Biodiversity Conservation
Science

Department of
Agriculture, Environment
and Rural Affairs
www.daera-ni.gov.uk

[redacted]

[redacted]

2nd Floor
Klondyke Building
Cromac Avenue
Belfast
BT7 2JA

Our Ref: DAERA/20-298

23 November 2020

Dear [redacted]

Environmental Information Regulations 2004

Thank you for your email received on 6 November 2020 requesting information on the Mourne Mountains SAC Conservation Objectives.

I can advise that the Department has completed its search and can confirm that it holds the information you requested is detailed below:

Q1 *Arising from the Eastern Mournes SAC Conservation Objectives which are due to be reviewed in November 2020. Could you please provide me with some information as to how this is going and when will the updated Conservation Objectives be published?*
A review of the Eastern Mournes SAC Conservation Objectives has not yet been started, and no plans are currently in place to commence it.

Q2 *Is it also possible to access habitat mapping or condition assessment information for the SAC?*
Attached at Annex 1 is the Eastern Mournes Condition Assessment Report 2016, please note that the habitat points are publically available via the NIEA Map Viewer (https://appsd.daera-ni.gov.uk/nedmapviewer/) and they have relevance to the condition assessment report.

If you require any clarification, believe that any part of your request has been overlooked, misunderstood or misinterpreted, please contact me in the first instance to see if it is a matter that can be resolved.

If you are unhappy with the manner in which your request for information has been handled or the decision to release/withhold information, you have the right to request a formal review by the Department. If you wish to do so, please contact The Review Section either by e-mailing daera.informationmanager@daera-ni.gov.uk or by post at The Department of Agriculture, Environment and Rural Affairs, Data Protection &

Information Management Branch, Floor 2, Ballykelly House, 111 Ballykelly Road, Ballykelly, Limavady BT49 9HP, within two months from the date of this letter.

If after such an internal review you are still unhappy with the response, you have the right to appeal to the Information Commissioner at Wycliffe House, Water Lane, Wilmslow, CHESHIRE, SK9 5AF, who will undertake an independent review of the Department's decision.

Yours sincerely

[redacted]

Biodiversity Conservation Science

Enc

Eastern Mournes Condition Assessment Report 2016

Site Description

The Eastern Mournes ASSI/SAC is an extensive area of dry and wet heath, interspersed with blanket bog, acid grassland and flushes. In addition, there are large areas of scree and on the highest slopes and plateaux, more restricted areas of summit heath. These habitats support a number of associated scarce and rare higher and lower plants and invertebrates.

Dates: September to October 2016

Survey Effort: 30 + team days

The bulk of the work was undertaken by ADAS (https://www.adas.uk) under contract.

Methods

For the first Condition Assessment (CA) in 2003, a regular grid was placed over the ASSI to enable the systematic sampling of the whole area: samples were 450m apart, giving a sampling intensity of approx 1 point per 20 hectares. The grid ensured even coverage, and helped to avoid subjectivity or bias in the choice of sampling position. However, it may have under-sampled less extensive and localised habitats such as montane heath, scree and cliff, as discussed in further detail below.

The 2008 and 2016 Condition Assessments used the same sample points (Map 1). These points were pre-programmed into the GPS units for accurate navigation to each point. The 2016 Condition Assessment used the 2008 survey points as the point coordinates, rather than the original waypoints, thus representing "semi-permanent" plots (see discussion below).

At each point, a range of vegetation composition and structure attributes were recorded, largely within a 2x2m quadrat. In addition, a number of management attributes were also recorded, either within the 2x2m quadrat, or in the immediate surrounding area (i.e. within a 10m radius), or very occasionally within a wider area. All this information was recorded directly onto the GPS units. Additional plots were recorded for scree or cliff from a safe vantage point.

During 2008 and 2009, staff from Northern Ireland Environment Agency (NIEA) recorded additional points in the montane heath communities: this was also the case in 2016. These habitats are very localised, and would have been under-recorded using grid sampling alone. The locations of any rare plants were also recorded.

SAC Features

SAC Feature	ASSI feature	Approx Extent (ha)
European dry heaths	Dry heath	4680
Northern Atlantic wet heaths with *Erica tetralix*	Wet heath	889
Blanket bog (active only)	Blanket Bog	318
Alpine and Boreal heaths	Montane heath	32.14
Siliceous alpine and boreal grasslands	Montane heath	32.1
Siliceous rocky slopes with chasmophytic vegetation	Inland Rock	58.54
Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Caleopsietalia ladani*)	Inland Rock	17.65

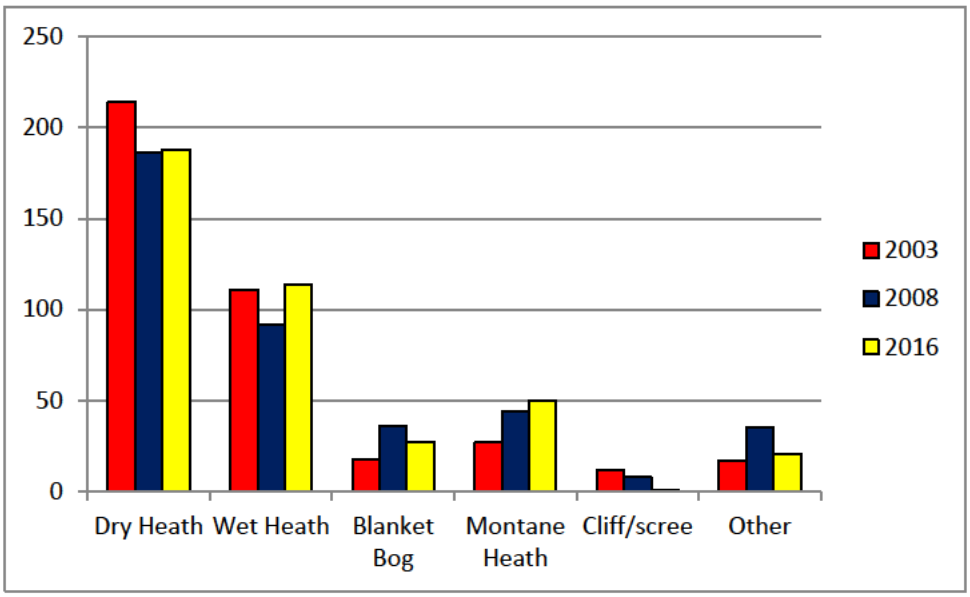
Additional ASSI Features (not assessed in this report)

ASSI Feature	Description
Earth Science	Pleistocene - Upland glacial landforms
Earth Science	Tertiary igneous - Ben Crom
Earth Science	Tertiary igneous - Bloody River
Earth Science	Tertiary igneous - Diamond Rocks
Earth Science	Tertiary igneous - Eagle Rock
Earth Science	Tertiary igneous – Glen River
Earth Science	Tertiary igneous - Lindsay's Leap
Oligotrophic lakes	
Fungi assemblage	
Invertebrate assemblage	
Higher Plant Assemblage	

Plots Recorded

In 2016, a total of 401 sample plots were recorded: 360 by ADAS and 41 montane plots by NIEA.

Figure 1: Breakdown of CA plots by habitat type 2003-2016



Habitat	2003	2008	2016
Dry Heath	214	186	188
Wet Heath	111	92	114
Blanket Bog	18	36	27
Montane Heath	27	44	50
Cliff/scree	12	8	1
Other	17	35	21
TOTAL	**399**	**401**	**401**

Overall, sample numbers and the rough breakdown of habitats was similar to those of previous assessments (Figure 1 above), although numbers do vary from year to year. This is to be expected, given the variability of habitats, and the difficulty of classification of moorland habitats generally, even with very clear decision rules provided. The variation from one time period to another is not considered to have had a significant impact on the results or their interpretation.

Cliff and scree have only one plot: these are very robust habitats that are considered to be at low risk, and damaging activities are likely to be identified by Site Integrity Monitoring (SIM). However, montane heath is a very fragile habitat, so particular effort was made to increase its sampling rate.

Map 1 shows the location of the 2016 sample points. Five points were omitted by ADAS (33, 227, 239, 240 and 244), and some points were duplicated. All of these duplicate records were checked and found to differ in values, and location (albeit slight), so were retained for the analysis. NIEA do not consider that these have had any impact on the results or the subsequent interpretation.

Results

Most of the key habitats in the Eastern Mournes were found to be in **unfavourable condition**: this is the same as the 2003 and 2008 Condition Assessment results.

Feature	Condition
European dry heaths	Unfavourable
Northern Atlantic wet heaths with *Erica tetralix*	Unfavourable
Active Blanket bog	Unfavourable
Alpine and Boreal heaths	Unfavourable
Siliceous alpine and boreal grasslands	Unfavourable
Siliceous rocky slopes with chasmophytic vegetation	Favourable
Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Caleopsietalia ladani*)	Favourable

1. **Dry Heath results:**

   This failed on six attributes:

   1. **Dwarf-shrub height:** only 14% of heather was in the taller/more mature age-class (>35cm): the target is 25% or more
   2. **Bare Peat:** the recorded 3% cover was just above the target of 2% cover
   3. **Dwarf-shrub cover:** Dwarf-shrub cover was >75% in 40% of plots: the target is >75% in >75% of plots. The mean cover of dwarf-shrubs was 58%: the target is >75%.
   4. **Graminoid Cover:** the mean cover of grasses was of 36%: the target is <33%.
   5. **Management Grazing:** signs of moderate or heavy grazing were present in 36% of plots: the target is <5%.
   6. **Erosion Features associated with human impacts:** Man induced/enhanced erosion was local/occasional in 28% of plots and fairly frequent in 3%: the target is <2%.

2. **Wet Heath results:**

   This failed on six attributes:

   1. **Dwarf-shrub height:** only 8% of heather was in the taller/more mature age-class (> 35cm): the target is 25% or more
   2. **Bare Peat:** the recorded 4.6% cover was higher than the target of 2% cover

3. **Dwarf-shrub cover:** at 49.5%, dwarf-shrub cover is marginally below the target of 50-75%. In contrast, graminoid cover marginally achieves the target (with a value of 49.5% compared to a threshold of less than 50%).
4. **Mean Bryophyte Cover:** the mean cover of byrophytes was of 20.8%: the target is <25%.
5. **Management Grazing:** signs of moderate or heavy grazing were present in 13% of plots: the target is <5%.
6. **Erosion Features associated with human impacts:** Man induced/enhanced erosion was local/occasional in 43% of plots and fairly frequent in 2%: the target is less than 2%.

