National Survey of Upland Habitats

(Phase 4, 2013-2014)

Site Report No. 15:

Slieve Mish Mountains cSAC (002185), Co. Kerry

Philip M. Perrin, Jenni R. Roche, Simon J. Barron,
Orla H. Daly, Rory L. Hodd and Fiona M. Devaney

October 2014

Commissioned by National Parks and Wildlife Service

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Cover photo: Caherconree from the slopes of Baurtregaum, Slieve Mish, Co. Kerry, taken by Rory Hodd.

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EXECUTIVE SUMMARY

- Slieve Mish Mountains cSAC (002185), in County Kerry was surveyed between April and June 2014 as part of the National Survey of Upland Habitats (NSUH).
- The area of the site is 97.9 km^2. Using GIS and aerial photograph interpretation, the site was divided into 1384 polygons, each representing an area of relatively homogeneous habitat mosaic. Each polygon was surveyed on the ground to create a habitat map for the site.
- A total of 18 Annex I habitats, 47 Fossitt habitats and 89 provisional upland vegetation communities were recorded. Annex I habitats comprise 84.4% of the site. The Annex I upland habitats present which are primary focus habitats for the NSUH are 4010 Wet heath (47.4%), *7130 Active blanket bog (19.5%), 4030 Dry heath (11.4%), 4060 Alpine and Boreal heath (4.3%), 8110 Siliceous scree (0.8%), 8220 Siliceous rocky slopes (0.3%), 7130 Inactive blanket bog (0.1%), 8210 Calcareous rocky slopes (0.02%), 7140 Transition mires (0.01%) and 7230 Alkaline fens (0.008%).
- Rare and notable species recorded during the survey include: *Diphasiastrum alpinum, Trichomanes speciosum, Sibthorpia europaea, Saxifraga rosacea* subsp. *rosacea*, *Encalypta ciliata*, *Bazzania pearsonii*, *Pohlia wahlenbergii* var. *glacialis, Sticta fuliginosa* and *Cetraria muricata.*
- Areas of particular botanical interest include the species-rich calcareous cliffs at Gormagh, Derrymore, Curraheen Glen and the high peaks of Baurtregaum and Caherconree.
- The conservation status of the upland Annex I habitats that form the primary focus of the NSUH was assessed. A total of 92 monitoring stops were recorded in these habitats. The conservation status of 7140 Transition mires, 7230 Alkaline fens and 8110 Siliceous scree were assessed as Favourable. 4010 Wet heath and *7130/7130 Blanket bog were assessed as Unfavourable – Bad. The remaining primary focus habitats were assessed as Unfavourable – Inadequate.
- The main impacts/activities affecting the site are sheep grazing, burning, peat cutting and erosion.
- It is recommended that:

  Whilst stock level reductions implemented *c.* 2002 under the Commonage Framework Plans 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.

  Regulation of burning at a site level should be instigated as uncontrolled burns are currently impacting negatively on heath and bog habitats.

  Appropriate regulation of machine turf-cutting is required within the site.

  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

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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 Irish Wildlife Manual No. 79 (Perrin *et al.*, 2014) which detail the methodologies used for all aspects of this survey. These were initially devised during a 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 Slieve Mish Mountains cSAC (002185) for the NSUH (Phase 4, 2013-14). 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 this 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.

1.4 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.

1.5 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.

1.6 Fieldwork was conducted between April and June 2014. The boundary of the cSAC as used in this survey is the version that was provided by NPWS in February 2014.

Background site information

1.7 Slieve Mish Mountains cSAC, Co. Kerry, (Fig. 1) is a large site, 97.9 km^2 in extent. The site lies southwest of Tralee on the Dingle Peninsula, dominating the narrow section of the peninsula with Tralee Bay to the north and Castlemaine Harbour to the south (O.S. Discovery Series map 71). The underlying geology is mainly Devonian old red sandstone with a band of Ordovician metasediments on the western slopes. The main peaks are Baurtregaum (alt. 851 m)

and Caherconree (alt. 835 m). The northern flank is intersected by a series of deep glaciated river valleys.

1.8 The site has been designated for a 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: Annex I habitat data from the Natura 2000 Standard Data Form for Slieve Mish Mountains cSAC. Data retrieved from www.npws.ie 3rd February 2014. Rep. = Representativity, Surf. = Relative Surface, Cons. = Conservation status, Glob. = Global Assessment.

Annex I code	**Habitat**	**Area (%)**	**Rep.**	**Surf.**	**Cons.**	**Glob.**
4010	Wet heaths	20	C	B	C	C
4030	Dry heaths	34	B	B	B	B
4060	Alpine and Boreal heaths	7	B	B	B	C
8220	Siliceous rocky slopes	1	B	C	A	B

2. FIELD SURVEY

Description of habitats

Knockawaddra, Barnanageehy and Knockauncorragh

2.1 The eastern portion of the site consists of a gently rising, undulating ridge, running westwards from Knockawaddra. The vegetation of the summit of this ridge is primarily **HH3 Wet heath**, interspersed with areas of **PB2 Upland blanket bog**, classified according to Fossitt (2000). The wet heath is characterised by a range of species, with *Molinia caerulea*, *Trichophorum germanicum* and *Calluna vulgaris* frequent throughout, and *Ulex gallii* dominant in places. The blanket bog vegetation is most extensive on the gentle slopes running north from the ridge, where it is generally dominated by *Eriophorum vaginatum*, *C. vulgaris* and *Sphagnum* spp. In places, there are patches of **HH1 Dry siliceous heath,** which is characterised by dwarf shrubs including *C. vulgaris* and *U. gallii*. There are a number of narrow, deep river valleys running from the northern side of this ridge, within which there are areas of **WN1 Oak-birch-holly woodland** and **WS1 Scrub**. This portion of the site is highly modified by human impact, with a road running across the ridge and a number of aerials situated on top of the ridge. There are also areas of extensive peat cutting and large areas have been burnt repeatedly.

2.2 As the ridge gains altitude, to the peaks of Barnanageehy and Knockauncorragh, the vegetation along the top of the ridge consists of a mosaic of **HH4 Montane heath** and **PB2 Upland blanket bog**. The montane heath is characterised by *Calluna vulgaris*, *Racomitrium lanuginosum* and *Juncus squarrosus*. A deep valley is cut into the south side of the ridge between Barnanageehy and Knockauncorragh, running down to Boolteens East. The floor of this valley is clothed in blanket bog and **HH3 Wet heath**, containing much *Molinia caerulea*. In the upper part of this valley there is an infilled lake (Lough Ablockaun), now vegetated with **PF2 Poor fen and flush**, dominated by *Juncus effusus* and *Sphagnum* spp., and **PF3 Transition mire and quaking bog**, consisting of a carpet of *Sphagnum cuspidatum*, through which *Menyanthes trifoliata* grows. A very steep slope rises to the west of this valley, the vegetation of which is mainly **HH1 Dry siliceous heath**, characterised by *C. vulgaris* and a dense carpet of *Sphagnum* spp. and pleurocarpous mosses, including *Rhytidiadelphus loreus* and *Thuidium tamariscinum*. Intermixed with the dry heath are areas of cliff, consisting of both **ER1 Exposed siliceous rock**, characterised by *Saxifraga spathularis* and *Hymenophyllum wilsonii*, and **ER2 Exposed calcareous rock**, characterised by *Asplenium trichomanes*, *Tortella tortuosa* and *Ctenidium molluscum*.

Baurtregaum, Caherconree and adjacent valleys

2.3 The highest part of the site is located in the centre, with the peaks of Baurtregaum and Caherconree both attaining heights of greater than 800 m. The northern slopes are incised by two large valleys, Curraheen and Derrymore, and two smaller valleys, including that of the Derryquay River. The northern slopes are generally covered in their lower parts with **HH3 Wet heath**, characterised by *Trichophorum germanicum*, *Molinia caerulea* and *Calluna vulgaris*, which is much degraded and overgrazed towards the margins of the site. There are areas of **HD1 Dense bracken** and **WS1 Scrub** in places on the lower slopes. As height is gained, the vegetation

transitions into **PB2 Upland blanket bog** and **HH1 Dry siliceous heath**, depending on steepness of slope and drainage. *C. vulgaris* is dominant in both habitats here, with a dense understorey of pleurocarpous mosses and *Sphagnum* spp., the areas of blanket bog being differentiated primarily by the presence of *Eriophorum vaginatum*. At altitudes above 500 m on these slopes, there is much **HH4 Montane heath**, characterised by *C. vulgaris* and *Racomitrium lanuginosum*.

2.4 Curraheen Glen is a *c.*4.5 km long U-shaped valley that runs northeast from the summit of Baurtregaum. The floor and walls of the valley are covered mainly with **HH1 Dry siliceous heath**, **PB2 Upland blanket bog** and **GS3 Dry-humid acid grassland**, with **HH3 Wet heath** in the lower reaches of the valley and **HH4 Montane heath** in the higher parts of the valley. Coumbrack Lake, a small **FL2 Acid oligotrophic lake** is located near the head of the valley. Small patches of **PF1 Rich fen and flush**, characterised by the presence of *Drepanocladus revolvens*, *Carex panicea* and *Carex viridula* subsp. *oedocarpa*, are found in the lower reaches of the valley. There are extensive areas of sparsely vegetated **ER1 Exposed siliceous rock**, characterised by *Saxifraga spathularis*, along the valley walls. **ER2 Exposed calcareous rock** outcrops at a number of points within the Curraheen Glen, the greatest extent occurring at Gormagh. Here, the vegetation is characterised by the ferns *Cystopteris fragilis* and *Asplenium trichomanes* and a range of calcicolous bryophyte species. These cliffs also support tall-herb vegetation, characterised by *Angelica sylvestris*, *Succisa pratensis*, *Primula vulgaris* and *Festuca rubra*, and extensive stands of **FP2 Non-calcareous springs**, defined by *Philonotis fontana* and *Saxifraga stellaris*. There are some stands of hepatic mat vegetation on the north-facing slopes above Coumbrack Lake, containing characteristic species including *Bazzania pearsonii* and *Scapania ornithopodioides*.

2.5 Similar to Curraheen, Derrymore Glen runs from the northern margin of the site to the highest summits. The vegetation of the valley floor is primarily **GS3 Dry-humid acid grassland**, **PB2 Upland blanket bog** and **PF2 Poor fen and flush**. There are three **FL2 Acid oligotrophic lakes** located at various levels on the valley floor. A small area of species-rich *Nardus* grassland, characterised by a high cover of forb species, such as *Thymus polytrichus*, occurs beside the lowest of these lakes. The walls of the valley support **HH1 Dry siliceous heath** and **HH3 Wet heath** at lower altitudes, transitioning into **HH4 Montane heath** higher up the valley. There are extensive patches of **ER3 Siliceous scree** on the higher slopes of the valley, below the summit of Gearhane, on which *Hymenophyllum wilsonii*, *Racomitrium lanuginosum* and a wide range of bryophytes grow. **ER1 Exposed siliceous rock** occurs mainly around the top end of the valley, supporting a variety of species, including *Saxifraga spathularis*, *H. wilsonii* and numerous moss and liverwort species. Outcropping **ER2 Exposed calcareous rock** is occasional, and is dominated by the cushion forming mosses *Anoectangium aestivum* and *Amphidium mougeotii*, alongside the vascular species *Cystopteris fragilis* and *Saxifraga rosacea*. Much hepatic mat vegetation occurs on the upper slopes of the valley, with *Mastigophora woodsii* particularly prominent.

2.6 The highest area of the site, from Glanbrack Mountain in the east to the fort at Caherconree in the west, and along the northern ridges of Scragg and Gearhane, is vegetated by an almost

continuous swathe of **HH4 Montane heath**. At the eastern end of the main ridge, there is an area akin to fellfield with very sparse vegetation characterised by *Thymus polytrichus, Oligotrichum hercynicum* and *Nardia scalaris*. Elsewhere along this ridge, and on the other ridges radiating out from the highest peaks, the montane heath vegetation is dominated by *Calluna vulgaris*. It is lichen-rich in places, with species including *Cetraria islandica* and a number of *Cladonia* spp., such as *Cladonia arbuscula* and *Cladonia ciliata*. *Juncus squarrosus* is prominent throughout this montane heath vegetation, particularly in the areas to the west of the summit of Caherconree. In the highly exposed area around the summits of Baurtregaum and Caherconree, and along the ridge from Caherconree to Gearhane, there is little *C. vulgaris* and much **ER3 Siliceous scree and loose rock**. Species of arctic-montane distribution, particularly *Carex bigelowii* and *Salix herbacea*, are frequent in these areas, often in association with a sparse cover of graminoid and bryophyte species.

2.7 The area south of the summits is characterised by rolling river valleys and steep spurs. This area is extensively burnt in places, and the vegetation is primarily **HH3 Wet heath**, particularly on the lower slopes, characterised by *Calluna vulgaris*, *Molinia caerulea* and *Ulex gallii*. On the steeper slopes above this, there is much **HH1 Dry siliceous heath** vegetation, characterised by *C. vulgaris*, *Erica cinerea* and pleurocarpous mosses, such as *Hylocomium splendens* and *Thuidium tamariscinum*. Where the dry heath is burnt, there is an abundance of *Campylopus introflexus*. **PB2 Upland blanket bog**, characterised by *C. vulgaris, Eriophorum vaginatum*, pleurocarpous mosses and *Sphagnum* spp. occurs at medium altitudes where the slope is less steep, and is often rich in liverwort species including *Anastrepta orcadensis*, *Barbilophozia floerkei* and *Ptilidium ciliare*.

2.8 A broad slope sweeps down to the west of the ridge from Caherconree to Gearhane. The upper parts of this slope are primarily **HH4 Montane heath**, dominated by *Calluna vulgaris*, *Vaccinium myrtillus* and *Racomitrium lanuginosum.* In places close to the top of the ridge, there are no dwarf shrubs present, with *R. lanuginosum* and *Carex bigelowii* forming a continuous cover. Further down the slope, there are areas of **GS3 Dry-humid acid grassland**, which is species-rich in places, containing a high proportion of forb species such as *Thymus polytrichus*, *Prunella vulgaris* and *Lotus corniculatus.* Patches of **ER3 Siliceous scree** are scattered across this slope, the sparse vegetation characterised by *Saxifraga spathularis*, *R. lanuginosum* and a range of small bryophyte species. As the slope levels off, **PB2 Upland blanket bog**, characterised by *C. vulgaris* and *Eriophorum vaginatum*, becomes the primary vegetation type, interspersed with extensive areas of **PF2 Poor fen and flush**, dominated by *Juncus effusus* and *Sphagnum fallax*, and **GS4 Wet grassland**. On the lower reaches of this slope, there is an area of **PF3 Transition mire and quaking bog** characterised by *Menyanthes trifoliata* and a number of *Carex* spp. including *Carex dioica*, *Carex echinata* and *Carex nigra.* There is an area of **WN1 Oak-birch-holly woodland** in a river valley at Glendine.

Moanlaur ridge

2.9 At Beheenagh, the site is bisected by the Camp to Aughils road, west of which the Moanlaur ridge rises. There is a small corrie at Coumastabla to the northwest of the ridge, within which there are areas of **ER3 Siliceous scree and loose rock** and **ER1 Exposed siliceous rock**,

characterised by *Saxifraga spathularis*, *Polypodium vulgare*, *Hymenophyllum wilsonii* and *Isothecium myosuroides*. The slopes and ridge top to the west of Coumastabla are dominated primarily by **PB2 Upland blanket bog**, characterised by *Calluna vulgaris* and *Eriophorum vaginatum*, which has been impacted at its edges by peat cutting. West of this area, the vegetation transitions into **HH3 Wet heath** on the lower slopes, characterised by *C. vulgaris*, *Molinia caerulea* and *Schoenus nigricans*. There are small areas of **HH4 Montane heath**, characterised by *C. vulgaris* and *Racomitrium lanuginosum* on the summit of Moanlaur and adjacent peaks. The area south of the ridge consists of a number of valleys and broad spurs, clothed with **HH3 Wet heath**, characterised by *C. vulgaris*, *M. caerulea*, *Ulex gallii* and *Trichophorum germanicum*. The western end of the ridge, above Inch is vegetated primarily with **HH1 Dry siliceous heath**, characterised by abundant *C. vulgaris* and, on north-facing slopes, *Sphagnum capillifolium*. There is much *U. gallii* and extensive areas of **HD1 Dense bracken** on the lower western slopes. Intensive burning has taken place at the western end of the ridge and along the southern slopes.

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

Habitat statistics

2.11 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 1-16).

2.12 The most abundant habitat within a polygon is termed the primary habitat. The primary Fossitt habitat types for Slieve Mish 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.

2.13 A total of 47 Fossitt (2000) habitats were recorded during this survey within Slieve Mish Mountains cSAC and details of their coverage are presented in Table 2. **HH3 Wet heath** was the most extensive habitat covering 47.4% of the site, followed by **PB2 Upland blanket bog** at 19.5%, **HH1 Dry siliceous heath** at 11.4%, **HH4 Montane heath** at 5.5% and **GS3 Dry-humid acid grassland** at 4.5%.

Table 2: Extent of Fossitt habitats within Slieve Mish Mountains cSAC.

Fossitt code	Habitat	Area (ha)	% of site
BL1	Stone walls and other stonework	4.6	0.05
BL2	Earth banks	0.4	0.004
BL3	Buildings and artificial surfaces	10.3	0.1
ED1	Exposed sand, gravel or till	25.1	0.3
ED2	Spoil and bare ground	39.0	0.4
ED3	Recolonising bare ground	6.2	0.06
ER1	Exposed siliceous rock	0.4	0.004
ER2	Exposed calcareous rock	52.7	0.5
ER3	Siliceous scree and loose rock	2.9	0.03
ER4	Calcareous scree and loose rock	258.8	2.6
FL1	Dystrophic lakes	0.2	0.002
FL2	Acid oligotrophic lakes	1.0	0.01
FL8	Other artificial lakes and ponds	2.4	0.02
FP2	Non-calcareous springs	0.06	0.0006
FS1	Reed and large sedge swamps	7.0	0.07
FS2	Tall-herb swamps	0.2	0.002
FW1	Eroding/upland rivers	23.0	0.2
FW4	Drainage ditches	0.04	0.0004
GA1	Improved agricultural grassland	1.9	0.02
GA2	Amenity grassland (improved)	0.3	0.003
GS1	Dry calcareous and neutral grassland	0.01	0.0001
GS3	Dry-humid acid grassland	445.2	4.5
GS4	Wet grassland	98.1	1.0
HD1	Dense bracken	172.9	1.8
HH1	Dry siliceous heath	1119.3	11.4
HH2	Dry calcareous heath	0.007	0.00007
HH3	Wet heath	4640.7	47.4
HH4	Montane heath	539.3	5.5
PB2	Upland blanket bog	1912.2	19.5
PB3	Lowland blanket bog	7.2	0.07
PB4	Cutover bog	0.5	0.005
PB5	Eroding blanket bog	12.4	0.1
PF1	Rich fen and flush	31.2	0.3
PF2	Poor fen and flush	304.4	3.1
PF3	Transition mire and quaking bog	1.1	0.01
WD1	(Mixed) broadleaved woodland	0.2	0.002
WD2	Mixed broadleaved/conifer woodland	0.02	0.0002
WD4	Conifer plantation	2.8	0.03
WD5	Scattered trees and parkland	0.8	0.008
WL1	Hedgerows	0.3	0.003
WL2	Treelines	0.2	0.002
WN1	Oak-birch-holly woodland	9.9	0.1
WN2	Oak-ash-hazel woodland	1.4	0.01

Table 2: continued.

Fossitt code	Habitat	Area (ha)	% of site
WN6	Wet willow-alder-ash woodland	6.4	0.07
WS1	Scrub	47.9	0.5
WS2	Immature woodland	1.0	0.01
WS3	Ornamental / non-native shrubs	0.01	0.0001
	Total site area	9791.8	

Table 3: Extent of Annex I habitats within Slieve Mish Mountains cSAC. *denotes priority habitat.

Annex I code	Habitat	Area (ha)	% of site
3130	Upland oligotrophic lakes	2.2	0.02
3160	Dystrophic lakes	0.4	0.004
3260	Floating river vegetation	2.9	0.03
4010	Wet heath	4640.7	47.4
4030	Dry heath	1117.7	11.4
4060	Alpine and Boreal heath	417.1	4.3
6150	Siliceous alpine and boreal grasslands	39.6	0.4
*6230	Species-rich *Nardus* grasslands	1.0	0.01
6430	Hydrophilous tall herb communities	0.2	0.002
7130	Inactive blanket bog	10.4	0.1
*7130	Active blanket bog	1908.8	19.5
7140	Transition mires	1.05	0.01
7230	Alkaline fens	0.81	0.008
8110	Siliceous scree	80.0	0.8
8210	Calcareous rocky slopes	2.4	0.02
8220	Siliceous rocky slopes	32.0	0.3
91A0	Old oak woodlands	7.0	0.07
*91E0	Alluvial forests	1.6	0.02
	non-Annex I habitats	1525.9	15.6
	Total site area	9791.8	
	Total area of Annex I habitats	8265.9	84.4

Table 4: Extent of provisional vegetation communities within Slieve Mish Mountains cSAC.

Code	Provisional communities and sub-communities	Area (ha)	% of site	% of habitat
PO1	*Menyanthes trifoliata - Carex limosa* pool community			
PO1a	infilling pool sub-community	1.1	0.01	95.8
PO1b	aquatic sub-community	0.05	0.0005	4.2
SW1	*Potamogeton polygonifolius* soakway	1.3	0.01	100.0
SPG1	*Philonotis fontana - Saxifraga stellaris* spring			
SPG1a	typical sub-community	2.3	0.02	32.1
SPG1b	species-poor *Sphagnum denticulatum* sub-community	4.7	0.05	56.1
SPG2	*Anthelia julacea – Sphagnum inundatum* spring	0.1	0.001	1.3

Table 4: continued.

Code	Provisional communities and sub-communities	Area (ha)	% of site	% of habitat
PFLU1	*Carex nigra/echinata - Sphagnum denticulatum* flush	1.1	0.01	0.3
PFLU2	*Juncus effusus - Sphagnum cuspidatum/palustre* flush	215.6	2.2	61.5
PFLU3	*Juncus acutiflorus/effusus - Calliergonella cuspidata* flush	67.1	0.7	19.1
PFLU4	*Molinia caerulea - Sphagnum palustre* flush			
PFLU4a	typical sub-community	65.6	0.7	18.7
RFLU1	*Carex viridula oedocarpa - Pinguicula vulgaris - Juncus bulbosus* flush			
RFLU1a	brown moss sub-community	0.5	0.006	1.7
RFLU1b	species-poor sub-community	30.4	0.3	97.4
RFLU4	*Schoenus nigricans - Scorpidium scorpioides* flush	0.3	0.003	0.9
UG1	*Agrostis capillaris – Festuca ovina* upland grassland			
UG1a	typical sub-community	149.3	1.5	31.6
UG1b	*Sphagnum* spp. sub-community	15.8	0.2	3.3
UG1c	species-rich sub-community	0.2	0.002	0.05
UG1d	*Juncus squarrosus* sub-community	29.5	0.3	6.3
UG2	*Nardus stricta – Galium saxatile* upland grassland			
UG2a	typical sub-community	94.8	1.0	20.1
UG2b	*Sphagnum* spp. sub-community	36.8	0.4	7.8
UG2c	species-rich sub-community	0.7	0.008	0.2
UG2d	*Juncus squarrosus* sub-community	117.7	1.2	24.9
UG4	*Molinia caerulea – Anthoxanthum odoratum* wet grassland	27.6	0.3	5.8
BK1	*Pteridium aquilinum* community	172.9	1.8	100
DH1	*Ulex gallii - Erica cinerea* dry heath	151.0	1.5	13.5
DH3	*Calluna vulgaris – Erica cinerea* dry heath	669.1	6.8	59.9
DH4	*Calluna vulgaris – Sphagnum capillifolium* dry /damp heath	277.4	2.8	24.8
DH5	*Calluna vulgaris – Antennaria dioica* heath	0.007	0.00007	0.0006
DH6	*Calluna vulgaris – Vaccinium myrtillus* dry heath	19.6	0.2	1.8
WH1	*Schoenus nigricans – Erica tetralix* wet heath			
WH1a	continuous cover sub-community	60.5	0.6	1.3
WH1b	open sub-community	30.7	0.3	0.7
WH2	*Trichophorum germanicum – Cladonia* spp. *– Racomitrium lanuginosum* wet heath	1.4	0.01	0.03
WH3	*Calluna vulgaris – Molinia caerulea – Sphagnum capillifolium* wet/damp heath	1980.5	20.2	43.1
WH4	*Trichophorum germanicum – Eriophorum angustifolium* wet heath			
WH4a	typical sub-community	283.0	2.9	10.8
WH4b	*Calluna vulgaris* sub-community	810.7	8.3	34.7
WH4c	*Juncus squarrosus* sub-community	25.9	0.3	1.7
WH5	*Trichophorum germanicum – Nardus stricta – Racomitrium lanuginosum* montane wet heath	51.4	0.5	3.4
WH6	*Schoenus nigricans – Molinia caerulea – Myrica gale* wet heath	5.2	0.05	0.4
WH7	*Molinia caerulea – Ulex gallii* wet heath	1391.3	14.2	90.0
MH1	*Calluna vulgaris – Racomitrium lanuginosum* montane heath			
MH1a	typical sub-community	138.8	1.4	25.8
MH1b	*Juncus squarrosus* sub-community	238.1	2.4	44.2
MH2	*Vaccinium myrtillus – Racomitrium lanuginosum – Herbertus aduncus* montane heath	10.5	0.1	1.9

Table 4: continued.

