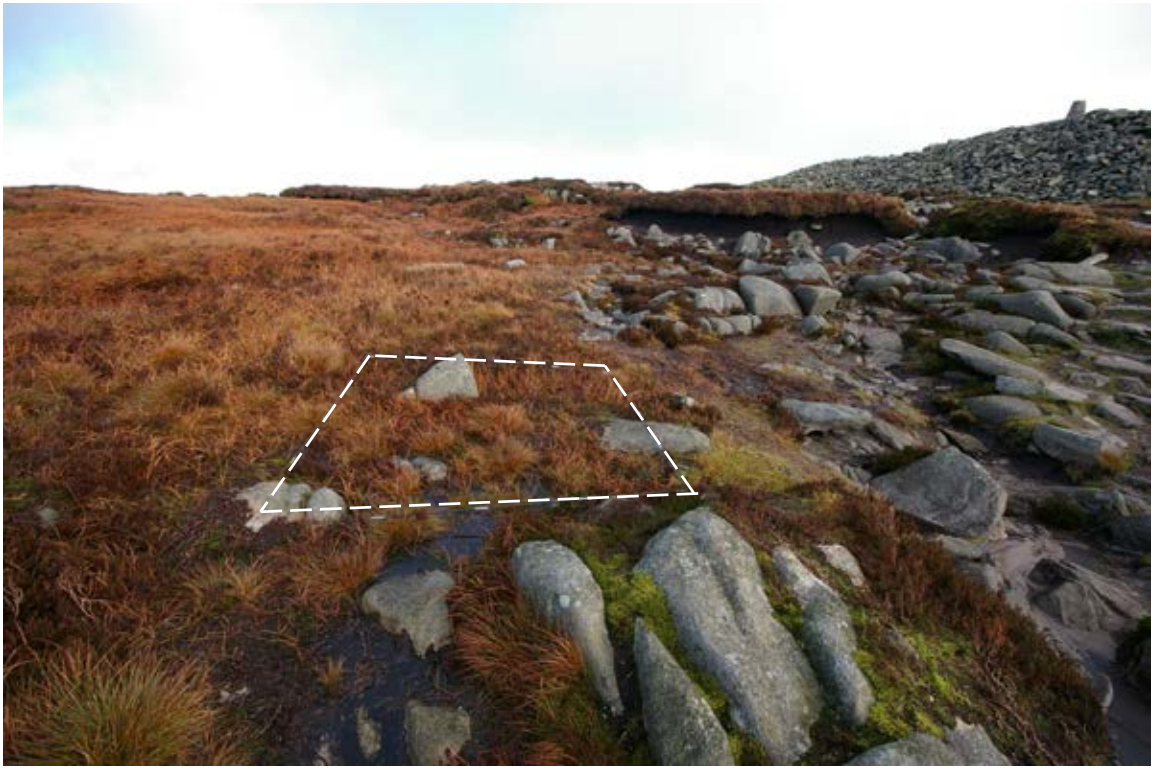
Racomitrium lanuginosum

Campylopus introflexus

NVC classification: ~H10b *Calluna vulgaris-Erica cinerea* heath

NE





NVC record sheet: G 07

Location	Coordinates [●] X,Y		Region	Author
Plateau	302462	320390	Initial braiding area	MVA

Site and vegetation description
The assessment quadrat has been placed on a diversion respect the main trampled area, consisting in a single scar line along the heath vegetation.
The vegetation here is dominated by heather interspersed with abundant pil sedge which forms locally dense patches covering the heather. Crowberry can be found locally abundant in this area especially when the heather cover is less dense.

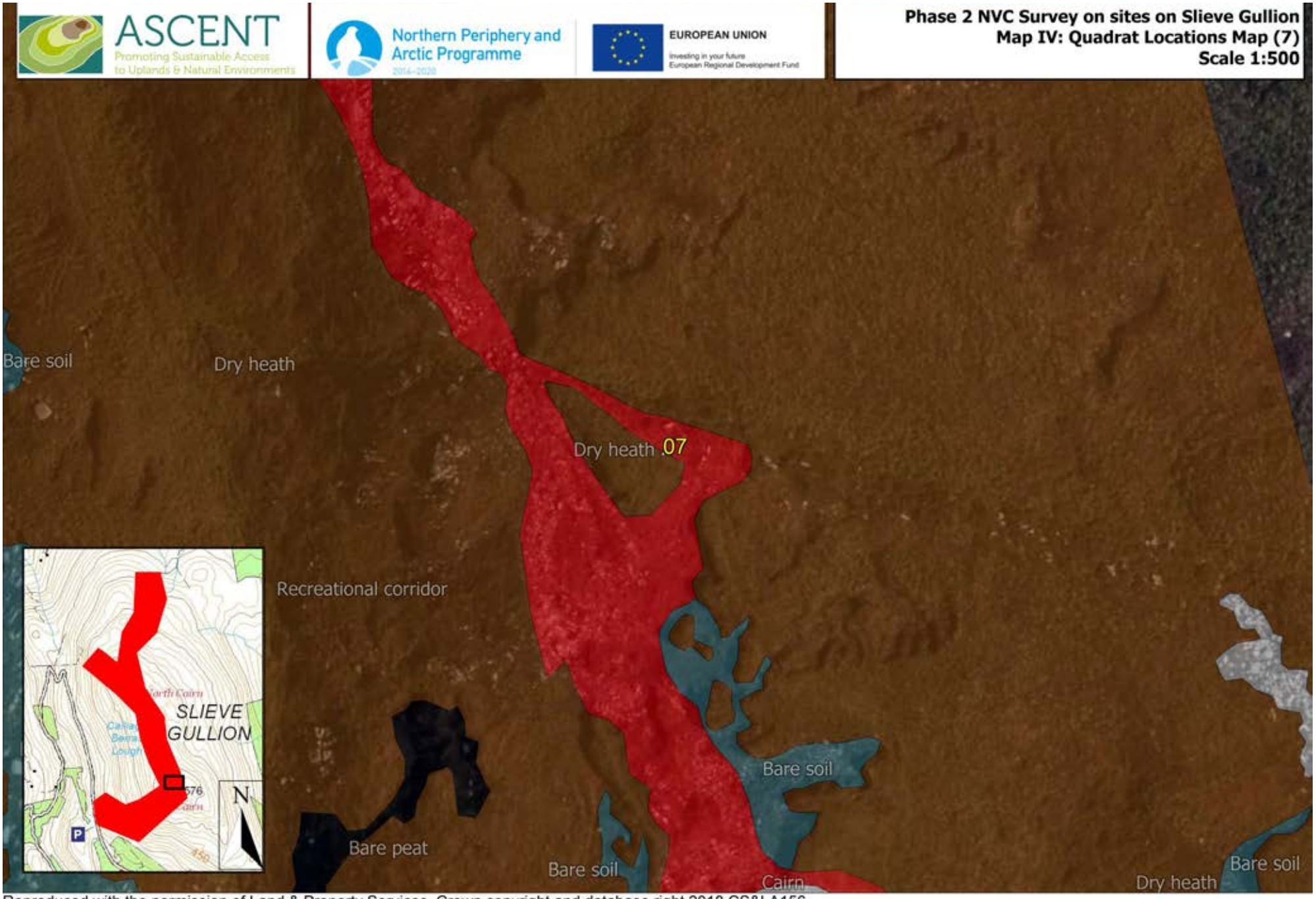
Date 29/01/2018	**Sampling position** RS (NW)
Altitude 572m	**Slope** 1%
Aspect Y 290º NW X 205º SW	$\bar{X}$ **Soil depth** 26,11cm
Bare rock 0% / **Bare soil** 5%	**Sample area** 2 m x 2 m
$\bar{X}$ **Vegetation height** 14,67cm	**Layers cover** - / 95% / 80%
Fixed point photography nº IMGGQ07	

Species list:

Hypnum spp.	10
Calluna vulgaris	8
Carex pilulifera	5
Trichophorum cespitosum	4
Empetrum nigrum	3
Campylopus introflexus	3
Vaccinium myrtilus	1

NVC classification: ~H12 *Calluna vulgaris – Vaccinium myrtillus* heath

NW



NVC record sheet: G 08

Location	**Coordinates [●] X,Y**		**Region**	**Author**
Plateau	302399	320500	Before the central wide trampled area	MVA

Site and vegetation description
The quadrat has been placed in the middle of a diversion trampling scar along the heath vegetation, used by walkers that try to avoid the central wide bare peat trampled area.
The vegetation is dominated by heather interspersed with deer grass and pill sedge, locally abundant, and frequent *Racomitrium* moss tussocks.

