

National Survey of Upland Habitats

(Pilot Survey Phase, 2009-2010)

Site Report No. 4:

Carlingford Mountain cSAC (000453), Co. Louth

(Revision)



Jenni R. Roche, Philip M. Perrin, Simon J. Barron and Orla H. Daly

January 2014

Commissioned by National Parks and Wildlife Service

Department of Environment, Heritage and Local Government

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Citation:

Roche, J.R., Perrin, P.M. Barron, S.J. & Daly, O.H. (2014) National Survey of Upland Habitats (Pilot Survey Phase, 2009-2010), Site Report No. 4: Carlingford Mountain cSAC (000453), Co. Louth (Revision). National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Cover photo: Heath near the summit of Carlingford Mountain, taken by Philip Perrin.

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EXECUTIVE SUMMARY

- Carlingford Mountain cSAC (000453), Co. Louth was surveyed as part of the National Survey of Upland Habitats (NSUH) between April and May 2010. This report supersedes the original report, produced in 2010 by the same authors, by updating the format and assessment procedures to those finalised during Phase 3 of the NSUH (2013-2013).
- The area of the site is 31.0 km². Using GIS and aerial photograph interpretation, the site was divided into 349 polygons, each representing areas of relatively homogeneous habitat mosaic. Each polygon was surveyed on the ground to create a habitat map for the site.
- A total of 13 Annex I habitats, 33 Fossitt habitats and 46 provisional upland vegetation communities were recorded. Annex I habitats comprise 53.0% of the site. The Annex I upland habitats present which are primary focus habitats for the NSUH are 4030 Dry heath (34.6%), 4010 Wet heath (9.1%), *7130 Active blanket bog (3.0%), 8220 Siliceous rocky slopes (2.7%), 7230 Alkaline fens (1.5%), 4060 Alpine and Boreal heath (0.9%), 8110 Siliceous scree (0.5%), *6230 Species-rich *Nardus* grasslands (0.4%), 7130 Inactive blanket bog (0.1%) and 7140 Transition mire (0.1%).
- Rare and notable species recorded during the survey include *Diphysastrum alpinum*, *Scorpidium scorpioides*, *Polytrichastrum alpinum* and *Vaccinium vitis-idaea*.
- Areas of particular botanical interest include the PF1 Rich fen and flush which is found on the lower slopes throughout the site, where localised base-enrichment occurs, and the higher summits. Both Carlingford Mountain and Black Mountain support 4060 Alpine and Boreal heath containing Arctic-alpine plants.
- The conservation status of the upland Annex I habitats that form the primary focus of the NSUH was assessed. A total of 27 monitoring stops were recorded in these habitats. The conservation status of 8110 Siliceous scree was assessed as Favourable while that of the remaining primary focus habitats was assessed as Unfavourable – Bad.
- The main impacts/activities affecting the site are sheep grazing, burning and peat erosion.
- It is recommended that:

Whilst destocking levels implemented under CFP c. 2002 appear to have resulted in some improvement to Annex I habitats, continued monitoring is required to assess the recovery of these habitats. The available data do not support an increase in stocking levels.

Whilst burning can be an important tool in heathland management, uncontrolled high-frequency burning can damage the long-term viability of heaths and bogs. Burning should be regulated at a site level.

The feasibility of active restoration measures in severely eroded bog should be examined if these areas are to achieve Favourable conservation status.

* Priority Annex I habitat

ACKNOWLEDGEMENTS

The authors would like to extend their gratitude to the other field ecologists who worked on this project: Fiona Devaney, Kate McNutt and Brendan O'Hanrahan. The contribution of Francisco Porras, Nick Hodgetts, David Holyoak and Julian Aherne is also acknowledged.

We would also like to thank the Irish Farmers' Association, and the many landowners who permitted us to survey their lands and provided helpful background site information.

We would like to thank the National Parks and Wildlife Service (NPWS) who commissioned this project and the many NPWS personnel who assisted with this project including Caitriona Douglas (Project Co-ordinator), John Brophy (Conservation Ranger), Naomi Kingston, Deirdre Lynn, Terence O'Rourke, Andy Bleasdale, Neil Lockhart, Mike Wyse Jackson and Mel Conway.

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FILES ACCOMPANYING REPORT

ESRI format polygon shapefile with habitat data

ESRI format point shapefile with waypoint data

ESRI format point shapefile with monitoring stop / relevé data

ESRI format point shapefile with rare and notable species data

Microsoft Excel format polygon attributes table

Microsoft Excel format image databank

Microsoft Access condition assessment database

Turboveg relevé database

Site, relevé and waypoint photographs

1. INTRODUCTION

Overview

- 1.1 The principal objectives of the National Survey of Upland Habitats (NSUH) are to classify and map the location and extent of upland habitats within a range of sites using the schemes of Fossitt (2000) and Annex I of the EU Habitats Directive, and to assess the conservation status of a suite of upland Annex I habitats. Selected sites largely comprise upland candidate Special Areas of Conservation (cSACs). The assessment procedure involves evaluation of habitat condition indicators at a network of monitoring stops (point samples) distributed across the range of these habitats at the surveyed sites.
- 1.2 These data are required to provide a scientific basis for the development of policies and management practices for the maintenance (or restoration) of favourable conservation status of Annex I habitats and to provide a scientific basis for monitoring of their status into the future. This site report should be read in conjunction with Irish Wildlife Manual No. 48 (Perrin *et al.*, 2010) and No. 79 (Perrin *et al.*, 2014) which detail the methodologies used for all aspects of this survey. These were initially devised during the scoping study and pilot survey of upland habitats completed in 2009 (Perrin *et al.*, 2009).
- 1.3 This report summarises the results of the field survey of Carlingford Mountain cSAC (000453) for the NSUH (Pilot Survey Phase, 2009-2010). It revises an original report produced by the same authors in 2010 by updating the format and assessment procedures to those finalised during Phase 3 of the NSUH.
- 1.4 Section 2 of this report presents a detailed description of the habitats within the site, which should be read in conjunction with the relevant O.S. Discovery Series map and the figures associated with the report. It also contains summary statistics on the extent of each habitat type recorded and a compilation of rare and notable floral records for the site.
- 1.5 Section 3 presents a detailed account of the conservation assessment for the upland Annex I habitats that are the primary focus of the NSUH. This is presented on a habitat-by-habitat basis and for each habitat the parameters of area, structure and functions and future prospects are examined. Available data from the Commonage Framework Plan are also presented.
- 1.6 Section 4 of this report recommends amendments to the Natura 2000 Standard Data Form based on the results of this survey and makes additional recommendations in regard to monitoring and management.
- 1.7 NSUH fieldwork was conducted in Carlingford Mountain cSAC between April and mid-May 2009. The boundary of the cSAC as used in this survey was that provided by NPWS at the end of 2009.

Background site information

- 1.8 Carlingford Mountain cSAC (Fig. 1) is a relatively small site, being 31.0 km² in extent and is located on the Cooley Peninsula in Co. Louth. It lies between the villages of Carlingford and Omeath to the east and Ravensdale to the west (O.S Discovery Series map 36). It comprises two

main upland areas of dolerite, granite, slate and gabbro that are narrowly linked at the Windy Gap. In the east is Carlingford Mountain proper, with the peaks of Slieve Foye (alt. 588 m), The Eagles Rock (alt. 528 m), The Ravens Rock (alt. 457 m) and The Foxes Rock (alt. 404 m) and Barnavave (alt. 350 m). On Carlingford Mountain, several cascades and a few small mountain lakes are to be found. In the west the terrain is less steep and rocky. It is dominated by the transmission tower at Clermont Cairn on the top of Black Mountain (alt. 508 m) and extends from The Castle (alt. 383 m) in the south to Anglesey Mountain (alt. 422 m) in the north where the site borders Northern Ireland. The Táin Way waymarked walk crosses both Carlingford Mountain and Black Mountain, providing relatively easy access for members of the public.

- 1.9 The site has been designated for a relatively small number of Annex I habitats (Table 1). The full category titles for Annex I habitats mentioned in this report are found in Appendix 1.

Table 1: Qualifying interests of Carlingford Mountain cSAC. Rep. = Representativity, Cons. = Conservation status, Surf. = Relative Surface, Glob. = Global Assessment. Data retrieved from <http://natura2000.eea.europa.eu> 20th January 2011

Annex I Code	Habitat	Area (%)	Rep.	Surf.	Cons.	Glob.
4060	Alpine and Boreal heath	3	C	C	C	C
8110	Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>)	2	B	B	B	B
8210	Calcareous rocky slopes with chasmophytic vegetation	1	C	C	B	C
8220	Siliceous rocky slopes with chasmophytic vegetation	1	C	C	B	C

2. FIELD SURVEY

Description of habitats

Carlingford Mountain

- 2.1 The peaks of Carlingford Mountain support a variant of **HH4 Montane heath** dominated by *Racomitrium lanuginosum*, *Calluna vulgaris* and *Nardus stricta*. **ER1 Exposed siliceous rock** is also abundant here although, due to the nature of the bedrock, clefts and crevices are uncommon. Hence it is bryophytes such as *R. lanuginosum* and *Campylopus atrovirens* that tend to characterise the rock faces rather than vascular species. Around some of the small **FL1 Dystrophic lakes** found near the top of the mountain are areas of **PF3 Transition mire and quaking bog**.
- 2.2 Further down the mountain and on the lower peak of Barnavave, **HH1 Dry siliceous heath** dominates. It is characterised by *Calluna vulgaris* and *Erica tetralix*, with *Ulex gallii* locally abundant at lower altitudes. The lower slopes also support **GS3 Dry-humid acid grassland** and around the fringes of the site are extensive areas of **HD1 Dense bracken**.
- 2.3 On the lower southern fringes of the mountain close to the Táin Way are extensive flushed slopes comprising mosaics of **HH3 Wet heath** and rich flush (**PF1 Rich fen and flush**) supporting *Schoenus nigricans* and *Erica tetralix* with abundant *Pinguicula vulgaris*. On the eastern flank of Barnavave is a relatively large area of siliceous scree (**ER3 Siliceous scree and loose rock**).

Black Mountain and Anglesey Mountain

- 2.4 The higher slopes of Anglesey Mountain support **HH1 Dry siliceous heath** with some areas of **PB2 Upland blanket bog** on more level ground. Lower down this gives way to extensive swathes of **HD1 Dense bracken**. In the upper reaches of a stream valley here are large areas of rushy poor flush (**PF2 Poor fen and flush**). Further south, towards the winding road which bisects the site, is an area of **PB2 Upland blanket bog** supporting *Empetrum nigrum*.
- 2.5 The highest areas of Black Mountain are dominated by **HH1 Dry siliceous heath** with *Calluna vulgaris* and *Erica cinerea*. The saddle to the southeast of Black Mountain is dominated by **HH3 Wet heath** and the summit of the adjacent unnamed 475 m peak is dominated by **HH4 Montane heath**. The lower slopes of this section feature extensive areas of **GS3 Dry-humid acid grassland**, **HD1 Dense bracken** and **PF2 Poor fen and flush**, the latter being generally dominated by *Juncus acutiflorus* or *Juncus effusus*.
- 2.6 The southwest part of the site around the area known as the Castle, is predominantly **HH1 Dry siliceous heath** with **HD1 Dense bracken**, **GS3 Dry-humid acid grassland** and some small areas of **ER1 Exposed siliceous rock**.

-
- 2.7 A selection of photographs taken during fieldwork of landscapes, habitats and species are presented in Appendix 2.

Habitat statistics

2.8 The NSUH maps habitats and vegetation communities on a polygon basis. Following aerial photograph interpretation, a survey site is divided into numerous polygons based on areas of homogeneous patternation and topography. The majority of these polygons represent mosaics of habitats rather than single habitats. Each polygon is surveyed on the ground and the habitats and vegetation communities present in each are listed and their percentage cover estimated. For further details see Perrin *et al.* (2009; 2014). The field maps for this site, which present the amended and numbered polygons, accompany this report (Field maps 1-8).

Table 2: Extent of Fossitt habitats within Carlingford Mountain cSAC

Fossitt Code	Habitat	Total Area (ha)	% of Site
BL1	Stone walls and other stonework	0.9	0.03
BL3	Buildings and artificial surfaces	3.2	0.10
ED1	Exposed sand, gravel or till	8.0	0.26
ED2	Spoil and bare ground	12.6	0.41
ED3	Recolonising bare ground	4.4	0.14
ER1	Exposed siliceous rock	117.4	3.78
ER3	Siliceous scree and loose rock	119.1	3.84
FL1	Dystrophic lakes	1.3	0.04
FL2	Acid oligotrophic lakes	0.9	0.03
FP2	Non-calcareous springs	4.0	0.13
FS1	Reed and large sedge swamps	0.01	0.0002
FW1	Eroding/upland rivers	9.7	0.31
FW4	Drainage ditches	0.04	0.001
GA1	Improved agricultural grassland	2.0	0.07
GS3	Dry-humid acid grassland	666.8	21.50
GS4	Wet grassland	60.3	1.94
HD1	Dense bracken	247.5	7.98
HH1	Dry siliceous heath	1073.3	34.61
HH3	Wet heath	283.13	9.13
HH4	Montane heath	103.2	3.33
PB2	Upland blanket bog	96.2	3.10
PB4	Cutover bog	0.003	0.0001
PB5	Eroding blanket bog	1.9	0.06
PF1	Rich fen and flush	68.6	2.21
PF2	Poor fen and flush	117.4	3.79
PF3	Transition mire and quaking bog	1.6	0.05
WD4	Conifer plantation	27.6	0.89
WD5	Scattered trees and parkland	0.08	0.002
WL2	Treelines	0.02	0.001
WN2	Oak-ash-hazel woodland	0.1	0.01
WN6	Wet willow-alder-ash woodland	0.6	0.02
WS1	Scrub	66.1	2.13
WS5	Recently-felled woodland	3.4	0.11
Total Site Area		3101.2	

Table 3: Extent of Annex I habitats within Carlingford Mountain cSAC. Asterisk denotes priority habitat.

Annex I Code	Habitat	Total Area (ha)	% of Site
3130	Upland oligotrophic lakes	0.9	0.03
3160	Dystrophic lakes	1.3	0.04
3260	Floating river vegetation	0.3	0.01
4010	Wet heath	283.1	9.13
4030	Dry heath	1073.3	34.61
4060	Alpine and Boreal heath	28.8	0.93
*6230	Species-rich <i>Nardus</i> grasslands	13.3	0.43
*7130	Active blanket bog	92.6	2.99
7130	Inactive blanket bog	3.6	0.12
7140	Transition mires	1.6	0.05
7230	Alkaline fens	45.3	1.46
8110	Siliceous scree	14.2	0.46
8220	Siliceous rocky slopes	84.7	2.73
-	non-Annex I habitats	1458.1	47.02
	Total site area	3101.2	
	Total area of Annex I habitats	1643.1	52.98

- 2.9 The most abundant habitat within a polygon is termed the primary habitat. The primary Fossitt habitat types for Carlingford Mountain cSAC are shown in Fig. 2 and the primary Annex I habitat types are presented in Fig. 3. It is important to note that these maps do not convey the full complexity of habitats within the site. For full details of the habitat composition of each polygon refer to the polygon attribute table associated with the GIS. This information also accompanies this report in Microsoft Excel format.
- 2.10 A total of 33 Fossitt (2000) habitats were recorded from Carlingford Mountain cSAC, with details of their coverage being presented in Table 2. The most extensive was **Dry heath (HH1)**, covering 34.6% of the site, followed by **Dry-humid acid grassland (GS3)**, **Wet heath (HH3)** and **Dense bracken (HD1)**.
- 2.11 A total of 13 Annex I habitats were recorded within Carlingford Mountain cSAC, covering 53.0% of the site (Table 3). The most dominant Annex I habitat was **Dry heath (4030)**, which covered 34.6% of the site. The next most extensive was **Wet heath (4010)**, covering 9.1% of the site, followed by **Active blanket bog (*7130)** and **Siliceous rocky slopes (8220)**. Note that significant areas of non-Annex habitats may occur within an SAC. These may occur in intimate mosaic with Annex I habitats. They may have an important protective or support function in relation to associated Annex habitats, be the target of restoration objectives or improve the coherence and connectivity between fragmented areas of Annex I habitat.
- 2.12 A total of 46 provisional upland vegetation communities and sub-communities (Perrin *et al.*, 2014) were recorded within Carlingford Mountain cSAC. Details of their coverage are presented in Table 4.

Table 4: Extent of provisional vegetation communities within Carlingford Mountain cSAC.

Code	Provisional communities and sub-communities	Area (ha)	% of site	% of habitat
PO1	<i>Menyanthes trifoliata</i> - <i>Carex limosa</i> pool community			
PO1b	aquatic sub-community	0.04	0.001	100.0
SW1	<i>Potamogeton polygonifolius</i> soakway	1.5	0.05	100.0
SPG1	<i>Philonotis fontana</i> - <i>Saxifraga stellaris</i> spring			
SPG1a	typical sub-community	1.9	0.06	47.5
SPG1b	species-poor <i>Sphagnum denticulatum</i> sub-community	2.1	0.07	52.5
PFLU2	<i>Juncus effusus</i> - <i>Sphagnum cuspidatum</i> /palustre flush	90.1	2.91	51.1
PFLU3	<i>Juncus acutiflorus</i> /effusus - <i>Calliergonella cuspidata</i> flush	60.3	1.94	34.2
PFLU4	<i>Molinia caerulea</i> - <i>Sphagnum palustre</i> flush			
PFLU4a	typical sub-community	25.8	0.83	14.6
PFLU5	<i>Carex rostrata</i> – <i>Sphagnum</i> spp. flush	0.35	0.01	0.2
RFLU1	<i>Carex viridula oedocarpa</i> - <i>Pinguicula vulgaris</i> - <i>Juncus bulbosus</i> flush			
RFLU1a	brown moss sub-community	21.2	0.69	30.4
RFLU1b	species-poor sub-community	19.3	0.62	27.7
RFLU3	<i>Carex panicea</i> – <i>Carex viridula</i> subsp. <i>oedocarpa</i> flush	3.9	0.13	5.6
RFLU4	<i>Schoenus nigricans</i> – <i>Scorpidium scorpioides</i> flush	24.1	0.78	34.5
RFEN	<i>Carex rostrata</i> fen			
RFEN1b	species-poor sub-community	1.3	0.04	1.8
UG1	<i>Agrostis capillaris</i> - <i>Festuca ovina</i> upland grassland			
UG1a	typical sub-community	149.8	4.83	22.5
UG1b	<i>Sphagnum</i> spp. sub-community	0.5	0.02	0.1
UG1c	species-rich calcareous sub-community	5.6	0.18	0.8
UG1d	<i>Juncus squarrosus</i> sub-community	0.5	0.02	0.1
UG2	<i>Nardus stricta</i> - <i>Galium saxatile</i> upland grassland			
UG2a	typical sub-community	461.9	14.90	69.3
UG2b	<i>Sphagnum</i> spp. sub-community	3.1	0.10	0.5
UG2c	species-rich sub-community	7.7	0.25	1.2
UG2d	<i>Juncus squarrosus</i> sub-community	37.7	1.21	5.7
BK1	<i>Pteridium aquilinum</i> community	247.5	7.98	100.0
DH1	<i>Ulex gallii</i> – <i>Erica cinerea</i> dry heath	134.6	4.34	12.5
DH3	<i>Calluna vulgaris</i> - <i>Erica cinerea</i> dry heath	891.3	28.74	83.0
DH4	<i>Calluna vulgaris</i> - <i>Sphagnum capillifolium</i> dry/damp heath	1.0	0.03	0.1
DH6	<i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> dry heath	46.4	1.50	4.3
WH1	<i>Schoenus nigricans</i> – <i>Erica tetralix</i> wet heath			
WH1a	continuous cover sub-community	31.7	1.02	11.2
WH1b	open sub-community	0.04	0.001	0.01
WH2	<i>Trichophorum germanicum</i> – <i>Cladonia</i> spp. – <i>Racomitrium lanuginosum</i> wet heath	4.0	0.13	1.4
WH3	<i>Calluna vulgaris</i> - <i>Molinia caerulea</i> - <i>Sphagnum capillifolium</i> wet/damp heath	149.7	4.83	52.9
WH4	<i>Trichophorum germanicum</i> - <i>Eriophorum angustifolium</i> wet heath			
WH4a	typical sub-community	4.8	0.15	1.7
WH4b	<i>Calluna vulgaris</i> sub-community	54.8	1.77	19.4
WH4c	<i>Juncus squarrosus</i> sub-community	5.8	0.19	2.0
WH5	<i>Trichophorum germanicum</i> - <i>Nardus stricta</i> - <i>Racomitrium lanuginosum</i> montane wet heath	32.3	1.04	11.4

Table 4: continued.