Code	Provisional communities and sub-communities	Area (ha)	% of site	% of habitat
MH3	*Vaccinium myrtillus – Rhytidiadelphus loreus – Anthoxanthum odoratum* montane heath	29.5	0.3	5.5
MH5	*Nardus stricta – Carex binervis – Racomitrium lanuginosum* montane grass-heath	77.4	0.8	14.4
MH6	*Carex bigelowii – Racomitrium lanuginosum* montane vegetation			
MH6a	typical sub-community	16.2	0.2	3.0
MH6c	*Juncus squarrosus* sub-community	12.1	0.1	2.3
MH6d	*Deschampsia flexuosa* sub-community	0.03	0.0003	0.006
MH7	*Nardus stricta – Carex bigelowii* montane vegetation			
MH7a	typical sub-community	1.9	0.02	0.4
MH7c	*Juncus squarrosus* sub-community	9.3	0.1	1.7
MH8	*Festuca vivipara – Thymus polytrichus – Galium saxatile* montane vegetation	5.1	0.05	1.0
BB1	*Schoenus nigricans – Eriophorum angustifolium bog*			
BB1a	continuous cover sub-community	6.7	0.07	0.4
BB2	*Schoenus nigricans – Sphagnum* spp. bog	0.2	0.002	0.01
BB3	*Eriophorum vaginatum – Sphagnum papillosum* bog	66.1	0.7	3.5
BB4	*Trichophorum germanicum – Eriophorum angustifolium* bog	130.0	1.3	6.8
BB5	*Calluna vulgaris – Eriophorum* spp. Bog			
BB5a	typical sub-community	1576.6	16.1	82.9
BB5b	*Juncus squarrosus* sub-community	122.3	1.2	6.4
BB6	*Eriophorum angustifolium – Juncus squarrosus* bog			
BB6a	typical sub-community	0.5	0.005	0.02
BB6b	arctic-alpine sub-community	0.3	0.003	0.02
HW1	*Sphagnum denticulatum/cuspidatum* hollow			
HW1i	upland variant	6.1	0.06	16.2
HW1iii	flush variant	17.7	0.2	47.1
HW2	*Eriophorum angustifolium – Sphagnum fallax* hollow			
HW2i	upland variant	10.4	0.1	27.7
HW2ii	lowland variant	0.01	0.0001	0.03
HW4	*Eleocharis multicaulis* hollow			
HW4i	bog variant	0.3	0.003	0.7
HW4ii	flush variant	3.1	0.03	8.2
DP1	*Campylopus introflexus – Polytrichum* spp. degraded peat community	6.1	0.06	99.1
DP2	*Nardus stricta – Eriophorum angustifolium* degraded peat community	0.05	0.0005	0.9
TH1	*Luzula sylvatica – Vaccinium myrtillus* tall herb vegetation			
TH1i	rock face variant	0.9	0.009	33.8
TH1ii	dry heath variant	1.5	0.02	58.0
TH3	*Sedum rosea – Angelica sylvestris* tall herb vegetation	0.2	0.002	8.2
SC1	Siliceous scree community	3.8	0.04	100
RS1	*Saxifraga spathularis – Asplenium adiantum-nigrum* rock cleft community	1.6	0.02	95.1
RS2	*Saxifraga aizoides – Asplenium* spp. – *Orthothecium rufescens* rock cleft community	0.08	0.0009	4.9

Table 4: continued.

Code	Provisional communities and sub-communities	Area (ha)	% of site	% of habitat
HM1	*Calluna vulgaris – Scapania gracilis* hepatic mat			
HM1i	non-Annex I grassland variant	0.1	0.001	6.2
HM1iii	dry heath variant	0.3	0.003	18.0
HM1iv	wet heath variant	0.005	0.00005	0.3
HM1v	montane heath variant	0.05	0.0005	3.0
HM1vi	non-Annex I siliceous rock variant	0.04	0.0004	2.2
HM1vii	Annex I siliceous rock variant	0.07	0.0007	4.4
HM1viii	siliceous scree variant	0.1	0.001	6.5
HM1ix	upland bog variant	0.003	0.00003	0.2
HM1xi	siliceous loose rock variant	0.04	0.0004	2.3
HM2	*Calluna vulgaris – Herbertus aduncus* hepatic mat			
HM2i	non-Annex I grassland variant	0.2	0.002	11.0
HM2iii	dry heath variant	0.3	0.003	18.8
HM2iv	wet heath variant	0.04	0.0004	2.4
HM2v	montane heath variant	0.08	0.0008	4.7
HM2vi	non-Annex I siliceous rock variant	0.003	0.00003	0.2
HM2vii	Annex I siliceous rock variant	0.1	0.001	5.7
HM2viii	siliceous scree variant	0.2	0.002	10.9
HM2ix	upland bog variant	0.04	0.0004	2.4
HM2xi	siliceous loose rock variant	0.01	0.0001	0.8
	Total area of vegetation communities	9288.6	94.9	
	Not covered	78.0	0.8	
	Non-vegetation cover types	425.1	4.3	
	Total site area	9791.8		

2.14 A total of 18 Annex I habitats were recorded during this survey within Slieve Mish Mountains cSAC, covering 84.4% of the site (Table 3). The main Annex I habitat was **4010 Wet heaths** which covered 47.4% of the site, followed by ***7130 Active blanket bogs** and **4030 Dry heaths** which covered 19.5% and 11.4% of the site respectively. The next most frequent habitat was **4060 Alpine and Boreal heaths** at 4.3%. 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.

2.15 A total of 89 provisional upland vegetation communities and sub-communities (Perrin *et al.*, 2014) were recorded within Slieve Mish Mountains cSAC. Details of their coverage are presented in Table 4.

2.16 Gradated maps displaying the cover of Annex I habitats currently assessed under the NSUH plus **6150 Siliceous alpine and boreal grassland** and **6430 Hydrophilous tall herb communities** are shown in Figs. 4a-m. 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

2.17 Rare and notable plant records for the site are listed in Table 5 and their locations, where accurately known, are presented in Figs. 5a-b. 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, Annex II of the Habitats Directive and/or the relevant Red Data List. For vascular plants this is Curtis & McGough (1988) and for bryophytes it is Lockhart *et al*. (2012). For lichens a preparatory list provided by D. McFerran, National Museums Northern Ireland was used; this is very much provisional and IUCN status has not been assigned to these species. Notable records comprise plants which are not rare but are of particular interest in an upland context.

2.18 Several arctic-alpine species were recorded during the survey. *Carex bigelowii*, *Cetraria islandica* and *Salix herbacea* were noted from stations from the ridge of Glanbrack Mountain west to the high peaks of Baurtregaum and Caherconree and south along the spur at Ballyarkane Oughter. The discovery of *Diphasiastrum alpinum* on the high slopes north of Baurtregaum is of particular significance as this is only the second record of the species in Co. Kerry since 1874, after it was found in Killarney National Park by the NSUH in 2011.

2.19 *Saxifraga rosacea* subsp. *rosacea* has been recorded at several locations within the site since the late nineteenth century, including Baurtregaum, Caherconree, the Gormagh cliffs, Curraheen Glen and near Derrymore Lough. This survey found the species at these locations and added new stations at the east-facing cliffs near Lough Ablockaun and in a stream valley at Commons. *Poa alpina* was found close to the summit of Baurtregaum in 2009, but could not be relocated during this survey.

2.20 *Trichomanes speciosum* also occurs within the site and was refound during the present study. Details of this species are included in Table 5 but it is not been mapped as the location is considered sensitive data. Two other red-listed vascular plant species have previously been recorded within or close to the boundary of the site. *Stachys officinalis* has been recorded adjacent to the cSAC, on the roadside north-east of Knockbrack. Old records (1890, 1914) exist for *Mentha pulegium* near Aughils.

2.21 Other previous vascular plant records include *Carum verticillatum,* recorded from the entrance to Scotia's Grave, and *Sibthorpia europaea*, recorded at the disused Tralee waterworks (Wyse Jackson & Wyse Jackson, 1994) and other locations on the northern fringes of the site. It was refound during the present survey near the waterworks and also noted in flush systems at Commons.

2.22 One of the most significant bryophyte records made during the survey was of *Encalypta ciliata*, a Critically Endangered species previously only known from the Galtee Mountains and Antrim. It was found on the species-rich calcareous cliffs at Gormagh. In a spring near this location *Pohlia wahlenbergii* var. *glacialis* was recorded. This taxon has only a single accepted Irish record (Benbulbin, Sligo, in 1963) and is listed as Regionally Extinct. However, as discussed by Lockhart *et al.* (2012), it appears to be "merely a large, luxuriant, montane form of *P. wahlenbergii* with wider leaf cells."

2.23 A number of other new vice-county bryophyte records were made during the survey including: *Anastrophyllum minutum*, *Bryoerythrophyllum ferruginascens*, *Drepanocladus revolvens*, *Grimmia trichophylla*, *Gymnocolea inflata*, *Lophozia sudetica*, *Pohlia cruda*, *Sphagnum contortum*, *Sphagnum russowii* and *Sphagnum squarrosum*. *Scapania ornithopodioides*, which is listed as Vulnerable, was noted in Derrymore and on the cliffs at Gormagh. *Bazzania pearsonii*, also Vulnerable, was found near the top of Curraheen Glen and near Caherconree. Several bryophytes with Near Threatened status were also recorded.

2.24 In 2009, during a British Bryological Society field meeting which included a visit to the upper Curraheen River and the Gormagh cliffs, *Radula carringtonii, Scapania ornithopodioides* and *Moerckia hibernica* were recorded. *Heterocladium wulfsbergii* has been found in Barnanageehy corrie (Bosanquet & Preston, 2010).

2.25 Several rare lichens that appear on the provisional Red Data List have previously been recorded from Slieve Mish. During a LichenIreland survey in 2007, *Leptogium brebissonii, Lobaria scrobiculata, Pannaria conoplea, Parmeliella parvula, Sticta limbata* and *Sticta sylvatica* were recorded from the area north of Ballyarkane Oughter and *Sticta sylvatica* and *Hypotrachyna sinuosa* from the area between Knockbrack and Ballyarkane Oughter. During the NSUH survey the red-listed *Sticta fuliginosa* was found at Beheenagh. *Cetraria muricata*, a new vice-county record, was found in siliceous scree on Gearhane.

Table 5: Records of rare and notable plant species from Slieve Mish Mountains cSAC.

Species	Red Data List	FPO	Annex II	Year of record (s)	NSUH	Previous records
Vascular plants						
Carex bigelowii	-	-	-	*c.* 1882, *c.* 1889, 2014	•	3, 4, 5, 9
Carum verticillatum	-	-	-	1890, 1997	-	1, 3
Cochlearia officinalis subsp. *pyrenaica*	-	-	-	-	-	3, 4
Cystopteris fragilis	-	-	-	*c.* 1882, 1888, 2005, 2014	•	1, 3, 4, 5, 10
Deschampsia cespitosa subsp. *alpina*	-	-	-	*c.* 1882	-	3, 4, 5
Dactylorhiza maculata subsp. *ericetorum*‡	-	-	-	2005	-	1
Diphasiastrum alpinum	-	-	-	2014	•	-
Festuca filiformis	-	-	-	2005	-	1
Mentha pulegium†	VU	•	-	1890, 1914	-	1
Ophioglossum vulgatum	-	-	-	2014	•	-
Oreopteris limbosperma	-	-	-	1997	-	1, 3, 4
Oxyria digyna	-	-	-	1888, 1892	-	3, 10
Poa alpina	RA	-	-	2009	-	1
Salix herbacea	-	-	-	*c.* 1882, *c.* 1889, 1987, 1999, 2005, 2014	•	1, 3, 4, 5, 9
Saxifraga rosacea subsp. *rosacea*	-	-	-	*c.* 1882, 1888, 1890, 1908, 1984, 1994, 2005, 2014	•	1, 3, 4, 5, 10
Saxifraga x *polita*	-	-	-	1997	-	1
Sibthorpia europaea	RA	-	-	1840, 1890, 1891, 1898, 1899, 1907, 1986, 1993, 1997, 1998, 2005, 2014	•	1, 2, 3, 4

Table 5. continued.

Species	Red Data List	FPO	Annex II	Year of record (s)	NSUH	Previous records
Sisyrinchium bermudiana	-	-	-	1996	-	1
Stachys officinalis	VU	•	-	*c*. 1889, 1995-1996, 1998	-	1, 2, 3, 4, 9
Trichomanes speciosum‡	RA	•	•	1997, 2011, 2013	-	1, 2, 3, 4, 6
Wahlenbergia hederacea	-	-	-	1997, 1998	-	1, 3, 4
Bryophytes						
Acrobolbus wilsonii	VU	-	-	1950	-	1, 3, 4, 7, 12
*Anastrophyllum minutum**	-	-	-	2014	•	-
Barbilophozia barbata	CR	-	-	1898	-	1, 7, 12
Bazzania pearsonii	VU	-	-	2006, 2009, 2014	•	1, 7
*Bryoerythrophyllum ferruginascens**	-	-	-	2014	•	-
Campylopus schimperi	RE	-	-	1899	-	1, 7, 12
Campylopus subulatus	VU	-	-	1949	-	1, 7, 12
Dichodontium flavescens	-	-	-	2014	•	-
*Distichium capillaceum**	-	-	-	2014	•	-
Douinia ovata	NT	-	-	2014	•	-
*Drepanocladus revolvens**	-	-	-	2014	•	-
Dumortiera hirsuta	NT	-	-	2006, 2014	•	1
*Encalypta ciliata**	CR	-	-	2014	•	-
Grimmia ramondii	NT	-	-	2006, 2014	•	1
Grimmia torquata	NT	-	-	2014	•	-
*Grimmia trichophylla**	-	-	-	2014	•	-
*Gymnocolea inflata**	-	-	-	2014	•	-
Hageniella micans	NT	-	-	1950, 1951		3, 4, 12
Heterocladium heteropterum var. *heteropterum**	-	-	-	2014	•	-
Heterocladium wulfsbergii	NT	-	-	2006, 2009	-	1, 11
Hylocomiastrum umbratum	NT	-	-	2014	•	-
Isothecium holtii	-	-	-	2014	•	-
Jungermannia exsertifolia subsp. *cordifolia*	-	-	-	2014	•	-
Kurzia sylvatica	NT	-	-	2014	•	-
Lejeunea eckloniana	NT	-	-	1950	-	1, 3, 4, 12
Lejeunea flava subsp. *moorei*	VU	-	-	1899	-	1, 3, 4, 12
*Lophozia sudetica**	-	-	-	2014	•	-
Marchantia polymorpha var. *polymorpha**	-	-	-	2014	•	-
Marsupella emarginata var. *aquatica**	-	-	-	2014	•	-
Mastigophora woodsii	NT	-	-	1950, 2005, 2006, 2009, 2014	•	1, 7, 12
Metzgeria leptoneura	NT	-	-	2014	•	-
Moerckia hibernica	DD	-	-	2009, 2014	•	1, 7, 11
Paraleptodontium recurvifolium	NT	-	-	2006, 2014	•	1, 7
Plagiothecium denticulatum var. *obtusifolium*	NT	-	-	2006	-	1
Platyhypnidium lusitanicum	NT	-	-	2014	•	-
*Pohlia cruda**	-	-	-	2014	•	-
Pohlia wahlenbergii var. *glacialis**	RE	-	-	2014	•	-
Radula carringtonii	NT	-	-	2009, 2014	•	1, 7, 11
Radula voluta	-	-	-	2014	•	-

Table 5. continued.

Species	Red Data List	FPO	Annex II	Year of record (s)	NSUH	Previous records
Rhabdoweisia crispata	NT	-	-	2014	•	-
Scapania aequiloba	-	-	-	2014	•	-
Scapania ornithopodioides	VU	-	-	2009, 2014	•	1, 7, 11
Scapania scandica	-	-	-	2014	•	-
Scapania subalpina	DD	-	-	1890, 1899	-	1
Schistidium strictum	NT	-	-	2006, 2014	•	1
Solenostoma sphaerocarpum	NT	-	-	1899	-	1
Sphagnum angustifolium	-	-	-	2014	•	-
Sphagnum capillifolium subsp. *capillifolium*	DD	-	-	2014	•	-
*Sphagnum contortum**	-	-	-	2014	•	-
*Sphagnum russowii**	NT	-	-	2014	•	-
*Sphagnum squarrosum**	-	-	-	2014	•	-
Tetrodontium brownianum	NT	-	-	2014	•	-
Trichostomum hibernicum	-	-	-	2014	•	-
Zygodon rupestris	-	-	-	2014	•	-
Lichens						
Cetraria islandica	-	-	-	2014	•	-
*Cetraria muricata**	-	-	-	2014	•	-
Cladonia rangiferina	•	-	-	-	-	4
Leptogium brebissonii	•	-	-	2007	-	1, 8
Lobaria scrobiculata	•	-	-	2007	-	1, 8
Pannaria conoplea	•	-	-	2007	-	1, 8
Parmeliella parvula	•	-	-	2007	-	1, 8
Sticta fuliginosa	•	-	-	2014	•	-
Sticta limbata	•	-	-	2007	-	1, 8
Sticta sylvatica	•	-	-	2007	-	1, 8

* Denotes new or updated vice county record from NSUH fieldwork

† Occurs just outside the site

‡ Location considered sensitive data and omitted from Fig. 5

Previous records:
1, NPWS Recorder database and associated data
2, Natura 2000 Standard Data Form
3, cSAC site synopsis (2000)
4, NPWS Conservation Statement (2009)
5, Hart (1882)
6, Ní Dhúill (unpublished data)
7, Lockhart *et al.* (2012)
8, LichenIreland database
9, Scully (1889)
10, Scully (1916)
11. Bosanquet & Preston (2010)
12. Stewart, undated

Red Data List:
RE, Regionally Extinct
CR, Critically Endangered
VU, Vulnerable
RA, Rare
NT, Near Threatened
DD, Data Deficient

2.26 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.

2.27 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

2.28 Faunal records during this survey include Golden Plover (*Pluvius apricaria*), Wheatear (*Oenanthe oenanthe*), Red Grouse (*Lagopus lagopus*), Cuckoo (*Cuculus canorus*), Snipe (*Gallinago gallinago*), Stonechat (*Saxicola torquata*), Skylark (*Alauda arvensis*), Kestrel (*Falco tinnunculus*), Chough (*Pyrrhocorax pyrrhocorax*), Hen Harrier (*Circus cyaneus*), Irish Hare (*Lepus timidus hibernicus)*, Fox (*Vulpes vulpes*), Feral Goat (*Capra hircus*), Rabbit (*Oryctolagus cuniculus*), Common Lizard (*Zootoca vivipara*), Common Frog (*Rana temporaria*), Kerry Slug (*Geomalacus maculosus*), Hummingbird Hawkmoth (*Macroglossum stellatarum*) and Emperor Moth (*Saturnia pavonia*).

2.29 Previous records of other fauna for the site include Trout (*Salmo trutta*), Peregrine (*Falco peregrinus*) and Raven (*Corvus corax*).

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 92 monitoring stops were recorded within Slieve Mish Mountains cSAC for this purpose (Fig. 6 and Table 6); 10 additional relevés were recorded in habitats that were not assessed. The future prospects parameter examines the current impacts to 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 heaths	35
4030	Dry heaths	12
4060	Alpine and Boreal heaths	9
*6230	Species-rich *Nardus* grasslands	2
*7130/7130	Blanket bogs	17
7140	Transition mires	2
7230	Alkaline fens	1
8110	Siliceous scree	5
8210	Calcareous rocky slopes	4
8220	Siliceous rocky slopes	5

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 The Slieve Mish Mountains cSAC is dominated by commonage with these areas comprising 92.8 km^2 or 94.8% of the site. A baseline CFP survey of the majority of these areas occurred in 1999. An interim destocking level of 30% had been applied in Kerry prior to the CFP

commencing. This was then adjusted using available CFP results *c.*2002. A resurvey of all stations and a subset of subunits occurred in 2006. Results from this baseline survey are shown in Fig. 7. Only three agricultural units (KE7-B, KE7-Q and KE8-B) have been resurveyed, in 2008-2009. The condition of these units was found to have improved as the destocking assessment was reduced in each case (60.9% to 42.7%, 50.0% to 0.0% and 66.0% to 50.0%, respectively).

3.4 The CFP baseline survey recorded 107 subunits within or partially within Slieve Mish Mountains cSAC (Table 7). These indicate commonage within the site was in moderate condition at this time with 61.0% of the area being assessed as undamaged (U) but 20.5% of the area being assessed as moderately to severely damaged (MS) or worse.

Table 7: Frequency of CFP subunit damage levels in Slieve Mish Mountains cSAC baseline survey.

Damage level	**Frequency (*n* =107)**	**Area %**
U	26 (24.3%)	61.0
MU	18 (16.8%)	6.2
MM	20 (18.7%)	12.4
MS	22 (20.6%)	11.2
S/S*	21 (19.6%)	9.3

3.5 The CFP recorded 73 stations within Slieve Mish Mountains cSAC (Table 8). These indicate commonage within the site was in very poor condition at this time with only 35.6% of stations being undamaged (U) and 41.1% of stations being moderately to severely damaged (MS) or worse.

Table 8: Frequency of CFP station damage level in Slieve Mish Mountains cSAC baseline survey. Percentages indicate proportion of stations within each column.

Damage level	**Wet heath/Dry heath/ Blanket bog (*n* = 71)**	**Upland grassland (*n* = 2)**	**All habitats (*n* = 73)**
U	26 (36.6%)	0 (0.0%)	26 (35.6%)
MU	7 (9.9%)	2 (100.0%)	9 (12.3%)
MM	8 (11.3%)	0 (0.0%)	8 (11.0%)
MS	10 (14.1%)	0 (0.0%)	10 (13.7%)
S/S*	20 (28.2%)	0 (0.0%)	20 (27.4%)

3.6 Summary data for some of the key indicators recorded at CFP stations are compared with NSUH data in Table 9. They suggest that there has been a decrease in the area of bare peat, an increase in sward height and an increase in *Calluna* height. However, the data also suggest a decrease in *Calluna* cover.

Table 9: Mean values for key indicators from CFP stations in Slieve Mish Mountains cSAC, baseline survey (1999) with related data from the NSUH survey (2014).

	Wet heath/Dry heath/ Blanket bog		**Upland grassland and other habitats**
	CFP (*n* = 69-71)	**NSUH** (*n* = 74)	**CFP** (*n* = 2)
Bare peat cover (%)	4.3	2.5	0.0
Sward height (cm)	13.1	19.7	6.0
Calluna height (cm)	11.6	18.7†	-
Calluna cover			
D (>50%)	29 (40.8%)	17 (23.0%)	-
A (26-50%)	25 (35.2%)	21 (28.4%)	-
F (5-25%)	12 (16.9%)	25 (33.8%)	-
O (<5%)	4 (5.6%)	11 (14.9%)	-
Absent	1 (1.4%)	0 (0.0%)	-

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

3.7 The analysis of key indicator values is rather inconclusive and as there has been no extensive CFP resurvey of this site it not possible to derive much information on trends from the other data. However, the fact that reduction of stock numbers occurred in over 39% of the commonage may, in itself, be seen as a positive trend for **4010 Wet heaths**, **4030 Dry heaths** and ***7130/7130 Blanket bogs** and other habitats where grazing has been recorded as an impact.

4010 Wet heaths

Area

3.8 Changes in the area of **4010 Wet heaths** were recorded for the period 1995 to 2014 through a combination of observations in the field and analysis of aerial photographs and online satellite imagery available (Table 10). Both losses and gains in habitat 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 main losses in area of **4010 Wet heaths** were due to erosion (1.01 ha), paths, tracks, cycling tracks (0.95 ha) and dispersed habitation (0.78 ha). The main gains in area of **4010 Wet heaths** (1.20 ha in total) were due to revegetated tracks throughout the habitat (0.92 ha) and recolonised disturbed or bare ground/peat (0.18 ha). All gains in area were recorded as species composition change (succession). 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.

Structure and functions

3.9 A total of 35 monitoring stops were recorded in **4010 Wet heaths** within the Slieve Mish Mountains cSAC (Table 11). In the assessment of structure and functions, 29 monitoring stops

failed one criterion or more. Following a review of the ecological condition of those stops, expert judgement determined that one should pass because the failure was marginal. This reduced the number of monitoring stops that failed to 28, resulting in an overall failure rate of 80.0%. The structure and functions of **4010 Wet heaths** were therefore assessed as Unfavourable – Bad.

Table 10: Impacts causing obvious changes in areas of 4010 Wet heaths, 1995-2014.

Impact code	Impact	Area (ha) 1995-2000	Area (ha) 2000-2005	Area (ha) 2005-2014	Area (ha) 1995-2014
C01	Mining and quarrying	-0.17	-0.02	-0.05	-0.24
C01.03	Peat extraction	-0.01	0.00	0.00	-0.01
D01.01	Paths, tracks, cycling tracks	-0.35	-0.55	-0.05	-0.95
E01.03	Dispersed habitation	0.00	-0.78	0.00	-0.78
E04	Structures, buildings in the landscape	0.00	-0.16	0.00	-0.16
G05	Other human intrusions and disturbances	-0.08	-0.21	0.00	-0.28
J02.07	Water abstractions from groundwater	-0.27	-0.13	0.00	-0.40
J02.12	Dykes, embankments, artificial beaches, general	-0.62	0.00	0.00	-0.62
K01.01	Erosion	-0.12	-0.89	0.00	-1.01
K02.01	Species composition change (succession)	+0.47	+0.10	+0.63	+1.20
L05	Collapse of terrain, landslide	-0.10	0.00	0.00	-0.10
All impacts		-1.24	-2.63	+0.54	-3.33
% of habitat		-0.03	-0.06	<+0.01	-0.07
% change per year		-0.01	-0.01	<+0.01	>-0.01

3.10 The vegetation composition of **4010 Wet heaths** was poor in many cases, with failures being recorded under eight criteria. In total, 45.7% of monitoring stops failed due to inadequate cover of positive indicator species, 42.9% failed due to inadequate cover of ericoid species and 34.3% failed due to inadequate cover of *Cladonia* spp., *Sphagnum* spp., *Racomitrium lanuginosum* and pleurocarpous mosses. A further 8.6% and 5.7% of monitoring stops failed due to excessive cover of non-native species in the local vicinity and within the monitoring stop respectively, while 5.7% of monitoring stops failed due to excessive cover of *Juncus effusus.* One monitoring stop (2.9%) failed due to excessive dwarf shrub cover and another (2.9%) due to excessive cover of *Pteridium aquilinum*.

3.11 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) appears to have overestimated the condition of the structure and functions of **4010 Wet heaths**. It stated that, where they were relatively undamaged, the **4010 Wet heaths** present within the site contained a good diversity of species and were rich in bryophytes. It also stated that, while some areas

had been damaged by overgrazing, a reasonable quantity of undamaged **4010 Wet heaths** remained. This is not consistent with the findings of the present study. The maintenance of this habitat at favourable conservation status was identified as one of the main conservation objectives for the site.

Table 11: Monitoring criteria and failure rates for 4010 Wet heaths (n = 35).