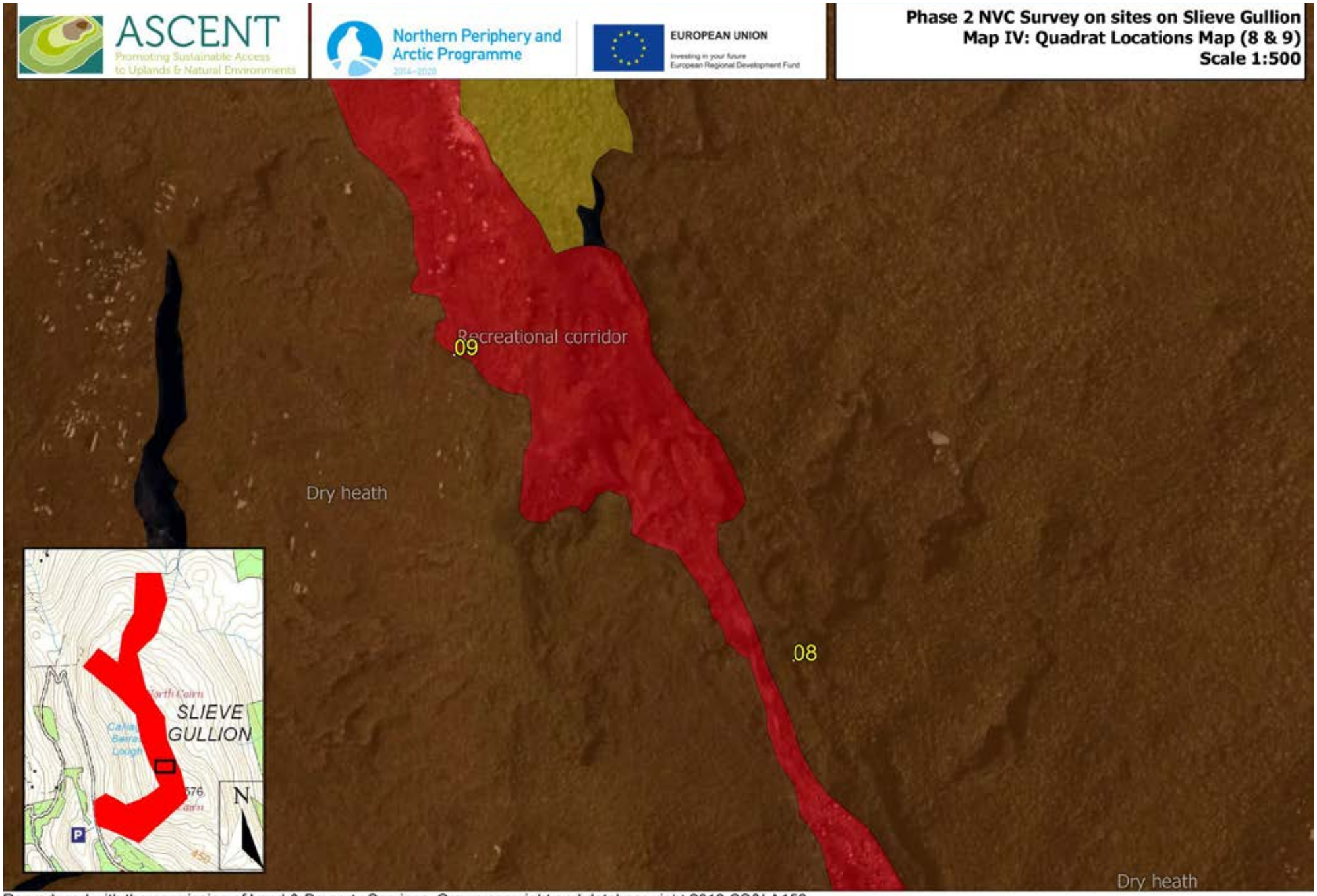
Date 29/01/2018	**Sampling position** LS (NW)
Altitude 552 m	**Slope** 5%
Aspect Y 335º NW X 240º SW	$\bar{X}$ **Soil depth** 124,62 cm
Bare rock 0% / **Bare soil** 10%	**Sample area** 2 m x 2 m
$\bar{X}$ **Vegetation height** 17,79 cm	**Layers cover** - 40% 2%
Fixed point photography nº IMGGQ08	

Species list:

Calluna vulgaris	9
Trichophorum cespitosum	7
Empetrum nigrum	4
Carex pilulifera	4
Hypnum spp.	4
Racomitrium lanuginosum	4
Sphagnum spp.	4
Campylopus introflexus	3
Vaccinium myrtilus	2

NVC classification: ~H12 *Calluna vulgaris – Vaccinium myrtillus* heath

NW



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NVC record sheet: G 09

Location	**Coordinates [●] X,Y**		**Region**	**Author**
Plateau	302360	320535	After the central wide trampled area	MVA

Site and vegetation description
The quadrat has been placed in the middle of a heather patch side diversion from the central heavily trampled peat hollow.
Vegetation dominated here by heather and bell heather with abundant peat moss patches and interspersed areas of deer grass.

Date 29/01/2018	**Sampling position** LS (NE)
Altitude 553 m	**Slope** 10%
Aspect Y 105º SE X 10º NE	$\bar{X}$ **Soil depth** 32,40 cm
Bare rock 0% / **Bare soil** 5%	**Sample area** 2 m x 2 m
$\bar{X}$ **Vegetation height** 21,95 cm	**Layers cover** - / 95% / 90%
Fixed point photography nº IMGGQ09	

Species list:

Calluna vulgaris	8
Campylopus introflexus	7
Hypnum spp.	6
Trichophorum cespitosum	5
Erica cinerea	2
Carex pilulifera	2
Vaccinium myrtilus	1

NVC classification: ~H10 *Calluna vulgaris-Erica cinerea* heath

NE

NVC record sheet: G 10

Location	**Coordinates [●] X,Y**		**Region**	**Author**
Plateau	302277	320901	Section before the lake	MVA

Site and vegetation description
The sample area has been set in front of a big rock boulder, placed on the side diversion respect the main path line, where the bare peat abundance makes difficult navigation in that section. Visitors here walk on the deer grass tussocks to avoid the wet and peat exposed areas.
The vegetation here is characterised by abundant deer grass forming mosaics with heather and bell heather.

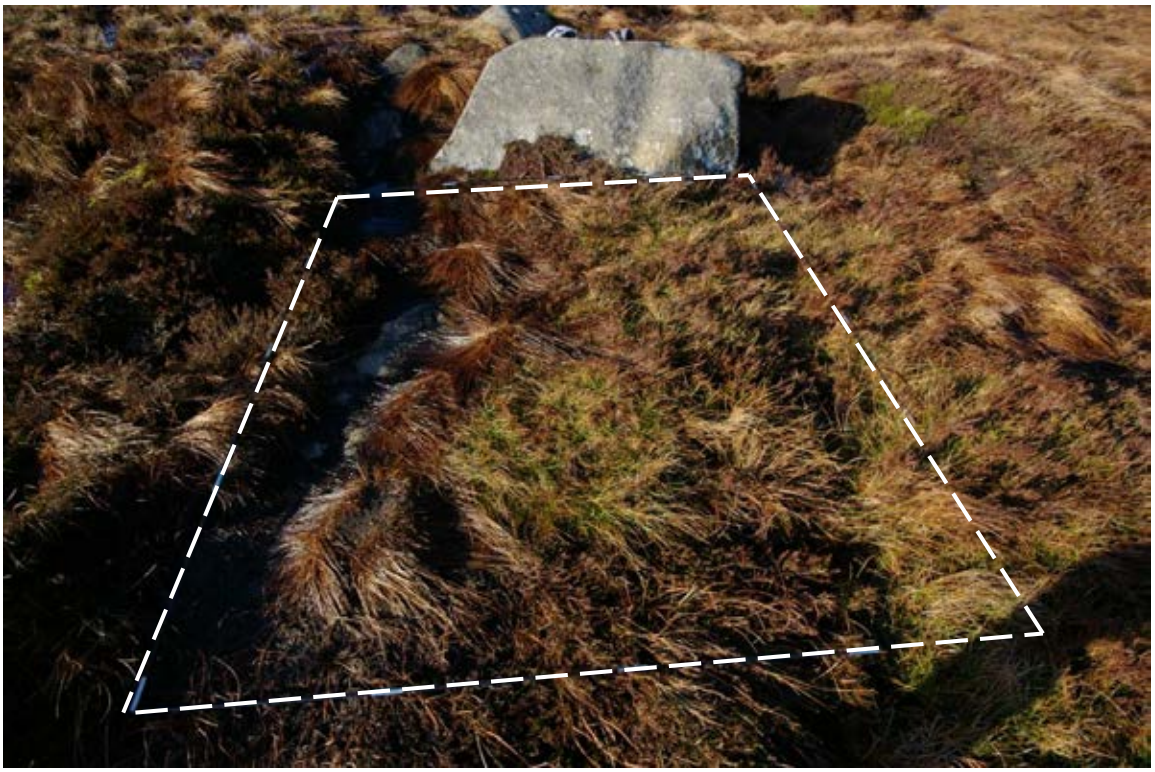
Date 29/01/2018	**Sampling position** LS (NW)
Altitude 547 m	**Slope** 1%
Aspect Y 320º NW X 220º SW	$\bar{X}$ **Soil depth** 18,52 cm
Bare rock 10% / **Bare soil** 15%	**Sample area** 2 m x 2 m
$\bar{X}$ **Vegetation height** 20,08 cm	**Layers cover** - / 75% / 10%
Fixed point photography nº IMGGQ10	