3. Blanket bog results:

This failed on three attributes:

1. ***Sphagnum* Cover/Abundance (% cover and frequency):** *Sphagnum* cover ≥ 25% in 29.63% of plots: the target is a minimum cover of 25% over at least 66% of the bog surface.
2. **Erosion Features associated with human impacts:** Man induced or enhanced erosion was rare in 14.81% of plots, occasional in 3.7% of plots, abundant in 3.7% of plots and dominant in 3.7% of plots. The target is < 2% of the total area of blanket bog, other than in very localised instances.
3. **Graminoid Cover (%):** Mean cover of grasses was 64.22%: the target is for the cover to be <50%.

4. Alpine and Boreal heaths and Siliceous alpine and boreal grasslands results:

This failed on one attribute:

1. **Cover of characteristic species (%):** The mean *Racomitrium lanuginosum* cover was 31%: the target is for the collective cover of dwarf-shrubs, *R. lanuginosum* and robust lichens to compose at least 90% of total vegetation cover.

Discussion

Although condition assessment cannot provide a definitive statement of cause and effect, it is clear that the main habitats are failing because of high grazing levels, either current, in the past, or both. This is evidenced in particular by the low dwarf-shrub cover, high graminoid cover and the amount of bare ground present. Heavy grazing of heath and bog vegetation tends to suppress the growth of dwarf-shrubs, while at the same time favouring the spread of grass and grass-like species. In addition, indicators of grazing (i.e. dung, grazing-tolerant species such as *Nardus stricta*, and Heather growth-forms induced by high grazing levels) were recorded at relatively high frequencies. The evidence points to prolonged heavy grazing in the past over a wide area. However, there are clear signs that these impacts have been changing over the last decade or so.

Other factors that are also significant, although generally at a more localised scale, include burning and recreational pressures.

1. Trends in Condition

a) Dry Heath

For dry heath, the major habitat of the Eastern Mournes, the proportion of plots with a 75% or greater cover of dwarf-shrub species was 40%, whereas the current target is for 75% of plots to achieve this cover, so the habitat fails on this key attribute. In 2008, 47% of plots in 2008 had less than 75% cover of dwarf-shrub species, suggesting that there has been a decline in the

condition of the dry heath since the 2008 CA. This is reinforced by several of other key indicators (see Table 1 below): mean dwarf-shrub height has declined since 2008, while mean dwarf-shrub cover and bryophyte cover have also shown decreases. Dry heath also fails on bare peat cover, which is higher than the target threshold of 2%: this has fallen from 2008, when it was 4%.

Table 1: Key Results for Dry Heath and Comparison with previous assessments

Year	No of Plots	Dwarf shrub height (cm)	Dwarf-shrub cover	*Calluna* cover	*Erica cinerea*	*Erica tetralix*	*Ulex gallii*	Grasses	Bryophytes	Bare Peat
2016	**188**	**21.85cm**	**58%**	**31%**	**23%**	**1%**	**3%**	**36%**	**17%**	**3%**
2008	**186**	**24.5cm**	**64%**	**32%**	**25%**	**1%**	**3%**	**27%**	**22%**	**4%**
2003	**214**	**18cm**	**62%**	**36%**	**20%**		**2%**	**30%**	**23%**	**6.5%**

b) Wet Heath

Wet heath is unfavourable, failing on a number of attributes:

1. **Bare peat**: the recorded value of 4.6% was more that the target of 2% or less.
2. **Dwarf-shrub cover**: the recorded value of 49.5% was marginally below the target of 50-75%.
3. **Mean bryophyte cover**: the recorded value of 20.8% was lower that the target of 25% or higher.

The overall pattern of results for wet heath from 2003 to 2016 makes the identification of a clear trend difficult. However, in contrast to dry heath, the results, in particular the dwarf-shrub cover, suggest a slight improvement in condition since 2008.

Table 2: Key Results for Wet Heath and Comparison with previous assessments

Year	No of Plots	Dwarf-shrub height (cm)	Dwarf-shrub cover	*Calluna* cover	*Erica tetralix*	Graminoid cover	*Molinia*	*Sphagnum*	Other bryophytes	Bare Peat
2016	**114**	**21cm**	**49.5%**	**23.4%**	**15.3%**	**49.5%**	**18.0%**	**8.2%**	**12.6%**	**4.6%**
2008	**92**	**24cm**	**44.0%**	**17.0%**	**12.0%**	**49%**	**21%**	**6%**	**9%**	**4%**
2003	**111**	**16cm**	**38%**	**8%**	**9%**	**53%**	**23%**	**12%**	**10%**	**7%**

c) Blanket Bog

Blanket bog fails on the key attribute of *Sphagnum* cover. The target is a minimum cover of 25% over at least 66% of the bog surface: only 8 out of the 27 plots achieve this target, with a mean value of 19% cover.

Any trend in condition is difficult to identify, as many of the key indicators show inconsistent trends over time. For example, graminoid cover has increased markedly since 2008, generally indicating declining condition, while bare peat has declined: see Table 3 below.

Table 3: Key Results for Blanket bog and Comparison with previous assessments

Year	No of Plots	Dwarf-shrub height (cm)	Dwarf-shrub cover	*Calluna* cover	*Erica tetralix*	Graminoid cover	*Sphagnum*	Thick *Sphagnum*	Other bryophytes	Bare Peat
2016	27	24cm	34%	24%	6%	64%	19%	10%	11%	1%
2008	36	25cm	47%	30%	7%	40	15	8	14	4
2003	18	16cm	32%	21%	6%	60%	21%	14%	14%	2%

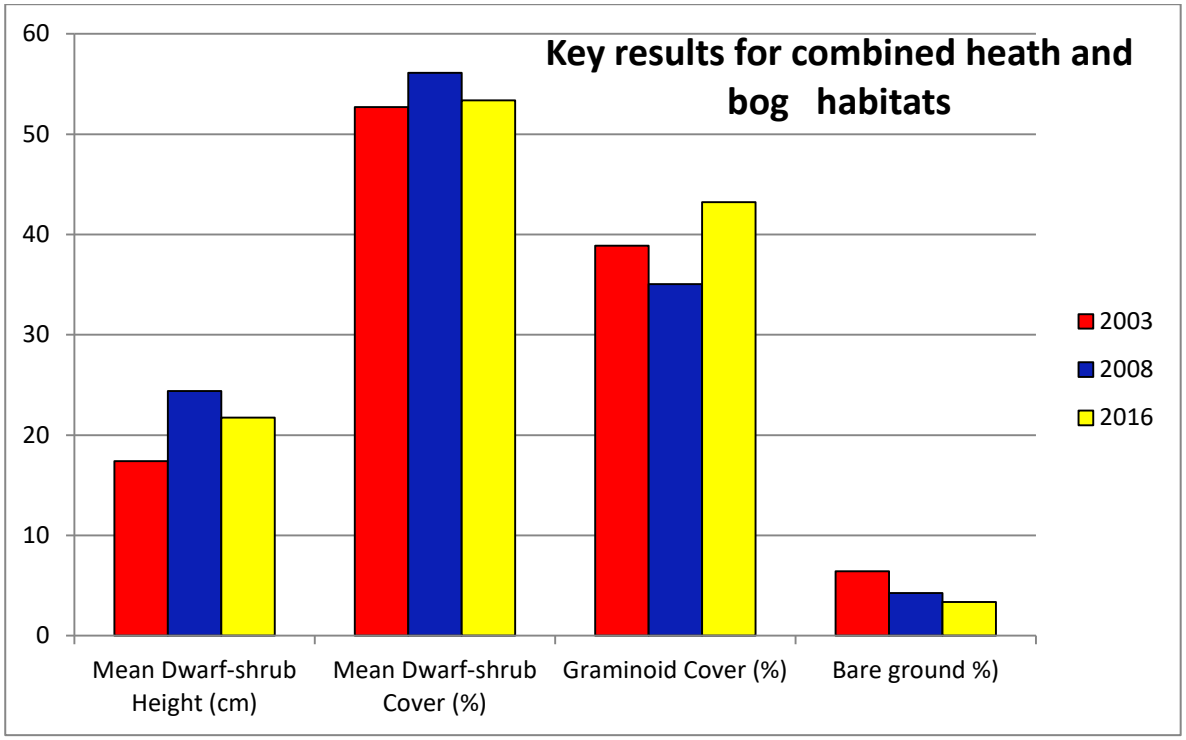
It is possible that some of these changes may be the result of differences in habitat classification between the two surveys. For example, the number of blanket bog samples varied from 18 in 2003, 36 in 2008, and 27 in 2016. To reduce the effects of this, the results for some of the major indicators (mean dwarf-shrub cover and height, graminoid cover and bare ground) for the three habitats have been combined in Table 4 below.

Table 4: Key Results for Heath and Bog combined and Comparison with previous assessments

	2003		2008		2016	
Mean Dwarf-shrub Height	17.4cm	343 samples	24.4cm	(311 samples)	21.73cm	317 samples
Mean Dwarf-shrub Cover	52.7%	343 samples	56.1%	(314 samples)	53.36%	329 samples
Graminoid Cover	38.88%	343 samples	35.06%	(314 samples)	43.22%	329 samples
Bare ground	6.42%	343 samples	4.25%	(314 samples)	3.36%	329 samples

With such a large sample and any potential effects of misclassification removed, the results are more reliable: see Figure 2 below.

Figure 2: Key results for combined heath and bog habitats



These show a fairly consistent trend of improvement in condition from 2003 to 2008 (an increase in dwarf-shrub height, accompanied by a small increase in dwarf-shrub cover, reduction in graminoid cover, and a decrease in bare ground). This modest improvement since 2003 suggests that grazing levels have declined over the recent past. This is not unexpected, given the economic changes in farming recently, in particular the switch from headage-based to area-based payments. There is now much less incentive to maintain high stocking levels. However, comparing the data between 2008 and 2016 shows a more mixed picture, with a continuing decline in bare ground, but a decrease in dwarf-shrub height and cover and an increase in graminoid cover. Potential reasons for these apparently conflicting trends are discussed below.