Criteria		Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition					
1	*Erica tetralix* present	20m radius	35	0	0
2	Cover of positive indicator species ≥ 50%	Relevé	35	16	45.7
3	Total cover of *Cladonia* species, *Sphagnum* species, *Racomitrium lanuginosum* and pleurocarpous mosses ≥ 10%	Relevé	35	12	34.3
4	Cover of ericoid species and *Empetrum nigrum* ≥ 15%	Relevé	35	15	42.9
5	Cover of dwarf shrub species < 75%	Relevé	35	1	2.9
6	Cover of the following negative indicator species: *Agrostis capillaris, Holcus lanatus, Phragmites australis, Ranunculus repens* collectively < 1%	Relevé	35	0	0
7	Cover of non-native species < 1%	Relevé	35	2	5.7
8	Cover of non-native species < 1%	Local vicinity	35	3	8.6
9	Cover of scattered native trees and scrub < 20%	Local vicinity	35	0	0
10	Cover of *Pteridium aquilinum* < 10%	Local vicinity	35	1	2.9
11	Cover of *Juncus effusus* < 10%	Local vicinity	35	2	5.7
Vegetation structure					
12	Crushed, broken and/or pulled up *Sphagnum* species < 10% of *Sphagnum* cover	Relevé	32	0	0
13	Last complete growing season's shoots of ericoids, *Empetrum nigrum* and *Myrica gale* showing signs of browsing collectively < 33%	Relevé	32	7	21.9
14	No signs of burning into the moss, liverwort or lichen layer, or exposure of peat surface due to burning	Local vicinity	35	11	31.4
15	No signs of burning inside boundaries of sensitive areas*	Local vicinity	25	8	32.0
Physical structure					
16	Cover of disturbed bare ground < 10%	Relevé	35	5	14.3
17	Cover of disturbed bare ground < 10%	Local vicinity	35	4	11.4
18	Area showing signs of drainage resulting from heavy trampling or tracking or ditches < 10%	Local vicinity	35	5	14.3

*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, haggs 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.

3.12 The vegetation structure of **4010 Wet heaths** was poor in many cases, with 32.0% of monitoring stops failing due to burning in sensitive areas and 31.4% failing due to burning in the bryophyte and lichen layer or peat exposure due to burning. Furthermore, 21.9% of monitoring stops failed due to excessive levels of grazing.

3.13 The physical structure of **4010 Wet heaths** was poor in some cases, with 14.3% and 11.4% of monitoring stops failing due to excessive cover of disturbed bare ground within the monitoring stop and in the local vicinity respectively. Finally, drainage, due to heavy trampling, tracking or ditches, resulted in the failure of 14.3% of monitoring stops.

Future prospects

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

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

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.01	Non-intensive cattle grazing	High	Negative	1.5%	Inside	-1.5	Imp
A04.02.02	Non-intensive sheep grazing	High	Negative	100%	Inside	-4.5	Imp
A04.02.03	Non-intensive horse grazing	Medium	Negative	<1%	Inside	-0.5	Ins
A05.02	Stock feeding	High	Negative	<1%	Inside	-0.75	Imp
C01	Mining and quarrying	High	Negative	<1%	Inside	-0.75	Ins
C01.03	Peat extraction	High	Negative	<1%	Inside	-0.75	Ins
D01.01	Paths, tracks, cycling tracks	High	Negative	<1%	Inside	-0.75	Ins
E01.03	Dispersed habitation	High	Negative	<1%	Inside	-0.75	Ins
E04	Structures, buildings in the landscape	High	Negative	<1%	Inside	-0.75	Ins
G01.02	Walking, horse-riding and non-motorised vehicles	Medium	Negative	<1%	Inside	-0.5	Ins
G01.03.02	Off-road motorised driving	Medium	Negative	<1%	Inside	-0.5	Ins
G05	Other human intrusions and disturbances	High	Negative	<1%	Inside	-0.75	Ins
H05.01	Garbage and solid waste	Medium	Negative	<1%	Inside	-0.5	Ins
I01	Invasive non-native species	Medium	Negative	1%	Inside	-1.0	Ins
I02	Problematic native species	Medium	Negative	8.6%	Inside	-1.0	Ins
J01.01	Burning down	High	Negative	9.8%	Inside	-1.5	Ins
J02.07	Water abstractions from groundwater	High	Negative	<1%	Inside	-0.75	Ins
J02.12	Dykes, embankments, artificial beaches, general	High	Negative	<1%	Inside	-0.75	Ins
K01.01	Erosion	High	Negative	1.4%	Inside	-1.5	Ins
K02.01	Species composition change (succession)	High	Positive	<1%	Inside	0.75	Ins
L05	Collapse of terrain, landslide	High	Negative	<1%	Inside	-0.75	Ins
	Overall score					-19.75	

Non-intensive cattle grazing (A04.02.01)

3.15 The Slieve Mish cSAC Conservation Statement (NPWS, 2009) stated that cattle grazing occurred within the site, to a lesser extent than sheep grazing. Grazing was identified as one one of the main management issues within the site. Overgrazing has caused habitat degradation in some areas, particularly **4010 Wet heaths** on the lower slopes. However, a reasonable quantity of relatively undamaged **4010 Wet heaths** was said to remain. The impact of grazing in commonage areas was assessed under the Commonage Framework Planning Project, with destocking levels of between 0 and 65% being recommended.

3.16 During the present survey, cattle grazing was noted in **4010 Wet heaths** at several locations within the site, with heavy poaching occurring in some cases. The area affected has been estimated to be 1.5%, based on the extent of **4010 Wet heaths** present in polygons in which cattle grazing was recorded. The intensity of this impact has been assessed as high overall and its influence as negative. The trend was assessed as improving due to the CFP reduction in stock numbers.

Non-intensive sheep grazing (A04.02.02)

3.17 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that most of the site is used for extensive sheep grazing. Grazing was identified as one of the main management issues within the site. Overgrazing has led to habitat degradation in some areas, particularly **4010 Wet heaths** on the lower slopes. However, a reasonable quantity of relatively undamaged **4010 Wet heaths** was said to remain. The impact of grazing in commonage areas was assessed under the Commonage Framework Planning Project, with destocking levels of between 0 and 65% being recommended.

3.18 The present survey indicates that grazing by sheep is the dominant land use within **4010 Wet heaths** in the Slieve Mish Mountains cSAC. This impact was recorded at the majority of **4010 Wet heaths** monitoring stops, with 21.9% failing due to excessive levels of grazing. Grazing intensity varied across the site, with the proportion of dwarf shrub shoots showing signs of grazing ranging from 0 to 70%. Heather cover was generally low, with 42.9% of **4010 Wet heaths** monitoring stops failing due to inadequate cover of ericoid species and *Empetrum nigrum.* Disturbed bare ground, which may be associated with trampling by sheep, was also recorded at the majority of monitoring stops, with 14.3% and 11.4% failing due to excessive cover of disturbed bare ground within the monitoring stop and in the local vicinity respectively. The intensity of this impact has been assessed as high overall and its influence as negative. The trend was assessed as improving due to the CFP reduction in stock numbers.

Non-intensive horse grazing (A04.02.03)

3.19 During the present survey, grazing by horses was recorded in **4010 Wet heaths** at Curraheen, Caherleheen, Lissardboola and Boolteens East. Some of these animals appear to have been abandoned on the site and a number of horse carcasses were observed. Grazing by donkeys also occurred at Boolteens East. Heavy poaching was noted at Caherleheen. The intensity of this impact has been assessed as medium overall and its influence as negative. The area of **4010**

Wet heaths affected has been estimated to be less than 1% due to the relatively localised nature of the impact.

Stock feeding (A05.02)

3.20 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that the out-wintering of livestock and associated supplementary feeding in places has exacerbated the degradation of **4010 Wet heaths** caused by overgrazing. During the present survey, supplementary feeders were noted at several locations within the site, with poaching occurring due to trampling by cattle and sheep. The intensity of this impact has been assessed as high and its influence as negative. The area of **4010 Wet heaths** affected has been estimated to be less than 1% due to the localised nature of the impact. The trend was assessed as improving due to the CFP reduction in stock numbers.

Mining and quarrying (C01)

3.21 There are small quarry sites within **4010 Wet heaths** which have been active within the reporting window near Garraun on the lower eastern slopes of Knockawaddra, on the cSAC boundary at Ballydunlea and west of the mountain road above Aughils.

Peat extraction (C01.03)

3.22 Some minor loss of **4010 Wet heaths** due to peat extraction was noted on the western slopes of Knockawaddra.

Paths, tracks, cycling tracks (D01.01)

3.23 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) states that there are a number of rough tracks entering the site. These tracks were identified as one of the main management issues within the site as they degrade the habitats in their direct vicinity and open up new areas for turf cutting. During the present survey, a track built for scrambler bikes was observed in **4010 Wet heaths** at Curraheen and loss of habitat due to tracks was recorded from several locations along the southern, northern and eastern boundaries.

Dispersed habitation (E01.03)

3.24 Some relatively new houses have been built within the boundaries of the site, between Clasheen Bridge and Derryquay Bridge. While the area affected was dominated by non-Annex **WS1 Scrub**, this activity is likely to have resulted in the loss of some **4010 Wet heaths**. The intensity of this impact has been assessed as high and its influence as negative (Table 12). The area of the habitat affected has been estimated to be less than 1%, due to the localised nature of this impact.

Structures, buildings in the landscape (E04)

3.25 A cluster of telecommunication masts is present within the site on the spur east of Knockmoyle; this is the peak overlooking the short mountain road to the east of Barnanageehy which is unnamed on the O.S. Discovery map. Most of the construction here appears to pre-date the reporting window, but there have been some small recent losses of habitat. North of the masts on the west side of the road, a farm building has been constructed.

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

3.26 A way marked walking route, the Dingle Way, passes through the north and west of the site. The western end of the Slieve Mish Mountains cSAC is popular with hill walkers, most of whom walk from Beheeragh to Caherconree and some of whom go on to Baurtregaum, the highest summit in the site at 851 m. Both of these routes traverse areas of **4010 Wet heaths** and path erosion is occurring in places, particularly at Beheeragh. The intensity of this impact is assessed as medium 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)

3.27 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that motorbike scrambling occurs occasionally within the site. During the present survey, a track built for scrambler bikes was observed in **4010 Wet heaths** at Curraheen. Tractor tracks were also observed in **4010 Wet heaths**. The intensity of this impact is assessed as medium 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.

Other human disturbances and intrusions (G05)

3.28 A small area of the land supporting this habitat has been cleared at Caherleheen. Movement of earth and rock near Boolteens East is associated with dumping of old vehicles. Some disturbance of peat has occurred in the past near the viewpoint on the short mountain road at Ballyraymean Upper.

Garbage and solid waste (H05.01)

3.29 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that dumping has been recorded in a number of locations within the site. During the present survey, dumping of vehicles was noted in **4010 Wet heaths** at Knockbrack and Boolteens East and dumping of rubble, plastic and metal was noted in **4010 Wet heaths** at Aughils. The intensity of the impact has been assessed as medium and its influence as negative. The area of **4010 Wet heaths** affected has been estimated to be less than 1% due to the localised nature of the impact.

Invasive non-native species (I01)

3.30 *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.

3.31 *Campylopus introflexus* was recorded within 22.9% of **4010 Wet heaths** monitoring stops and excessive cover of this species resulted in the failure of 5.7% of monitoring stops. The mean cover of *C. introflexus* within **4010 Wet heaths** monitoring stops was 0.9%. The degraded peat vegetation community DP1 *Campylopus introflexus – Polytrichum* spp. was recorded within 132

polygons dominated by **4010 Wet heaths** during vegetation mapping with cover scores of up to 5%.

3.32 Excessive cover of *Rhododendron ponticum* in the local vicinity resulted in the failure of another **4010 Wet heaths** monitoring stop (2.9%), at Derrymore East This non-native shrub is highly invasive, very difficult to eradicate completely and transforms the habitats in which it becomes established, making it highly detrimental to their conservation status. The intensity of this impact has been assessed as medium overall and its influence as negative. The area affected has been estimated to be 1%.

Problematic native species (I02)

3.33 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that overgrazed areas of **4010 Wet heaths** had been invaded by non-characteristic species such as *Juncus effusus, Nardus stricta* and *Ulex europaeus*. In the assessment of structure and functions, two **4010 Wet heaths** monitoring stops (5.7%) failed due to excessive cover of *Juncus effusus*, with cover scores of 20%, and another monitoring stop (2.9%) failed due to excessive cover of *Pteridium aquilinum*, with a cover score of 15%. These species can potentially become dominant within this habitat, resulting in reduced floral species diversity, development of **PF2 Poor fen and flush** or **HD1 Dense bracken** vegetation and the loss of Annex I habitat. The intensity of this impact has been assessed as medium and its influence as negative. The area of **4010 Wet heaths** affected was estimated to be 8.6%, based on the proportion of monitoring stops that failed due to excessive cover of these species.

Burning down (J01.01)

3.34 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that burning is one of the main management issues within the site. Parts of the site are periodically burned to encourage more palatable grazing for livestock. This uncontrolled burning is detrimental to the ecological quality of **4010 Wet heaths**. The present survey indicates that extensive burning has occurred in **4010 Wet heaths** within the site, with an estimated 9.8% having been affected by burning within the last few years. The intensity of this impact has been assessed as high and its influence as negative.

Water abstractions from groundwater (J02.07)

3.35 Drainage has been recorded under this impact category. Water is being drained from **4010 Wet heaths** and diverted away by means of ditches. The intended purpose is not water abstraction but desiccation of the peat. Although the impact category does not accurately describe the impact in question it is the most appropriate option available on the list recommended by the EU for Habitats Directive Article 17 assessments (Ssymank, 2009).

3.36 Relatively recently constructed drainage ditches were recorded in **4010 Wet heaths** at several locations within the Slieve Mish Mountains cSAC, resulting in habitat loss and desiccation of the peat in surrounding areas. These include areas at Boolteens East, Caherleheen and above Clasheen Bridge. 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.

Dykes, embankments, artificial beaches, general (J02.12)

3.37 On the border of the site near Curraheen a small area of **4010 Wet heaths** has been lost due to construction of an embankment and a ditch. The ditch is filled with limestone rocks. The purpose of the works appears to be prevention of water flooding into an old quarry to the north, where an industrial unit is now situated.

Erosion (K01.01)

3.38 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that on parts of the site, overgrazing has led to some habitat degradation, particularly of the **4010 Wet heaths** on the lower slopes. During vegetation mapping, peat erosion was recorded in **4010 Wet heaths**, particularly where heavy trampling by sheep or burning had occurred. Due to the CFP reduction in stock numbers, the number of sheep on this site has fallen in recent years. However, 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 this area was within the range of 1600-2800 mm per year for 1981-2010 (Met Éireann, 2014). Therefore unless restoration measures are undertaken in badly eroded areas, erosion is likely to continue. It was assessed that there is insufficient data to determine the trend for this impact. Approximately 1.4% of the area of **4010 Wet heaths** is estimated to be under threat from erosion; this is the proportion of the habitat occurring in polygons with at least 5% bare, shallow peat.

Species composition change (succession) (K02.01)

3.39 There have been small gains in the area of **4010 Wet heaths** due to the revegetation of tracks, quarries and areas of bare peat, mostly near the low edges of the site. This impact has been assessed as positive and of high impact due to the creation of new habitat.

Collapse of terrain, landslide (L05)

3.40 Small losses of **4010 Wet heaths** habitats were recorded due to small scale slippage of peat.

3.41 The overall impacts score for **4010 Wet heaths** has been calculated as -19.75. This is well below the nominal Favourable Reference Value of zero. While, the combined future trend for area and structure and functions is deemed to be improving due to the CFP reduction in stock numbers, it is not thought that this will result in a significant change in the conservation status of the habitat overall within the next twelve years due to continued significant negative impacts such as erosion and burning. The future prospects for this habitat were therefore assessed as Unfavourable – Bad.

4030 Dry heaths

Area

3.42 Changes in the area of **4030 Dry heaths** were recorded for the period 1995 to 2014 through a combination of observations in the field and analysis of aerial photographs and online satellite imagery (Table 13). Both losses and gains in habitat 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. Losses in area of **4030 Dry heaths** were recorded due to collapse of terrain, landslide (0.25 ha). Gains in area of **4030 Dry heaths** were due to revegetated landslides (0.14 ha) and bare ground (1.32 ha) within the habitat. All gains in area were recorded as species composition change (succession). These impacts and trends are discussed later under future prospects. The overall change in habitat area was a gain of less than 1% per year resulting in a status of Favourable.

Table 13: Impacts causing obvious changes in areas of 4030 Dry heaths, 1995-2014.

Impact code	Impact	Area (ha) 1995-2000	Area (ha) 2000-2005	Area (ha) 2005-2014	Area (ha) 1995-2014
K02.01	Species composition change (succession)	+1.32	+0.14	0.00	+1.46
L05	Collapse of terrain, landslide	-0.16	>-0.01	-0.09	-0.25
All impacts		+1.16	+0.14	-0.09	+1.21
% of habitat		+0.10	0.01	-0.01	+0.11
% change per year		+0.02	<+0.01	>-0.01	<+0.01

Structure and functions

3.43 Twelve monitoring stops were recorded in **4030 Dry heaths** within the Slieve Mish Mountains cSAC (Table 14). In the assessment of structure and functions, four 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. This reduced the number of monitoring stops that failed to three, resulting in an overall failure rate of 25%. The structure and functions of **4030 Dry heaths** were therefore assessed as Unfavourable – Inadequate.

3.44 The vegetation composition of **4030 Dry heaths** was poor in some cases. Two monitoring stops (16.7%) failed due to excessive cover of non-native species in the local vicinity and within the monitoring stop. Single failures were recorded due to an inadequate number of bryophyte and non-crustose lichen species, an inadequate number of positive indicator species, an inadequate cover of positive indicator species and excessive cover of *Pteridium aquilinum*, each of which resulted in the failure of 8.3% of monitoring stops. The vegetation structure of **4030 Dry heaths**

Table 14: Monitoring criteria and failure rates for 4030 Dry heaths (*n* = 12).

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 *Campylopus* spp. and *Polytrichum* spp. ≥ 3	Relevé	12	1	8.3
2	Number of positive indicator species present ≥ 2	Relevé	12	1	8.3
3a*	DH5 (Calcareous heaths): cover of positive indicator species 50-75%	Relevé	0	n/a	n/a
3b*	Siliceous heaths: cover of positive indicator species ≥ 50%		12	1	8.3
4	Proportion of dwarf shrub cover composed of *Myrica gale*, *Salix repens*, *Ulex gallii* collectively < 50%	Relevé	12	0	0
5	Cover of the following weedy negative indicator species: *Cirsium arvense*, *C. vulgare*, *Ranunculus repens*, large *Rumex* species (except *R. acetosa*), *Senecio jacobaea*, *Urtica dioica* collectively < 1%	Relevé	12	0	0
6	Cover of non-native species < 1%	Relevé	12	2	16.7
7	Cover of non-native species < 1%	Local vicinity	12	2	16.7
8	Cover of scattered native trees and scrub < 20%	Local vicinity	12	0	0
9	Cover of *Pteridium aquilinum* < 10%	Local vicinity	12	1	8.3
10	Cover of *Juncus effusus* < 10%	Local vicinity	12	0	0
Vegetation structure					
11	Senescent proportion of *Calluna vulgaris* cover < 50%	Relevé	12	0	0
12	Last complete growing season's shoots of ericoids and *Empetrum nigrum* showing signs of browsing collectively < 33%	Relevé	12	1	8.3
13	No signs of burning inside boundaries of sensitive areas*	Local vicinity	12	3	25.0
14	Outside boundaries of sensitive areas, all growth phases of *Calluna vulgaris* should occur throughout, with ≥ 10% of cover in mature phase	Local vicinity	10	3	30.0
Physical structure					
15	Cover of disturbed bare ground < 10%	Relevé	12	0	0
16	Cover of disturbed bare ground < 10%	Local vicinity	12	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 m^2 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, haggs and erosion gullies, and within 5 – 10 m of the edge of watercourses.

was also poor in some cases. Three monitoring stops (30.0% of monitoring stops to which this criterion was applicable) failed due to poor structural diversity of *Calluna vulgaris*. These three monitoring stops (25.0%) also failed due to burning in sensitive areas. One of these monitoring stops (8.3%) also failed due to excessive levels of browsing by sheep. The physical structure of **4030 Dry heaths** was good, with no failures being recorded under the relevant criteria. These results indicate that burning is the main impact affecting **4030 Dry heaths** within the Slieve Mish Mountains cSAC.

3.45 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that the **4030 Dry heaths** present within the site were rich in bryophytes and retained a good structure, although some had been degraded by grazing. The maintenance of this habitat at Favourable conservation status was identified as one of the main conservation objectives for the site.

Future prospects

3.46 Eight impacts were recorded within **4030 Dry heaths** (Table 15).

Table 15: Assessment of impacts for 4030 Dry heaths. 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	75.0%	Inside	-2.0	Imp
G01.02	Walking, horseriding and non-motorized vehicles	Low	Neutral	<1%	Inside	0	Ins
G01.03.02	Off-road motorised driving	Low	Negative	<1%	Inside	-0.25	Ins
I01	Invasive non-native species	Low	Negative	6.1%	Inside	-0.5	Ins
I02	Problematic native species	Medium	Negative	8.3%	Inside	-1.0	Ins
J01.01	Burning down	High	Negative	15.6%	Inside	-1.5	Ins
K02.01	Species composition change (succession)	High	Positive	<1%	Inside	0.75	Ins
L05	Collapse of terrain, landslide	High	Negative	<1%	Inside	-0.75	Ins
	Overall score					-5.25	

Non-intensive sheep grazing (A04.02.02)

3.47 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that most of the site is used for extensive sheep grazing. Grazing was identified as one of the main management issues within the site. Overgrazing has led to habitat degradation in some areas, particularly heaths on the lower slopes. The impact of grazing in commonage areas was assessed under the Commonage Framework Planning Project, with destocking levels of between 0 and 65% being recommended.

3.48 The present survey indicates that grazing by sheep is the dominant land use within **4030 Dry heaths** in the Slieve Mish Mountains cSAC. This impact was detected at 75% of **4030 Dry heaths** monitoring stops, with 8.3% failing due to excessive levels of grazing. Grazing intensity varied across the site, with the proportion of dwarf shrub shoots showing signs of grazing ranging from 0 to 70%. Disturbed bare ground was recorded within or in the local vicinity of

50% of monitoring stops but was not sufficiently extensive to cause any of these to fail. The intensity of this impact has been assessed as medium overall and its influence as negative. The trend was assessed as improving due to the CFP reduction in stock numbers.

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

3.49 A way marked walking route, the Dingle Way, passes through the north and west of the site. The western end of the Slieve Mish Mountains cSAC is popular with hill walkers, most of whom walk from Beheeragh to Caherconree and some of whom go on to Baurtregaum, the highest summit in the site at 851 m. Both of these routes traverse areas of **4030 Dry heaths**, particularly at Caherconree, but no significant path erosion was observed. The intensity of this impact is 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.

Off-road motorised driving (G01.03.02)

3.50 During the present survey, tractor tracks were observed in **4030 Dry heaths** on the southern slopes of Knockawaddra. This was deemed to be a low intensity negative impact.

Invasive non-native species (I01)

3.51 *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.

3.52 *Campylopus introflexus* was recorded within two **4030 Dry heaths** monitoring stops (16.7%), with cover scores of 3% and 70%, resulting in the failure of these monitoring stops. The mean cover of *C. introflexus* within **4030 Dry heaths** monitoring stops was 6.1%. The degraded peat vegetation community DP1 *Campylopus introflexus – Polytrichum* spp. was recorded within 28 polygons dominated by **4030 Dry heaths** during vegetation mapping with cover scores of up to 3%. The intensity of this impact was assessed as low. As *C. introflexus* was recorded as forming an extensive carpet at one monitoring stop, its influence was assessed as negative.

Problematic native species (I02)

3.53 In the assessment of structure and functions, one monitoring stop (8.3%) failed due to excessive cover of *Pteridium aquilinum*, with a cover score of 10%. Bracken can become dominant within this habitat, resulting in reduced floral species diversity, development of **HD1 Dense bracken** vegetation and the loss of Annex I habitat. As grazing pressure decreases, bracken may spread into Annex I habitats. The intensity of this impact has been assessed as medium and its influence as negative.

Burning down (J01.01)

3.54 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that burning is one of the main management issues within the site. Parts of the site are periodically burned to

encourage more palatable grazing for livestock. This uncontrolled burning is detrimental to the ecological quality of **4030 Dry heaths**. The present survey indicates that extensive uncontrolled burning has occurred in **4030 Dry heaths** in numerous locations within the site, with an estimated 15.6% having been affected by burning within the last few years. The intensity of this impact has been assessed as high and its influence as negative.

Species composition change (succession) (K02.01)

3.55 There have been small gains in the area of **4030 Dry heaths** in the upper Derryquay area due to the revegetation of bare ground and landslides. This impact has been assessed as positive and of high impact due to the creation of new habitat.

Collapse of terrain, landslide (L05)

3.56 Small losses of **4030 Dry heaths** habitat in the upper Derryquay area have been recorded due to small scale landslides.

3.57 The overall impacts score for **4030 Dry heaths** has been calculated as -3.75. This is below the nominal Favourable Reference Value of zero. The combined future trend for area and structure and functions is deemed to be no change despite the CFP reduction in stock numbers due to the foreseen ongoing impact of burning and bracken encroachment. The future prospects for this habitat were therefore assessed as Unfavourable – Inadequate.

4060 Alpine and Boreal heaths

Area

3.58 Changes in the area of **4060 Alpine and Boreal heaths** were recorded for the period 1995 to 2014 through a combination of observations in the field and analysis of aerial photographs and online satellite imagery (Table 16). 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. Minor losses in area of **4060 Alpine and Boreal heaths** were recorded due to collapse of terrain, landslides (0.04 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.

Structure and functions

3.59 Nine monitoring stops were recorded in **4060 Alpine and Boreal heaths** within the Slieve Mish Mountains cSAC (Table 17). In the assessment of structure and functions, the monitoring stops did not fail any criteria, resulting in an overall failure rate of 0%. The structure and functions of **4060 Alpine and Boreal heaths** were therefore assessed as Favourable.

Table 16: Impacts causing obvious losses in areas of 4060 Alpine and Boreal heaths, 1995-2014.