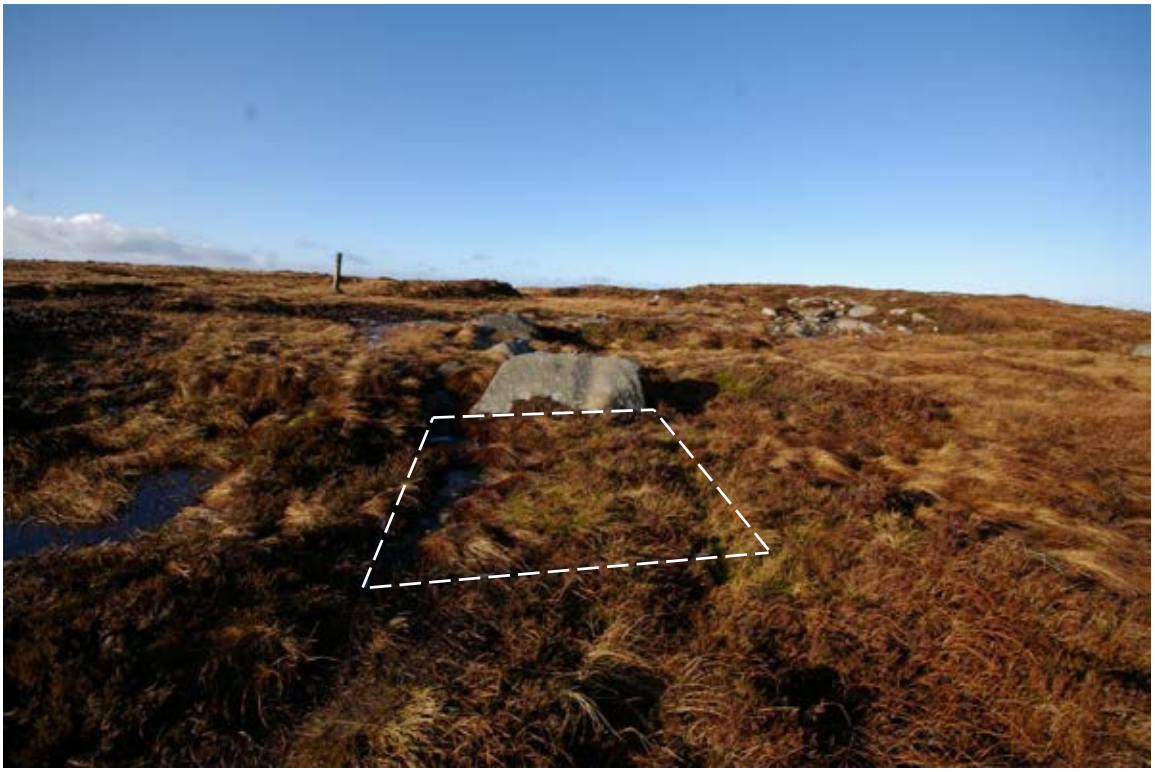
Species list:

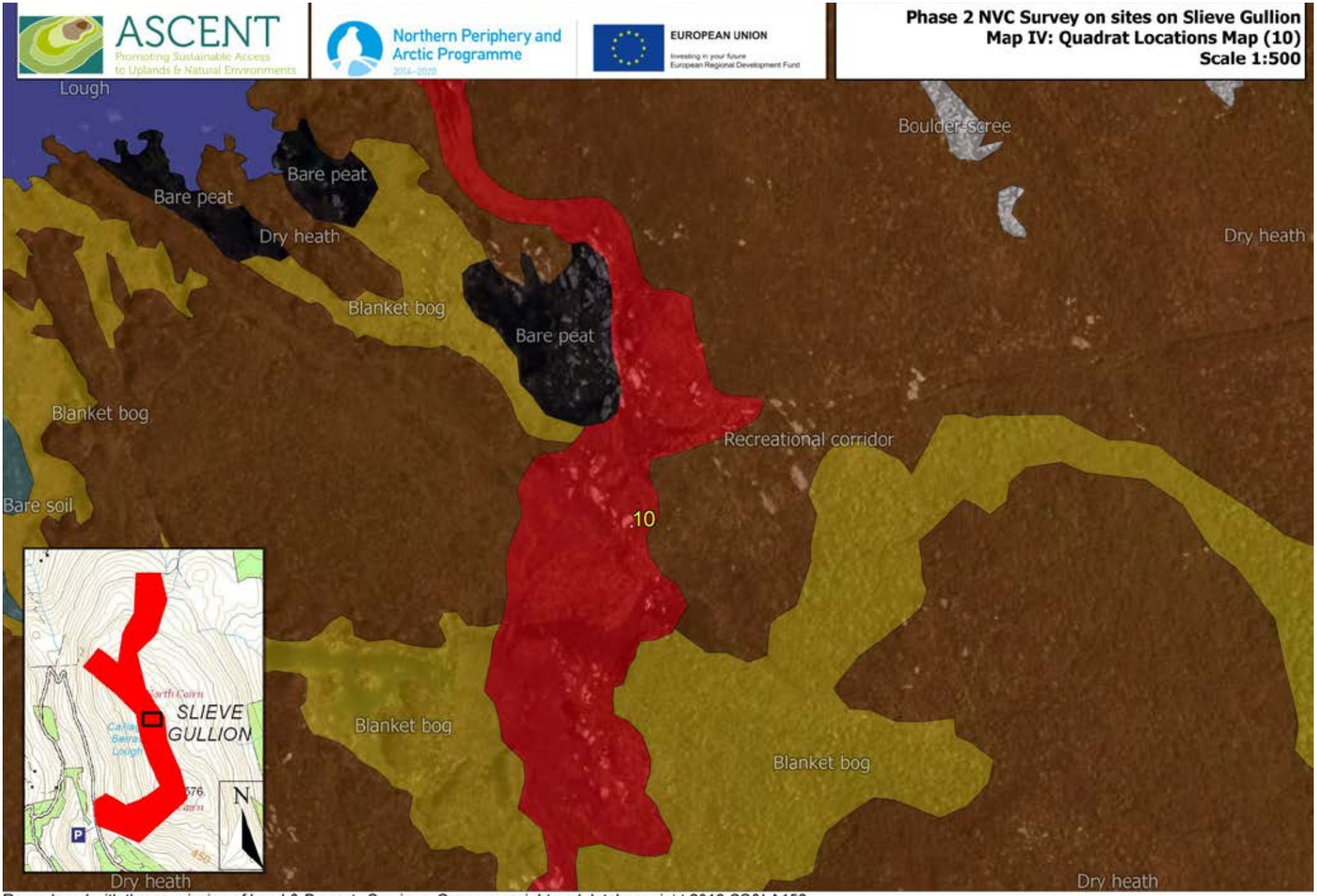
Trichophorum cespitosum	8
Calluna vulgaris	6
Erica cinerea	3
Hypnum spp.	3
Campylopus introflexus	2
Racomitrium lanuginosum	1

NVC classification: ~H10b *Calluna vulgaris-Erica cinerea* heath

NW







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NVC record sheet: G 11

Location	**Coordinates [●] X,Y**		**Region**	**Author**
Plateau	302201	321035	Section after the lake	MVA

Site and vegetation description
The quadrat has been placed including the parallel side diversion respect to the main path line, with remaining of a stone pitch section. The sample area includes within two of braiding lines produced by walkers avoiding rocks and bare peat on that area.
The vegetation here is dominated by heather with dense tussocks of deer grass locally abundant.

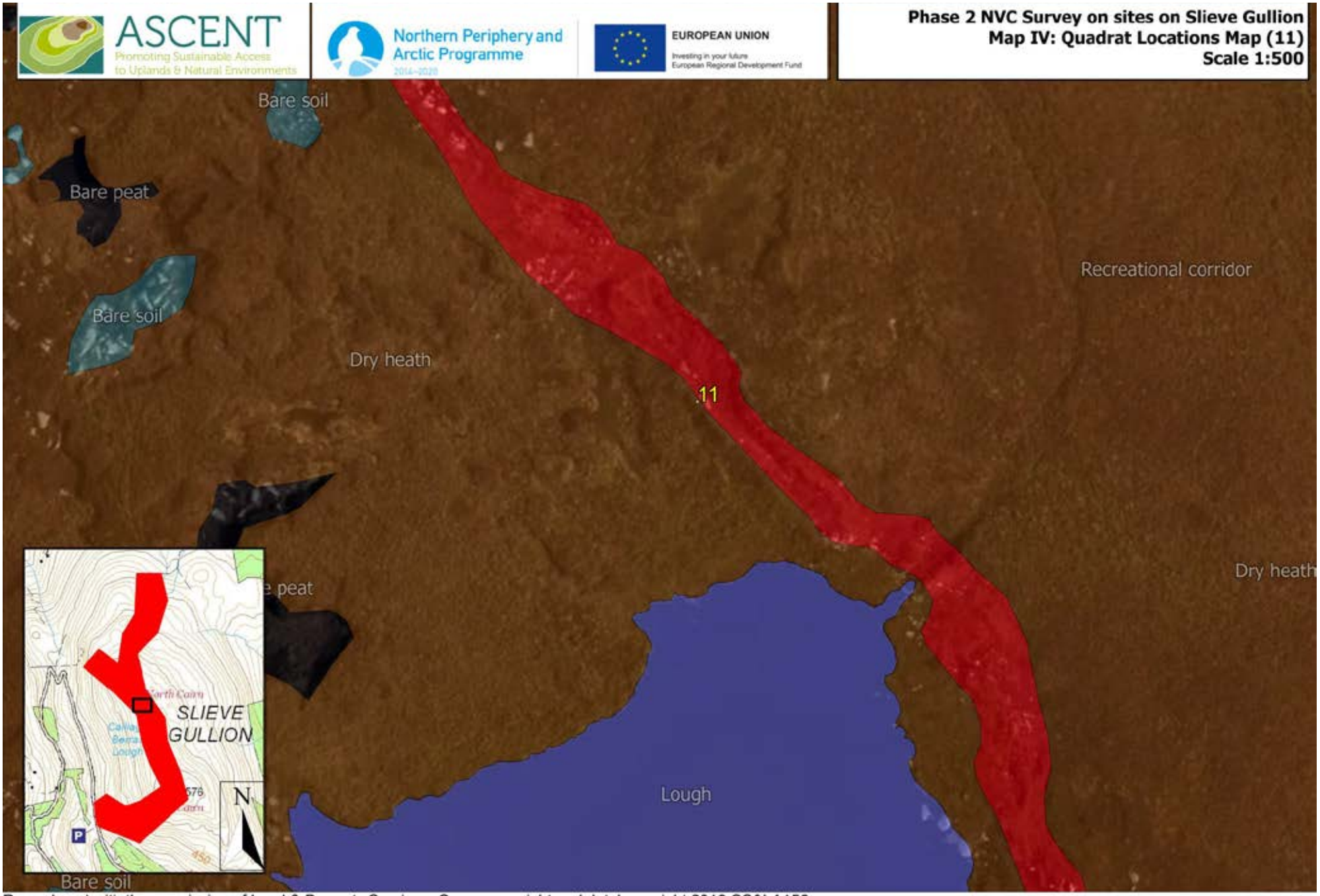
Date 29/01/2018	**Sampling position** LS (NW)
Altitude 543m	**Slope** 1 %
Aspect Y 335º NW X 330º SW	**$\bar{X}$ Soil depth** 49,73cm
Bare rock 0% / **Bare soil** 10%	**Sample area** 2 m x 2 m
$\bar{X}$ Vegetation height 26,48cm	**Layers cover** - / 75% / 55%
Fixed point photography nº IMGGQ11	

Species list:

Calluna vulgaris	8
Hypnum spp.	8
Vaccinium myrtilus	6
Campylopus introflexus	5
Trichophorum cespitosum	4
Carex pilulifera	1

NVC classification: ~H12 *Calluna vulgaris – Vaccinium myrtillus* heath

NW



NVC record sheet: G 12

Location	**Coordinates [●] X,Y**		**Region**	**Author**
Plateau	302094	321214	Section just after the North Cairn	MVA

Site and vegetation description
The quadrat has been placed immediately next to a rocky section of the main path. A scar over the vegetation is produced by walkers avoiding those rocks.
The vegetation here is dominated by heather with locally dense patches of pill sedge and deer grass.