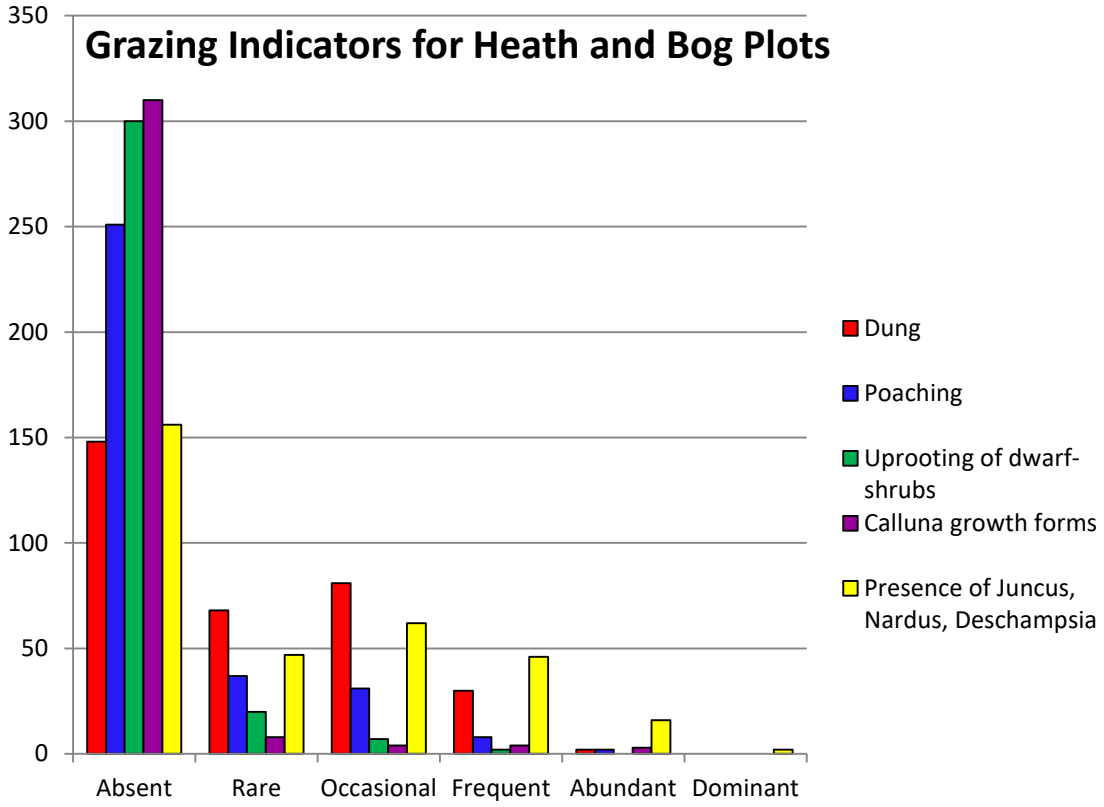
2. Geographical Trends in Condition

Some marked geographical patterns in condition are evident across the Eastern Mournes. The previous condition assessments found a pronounced difference between the condition of the vegetation within, and outside the Mourne Wall. Although both areas were unfavourable for dry heath, wet heath and blanket bog, the communities inside the wall were generally in better condition than those outside. For example, in 2008, 55% of the dry heath plots within the wall had a dwarf-shrub cover of 75% or more, compared to a value of 33% outside the wall. This reinforces the evidence for grazing levels as the main driver of habitat condition, as grazing levels have generally been lower within the wall than outside it.

Maps 2 and 3 illustrate the geographical distribution of the key attributes, dwarf-shrub height and cover, for the three main habitats. Although these show the values for individual 2x2m quadrats and, as such, reflect in part the high variability of each sample, the overall pattern is as would be expected (and as described in the 2003 CA), with higher values of dwarf-shrub cover tending to be concentrated within the central part of the ASSI, and lower values around the periphery, especially to the north and east. Graminoid cover shows the opposite trend, illustrating where grazing pressures have tended to be been higher: (Map 4).

The series of maps below illustrate how some of the different grazing indicators can be used to gauge both historical and current grazing pressures. Across the site as a whole, the frequency of dung (Map 5) can be used a rough indicator of where recent grazing has taken place and what that level of grazing has been. Apart from a few isolated points, the spatial pattern suggests that current grazing is generally light, with higher stocking levels to the north, and in the Slieve Binnian area. Poaching (Map 6) is even scarcer across the site, but again the pattern suggests heavier grazing in the north and around Slieve Binnian. On the other hand, the presence of *Nardus stricta*, *Deschampsia flexuosa* and *Juncus squarrosus* (Map 7) indicates heavy grazing over a prolonged period of time. These indicators take a much longer time to decline in cover and frequency when grazing levels are reduced: they have more records at higher frequency than for other grazing indicators (see Figure 3 below). Hence, these are more frequent across the site as a whole, but are particularly concentrated around the edges of the site, as would be expected from historical land-use management.

Figure 3: Grazing indicators for heath and bog plots



Bare ground may reflect a range of environmental factors (e.g. natural erosion), as well as anthropogenic factors. The latter include heavy grazing pressure, but also burning and recreational activities. Some of the factors responsible, particularly the latter two, can be very localised in their impacts, and depending upon where individual CA plots are located, they may reflect these local pressures. Hence, the distribution of plots with a high cover of bare ground (Map 8) displays a very scattered distribution across the site, with no obvious geographical pattern.

Overall Conclusion

The general picture is one of a site that has been heavily grazed in the past, particularly around the lower slopes and mountain tops, where grazing levels are now generally lower than before. Data that compare the three assessment time period do not show a consistent trend, with evidence suggesting a marginal deterioration in condition between 2008 and 2016, compared to a slight improvement between 2002 and 2008. It is believed that burning may well be the key factor here. Although burning has occurred frequently in the past, it has tended to be relatively localised in its impact. Signs of recent burning (within the previous 1-2 years) were relatively rare in 2016, with only 10 records (Map 9). However, in 2011, a series of fires caused extensive damage over a very large area.

Photo: View down Annalong Valley from the col between Slieve Binnian and Slievelamagan (Source: Mournes Heritage Trust, April 2011).

Photo from April 2011: looking towards Slievelamagan from Slieve Binnian (Source: Mournes Heritage Trust).

The total area affected by the 2011 fires was around 850ha, which represents over 11% of the total area of the ASSI. As the pictures show clearly, the fires were not only extensive, but also very severe, destroying virtually all of the above-ground vegetation and in places burning into the shallow peat soils. Furthermore, examination of aerial photographs from 2012 and 2014 indicated that further burning, albeit at a smaller scale than the 2011 fires, took place between these dates, mainly to the east of the site. Burning has been undertaken in the Eastern Mournes for decades (possibly centuries), but it is unusual for such a large area to be burnt over such as short period of time, and it is inevitable that this will have impacted the site and affected its condition, particularly in terms of dwarf-shrub cover and height.

Wildfires, whether started accidentally of deliberately, are therefore a major factor affecting the condition of the ASSI. As a result of the Spring 2011 fires, Wildfire Advisory Services (WAS) was commissioned to deliver advice on how to reduce the impact of wildfire in the Eastern Mournes, including recommendations on actions to be taken. This work simulated thousands of different scenarios to predict wildfire movement and intensity based on historic flash points, terrain and topography, wind direction and speed, influence of valleys in wind tunnel creation and air flow movement and Northern Ireland weather patterns.

Several important factors were identified:

1. There is a direct correlation between wildfire events and severe drought periods.
2. Over the last decade the number of severe drought periods has increased slowly but significantly since 2005.
3. At the same time the total number of minor droughts is slightly decreasing.
4. With more periods of drought the potential fire season is getting longer.

The findings of the report have been used to target areas for firebreaks with a view to rolling out the project to other areas in Northern Ireland through the Northern Ireland Wildfire Forum.

ANNEX 1

SAC Feature – European dry heaths

ASSI Feature – Dry heath

Attribute	Target	Method of Assessment	2016 Monitoring Results	Assessment	Field notes	Comments
Extent						
*Area of dry heath	Maintain extent of dry heath	Visual estimate in 2x2m plots and across the dry heath using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Dry heath covered 188 plots. (186 in 2008; 214 in 2003)	Favourable (No loss)	No loss of dry heath was observed during the condition assessment; aerial photographs were consulted.	Note that it may be possible to extend dry heath communities, provided this is into degraded areas and does not encroach into other habitats of scientific interest.
*Heath community diversity	Maintain the presence of the dry heath communities H7, H8, H10 etc. as established at base line survey.	Visual estimate in 2x2m plots.	H8 - 15 H10 – 159 H12 – 3 H21 – 1 Other – 10	Favourable	Good range of heathland types, from low altitude to high altitude communities.	Repeat monitoring of plots using GPS should indicate whether dry heath communities have changed or been lost.
Vegetation structure						
Dwarf-shrub height	Average ericoid height should be 15-35cm with at least 25% of the dry heath in the late mature/degenerate growth phase (greater than 35cm)	Visual estimate in 2x2m plots.	Mean ericoid height 21.85cm*	Favourable		
			Ericoid height >35cm in 13.83% of plots	**Unfavourable**		
*Bare Peat, or ground covered by algal mats (% cover)	Bare peat etc. (excluding recently burnt areas), should occupy less than 2% of the dry heath surface overall.	Visual estimate in 2x2m plots.	Mean bare peat cover 2.91%*	**Unfavourable**		Bare peat (not exposed rock) or peat carpeted by *Polytrichum* spp., *Campylopus* spp. crust forming lichens or algal mats can occur as a consequence of constant burning and/or grazing. Bare peat here represents bare peat etc. within the dry vegetation rather than naturally eroded surfaces where exposed rock can form a natural part of the dry heath community.