Code	Provisional communities and sub-communities	Area (ha)	% of site	% of habitat
MH1	<i>Calluna vulgaris</i> - <i>Racomitrium lanuginosum</i> montane heath			
MH1a	typical sub-community	28.8	0.93	27.9
MH5	<i>Nardus stricta</i> - <i>Carex binervis</i> - <i>Racomitrium lanuginosum</i> montane grass-heath	74.4	2.40	72.1
BB3	<i>Eriophorum vaginatum</i> – <i>Sphagnum papillosum</i> bog	10.3	0.33	11.3
BB5	<i>Calluna vulgaris</i> - <i>Eriophorum</i> spp. bog			
BB5a	typical sub-community	77.4	2.49	84.7
BB5b	<i>Juncus squarrosus</i> sub-community	3.1	0.10	3.4
BB6	<i>Eriophorum angustifolium</i> – <i>Juncus squarrosus</i> bog			
BB6a	typical sub-community	0.6	0.02	0.6
HW1	<i>Sphagnum denticulatum/cuspidatum</i> hollow			
HW1i	upland variant	1.2	0.04	25.7
HW2	<i>Eriophorum angustifolium</i> - <i>Sphagnum fallax</i> hollow			
HW2i	upland variant	3.6	0.12	74.3
DP1	<i>Campylopus introflexus</i> - <i>Polytrichum</i> spp. degraded peat community	4.4	0.14	100.0
TH1	<i>Luzula sylvatica</i> - <i>Vaccinium myrtillus</i> tall herb vegetation			
TH1i	rock face variant	0.02	0.001	100.0
SC1	Siliceous scree community	0.6	0.02	100.0
RS1	<i>Saxifraga spathularis</i> - <i>Asplenium adiantum-nigrum</i> rock cleft community	0.8	0.03	100.0
	Total area of vegetation communities	2727.8	87.96	
	Not covered	99.98	3.22	
	Non-vegetation cover types	273.4	8.82	
	Total site area	3101.2		

2.13 Gradated maps displaying the cover of Annex I habitats currently assessed under the NSUH are shown in Figs. 4a-j. These maps present the actual distributions of individual habitats within the site which may be masked in the primary habitat maps which show only the most extensive habitat in each polygon.

Rare and notable flora

2.14 Rare and notable plant records for the site are listed in Table 5 and their locations, where accurately known, are presented in Fig. 5. The list is compiled from records made during the present survey and from existing records. For each species it is indicated whether it is listed on the Flora Protection Order, 1999 and/or the relevant Red Data List. For vascular plants this is Curtis & McGough (1988) and for bryophytes it is Lockhart *et al.* (2012).

2.15 During the NSUH survey the notable clubmoss *Diphasiastrum alpinum* was recorded from **4060 Alpine and Boreal heath** on both Carlingford Mountain and Black Mountain. This species is rare, declining and yet under-recorded in Ireland and is also likely to be threatened by climate change (Roche, 2011; Roche & Perrin, 2010). A single specimen of *Vaccinium vitis-idaea*, which is

rather rare in Ireland (Parnell & Curtis, 2012), was found growing in a rocky cleft near the summit of Carlingford Mountain.

- 2.16 Previous rare vascular plant records for the site include *Cryptogramma crispa*, which is known to occur from an area of **8110 Siliceous scree** within the site. *Hammarbya paludosa* has previously been recorded from bog near Clermont. Historical records for *Gnaphalium sylvaticum* also exist for the site.

Table 5: Records of rare and notable plant species from Carlingford Mountain cSAC.

Species	Red Data List	FPO	Annex II	Year of record (s)	NSUH	Previous records
Vascular plants						
<i>Cryptogramma crispa</i>	RA	•	-	1836, 1970	-	1, 2, 3
<i>Diphasiastrum alpinum</i>	-	-	-	2010	•	-
<i>Gnaphalium sylvaticum</i>	RA	•	-	1900	-	1
<i>Hammarbya paludosa</i>	RA	•	-	1973	-	1
<i>Vaccinium vitis-idaea</i>	-	-	-	2010	•	-
Bryophytes						
<i>Campylopus subulatus</i>	VU	-	-	2010	-	4
<i>Grimmia decipiens</i>	NT	-	-	?	-	4
<i>Grimmia donniana</i>	NT	-	-	2007	-	1
<i>Grimmia ramondii</i>	NT	-	-	?	-	4
<i>Hedwigia integrifolia</i>	VU	-	-	2010	-	4
<i>Leiocolea bantriensis</i>	NT	-	-	?	-	4
<i>Marsupella funckii</i>	NT	-	-	?	-	4
<i>Pogonatum nanum</i>	EN	-	-	1999, 2010	-	4
<i>Polytrichastrum alpinum</i> *	-	-	-	2010	•	-
<i>Scorpidium scorpioides</i> *	-	-	-	2010	•	-

* Denotes new vice county record from NSUH fieldwork

Previous records: 1, NPWS Recorder database and associated data
2, Natura 2000 Standard Data Form
3, cSAC site synopsis
4, Lockhart *et al.* (2012)

Red Data List: EN, Endangered NT, Near Threatened
VU, Vulnerable RA, Rare

- 2.17 New vice-county records for the bryophytes *Scorpidium scorpioides* and *Polytrichastrum alpinum* were made during the present survey. *Scorpidium scorpioides* was recorded in rich fens and flushes throughout the site, while *Polytrichastrum alpinum* was recorded in an area of ***6230 Species-rich *Nardus* grasslands** on the western slopes of the unnamed 475 m peak.
- 2.18 Previous rare bryophyte records for the site include *Campylopus subulatus*, *Grimmia decipiens*, *Grimmia donniana*, *Grimmia ramondii*, *Hedwigia integrifolia*, *Leiocolea bantriensis* and *Marsupella funckii*. According to Lockhart *et al.* (2012), the site contains two of Ireland's three known populations of *Pogonatum nanum*.
- 2.19 The NSUH survey did not actively seek to relocate previous rare plant records; therefore no inference should be made from the absence of a record in the current survey.

- 2.20 A list of the scientific and common names of all vascular plants, bryophytes and lichens recorded during the survey of this site are presented in Appendix 3.

Fauna

- 2.21 The common lizard (*Zootoca vivipara*) and the Irish hare (*Lepus timidus hibernicus*) were recorded from the lower slopes of Black Mountain during the present survey.
- 2.22 Previous faunal records for the site include the EU Birds Directive Annex I listed Peregrine (*Falco peregrinus*), Atlantic Salmon (*Salmo salar*), Brown Trout (*Salmo trutta*), Common Frog (*Rana temporaria*), Raven (*Corvus corax*), Snipe (*Gallinago gallinago*) and the dragonflies the Common Hawker (*Aeshna juncea*) and Common Darter (*Sympetrum striolatum*).

3. CONSERVATION ASSESSMENT

- 3.1 The conservation status of Annex I habitats that form the primary focus of the NSUH was assessed using the methodology detailed in Perrin *et al.* (2014). The assessments comprise three parameters: area, structure and functions, and future prospects. The area parameter examines gains or losses in an Annex I habitat. The structure and functions parameter examines the vegetation composition and structure of the habitats and the physical structure of the substrate; a total of 27 monitoring stops were recorded within Carlingford Mountain cSAC for this purpose (Fig. 6 and Table 6); 1 additional relevé was recorded in a non-Annex habitat. The future prospects parameter examines the current impacts/activities on the site that are affecting area and structure and functions, and predicts the future status of the habitat based on future trends where there is sufficient data. The future prospects parameter can also be informed by available data from the Commonage Framework Plan project (CFP).

Table 6: The number of monitoring stops recorded in primary focus Annex I habitats.

Annex I code	Habitat	Number of stops
4010	Wet heath	4
4030	Dry heath	10
4060	Alpine and Boreal heath	2
*6230	Species-rich <i>Nardus</i> grasslands	1
*7130/7130	Blanket bog	4
7230	Alkaline fens	1
8110	Siliceous scree	1
8220	Siliceous rocky slopes	4

Commonage Framework Plan

- 3.2 Surveys were initiated in 1998 to assess livestock impacts on commonages in Ireland and to devise Commonage Framework Plans (CFP) to improve commonage condition. Assessments were made on an area basis by dividing the commonage into subunits based on areas of a consistent level of damage. Point sample assessments were made at a series of stations, of 10 x 10 m, within the subunits. The habitats identified by the CFP relevant to the NSUH sites were blanket bog, wet heath, dry heath and upland grassland. The damage assessment scale used was undamaged (U), moderately damaged to undamaged (MU), moderately damaged (MM), moderately to severely damaged (MS), severely damaged (S) or very severely damaged (S*). Further details of CFP methodology can be found in Anon. (1998) and use of this data by the NSUH has been reviewed by Perrin (2012).
- 3.3 Carlingford Mountain cSAC is predominantly commonage with these areas comprising 29.2 km² or 94.2% of the site. A baseline CFP survey of these areas occurred between 2000 and 2002 with stock reduction resulting from these assessments occurring c.2002. A resurvey of all stations and a subset of subunits occurred in 2008. Results from these surveys are shown in Figs. 7a and 7b.

- 3.4 Of the 32 subunits within or partially within the cSAC, 27 subunits were resurveyed in 2008 (Table 7). The baseline survey indicates commonage within the site was in relatively good condition at this time with 71.5% of the area of subunits being undamaged (U) and no subunits being moderately to severely damaged (MS) or worse. Pairwise comparison of the resurveyed subunits indicates that 7 subunits (25.9%) improved, 19 subunits (70.4%) did not change significantly and only 1 subunit (3.7%) disimproved. The main change was an increase in the proportion of undamaged (U) subunits and a decrease in the number of moderately damaged to undamaged (MU) subunits. In 2008, 97.9% of the area of commonage was deemed to be undamaged (U).

Table 7: Frequency of CFP subunit damage levels in the Carlingford Mountain cSAC baseline surveys and 2008 resurvey.

Damage level	Baseline (n = 32)		Resurvey (n = 27)	
	Frequency	Area %	Frequency	Area%
U	20 (62.5%)	71.5	26 (96.3%)	97.9
MU	11 (34.4%)	27.6	1 (3.7%)	2.1
MM	1 (3.1%)	0.8	0 (0.0%)	0.0
MS	0 (0.0%)	0.0	0 (0.0%)	0.0
S/S*	0 (0.0%)	0.0	0 (0.0%)	0.0

- 3.5 The CFP recorded 72 stations within Carlingford Mountain cSAC (Table 8). The baseline survey indicates commonage within the site was in relatively undamaged condition at this time with 80.6% of stations being undamaged (U) and no stations being moderately to severely damaged (MS) or worse. The main changes between the baseline survey and the resurvey in 2008 were an increase in the proportion of undamaged (U) stations and a decrease in the number of moderately damaged to undamaged (MU) stations.

Table 8: Frequency of CFP station damage level in Carlingford Mountain cSAC, baseline surveys and 2008 resurvey. Percentages indicate proportion of stations within each column.

Damage level	Wet heath/Dry heath/ Blanket bog		Upland grassland and other habitats		All habitats	
	Baseline (n = 56)	Resurvey (n = 51)	Baseline (n = 16)	Resurvey (n = 21)	Baseline (n = 72)	Resurvey (n = 72)
U	46 (82.1%)	47 (92.2%)	12 (75.0%)	20 (95.2%)	58 (80.6%)	67 (93.1%)
MU	8 (14.3%)	3 (5.9%)	4 (25.0%)	1 (4.8%)	12 (16.7%)	4 (5.6%)
MM	2 (3.6%)	1 (2.0%)	0 (0.0%)	0 (0.0%)	2 (2.8%)	1 (1.4%)
MS	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
S/S*	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

- 3.6 Summary data for some of the key indicators recorded at CFP stations are compared with NSUH data in Table 9. Whilst station and subunit data indicates improvement between the baseline survey and 2008, the variables on which these assessments were apparently made contrarily indicate a disimprovement, with considerable reductions in sward height, *Calluna* height and the frequency of stations dominated by *Calluna*. The NSUH survey recorded similar values to the baseline survey for *Calluna* cover and height, whilst indicating a further decline in sward height.

Table 9: Mean values for key indicators from CFP stations in the Carlingford cSAC, baseline survey and the 2008 resurvey, with related data from NSUH survey.

	Wet heath/Dry heath/ Blanket bog			Upland grassland and other habitats	
	Original	Resurvey	NSUH	Original	Resurvey
	(n = 56)	(n = 51)	(n = 20)	(n =16)	(n =21)
Bare peat cover (%)	<0.1	0.2	0.2	0.0	<0.1
Sward height (cm)	38.6	20.4	15.6	22.8	48.3
<i>Calluna</i> height (cm)	25.2	16.3	24.5†	-	-
<i>Calluna</i> cover					
D (>50%)	18 (32.1%)	8 (15.7%)	6 (30.0%)	-	-
A (25-50%)	16 (28.6%)	11 (21.6%)	4 (20.0%)	-	-
F (5-25%)	12 (21.4%)	16 (31.4%)	6 (30.0%)	-	-
O (<5%)	9 (16.1%)	12 (23.5%)	4 (20.0%)	-	-
Absent	1 (1.8%)	4 (7.8%)	0 (0.0%)	-	-

† Dwarf shrub height is used here as an estimate of *Calluna* height

- 3.7 With no clear trend in the CFP data it is difficult to draw many conclusions. As the subunit approach presents an overview of the whole site, more weighting could be applied to these data. This may be very tentatively seen as a positive trend for **4010 Wet heath**, **4030 Dry heath** and ***7130/7130 Blanket bog** between 2000-2002 and 2011. As the original survey found little damage at this site, reduction of stock under the CFP would not have had a major impact on the numbers of grazing animals, therefore the magnitude of this trend is likely to be slight.

4010 Wet heath

Area

- 3.8 Changes in the area of **4010 Wet heath** were recorded for the period 1995 to 2012 through a combination of observations in the field and analysis of aerial photographs and satellite imagery available through Google Earth (Table 10). Only losses in habitat were found, there were no gains in habitat area. These data are restricted to obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process.

The loss in area of **4010 Wet heath** was due to track development (0.08 ha). This impact is discussed later under future prospects. The overall change in habitat area was a loss of less than 1% per year resulting in a status of Unfavourable – Inadequate.

Table 10: Impacts causing obvious losses in areas of 4010 Wet heath, 1995-2012.

Impact code	Impact	Area (ha)	Area (ha)	Area (ha)	Area (ha)
		1995-2000	2000-2005	2005-2012	1995-2012
D01.01	Paths, tracks and cycle tracks	0.08	0.00	0.00	0.08
	All impacts	0.08	0.00	0.00	0.08
	% of habitat	0.03	0.00	0.00	0.03
	% loss per year	0.01	0.00	0.00	0.002

Structure and functions

- 3.9 Four monitoring stops were recorded in **4010 Wet heath** within Carlingford Mountain cSAC (Table 11). In the assessment of structure and functions, two monitoring stops failed one criterion or more. Following a review of the ecological condition of these stops, expert judgement determined that no changes should be made, resulting in an overall failure rate of 50.0%. The structure and functions of **4010 Wet heath** were therefore assessed as Unfavourable – Bad.
- 3.10 The vegetation composition of **4010 Wet heath** was poor in 50.0% of cases, with two monitoring stops failing due to inadequate cover of *Cladonia* spp., *Sphagnum* spp., *Racomitrium lanuginosum* and pleurocarpous mosses. One of these monitoring stops also exhibited poor vegetation structure and physical structure, failing due to excessive grazing and cover of disturbed bare ground.

Future prospects

- 3.11 The impacts codes (Ssymank, 2009) and associated data recorded for **4010 Wet heath** are presented in Table 12. Eight impacts were recorded within **4010 Wet heath**.

Non-intensive sheep grazing (A04.02.02)

- 3.12 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that grazing was the main land use throughout the site and that grazing levels appeared to be low. Approximately 95% of the site is held as commonage and the impacts of grazing on these parts of the site were assessed by the CFP in Commonage Plan LH1. The plan recommended destocking levels between 0 and 6.9%, depending on the area concerned. In 2001, the area was the focus of the Foot and Mouth eradication programme, which resulted in the disposal of all sheep on the site. The Conservation Statement noted some localised overgrazing, poaching and soil exposure, particularly on the upper slopes of Carnavaddy Mountain, but described the majority of the site as undamaged.

- 3.13 Although 33.3% of **4010 Wet heath** monitoring stops failed the assessment of structure and functions due to excessive grazing, this was due to grazing by horses rather than sheep. The intensity of this impact was assessed as low and its influence as neutral. The trend was assessed as improving due to reduction of stock under the CFP, although the magnitude of this trend is likely to be slight.

Table 11: Monitoring criteria and failure rates for 4010 Wet heath ($n = 4$).

Criteria	Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition				
1 <i>Erica tetralix</i> present	20m radius	4	0	0
2 Cover of positive indicator species $\geq 50\%$	Relevé	4	0	0
3 Total cover of <i>Cladonia</i> species, <i>Sphagnum</i> species, <i>Racomitrium lanuginosum</i> and pleurocarpous mosses $\geq 10\%$	Relevé	4	2	50.0
4 Cover of ericoid species and <i>Empetrum nigrum</i> $\geq 15\%$	Relevé	4	0	0
5 Cover of dwarf shrub species $< 75\%$	Relevé	4	0	0
6 Cover of the following negative indicator species: <i>Agrostis capillaris</i> , <i>Holcus lanatus</i> , <i>Phragmites australis</i> , <i>Ranunculus repens</i> collectively $< 1\%$	Relevé	4	0	0
7 Cover of non-native species $< 1\%$	Relevé	4	0	0
8 Cover of non-native species $< 1\%$	Local vicinity	4	0	0
9 Cover of scattered native trees and scrub $< 20\%$	Local vicinity	4	0	0
10 Cover of <i>Pteridium aquilinum</i> $< 10\%$	Local vicinity	4	0	0
11 Cover of <i>Juncus effusus</i> $< 10\%$	Local vicinity	4	0	0
Vegetation structure				
12 Crushed, broken and/or pulled up <i>Sphagnum</i> species $< 10\%$ of <i>Sphagnum</i> cover	Relevé	4	0	0
13 Last complete growing season's shoots of ericoids, <i>Empetrum nigrum</i> and <i>Myrica gale</i> showing signs of <u>browsing</u> collectively $< 33\%$	Relevé	3	1	33.3
14 No signs of <u>burning</u> into the moss, liverwort or lichen layer, or exposure of peat surface due to burning	Local vicinity	4	0	0
15 No signs of <u>burning</u> inside boundaries of sensitive areas*	Local vicinity	4	0	0
Physical structure				
16 Cover of <u>disturbed</u> bare ground $< 10\%$	Relevé	4	0	0
17 Cover of <u>disturbed</u> bare ground $< 10\%$	Local vicinity	4	0	0
18 Area showing signs of <u>drainage</u> resulting from heavy trampling or tracking or ditches $< 10\%$	Local vicinity	4	1	25.0

*Sensitive areas

(a) Vegetation severely wind-clipped, mostly forming a mat less than 10 cm thick.

(b) Areas where soils are thin and less than 5 cm deep.

(c) Slopes greater than 1 in 3 (18°) and all the sides of gullies.(d) Ground with abundant, and/or an almost continuous carpet of *Sphagnum*, liverworts and/or lichens.

(e) Pools, wet hollows, hags and erosion gullies, and within 5 – 10 m of the edge of watercourses.

(f) Areas above 400 m in altitude.

(g) Areas within 50 m of functioning drains.

Non-intensive horse grazing (A04.02.03)

- 3.14 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that the main land use within the site is sheep and horse grazing, with some donkeys also present. To prevent nuisance, annoyance, injury to persons or damage to property, Louth County Council enacted the “Louth County Council (Control of Horses) Bye-Laws 2003”, outlining the regulations for keeping licensed horses in the “Declared Control Area” of the upland commonage area of the Cooley Peninsula, including Carlingford Mountain cSAC.
- 3.15 During the present survey, horses were observed grazing within **4010 Wet heath**, with 33.3% of monitoring stops failing due to excessive grazing and trampling by horses. The intensity of this impact has been assessed as medium and its influence as negative.

Table 12: Assessment of impacts for 4010 Wet heath. Under trend, Imp = Improving, Ins = Insufficient data.

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Low	Neutral	100%	Inside	0	Imp
A04.02.03	Non-intensive horse grazing	Medium	Negative	33.3%	Inside	-1.5	Ins
A04.02.04	Non-intensive goat grazing	Low	Neutral	Ins	Inside	0	Imp
D01.01	Paths, tracks, cycling tracks	High	Negative	0.03%	Inside	-0.75	Ins
G01.02	Walking, horseriding and non-motorized vehicles	High	Negative	<1%	Inside	-0.75	Ins
G01.03.02	Off-road motorised driving	High	Negative	<1%	Inside	-0.75	Imp
I01	Invasive non-native species	Low	Neutral	0.1%	Inside	0	Ins
J01.01	Burning down	High	Negative	25%	Inside	-1.5	Ins
Overall score						-5.25	

Non-intensive goat grazing (A04.02.04)

- 3.16 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that, in 2001, the area was the focus of the Foot and Mouth eradication programme, which resulted in the disposal of all wild goats on the site. As overall grazing levels appeared to be low, the intensity of goat grazing was assessed as low and its influence as neutral. The trend was assessed as improving due to the reduction in overall grazing levels.

Paths, tracks, cycle tracks (D01.01)

- 3.17 Analysis of aerial photographs during the assessment of area showed that, during the period 1995-2000, approximately 0.08 ha of **4010 Wet heath** was lost to the development of tracks. The intensity of this impact has been assessed as high and its influence as negative.

Walking, horseriding and non-motorized vehicles (G01.02)

- 3.18 The Carlingford Mountain cSAC is a popular area for recreation. The main recreational activity within the site is hillwalking. A waymarked route, The Táin Way, crosses the site at two locations. There are several other tracks within the site, particularly along the ridgelines. Mountain bike tracks are also present within the site. Trial bike riding has occurred but events are restricted to areas of the site where little or no damage will occur and are only allowed

under permit from NPWS. In some areas of the site, particularly around Carnavaddy, soil erosion, widening of informal tracks and creation of new tracks is occurring (NPWS, 2009).

- 3.19 During the present survey, relatively high numbers of walkers were observed within the site and path erosion was noted to be ongoing (Plate 1). The intensity of this impact has been assessed as high and its influence as negative. The area of the habitat affected has been estimated to be less than 1%, due to the localised nature of this impact.