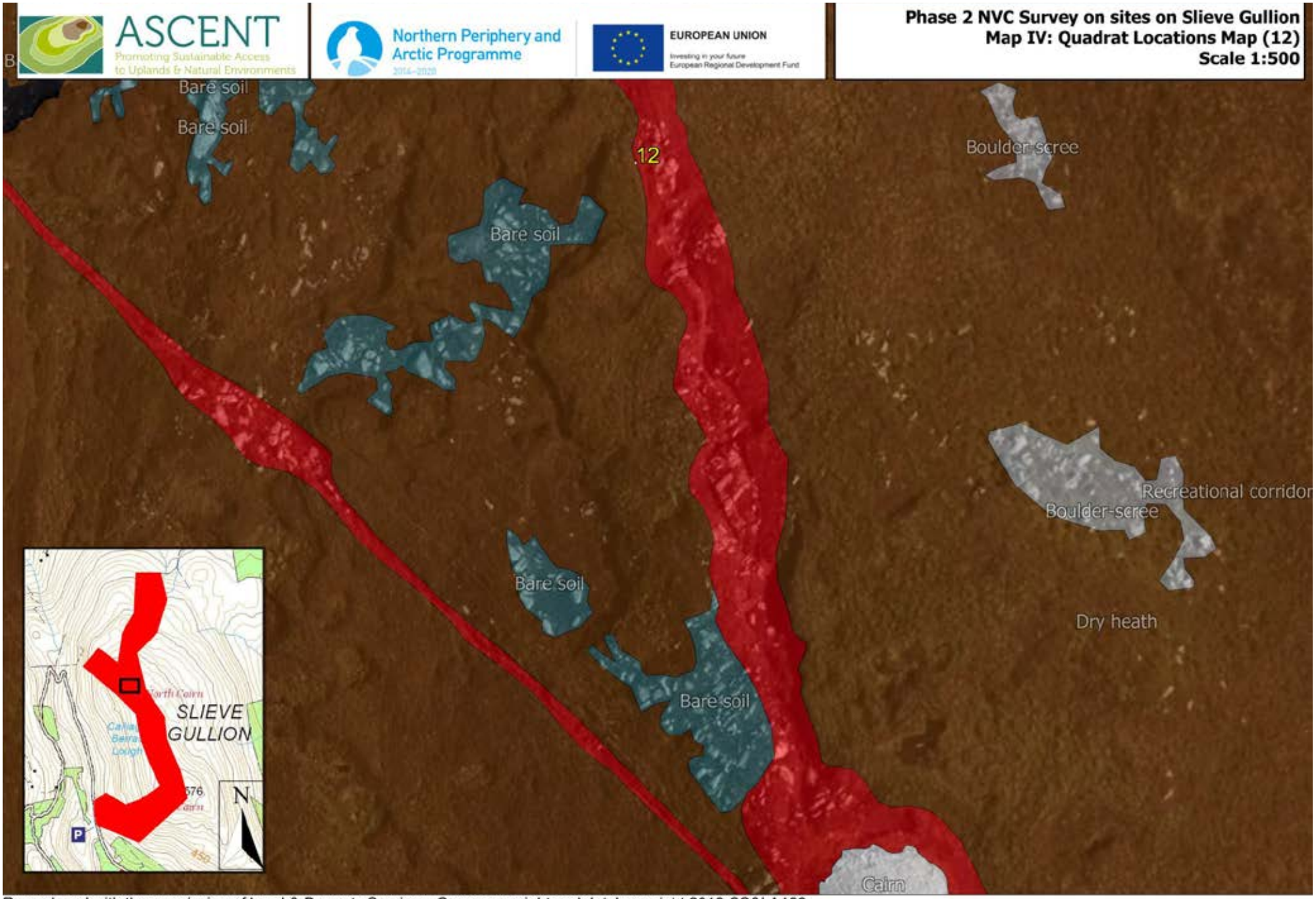
Date 29/01/2018	**Sampling position** LS (NW)
Altitude 539 m	**Slope** 5%
Aspect Y 320º NW X 240º SW	$\bar{X}$ **Soil depth** 30,92 cm
Bare rock 5% / **Bare soil** 15%	**Sample area** 2 m x 2 m
$\bar{X}$ **Vegetation height** 20,72 cm	**Layers cover** - / 80% / 65%
Fixed point photography nº IMGGQ12	

Species list:

Hypnum spp.	8
Calluna vulgaris	7
Carex pilulifera	7
Trichophorum cespitosum	4
Campylopus introflexus	4
Vaccinium myrtilus	2

NVC classification: ~H12 *Calluna vulgaris – Vaccinium myrtillus* heath

NW



NVC record sheet: G 13

Location	**Coordinates [●] X,Y**		**Region**	**Author**
North Cairn West Slope	301939	321281	Forestry ownership boundary path	MVA

Site and vegetation description
The quadrat has been placed in the middle of a double diversion scar line along the dense heather vegetation.
The vegetation here is dominated by dense heather homogeneous cover, a regeneration area affected by the 2012 wildfire.

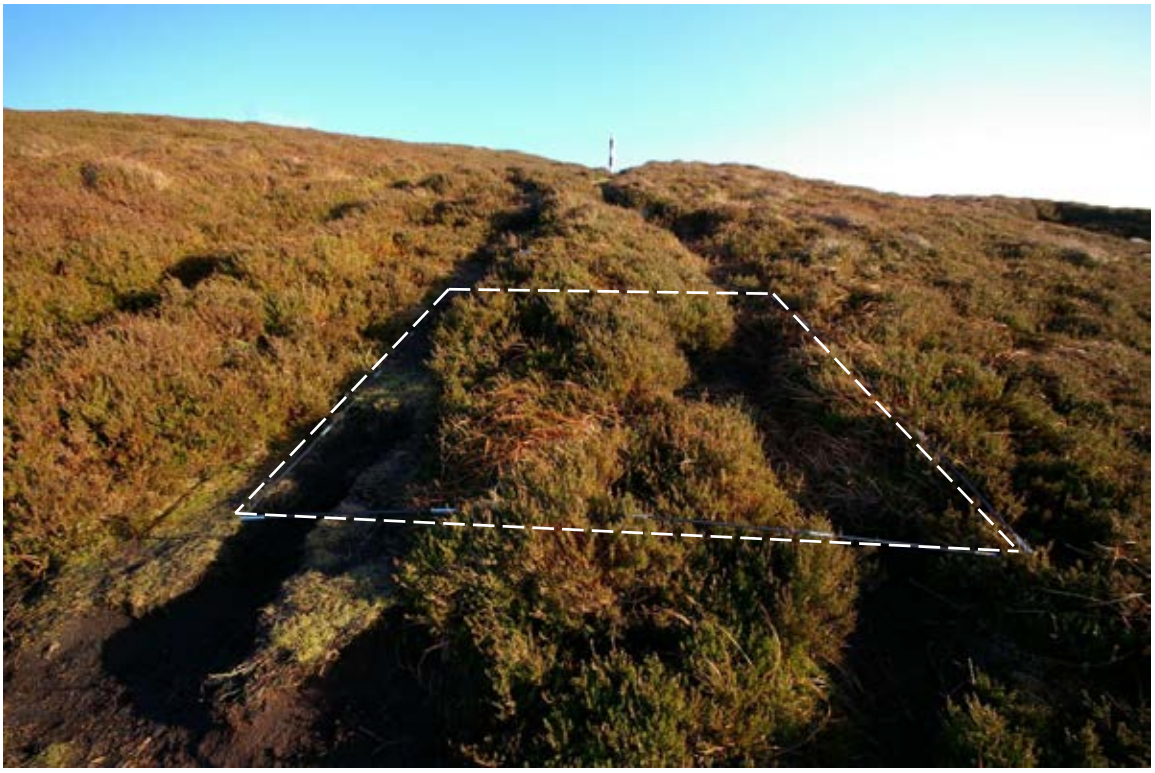
Date	**Sampling position**
29/01/2018	M
Altitude	**Slope**
514 m	10 %
Aspect	**$\bar{X}$ Soil depth**
Y 120º SE X 40º NE	71,45 cm
Bare rock / **Bare soil**	**Sample area**
0% / 20%	2 m x 2 m
$\bar{X}$ Vegetation height	**Layers cover**
6 cm	- / 70% / 10%
Fixed point photography nº	
IMGGQ13	