Vegetation composition - Positive indicators						
*Ericaceous cover (% cover)	Dwarf-shrub cover should be greater than 75% over at least 75% of the dry heath community; and mean dwarf-shrub cover should be greater than 75%	Visual estimate in 2x2m plots.	Dwarf-shrub cover > 75% in 40.43% of plots.	**Unfavourable**		
			Mean dwarf-shrub cover 58.47%	**Unfavourable**		
*Ericoid diversity	At least two species of dwarf-shrub at least present in 90% of plots.	Visual estimate in 2x2m plots.	5 plots with one dwarf-shrub species present (inc. *U. gallii*) 97.3% with at least 2 species	Favourable		
*Cover of *Ulex gallii* (% cover)	*Ulex gallii* cover should be less than 50% in plots within H8 stands.	Visual estimate in 2x2m plots.	A mean of 24.73% *Ulex gallii* present in plots within H8.	Favourable	Stands of H8 are generally restricted to the south-east of N Ireland.	Mean percentage cover should be assessed for stands of H8 only: i.e. exclude plots in other heath communities from the calculations.
*Cover of graminoids (% cover)	Total graminoid cover should be less than 33%	Visual estimate in 2x2m plots.	Mean graminoid cover 36.41%	**Unfavourable**		Include true grasses, sedges and rushes in this assessment. *Nardus stricta, Deschampsia flexuosa*, *Juncus squarrosus* or other graminoids should not dominate over other species.
*Frequency and % cover of Bryophyte and bushy lichens (esp. *Cladonia* spp.) (DAFOR and % cover)	Bryophytes (excluding *Polytrichum* spp. and *Campylopus* spp. on bare ground) and/or Cladonia species should be at least Frequent. Combined mean cover should be greater than 5%	Visual estimate in 2x2m plots.	Bryophytes and lichens present in 90.96% of plots, therefore constant.	Favourable	At least frequent is equivalent to greater than 41% occurrence in recorded plots.	Generally only bryophytes (mosses and liverworts) figure in this assessment, but occasionally bushy lichens can also be a prominent feature of the dry heath vegetation.
			Mean cover 17.4%	Favourable		

Vegetation composition - Indicators of negative change						
*Frequency and % cover of scrub/tree encroachment on dry heath communities (DAFOR and % cover)	Scrub/tree encroachment should be no more than occasional over the dry heath community.	Visual estimate within a 10m radius of plots and across the feature using a combination of aerial photographs and Condition Assessment structured walk.	Present in 3.19% of plots, therefore rare.	Favourable	No more than occasional is equivalent to less than 40% occurrence in recoded plots.	Scrub encroachment should be checked using a combination of aerial photographs and Condition Assessment. Include invasive alien species in addition to *Betula pubescens, Prunus spinosa* and *Rubus* spp. Invasive exotic species such as *Rhododendron ponticum* should be removed immediately. Exclude *Ulex europaeus*
	Mean cover should be less than 5%.		Mean cover 0.06%	Favourable		
*Cover of Gorse *Ulex europaeus* (% cover)	Gorse cover should be less than 5%. During repeat surveys, Gorse cover should not exceed that of the baseline survey.	Visual estimate in 2x2m plots and across the feature using a combination of aerial photographs and Condition Assessment structured walk.	Mean cover 0%	Favourable		Although a natural component of heath communities, Gorse can become invasive under both low and high grazing pressures. It is important to assess whether the relative quantities present in the site are increasing.
*Cover of Bracken (*Pteridium aquilinum*) encroachment (% cover)	Bracken cover less than 10% in dense canopy. During repeat surveys, Bracken cover should not exceed that of the baseline survey.	Visual estimate in 2x2m plots and across the feature using a combination of aerial photographs and Condition Assessment structured walk.	Mean bracken cover 1.17%	Favourable		Although a natural component of heath communities, Bracken can become invasive under both low and high grazing pressures. It is important to assess whether the relative quantities present in the site are increasing.
*Frequency and cover of undesirable agricultural grasses and weeds (DAFOR and % cover)	None of the following should be more than rare: *Cirsium arvense, C. vulgare, Jacobaea vulgaris, Urtica dioica, Plantago major, Phleum pratense, Trifolium repens, Holcus lanatus, Lolium perenne*.	Visual estimate in 2x2m plots.	*Cirsium arvense, C. vulgare, Jacobaea vulgaris, Urtica dioica, Plantago major, Phleum pratense, Trifolium repens, Holcus lanatus,* and *Lolium perenne* present in 0% of plots, therefore absent.	Favourable	No more than rare is equivalent to less than 20% occurrence in recorded plots.	

	Combined mean cover of agricultural grasses & weeds <1%		Mean cover 0.03%	Favourable		
*Management - Grazing (% cover)	Signs of moderate or heavy grazing should occupy less than 5% of the dry heath vegetation.	Visual estimate in 2x2m plots.	Dung more than occasional in 15.96% of plots. Poaching more than occasional in 3.19% of plots. Uprooting of dwarf shrubs more than occasional in 0% of plots. *Juncus squarrosus* etc. more than occasional in 26.6% of plots. *Calluna* growth forms more than occasional in 3.72% of plots. Therefore, signs of moderate or heavy grazing present in 36.17% of plots.	**Unfavourable**	Where they are recorded as more than occasional in any plot, the presence of droppings, the extent of poaching, uprooting of dwarf shrubs, invasion by *Juncus squarrosus* etc. indicate moderate and heavy grazing.	The frequency of droppings, the extent of poaching, uprooting of dwarf shrubs and invasion by *Juncus squarrosus* etc. indicate moderate and heavy grazing where any one of the above is recorded as more than occasional.
*Management - Burning (% cover)	Signs of recent burning should occupy less than 5% of the dry heath vegetation.	Visual estimate in 2x2m plots and across feature using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Burning recorded in 3.72% of plots.	Favourable	Recent burning is represented by areas burnt within the last two years.	

Frequency and cover of Erosion Features associated with human impacts (DAFOR and % cover)	No gully erosion or bare rock associated with concentrated human impacts (ATV tracks or recreational activities). Man induced/enhanced erosion should occupy less than 2% of the total area of dry heath other than very localised events	Visual estimate in 2x2m plots.	Paths and/or disturbed ground recorded as local-occasional in 27.66% of plots and fairly frequent in 2.66% of plots.	**Unfavourable**		The extent of man induced erosion should be monitored using a combination of aerial photographs and Condition Assessment. Where natural erosion is exacerbated by human activity, mainly hill walking, the heath will not be in favourable condition, except where such erosion is very limited in nature.
Indicators of local distinctiveness						
Herb diversity	Herbs (excluding negative indicators) at least frequent.	Visual estimate in 2x2m plots.	Herbs present in 84.04% plots	Favourable	At least frequent is equivalent to greater than 41% occurrence in recorded plots.	Some herbs should be present in most plots.

ANNEX 2

SAC Feature – Northern Atlantic wet heaths with *Erica tetralix*

ASSI Feature – Wet heath

Attribute	Target	Method of Assessment	2016 Monitoring Results	Assessment	Field notes	Comments
Extent						
* Area of wet heath	Maintain the extent of wet heath.	Visual estimate in 2x2m plots and across the wet heath using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Wet heath covered 114 plots.	Favourable (No loss)	No loss of wet heath was observed during the condition assessment; aerial photographs were consulted.	Any loss of wet heath, or fragmentation of this habitat is unacceptable. Note that it may be possible to extend wet heath communities, provided this is into degraded areas and does not encroach into other habitats of scientific interest.
* Heath community diversity	Maintain the presence of the wet heath community M15 as established at base line survey.	Visual estimate in 2x2m plots.	M15 – 104 M16 – 1 M25 – 3 Other - 6	Favourable	Good range of wet heath types, from low altitude to high altitude communities.	Repeat monitoring of plots using GPS should indicate whether wet heath communities have changed or been lost.
Vegetation structure						
Dwarf-shrub height	Average ericoid height should be 15-35cm, with at least 25% of the wet heath in the late mature/degenerate growth phase (greater than 35cm).	Visual estimate in 2x2m plots.	Mean ericoid height 21cm* Ericoid height >35cm in 7.89% of plots	Favourable **Unfavourable**		Heather height reflects the age structure of the Heather. On some areas of wet heath, the ericoid age structure will largely reflect recent burning patterns. In wet heath, burning should generally only be carried out in exceptional circumstances.
* Bare Peat, or ground covered by algal mats (% cover)	Bare peat etc. (excluding recently burnt areas), should occupy less than 2% of the wet heath surface overall.	Visual estimate in 2x2m plots.	Mean bare peat cover 4.64%	**Unfavourable**		Bare peat or peat carpeted by *Polytrichum* spp., *Campylopus* spp. crust forming lichens or algal mats can occur as a consequence of excessive burning and/or grazing. Bare peat here represents bare peat etc. within the wet heath vegetation.

Vegetation composition - Positive indicators						
* Ericaceous cover (% cover)	Dwarf-shrub cover should be maintained at 50-75%	Visual estimate in 2x2m plots.	Mean dwarf-shrub cover 49.51cm.	**Unfavourable**		Although dominated by dwarf shrubs, the sward should be composed of a variety of higher plants and bryophytes.
* Ericoid diversity	At least two species of dwarf-shrub at least present in 90% of plots.	Visual estimate in 2x2m plots.	6 plots with only 1 dwarf-shrub species - 5.3%	Favourable		Ericoid (dwarf-shrub species) include *Calluna vulgaris*, *Erica tetralix*, *Empetrum nigrum* and *Myrica gale*.
* Cover of graminoids (% cover)	Total graminoid cover should be less than 50%	Visual estimate in 2x2m plots.	Mean graminoid cover 49.46%	Favourable		Include true grasses, sedges, and rushes in this assessment. *Molinia caerulea*, *Trichophorum cespitosum*, *Deschampsia flexuosa*, *Juncus squarrosus* or other graminoids should not dominate over other species.Localised *Schoenus nigricans* flushes should not be included in this habitat assessment.
* Bryophyte cover and frequency of *Sphagnum* mosses (% cover and DAFOR)	Mean bryophyte cover (excluding *Polytrichum* spp. and *Campylopus* spp. on bare ground) should be at least 25%.	Visual estimate in 2x2m plots.	Mean bryophyte cover 20.83%	**Unfavourable**	At least frequent is equivalent to greater than 41% occurrence in recorded plots.	Bryophytes should include a range of pleurocarpus species forming patches below, or in more open swards beneath the dwarf-shrubs as well as *Sphagnum* moss species.
	Sphagnum moss species should be at least frequent throughout the moss layer.		*Sphagnum* moss species present in 55.26% of plots.	Favourable		

Vegetation composition - Indicators of negative change						
* Frequency and % cover of scrub/tree encroachment on wet heath communities (DAFOR and % cover)	Scrub/tree encroachment should be no more than rare over the wet heath community.	Visual estimate within a 10m radius of plots and across the feature using a combination of aerial photographs and Condition Assessment structured walk.	Present in 1.75% of plots.	Favourable	No more than rare is equivalent to less than 20% occurrence in recorded plots.	Scrub encroachment should be checked using a combination of aerial photographs and Condition Assessment. Invasive exotic species such as *Rhododendron ponticum* should be removed immediately.
	Mean cover should be less than 2%		Mean cover 0.02%	Favourable		
* Frequency and cover of undesirable agricultural grasses and weeds (DAFOR and % cover)	None of the following should be more than rare: *Cirsium arvense*, *C. vulgare*, *Jacobaea vulgaris*, *Urtica dioica*, *Plantago major*, *Phleum pratense*, *Trifolium repens*, *Holcus lanatus* and *Lolium perenne*.	Visual estimate in 2x2m plots.	*Cirsium arvense* 0% *C. vulgare* 0% Jacobaea vulgaris 0% *Urtica dioica* 0% *Plantago major* 0% *Phleum pratense* 0% *Trifolium repens* 0% *Holcus lanatus* 0% *Lolium perenne* 0%	Favourable	No more than rare is equivalent to less than 20% occurrence in recorded plots.	
	Combined mean cover of agricultural grasses and weeds less than 1%		Mean cover 0%	Favourable		