Plate 1: Area of erosion in mosaic of 4030 Dry heath/4010 Wet heath/*7130 Active blanket bog on Black Mountain, caused by walkers and bikes (Photo: BEC Consultants).

Off-road motorised driving (G01.03.02)

- 3.20 The Carlingford Mountain cSAC was previously used by off-road vehicles, such as quad bikes, but the frequency of this activity has decreased since the introduction of the draft “Louth County Council Regulations and Control of Off Road Vehicles Bye-Laws 2003”. Motorbike trials have occurred but events are only allowed under permit from NPWS. Although motorbike scrambling is not permitted within the site, there are tracks along the ridgelines that may be caused by scramblers. In some areas of the cSAC, particularly around Carnavaddy, soil erosion, widening of informal tracks and creation of new tracks is occurring (NPWS, 2009).
- 3.21 During the present survey, use of the site for off-road motorised driving was noted to be ongoing. The intensity of this impact was assessed as high and its influence as negative. The area of the habitat affected has been estimated to be less than 1%, due to the localised nature of this impact. The trend was assessed as improving due to the introduction of bye-laws controlling this activity.

Invasive non-native species (I01)

- 3.22 *Campylopus introflexus* is a non-native pioneer moss species of bare peat which can become abundant after disturbance such as peat cutting, burning or drainage (Atherton *et al.*, 2010). Carpets of the moss have been found to have a significant depressive effect on germination of *Calluna vulgaris* seeds and therefore this species can impact on re-establishment of heather (Equiha & Usher, 1993; Bernth, 1998). Klinck (2010) defined it as a mild or temporary invasive species as it does not have long-term effects on biodiversity.
- 3.23 *Campylopus introflexus* was recorded within two monitoring stops but was not sufficiently abundant to cause the stops to fail. The mean cover of *C. introflexus* within **4010 Wet heath** monitoring stops was 0.1% (Table 12). The degraded peat vegetation community DP1 *Campylopus introflexus* – *Polytrichum* spp. was recorded not within any polygons dominated by **4010 Wet heath** during vegetation mapping. As *C. introflexus* was not recorded as forming extensive carpets, this impact was assessed as being of low intensity and neutral influence.

Burning down (I01.01)

- 3.24 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that there have been several large fires within the site in recent years, where large tracts of heath were burned. The areas affected included Carnavaddy, Anglesey Mountain and Black Mountain. Uncontrolled burning may result in the loss of vegetation and subsequent soil erosion.
- 3.25 During the present survey, burning was observed to be ongoing within **4010 Wet heath**. Furthermore, analysis of recent satellite imagery showed that approximately 25% of the area of **4010 Wet heath** within the site had recently been burned. Very extensive burning was visible in the Eagle’s Rock and the Split Rock areas of Carlingford Mountain on images recorded between July 2011 and May 2012. Burning causes severe damage to the structure and functions of **4010 Wet heath** and is not an appropriate form of management for this habitat. The intensity of this impact has been assessed as high and its influence as negative.

- 3.26 The overall impacts score for **4010 Wet heath** has been calculated as -5.25. This is below the nominal Favourable Reference Value of zero. Improvements due to reductions in off-road motorised driving and grazing by sheep and goats are not thought to be sufficient to bring about a significant change in the conservation status of the habitat overall within the next twelve years, due to continued significant negative impacts such as burning and grazing by horses. The combined future trend for area and structure and functions was therefore assessed as no change. The future prospects for this habitat were therefore assessed as Unfavourable – Bad.

4030 Dry heath

Area

- 3.27 Changes in the area of **4030 Dry heath** were recorded for the period 1995 to 2012 through a combination of observations in the field and analysis of aerial photographs and satellite imagery available through Google Earth (Table 13). Both losses and gains in habitat area were found. These data are restricted to obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. The gain in area of **4030 Dry heath** was due to succession. The losses in area of **4030 Dry heath** were due to the development of tracks, paths and car parks. These impacts and trends are discussed later under future prospects. The overall change in habitat area was a loss of less than 1% per year resulting in a status of Unfavourable – Inadequate.

Table 13: Impacts causing obvious changes in areas of 4030 Dry heath, 1995-2012.

Impact code	Impact	Area (ha) 1995-2000	Area (ha) 2000-2005	Area (ha) 2005-2012	Area (ha) 1995-2012
D01.01	Paths, tracks and cycle tracks	-1.15	-0.15	0.00	-1.30
D01.03	Car parks and parking areas	0.00	0.00	-0.03	-0.03
K02.01	Species composition change (succession)	0.00	+0.90	0.00	+0.90
All impacts		-1.15	+0.75	-0.03	-0.43
% of habitat		-0.11	+0.07	-0.003	-0.04
% loss per year		-0.02	+0.01	-0.0004	-0.002

Structure and functions

- 3.28 Ten monitoring stops were recorded in **4030 Dry heath** within Carlingford Mountain cSAC (Table 14). In the assessment of structure and functions, six monitoring stops failed one criterion or more. Following a review of the ecological condition of these stops, expert judgement determined that no changes should be made, resulting in an overall failure rate of

60.0%. The structure and functions of **4030 Dry heath** were therefore assessed as Unfavourable – Bad.

- 3.29 The vegetation composition of **4030 Dry heath** was poor, with 20.0% of monitoring stops failing due to inadequate cover of bryophytes and lichens. A further 20.0% of monitoring stops failed due to *Ulex gallii* comprising an excessive proportion of dwarf shrub cover and a further 10.0% failed due to inadequate cover of positive indicator species.
- 3.30 The vegetation structure of **4030 Dry heath** was also poor, with 40.0% of monitoring stops failing due to excessive grazing and 22.2% due to poor structural diversity of *Calluna vulgaris*. The physical structure of **4030 Dry heath** was good, with no failures being recorded under the relevant criteria.

Future prospects

- 3.31 Ten impacts were recorded within **4030 Dry heath** (Table 15).

Non-intensive sheep grazing (A04.02.02)

- 3.32 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that grazing was the main land use throughout the site and that grazing levels appeared to be low. Approximately 95% of the site is held as commonage and the impacts of grazing on these parts of the site were assessed by the CFP in Commonage Plan LH1. The plan recommended destocking levels between 0 and 6.9%, depending on the area concerned. In 2001, the area was the focus of the Foot and Mouth eradication programme, which resulted in the disposal of all sheep on the site. The Conservation Statement noted some localised overgrazing, poaching and soil exposure, particularly on the upper slopes of Carnavaddy Mountain but described the majority of the site as undamaged.
- 3.33 The level of grazing within **4030 Dry heath** in the Carlingford Mountain cSAC varied, with the proportion of dwarf shrub shoots showing signs of grazing ranging from 0-50%. In contrast with the low grazing levels reported by the Carlingford Mountain cSAC Conservation Statement (NPWS, 2009), 40.0% of **4030 Dry heath** monitoring stops failed the assessment of structure and functions due to excessive grazing. Furthermore, 22.2% of monitoring stops failed due to poor structural diversity of *Calluna vulgaris*, with a lack growth in the mature phase. This may be due to grazing by sheep. The intensity of this impact was assessed as medium overall and its influence as negative. The trend was assessed as improving due to reduction of stock under the CFP, although the magnitude of this trend is likely to be slight.

Non-intensive horse grazing (A04.02.03)

- 3.34 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that the main land use within the site is sheep and horse grazing, with some donkeys also present. To prevent nuisance, annoyance, injury to persons or damage to property, Louth County Council enacted the “Louth County Council (Control of Horses) Bye-Laws 2003”, outlining the regulations for keeping licensed horses in the “Declared Control Area” of the upland commonage area of the Cooley Peninsula, including Carlingford Mountain cSAC.

Table 14: Monitoring criteria and failure rates for 4030 Dry heath ($n = 10$).

Criteria	Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition				
1 Number of bryophyte or non-crustose lichen species present, excluding <i>Campylopus</i> spp. and <i>Polytrichum</i> spp. ≥ 3	Relevé	10	2	20.0
2 Number of positive indicator species present ≥ 2	Relevé	10	0	0
3a* DH5 (Calcareous heath): cover of positive indicator species 50-75%	Relevé	0	n/a	n/a
3b* Siliceous heath: cover of positive indicator species $\geq 50\%$		10	1	10.0
4 Proportion of dwarf shrub cover composed of <i>Myrica gale</i> , <i>Salix repens</i> , <i>Ulex gallii</i> collectively $< 50\%$	Relevé	10	2	20.0
5 Cover of the following weedy negative indicator species: <i>Cirsium arvense</i> , <i>C. vulgare</i> , <i>Ranunculus repens</i> , large <i>Rumex</i> species (except <i>R. acetosa</i>), <i>Senecio jacobaea</i> , <i>Urtica dioica</i> collectively $< 1\%$	Relevé	10	0	0
6 Cover of non-native species $< 1\%$	Relevé	10	0	0
7 Cover of non-native species $< 1\%$	Local vicinity	10	0	0
8 Cover of scattered native trees and scrub $< 20\%$	Local vicinity	10	0	0
9 Cover of <i>Pteridium aquilinum</i> $< 10\%$	Local vicinity	10	0	0
10 Cover of <i>Juncus effusus</i> $< 10\%$	Local vicinity	10	0	0
Vegetation structure				
11 Senescent proportion of <i>Calluna vulgaris</i> cover $< 50\%$	Relevé	10	0	0
12 Last complete growing season's shoots of ericoids and <i>Empetrum nigrum</i> showing signs of <u>browsing</u> collectively $< 33\%$	Relevé	10	4	40.0
13 No signs of <u>burning</u> inside boundaries of sensitive areas*	Local vicinity	10	0	0
14 Outside boundaries of sensitive areas, all growth phases of <i>Calluna vulgaris</i> should occur throughout, with $\geq 10\%$ of cover in mature phase	Local vicinity	9	2	22.2
Physical structure				
15 Cover of <u>disturbed</u> bare ground $< 10\%$	Relevé	10	0	0
16 Cover of <u>disturbed</u> bare ground $< 10\%$	Local vicinity	10	0	0

*Sensitive areas

(a) Areas where soils are thin and less than 5 cm deep.

(b) Hill slopes greater than 1 in 2 (26°), and all the sides of gullies.(c) Ground with abundant, and/or an almost continuous carpet of *Sphagnum*, liverworts and/or lichens.(d) Areas of H21 and H22 heath as defined by the NVC (Rodwell 1991). These are heaths primarily composed of mixtures of *Calluna vulgaris* and *Vaccinium myrtillus* over a moist carpet of bryophytes that often has a high *Sphagnum* content. Within the provisional classification, these communities are comparable to DH4 and damper elements of DH6 respectively.(e) Areas with noticeably uneven structure, at a spatial scale of around 1 m² or less. The unevenness (e.g. more commonly found in very old heather stands) will relate to distinct, often large, spreading dwarf-shrub bushes. The dwarf-shrub canopy will not be completely continuous, and some of its upper surface may be twice as high as other parts. Layering is likely to be present and may be common.

(f) Pools, wet hollows, hags and erosion gullies, and within 5 – 10 m of the edge of watercourses.

- 3.35 During the present survey, horses were observed grazing within **4030 Dry heath** (Plate 2). As 40.0% of **4030 Dry heath** monitoring stops failed the assessment of structure and functions due to excessive grazing, the intensity of this impact has been assessed as medium and its influence as negative.



Plate 2: Horses grazing on Carlingford Mountain (Photo: BEC Consultants).

Non-intensive goat grazing (A04.02.04)

- 3.36 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that, in 2001, the area was the focus of the Foot and Mouth eradication programme, which resulted in the disposal of all wild goats on the site. As overall grazing levels were reported as low, the intensity of goat grazing was assessed as low and its influence as neutral. The trend was assessed as improving due to the reduction in overall grazing levels.

Paths, tracks, cycle tracks (D01.01)

- 3.37 Analysis of aerial photographs during the assessment of area showed that, during the period 1995-2005, approximately 1.3 ha of **4030 Dry heath** was lost to the development of tracks. The intensity of this impact has been assessed as high and its influence as negative.

Car parks and parking areas (D01.03)

3.38 Analysis of aerial photographs during the assessment of area showed that, during the period 2005-2012, approximately 0.03 ha of **4030 Dry heath** was lost to the development of a car parking area at the Windy Gap. The intensity of this impact has been assessed as high and its influence as negative.

Walking, horseriding and non-motorized vehicles (G01.02)

3.39 The Carlingford Mountain cSAC is a popular area for recreation. The main recreational activity within the site is hillwalking. A waymarked route, The Táin Way, crosses the site at two locations. There are several other walking tracks within the site, particularly in **4030 Dry heath** along the ridgelines. Mountain bike tracks are also present within the site. Trial bike riding has occurred but events are restricted to areas of the site where little or no damage will occur and are only allowed under permit from NPWS. In some areas of the site, particularly around Carnavaddy, soil erosion, widening of informal tracks and creation of new tracks is occurring (NPWS, 2009).

3.40 During the present survey, relatively high numbers of walkers were observed within the site and path erosion was noted to be ongoing (Plate 1). The intensity of this impact has been assessed as high and its influence as negative.

Table 15: Assessment of impacts for 4030 Dry heath. Under trend, Imp = Improving, Ins = Insufficient data.

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Medium	Negative	80%	Inside	-2.5	Imp
A04.02.03	Non-intensive horse grazing	Medium	Negative	75%	Inside	-2.0	Ins
A04.02.04	Non-intensive goat grazing	Low	Neutral	Ins	Inside	0	Imp
D01.01	Paths, tracks, cycling tracks	High	Negative	0.1%	Inside	-0.75	Ins
D01.03	Car parks and parking areas	High	Negative	0.003%	Inside	-0.75	Ins
G01.02	Walking, horseriding and non-motorized vehicles	High	Negative	1%	Inside	-1.5	Ins
G01.03.02	Off-road motorised driving	High	Negative	1%	Inside	-1.5	Imp
I01	Invasive non-native species	Low	Negative	4%	Inside	-0.5	Ins
J01.01	Burning down	High	Negative	13%	Inside	-1.5	Ins
K02.01	Species composition change (succession)	High	Positive	0.1%	Inside	+0.75	Ins
Overall score						-10.25	

Off-road motorised driving (G01.03.02)

3.41 The Carlingford Mountain cSAC was previously used by off-road vehicles, such as quad bikes, but the frequency of this activity has decreased since the introduction of the draft "Louth County Council Regulations and Control of Off Road Vehicles Bye-Laws 2003". Motorbike trials have occurred but events are only allowed under permit from NPWS. Although motorbike scrambling is not permitted within the site, there are tracks in **4030 Dry heath** along the ridgelines that may be caused by scramblers. In some areas of the cSAC, particularly

around Carnavaddy, soil erosion, widening of informal tracks and creation of new tracks is occurring (NPWS, 2009).

- 3.42 During the present survey, use of the site for off-road motorised driving was noted to be ongoing. The intensity of this impact was assessed as high and its influence as negative. The trend was assessed as improving due to the introduction of bye-laws controlling this activity.

Invasive non-native species (I01)

- 3.43 *Campylopus introflexus* is a non-native pioneer moss species of bare peat which can become abundant after disturbance such as peat cutting, burning or drainage (Atherton *et al.*, 2010). Carpets of the moss have been found to have a significant depressive effect on germination of *Calluna vulgaris* seeds and therefore this species can impact on re-establishment of heather (Equiha & Usher, 1993; Bernth, 1998). Klinck (2010) defined it as a mild or temporary invasive species as it does not have long-term effects on biodiversity.
- 3.44 *Campylopus introflexus* was not recorded within the **4030 Dry heath** monitoring stops. However, the degraded peat vegetation community DP1 *Campylopus introflexus* – *Polytrichum* spp. was recorded within 18 polygons dominated by **4030 Dry heath** during vegetation mapping, with cover scores of up to 20%.
- 3.45 *Picea* and *Pinus* spp. were also found to be naturalising on areas of **4030 Dry heath** adjacent to **WD4 Conifer plantations**. The intensity of this impact was assessed as low overall and its influence as negative.

Burning down (I01.01)

- 3.46 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that there have been several large fires within the site in recent years, where large tracts of heath and *Ulex* scrub were burned. The areas affected included Carnavaddy, Anglesey Mountain and Black Mountain. Uncontrolled burning may result in the loss of vegetation and subsequent soil erosion.
- 3.47 During the present survey, burning was observed to be ongoing within **4030 Dry heath**. Furthermore, analysis of recent satellite imagery showed that approximately 13% of the area of **4030 Dry heath** within the site had recently been burned. Very extensive burning was visible in the Eagle's Rock and the Split Rock areas of Carlingford Mountain on images recorded between July 2011 and May 2012. Such extensive, uncontrolled burning is not an appropriate form of management for this habitat. The intensity of this impact has been assessed as high and its influence as negative.

Species composition change (succession) (K02.01)

- 3.48 Analysis of aerial photographs during the assessment of area showed that, during the period 2000-2005, approximately 0.9 ha of **4030 Dry heath** was gained due to succession. This occurred where an area that had previously been cleared to construct a forestry track recovered. The intensity of this impact has been assessed as high and its influence as positive.

- 3.49 The overall impacts score for **4030 Dry heath** has been calculated as -10.25. This is well below the nominal Favourable Reference Value of zero. Improvements due to reductions in off-road motorised driving and grazing are not thought to be sufficient to bring about a significant change in the conservation status of the habitat overall within the next twelve years due to continued significant negative impacts such as grazing by sheep and horses, burning and high levels of recreational pressure. The combined future trend for area and structure and functions was therefore assessed as no change. The future prospects for this habitat were therefore assessed as Unfavourable – Bad.

4060 Alpine and Boreal heath

Area

- 3.50 Changes in the area of **4060 Alpine and Boreal heath** were recorded for the period 1995 to 2012 through a combination of observations in the field and analysis of aerial photographs and satellite imagery available through Google Earth. These data are restricted to obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. No changes in area of habitat were noted; therefore the area status was assessed as Favourable.

Structure and functions

- 3.51 Two monitoring stops were recorded in **4060 Alpine and Boreal heath** within Carlingford Mountain cSAC (Table 16). In the assessment of structure and functions, both monitoring stops failed two criteria each. Following a review of the ecological condition of these stops, expert judgement determined that no changes should be made, resulting in an overall failure rate of 100.0%. The structure and functions of **4060 Alpine and Boreal heath** were therefore assessed as Unfavourable – Bad.
- 3.52 The vegetation composition of **4060 Alpine and Boreal heath** was poor in 50.0% of cases, with one monitoring stop failing due to excessive cover of the negative indicator species *Agrostis capillaris*. The vegetation structure of **4060 Alpine and Boreal heath** was poor throughout, with both monitoring stops failing due to excessive browsing. The physical structure of **4060 Alpine and Boreal heath** was poor in 50.0% of cases, with one monitoring stop failing due to burning within the habitat.

Future prospects

- 3.53 Five impacts were recorded within **4060 Alpine and Boreal heath** (Table 17).

Non-intensive sheep grazing (A04.02.02)

- 3.54 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that grazing was the main land use throughout the site and that grazing levels appeared to be low. Approximately 95% of the site is held as commonage and the impacts of grazing on these parts of the site were assessed by the CFP in Commonage Plan LH1. The plan recommended

destocking levels between 0 and 6.9%, depending on the area concerned. In 2001, the area was the focus of the Foot and Mouth eradication programme, which resulted in the disposal of all sheep on the site. The Conservation Statement noted some localised overgrazing, poaching and soil exposure, particularly on the upper slopes of Carnavaddy Mountain but described the majority of the site as undamaged.

Table 16: Monitoring criteria and failure rates for 4060 Alpine and Boreal heath ($n = 2$).

Criteria	Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition				
1 Number of bryophyte or non-crustose lichen species present ≥ 3	Relevé	2	0	0
2 Cover of positive indicator species $\geq 66\%$	Relevé	2	0	0
3 Cover of dwarf shrubs $\geq 10\%$	Relevé	2	0	0
4 Cover of the following negative indicator species: <i>Agrostis capillaris</i> , <i>A. vinealis</i> , <i>Anthoxanthum odoratum</i> , <i>Deschampsia flexuosa</i> , <i>Festuca ovina</i> , <i>F. vivipara</i> , <i>Galium saxatile</i> , <i>Potentilla erecta</i> and <i>Poa</i> spp. (except <i>Poa alpina</i>) collectively $< 10\%$	Relevé	2	1	50.0
5 Cover of non-native species $< 1\%$	Relevé	2	0	0
Vegetation structure				
6 Live leaves of <i>Carex bigelowii</i> , <i>Deschampsia flexuosa</i> , <i>Festuca ovina</i> , <i>F. vivipara</i> showing signs of <u>grazing</u> collectively $< 10\%$	Relevé	1	0	0
7 Last complete growing season's shoots of ericoids and <i>Empetrum nigrum</i> showing signs of <u>browsing</u> collectively $< 33\%$	Relevé	2	2	100.0
8 No signs of <u>burning</u> inside feature	Local vicinity	2	1	50.0
Physical structure				
9 Cover of <u>disturbed</u> bare ground $< 10\%$	Relevé	2	0	0
10 Cover of <u>disturbed</u> bare ground $< 10\%$	Local vicinity	2	0	0

3.55 The level of grazing within **4060 Alpine and Boreal heath** in the Carlingford Mountain cSAC was high, with the proportion of dwarf shrub shoots showing signs of grazing ranging from 40-50%. In contrast with the low grazing levels reported by the Carlingford Mountain cSAC Conservation Statement (NPWS, 2009), 100% of **4060 Alpine and Boreal heath** monitoring stops failed the assessment of structure and functions due to excessive grazing and 50% failed due to excessive browsing. This is likely to be due to grazing by sheep. The intensity of this impact was assessed as high and its influence as negative. The trend was assessed as improving due to reduction of stock under the CFP, although the magnitude of this trend is likely to be slight.