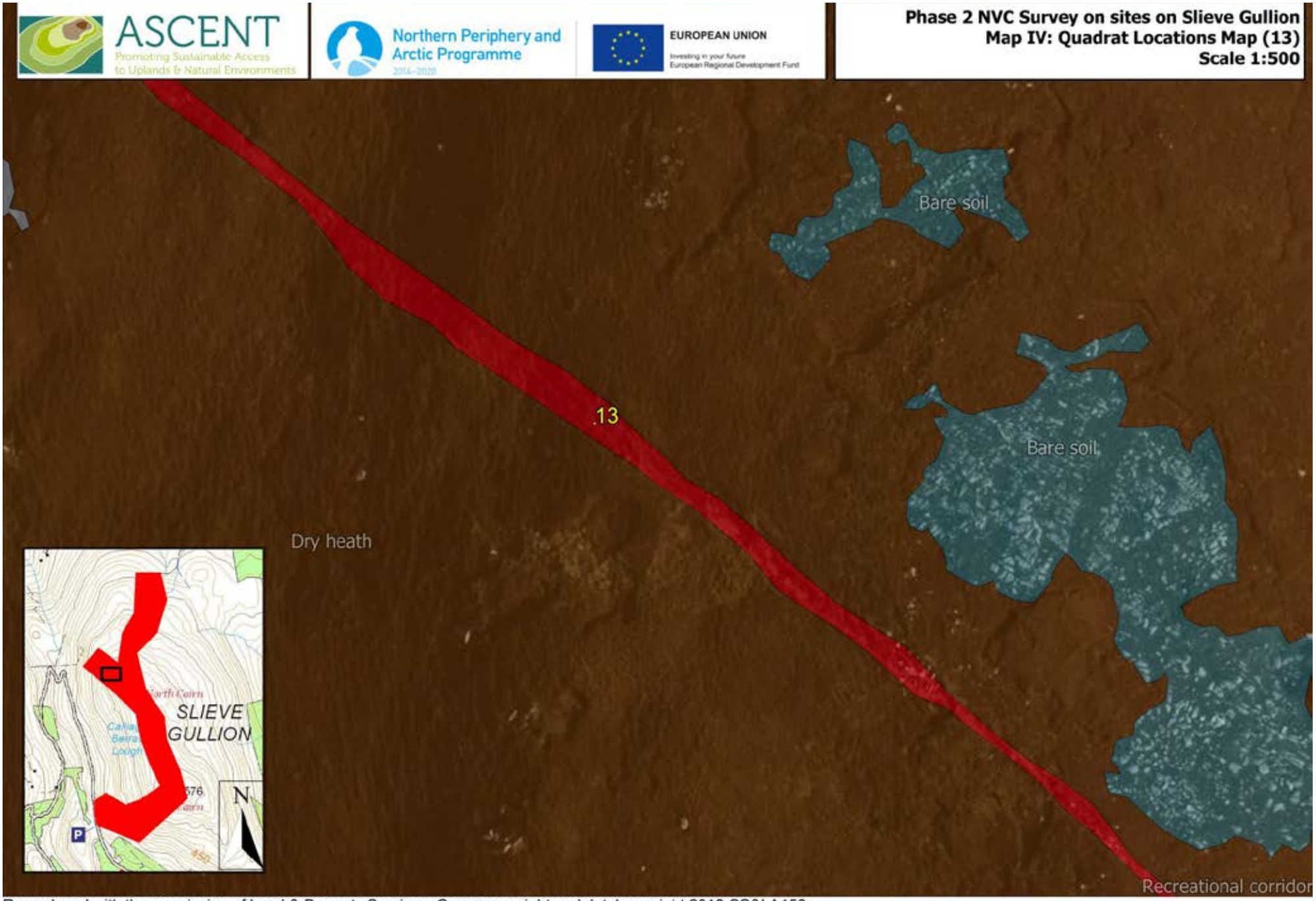
Species list:

Calluna vulgaris	8
Nardus stricta	4
Carex pilulifera	4
Campylopus introflexus	4
Vaccinium myrtilus	3
Trichophorum cespitosum	1

NVC classification: ~H12 *Calluna vulgaris – Vaccinium myrtillus* heath

SE





NVC record sheet: G 14

Location	**Coordinates [●] X,Y**		**Region**	**Author**
Ballard path	302060	321467	First grassy step section	MVA

Site and vegetation description
Wide step grassy path section with localized heavily trampling with the quadrat placed on the side of one of the side deeper scars.
The vegetation here consists of tall bushy heather surroundings over a dense moss carpet.

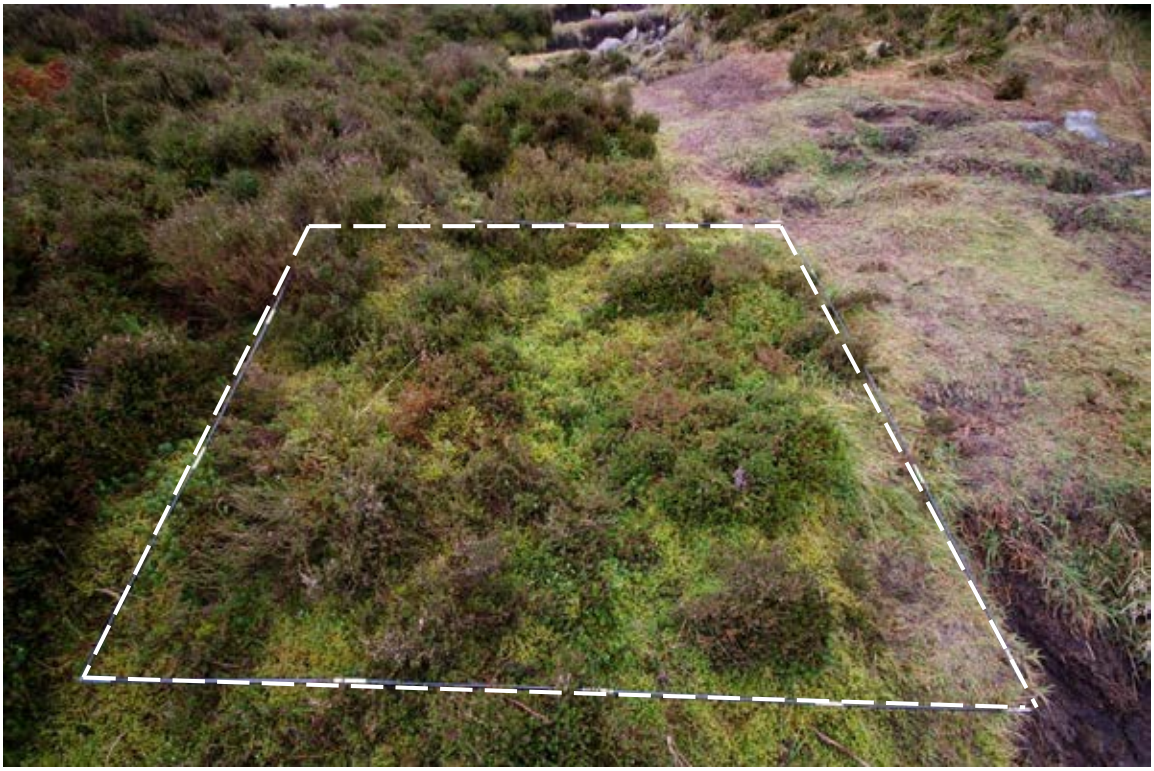
Date 30/01/2018	**Sampling position** LS (SW)
Altitude 497 m	**Slope** 10%
Aspect Y 220º SW X 125º SE	$\bar{X}$ **Soil depth** 42,32 cm
Bare rock 0% / **Bare soil** 1%	**Sample area** 2 m x 2 m
$\bar{X}$ **Vegetation height** 29,07 cm	**Layers cover** - / 40% / 90%
Fixed point photography nº IMGGQ14	

Species list:

Hypnum spp.	8
Calluna vulgaris	6
Galium saxatile	5
Polytrichum spp.	4
Campylopus introflexus	3
Vaccinium myrtillus	2
Nardus stricta	2
Agrostis spp.	2
Trichophorum cespitosum	1

NVC classification: ~H12 *Calluna vulgaris – Vaccinium myrtillus* heath

SW



Annex II:

Maps

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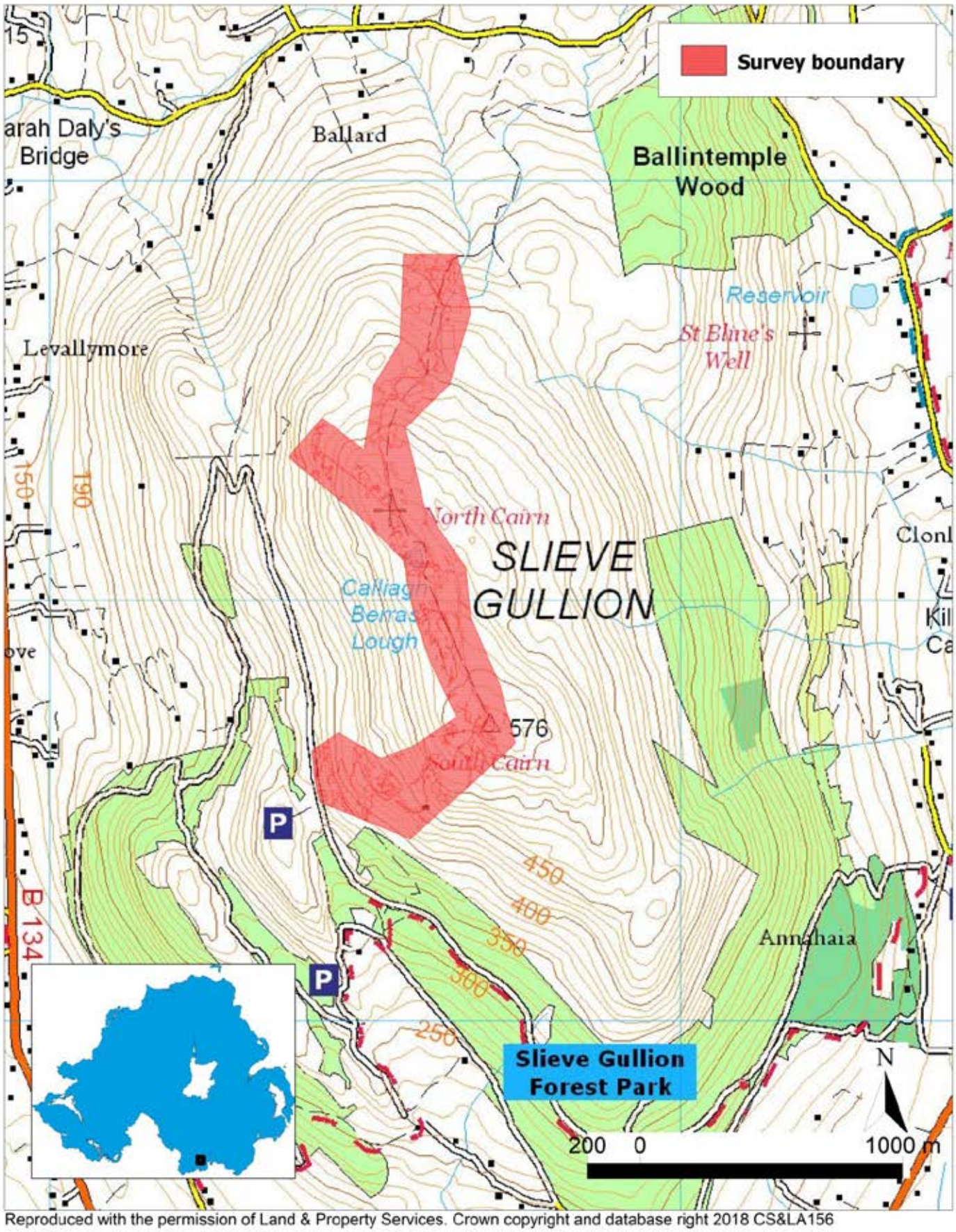
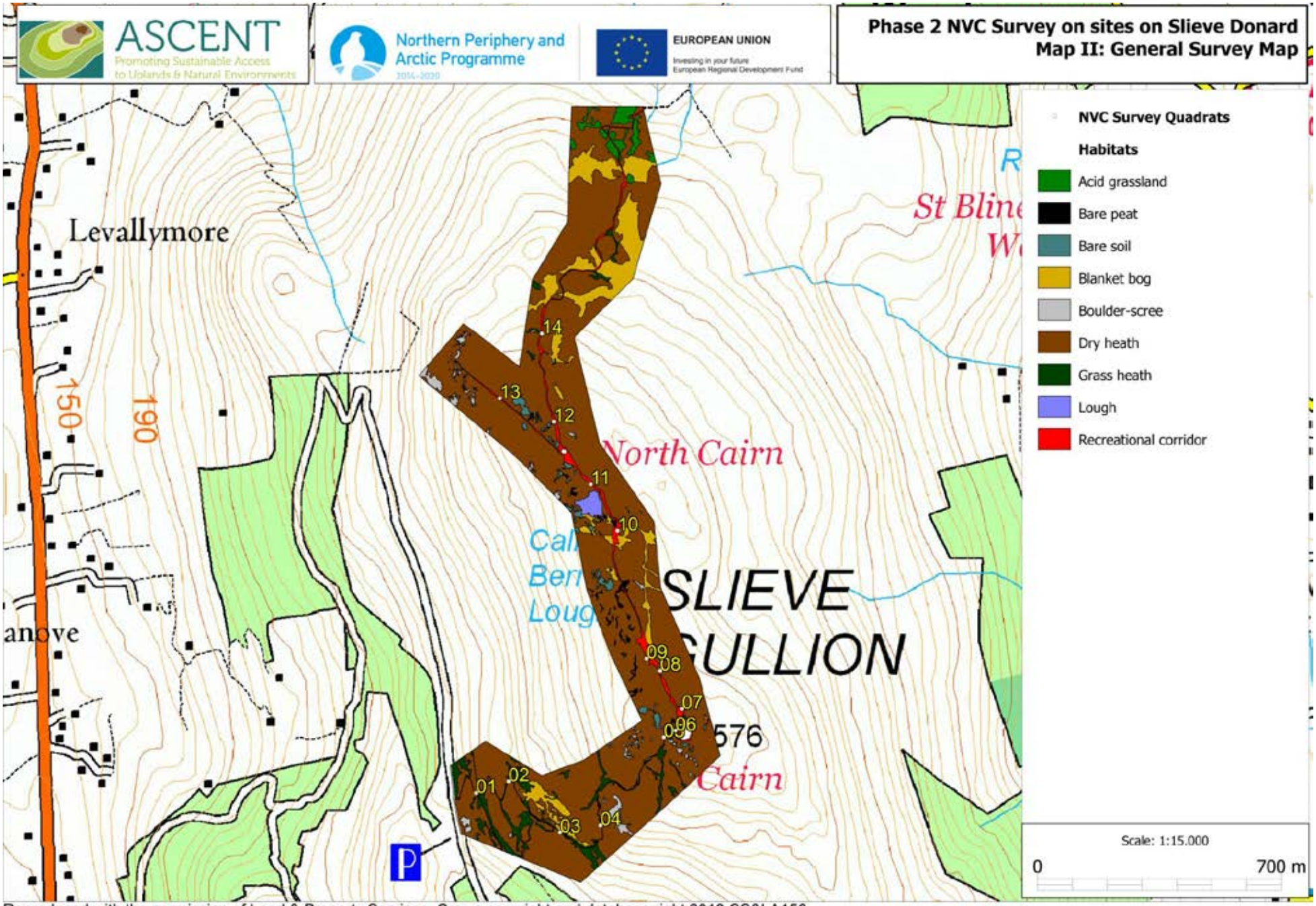
Phase 2 NVC Survey on sites on Slieve Gullion
Map I: Location Map
J022442
Scale: 1:10.000





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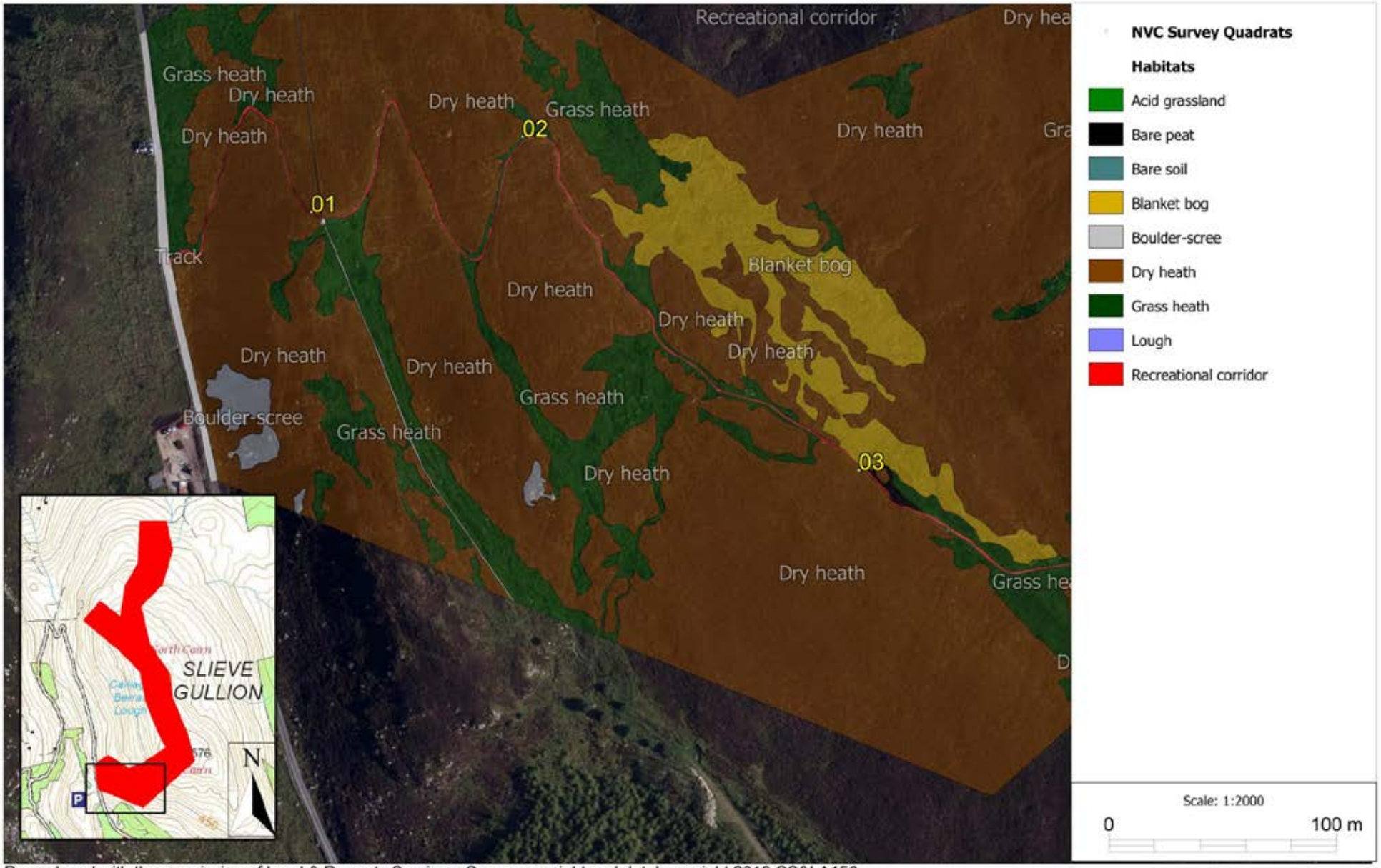
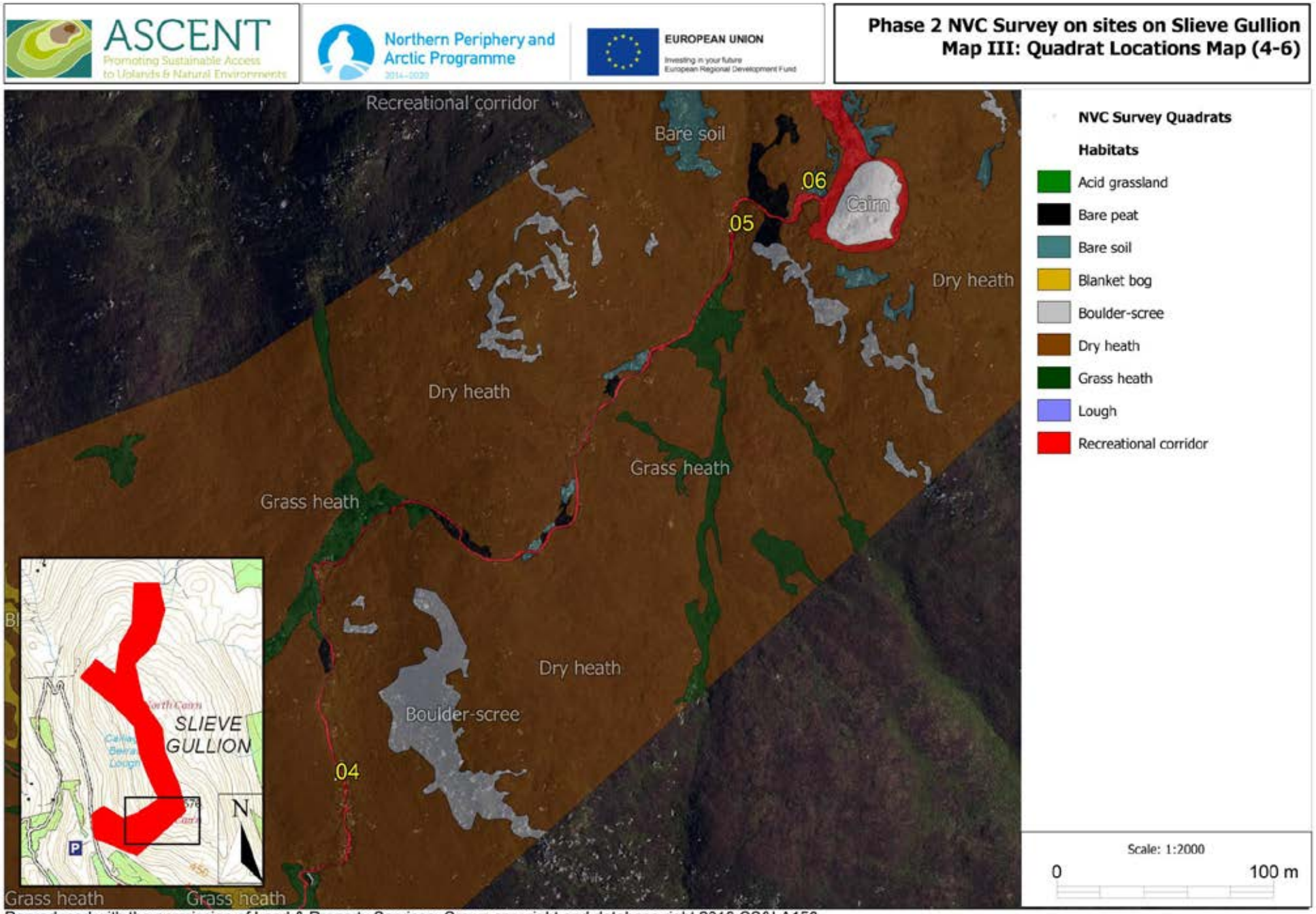
Phase 2 NVC Survey on sites on Slieve Gullion
Map III: Quadrat Locations Map (1-3)