* Management - Grazing (% cover)	Signs of moderate or heavy grazing should occupy less than 5% of the wet heath vegetation.	Visual estimate in 2x2m plots.	Dung more than occasional in 1.75% of plots. Poaching more than occasional in 3.51% of plots. Uprooting of dwarf more than occasional in 0% of plots. *Juncus squarrosus* etc. more than occasional in 10.53% of plots. *Calluna* growth forms more than occasional in 1.75% of plots. Therefore, signs of moderate or heavy grazing recorded in 13.16% of plots.	**Unfavourable**		The frequency of droppings, the extent of poaching, uprooting of dwarf shrubs and invasion by *Juncus squarrosus* etc. indicate moderate and heavy grazing where any one of the above is recorded as more than occasional.
* Management - Burning (% cover)	Signs of recent burning should occupy less than 5% of the wet heath vegetation.	Visual estimate in 2x2m plots and across the feature using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Burning recorded in 2.63% of plots.	Favourable	Recent burning is represented by areas burnt within the last two years.	

Frequency and cover of Erosion Features associated with human impacts (DAFOR and % cover)	No gully erosion, bare peat or rock associated with more concentrated human impacts (ATV tracks or recreational activities). Man induced/enhanced erosion should occupy less than 2% of the total area of wet heath other than very localised instances.	Visual estimate in 2x2m plots.	Paths and/or disturbed ground recorded as local-occasional in 42.98% of plots and fairly frequent in 1.75% of plots.	**Unfavourable**		The extent of man induced erosion should be monitored using a combination of aerial photographs and Condition Assessment. Where natural erosion is exacerbated by human activity, mainly hill walking, the heath will not be in favourable condition, except where such erosion is very limited in nature.
Indicators of local distinctiveness						
Herb diversity	Herbs (excluding negative indicators) at least frequent.	Visual estimate in 2x2m plots.	Herbs present in 93.86% plots	Favourable	At least frequent is equivalent to greater than 41% occurrence in recorded plots.	Wet heaths tend to be dominated by dwarf-shrubs and graminoids; however, some herbs should be present in most plots (albeit at a low cover).

ANNEX 3

SAC Feature – Active blanket bog

ASSI Feature – Blanket bog

Attribute	Target	Method of Assessment	Monitoring Results	Assessment	Field notes	Comments
Extent						
* Area of blanket bog and upland raised mire	Maintain the extent of the intact bog surface	Visual estimate in 2x2m plots and across the blanket bog using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Blanket Bog covered 27 points. No loss in extent recorded. (36 plots in 2008; 18 in 2003)	Favourable	**Any** loss or fragmentation of intact blanket bog should be investigated.	The blanket bog communities include M17 *Scirpus cespitosus Eriophorum vaginatum* blanket mire, M18 *Sphagnum papillosum* raised and blanket mire and M19 *Calluna vulgaris - Eriophorum vaginatum* blanket mire.
Vegetation structure						
* Pool/hummock system extent and complexity	The extent and complexity of pool and hummock systems at least maintained.	The extent of pool and hummock systems should be monitored using a combination of aerial photographs and SIM.	Permanent pools recorded in 3.7% of plots. (zero plots in 2008)	Not applicable	Assume the open water recorded was an erosion feature; no pool complexes known from the Eastern Mournes.	The extent of pool and hummock systems should be monitored using a combination of aerial photographs and Condition Assessment.
Dwarf-shrub Height (cm)	Average ericoid height should be 15-30cm.	Visual estimate in 2x2m plots.	Mean ericoid height 24cm. (24.7cm in 2008) Note: two zero values that were recorded in error were excluded from the analysis.	Favourable		On some areas of blanket bog, the dwarf-shrub height will largely reflect recent management patterns. However, on largely undisturbed sites with minimal or no grazing, dwarf shrubs should display no apparent growth forms with a fairly uniform height of 15-30cm.
* Bare Peat, or ground covered by algal mats (%)	Bare peat etc. (excluding recently burnt areas) should occupy less than 2% of the intact blanket bog surface overall.	Visual estimate in 2x2m plots.	Mean bare peat cover 1.11% (3.7% in 2008)	Favourable		Bare peat, or bare ground carpeted by *Polytrichum* spp., *Campylopus* spp. crust forming lichens or algal mats can occur as a consequence of peat cutting or excessive burning and/or grazing.

Vegetation composition - Positive indicators						
* *Sphagnum* Cover/Abundance (% cover and frequency)	*Sphagnum* moss species should have a minimum cover of 25% over at least 66% of the intact blanket bog surface.	Visual estimate in 2x2m plots.	*Sphagnum* cover ≥ 25% in 29.63% of plots. (25% in 2008) Mean *Sphagnum* cover 18.9% (15.4% in 2008)	**Unfavourable**	Species present should include a mixture of both thin species (S. *capillifolium* & *S. tenellum*) and thick hummock forming species (*S. papillosum* & *S. magellanicum*) at least occasional over the surface.	A constant *Sphagnum* moss cover is indicative of active peat formation and is dependent on the maintenance of a high water table. *Sphagnum* moss is therefore used to measure the hydrological integrity of the blanket bog surface.
	Thick, hummock forming species of *Sphagnum* should be at least occasional.		Thick *Sphagnum* species present in 37.04% plots. (30.6% in 2008) Mean thick *Sphagnum* cover 9.7% (7.9% in 2008)	Favourable		
* Ericaceous Cover (%)	Ericoid cover frequent over the surface of the intact blanket bog. Dwarf-shrub cover >33%: <33% is only acceptable in wetter areas where *Narthecium ossifragum* or *Sphagnum* spp. are abundant and forming lawns.	Visual estimate in 2x2m plots.	Dwarf-shrubs present in 96.3% of plots at 34.04% cover. (100% at 46.5% in 2008) Average dwarf-shrub cover is 34%. (46.5% in 2008)	Favourable		Ericoid (dwarf-shrub species) include *Calluna vulgaris*, *Erica tetralix*, *E. cinerea*, *Myrica gale*, *Vaccinium myrtillis* and *Empetrum nigrum*.
* Ericoid diversity (DAFOR)	At least two dwarf-shrub species to be widespread and frequent. Where three or more are present, but only one frequent and widespread, the abundance of the less abundant species may be combined and treated as if they are a single species.	Visual estimate in 2x2m plots.	24 plots contain 2 or more dwarf-shrub species - 85.12%	Favourable		A mono-dominant sward of *Calluna vulgaris* may suggest that the surface of the intact bog is drying out – i.e. the water table is too low beneath the surface of the bog.

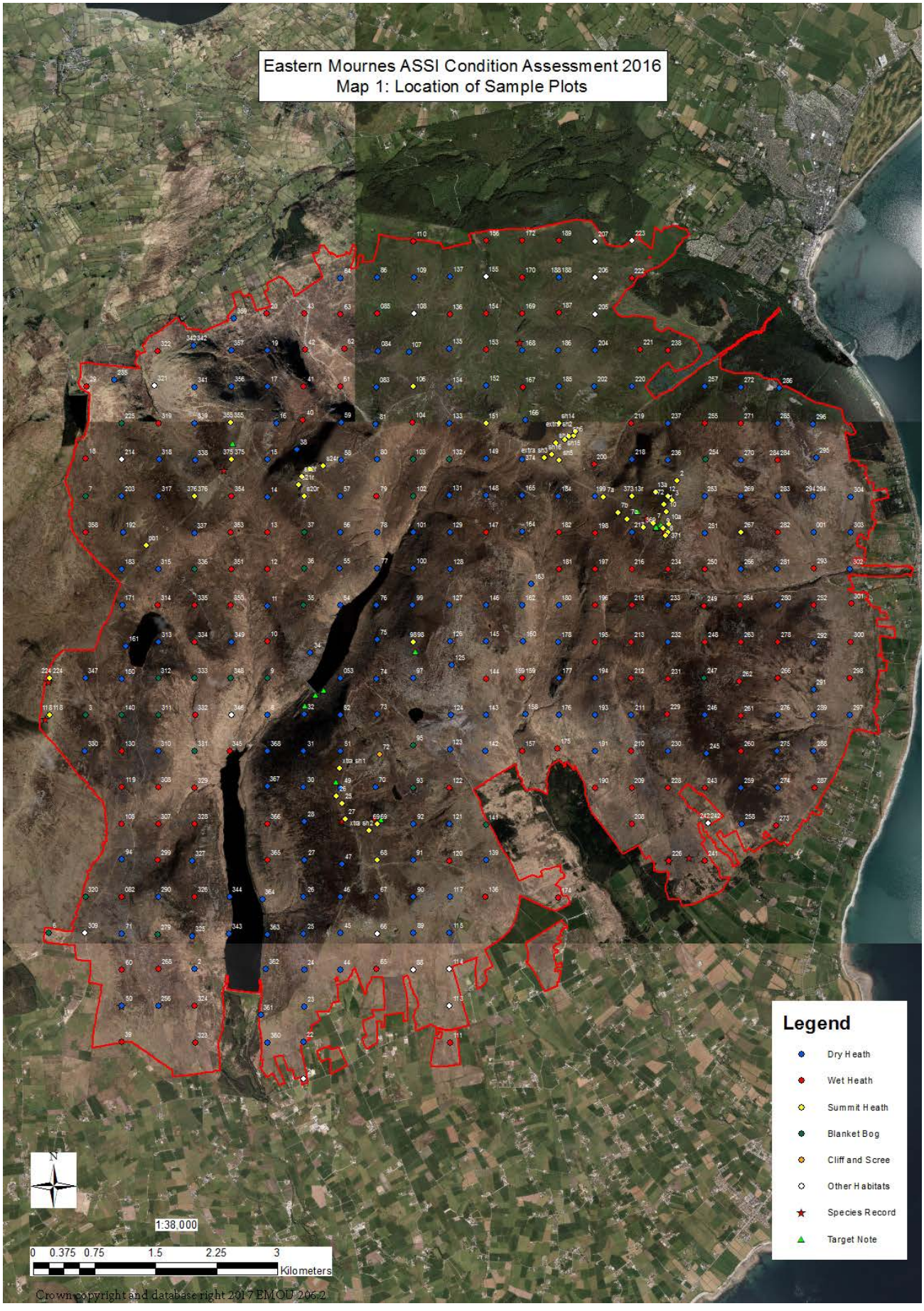
Vegetation composition - Indicators of negative change						
* Scrub/tree encroachment on any active peat surface (DAFOR)	Scrub/tree encroachment should be no more than rare on the intact bog surface, or in the actively regenerating cutover areas.	Visual estimate in 2x2m plots.	Scrub/tree encroachment is present in 0% of plots. (2.78% in 2008)	Favourable		Scrub encroachment should be checked using a combination of aerial photographs and Condition Assessment. Invasive exotic species such as Rhododendron ponticum should be removed immediately.
* Erosion Features associated with human impacts (% and DAFOR)	No gully erosion or bare peat associated with more concentrated human impacts (e.g. drainage, peat extraction, ATV tracks or recreational activities). Man induced/enhanced erosion should occupy less than 2% of the total area of blanket bog other than very localised instances.	Visual estimate in 2x2m plots.	Man induced or enhanced erosion rare in 14.81% of plots, occasional in 3.7% of plots, frequent in 0% of plots, abundant in 3.7% of plots and dominant in 3.7% of plots.	**Unfavourable**		The extent of man induced erosion should be monitored using a combination of aerial photographs and Condition Assessment. Erosion is a natural feature of blanket bog, particularly marginal fretting on breaks of slope. However, where natural erosion is exacerbated by human activity, the bog will not be in favourable condition, except where such erosion is very limited in nature.
* Graminoid Cover (%)	Total cover of graminoids should not exceed 50%, unless dominated by *Molinia caerulea* forming even swards over waterlogged areas with *Sphagnum* moss cover greater than 25%.	Visual estimate in 2x2m plots.	Mean Graminoid cover 64.22%	**Unfavourable**		Include true grasses, sedges, and rushes in this assessment. *Eriophorum vaginatum, Trichophorum cespitosum, Deschampsia flexuosa, Juncus squarrosus* or other graminoids (except *Molinia* in some instances) should not dominate over other species.