Non-intensive goat grazing (A04.02.04)

3.56 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that, in 2001, the area was the focus of the Foot and Mouth eradication programme, which resulted in the disposal of all wild goats on the site. As overall grazing levels were reported as low, the

intensity of goat grazing was assessed as low and its influence as neutral. The trend was assessed as improving due to the reduction in overall grazing levels.

Table 17: Assessment of impacts for 4060 Alpine and Boreal heath. Under trend, Imp = Improving, Ins = Insufficient data.

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	High	Negative	100%	Inside	-4.5	Imp
A04.02.04	Non-intensive goat grazing	Low	Neutral	Ins	Inside	0	Imp
G01.02	Walking, horseriding and non-motorized vehicles	High	Negative	5%	Inside	-1.5	Ins
G01.03.02	Off-road motorised driving	High	Negative	<1%	Inside	-0.75	Imp
J01.01	Burning down	High	Negative	53%	Inside	-3.0	Ins
Overall score						-9.75	

Walking, horseriding and non-motorized vehicles (G01.02)

3.57 The Carlingford Mountain cSAC is a popular area for recreation. The main recreational activity within the site is hillwalking. There are several hillwalking tracks within the site, particularly along the ridgelines, where **4060 Alpine and Boreal heath** tend to occur. Mountain bike tracks are also present within the site. Trial bike riding has occurred but events are restricted to areas of the site where little or no damage will occur and are only allowed under permit from NPWS. In some areas of the site, particularly around Carnavaddy, soil erosion, widening of informal tracks and creation of new tracks is occurring (NPWS, 2009).

3.58 During the present survey, relatively high numbers of walkers were observed within the site and path erosion was noted to be ongoing (Plate 2). The intensity of this impact has been assessed as high and its influence as negative. The area of **4060 Alpine and Boreal heath** affected was estimated to be 5%.

Off-road motorised driving (G01.03.02)

3.59 The Carlingford Mountain cSAC was previously used by off-road vehicles, such as quad bikes, but the frequency of this activity has decreased since the introduction of the draft "Louth County Council Regulations and Control of Off Road Vehicles Bye-Laws 2003". Motorbike trials have occurred but events are only allowed under permit from NPWS. Although motorbike scrambling is not permitted within the site, there are tracks along the ridgelines, where **4060 Alpine and Boreal heath** tend to occur, that may be caused by scramblers. In some areas of the cSAC, particularly around Carnavaddy, soil erosion, widening of informal tracks and creation of new tracks is occurring (NPWS, 2009).

3.60 During the present survey, use of the site for off-road motorised driving was noted to be ongoing. The intensity of this impact was assessed as high and its influence as negative. The area of the habitat affected has been estimated to be less than 1%, due to the localised nature of this impact. The trend was assessed as improving due to the introduction of bye-laws controlling this activity.

Burning down (I01.01)

- 3.61 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that there have been several large fires within the site in recent years, where large tracts of heath were burned. The areas affected included Carnavadly, Anglesey Mountain and Black Mountain. Uncontrolled burning may result in the loss of vegetation and subsequent soil erosion.
- 3.62 During the present survey, burning was observed to be ongoing within **4060 Alpine and Boreal heath**. Furthermore, analysis of recent satellite imagery showed that approximately 53% of the area of **4060 Alpine and Boreal heath** within the site had recently been burned. Very extensive burning was visible in the Eagle's Rock and the Split Rock areas of Carlingford Mountain on images recorded between July 2011 and May 2012. Burning causes severe damage to the structure and functions of **4060 Alpine and Boreal heath** and is not an appropriate form of management for this habitat. The intensity of this impact has been assessed as high and its influence as negative.
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- 3.63 The overall impacts score for **4060 Alpine and Boreal heath** has been calculated as -9.75. This is well below the nominal Favourable Reference Value of zero. Improvements due to reductions in off-road motorised driving and grazing are not thought to be sufficient to bring about a significant change in the conservation status of the habitat overall within the next twelve years due to continued significant negative impacts such as grazing by sheep, extensive burning and high levels of recreational pressure. The combined future trend for area and structure and functions was therefore assessed as no change. The future prospects for this habitat were therefore assessed as Unfavourable – Bad.

***6230 Species-rich *Nardus* grassland**

Area

- 3.64 Changes in the area of ***6230 Species-rich *Nardus* grassland** were recorded for the period 1995 to 2012 through a combination of observations in the field and analysis of aerial photographs and satellite imagery available through Google Earth. These data are restricted to obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. No changes in area of habitat were noted; therefore the area status was assessed as Favourable.

Structure and functions

- 3.65 One monitoring stop was recorded in ***6230 Species-rich *Nardus* grassland** within Carlingford Mountain cSAC (Table 18). In the assessment of structure and functions, the monitoring stop failed five criteria. Following a review of the ecological condition of this stop, expert judgement determined that no changes should be made, resulting in an overall failure rate of 100.0%. The structure and functions of ***6230 Species-rich *Nardus* grassland** were therefore assessed as Unfavourable – Bad.

- 3.66 The vegetation composition of ***6230 Species-rich *Nardus* grassland** was poor. The monitoring stop failed due to inadequate species richness and the absence of high quality indicator species. The vegetation structure of ***6230 Species-rich *Nardus* grassland** was also poor. The monitoring stop failed due to an excessively low forb:graminoid ratio and an excessively low sward height. The physical structure of ***6230 Species-rich *Nardus* grassland** was also poor in 50.0% of cases, with an excessive area of the habitat showing signs of serious grazing or disturbance.
- 3.67 The small sample size of one monitoring stop reflects the relative rarity of this habitat within Carlingford Mountain cSAC, where only 13.3 ha of ***6230 Species-rich *Nardus* grasslands** were recorded, comprising 0.4% of the site.

Table 18: Monitoring criteria and failure rates for *6230 Species-rich *Nardus* grassland (n = 1).

Criteria	Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition				
1 Number of high quality and general indicator species ≥ 7	Relevé	1	0	0
2a UG1c/UG2c: Number of high quality species present ≥ 2	Relevé	1	1	100.0
2b UG1e/UG2e: Number of high quality species present ≥ 1	Relevé	0	n/a	n/a
3 Species richness ≥ 25 species	Relevé	1	1	100.0
4 Cover of non-native species $\leq 1\%$	Relevé	1	0	0
5 Cover of the following negative indicator species: <i>Arrhenatherum elatius</i> , <i>Bellis perennis</i> , <i>Cirsium arvense</i> , <i>Cirsium vulgare</i> , <i>Dactylis glomerata</i> , <i>Eriophorum angustifolium</i> , <i>Eriophorum vaginatum</i> , <i>Holcus lanatus</i> , <i>Juncus effusus</i> , <i>Lolium perenne</i> , <i>Narthecium ossifragum</i> , <i>Ranunculus repens</i> , <i>Rumex crispus</i> , <i>Rumex obtusifolius</i> , <i>Senecio jacobaea</i> , <i>Trifolium repens</i> , <i>Urtica dioica</i> , individually $\leq 10\%$	Relevé	1	0	0
6 Cover of the above negative indicator species collectively $\leq 20\%$	Relevé	1	0	0
7 Cover of <i>Sphagnum</i> species $\leq 10\%$,	Relevé	1	0	0
8 Cover of <i>Polytrichum</i> species $\leq 25\%$		1	0	0
9 Cover of scrub, bracken and heath $\leq 5\%$	Relevé	1	0	0
Vegetation structure				
10 Forb component of forb : graminoid ratio 20-90%	Relevé	1	1	100.0
11 Proportion of the sward between 5-50 cm tall $\geq 25\%$	Relevé	1	1	100.0
12 Litter cover $\leq 20\%$	Relevé	1	0	0
Physical structure				
13 Cover of <u>disturbed</u> bare ground $\leq 10\%$	Relevé	1	0	0
14 Area of the habitat showing signs of serious <u>grazing</u> or <u>disturbance</u> $<20m^2$	Local vicinity	1	1	100.0

Future prospects

- 3.68 Four impacts were recorded within ***6230 Species-rich *Nardus* grasslands** (Table 19).

Non-intensive sheep grazing (A04.02.02)

- 3.69 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that grazing was the main land use throughout the site and that grazing levels appeared to be low.

Approximately 95% of the site is held as commonage and the impacts of grazing on these parts of the site were assessed by the CFP in Commonage Plan LH1. The plan recommended destocking levels between 0 and 6.9%, depending on the area concerned. In 2001, the area was the focus of the Foot and Mouth eradication programme, which resulted in the disposal of all sheep on the site. The Conservation Statement noted some localised overgrazing, poaching and soil exposure, particularly on the upper slopes of Carnavaddy Mountain but described the majority of the site as undamaged.

- 3.70 In contrast with the low grazing levels reported by the Carlingford Mountain cSAC Conservation Statement (NPWS, 2009), the assessment of structure and functions found that the level of grazing within ***6230 Species-rich *Nardus* grasslands** was high. The ***6230 Species-rich *Nardus* grasslands** monitoring stop failed due to an excessive area of the habitat showing signs of serious grazing or disturbance and also due to an excessively low sward height. This is likely to be due, at least in part, to grazing by sheep. The intensity of this impact was assessed as high and its influence as negative. The trend was assessed as improving due to reduction of stock under the CFP, although the magnitude of this trend is likely to be slight.

Table 19: Assessment of future prospects for *6230 Species-rich *Nardus* grasslands. Under trend, Imp = Improving, Ins = Insufficient data.

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	High	Negative	100%	Inside	-4.5	Imp
A04.02.03	Non-intensive horse grazing	High	Negative	100%	Inside	-4.5	Ins
A04.02.04	Non-intensive goat grazing	Low	Neutral	100%	Inside	0	Imp
G01.02	Walking, horseriding and non-motorised vehicles	Low	Neutral	<1%	Inside	0	Ins
Overall score						-9.0	

Non-intensive horse grazing (A04.02.03)

- 3.71 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that the main land use within the site is sheep and horse grazing, with some donkeys also present. To prevent nuisance, annoyance, injury to persons or damage to property, Louth County Council enacted the “Louth County Council (Control of Horses) Bye-Laws 2003”, outlining the regulations for keeping licensed horses in the “Declared Control Area” of the upland commonage area of the Cooley Peninsula, including Carlingford Mountain cSAC.
- 3.72 During the present survey, horses were observed grazing within ***6230 Species-rich *Nardus* grasslands**. As the ***6230 Species-rich *Nardus* grasslands** monitoring stop failed the assessment of structure and functions due to excessive grazing, the intensity of this impact has been assessed as high and its influence as negative.

Non-intensive goat grazing (A04.02.04)

- 3.73 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that, in 2001, the area was the focus of the Foot and Mouth eradication programme, which resulted in the disposal of all wild goats on the site. As overall grazing levels were reported as low, the

intensity of goat grazing was assessed as low and its influence as neutral. The trend was assessed as improving due to the reduction in overall grazing levels.

Walking, horseriding and non-motorized vehicles (G01.02)

- 3.74 The Carlingford Mountain cSAC is a popular area for recreation. The main recreational activity within the site is hillwalking. A waymarked route, The Táin Way, crosses the site at two locations. There are several other tracks within the site. Mountain bike tracks are also present within the site. Trial bike riding has occurred but events are restricted to areas of the site where little or no damage will occur and are only allowed under permit from NPWS. In some areas of the site, particularly around Carnavaddy, soil erosion, widening of informal tracks and creation of new tracks is occurring (NPWS, 2009).
- 3.75 During the present survey, although relatively high numbers of walkers were observed within the site, no significant resultant damage was noted within ***6230 Species-rich *Nardus* grasslands**. The intensity of this impact has been assessed as low and its influence as neutral. The area of the habitat affected has been estimated to be less than 1%, due to the localised nature of this impact.

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- 3.76 The overall impacts score for ***6230 Species-rich *Nardus* grasslands** was calculated as -9.0, which is well below the nominal Favourable Reference Value of zero. Improvements due to reductions in grazing are not thought to be sufficient to bring about a significant change in the conservation status of the habitat overall within the next twelve years due to continued significant negative impacts such as grazing by sheep and horses. The combined future trend for area and structure and functions was therefore assessed as no change. The future prospects for this habitat were therefore assessed as Unfavourable – Bad.

***7130/7130 Blanket bog**

Area

- 3.77 Changes in the area of ***7130/7130 Blanket bog** were recorded for the period 1995 to 2012 through a combination of observations in the field and analysis of aerial photographs and satellite imagery available through Google Earth. These data are restricted to obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. No changes in area of habitat were noted; therefore the area status was assessed as Favourable.

Structure and functions

- 3.78 Four monitoring stops were recorded in ***7130/7130 Blanket bog** within Carlingford Mountain cSAC (Table 20). The monitoring stops were located within ***7130 Active blanket bog**. In the assessment of structure and functions, three monitoring stops failed one criterion or more. Following a review of the ecological condition of these stops, expert judgement determined that one should pass because the failure was marginal, resulting in an overall failure rate of

50.0%. The structure and functions of ***7130 Active blanket bog** were therefore assessed as Unfavourable – Bad. Vegetation mapping indicated that the proportion of inactive, cutover and eroding bog within the total area of bog was 5.6% (Tables 2 and 3). These findings provide further support for the Unfavourable – Bad assessment result.

- 3.79 The vegetation composition of ***7130/7130 Blanket bog** was poor in most cases, with 50.0% of monitoring stops failing due to an inadequate number of positive indicator species and a further 25.0% failing due to excessive cover of the non-native moss species *Campylopus introflexus*. The vegetation structure of ***7130/7130 Blanket bog** was poor in 25.0% of cases, with one monitoring stop failing due to excessive grazing. The physical structure of ***7130/7130 Blanket bog** was good, with no failures being recorded under the relevant criteria.
- 3.80 Fahy (1972) stated that bog had developed in places in wet habitats within the site. The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that small areas of **PB2 Upland blanket bog** occurred on the flatter areas of the ridges but, given the eastern location of the site, the relatively low level of rainfall was not particularly conducive to active peat formation. This suggests that the examples of ***7130/7130 Blanket bog** are found within the site are marginal.

Future prospects

- 3.81 Nine impacts were recorded within ***7130/7130 Blanket bog** (Table 21).

Non-intensive sheep grazing (A04.02.02)

- 3.82 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that grazing was the main land use throughout the site and that grazing levels appeared to be low. Approximately 95% of the site is held as commonage and the impacts of grazing on these parts of the site were assessed by the CFP in Commonage Plan LH1. The plan recommended destocking levels between 0 and 6.9%, depending on the area concerned. In 2001, the area was the focus of the Foot and Mouth eradication programme, which resulted in the disposal of all sheep on the site. The Conservation Statement noted some localised overgrazing, poaching and soil exposure, particularly on the upper slopes of Carnavaddy Mountain but described the majority of the site as undamaged.
- 3.83 The level of grazing within ***7130/7130 Blanket bog** in the Carlingford Mountain cSAC varied, with the proportion of dwarf shrub shoots showing signs of grazing ranging from 0-50%. In contrast with the low grazing levels reported by the Carlingford Mountain cSAC Conservation Statement (NPWS, 2009), 25.0% of ***7130/7130 Blanket bog** monitoring stops failed the assessment of structure and functions due to excessive grazing. This may be due to grazing by sheep. The intensity of this impact was assessed as medium overall and its influence as negative. The trend was assessed as improving due to reduction of stock under the CFP, although the magnitude of this trend is likely to be slight.

Non-intensive horse grazing (A04.02.03)

- 3.84 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that the main land use within the site is sheep and horse grazing, with some donkeys also present. To

prevent nuisance, annoyance, injury to persons or damage to property, Louth County Council enacted the “Louth County Council (Control of Horses) Bye-Laws 2003”, outlining the regulations for keeping licensed horses in the “Declared Control Area” of the upland commonage area of the Cooley Peninsula, including Carlingford Mountain cSAC.

Table 20: Monitoring criteria and failure rates for *7130/7130 Blanket bog ($n = 4$).

Criteria	Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition				
1 Number of positive indicator species present ≥ 7	Relevé	4	2	50.0
2 Cover of bryophyte or lichen species, excluding <i>Sphagnum fallax</i> $\geq 10\%$	Relevé	4	0	0
3 Cover of <u>each</u> of the following species: <i>Calluna vulgaris</i> , <i>Eleocharis multicaulis</i> , <i>Eriophorum vaginatum</i> , <i>Molinia caerulea</i> , <i>Schoenus nigricans</i> , <i>Trichophorum germanicum</i> individually $< 75\%$	Relevé	4	0	0
4 Cover of the following negative indicator species: <i>Agrostis capillaris</i> , <i>Holcus lanatus</i> , <i>Phragmites australis</i> , <i>Pteridium aquilinum</i> , <i>Ranunculus repens</i> collectively $< 1\%$	Relevé	4	0	0
5 Cover of non-native species $< 1\%$	Relevé	4	1	25.0
6 Cover of non-native species $< 1\%$	Local vicinity	4	0	0
7 Cover of scattered native trees and scrub $< 10\%$	Local vicinity	4	0	0
Vegetation structure				
8 Crushed, broken and/or pulled up <i>Sphagnum</i> species $< 10\%$ of <i>Sphagnum</i> cover	Relevé	4	0	0
9 Last complete growing season's shoots of ericoids, <i>Empetrum nigrum</i> and <i>Myrica gale</i> showing signs of <u>browsing</u> collectively $< 33\%$	Relevé	4	1	25.0
10 No signs of <u>burning</u> into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Local vicinity	4	0	0
11 No signs of <u>burning</u> inside boundaries of sensitive areas*	Local vicinity	4	0	0
Physical structure				
12 Cover of <u>disturbed</u> bare ground $< 10\%$	Relevé	4	0	0
13 Cover of <u>disturbed</u> bare ground $< 10\%$	Local vicinity	4	0	0
14 Area showing signs of <u>drainage</u> resulting from heavy trampling or tracking or ditches or peat cutting $< 10\%$	Local vicinity	4	0	0
15 Cover of <u>erosion</u> gullies and eroded areas within the greater bog mosaic $< 5\%$	Local vicinity	4	0	0

*Sensitive areas

(a) Slopes greater than 1 in 3 (18°), and all the sides of gullies.

(b) Ground with abundant and/or an almost continuous carpet of *Sphagnum*, other mosses, liverworts and/or lichens.

(c) Patterned areas i.e. with pools, wet hollows, hags and erosion gullies.

(d) Areas within 5-10 m of watercourses.

(e) Areas above 400 m in altitude.

(f) Areas within 50 m of functioning drains.

- 3.85 During the present survey, horses were observed grazing within ***7130/7130 Blanket bog**. As 25.0% of ***7130/7130 Blanket bog** monitoring stops failed the assessment of structure and functions due to excessive grazing, the intensity of this impact has been assessed as medium and its influence as negative.

Table 21: Assessment of future prospects for *7130/7130 Blanket bog. Under trend, Imp = Improving, Ins = Insufficient data

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Medium	Negative	100%	Inside	-3.0	Imp
A04.02.03	Non-intensive horse grazing	Medium	Negative	50%	Inside	-1.5	Ins
A04.02.04	Non-intensive goat grazing	Low	Neutral	100%	Inside	0	Imp
C01.03.01	Hand cutting of peat	High	Negative	<1%	Inside	-0.75	Ins
G01.02	Walking, horse riding and non-motorised vehicles	High	Negative	<1%	Inside	-0.75	Ins
G01.03.02	Off-road motorised driving	High	Negative	<1%	Inside	-0.75	Imp
I01	Invasive non-native species	Low	Neutral	0.25%	Inside	0	Ins
J01.01	Burning down	High	Negative	12%	Inside	-1.5	Ins
K01.01	Erosion	Medium	Negative	8.1	Inside	-1.0	Ins
Overall score						-9.75	

Non-intensive goat grazing (A04.02.04)

- 3.86 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that, in 2001, the area was the focus of the Foot and Mouth eradication programme, which resulted in the disposal of all wild goats on the site. As overall grazing levels were reported as low, the intensity of goat grazing was assessed as low and its influence as neutral. The trend was assessed as improving due to the reduction in overall grazing levels.

Hand cutting of peat (C01.03.01)

- 3.87 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that peat cutting occurred in the past on parts of Anglesey Mountain and Windy Gap but the cutover areas had revegetated (NPWS, 2009). During the present survey, ongoing turf cutting by hand was observed within ***7130/7130 Blanket bog** on Carlingford Mountain (Plate 3). The intensity of this impact was assessed as high and its influence as negative. The area of the habitat affected has been estimated to be less than 1%, due to the localised nature of this impact.

Walking, horseriding and non-motorized vehicles (G01.02)

- 3.88 The Carlingford Mountain cSAC is a popular area for recreation. The main recreational activity within the site is hillwalking. A waymarked route, The Táin Way, crosses the site at two locations. There are several other tracks within the site, particularly along the ridgelines. Mountain bike tracks are also present within the site. Trial bike riding has occurred but events are restricted to areas of the site where little or no damage will occur and are only allowed under permit from NPWS. In some areas of the site, particularly around Carnavaddy, soil erosion, widening of informal tracks and creation of new tracks is occurring (NPWS, 2009).



Plate 3: Area of active hand-cutting of peat on the top of Carlingford Mountain (Photo: BEC Consultants).

- 3.89 During the present survey relatively high numbers of walkers were observed within the site. The intensity of this impact within ***7130/7130 Blanket bog** has been assessed as high and its influence as negative. The area of the habitat affected has been estimated to be less than 1%, due to the localised nature of this impact.