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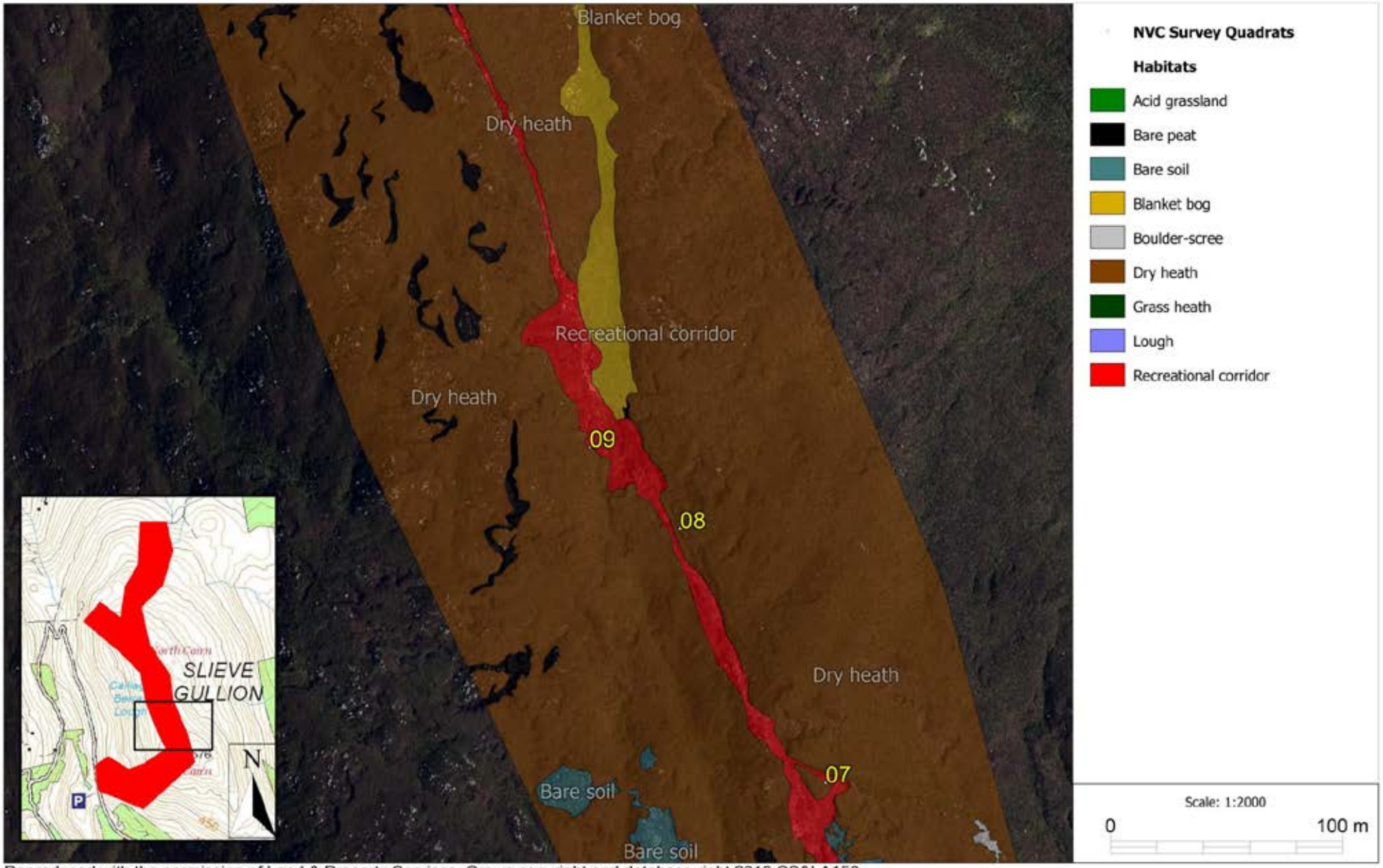
Phase 2 NVC Survey on sites on Slieve Gullion
Map III: Quadrat Locations Map (7-9)



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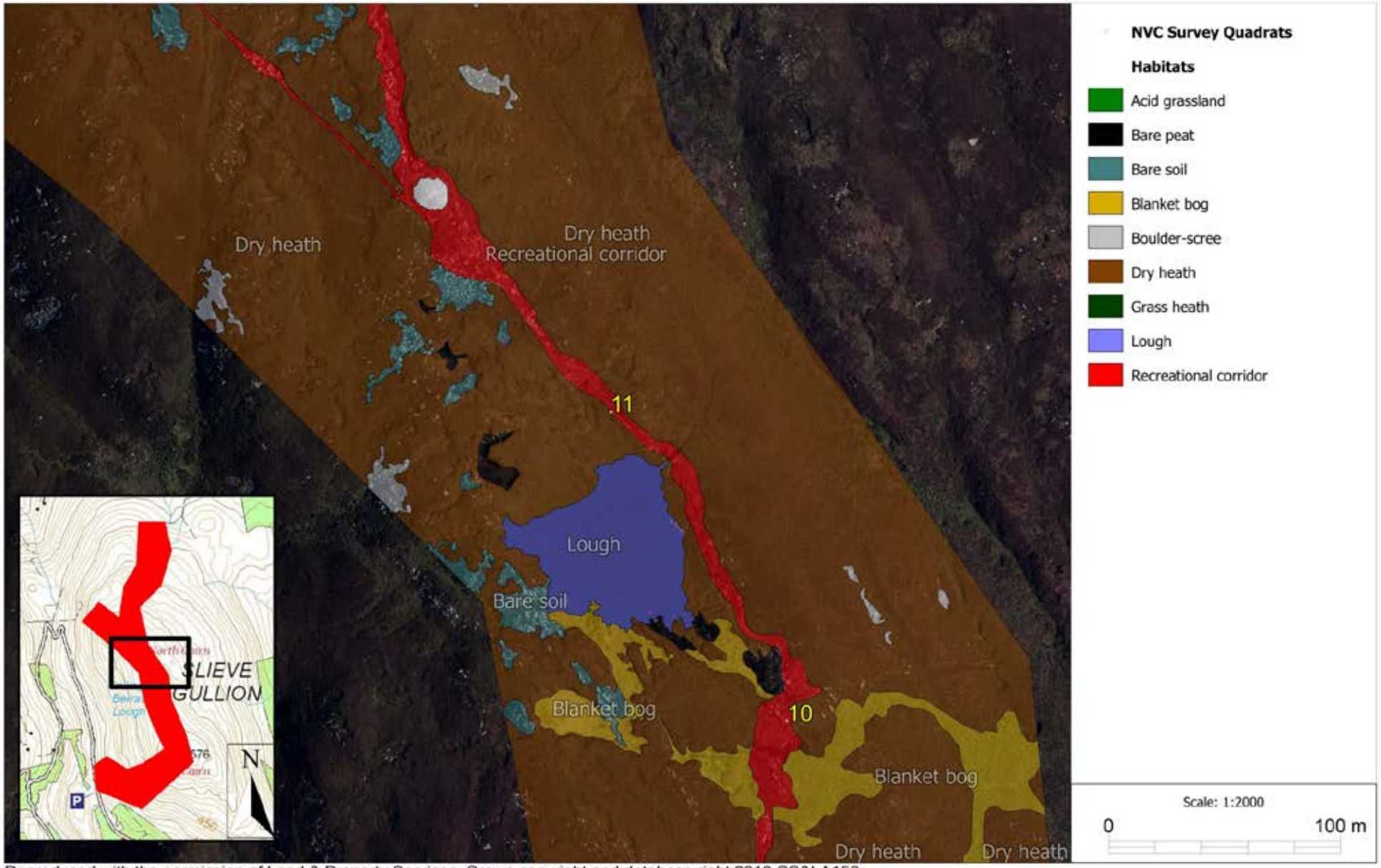
Phase 2 NVC Survey on sites on Slieve Gullion
Map III: Quadrat Locations Map (10-11)