Impact code	Impact	Area (ha) 1995-2000	Area (ha) 2000-2005	Area (ha) 2005-2014	Area (ha) 1995-2014
L05	Collapse of terrain, landslide	0.00	0.00	0.04	0.04
All impacts		0.00	0.00	0.04	0.04
% of habitat		0.00	0.00	0.01	0.01
% loss per year		0.00	0.00	<0.01	<0.01

3.60 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that the **4060 Alpine and Boreal heaths** present within the site are of at least reasonable quality although further research was recommended. The maintenance of this habitat at Favourable conservation status was identified as one of the main conservation objectives for the site.

Table 17: Monitoring criteria and failure rates for 4060 Alpine and Boreal heaths (n = 9).

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	9	0	0
2	Cover of positive indicator species ≥ 66%	Relevé	9	0	0
3	Cover of dwarf shrubs ≥ 10%	Relevé	9	0	0
4	Cover of the following negative indicator species: *Agrostis capillaris, A. vinealis, Anthoxanthum odoratum, Deschampsia flexuosa, Festuca ovina, F. vivipara, Galium saxatile, Potentilla erecta* and *Poa* spp. (except *Poa alpina*) collectively < 10%	Relevé	9	0	0
5	Cover of non-native species < 1%	Relevé	9	0	0
Vegetation structure					
6	Live leaves of *Carex bigelowii, Deschampsia flexuosa, Festuca ovina, F. vivipara* showing signs of grazing collectively < 10%	Relevé	7	0	0
7	Last complete growing season's shoots of ericoids and *Empetrum nigrum* showing signs of browsing collectively < 33%	Relevé	9	0	0
8	No signs of burning inside feature	Local vicinity	9	0	0
Physical structure					
9	Cover of disturbed bare ground < 10%	Relevé	9	0	0
10	Cover of disturbed bare ground < 10%	Local vicinity	9	0	0

Future prospects

3.61 Three impacts were recorded within **4060 Alpine and Boreal heaths** (Table 18).

Table 18: Assessment of impacts for 4060 Alpine and Boreal heaths. 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
G01.02	Walking, horseriding and non-motorized vehicles	Low	Neutral	<1%	Inside	0	Ins
L05	Collapse of terrain, landslide	High	Negative	<1%	Inside	-0.75	Ins
	Overall score					-0.75	

Non-intensive sheep grazing (A04.02.02)

3.62 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that most of the site is used for extensive sheep grazing. Grazing was identified as one of the main management issues within the site. Overgrazing has led to habitat degradation in some areas but predominantly on the lower slopes, where **4060 Alpine and Boreal heaths** are generally absent. The impact of grazing in commonage areas was assessed under the Commonage Framework Planning Project, with destocking levels of between 0 and 65% being recommended.

3.63 The present survey indicates that grazing by sheep is the dominant land use within **4060 Alpine and Boreal heaths** in the Slieve Mish Mountains cSAC. This impact was detected at 100% of **4060 Alpine and Boreal heath** monitoring stops, but was not sufficiently intensive to cause any of these to fail. Grazing intensity varied across the site, with the proportion of dwarf shrub shoots showing signs of grazing ranging from 5 to 30%. Disturbed bare ground was recorded at the majority of monitoring stops but was not sufficiently extensive to cause any of these to fail. The intensity of this impact has been assessed as low overall and its influence as neutral. The trend was assessed as improving due to the CFP reduction in stock numbers.

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

3.64 The western end of the Slieve Mish Mountains cSAC is popular with hill walkers, most of whom walk from Beheeragh to Caherconree and some of whom go on to Baurtregaum, the highest summit in the site at 851 m. This route traverses areas of **4060 Alpine and Boreal heath**, particularly at Caherconree, but no significant path erosion was observed. The intensity of this impact is 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.

Collapse of terrain, landslide (L05)

3.65 A single occurrence of loss of habitat due to landslide was observed on the northern slopes of Glanbrack Mountain.

3.66 The overall impacts score for **4060 Alpine and Boreal heaths** has been calculated as -0.75. This is marginally below the nominal Favourable Reference Value of zero. The combined future trend for area and structure and functions is deemed to be improving due to the CFP reduction

in stock numbers. The future prospects for this habitat were therefore assessed as Unfavourable - Inadequate.

***6230 Species-rich *Nardus* grasslands**

Area

3.67 Changes in the area of ***6230 Species-rich *Nardus* grasslands** were recorded for the period 1995 to 2014 through a combination of observations in the field and analysis of aerial photographs and online satellite imagery. 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

3.68 Two monitoring stops were recorded in ***6230 Species-rich *Nardus* grasslands** within the Slieve Mish Mountains cSAC (Table 19). In the assessment of structure and functions, one monitoring stop failed one criterion. Following a review of the ecological condition of this stop, expert judgement determined that no change should be made, resulting in an overall failure rate of 50.0%. The structure and functions of ***6230 Species-rich *Nardus* grasslands** were therefore assessed as Unfavourable - Bad.

3.69 The vegetation composition and physical structure of ***6230 Species-rich *Nardus* grasslands** were good, with no failures being recorded under the relevant criteria. Indeed, one of the monitoring stops was exceptionally diverse, containing 54 species including a number of uncommon oceanic bryophytes. However, the vegetation structure of this monitoring stop was poor. Criterion 11 stipulates that at least 25% of the sward should be between 5 and 50 cm in height. A result of only 10% was recorded, resulting in the failure of the monitoring stop in question. The sward height was found to be inadequate due to high levels of grazing by sheep.

Future prospects

3.70 Two impacts were recorded within ***6230 Species-rich *Nardus* grasslands** (Table 20).

<u>Non-intensive sheep grazing (A04.02.02)</u>

3.71 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that most of the site is used for extensive sheep grazing. Grazing was identified as one of the main management issues within the site. Overgrazing has led to habitat degradation in some areas. The impact of grazing in commonage areas was assessed under the Commonage Framework Planning Project, with destocking levels of between 0 and 65% being recommended.

3.72 The present survey indicates that grazing by sheep is the dominant land use within ***6230 Species-rich *Nardus* grasslands** in the Slieve Mish Mountains cSAC. This impact was noted at both ***6230 Species-rich *Nardus* grasslands** monitoring stops. One monitoring stop (50.0%), located in Derrymore Glen, failed due to a low sward height caused by excessive grazing while the other exhibited an optimal level of grazing. The intensity of this impact has been assessed

as medium overall and its influence as negative. While medium intensity grazing would normally be considered a positive influence within ***6230 Species-rich *Nardus* grasslands**, in this case, its influence was assessed as negative because grazing levels were not optimal at one of the stops. The trend was assessed as improving due to the CFP reduction in stock numbers.

Table 19: Monitoring criteria and failure rates for *6230 Species-rich *Nardus* grasslands (n = 2).

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	2	0	0
2a	UG1c/UG2c: Number of high quality species present ≥ 2	Relevé	2	0	0
2b	UG1e/UG2e: Number of high quality species present ≥ 1	Relevé	0	n/a	n/a
3	Species richness ≥ 25 species	Relevé	2	0	0
4	Cover of non-native species ≤ 1%	Relevé	2	0	0
5	Cover of the following negative indicator species: *Arrhenatherum elatius, Bellis perennis, Cirsium arvense, Cirsium vulgare, Dactylis glomerata, Eriophorum angustifolium, Eriophorum vaginatum, Holcus lanatus, Juncus effusus, Lolium perenne, Narthecium ossifragum, Ranunculus repens, Rumex crispus, Rumex obtusifolius, Senecio jacobaea, Trifolium repens, Urtica dioica*, individually ≤ 10%	Relevé	2	0	0
6	Cover of the above negative indicator species collectively ≤ 20%	Relevé	2	0	0
7	Cover of *Sphagnum* species ≤ 10%,	Relevé	2	0	0
8	Cover of *Polytrichum* species ≤ 25%		2	0	0
9	Cover of scrub, bracken and heath ≤ 5%	Relevé	2	0	0
Vegetation structure					
10	Forb component of forb : graminoid ratio 20-90%	Relevé	2	0	0
11	Proportion of the sward between 5-50 cm tall ≥ 25%	Relevé	2	1	50.0
12	Litter cover ≤ 20%	Relevé	2	0	0
Physical structure					
13	Cover of disturbed bare ground ≤ 10%	Relevé	2	0	0
14	Area of the habitat showing signs of serious grazing or disturbance <20m²	Local vicinity	2	0	0

Invasive non-native species (I01)

3.73 *Epilobium brunnescens* is a species of damp, stony places, especially in the mountains, which is localised but spreading in Ireland (Parnell & Curtis, 2012). During the present survey, *E. brunnescens* was recorded within one ***6230 Species-rich *Nardus* grasslands** monitoring stop (50.0%). The intensity of this impact is assessed as low, since this species does not tend to transform the nature of the habitats in which it becomes established but, nonetheless, its influence has been assessed as negative (Table 20). The area affected has been estimated to be 0.25%, based on the average cover of *E. brunnescens* within ***6230 Species-rich *Nardus* grasslands** monitoring stops.

3.74 The overall impacts score for ***6230 Species-rich *Nardus* grasslands** has been calculated as -3.25. This is below the nominal Favourable Reference Value of zero but the combined future trend for area and structure and functions was deemed to be improving due to the CFP reduction in stock numbers. The future prospects for this habitat were therefore assessed as Unfavourable - Inadequate.

Table 20: Assessment of impacts 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	Medium	Negative	100%	Inside	-3.0	Imp
I01	Invasive non-native species	Low	Negative	0.25%	Inside	-0.25	Ins
	Overall score					-3.25	

***7130/7130 Blanket bogs**

Area

3.75 Changes in the area of ***7130/7130 Blanket bogs** were recorded for the period 1995 to 2014 through a combination of observations in the field and analysis of aerial photographs and online satellite imagery (Table 21). Both losses and gains in habitat 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 main measured losses in area of ***7130/7130 Blanket bogs** were due to peat extraction (combined area of 7.09 ha) and collapse of terrain, landslide (0.45 ha). The main gains in area of ***7130/7130 Blanket bogs** (6.23 ha in total) were due to revegetating cutover peat (4.76 ha) and revegetating bare ground (1.29 ha). All gains in area were recorded as species composition change (succession). Erosion has unquestionably resulted in loss of habitat, but due to the gradual and diffuse nature of this impact it was impractical to measure the area lost. Even when including the loss due to erosion it is estimated that the overall change in habitat area was a loss of less than 1% per year resulting in a status of Unfavourable – Inadequate. These impacts and trends are discussed later under future prospects.

Structure and functions

3.76 Seventeen monitoring stops were recorded in ***7130/7130 Blanket bogs** within the Slieve Mish Mountains cSAC (Table 22). All of these monitoring stops were located within ***7130 Active blanket bog** rather than **7130 Inactive blanket bog**. In the assessment of structure and functions, nine monitoring stops failed one criterion or more. 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 52.9%. The structure and functions of ***7130/7130 Blanket bogs** were therefore assessed as Unfavourable – Bad. Vegetation mapping indicated that the proportion of inactive, eroding and cutover bog within the total area of bog was 1.2%.

3.77 The vegetation composition of one ***7130/7130 Blanket bogs** monitoring stop (5.9%) was poor, failing due to an inadequate cover of bryophyte and lichen species. The vegetation structure of ***7130/7130 Blanket bogs** was also poor in some cases. Five monitoring stops failed due to burning in the bryophyte and lichen layer or peat exposure due to burning (29.4%) and burning in sensitive areas (38.5% of monitoring stops to which this criterion was applicable). The physical structure of ***7130/7130 Blanket bogs** was poor in some cases. Three monitoring stops (17.6%) failed due to excessive levels of drainage. One of these (5.9%) also failed due to excessive cover of disturbed bare ground within the monitoring stop and in the local vicinity. A further two monitoring stops (11.8%) failed due to excessive levels of erosion. These results indicate that burning is the main impact affecting ***7130/7130 Blanket bogs** within the Slieve Mish Mountains cSAC.

Table 21: Impacts causing obvious changes in area of *7130/7130 Blanket bogs, 1995-2014.
n.m. indicates not measured.

Impact code	Impact	Area (ha) 1995-2000	Area (ha) 2000-2005	Area (ha) 2005-2014	Area (ha) 1995-2014
C01.03	Peat extraction	-2.31	-0.58	-1.27	-4.15
C01.03.02	Mechanical removal of peat	-2.93	0.00	0.00	-2.93
D01.01	Paths, tracks, cycling tracks	-0.02	0.00	-0.19	-0.21
K01.01	Erosion	n.m.	n.m.	n.m.	n.m.
K02.01	Species composition change (succession)	+1.29	+4.58	+0.36	+6.23
L05	Collapse of terrain, landslide	-0.23	0.00	-0.22	-0.45
All impacts		-4.20	+4.00	-1.32	-1.51
% of habitat		-0.22	+0.21	-0.07	-0.08
% change per year		-0.04	+0.04	-0.01	>-0.01

Future prospects

3.78 Thirteen impacts were recorded within ***7130/7130 Blanket bogs** (Table 23).

Non-intensive sheep grazing (A04.02.02)

3.79 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that most of the site is used for extensive sheep grazing. Grazing was identified as one of the main management issues within the site. Overgrazing has led to habitat degradation in some areas, with most of the ***7130/7130 Blanket bogs** on the lower slopes having been significantly damaged. The impact of grazing in commonage areas was assessed under the Commonage Framework Planning Project, with destocking levels of between 0 and 65% being recommended.

3.80 Although grazing by sheep was detected at the majority of ***7130/7130 Blanket bogs** monitoring stops, grazing intensity was not sufficiently high to cause any stops to fail. Grazing intensity varied across the site, with the proportion of dwarf shrub shoots showing signs of

grazing ranging from 0 to 30%. The intensity of this impact has been assessed as low overall and its influence as neutral. The trend was assessed as improving due to the CFP reduction in stock numbers.

Table 22: Monitoring criteria and failure rates for *7130/7130 Blanket bogs (*n* = 17).

Criteria		Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition					
1	Number of positive indicator species present ≥ 7	Relevé	17	0	0
2	Cover of bryophyte or lichen species, excluding *Sphagnum fallax* ≥ 10%	Relevé	17	1	5.9
3	Cover of each of the following species: *Calluna vulgaris, Eleocharis multicaulis, Eriophorum vaginatum, Molinia caerulea, Schoenus nigricans, Trichophorum germanicum* individually < 75%	Relevé	17	0	0
4	Cover of the following negative indicator species: *Agrostis capillaris, Holcus lanatus, Phragmites australis, Pteridium aquilinum, Ranunculus repens* collectively < 1%	Relevé	17	0	0
5	Cover of non-native species < 1%	Relevé	17	0	0
6	Cover of non-native species < 1%	Local vicinity	17	0	0
7	Cover of scattered native trees and scrub < 10%	Local vicinity	17	0	0
Vegetation structure					
8	Crushed, broken and/or pulled up *Sphagnum* species < 10% of *Sphagnum* cover	Relevé	17	0	0
9	Last complete growing season's shoots of ericoids, *Empetrum nigrum* and *Myrica gale* showing signs of browsing collectively < 33%	Relevé	16	0	0
10	No signs of burning into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Local vicinity	17	5	29.4
9	No signs of burning inside boundaries of sensitive areas*	Local vicinity	13	5	38.5
Physical structure					
12	Cover of disturbed bare ground < 10%	Relevé	17	1	5.9
13	Cover of disturbed bare ground < 10%	Local vicinity	17	1	5.9
14	Area showing signs of drainage resulting from heavy trampling or tracking or ditches or peat cutting < 10%	Local vicinity	17	3	17.6
15	Cover of erosion gullies and eroded areas within the greater bog mosaic < 5%	Local vicinity	17	2	11.8

*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, haggs 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.

Table 23: Assessment of impacts for *7130/7130 Blanket bogs. 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	Low	Neutral	<1%	Inside	0	Ins
C01.03.01	Hand cutting of peat	High	Negative	0.9%	Inside	-0.75	Ins
C01.03.02	Mechanical removal of peat	High	Negative	3.5%	Inside	-1.5	Ins
D01.01	Paths, tracks, cycling tracks	High	Negative	<1%	Inside	-0.75	Ins
G01.02	Walking, horseriding and non-motorized vehicles	Low	Neutral	<1%	Inside	0	Ins
G01.03.02	Off-road motorised driving	High	Negative	<1%	Inside	-0.75	Ins
H05.01	Garbage and solid waste	Low	Negative	<1%	Inside	-0.25	Ins
I01	Invasive non-native species	Low	Negative	0.04%	Inside	-0.25	Ins
J01.01	Burning down	High	Negative	7.1%	Inside	-1.5	Ins
K01.01	Erosion	High	Negative	0.5%	Inside	-0.75	Ins
K02.01	Species composition change (succession)	High	Positive	<1%	Inside	0.75	Ins
L05	Collapse of terrain, landslide	High	Negative	<1%	Inside	-0.75	Ins
	Overall score					-6.5	

Non-intensive horse grazing (A04.02.03)

3.81 During the present survey, a horse was observed grazing in ***7130/7130 Blanket bogs** in the glen at Curraheen. The animal appeared to have been abandoned. A horse carcass was observed in the area. As this impact was limited to the presence of a single animal, its intensity has been assessed as low and its influence as neutral. The area of ***7130/7130 Blanket bogs** affected has been estimated to be less than 1% due to the localised nature of the impact.

Peat extraction (C01.03)

3.82 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that turf cutting is one of the main management issues within the site and that most of the ***7130/7130 Blanket bogs** have been extensively cutover. Turf cutting has reduced the area and quality of ***7130/7130 Blanket bogs** within the site, especially on the lower slopes. Some turf cutting was stated to be ongoing, for example, on the western slopes of Knockawaddra, south of Blennerville and south of Camp. However, this activity was said to be small in scale and diminishing. During the present survey, recent peat extraction was observed at Commons, Glanmore, Slieve East, south-west of Knockawaddra and south-west of Knockmichael. Hand cutting of peat and mechanical removal of peat are assessed separately below.

Hand cutting of peat (C01.03.01)

3.83 Some recent cutting by hand for domestic purposes was observed south-west of Knockmichael. While it is acknowledged that hand cutting is less damaging than mechanical cutting of peat, the intensity of this impact was assessed as high and its influence as negative, due to the loss of habitat where peat is extracted and the drainage of surrounding habitats. The area of

***7130/7130 Blanket bogs** affected has been estimated to be 0.9%, based on the area of the habitat within the polygons where **PB4 Cutover bog** was recorded and turf cutting by hand was noted.

Mechanical removal of peat (C01.03.02)

3.84 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that mechanised turf cutting was ongoing on the western slopes of Knockawaddra and on the lower northern slopes of Knockmore. During the present survey, recent mechanical peat cutting, carried out using a digger, was observed at Commons and south-west of Knockawaddra (Plate A16). Less recent mechanical peat extraction was observed at Knockmoyle (east of Barnanageehy). The intensity of this impact has been assessed as high and its influence as negative. The area of ***7130/7130 Blanket bogs** affected has been estimated as 3.5%, the area of the habitat within the polygons where **PB4 Cutover bog** was recorded, excluding the area that was cut by hand.

Paths, tracks, cycling tracks (D01.01)

3.85 There have been small losses of ***7130/7130 Blanket bogs** habitat due to tracks at Glanmore in the west of the site and between Barnanageehy and Knockmichael Mountain in the east.

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

3.86 A way marked walking route, the Dingle Way, passes through the north and west of the site. The western end of the Slieve Mish Mountains cSAC is popular with hill walkers, most of whom walk from Beheeragh to Caherconree and some of whom go on to Baurtregaum, the highest summit in the site at 851 m. Both of these routes traverse areas of ***7130/7130 Blanket bogs** but no significant path erosion was observed in this habitat. The intensity of this impact is 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.

Off-road motorised driving (G01.03.02)

3.87 During the present survey, vehicle tracks associated with turf cutting activities were noted within ***7130/7130 Blanket bogs**. The impact was assessed as high and negative due to the sensitivity of bogs, but the areas was estimated to be less than 1%, due to the localised nature of this impact.

Garbage and solid waste (H05.01)

3.88 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that dumping has been recorded in a number of locations within the site. The presence of rough tracks into the site sometimes facilitates dumping. During the present survey, dumping was noted in ***7130/7130 Blanket bogs** in the turf cutting area between Knockmichael Mountain and Barnangeehy. The intensity of the impact has been assessed as low and its influence as negative. The area of ***7130/7130 Blanket bogs** affected has been estimated to be less than 1% due to the localised nature of the impact.

Invasive non-native species (I01)

3.89 *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.

3.90 *Campylopus introflexus* was recorded within two ***7130/7130 Blanket bogs** monitoring stops (11.8%), with a cover score of 0.3%, which was not sufficiently high to cause these monitoring stops to fail. The mean cover of *C. introflexus* within ***7130/7130 Blanket bogs** monitoring stops was 0.04%. The degraded peat vegetation community DP1 *Campylopus introflexus – Polytrichum* spp. was recorded within 24 polygons dominated by ***7130/7130 Blanket bogs** during vegetation mapping with cover scores of up to 5%. The intensity of this impact was assessed as low. Its influence was assessed as negative, as *C. introflexus* was recorded as forming extensive carpets.

Burning down (J01.01)

3.91 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that burning is one of the main management issues within the site. Parts of the site are periodically burned to encourage more palatable grazing for livestock. This uncontrolled burning is detrimental to the ecological quality of ***7130/7130 Blanket bogs**. The present survey indicates that extensive uncontrolled burning has occurred in ***7130/7130 Blanket bogs** in numerous locations within the site, with an estimated 7.1% having been affected by burning within the last few years. The intensity of this impact has been assessed as high and its influence as negative.

Erosion (K01.01)

3.92 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that ***7130/7130 Blanket bogs** on the ridge suffer from severe gully erosion. During vegetation mapping, peat erosion was recorded in ***7130/7130 Blanket bogs**, and was particularly severe at on the spur to the south of Caherconree, where hagging and gully erosion were observed. Hagging was also observed within ***7130/7130 Blanket bogs** on the saddle to the south-west of Caherconree. Due to the CFP reduction in stock numbers, the number of sheep on this site has fallen in recent years. However, 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 this area was within the range of 1600-2800 mm per year for 1981-2010 (Met Éireann, 2014). Therefore unless restoration measures are undertaken in badly eroded areas, erosion is likely to continue. The intensity of this impact is assessed as high and its influence as negative. Approximately 0.5% of the area of ***7130/7130 Blanket bogs** is estimated to be under threat from erosion; this is the proportion of the habitat occurring in polygons with at least 5% **PB5 Eroding blanket bog**.

Species composition change (succession) (K02.01)

3.93 There have been small gains in the area of ***7130/7130 Blanket bogs** in various locations in the east of the site due to colonisation of cutover peat. This impact has been assessed as positive and of high impact due to the creation of new habitat.

Collapse of terrain, landslide (L05)

3.94 Small losses of ***7130/7130 Blanket bogs** habitat in the upper Derryquay area and near Knockmore have been recorded due to small scale landslides.

3.95 The overall impacts score for ***7130/7130 Blanket bogs** has been calculated as -6.5. This is below the nominal Favourable Reference Value of zero. Due to continued significant negative impacts such as erosion, burning and peat extraction, 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.

7140 Transition mires

Area

3.96 Changes in the area of **7140 Transition mires** were examined for the period 1995 to 2014 through a combination of observations in the field and analysis of aerial photographs and online satellite imagery. 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

3.97 Two monitoring stops were recorded in **7140 Transition mires** within the Slieve Mish Mountains cSAC (Table 24). In the assessment of structure and functions, one monitoring stop failed one criterion. Following a review of the ecological condition of this stop, expert judgement determined that it should pass because the failure was marginal. This resulted in an overall failure rate of 0%. The structure and functions of **7140 Transition mires** were therefore assessed as Favourable.

Future prospects

3.98 No impacts (Threats, Pressures and Activities code X) were recorded within **7140 Transition mires** within the Slieve Mish Mountains cSAC. The overall impacts score for **7140 Transition mires** was therefore calculated as 0, 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.

Table 24: Monitoring criteria and failure rates for 7140 Transition mires (n = 2).

Criteria		Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition					
1a	PO1a: number of positive indicator species from Groups i or ii present ≥ 3	Relevé	2	1	50.0
1b	PFLU5: number of positive indicator species from Groups i or ii present ≥ 3		0	n/a	n/a
1c	RFEN1b: number of positive indicator species from Groups i or ii present ≥ 6		0	n/a	n/a
2	Number of species from Group i present ≥ 1	Relevé	2	0	0
3	Cover of the following species: small to medium sized *Carex* spp., *Equisetum fluviatile*, *Hydrocotyle vulgaris*, *Hypericum elodes*, *Mentha aquatica*, *Menyanthes trifoliata*, *Potentilla palustris*, *Sphagnum* spp. collectively ≥ 25%	Relevé	2	0	0
4	Cover of the following species: *Anthoxanthum odoratum*, *Epilobium hirsutum*, *Holcus lanatus* collectively < 1%	Relevé	2	0	0
5	Cover of non-native species < 1%	Relevé	2	0	0
Vegetation structure					
6	PFLU5/RFEN1b: ≥ 50% of the tips of live leaves and/or flowering shoots of vascular plants should be more than 15 cm above the ground surface	Relevé	0	n/a	n/a
Physical structure					
7	Cover of disturbed bare ground < 10%	Relevé	2	0	0
8	Cover of disturbed bare ground < 10%	Local vicinity	2	0	0
9	Area showing signs of drainage resulting from heavy trampling or tracking or ditches < 10%	Local vicinity	2	0	0

7230 Alkaline fens

Area

3.99 Changes in the area of **7230 Alkaline fens** were recorded for the period 1995 to 2014 through a combination of observations in the field and analysis of aerial photographs and online satellite imagery. 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

3.100 One monitoring stop was recorded in **7230 Alkaline fens** within the Slieve Mish Mountains cSAC (Table 25). It was referable to the RFLU1a *Carex viridula* subsp. *oedocarpa – Pinguicula vulgaris – Juncus bulbosus* flush brown moss sub-community. 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 **7230 Alkaline fens** were therefore assessed as Favourable.

3.101 The small sample size of one monitoring stop reflects the relative rarity of this habitat within the Slieve Mish Mountains cSAC, where only 0.8 ha of **7230 Alkaline fens** were recorded, comprising 0.01% of the site.