Off-road motorised driving (G01.03.02)

- 3.90 The Carlingford Mountain cSAC was previously used by off-road vehicles, such as quad bikes, but the frequency of this activity has decreased since the introduction of the draft “Louth County Council Regulations and Control of Off Road Vehicles Bye-Laws 2003”. Motorbike trials have occurred but events are only allowed under permit from NPWS. Although motorbike scrambling is not permitted within the site, there are tracks along the ridgelines that may have been caused by scramblers. In some areas of the cSAC, particularly around Carnavaddy, soil erosion, widening of informal tracks and creation of new tracks is occurring (NPWS, 2009).
- 3.91 During the present survey, use of the site for off-road motorised driving was noted to be ongoing. The intensity of this impact was assessed as high and its influence as negative. The area of the habitat affected has been estimated to be less than 1%, due to the localised nature of this impact. The trend was assessed as improving due to the introduction of bye-laws controlling this activity.

Invasive non-native species (I01)

- 3.92 *Campylopus introflexus* is a non-native pioneer moss species of bare peat which can become abundant after disturbance such as peat cutting, burning or drainage (Atherton *et al.*, 2010). Carpets of the moss have been found to have a significant depressive effect on germination of *Calluna vulgaris* seeds and therefore this species can impact on re-establishment of heather (Equiha & Usher, 1993; Bernth, 1998). Klinck (2010) defined it as a mild or temporary invasive species as it does not have long-term effects on biodiversity.
- 3.93 *Campylopus introflexus* was present within one ***7130/7130 Blanket bog** monitoring stop with a cover score of 1%, causing that monitoring stop to fail the assessment of structure and functions. The mean cover of *C. introflexus* within ***7130/7130 Blanket bog** monitoring stops was 0.25% (Table 21). The degraded peat vegetation community DP1 *Campylopus introflexus* – *Polytrichum* spp. was recorded within two polygons dominated by ***7130/7130 Blanket bog** during vegetation mapping but was not recorded as forming extensive carpets. This impact was therefore assessed as being of low intensity and neutral influence.

Burning down (J01.01)

- 3.94 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that there have been several large fires within the site in recent years. The areas affected included Carnavaddy, Anglesey Mountain and Black Mountain. Uncontrolled burning may result in the loss of vegetation and subsequent soil erosion.
- 3.95 Analysis of recent satellite imagery showed that approximately 12% of the area of ***7130/7130 Blanket bog** within the site had recently been burned. Very extensive burning was visible in the Eagle's Rock and the Split Rock areas of Carlingford Mountain on images recorded between July 2011 and May 2012. Burning causes severe damage to the structure and functions of ***7130/7130 Blanket bog** and is not an appropriate form of management for this habitat. The intensity of this impact has been assessed as high and its influence as negative.

K01.01 Erosion

- 3.96 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) suggested that uncontrolled burning of vegetation, off-road motorised driving, walking and cycling were contributing to erosion within the site. During vegetation mapping, exposed peat and peat erosion were observed within ***7130/7130 Blanket bog** around the summits. However, peat haggings and erosion gullies, which are indicative of very severe erosion, were not observed. Once exposed by removal of the vegetation, areas of bare peat may continue to erode due to climatic conditions regardless of manipulation of grazing levels; the mean annual rainfall for the high summits within the site was within the range of 1400-1600 mm per year for 1981-2010 (Met Éireann, 2013). Therefore unless restoration measures are undertaken in badly eroded areas, erosion is likely to continue. The intensity of this impact is assessed as medium and its influence as negative. It was assessed that there is insufficient data to determine the trend for this impact. The area of ***7130/7130 Blanket bog** estimated to be under threat from erosion is 8.1%; this is the proportion of the habitat occurring in polygons with at least 5% **PB5 Eroding blanket bog**.

- 3.97 The overall impacts score for ***7130/7130 Blanket bog** has been calculated as -9.75. This is well below the nominal Favourable Reference Value of zero. Improvements due to reductions in off-road motorised driving and grazing are not thought to be sufficient to bring about a significant change in the conservation status of the habitat overall within the next twelve years, due to continued significant negative impacts such as grazing by sheep and horses, burning and erosion. The combined future trend for area and structure and functions was therefore assessed as no change. The future prospects for this habitat were therefore assessed as Unfavourable – Bad.

7230 Alkaline fens

Area

- 3.98 Changes in the area of **7230 Alkaline fens** were recorded for the period 1995 to 2012 through a combination of observations in the field and analysis of aerial photographs and satellite imagery available through Google Earth. These data are restricted to obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. No changes in area of habitat were noted; therefore the area status was assessed as Favourable.

Structure and functions

- 3.99 One monitoring stop was recorded in **7230 Alkaline fens** within Carlingford Mountain cSAC (Table 22). The monitoring stop was recorded in the RFLU4 *Schoenus nigricans* - *Scorpidium scorpioides* flush community. In the assessment of structure and functions, the monitoring stop did not fail any criteria. The structure and functions of **7230 Alkaline fens** were therefore assessed as Favourable.
- 3.100 The monitoring stop passed Criterion 8, with more than 50% of the live leaves and flowering shoots being more than 5 cm above the ground surface. However it should be noted that, despite exceeding 5 cm in height, the tussocks of *Schoenus nigricans* within the monitoring stop were heavily grazed.
- 3.101 The small sample size of one monitoring stop reflects the relative rarity of this habitat within Carlingford Mountain cSAC, where 45.3 ha of **7230 Alkaline fens** were recorded, comprising only 1.5% of the site.

Future prospects

- 3.102 Two impacts were recorded within **7230 Alkaline fens** (Table 23).

Non-intensive sheep grazing (A04.02.02)

- 3.103 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that grazing was the main land use throughout the site and that grazing levels appeared to be low.

Approximately 95% of the site is held as commonage and the impacts of grazing on these parts of the site were assessed by the CFP in Commonage Plan LH1. The plan recommended destocking levels between 0 and 6.9%, depending on the area concerned. In 2001, the area was the focus of the Foot and Mouth eradication programme, which resulted in the disposal of all sheep on the site. The Conservation Statement noted some localised overgrazing, poaching and soil exposure but described the majority of the site as undamaged.

- 3.104 During the present survey, sheep were observed grazing within **7230 Alkaline fens**. The level of grazing within the monitoring stop was high overall. The intensity of this impact has been assessed as medium and its influence as negative. The trend was assessed as improving due to reduction of stock under the CFP, although the magnitude of this trend is likely to be slight.

Table 22: Monitoring criteria and failure rates for 7230 Alkaline fens ($n = 1$).

Criteria	Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition				
1 At least one brown moss species present	Relevé	1	0	0
2a RFLU1a/RFLU2: number of positive vascular indicator species present ≥ 2	Relevé	0	n/a	n/a
2b RFLU4/RFEN1a: number of positive vascular indicator species present ≥ 3		1	0	0
3a RFLU1a/RFLU2: vegetation cover of brown mosses and vascular indicator species $\geq 20\%$	Relevé	0	n/a	n/a
3b RFLU4/RFEN1a: vegetation cover of brown mosses and vascular indicator species $\geq 75\%$		1	0	0
4 Total cover of the following species: <i>Anthoxanthum odoratum</i> , <i>Epilobium hirsutum</i> , <i>Holcus lanatus</i> , <i>Ranunculus repens</i> $< 1\%$	Relevé	1	0	0
5 Cover of non-native species $< 1\%$	Relevé	1	0	0
6 Cover of scattered native trees and scrub $< 10\%$	Local vicinity		0	0
7 Total cover of <i>Juncus effusus</i> and <i>Phragmites australis</i> $< 10\%$	Local vicinity	1	0	0
Vegetation structure				
8 At least 50% of the live leaves/flowering shoots are more than 5 cm above ground surface	Relevé	1	0	0
Physical structure				
9 Cover of <u>disturbed</u> , bare ground $< 10\%$	Relevé	1	0	0
10 Cover of <u>disturbed</u> , bare ground $< 10\%$	Local vicinity	1	0	0
11 Area showing signs of <u>drainage</u> resulting from ditches or heavy trampling or tracking $< 10\%$	Local vicinity	1	0	0
12 Where tufa is present, <u>disturbed</u> proportion of vegetation cover $< 1\%$	Local vicinity	0	n/a	n/a

Non-intensive horse grazing (A04.02.03)

- 3.105 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that the main land use within the site is sheep and horse grazing, with some donkeys also present. To prevent nuisance, annoyance, injury to persons or damage to property, Louth County Council

enacted the “Louth County Council (Control of Horses) Bye-Laws 2003”, outlining the regulations for keeping licensed horses in the “Declared Control Area” of the upland commonage area of the Cooley Peninsula, including Carlingford Mountain cSAC.

- 3.106 During the present survey, horses were observed grazing within **7230 Alkaline fens**. Horse dung was present within the monitoring stop. The level of grazing within the monitoring stop was high overall. The intensity of this impact has been assessed as medium and its influence as negative.

Table 23: Assessment of future prospects for 7230 Alkaline fens. Under trend, Imp = Improving, Ins = Insufficient data.

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Medium	Negative	100%	Inside	-3.0	Imp
A04.02.03	Non-intensive horse grazing	Medium	Negative	100%	Inside	-3.0	Ins
Overall score						-6.0	

- 3.107 The overall impacts score for **7230 Alkaline fens** has been calculated as -6.0. This is below the nominal Favourable Reference Value of zero. Improvements due to minor reductions in sheep grazing are not thought to be sufficient to bring about a significant change in the conservation status of the habitat overall within the next twelve years. The combined future trend for area and structure and functions was therefore assessed as no change. The future prospects for this habitat were therefore assessed as Unfavourable – Bad.

8110 Siliceous scree

Area

- 3.108 Changes in the area of **8110 Siliceous scree** were recorded for the period 1995 to 2012 through a combination of observations in the field and analysis of aerial photographs and satellite imagery available through Google Earth. These data are restricted to obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. No changes in area of habitat were noted; therefore the area status was assessed as Favourable.

Structure and functions

- 3.109 One monitoring stop was recorded in **8110 Siliceous scree** within Carlingford Mountain cSAC (Table 24). In the assessment of structure and functions, this monitoring stop did not fail any criteria, resulting in an overall failure rate of 0%. The structure and functions of **8110 Siliceous scree** were therefore assessed as Favourable.

3.110 The small sample size of one monitoring stop reflects the relative rarity of this habitat within Carlingford Mountain cSAC, where 14.2 ha of **8110 Siliceous scree** were recorded, comprising only 0.5% of the site.

Table 24: Monitoring criteria and failure rates for 8110 Siliceous scree ($n = 1$).

Criteria	Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition				
1 Cover of bryophyte and non-crustose lichen species $\geq 5\%$	Relevé	1	0	0
2 Proportion of vegetation composed of following negative indicator species: <i>Cirsium arvense</i> , <i>C. vulgare</i> , <i>Rubus fruticosus</i> agg., large <i>Rumex</i> species (except <i>R. acetosa</i>), <i>Senecio jacobaea</i> , <i>Urtica dioica</i> collectively $< 1\%$	Relevé	1	0	0
3 Proportion of vegetation composed of non-native species $< 1\%$	Relevé	1	0	0
4 Block scree: number of positive indicator species for 8220 present ≥ 1	Local vicinity	1	0	0
5 Cover of grass species and dwarf shrubs collectively $< 20\%$	Local vicinity	1	0	0
6 Cover of <i>Pteridium aquilinum</i> , native trees and scrub collectively $< 25\%$	Local vicinity	1	0	0
Vegetation structure				
7 Live leaves of forbs and shoots of dwarf shrubs showing signs of <u>grazing</u> or <u>browsing</u> collectively $< 50\%$	Relevé	1	0	0
Physical structure				
8 Ground <u>disturbed</u> by human & animal paths, scree running, vehicles $< 10\%$	Relevé	1	0	0
9 Ground <u>disturbed</u> by human & animal paths, scree running, vehicles $< 10\%$	Local vicinity	1	0	0

Future prospects

3.111 No impacts (Threats, Pressures and Activities code X) were recorded within **8110 Siliceous scree**. Similarly, the Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that the **8110 Siliceous scree** within the site was relatively undisturbed, in its natural condition and of good conservation value.

3.112 The overall impacts score for **8110 Siliceous scree** has been calculated as zero, which equals the nominal Favourable Reference Value. The combined future trend for area and structure and functions is deemed to be no change. The future prospects for this habitat were therefore assessed as Favourable.

8220 Siliceous rocky slopes

Area

3.113 Changes in the area of **8220 Siliceous rocky slopes** were recorded for the period 1995 to 2012 through a combination of observations in the field and analysis of aerial photographs and satellite imagery available through Google Earth. These data are restricted to obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. No changes in area of habitat were noted; therefore the area status was assessed as Favourable.

Structure and functions

3.114 Four monitoring stops were recorded in **8220 Siliceous rocky slopes** within Carlingford Mountain cSAC (Table 25). In the assessment of structure and functions, two monitoring stops failed one criterion or more. Following a review of the ecological condition of these stops, expert judgement determined that no changes should be made, resulting in an overall failure rate of 50.0%. The structure and functions of **8220 Siliceous rocky slopes** were therefore assessed as Unfavourable - Bad. The **8220 Siliceous rocky slopes** within Carlingford Mountain cSAC were marginal examples of this habitat.

3.115 The vegetation composition of **8220 Siliceous rocky slopes** was poor in 50.0% of cases. Two monitoring stops failed due to excessive cover of the non-native moss *Campylopus introflexus*. One of these monitoring stop also failed due to an inadequate number of positive indicator species.

3.116 Assessment criteria were developed for this habitat after the field survey of this site had been completed and were retrospectively applied to floristic data recorded from relevés. The proportion of live leaves of forbs and shoots of dwarf shrubs showing signs of grazing or browsing was not recorded. Therefore the vegetation structure of the **8220 Siliceous rocky slopes** monitoring stops was not assessed.

Table 25: Monitoring criteria and failure rates for 8220 Siliceous rocky slopes ($n = 4$).

Criteria	Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition				
1 Number of positive indicator species present ≥ 1	Local vicinity	4	1	25.0
2 Proportion of vegetation composed of non-native species $< 1\%$	Local vicinity	4	2	50.0
3 Cover of <i>Pteridium aquilinum</i> , native trees and scrub collectively $< 25\%$	Local vicinity	4	0	0
Vegetation structure				
4 Live leaves of forbs and shoots of dwarf shrubs showing signs of <u>grazing</u> or <u>browsing</u> collectively $< 50\%$	Local vicinity	0	n/a	n/a

Future prospects

3.117 Two impacts were recorded within **8220 Siliceous rocky slopes** (Table 26).

Non-intensive sheep grazing (A04.02.02)

3.118 The Carlingford Mountain cSAC Conservation Statement (NPWS, 2009) stated that grazing was the main land use throughout the site and that grazing levels appeared to be low. Approximately 95% of the site is held as commonage and the impacts of grazing on these parts of the site were assessed by the CFP in Commonage Plan LH1. The plan recommended destocking levels between 0 and 6.9%, depending on the area concerned. In 2001, the area was the focus of the Foot and Mouth eradication programme, which resulted in the disposal of all sheep on the site.

3.119 Grazing levels within **8220 Siliceous rocky slopes** were not assessed during the assessment of structure and functions (see paragraph 3.113). However, the Conservation Statement (NPWS, 2009) stated that **8220 Siliceous rocky slopes** within the site were well conserved despite some damage from trampling and overgrazing by sheep. The intensity of this impact was therefore assessed as medium and its influence as negative. The area of **8220 Siliceous rocky slopes** affected by this impact has been estimated to be 5%. The trend was assessed as improving due to reduction of stock under the CFP, although the magnitude of this trend is likely to be slight.

Table 26: Assessment of future prospects for 8220 Siliceous rocky slopes. Under trend, Imp = Improving, Ins = Insufficient data.

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Medium	Negative	5%	Inside	-1.0	Imp
I01	Invasive non-native species	Low	Negative	0.2%	Inside	-0.25	Ins
	Overall score					-1.25	

Invasive non-native species (I01)

3.120 The non-native moss *Campylopus introflexus* was recorded within two **8220 Siliceous rocky slopes** monitoring stops with cover scores of 0.3 and 0.5%, resulting in the failure of those monitoring stops. *C. introflexus* is generally a pioneer species of bare peat which can become abundant after disturbance such as peat cutting, burning or drainage (Atherton *et al.*, 2010). It is therefore unlikely to spread within **8220 Siliceous rocky slopes**.

3.121 The creeping non-native shrub *Cotoneaster integrifolius* was recorded within another **8220 Siliceous rocky slopes** monitoring stop (Plate 4), with a cover score of 0.1%. It is a species of rocky and gravelly places and is naturalised throughout Ireland (Parnell and Curtis, 2012). The intensity of this impact has been assessed as low and its influence as negative. The mean cover of non-native species within **8220 Siliceous rocky slopes** monitoring stops was 0.2%.



Plate 4: 8220 Siliceous rocky slope with chasmophytic vegetation. The creeping non-native shrub *Cotoneaster integrifolius* is visible on the right (Photo: Jenni Roche).

3.122 The overall impacts score for **8220 Siliceous rocky slopes** has been calculated as -1.25, which is below the nominal Favourable Reference Value. Improvements due to minor reductions in sheep grazing are not thought to be sufficient to bring about a significant change in the conservation status of the habitat overall within the next twelve years. The combined future trend for area and structure and functions is deemed to be no change. The future prospects for this habitat were therefore assessed as Unfavourable - Inadequate.

Summary of conservation assessment

3.123 The summary results for the conservation assessment of Annex I habitats in Carlingford Mountain cSAC are presented in Table 27. Of the eight habitats assessed, one was assessed as Favourable and seven as Unfavourable – Bad.

3.124 Habitats generally performed well in the assessment of area, with no major losses of habitat being readily apparent. Peatland habitats, ***6230 Species-rich *Nardus* grassland** and **8220 Siliceous rocky slopes** generally performed poorly in the assessments of structure and functions and future prospects, while **8110 Siliceous scree** performed better. The poor

performance of **8220 Siliceous rocky slopes** in the assessment of the structure and functions was due in part to the inclusion of marginal examples of the habitat. This habitat performs better in the assessment of future prospects as the threats and pressures affecting it are relatively minor, with no loss of area being recorded. **7230 Alkaline fens** performed well in the assessment of structure and functions but poorly in the assessment of future prospects. This was due to grazing impacts that were not reflected in the assessment of structure and functions (see paragraph 3.99).

Table 27: Summary of conservation status assessments for Annex I habitats in Carlingford Mountain cSAC.

Annex I code	Habitat	Area	Structure and functions	Future prospects	Overall assessment
4010	Wet heath	Unfavourable - Inadequate	Unfavourable - Bad	Unfavourable - Bad	Unfavourable - Bad
4030	Dry heath	Unfavourable - Inadequate	Unfavourable - Bad	Unfavourable - Bad	Unfavourable - Bad
4060	Alpine and Boreal heath	Favourable	Unfavourable - Bad	Unfavourable - Bad	Unfavourable - Bad
*6230	Species-rich <i>Nardus</i> grassland	Favourable	Unfavourable - Bad	Unfavourable - Bad	Unfavourable - Bad
*7130/7130	Blanket bog	Favourable	Unfavourable - Bad	Unfavourable - Bad	Unfavourable - Bad
7230	Alkaline fens	Favourable	Favourable	Unfavourable - Bad	Unfavourable - Bad
8110	Siliceous scree	Favourable	Favourable	Favourable	Favourable
8220	Siliceous rocky slopes	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	Unfavourable - Bad

4. DISCUSSION

Natura 2000 Standard Data Form

- 4.1 Nine Annex I habitats were recorded in the cSAC that are currently not listed for the site on the Natura 2000 Standard Data Form: habitats 3130, 3160, 3260, 4010, 4030, *6230, *7130, 7130, 7140 and 7230. There are a number of small lakes associated with heath habitats on Carlingford Mountain attributable to **3130 Upland oligotrophic lakes** and a number of small **3160 Dystrophic lakes**, again on Carlingford Mountain, particularly in the White Bog area. One example of **3260 Floating river vegetation** was recorded on a stream flowing east off Black Mountain at Tullaghmeath. **4010 Wet heath** and **4030 Dry heath** occur throughout the site and are the two most frequently occurring Annex I habitats within the cSAC. ***6230 Species-rich *Nardus* grassland** occurs, mainly on the upper slopes of Carlingford Mountain. Small areas of ***7130/7130 Blanket bog** occur throughout the site. **7140 Transition mire** was recorded in The White Bog area, west of Carlingford Mountain and **7230 Alkaline fen** were recorded throughout the site.
- 4.2 The Annex I habitat **8210 Calcareous rocky slopes** is listed as a qualifying interest for the Carlingford Mountain cSAC (Table 1) but this habitat was not recorded during the NSUH survey at this site.
- 4.3 The Natura 2000 Standard Data Form for this site should be reviewed and updated in light of the data presented in this report in terms of the habitats listed, areas and ratings. It is obligatory that all Annex I habitats within an SAC are listed on this form even if they are subsequently ranked as having a non-significant presence.