* Management - Peat extraction	No evidence of unconsented active peat extraction.	Visual estimate in 2x2m plots.	No peat cutting recorded	Favourable		In some instances areas of cut peat can re-vegetate with good blanket bog vegetation which meets the attributes for favourable condition.
*** Management - Grazing (%)**	Signs of moderate or heavy grazing by cattle or sheep should occupy less than 5% of the blanket bog vegetation within any grazing unit.	Visual estimate in 2x2m plots.	Dung more than occasional in 0% of plots. Poaching more than occasional in 0% of plots. Uprooting of dwarf shrubs more than occasional in 0% of plots. *Juncus squarrosus* etc. more than occasional in 7.41% of plots. *Calluna* growth forms more than occasional in 0% of plots. Therefore, signs of moderate or heavy grazing present in 7.41% of plots.	Favourable		The frequency of droppings, the extent of poaching and the presence of grazing induced *Calluna vulgaris* growth forms indicate moderate and heavy grazing where any one of the above is recorded as more than occasional.
Indicators of local distinctiveness						
Molinia caerulea cover (%)	Where *Molinia caerulea* cover is greater than 50%, it should form an even (not tussocky) sward in waterlogged conditions with *Sphagnum* moss cover greater than 25%.	Visual estimate in 2x2m plots.	Mean *Molinia* cover 34.41%	Favourable		*Molinia caerulea* only occurs as a natural component of the bog vegetation in the extreme west of Northern Ireland where the climate is generally warmer and wetter, i.e. more oceanic.

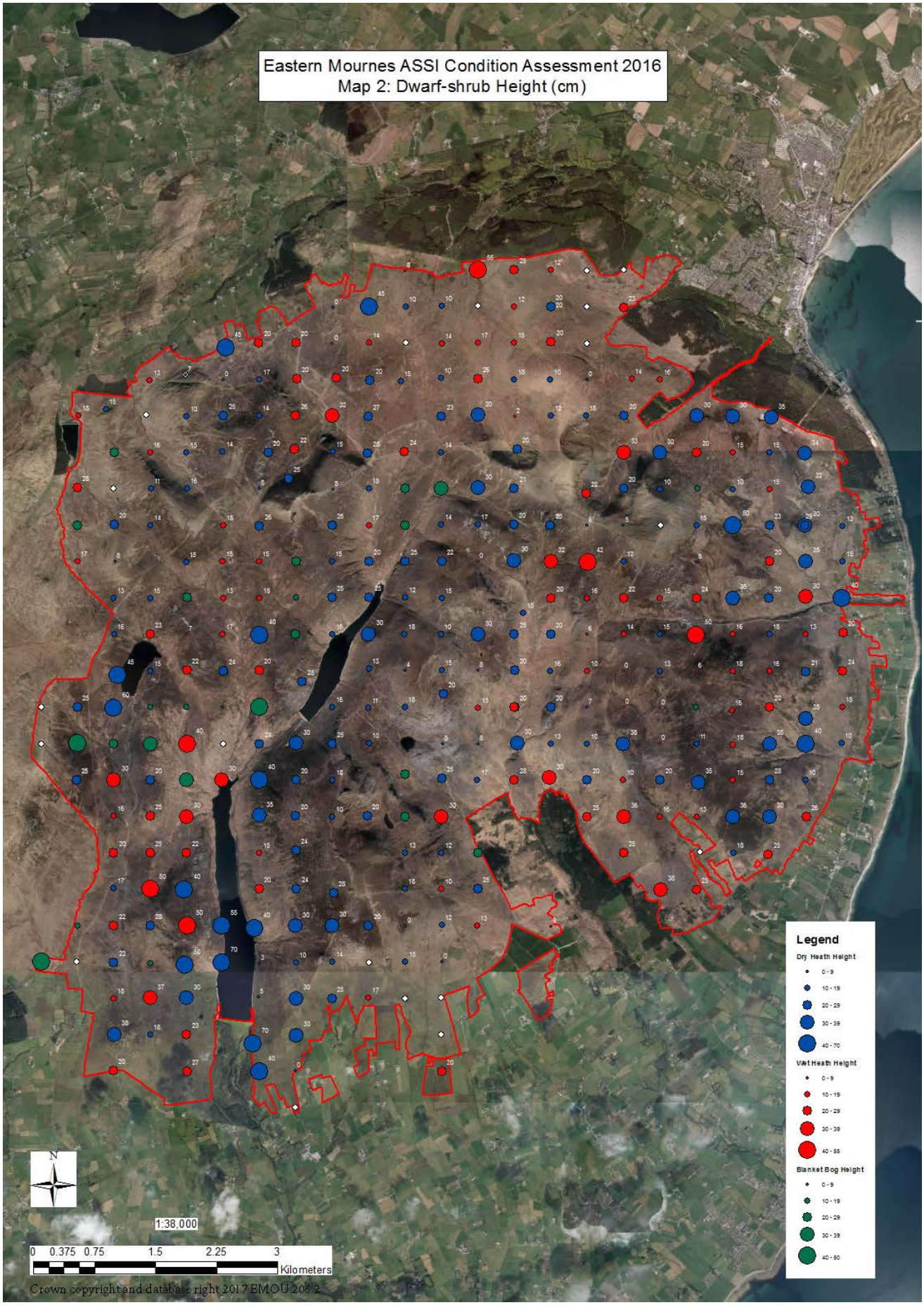
Presence of rare or scarce species specific to the site.	*Sphagnum imbricatum* and *Sphagnum fuscum*, where they have been recorded, should remain at least present along the length of each of the W-walks.	Visual estimate in 2x2m plots.	Neither species recorded from the site	Not applicable		If these species are not recorded on any one visit, it does not automatically make the site unfavourable.