Future prospects

3.102 Two impacts were recorded within **7230 Alkaline fens** (Table 26).

Non-intensive sheep grazing (A04.02.02)

3.103 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that most of the site is used for extensive sheep grazing. Grazing was identified as one of the main management issues within the site and overgrazing has led to habitat degradation in some areas. The impact of grazing in commonage areas was assessed under the Commonage Framework Planning Project, with destocking levels of between 0 and 65% being recommended.

3.104 Grazing by sheep was detected at the **7230 Alkaline fens** monitoring stop but the grazing intensity was not sufficiently high to cause the stop to fail. The intensity of this impact has been assessed as low. Its influence has been assessed as positive as the resulting disturbance created open areas with bare ground which were colonised by the brown mosses that are characteristic of **7230 Alkaline fens**. The trend was assessed as improving due to the CFP reduction in stock numbers which is likely to have brought the grazing intensity to its current optimum level.

Non-intensive horse grazing (A04.02.03)

3.105 During the present survey, horses were observed grazing at the mouth of the glen at Curraheen, where the **7230 Alkaline fens** monitoring stop was located. Another animal, which appeared to have been abandoned on the site, and a horse carcass were observed further up the glen where other examples of this habitat occur. The intensity of this impact has been assessed as low. Its influence has been assessed as positive as the resulting disturbance created open areas with bare ground which were colonised by the brown mosses that are characteristic of **7230 Alkaline fens**. The area of **7230 Alkaline fens** affected has been estimated to be 26.0%, based on the area of **7230 Alkaline fens** found within the affected polygons.

3.106 The overall impacts score for **7230 Alkaline fens** has been calculated as 2.25, which exceeds the nominal Favourable Reference Value of zero. The combined future trend for area and structure and functions is deemed to be improving due to the CFP reduction in stock numbers. The future prospects for this habitat were therefore assessed as Favourable.

Table 25: 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	1	0	0
2b	RFLU4/RFEN1a: number of positive vascular indicator species present ≥ 3		0	n/a	n/a
3a	RFLU1a/RFLU2: vegetation cover of brown mosses and vascular indicator species ≥ 20%	Relevé	1	0	0
3b	RFLU4/RFEN1a: vegetation cover of brown mosses and vascular indicator species ≥ 75%		0	n/a	n/a
4	Total cover of the following species: *Anthoxanthum odoratum, Epilobium hirsutum, Holcus lanatus, Ranunculus repens* < 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	1	0	0
7	Total cover of *Juncus effusus* and *Phragmites australis* < 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 disturbed, bare ground < 10%	Relevé	1	0	0
10	Cover of disturbed, bare ground < 10%	Local vicinity	1	0	0
11	Area showing signs of drainage resulting from ditches or heavy trampling or tracking < 10%	Local vicinity	1	0	0
12	Where tufa is present, disturbed proportion of vegetation cover < 1%	Local vicinity	0	n/a	n/a

Table 26: Assessment of impacts for 7230 Alkaline fens. Under trend Imp = Improving, Ins = Insufficient.

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Low	Positive	100%	Inside	1.5	Imp
A04.02.03	Non-intensive horse grazing	Low	Positive	26.0%	Inside	0.75	Ins
	Overall score					2.25	

8110 Siliceous scree

Area

3.107 Changes in the area of **8110 Siliceous scree** were examined for the period 1995 to 2014 through a combination of observations in the field and analysis of aerial photographs and online satellite imagery. 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

3.108 Five monitoring stops were recorded in **8110 Siliceous scree** within the Slieve Mish Mountains cSAC (Table 27). In the assessment of structure and functions, the monitoring stops 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.

Table 27: Monitoring criteria and failure rates for 8110 Siliceous scree (n = 5).

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

Future prospects

3.109 Three impacts were recorded within **8110 Siliceous scree**, details of two are listed in Table 28.

Non-intensive sheep grazing (A04.02.02)

3.110 The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) stated that most of the site is used for extensive sheep grazing. Grazing was identified as one of the main management issues within the site and overgrazing has led to habitat degradation in some areas. The impact of grazing in commonage areas was assessed under the Commonage Framework Planning Project, with destocking levels of between 0 and 65% being recommended.

3.111 Grazing by sheep was detected at 60% of **8110 Siliceous scree** monitoring stops but the grazing intensity was not sufficiently high to cause any stops to fail. The intensity of this impact has

been assessed as low and its influence as neutral. The trend was assessed as improving due to the CFP reduction in stock numbers.

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

3.112 The western end of the Slieve Mish Mountains cSAC is popular with hill walkers, most of whom walk from Beheeragh to Caherconree and some of whom go on to Baurtregaum, the highest summit in the site at 851 m. This route traverses areas of **8110 Siliceous scree**, particularly at Caherconree and Baurtregaum, but no significant path erosion was observed. The intensity of this impact is 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.

Invasive non-native species (I01)

3.113 Although the non-native moss *Campylopus introflexus* was recorded within one **8110 Siliceous scree** monitoring stop, its cover (0.1%) was not sufficiently high for the stop to fail. *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 **8110 Siliceous scree**. It is not regarded as a significant threat to the conservation status of this habitat and is omitted from Table 28.

Table 28: Assessment of impacts for 8110 Siliceous scree. Under trend Imp = Improving Ins = Insufficient.

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Low	Neutral	60%	Inside	0	Imp
G01.02	Walking, horseriding and non-motorized vehicles	Low	Neutral	<1%	Inside	0	Ins
	Overall score					0	

3.114 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.

8210 Calcareous rocky slopes

Area

3.115 Changes in the area of **8210 Calcareous rocky slope** were recorded for the period 1995 to 2014 through a combination of observations in the field and analysis of aerial photographs and online satellite imagery. 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

3.116 Four monitoring stops were recorded in **8210 Calcareous rocky slopes** within the Slieve Mish Mountains cSAC (Table 29). 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 one should pass because the failure was marginal. This reduced the number of monitoring stops that failed to one, resulting in an overall failure rate of 25.0%. The structure and functions of **8210 Calcareous rocky slopes** were therefore assessed as Unfavourable – Inadequate.

Table 29: Monitoring criteria and failure rates for 8210 Calcareous rocky slopes (n = 4).

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

Future prospects

3.117 Invasive non-native species was the only impact recorded within **8210 Calcareous rocky slopes** (Table 30).

Invasive non-native species (I01)

3.118 *Epilobium brunnescens* is a species of damp, stony places, especially in the mountains, which is localised but spreading in Ireland (Parnell & Curtis, 2012). During the present survey, *E. brunnescens* was recorded within all four **8210 Calcareous rocky slopes** monitoring stops (100.0%). The intensity of this impact is assessed as low, since this species does not tend to

transform the nature of the habitats in which it becomes established but, nonetheless, its influence has been assessed as negative. The area affected has been estimated to be 4.0%, based on the average cover of *E. brunnescens* within **8210 Calcareous rocky slopes** monitoring stops.

Table 30: Assessment of impacts for 8210 Calcareous rocky slopes. Under trend, Ins = Insufficient data.

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
I01	Invasive non-native species	Low	Negative	4.0%	Inside	-0.5	Ins
	Overall score					-0.5	

3.119 The overall impacts score for **8210 Calcareous rocky slopes** has been calculated as -0.5, which is below the nominal Favourable Reference Value of zero. 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.

8220 Siliceous rocky slopes

Area

3.120 Changes in the area of **8220 Siliceous rocky slope** were recorded for the period 1995 to 2014 through a combination of observations in the field and analysis of aerial photographs and online satellite imagery. 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

3.121 Five monitoring stops were recorded in **8220 Siliceous rocky slopes** within the Slieve Mish Mountains cSAC (Table 31). In the assessment of structure and functions, the monitoring stops did not fail any criteria, resulting in an overall failure rate of 0%. The structure and functions of **8220 Siliceous rocky slopes** were therefore assessed as Favourable.

Future prospects

3.122 The only impact recorded within **8220 Siliceous rocky slopes** was invasive, non-native species (Table 32). The Slieve Mish Mountains cSAC Conservation Statement (NPWS, 2009) identified the maintenance of this habitat at Favourable conservation status as one of the main conservation objectives for the site.

Table 31: Monitoring criteria and failure rates for 8220 Siliceous rocky slopes (n = 5).

Criteria		Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition					
1	Number of positive indicator species present ≥ 1	Local vicinity	5	0	0
2	Proportion of vegetation composed of non-native species < 1%	Local vicinity	5	0	0
3	Cover of *Pteridium aquilinum*, native trees and scrub collectively < 25%	Local vicinity	5	0	0
Vegetation structure					
4	Live leaves of forbs and shoots of dwarf shrubs showing signs of grazing or browsing collectively < 50%	Local vicinity	5	0	0

Table 32: Assessment of impacts for 8220 Siliceous rocky slopes. Under trend, Ins = Insufficient data.

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
I01	Invasive non-native species	Low	Negative	0.2%	Inside	-0.25	Ins
	Overall score					-0.25	

Invasive non-native species (I01)

3.123 *Epilobium brunnescens* is a species of damp, stony places, especially in the mountains, which is localised but spreading in Ireland (Parnell & Curtis, 2012). During the present survey, *E. brunnescens* was recorded within two **8220 Siliceous rocky slopes** monitoring stops (40.0%). The intensity of this impact is assessed as low, since this species does not tend to transform the nature of the habitats in which it becomes established but, nonetheless, its influence has been assessed as negative. The area affected has been estimated to be 0.2%, based on the average cover of *E. brunnescens* within **8220 Siliceous rocky slopes** monitoring stops.

3.124 The overall impacts score for **8220 Siliceous rocky slopes** has been calculated as -0.25, which is marginally below the nominal Favourable Reference Value of zero. The negative influence of invasive non-native species is likely to remain and potentially increase in the future. The combined future trend for area and structure and functions is deemed to be no change. The future prospects for this habitat were however assessed as Unfavourable - Inadequate.

Summary of conservation assessment

3.125 The summary results for the conservation assessment of Annex I habitats in Slieve Mish Mountains cSAC are presented in Table 33. Of the ten habitats assessed, three habitats were assessed as Favourable, five as Unfavourable – Inadequate and two as Unfavourable – Bad.

Table 33: Summary of conservation status assessments for Annex I habitats in Slieve Mish Mountains cSAC.

Annex I code	Habitat	Area	Structure and functions	Future prospects	Overall assessment
4010	Wet heaths	Unfavourable - Inadequate	Unfavourable - Bad	Unfavourable - Bad	Unfavourable - Bad
4030	Dry heaths	Favourable	Unfavourable - Inadequate	Unfavourable - Inadequate	Unfavourable - Inadequate
4060	Alpine and Boreal heaths	Unfavourable - Inadequate	Favourable	Unfavourable - Inadequate	Unfavourable - Inadequate
*6230	Species-rich *Nardus* grasslands	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	Unfavourable - Inadequate
*7130/7130	Blanket bogs	Unfavourable - Inadequate	Unfavourable - Bad	Unfavourable - Bad	Unfavourable - Bad
7140	Transition mires	Favourable	Favourable	Favourable	Favourable
7230	Alkaline fens	Favourable	Favourable	Favourable	Favourable
8110	Siliceous scree	Favourable	Favourable	Favourable	Favourable
8210	Calcareous rocky slopes	Favourable	Unfavourable - Inadequate	Unfavourable - Inadequate	Unfavourable - Inadequate
8220	Siliceous rocky slopes	Favourable	Favourable	Unfavourable - Inadequate	Unfavourable - Inadequate

4. DISCUSSION

Natura 2000 Standard Data Form

4.1 Fourteen 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, 6150, *6230, 6430, *7130, 7140, 7230, 8110, 8210, 8220, 91A0, *91E0. Derrymore Lough and Coumbrack Lake are small but clear examples of **3130 Upland oligotrophic lakes**. **3160 Dystrophic lakes** occur in the form of bog pools on Knockauncorragh and on the northeastern side of Lack Mountain. **3260 Floating river vegetation** was recorded in several of the streams within the site chiefly due to the presence of *Fontinalis antipyretica*. These include Derrymore River, Derryquay River and Curraheen River. **6150 Siliceous alpine and boreal grassland** occurs frequently on the high slopes northwest of the summit of Baurtregaum and around the top of Derrymore corrie. ***6230 Species-rich *Nardus* grasslands** occurs as localised examples in the top of Curraheen Glen and on the western slopes of Caherconree. Small examples of ledge communities classified as **6430 Hydrophilous tall herb communities** occur in Derrymore, Curraheen Glen and on the slopes above Lough Ablockaun. ***7130 Blanket bog** covers 19.4% of the cSAC, occurring at medium to high altitudes and forming a zone above the wet and dry heaths but below the montane habitats. Lough Ablockaun is completely infilled and forms a species-poor example of **7140 Transition mires**. A better example occurs at Commons, where the habitat occurs as flushes with *Carex dioica* and *Menyanthes trifoliata*. **7230 Alkaline fens** is represented by brown moss flushes in the valleys and on lower slopes, with some good examples near the lower reaches of the Curraheen River. **8220 Siliceous rocky slopes** occurs in most of the valleys often accompanied by **8110 Siliceous scree.** This latter habitat is also found on some of the lower slopes. **8210 Calcareous rocky slopes** cover a very small area, but there are examples on the back wall of Curraheen Glen and, in particular, the cliffs at Gormagh. The woodlands along the river at Clahane were classified as **91A0 Old oakwoods** and the stand along the river at Caherleheen was classified as ***91E0 Alluvial forests**.

4.2 The current version of the Natura 2000 Standard Data Form for this site estimates the area of **4010 Wet heath** to be 20% of the site whereas this survey has estimated it to be substantially higher at 47.4%. Conversely, the form reports the area of **4030 Dry heath** to be 34% whereas the survey mapped this habitat as only 11.4% of the cSAC.

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 <u>obligatory</u> 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 Slieve Mish Mountains cSAC, an up-to-date and finalised 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 major impacts are livestock grazing, burning, turf-cutting and peat erosion.

4.5 Levels of livestock grazing are being addressed through the CFP. Whilst the CFP reduction in stock numbers 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 has had a major impact on **4010 Wet heaths**, **4030 Dry heaths** and ***7130/7130 Blanket bogs**. Regulation of burning at a site level is required.

4.7 Erosion of upland blanket peat is a major impact in ***7130/7130 Blanket bogs.** Whilst some areas of eroded peat may gradually revegetate as a result of the CFP reduction in stock numbers, 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 Recent turf-cutting by machine has occurred at several locations within the site, having a major localised impact on ***7130/7130 Blanket bogs**.

4.9 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.

4.10 Monitoring criteria should be developed for **6150 Siliceous alpine and boreal grasslands**. Future phases of monitoring should include assessment of this habitat and **6430 Hydrophilous tall herb communities**. Relevé data collected by this survey will allow these habitats to be, in part, retrospectively assessed.

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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, 6150 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 *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*	3130 Upland oligotrophic lakes
3160	Natural dystrophic lakes and ponds	3160 Dystrophic lakes
3260	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	3260 Floating river vegetation
4010	Northern Atlantic wet heaths with *Erica tetralix*	4010 Wet heath
4030	European dry heaths	4030 Dry heath
4060	Alpine and Boreal heaths	4060 Alpine and Boreal heath
6150	Siliceous alpine and boreal grasslands	6150 Siliceous alpine and boreal grasslands
6230	*Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)	*6230 Species-rich *Nardus* grasslands
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	6430 Hydrophilous tall herb communities
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 (*Androsacetalia alpinae* and *Galeopsetalia ladani*)	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
91A0	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	91A0 Old oak woodlands
91E0	*Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	*91E0 Alluvial forests

APPENDIX 2: PHOTOGRAPHS

Plate A1: *Saxifraga spathularis* in 8110 Siliceous scree, Shanahill (Photo: Jenni Roche).

Plate A2: *Ophioglossum vulgatum* in *6230 Species-rich *Nardus* grasslands, Beheenagh (Photo: Rory Hodd).

Plate A3: *Salix herbacea* within 8220 Siliceous rocky slope, Caherbla (Photo: Rory Hodd).

Plate A4: *Trichomanes speciosum*, Slieve Mish cSAC (Photo: Rory Hodd).

Plate A5: 4010 Wet heath, with *Trichophorum germanicum* and *Ulex gallii*, Shanahill (Photo: Jenni Roche).

Plate A6: *7130 Blanket bog, with *Calluna vulgaris* and *Eriophorum vaginatum*, Derryquay (Photo: Philip Perrin).

Plate A7: 4060 Alpine and Boreal heath, with *Calluna vulgaris*, *Racomitrium lanuginosum* and *Juncus squarrosus*, Knockauncorragh (Photo: Rory Hodd).

Plate A8: 6150 Siliceous alpine and boreal grassland, with *Carex bigelowii* and *Salix herbacea*, summit of Baurtregaum (Photo: Rory Hodd).

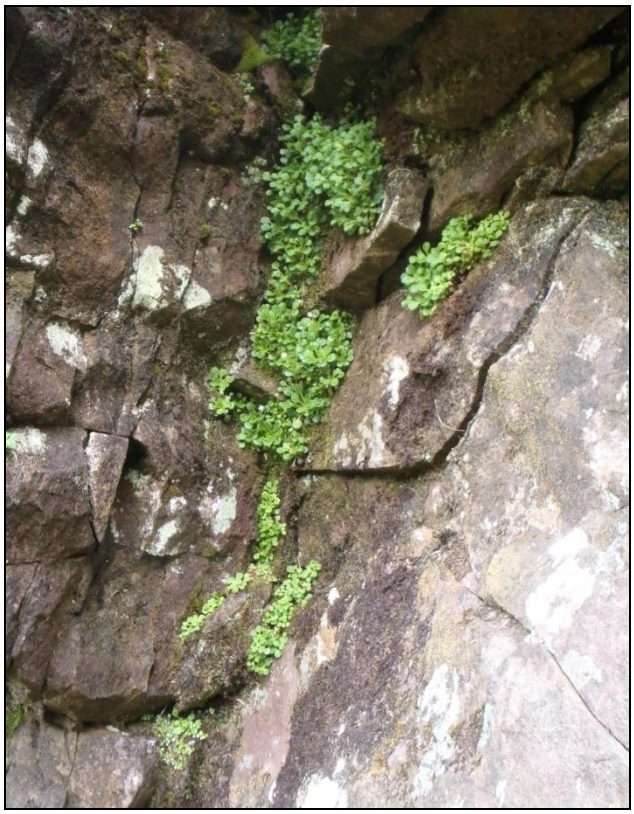

Plate A9: 8220 Siliceous rocky slope, with *Saxifraga spathularis*, Boolteens East (Photo: Philip Perrin).

Plate A10: 8210 Calcareous rocky slope, with *Cystopteris fragilis*, *Asplenium trichomanes* and *Amphidium mougeotii*, Gormagh (Photo: Rory Hodd).

Plate A11: 7140 Transition mire, with *Menyanthes trifoliata* and *Sphagnum cuspidatum*, Boolteens East (Photo: Rory Hodd).

Plate A12: *6230 Species-rich *Nardus* grasslands, Derrymore Glen (Photo: Rory Hodd).

Plate A13: View of Caherconree from the slopes of Baurtregaum (Photo: Jenni Roche).

Plate A14: Gormagh cliffs and Curraheen Glen (Photo: Rory Hodd).

Plate A15: Extensive burning in 4030 Dry heath, Caherbla (Photo: BEC Consultants).

Plate A16: Area of peat extraction using a digger, Knockawaddra (Photo: BEC Consultants).

APPENDIX 3: PLANT SPECIES LIST

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

VASCULAR SPECIES

Species name	Common name
Acer pseudoplatanus	Sycamore
Achillea millefolium	Yarrow
Agrostis canina	Velvet Bent
Agrostis capillaris	Common Bent
Agrostis stolonifera	Creeping Bent
Agrostis vinealis	Brown Bent
Aira praecox	Early Hair-grass
Anagallis tenella	Bog Pimpernel
Angelica sylvestris	Wild Angelica
Anthoxanthum odoratum	Sweet Vernal-grass
Armeria maritima	Thrift
Asplenium trichomanes	Maidenhair Spleenwort
Bellis perennis	Daisy
Betula pubescens	Downy Birch
Blechnum spicant	Hard-fern
Calluna vulgaris	Heather
Campanula rotundifolia	Harebell
Cardamine hirsuta	Hairy Bitter-cress
Cardamine pratensis	Cuckooflower
Carex bigelowii	Stiff Sedge
Carex binervis	Green-ribbed Sedge
Carex dioica	Dioecious Sedge
Carex echinata	Star Sedge
Carex hostiana	Tawny Sedge
Carex nigra	Common Sedge
Carex panicea	Carnation Sedge
Carex paniculata	Greater Tussock-sedge
Carex pilulifera	Pill Sedge
Carex pulicaris	Flea Sedge
Carex viridula	Yellow-sedge
Carex viridula subsp. *oedocarpa*	Yellow-sedge
Cerastium fontanum	Common Mouse-ear
Chrysosplenium oppositifolium	Opposite-leaved Golden-saxifrage
Crocosmia x *crocosmiiflora*	Montbretia
Cystopteris fragilis	Brittle Bladder-fern
Dactylorhiza incarnata	Early Marsh-orchid
Dactylorhiza maculata	Heath Spotted-orchid
Danthonia decumbens	Heath-grass
Deschampsia flexuosa	Wavy Hair-grass
Diphasiastrum alpinum	Alpine Clubmoss

VASCULAR SPECIES

Species name	Common name
Drosera anglica	Great Sundew
Dryopteris dilatata	Broad Buckler-fern
Dryopteris filix-mas	Male-fern
Eleocharis multicaulis	Many-stalked Spike-rush
Empetrum nigrum	Crowberry
Epilobium brunnescens	New Zealand Willowherb
Epilobium obscurum	Short-fruited Willowherb
Erica cinerea	Bell Heather
Erica tetralix	Cross-leaved Heath
Eriophorum angustifolium	Common Cottongrass
Eriophorum vaginatum	Hare's-tail Cottongrass
Euphrasia officinalis agg.	Eyebright
Fallopia japonica	Japanese Knotweed
Festuca ovina	Sheep's-fescue
Festuca rubra	Red Fescue
Festuca vivipara	Viviparous Sheep's-fescue
Fraxinus excelsior	Ash
Fuchsia magellanica	Fuchsia
Galium palustre	Common Marsh-bedstraw
Galium saxatile	Heath Bedstraw
Hieracium anglicum	a Hawkweed
Holcus lanatus	Yorkshire-fog
Huperzia selago	Fir Clubmoss
Hymenophyllum wilsonii	Wilson's Filmy-Fern
Hypericum elodes	Marsh St John’s-wort
Hypericum pulchrum	Slender St John's-wort
Hypochaeris radicata	Cat’s-ear
Ilex aquifolium	Holly
Jasione montana	Sheep’s-bit
Juncus acutiflorus	Sharp-flowered Rush
Juncus bulbosus	Bulbous Rush
Juncus effusus	Soft-rush
Juncus squarrosus	Heath Rush
Listera cordata	Lesser Twayblade
Lotus corniculatus	Common Bird's-foot-trefoil
Luzula multiflora	Heath Wood-rush
Luzula sylvatica	Great Wood-rush
Lysimachia nemorum	Yellow Pimpernel
Menyanthes trifoliata	Bogbean
Molinia caerulea	Purple Moor-grass
Myrica gale	Bog-myrtle
Nardus stricta	Mat-grass
Narthecium ossifragum	Bog Asphodel
Ophioglossum vulgatum	Adder’s tongue

VASCULAR SPECIES

Species name	Common name
Oreopteris limbosperma	Lemon-scented Fern
Oxalis acetosella	Wood-sorrel
Pedicularis sylvatica	Lousewort
Pinguicula grandiflora	Large-flowered Butterwort
Pinguicula vulgaris	Common Butterwort
Pinus sp.	a Pine
Plantago lanceolata	Ribwort Plantain
Poa pratensis sens. lat.	a Meadow-grass
Polygala serpyllifolia	Heath Milkwort
Polypodium vulgare	Polypody
Potamogeton polygonifolius	Bog Pondweed
Potentilla erecta	Tormentil
Primula vulgaris	Primrose
Prunella vulgaris	Selfheal
Pteridium aquilinum	Bracken
Quercus petraea	Sessile Oak
Ranunculus acris	Meadow Buttercup
Ranunculus ficaria	Lesser Celandine
Ranunculus flammula	Lesser Spearwort
Ranunculus repens	Creeping Buttercup
Rhododendron ponticum	Rhododendron
Rumex acetosa	Common Sorrel
Rumex acetosella	Sheep's Sorrel
Sagina procumbens	Procumbent Pearlwort
Salix cinerea	Grey Willow
Salix herbacea	Dwarf Willow
Saxifraga hirsuta	Kidney Saxifrage
Saxifraga rosacea subsp. *rosacea*	Irish Saxifrage
Saxifraga spathularis	St Patrick's-cabbage
Saxifraga stellaris	Starry Saxifrage
Schoenus nigricans	Black Bog-rush
Sedum rosea	Roseroot
Senecio jacobaea	Common Ragwort
Sibthorpia europaea	Cornish Moneywort
Solidago virgaurea	Goldenrod
Sorbus aucuparia	Rowan
Succisa pratensis	Devil's-bit Scabious
Thymus polytrichus	Wild Thyme
Trichomanes speciosum	Killarney Fern
Trichophorum germanicum	Deergrass
Trifolium repens	White Clover
Ulex europaeus	Gorse
Ulex gallii	Western Gorse
Vaccinium myrtillus	Bilberry
Viola riviniana	Common Dog-violet