Additional recommendations

- 4.4 Whilst a Conservation Statement exists for Carlingford Mountain cSAC, a Conservation Plan is required which should utilise the information provided by this report. Management objectives in the plan need to address the impacts highlighted in this report if progress is to be made towards attaining Favourable status for the Annex I habitats. The main impacts are livestock grazing, uncontrolled burning and, to a lesser extent, peat-erosion.
- 4.5 Levels of livestock grazing are being addressed through the CFP. Whilst reduction of stock under the CFP appears to have resulted in some improvement to Annex I habitats, these habitats are not currently attaining Favourable status. Continued monitoring is required to establish what would be sustainable levels of livestock for this site bearing in mind that there may be a considerable delay between changes in livestock levels and a response in the vegetation. The available data do not support an increase in stocking levels.
- 4.6 Burning is a major impact on heath habitats and the ***7130/7130 Blanket bog** in some areas of the cSAC. Whilst burning can be an important tool in heathland management, uncontrolled and too frequent burning can damage the long-term viability of heath. Regulation of burning at a site level is required.
- 4.7 Erosion of blanket peat is an impact on ***7130/7130 Blanket bog**. Whilst some areas of eroded peat may gradually revegetate as a result of reduction of stock under the CFP, in areas of more

severe erosion active restoration measures may be needed for this habitat to achieve Favourable status. These may include the damming of erosion gullies, stabilisation of bare peat with geotextiles or heather brash, the planting of *Eriophorum angustifolium*, and seeding of bare peat with *Sphagnum* propagules. The conservation of ***7130 Active blanket bog** should be prioritised as befitting its status.

- 4.8 It would be desirable for future phases of monitoring to expand on the network of monitoring stops established by this survey. Placement of additional stops should take into account the spatial distribution of existing stops.

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APPENDIX 1: ANNEX I HABITATS

The following standard abbreviations are used throughout this report for Annex I habitats. With the exception of habitats 4060 and 7130, these follow the abbreviations used in NPWS (2008).

Annex I code	Full name of Annex I habitat	Standard abbreviation
3130	Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i>	3130 Upland oligotrophic lakes
3160	Natural dystrophic lakes and ponds	3160 Dystrophic lakes
3260	Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation	3260 Floating river vegetation
4010	Northern Atlantic wet heaths with <i>Erica tetralix</i>	4010 Wet heath
4030	European dry heaths	4030 Dry heath
4060	Alpine and Boreal heaths	4060 Alpine and Boreal heath
6230	*Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)	*6230 Species-rich <i>Nardus</i> grasslands
7130	Blanket bogs (* if active bog)	*7130 Active blanket bog or 7130 Inactive blanket bog or *7130/7130 Blanket bog
7140	Transition mires and quaking bogs	7140 Transition mires
7230	Alkaline fens	7230 Alkaline fens
8110	Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsetalia ladani</i>)	8110 Siliceous scree
8210	Calcareous rocky slopes with chasmophytic vegetation	8210 Calcareous rocky slopes
8220	Siliceous rocky slopes with chasmophytic vegetation	8220 Siliceous rocky slopes

APPENDIX 2: PHOTOGRAPHS



Plate A1: The arctic-alpine *Diphysastrum alpinum* growing on Black Mountain (Photo: Jenni Roche).



Plate A2: *Vaccinium vitis-idaea* growing on a rocky ledge near the peak of Slieve Foye (Photo: Philip Perrin).



Plate A3: Deep cushions of *Campylopus atrovirens* growing on exposed bedrock (Photo: Philip Perrin).



Plate A4: 4030 Dry heath with *Calluna vulgaris* and *Ulex gallii* on Angelsey Mountain (Photo: Philip Perrin).



Plate A5: Area of *7130 Active blanket bog on a terrace on the northeast side of Carlingford Mountain (Photo: Philip Perrin).



Plate A6: A soakway with *Potamogeton polygonifolius* (Photo: Philip Perrin).



Plate A7: View from Slieve Foye looking north towards The Ravens Rock (Photo: Philip Perrin).



Plate A8: View southeast from an eroded area on one of the more southerly peaks on Black Mountain towards Carlingford Mountain. (Photo: BEC Consultants).



Plate A9: View of Carlingford Mountain from amongst 4030 Dry heath on Barnavave (Photo: Fiona Devaney).



Plate A10: View of Black Mountain from the east showing the mosaic of grassland and dry heath and the transmission tower on Clermont Cairn (Photo: Fiona Devaney).



Plate A11: Local interpretation of the EU Habitats Directive (Photo: Philip Perrin).

APPENDIX 3: PLANT SPECIES LIST

All species recorded from relevés, waypoints and polygons during the NSUH survey of Carlingford Mountain cSAC are listed.

VASCULAR SPECIES	
Species name	Common name
<i>Achillea millefolium</i>	Yarrow
<i>Agrostis canina</i>	Velvet Bent
<i>Agrostis capillaris</i>	Common Bent
<i>Agrostis stolonifera</i>	Creeping Bent
<i>Agrostis vinealis</i>	Brown Bent
<i>Anemone nemorosa</i>	Wood Anemone
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass
<i>Asplenium trichomanes</i>	Maidenhair Spleenwort
<i>Athyrium filix-femina</i>	Lady-fern
<i>Bellis perennis</i>	Daisy
<i>Blechnum spicant</i>	Hard-fern
<i>Calluna vulgaris</i>	Heather
<i>Carex binervis</i>	Green-ribbed Sedge
<i>Carex dioica</i>	Dioecious Sedge
<i>Carex echinata</i>	Star Sedge
<i>Carex flacca</i>	Glaucous Sedge
<i>Carex panicea</i>	Carnation Sedge
<i>Carex pilulifera</i>	Pill Sedge
<i>Carex rostrata</i>	Bottle Sedge
<i>Carex viridula</i>	Yellow-sedge
<i>Carex viridula</i> subsp. <i>oedocarpa</i>	a Yellow-sedge
<i>Cerastium</i> sp.	a Mouse-ear
<i>Cirsium arvense</i>	Creeping Thistle
<i>Cotoneaster integrifolius</i>	Entire-leaved Cotoneaster
<i>Cynosurus cristatus</i>	Crested Dog's-tail
<i>Dactylis glomerata</i>	Cock's-foot
<i>Deschampsia flexuosa</i>	Tufted Hair-grass
<i>Drosera rotundifolia</i>	Round-leaved Sundew
<i>Dryopteris dilatata</i>	Broad Buckler-fern
<i>Dryopteris filix-mas</i>	Male-fern
<i>Eleocharis multicaulis</i>	Many-stalked Spike-rush

VASCULAR SPECIES

Species name	Common name
<i>Empetrum nigrum</i>	Crowberry
<i>Epilobium brunnescens</i>	New Zealand Willowherb
<i>Erica cinerea</i>	Bell Heather
<i>Erica tetralix</i>	Cross-leaved Heath
<i>Eriophorum angustifolium</i>	Common Cottongrass
<i>Eriophorum vaginatum</i>	Hare's-tail Cottongrass
<i>Festuca ovina</i>	Sheep's-fescue
<i>Festuca rubra</i>	Red Fescues
<i>Festuca vivipara</i>	Viviparous Sheep's-fescue
<i>Galium saxatile</i>	Heath Bedstraw
<i>Hedera helix</i>	Ivy
<i>Holcus lanatus</i>	Yorkshire-fog
<i>Hydrocotyle vulgaris</i>	Marsh Pennywort
<i>Hypericum perforatum</i>	Slender St John's-wort
<i>Juncus acutiflorus</i>	Sharp-flowered Rush
<i>Juncus bulbosus</i>	Bulbous Rush
<i>Juncus squarrosus</i>	Heath Rush
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil
<i>Luzula campestris</i>	Field Wood-rush
<i>Luzula multiflora</i>	Heath Wood-rush
<i>Luzula sylvatica</i>	Great Wood-rush
<i>Molinia caerulea</i>	Purple Moor-grass
<i>Nardus stricta</i>	Mat-grass
<i>Narthecium ossifragum</i>	Bog Asphodel
<i>Pedicularis sylvatica</i>	Lousewort
<i>Picea</i> sp.	a Spruce
<i>Pinguicula vulgaris</i>	Common Butterwort
<i>Pinus</i> sp.	a Pine
<i>Plantago lanceolata</i>	Ribwort Plantain
<i>Polygala serpyllifolia</i>	Heath Milkwort
<i>Potentilla erecta</i>	Tormentil
<i>Primula vulgaris</i>	Primrose
<i>Prunella vulgaris</i>	Selfheal
<i>Pteridium aquilinum</i>	Bracken
<i>Schoenus nigricans</i>	Black Bog-rush
<i>Solidago virgaurea</i>	Goldenrod

VASCULAR SPECIES

Species name	Common name
<i>Succisa pratensis</i>	Devil's-bit Scabious
<i>Taraxacum officinale</i> agg.	Dandelions
<i>Thymus polytrichus</i>	Wild Thyme
<i>Trichophorum germanicum</i>	Deergrass
<i>Trifolium repens</i>	White Clover
<i>Ulex europaeus</i>	Gorse
<i>Ulex gallii</i>	Western Gorse
<i>Umbilicus rupestris</i>	Navelwort
<i>Vaccinium myrtillus</i>	Bilberry
<i>Vaccinium vitis-idaea</i>	Cowberry
<i>Veronica officinalis</i>	Heath Speedwell
<i>Viola riviniana</i>	Common Dog-violet

BRYOPHYTES

Species name	Common name
<i>Amphidium mougeotii</i>	Mougeot's Yoke-moss
<i>Andreaea rothii</i> subsp. <i>falcata</i>	Hunt's Rock-moss
<i>Andreaea rupestris</i> var. <i>rupestris</i>	Black Rock-moss
<i>Aneura pinguis</i>	Greasewort
<i>Aulacomnium palustre</i>	Bog Bead-moss
<i>Blindia acuta</i>	Sharp-leaved Blindia
<i>Brachythecium rutabulum</i>	Rough-stalked Feather-moss
<i>Breutelia chrysocoma</i>	Golden-head Moss
<i>Bryum alpinum</i>	Alpine Thread-moss
<i>Bryum pseudotriquetrum</i>	Marsh Bryum
<i>Calliergonella cuspidata</i>	Pointed Spear-moss
<i>Calypogeia arguta</i>	Notched Pouchwort
<i>Calypogeia fissa</i>	Common Pouchwort
<i>Calypogeia muelleriana</i>	Mueller's Pouchwort
<i>Campylium stellatum</i>	Yellow Starry Feather-moss
<i>Campylopus atrovirens</i>	Bristly Swan-neck Moss
<i>Campylopus flexuosus</i>	Rusty Swan-neck Moss
<i>Campylopus introflexus</i>	Heath Star-moss
<i>Cephalozia bicuspidata</i>	Two-horned Pincerwort
<i>Ctenidium molluscum</i>	Comb-moss

BRYOPHYTES

Species name	Common name
<i>Dichodontium palustre</i>	Marsh Forklet-moss
<i>Dicranum scoparium</i>	Broom Fork-moss
<i>Diphasiastrum alpinum</i>	Alpine Clubmoss
<i>Diplophyllum albicans</i>	White Earwort
<i>Drepanocladus revolvens</i>	Rust Hook-moss
<i>Fissidens adianthoides</i>	Maidenhair Pocket-moss
<i>Fissidens osmundoides</i>	Purple-stalked Pocket-moss
<i>Frullania tamarisci</i>	Tamarisk Scalewort
<i>Hookeria lucens</i>	Shining Hookeria
<i>Huperzia selago</i>	Fir Clubmoss
<i>Hylocomium splendens</i>	Glittering Wood-moss
<i>Hypnum jutlandicum</i>	Heath Plait-moss
<i>Kindbergia praelonga</i>	Common Feather-moss
<i>Leucobryum glaucum</i>	Large White-moss
<i>Lophocolea bidentata</i>	Bifid Crestwort
<i>Lophozia ventricosa</i>	Tumid Notchwort
<i>Pellia epiphylla</i>	Overleaf Pellia
<i>Philonotis calcarea</i>	Thick-nerved Apple-moss
<i>Philonotis fontana</i>	Fountain Apple-moss
<i>Plagiommium undulatum</i>	Hart's-tongue Thyme-moss
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss
<i>Polytrichum alpinum</i>	Alpine Haircap
<i>Polytrichum commune</i>	Common/Dense Haircap
<i>Polytrichum formosum</i>	Bank Haircap
<i>Pseudotaxiphyllum elegans</i>	Elegant Silk-moss
<i>Racomitrium affine</i>	Lesser Fringe-moss
<i>Racomitrium aquaticum</i>	Narrow-leaved Fringe-moss
<i>Racomitrium heterostichum</i>	Bristly Fringe-moss
<i>Racomitrium lanuginosum</i>	Wooly Fringe-moss
<i>Rhytidiadelphus loreus</i>	Little Shaggy-moss
<i>Rhytidiadelphus squarrosus</i>	Springy Turf-moss
<i>Riccardia multifida</i>	Delicate Germanderwort
<i>Scapania gracilis</i>	Western Earwort
<i>Scapania nemorea</i>	Grove Earwort
<i>Scleropodium purum</i>	Neat Feather-moss
<i>Scorpidium revolvens</i>	Rusty Hook-moss

BRYOPHYTES

Species name	Common name
<i>Scorpidium scorpioides</i>	Hooked Scorpion-moss
<i>Sphagnum denticulatum</i>	Cow-horn Bog-moss
<i>Sphagnum fallax</i>	Flat-topped Bog-moss
<i>Sphagnum palustre</i>	Blunt-leaved Bog-moss
<i>Sphagnum papillosum</i>	Papillose Bog-moss
<i>Sphagnum subnitens</i>	Lustrous Bog-moss
<i>Sphagnum tenellum</i>	Soft Bog-moss
<i>Thuidium tamariscinum</i>	Common Tamarisk-moss
<i>Trichostomum brachydontium</i>	Variable Crisp-moss

LICHENS

Species name	Species name
<i>Cladonia</i> species	<i>Stereocaulon vesuvianum</i>

Figure 1. Survey area / boundary of Carlingford Mountain cSAC (000453), Co. Louth



Figure 2. Primary Fossitt habitats within Carlingford Mountain cSAC (000453), Co. Louth

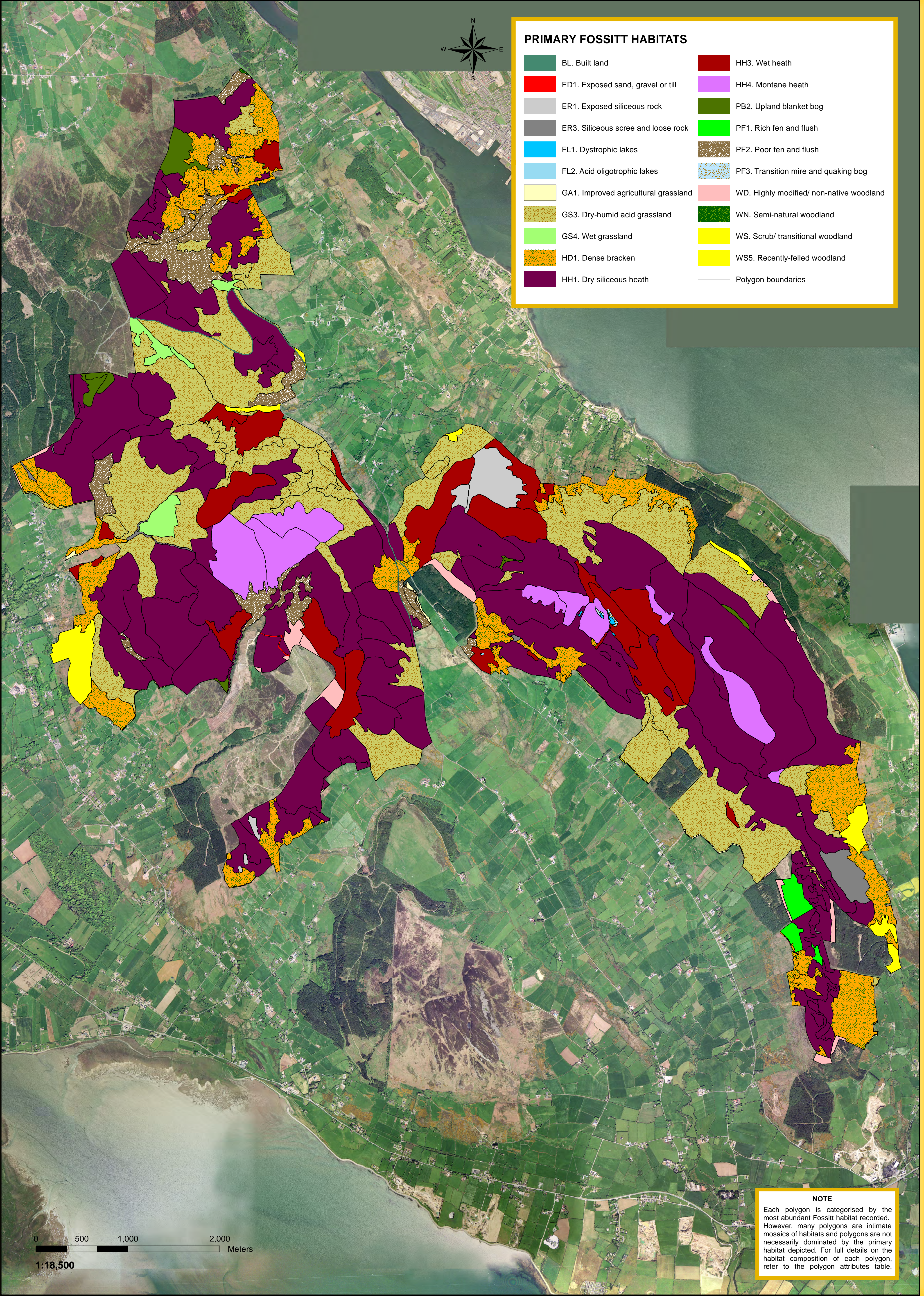


Figure 3. Primary Annex I habitats within Carlingford Mountain cSAC (000453), Co. Louth

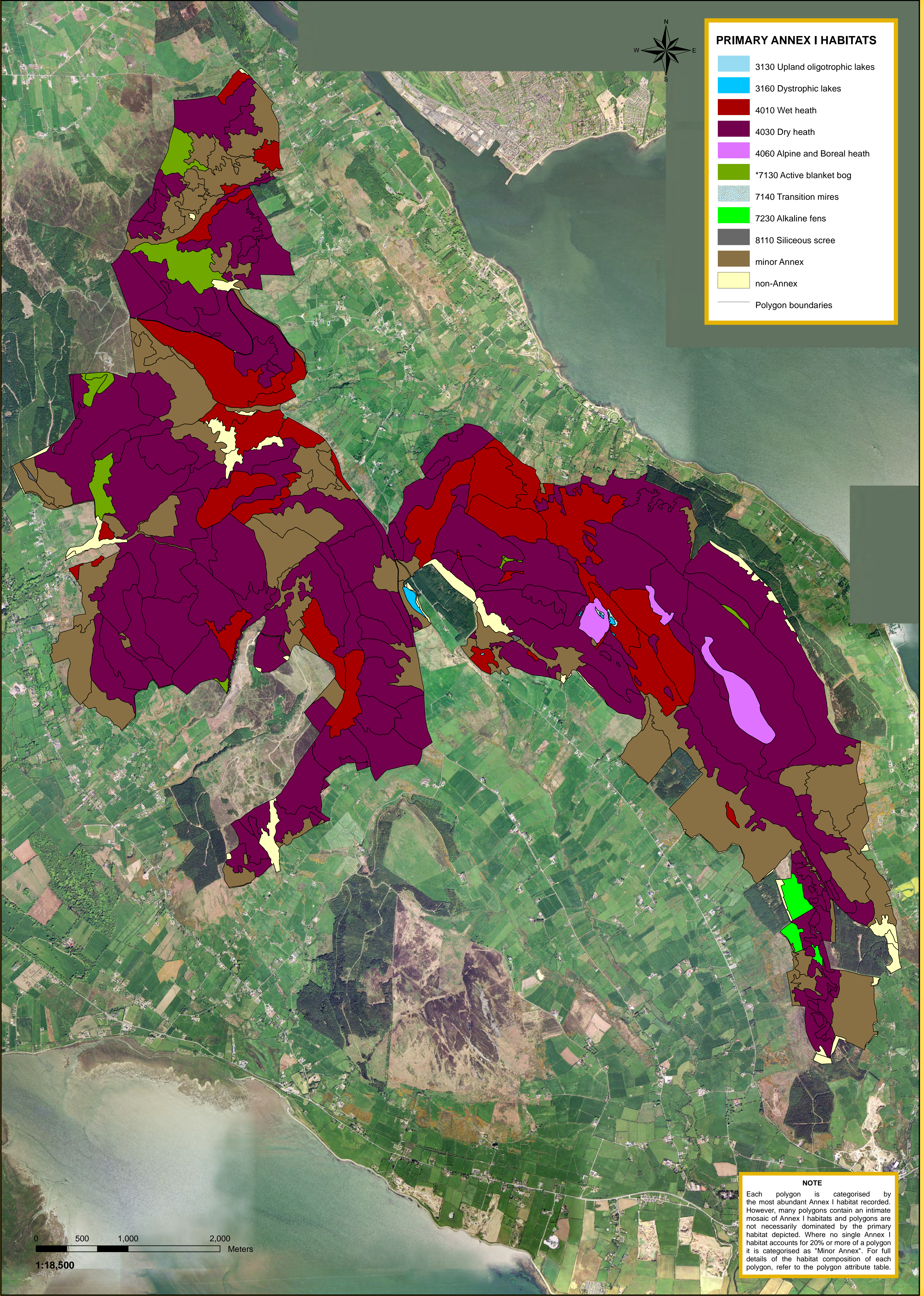


Figure 4a. Cover of 4010 WET HEATH within Carlingford Mountain cSAC (000453), Co. Louth