ANNEX 4: MAPS

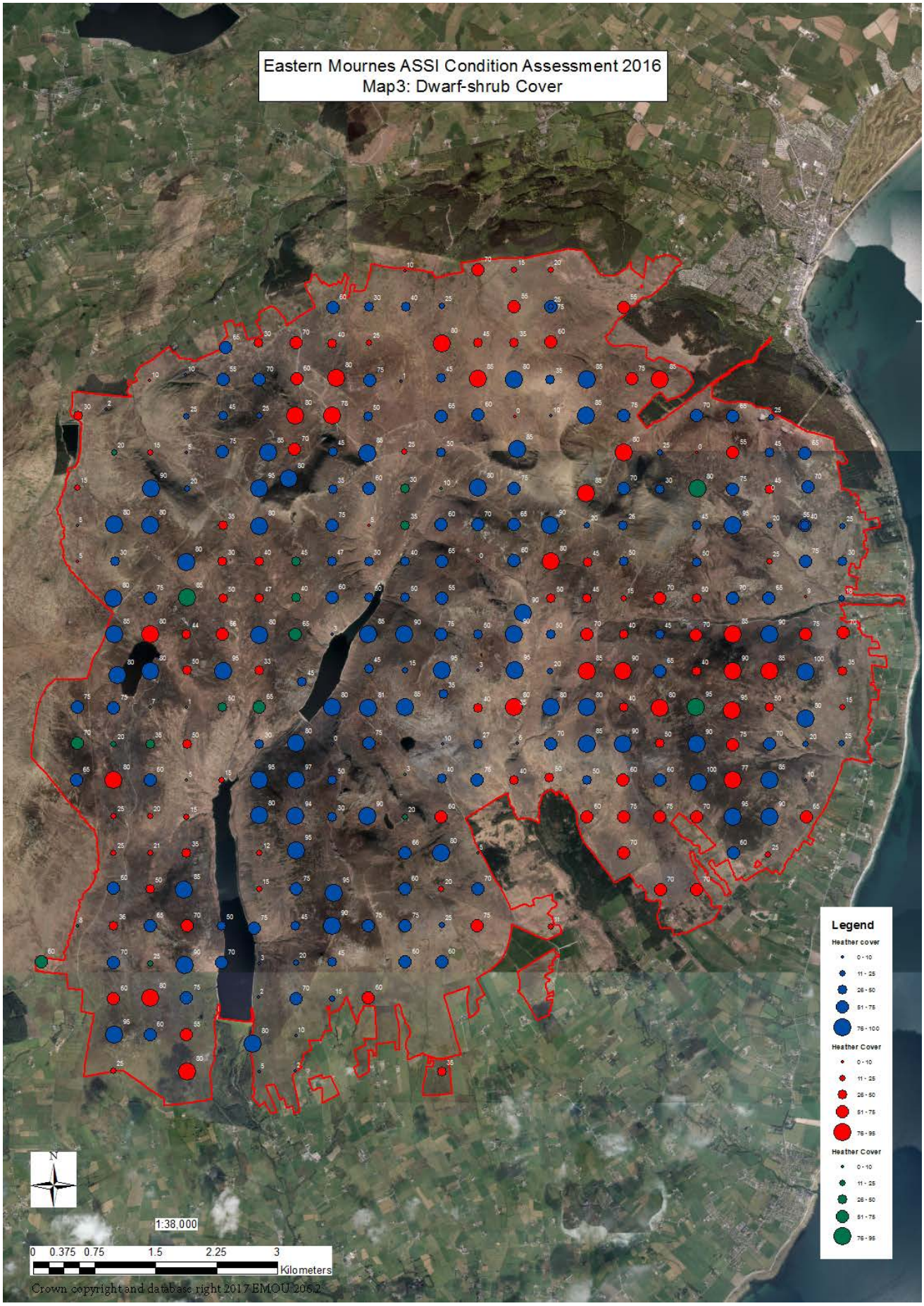
Map 1: Location of Sample Plots



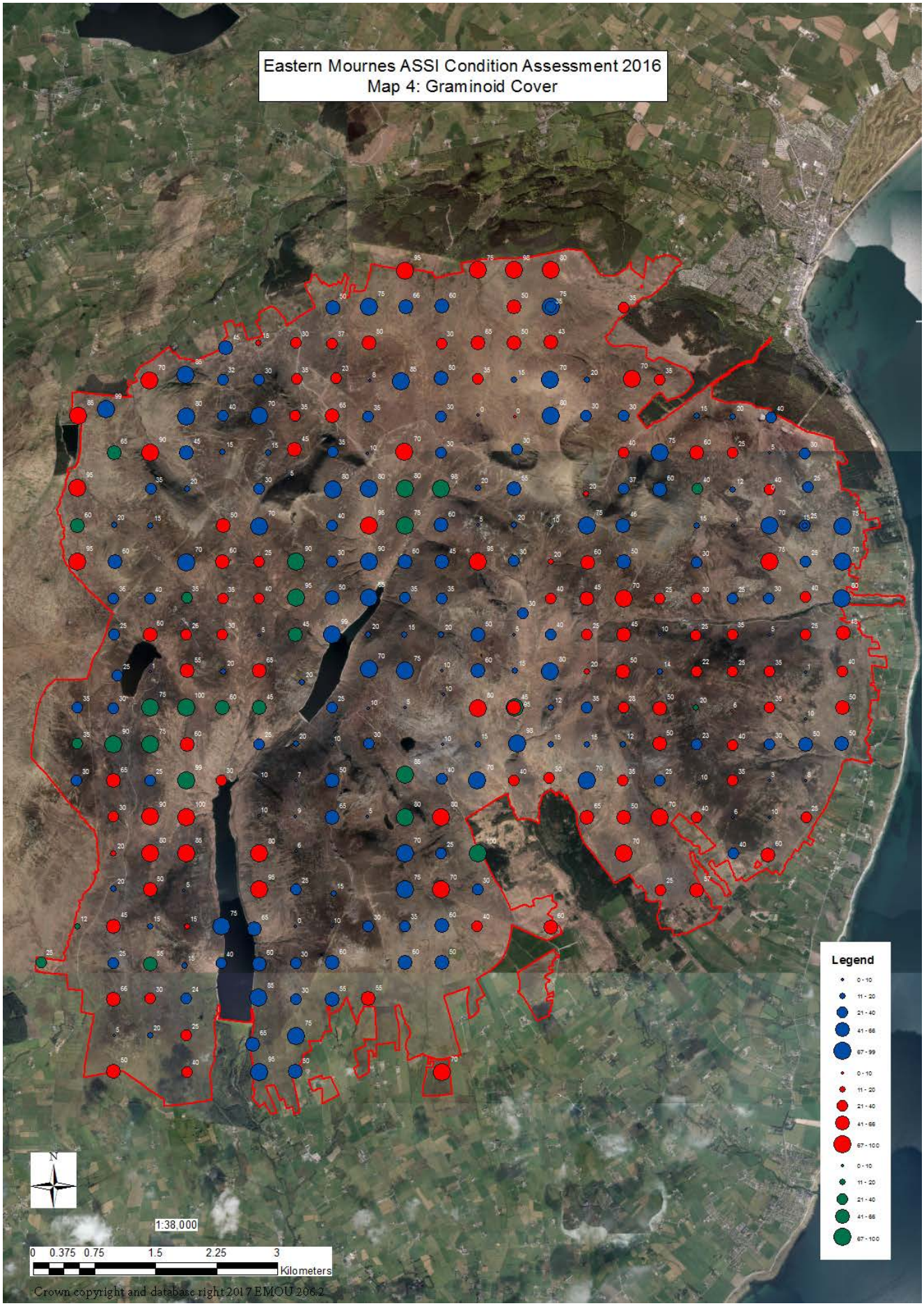
Map 2: Dwarf-shrub Height



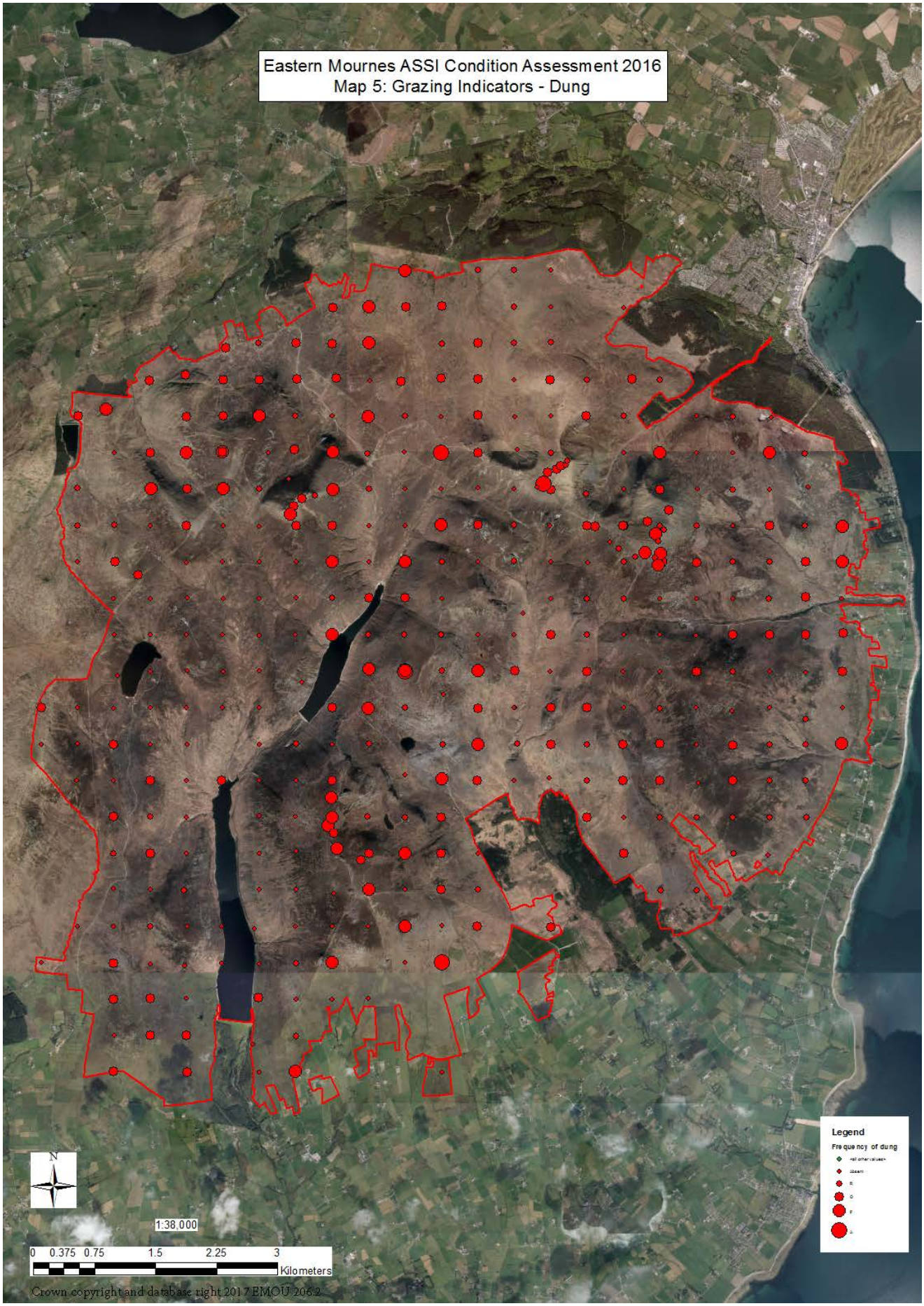
Map 3: Dwarf-shrub cover



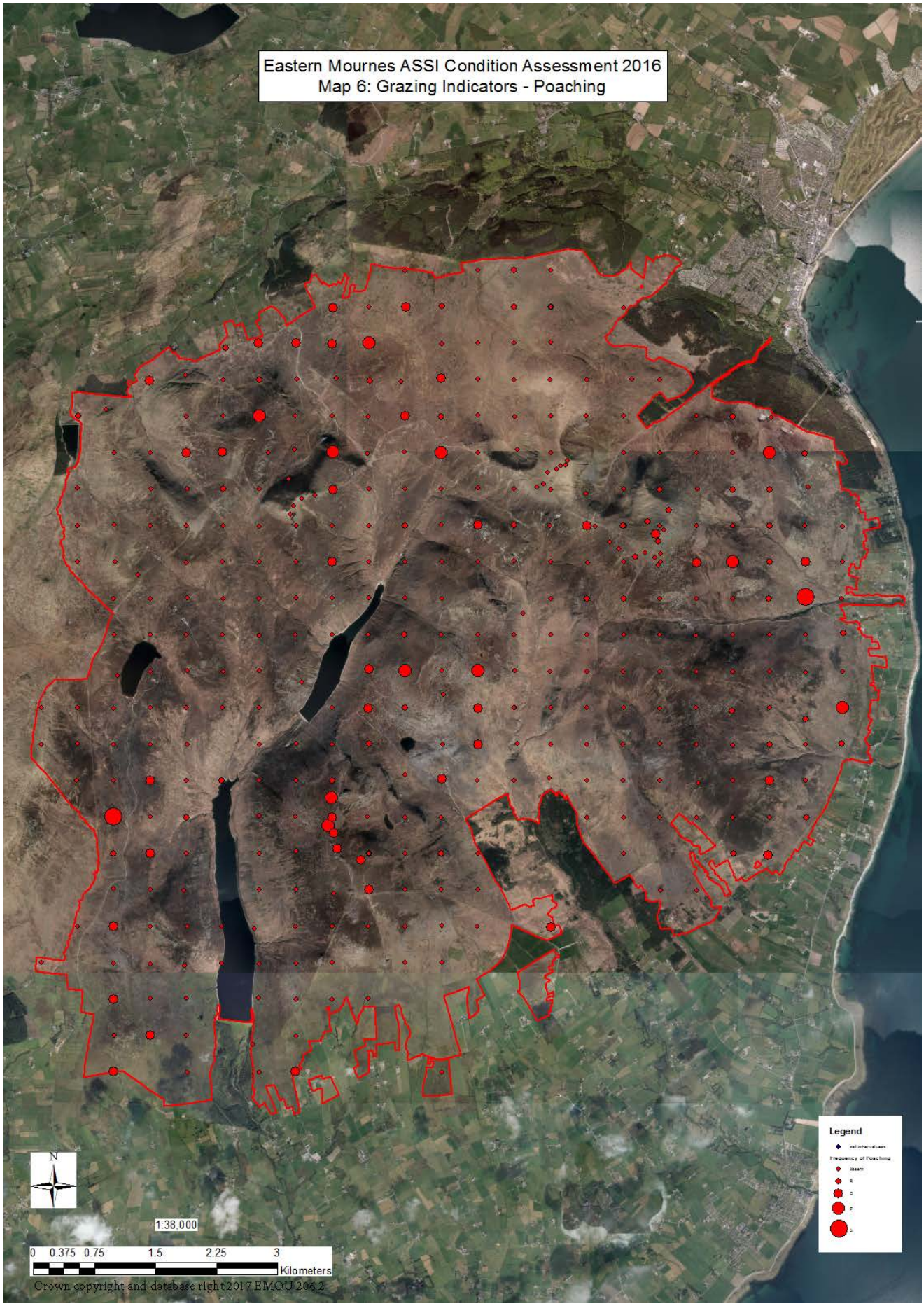
Map 4: Graminoid cover