BRYOPHYTES

Species name	Common name
Adelanthus decipiens	Deceptive Featherwort
Amphidium mougeotii	Mougeot's Yoke-moss
Anastrepta orcadensis	Orkney Notchwort
Anastrophyllum minutum	Comb Notchwort
Andreaea rothii	Dusky Rock-moss
Andreaea rupestris	Black Rock-moss
Aneura pinguis	Greasewort
Anomobryum julaceum	Slender Silver-moss
Anoectangium aestivum	Summer-moss
Anthelia julacea	Alpine Silverwort
Aphanolejeunea microscopica	Long-leaved Pouncewort
Atrichum undulatum	Common Smoothcap
Barbilophozia floerkei	Common Pawwort
Bazzania pearsonii	Arch-leaved Whipwort
Bazzania tricrenata	Lesser Whipwort
Blindia acuta	Sharp-leaved Blindia
Brachythecium plumosum	Rusty Feather-moss
Brachythecium rivulare	River Feather-moss
Breutelia chrysocoma	Golden-head Moss
Bryoerythrophyllum ferruginascens	Rufous Beard-moss
Bryum capillare	Capillary Thread-moss
Bryum pallescens	Tall-clustered Thread-moss
Bryum pseudotriquetrum	Marsh Bryum
Calliergon sarmentosum	Twiggy Spear-moss
Calliergonella cuspidata	Pointed Spear-moss
Calypogeia arguta	Notched Pouchwort
Calypogeia fissa	Common Pouchwort
Calypogeia muelleriana	Mueller's Pouchwort
Campylopus atrovirens	Bristly Swan-neck Moss
Campylopus brevipilus	Compact Swan-neck Moss
Campylopus flexuosus	Rusty Swan-neck Moss
Campylopus fragilis	Brittle Swan-neck Moss
Campylopus gracilis	Schwarz's Swan-neck Moss
Campylopus introflexus	Heath Star Moss
Campylopus pyriformis	Dwarf Swan-neck Moss
Campylopus setifolius	Silky Swan-neck Moss
Cephaloziella divaricata	Common Threadwort
Cephalozia bicuspidata	Snow Pincerwort
Cephalozia connivens	Forcipated Pincerwort
Cephaloziella sp.	a Threadwort
Chiloscyphus polyanthos	St Winifrid's Moss
Cladopodiella fluitans	Bog Notchwort
Cratoneuron filicinum	Fern-leaved Hook-moss
Ctenidium molluscum	Chalk Comb-moss

BRYOPHYTES

Species name	Common name
Dichodontium pellucidum	Transparent Fork-moss
Dichodontium flavescens	Yellowish Fork-moss
Dicranella heteromalla	Silky Forklet-moss
Dicranella palustris	Marsh Forklet-moss
Dicranum majus	Greater Fork-moss
Dicranum scoparium	Broom Fork-moss
Dicranum scottianum	Scott's Fork-moss
Diplophyllum albicans	White Earwort
Distichium capillaceum	Fine Distichium
Douinia ovata	Waxy Earwort
Drepanocladus revolvens	Rusty Hook-moss
Drepanolejeunea hamatifolia	Toothed Pouncewort
Dumortiera hirsuta	Dumortier's Liverwort
Encalypta ciliata	Fringed Extinguisher-moss
Fissidens adianthoides	Maidenhair Pocket-moss
Fissidens dubius	Rock Pocket-moss
Fissidens osmundoides	Purple-stalked Pocket-moss
Fissidens pusillus	Petty Pocket-moss
Frullania fragilifolia	Spotty Fingers
Frullania tamarisci	Tamarisk Scalewort
Frullania teneriffae	Sea Scalewort
Grimmia ramondii	Spreading-leaved Grimmia
Grimmia torquata	Twisted Grimmia
Grimmia trichophylla	Hair-pointed Grimmia
Gymnocolea inflata	Inflated Notchwort
Gymnomitrion crenulatum	Western Frostwort
Gymnostomum aeruginosum	Verdigris Tufa-moss
Harpanthus scutatus	Stipular Flapwort
Herbertus aduncus subsp. *hutchinsiae*	Juniper Prongwort
Heterocladium heteropterum var. *heteropterum*	Wry-leaved Tamarisk-moss
Hookeria lucens	Shining Hookeria
Hygrobiella laxifolia	Lax Notchwort
Hylocomiastrum umbratum	Shaded Wood-moss
Hylocomium splendens	Glittering Wood-moss
Hyocomium armoricum	Flagellate Feather-moss
Hypnum cupressiforme	Cypress-leaved Plait-moss
Hypnum lacunosum	a Plait-moss
Hypnum jutlandicum	Heath Plait-moss
Isopterygiopsis pulchella	Neat Silk-moss
Isothecium holtii	Holt's Mouse-tail Moss
Isothecium myosuroides	Slender Mouse-tail Moss
Isothecium myosuroides var. *brachythecioides*	Slender Mouse-tail Moss
Jungermannia atrovirens	Dark-green Flapwort
Jungermannia exsertifolia subsp. *cordifolia*	Cordate Flapwort

BRYOPHYTES

Species name	Common name
Kindbergia praelonga	Common Feather-moss
Kurzia sylvatica	Wood Fingerwort
Kurzia trichoclados	Heath Fingerwort
Lejeunea patens	Pearl Pouncewort
Lepidozia pearsonii	Pearson's Fingerwort
Lepidozia reptans	Creeping Fingerwort
Leucobryum glaucum	Large White-moss
Lophocolea bidentata	Bifid Crestwort
Lophozia incisa	Jagged Notchwort
Lophozia sudetica	Hill Notchwort
Lophozia ventricosa	Tumid Notchwort
Marchantia polymorpha subsp. *polymorpha*	Common Liverwort
Marsupella emarginata var. *aquatica*	Notched Rustwort
Marsupella emarginata var. *emarginata*	Notched Rustwort
Moerckia hibernica	Irish Ruffwort
Mastigophora woodsii	Wood's Whipwort
Metzgeria conjugata	Rock Veilwort
Metzgeria leptoneura	Hooked Veilwort
Microlejeunea ulicina	Fairy Beads
Mnium hornum	Swan's-neck Thyme-moss
Mylia taylorii	Taylor's Flapwort
Nardia compressa	Compressed Flapwort
Nardia scalaris	Ladder Flapwort
Neckera crispa	Crisped Neckera
Nowellia curvifolia	Wood-rust
Odontoschisma denudatum	Matchstick Flapwort
Odontoschisma sphagni	Bog-moss Flapwort
Oligotrichum hercynicum	Herycinian Haircap
Orthotrichum tenellum	Slender Bristle-moss
Orthothecium intricatum	Fine-leaved Leskea
Paraleptodontium recurvifolium	Drooping-leaved Beard-moss
Pellia epiphylla	Overleaf Pellia
Philonotis fontana	Fountain Apple-moss
Plagiochila bifaria	Killarney Featherwort
Plagiochila exigua	Petty Featherwort
Plagiochila porelloides	Lesser Featherwort
Plagiochila spinulosa	Prickly Featherwort
Plagiomnium undulatum	Hart's-tongue Thyme-moss
Plagiothecium succulentum	Juicy Silk-moss
Plagiothecium undulatum	Waved Silk-moss
Platyhypnidium lusitanicum	Portuguese Feather-moss
Pleurozia purpurea	Purple Spoonwort
Pleurozium schreberi	Red-stemmed Feather-moss
Pogonatum urnigerum	Urn Haircap

BRYOPHYTES

Species name	Common name
Pohlia cruda	Opal Thread-moss
Pohlia nutans	Nodding Thread-moss
Pohlia wahlenbergii	Pale Glaucous Thread-moss
Pohlia wahlenbergii var. *glacialis*	Pale Glaucous Thread-moss
Polytrichum alpinum	Alpine Haircap
Polytrichum commune	Common Haircap
Polytrichum formosum	Bank Haircap
Polytrichum juniperinum	Juniper Haircap
Porella arboris-vitae	Bitter Scalewort
Pseudotaxiphyllum elegans	Elegant Silk-moss
Ptilidium ciliare	Ciliated Fringewort
Racomitrium aciculare	Yellow Fringe-moss
Racomitrium ellipticum	Oval-fruited Fringe-moss
Racomitrium ericoides	Dense Fringe-moss
Racomitrium fasciculare	Green Mountain Fringe-moss
Racomitrium lanuginosum	Woolly Fringe-moss
Racomitrium sudeticum	Slender Fringe-moss
Radula aquilegia	Brown Scalewort
Radula carringtonii	Carrington's Scalewort
Radula lindenbergiana	Lindenberg's Scalewort
Radula voluta	Pale Scalewort
Rhabdoweisia crispata	Toothed Streak-moss
Rhizomnium punctatum	Dotted Thyme-moss
Rhytidiadelphus loreus	Little Shaggy-moss
Rhytidiadelphus squarrosus	Springy Turf-moss
Riccardia chamedryfolia	Jagged Germanderwort
Riccardia multifida	Delicate Germanderwort
Saccogyna viticulosa	Straggling Pouchwort
Scapania aequiloba	Lesser Rough Earwort
Scapania aspera	Rough Earwort
Scapania gracilis	Western Earwort
Scapania ornithopodioides	Bird's-foot Earwort
Scapania scandica	Norwegian Earwort
Scapania umbrosa	Shady Earwort
Scapania undulata	Water Earwort
Schistidium apocarpum	Sessile Grimmia
Schistidium strictum	Upright Brown Grimmia
Scleropodium purum	Neat Feather-moss
Sphagnum angustifolium	Fine Bog-moss
Sphagnum capillifolium subsp. *capillifolium*	Acute-leaved Bog-moss
Sphagnum capillifolium subsp. *rubellum*	Red Bog-moss
Sphagnum compactum	Compact Bog-moss
Sphagnum contortum	Twisted Bog-moss
Sphagnum cuspidatum	Feathery Bog-moss

BRYOPHYTES

Species name	Common name
Sphagnum denticulatum	Cow-horn Bog-moss
Sphagnum fallax	Flat-topped Bog-moss
Sphagnum inundatum	Lesser Cow-horn Bog-moss
Sphagnum molle	Blushing Bog-moss
Sphagnum palustre	Blunt-leaved Bog-moss
Sphagnum papillosum	Papillose Bog-moss
Sphagnum quinquefarium	Five-ranked Bog-moss
Sphagnum russowii	Russow's Bog-moss
Sphagnum squarrosum	Spiky Bog-moss
Sphagnum subnitens var. *subnitens*	Lustrous Bog-moss
Sphagnum tenellum	Soft Bog-moss
Splachnum sphaericum	Round-fruited Collar-moss
Tetrodontium brownianum	Brown's Four-tooth Moss
Thamnobryum alopecurum	Fox-tail Feather-moss
Thuidium delicatulum	Delicate Tamarisk-moss
Thuidium tamariscinum	Common Tamarisk-moss
Tortella tortuosa	Frizzled Crisp-moss
Trichostomum brachydontium	Variable Crisp-moss
Trichostomum hibernicum	Irish Crisp-moss
Trichostomum tenuirostre	Narrow-fruited Crisp-moss
Trichostomum tenuirostre var. *holtii*	Narrow-fruited Crisp-moss
Tritomaria quinquedentata	Lyon's Notchwort
Warnstorfia exannulata	Ringless Hook-moss
Zygodon rupestris	Park Yoke-moss

LICHENS

Species name	Species name
Cetraria aculeata	*Cladonia uncialis*
Cetraria islandica	*Cladonia uncialis* subsp. *biuncialis*
Cetraria muricata	*Cystocoleus ebeneus*
Cladonia arbuscula subsp. *squarrosa*	*Leptogium lichenoides*
Cladonia ciliata	*Parmelia saxatilis*
Cladonia ciliata var. *tenuis*	*Peltigera hymenina*
Cladonia crispata var. *cetrariiformis*	*Peltigera membranacea*
Cladonia floerkeana	*Placidium lachneum*
Cladonia furcata subsp. *furcata*	*Stereocaulon vesuvianum*
Cladonia portentosa	*Sticta fuliginosa*
Cladonia pyxidata	*Umbilicaria cylindrica*
Cladonia subcervicornis	

Figure 1. Survey area / cSAC boundary of Slieve Mish Mountains cSAC (002185), Co. Kerry

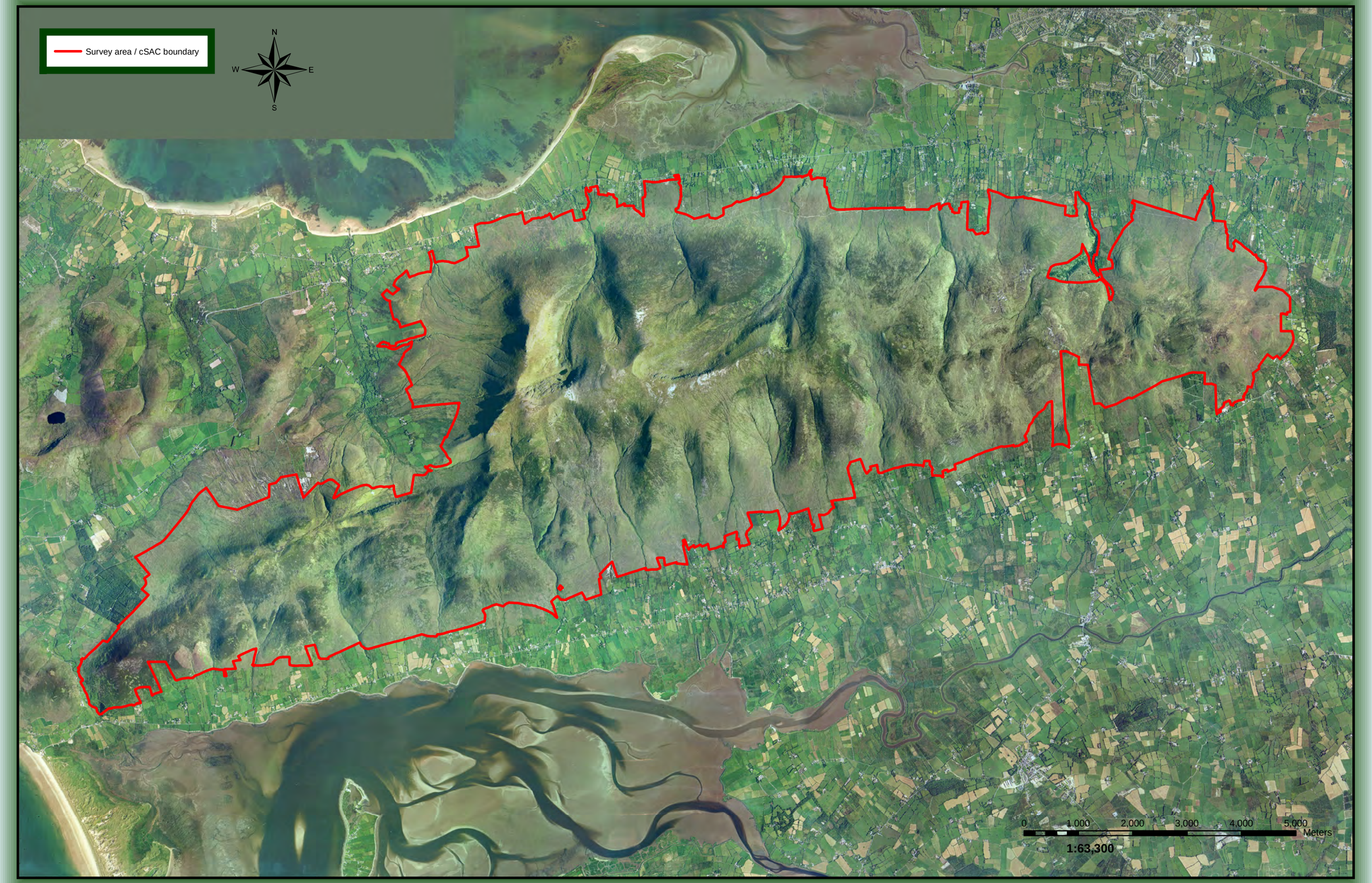

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Figure 2. Primary Fossitt habitats within Slieve Mish Mountains cSAC (002185), Co. Kerry

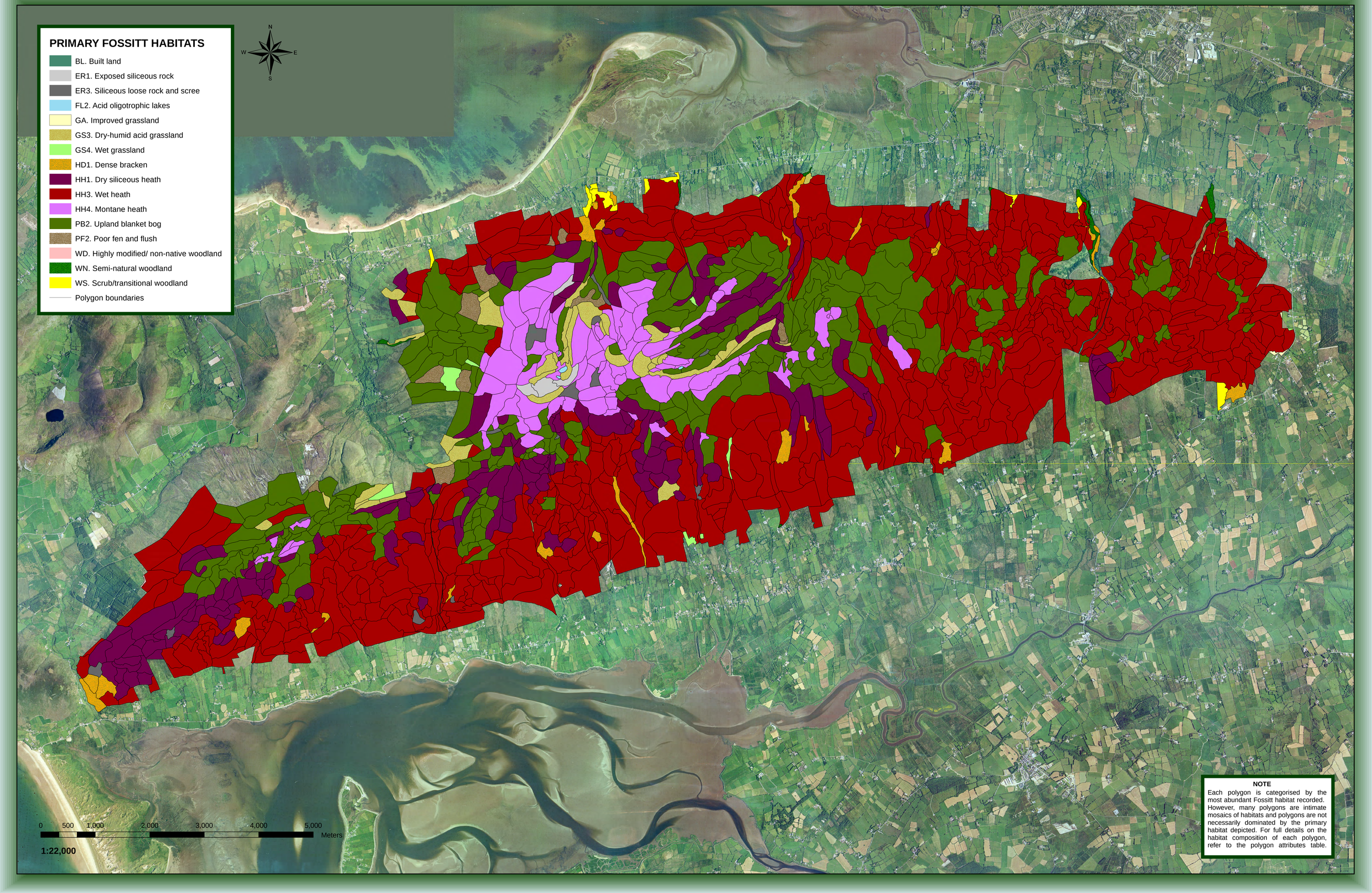

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Figure 3. Primary Annex I habitats within Slieve Mish Mountains cSAC (002185), Co. Kerry.

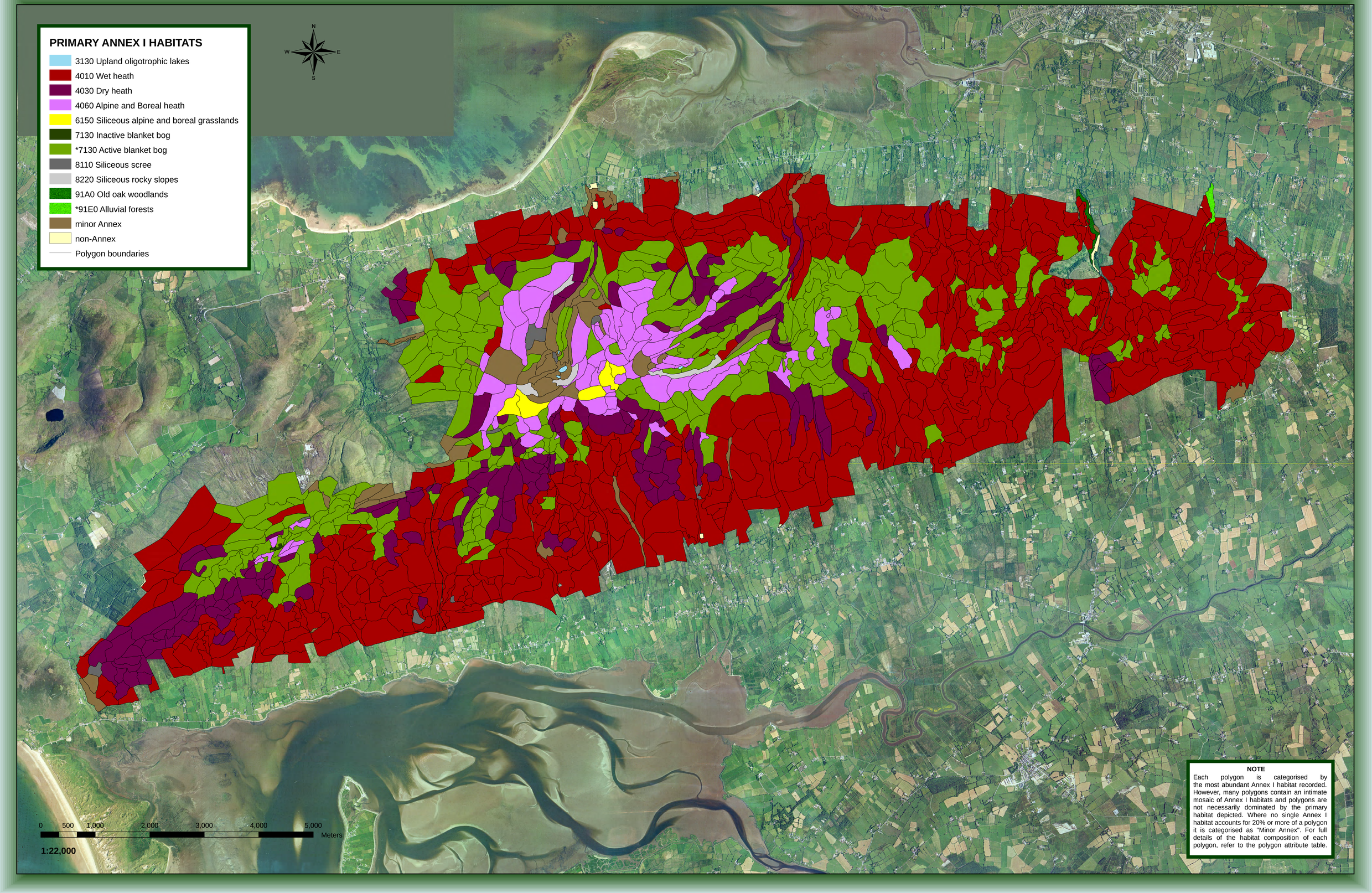

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Figure 4a. Cover of 4010 WET HEATH within Slieve Mish Mountains cSAC (002185), Co. Kerry

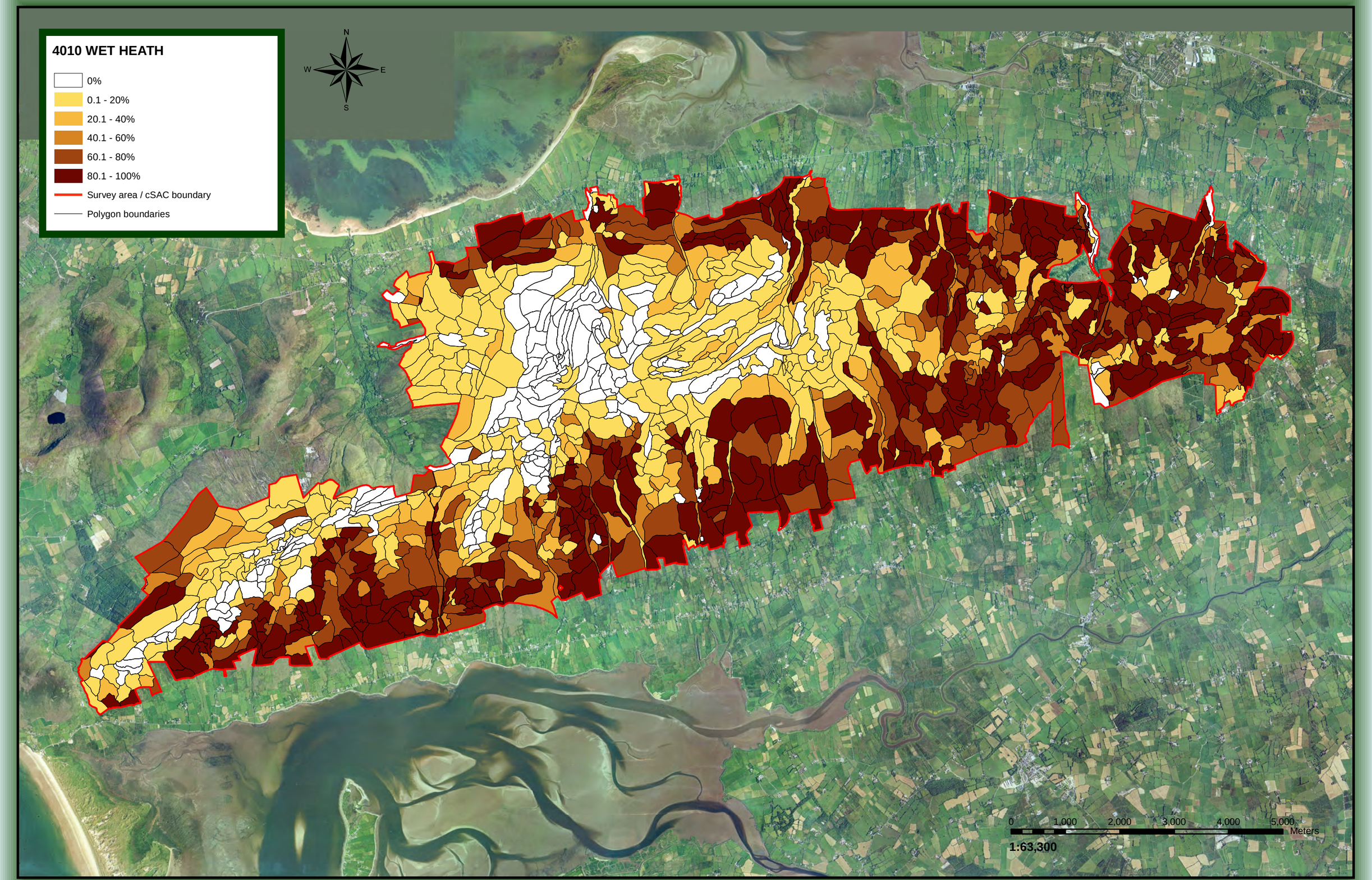

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Figure 4b. Cover of 4030 DRY HEATH within Slieve Mish Mountains cSAC (002185), Co. Kerry