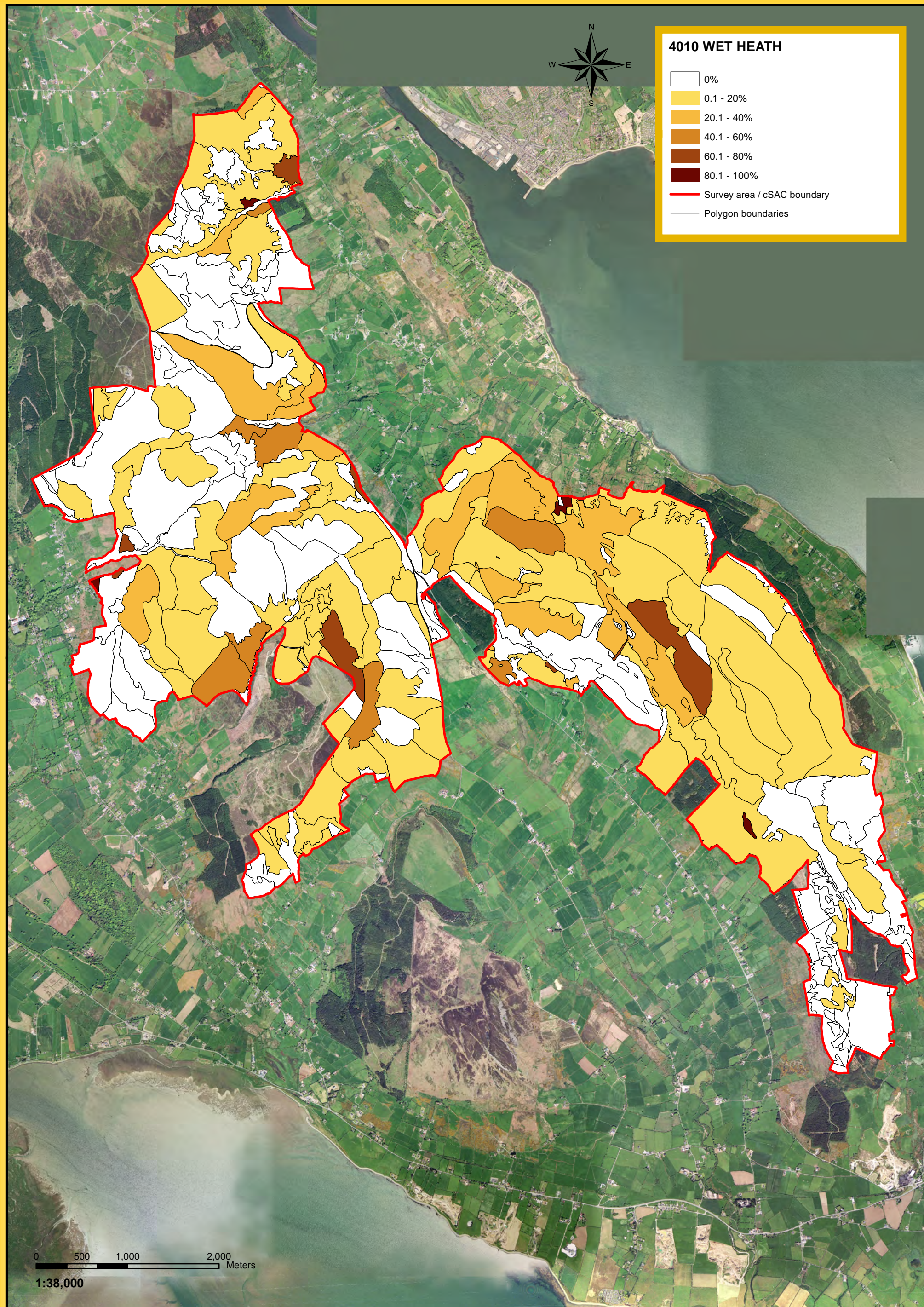


Figure 4b. Cover of 4030 DRY HEATH within Carlingford Mountain cSAC (000453), Co. Louth

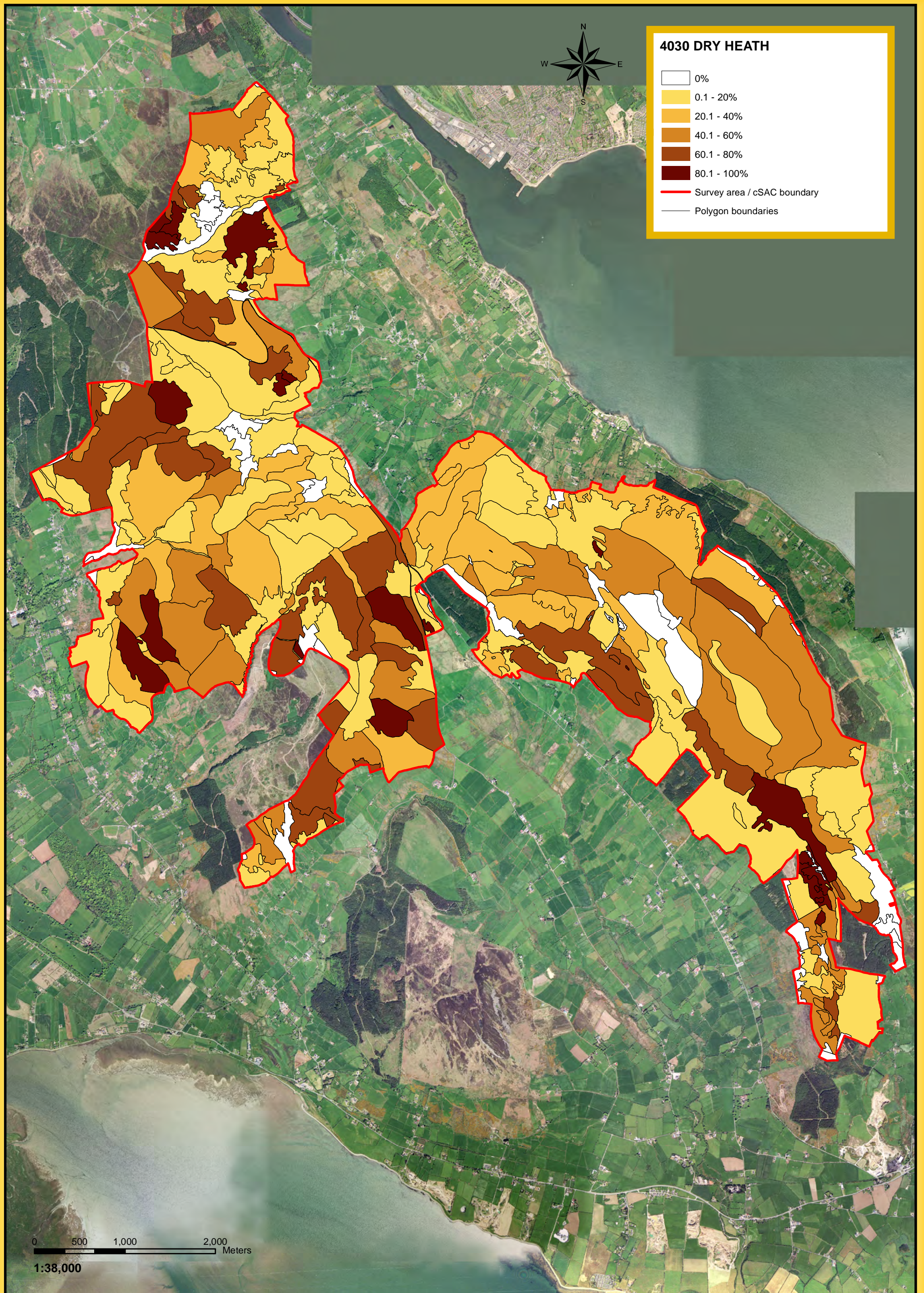


Figure 4c. Cover of 4060 ALPINE AND BOREAL HEATH within Carlingford Mountain cSAC (000453), Co. Louth

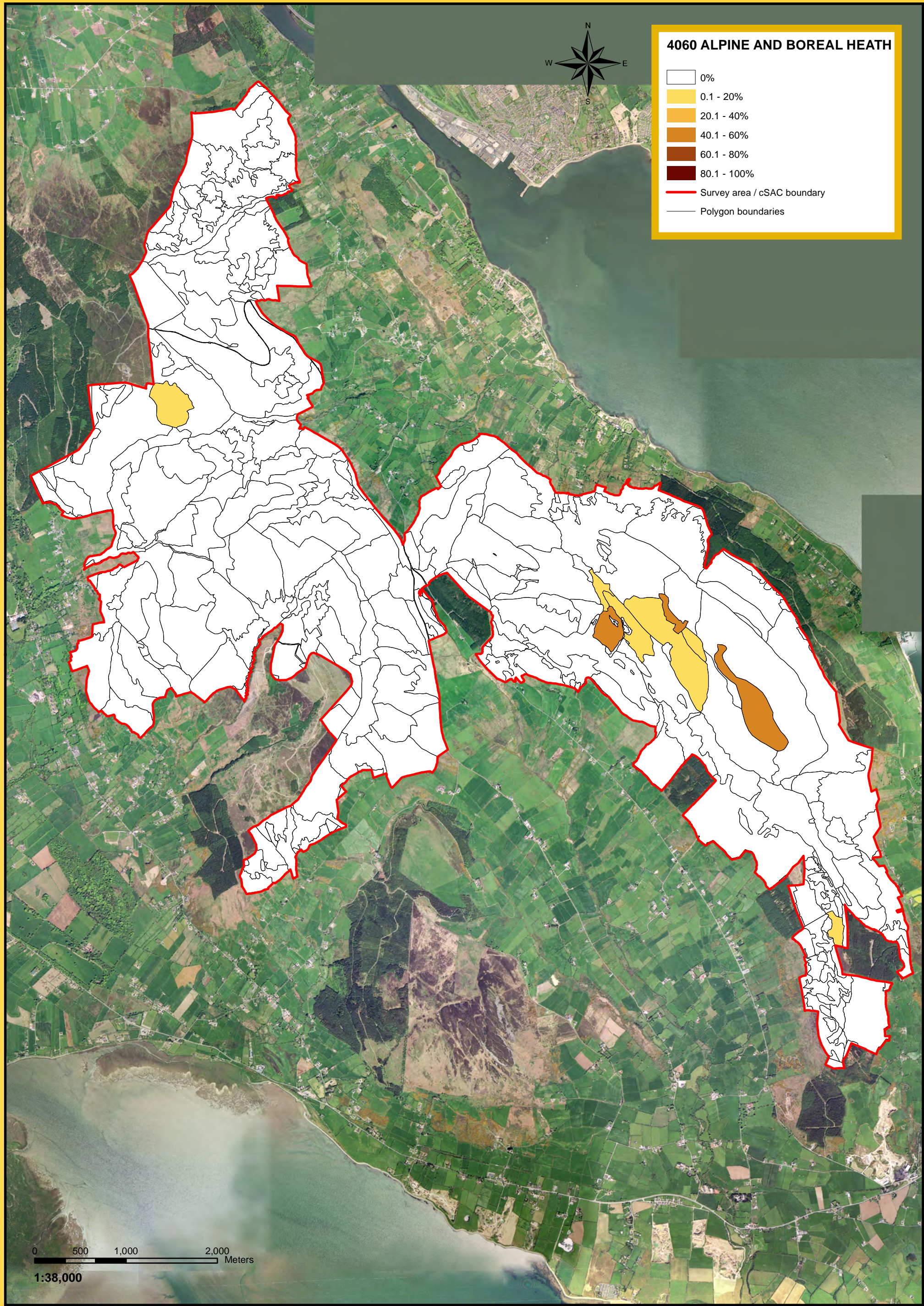


Figure 4d. Cover of *6230 SPECIES-RICH *NARDUS* GRASSLANDS within Carlingford Mountain cSAC (000453), Co. Louth

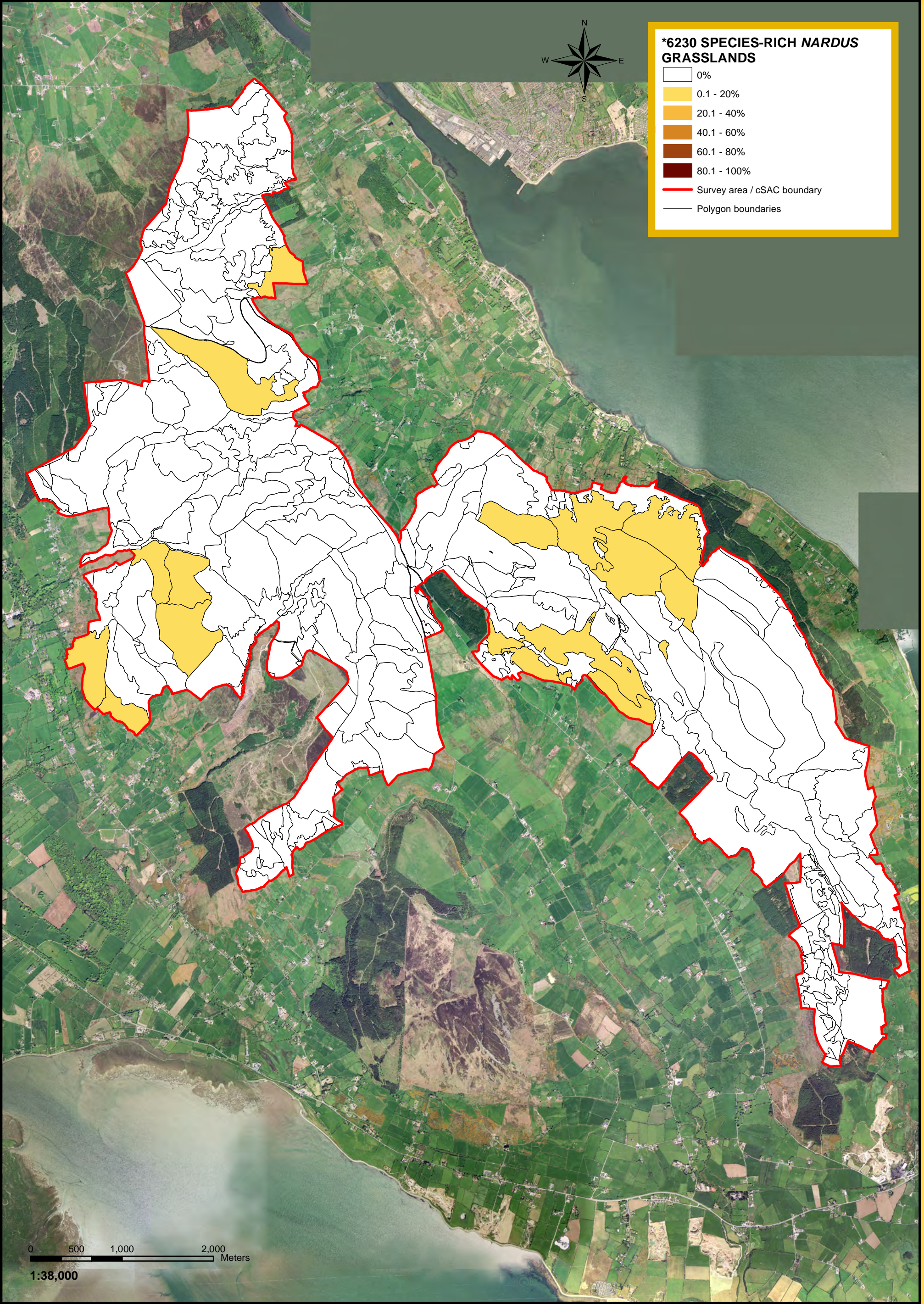


Figure 4e. Cover of *7130 ACTIVE BLANKET BOG within Carlingford Mountain cSAC (000453), Co. Louth

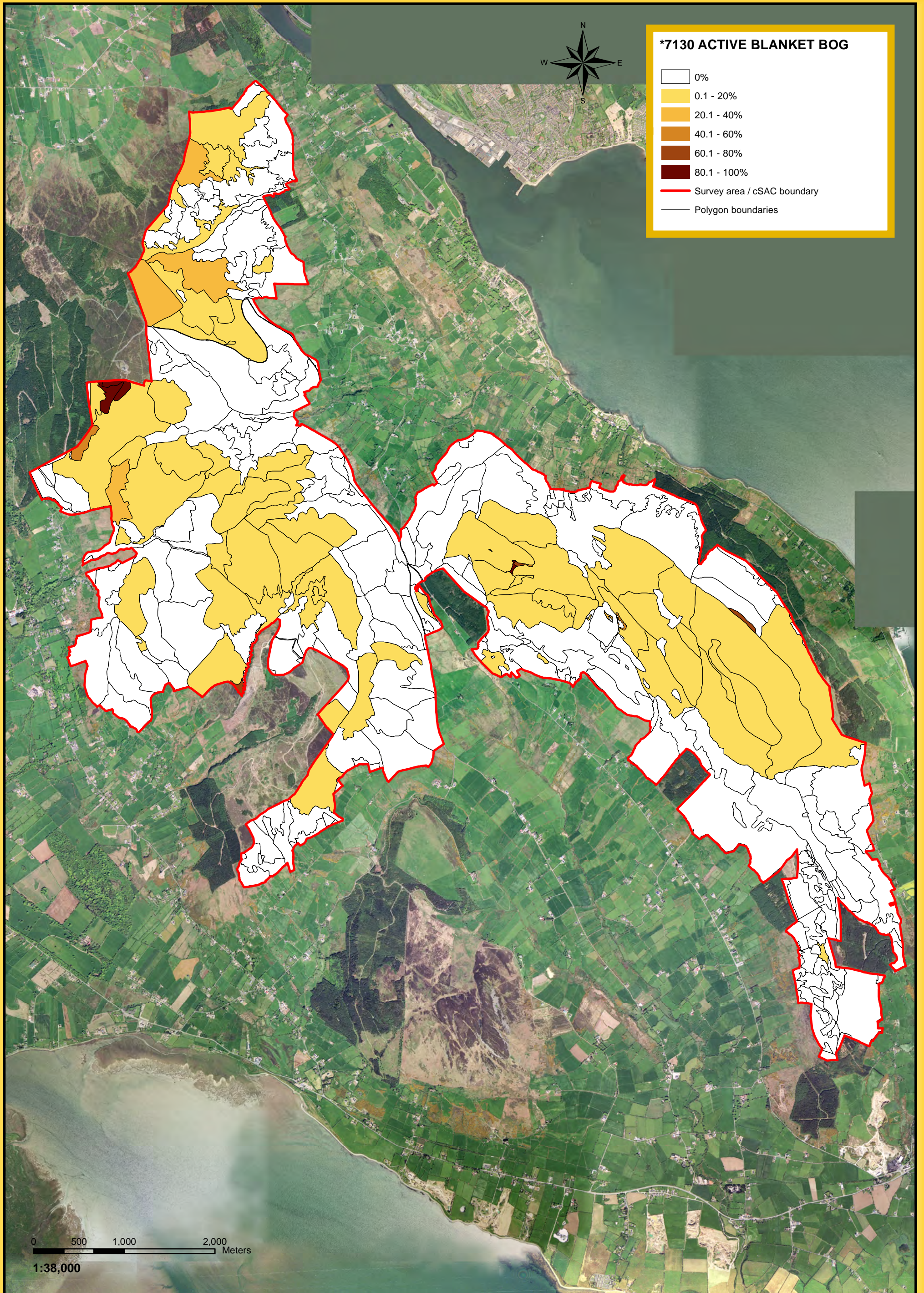


Figure 4f. Cover of 7130 INACTIVE BLANKET BOG within Carlingford Mountain cSAC (000453), Co. Louth

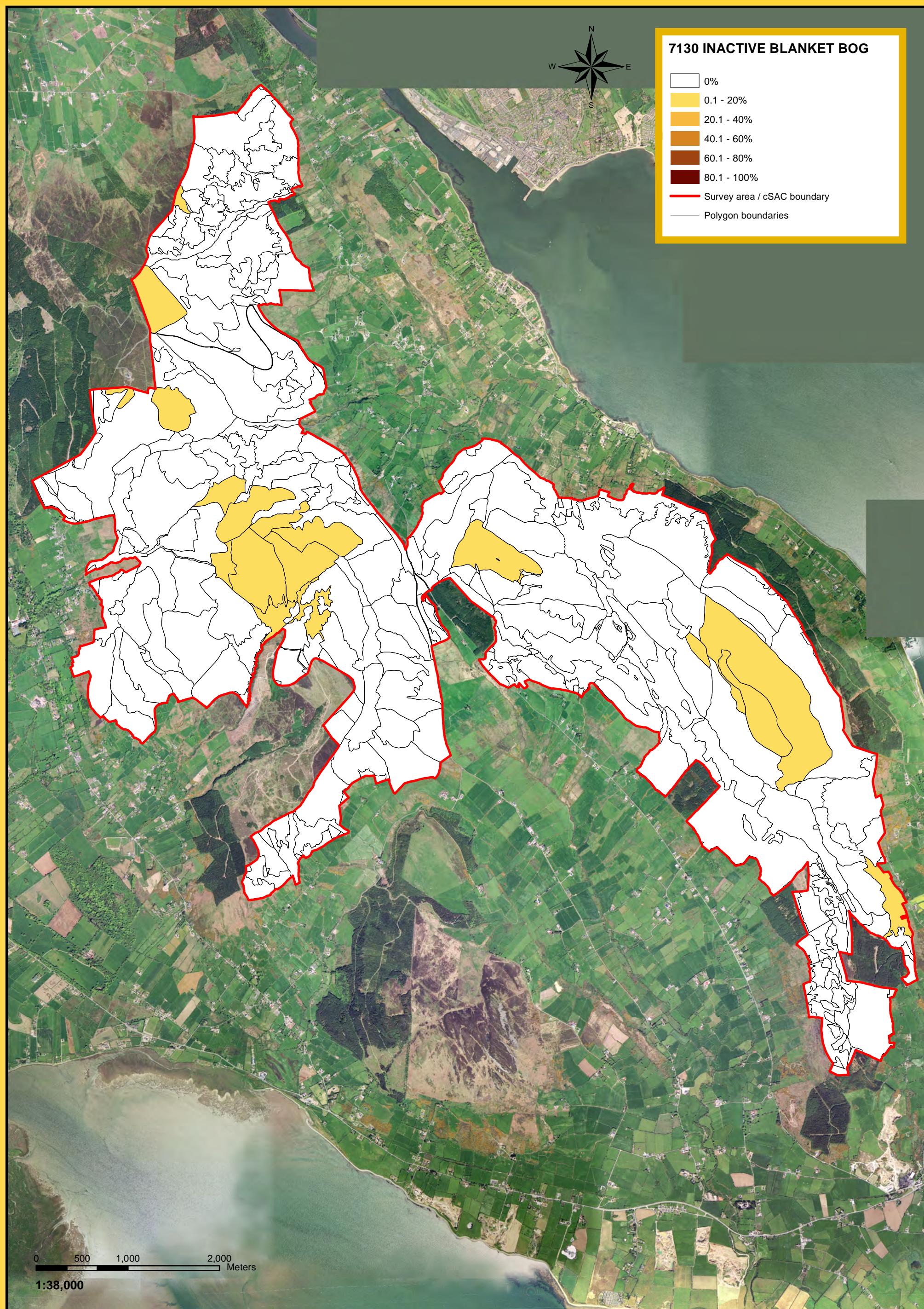


Figure 4g. Cover of 7140 TRANSITION MIRES within Carlingford Mountain cSAC (000453), Co. Louth