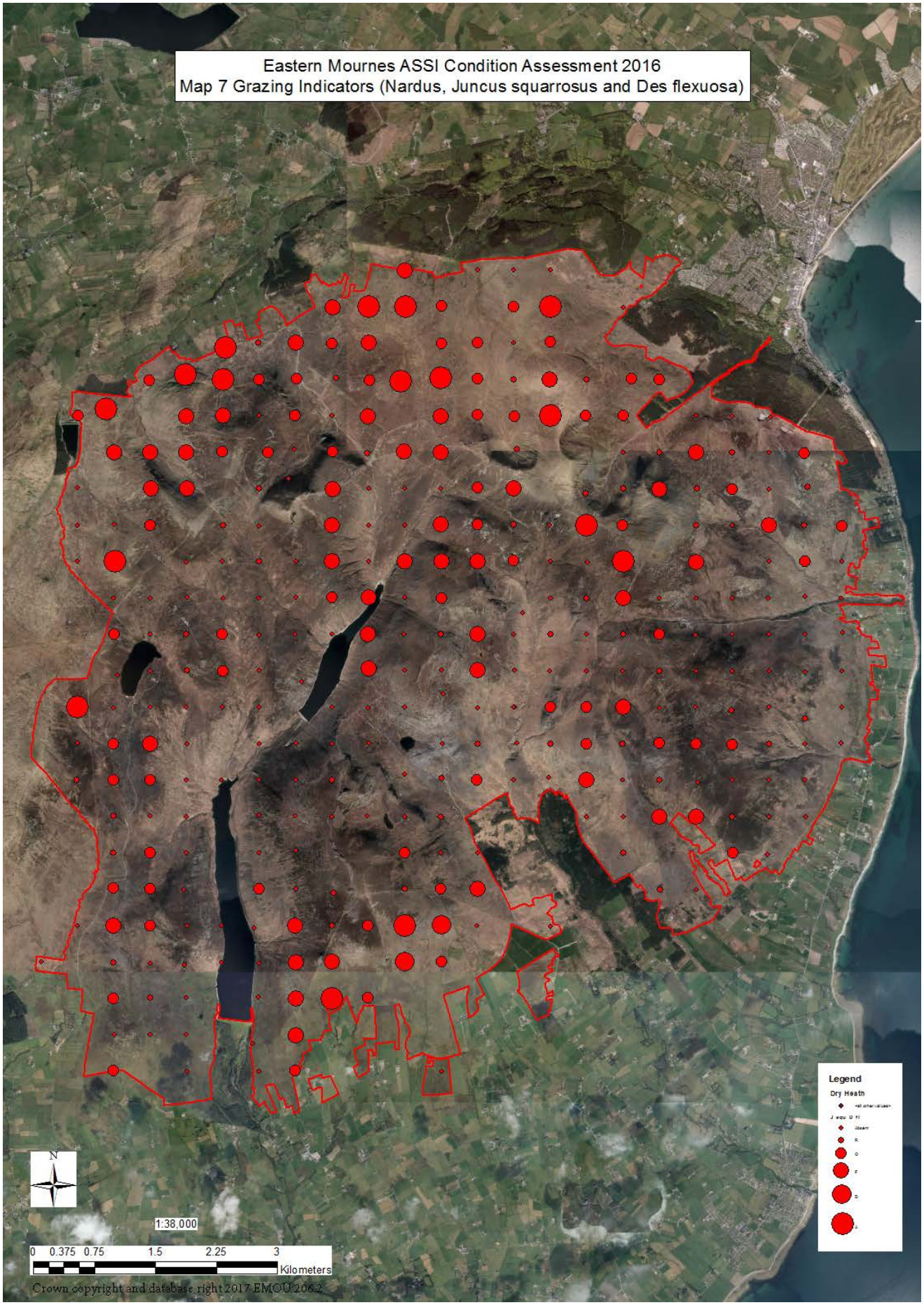
Map 5: Grazing Indicators - Dung



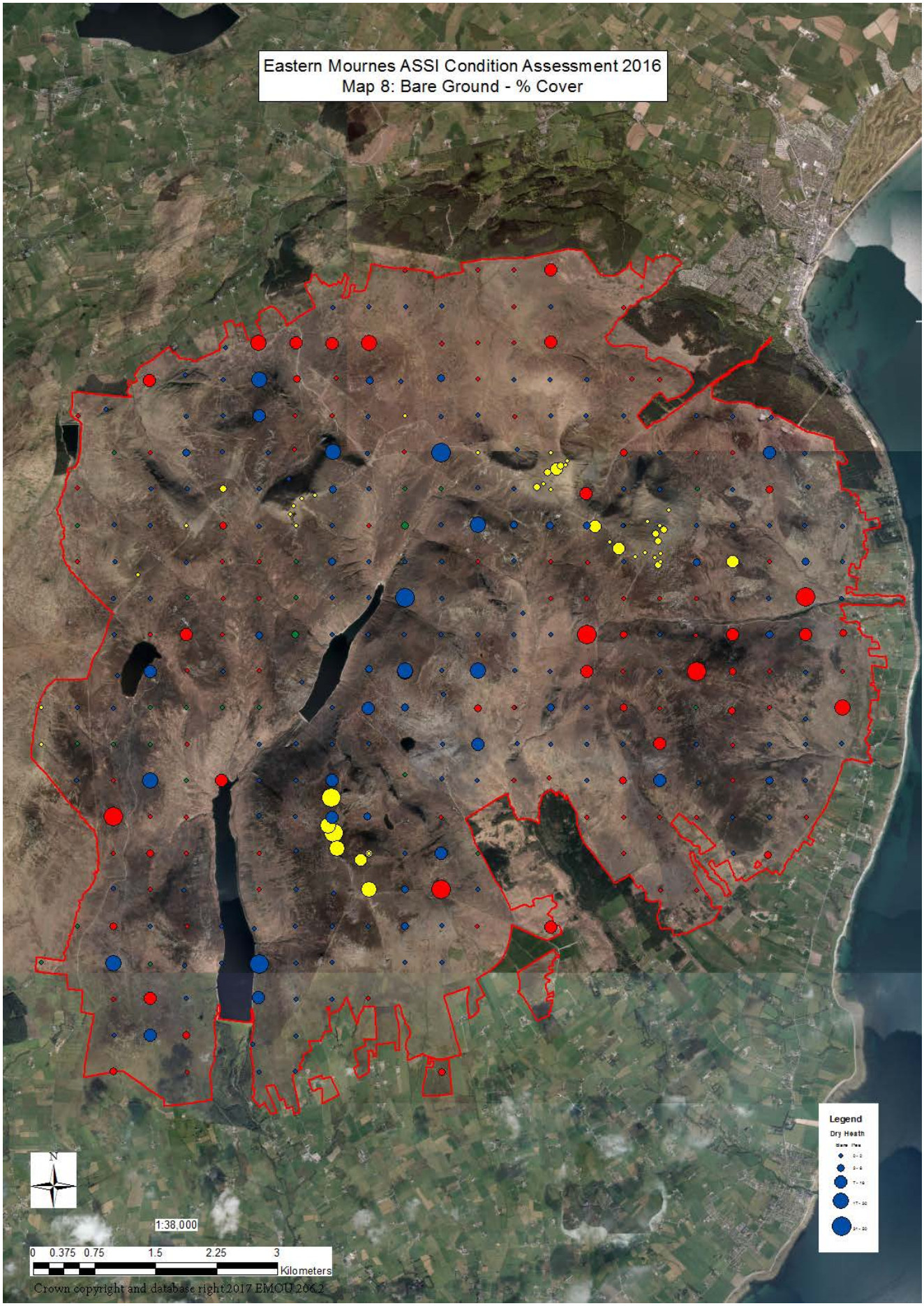
Map 6: Grazing Indicators - Poaching



Map 7: Grazing Indicators (Nardus stricta, Juncus squarrosus and Deschampsia flexuosa)



Map 8: Bare Ground - % Cover



Map 9: Recent Burning