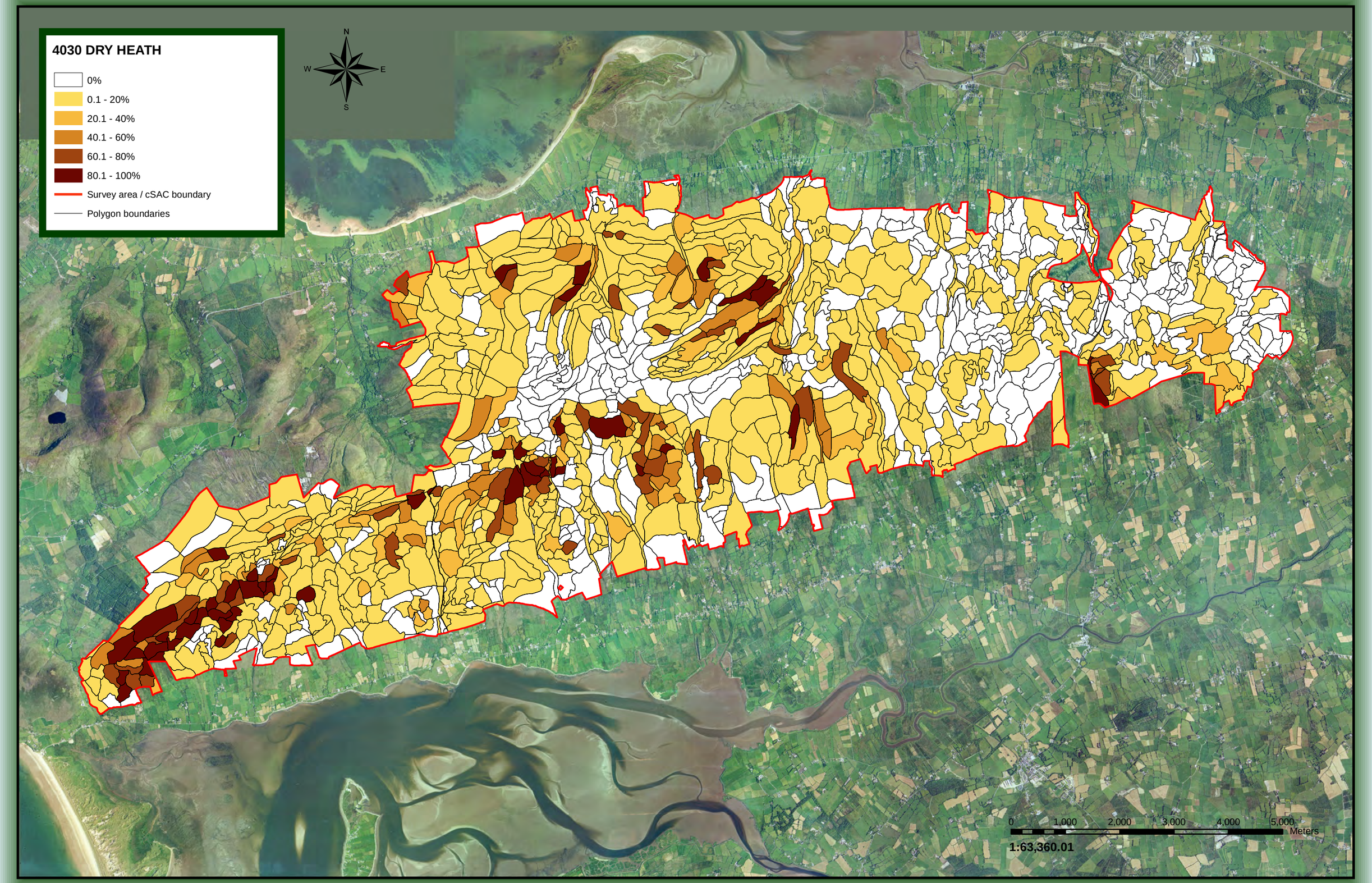

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Figure 4c. Cover of 4060 ALPINE AND BOREAL HEATH within Slieve Mish Mountains cSAC (002185), Co. Kerry

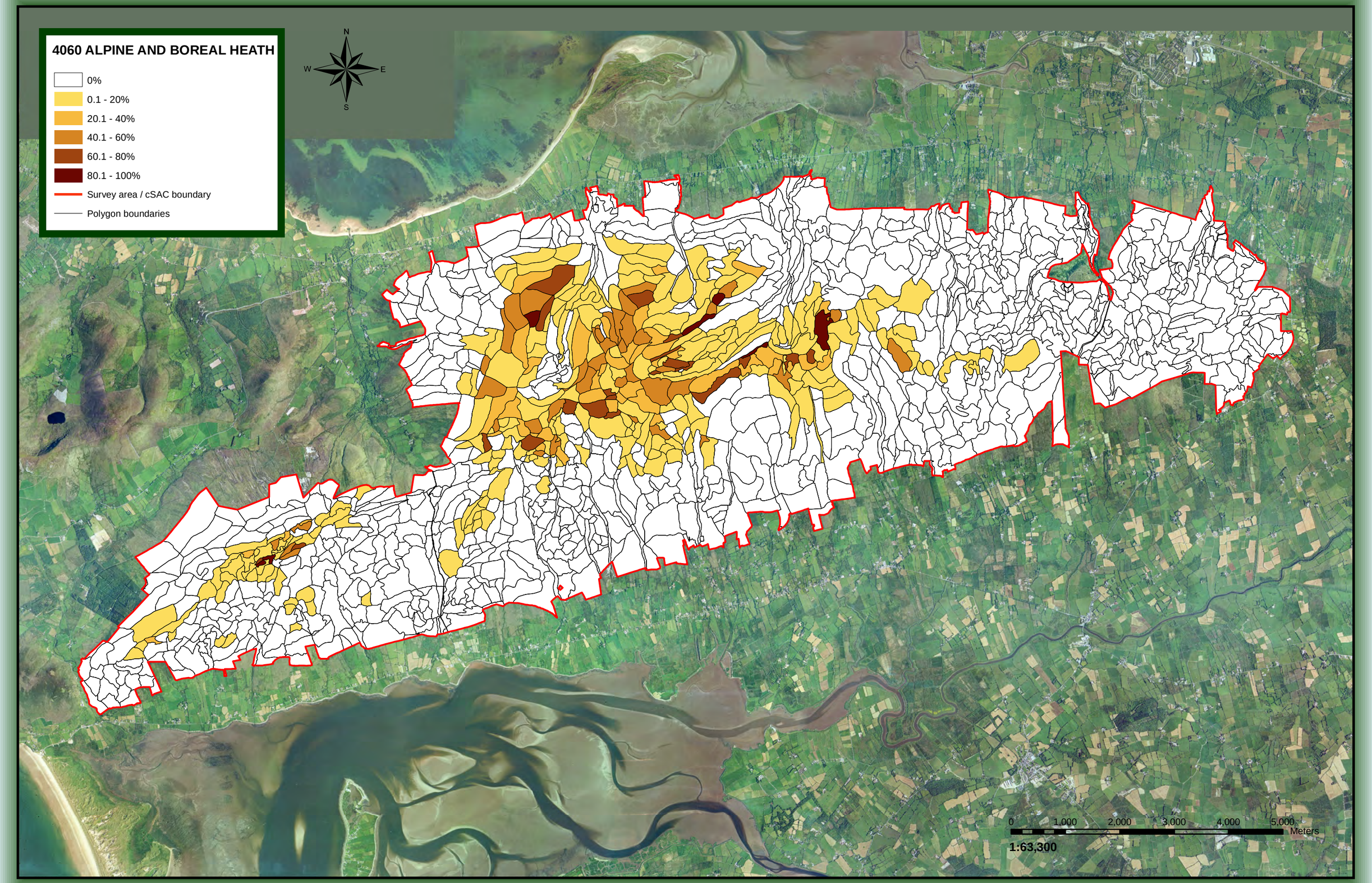

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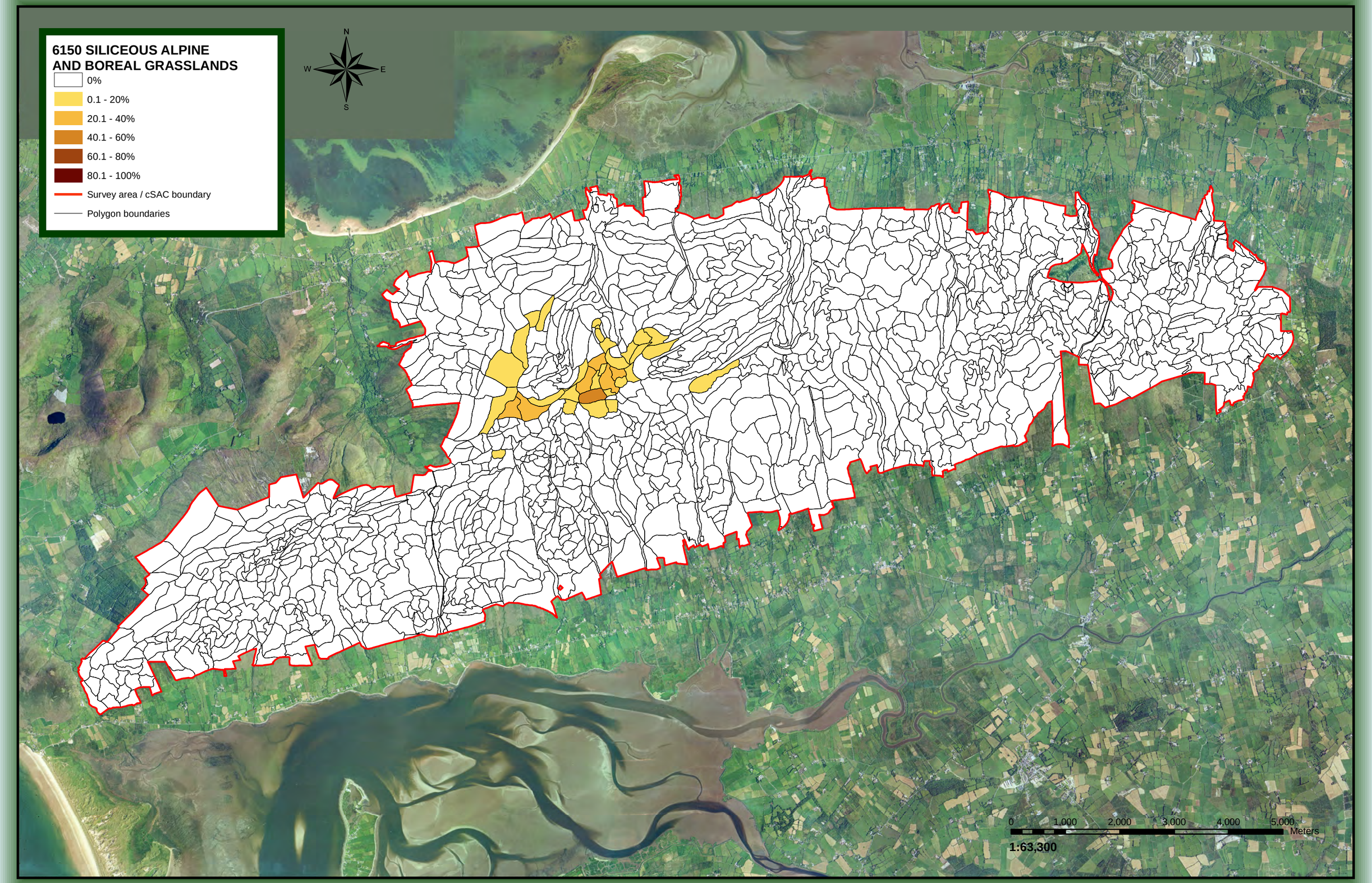
Figure 4d. Cover of 6150 SILICEOUS ALPINE AND BOREAL GRASSLANDS within Slieve Mish Mountains cSAC (002185), Co. Kerry



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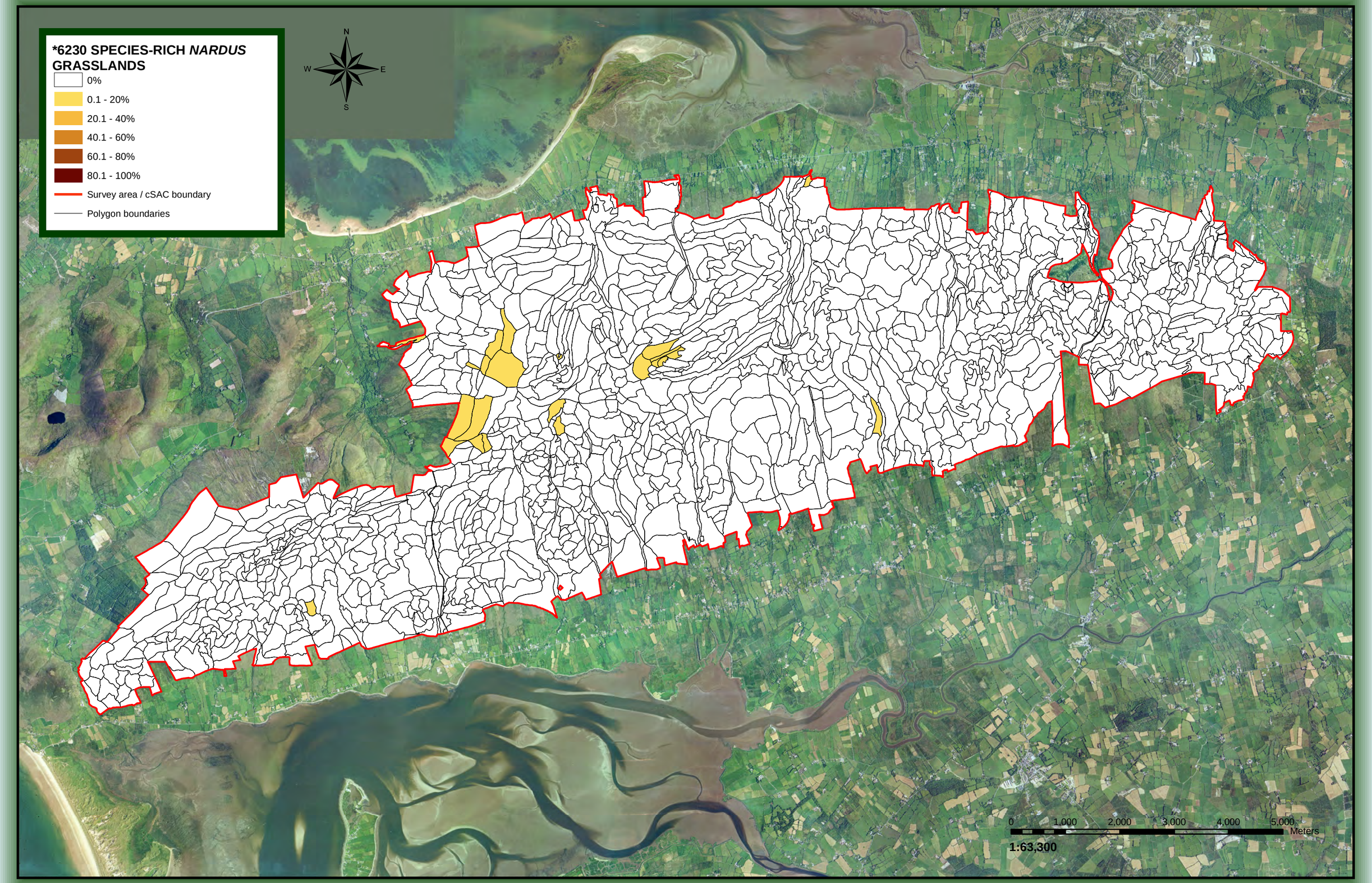
NSUH (Phase 4, 2013-2014) Site Report No. 15: Slieve Mish Mountains cSAC (002185), Co. Kerry. Map size A3.

Figure 4e. Cover of *6230 SPECIES-RICH *NARDUS* GRASSLANDS within Slieve Mish Mountains cSAC (002185), Co. Kerry



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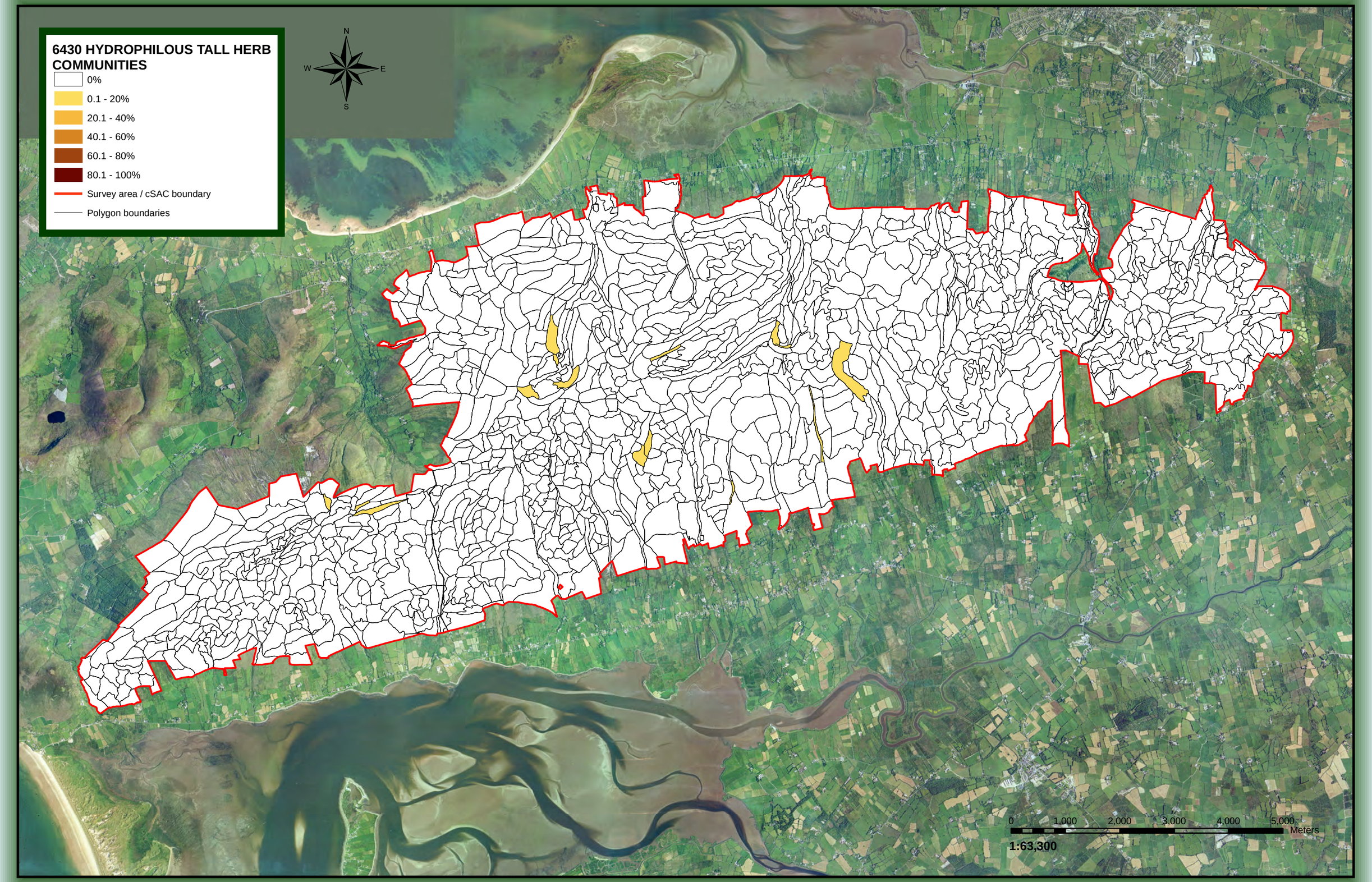
NSUH (Phase 4, 2013-2014) Site Report No. 15: Slieve Mish Mountains cSAC (002185), Co. Kerry. Map size A3.

Figure 4f. Cover of 6430 HYDROPHILOUS TALL HERB COMMUNITIES within Slieve Mish Mountains cSAC (002185), Co. Kerry



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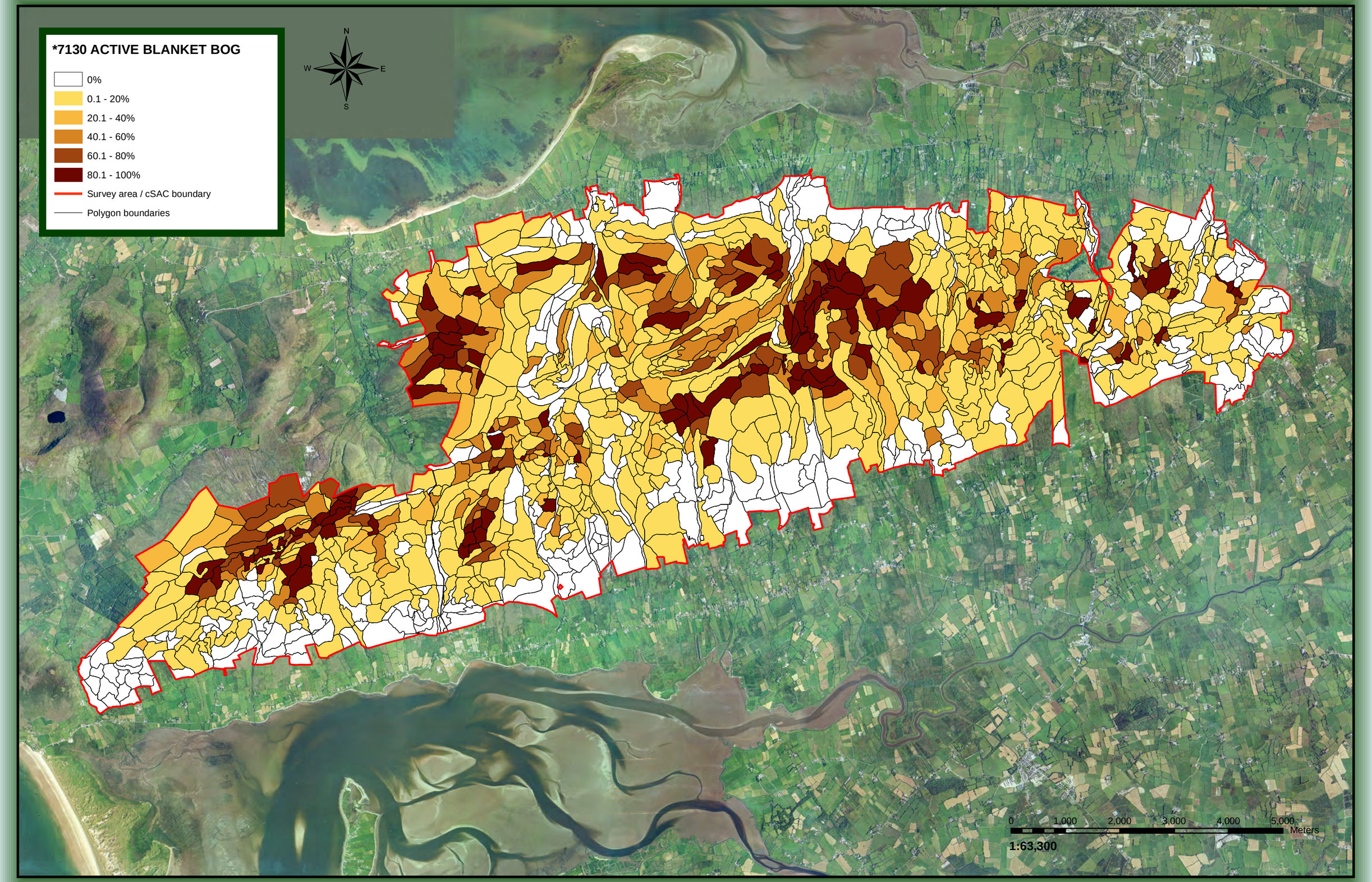
NSUH (Phase 4, 2013-2014) Site Report No. 15: Slieve Mish Mountains cSAC (002185), Co. Kerry. Map size A3.

Figure 4g. Cover of *7130 ACTIVE BLANKET BOG within Slieve Mish Mountains cSAC (002185), Co. Kerry



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NSUH (Phase 4, 2013-2014) Site Report No. 15: Slieve Mish Mountains cSAC (002185), Co. Kerry. Map size A3.