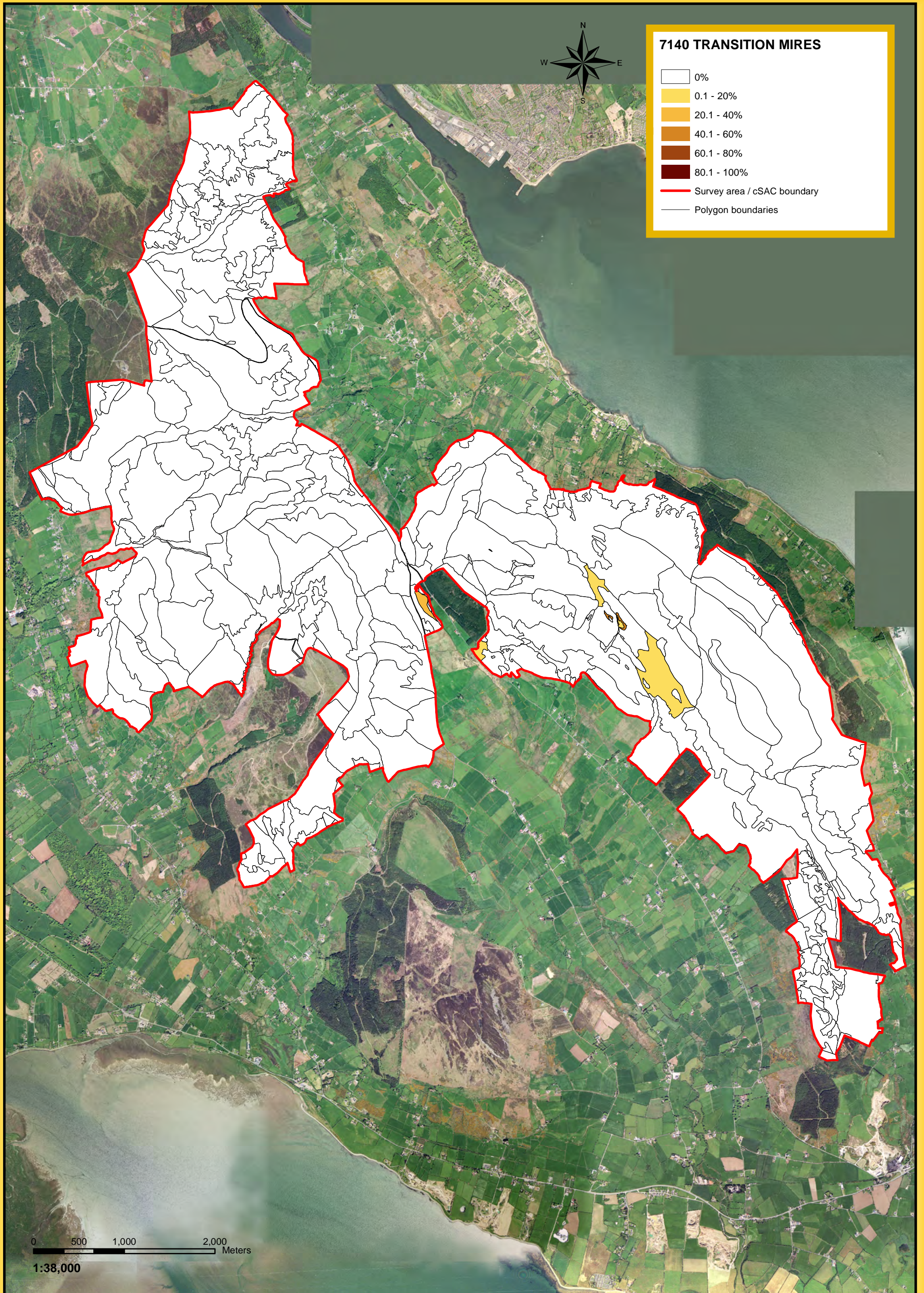


Figure 4h. Cover of 7230 ALKALINE FENS within Carlingford Mountain cSAC (000453), Co. Louth

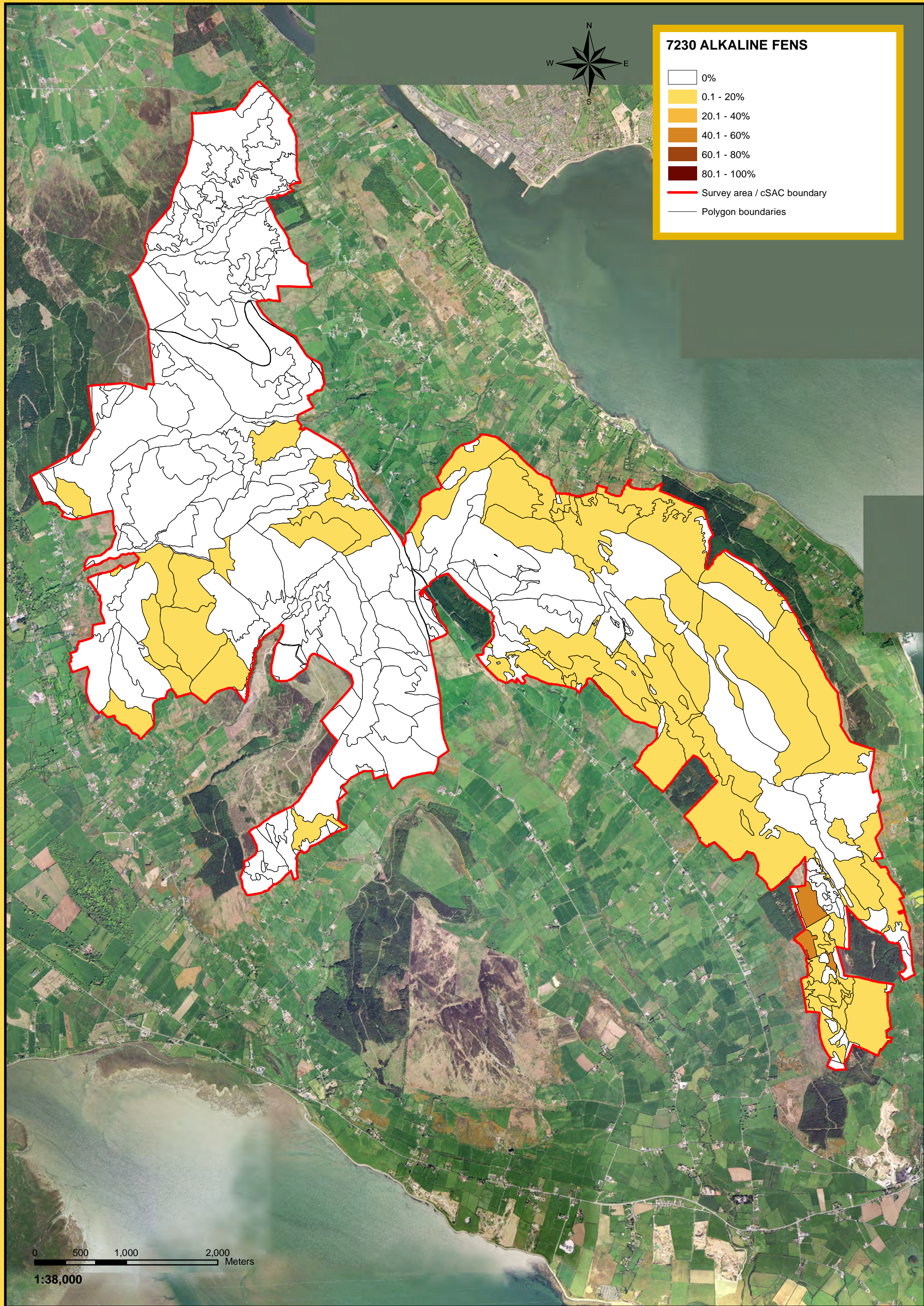


Figure 4i. Cover of 8110 SILICEOUS SCREE within Carlingford Mountain cSAC (000453), Co. Louth

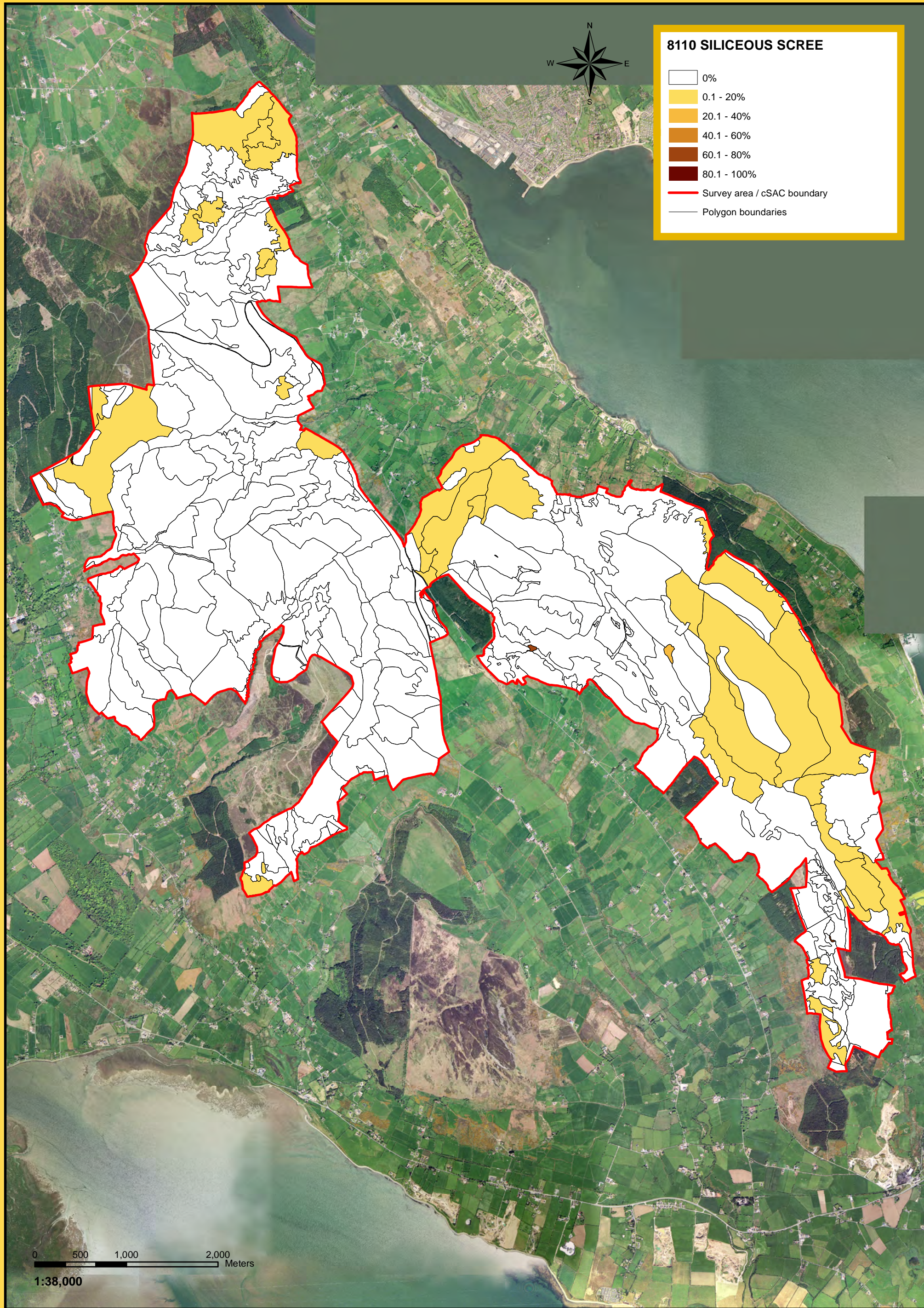


Figure 4j. Cover of 8220 SILICEOUS ROCKY SLOPES within Carlingford Mountain cSAC (000453), Co. Louth

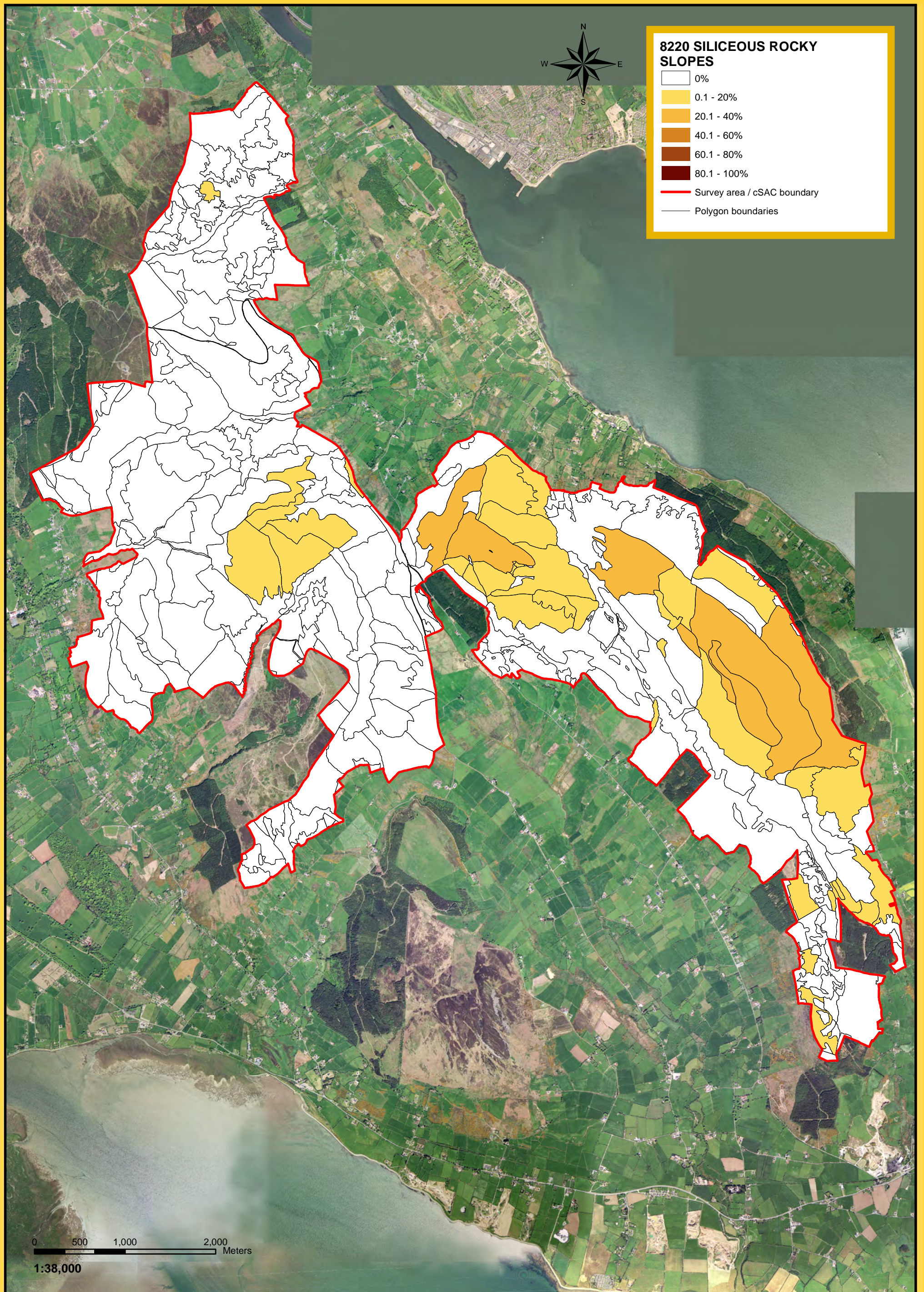


Figure 5. Location of rare and notable plant records within and surrounding Carlingford Mountain cSAC (000453), Co. Louth



Figure 6. Location and results of conservation assessment monitoring stops and other relevés within Carlingford Mountain cSAC (000453), Co. Louth



Figure 7a. Commonage Framework Plan damage assessment (2000-2002) within and surrounding Carlingford Mountain cSAC (000453), Co. Louth

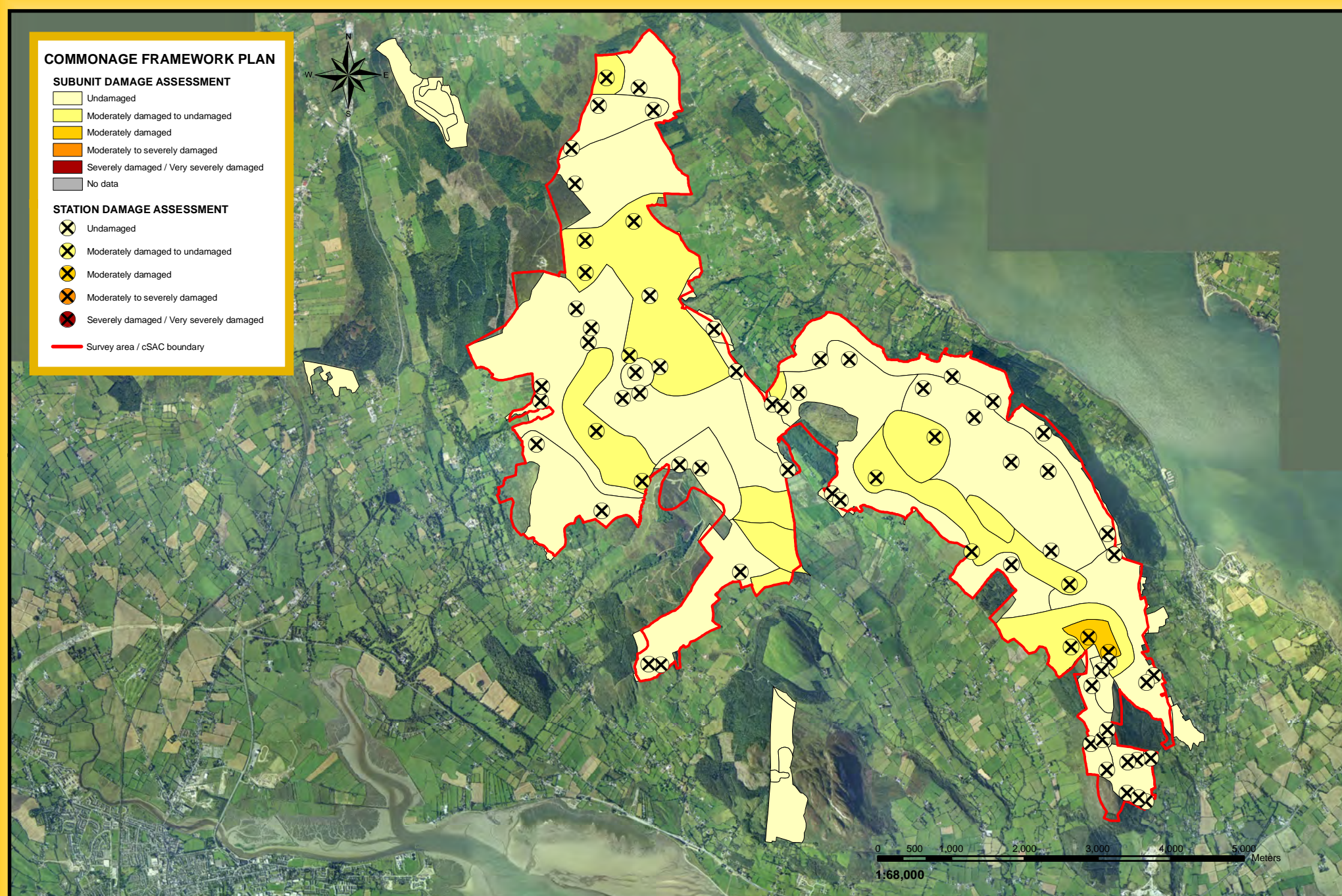


Figure 7b. Commonage Framework Plan damage assessment (2008) within and surrounding Carlingford Mountain cSAC (000453), Co. Louth