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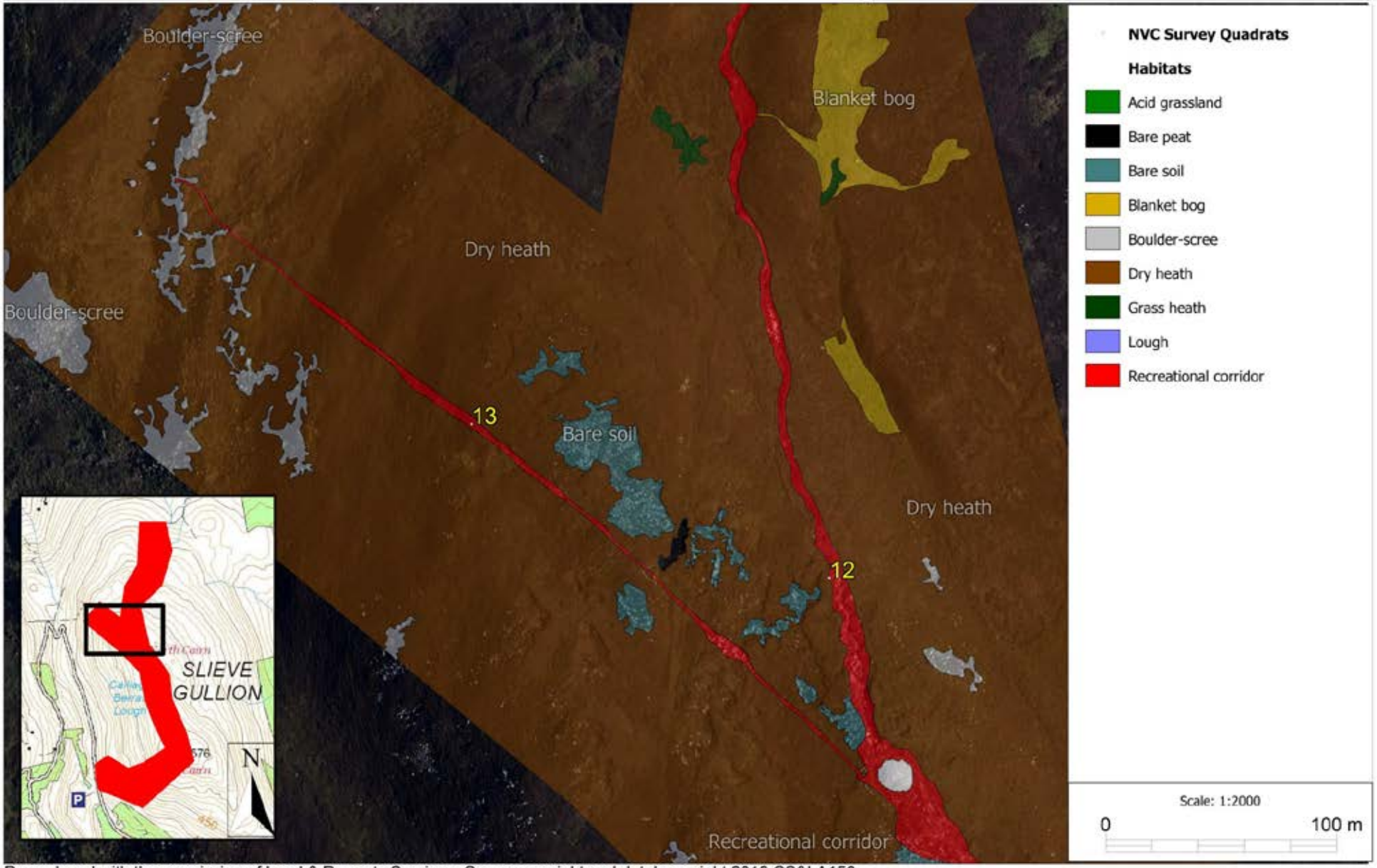
Phase 2 NVC Survey on sites on Slieve Gullion
Map III: Quadrat Locations Map (12-13)



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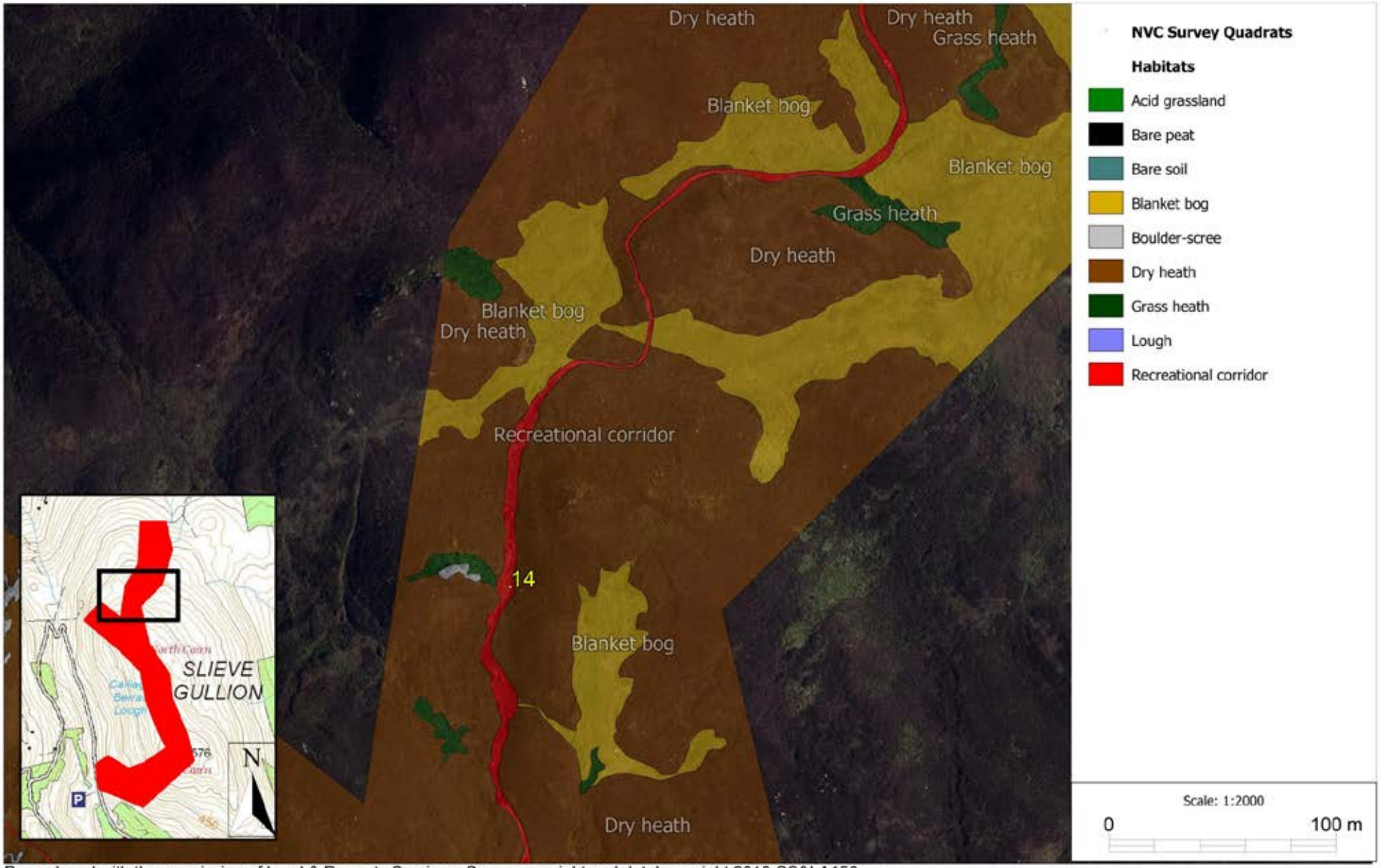
Phase 2 NVC Survey on sites on Slieve Gullion
Map III: Quadrat Locations Map (14)



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