Figure 4h. Cover of 7130 INACTIVE BLANKET BOG within Slieve Mish Mountains cSAC (002185), Co. Kerry

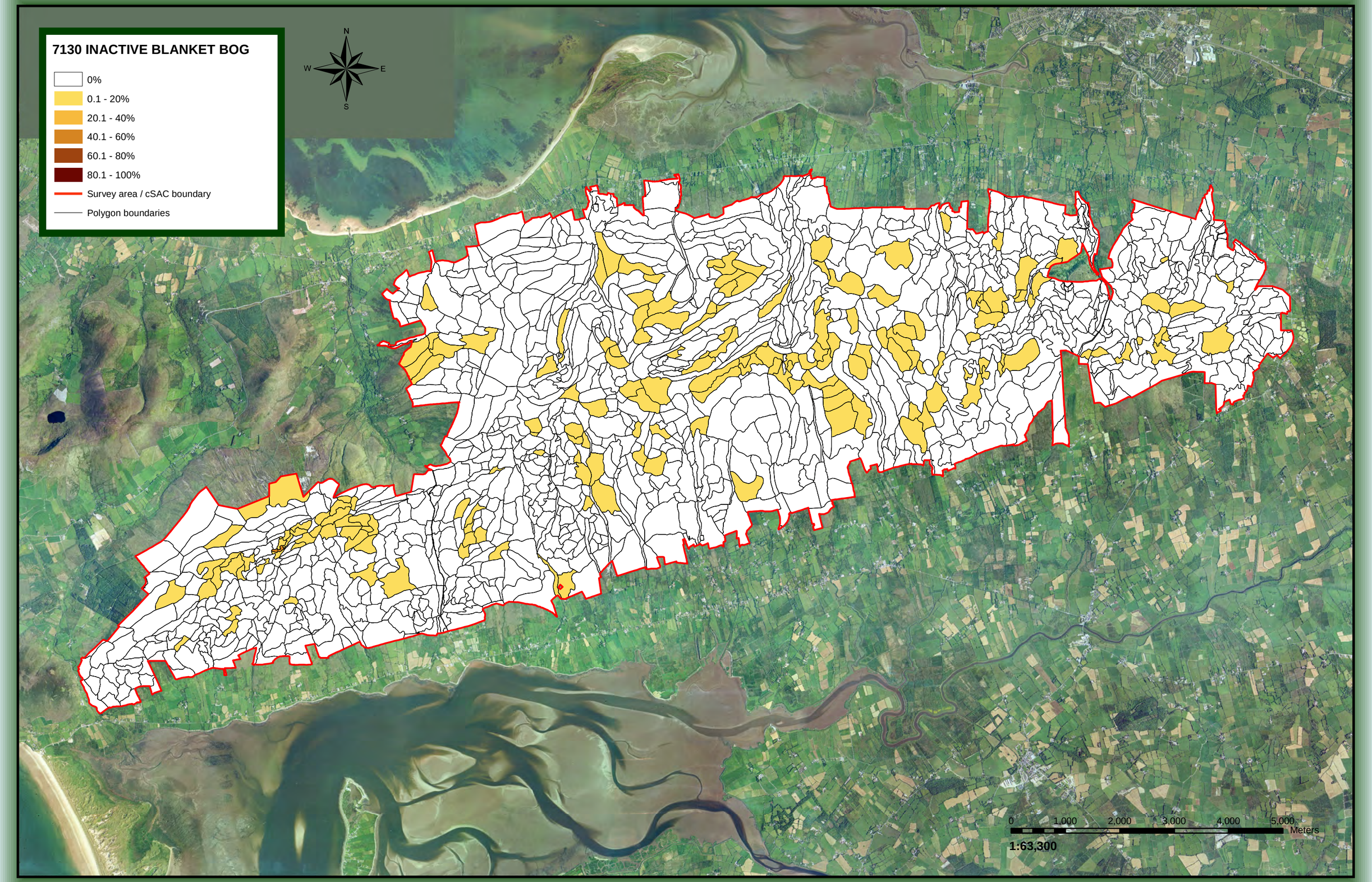

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Figure 4i. Cover of 7140 TRANSITION MIRES within Slieve Mish Mountains cSAC (002185), Co. Kerry

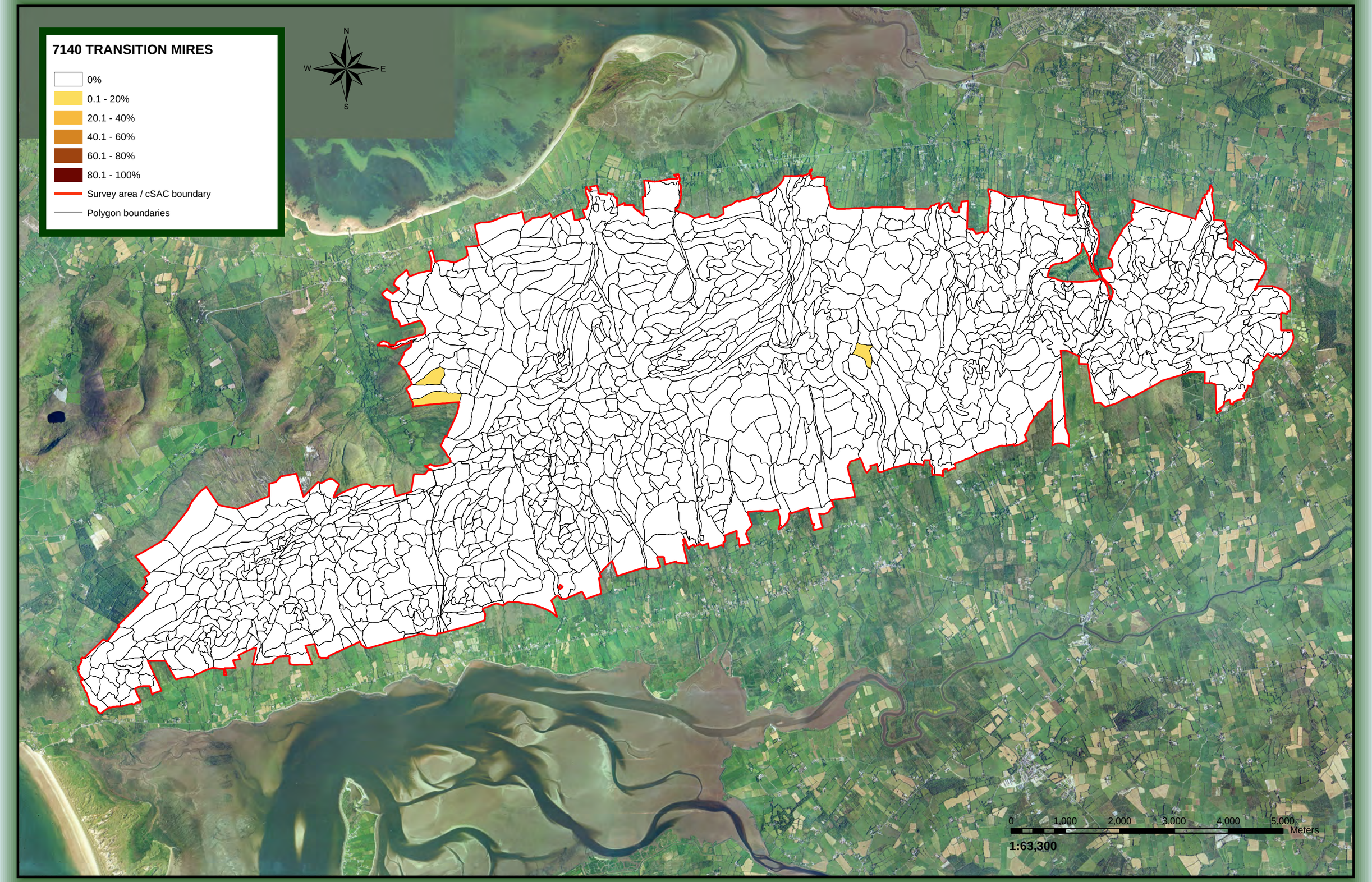

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Figure 4j. Cover of 7230 ALKALINE FENS within Slieve Mish Mountains cSAC (002185), Co. Kerry

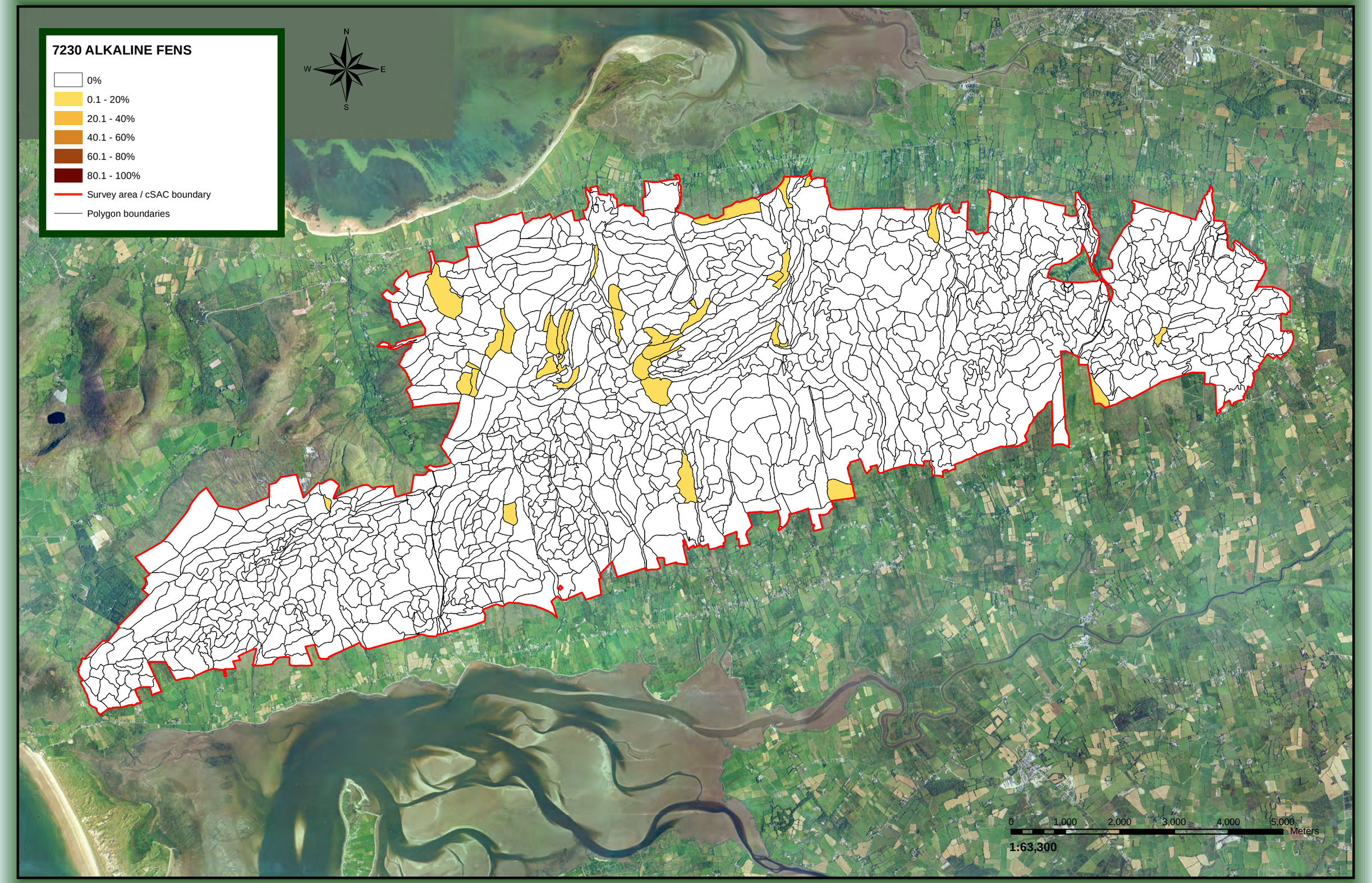

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Figure 4k. Cover of 8110 SILICEOUS SCREE within Slieve Mish Mountains cSAC (002185), Co. Kerry

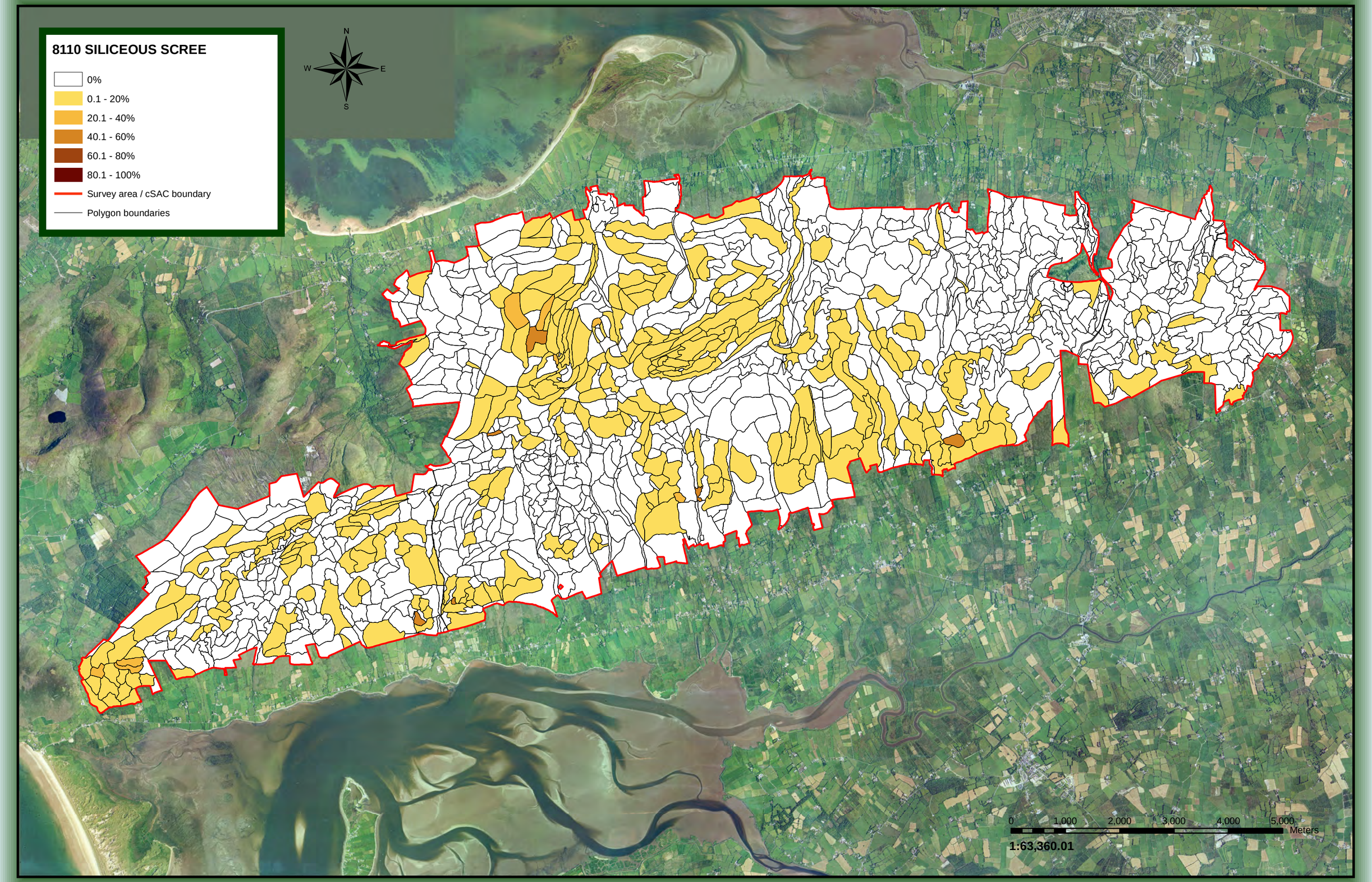

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Figure 4l. Cover of 8210 CALCAREOUS ROCKY SLOPES within Slieve Mish Mountains cSAC (002185), Co. Kerry

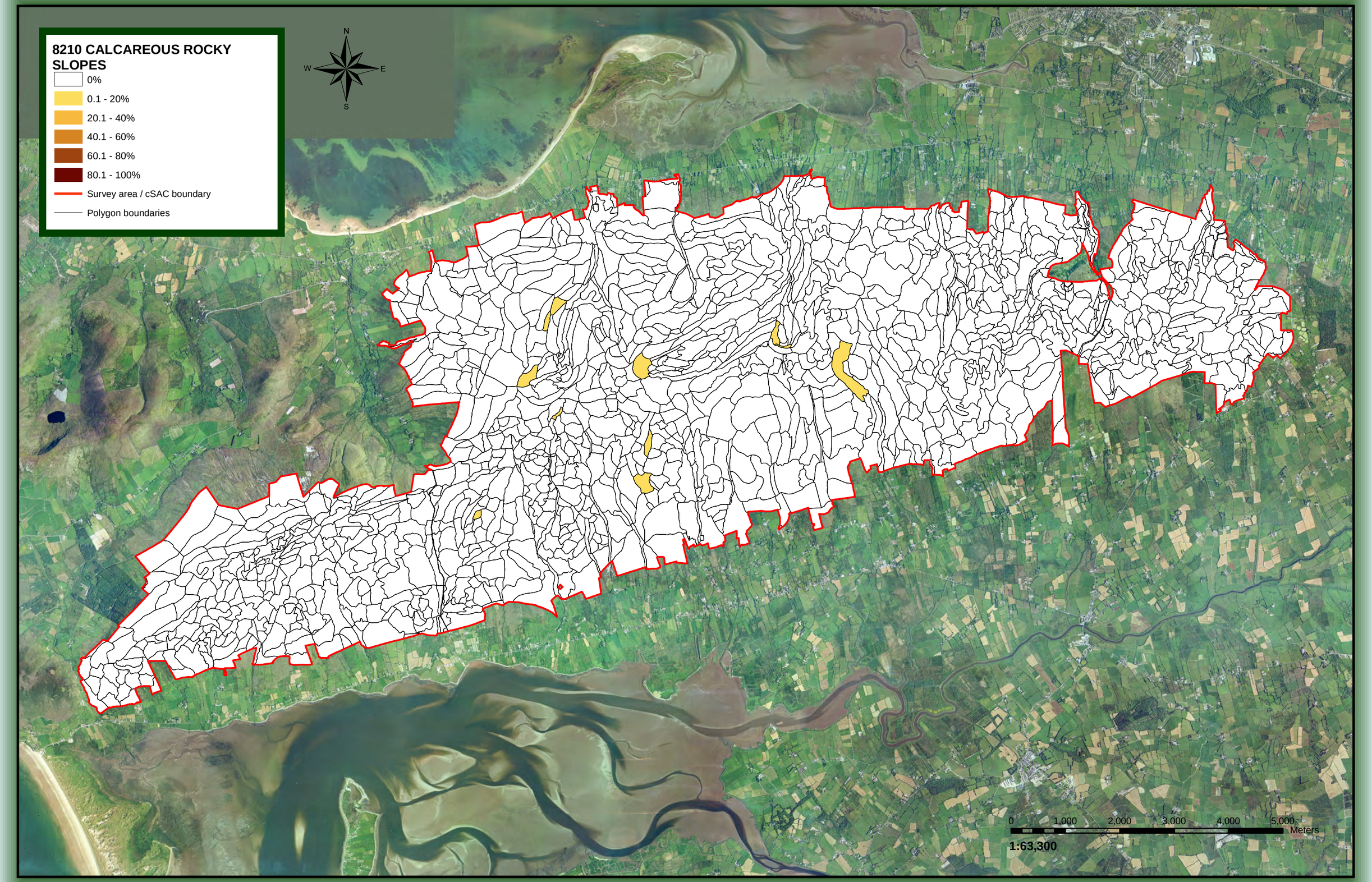

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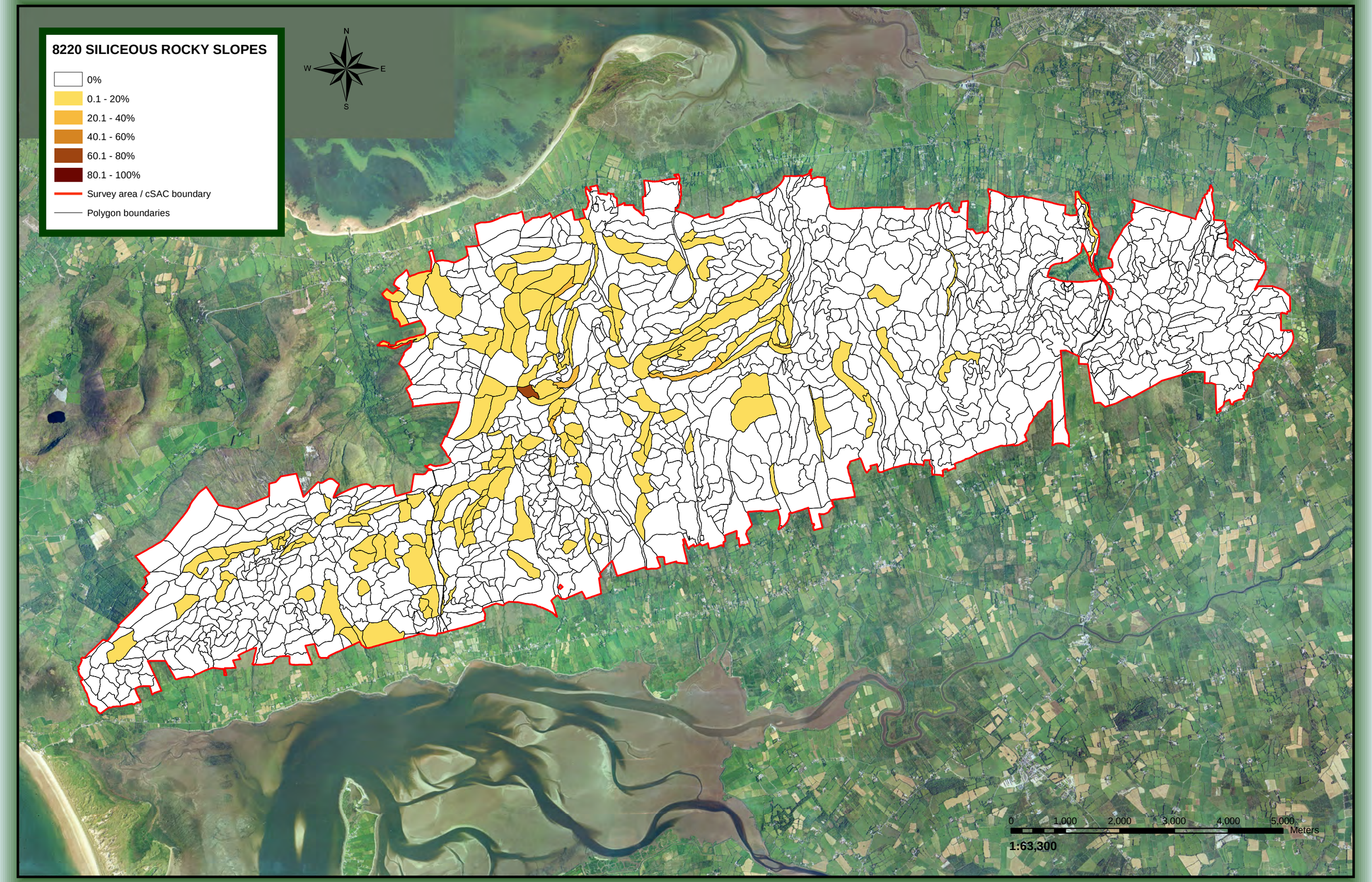
Figure 4m. Cover of 8220 SILICEOUS ROCKY SLOPES within Slieve Mish Mountains cSAC (002185), Co. Kerry



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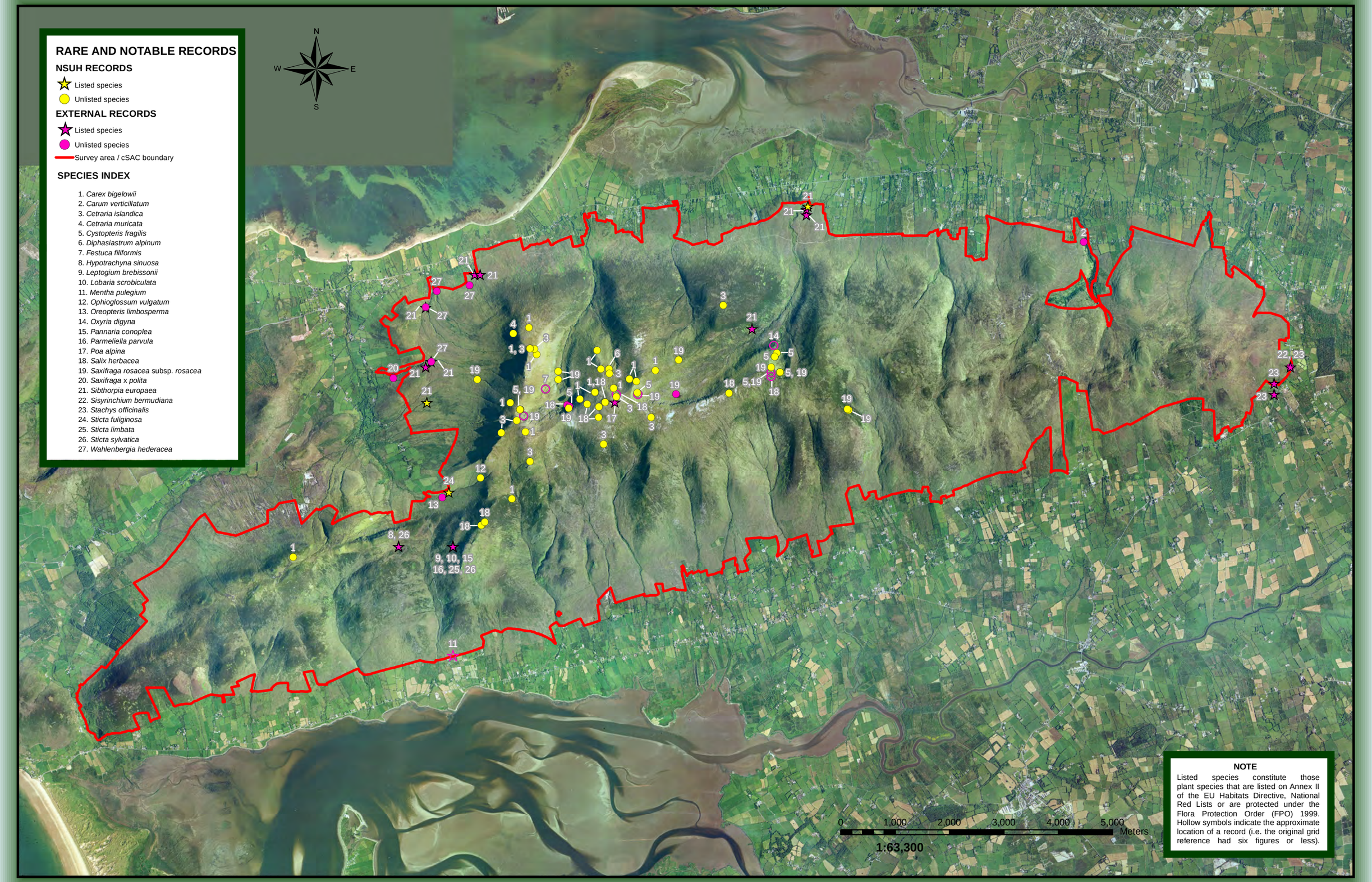
NSUH (Phase 4, 2013-2014) Site Report No. 15: Slieve Mish Mountains cSAC (002185), Co. Kerry. Map size A3.

Figure 5a. Location of rare and notable vascular plant and lichen records within and surrounding Slieve Mish Mountains cSAC (002185), Co. Kerry



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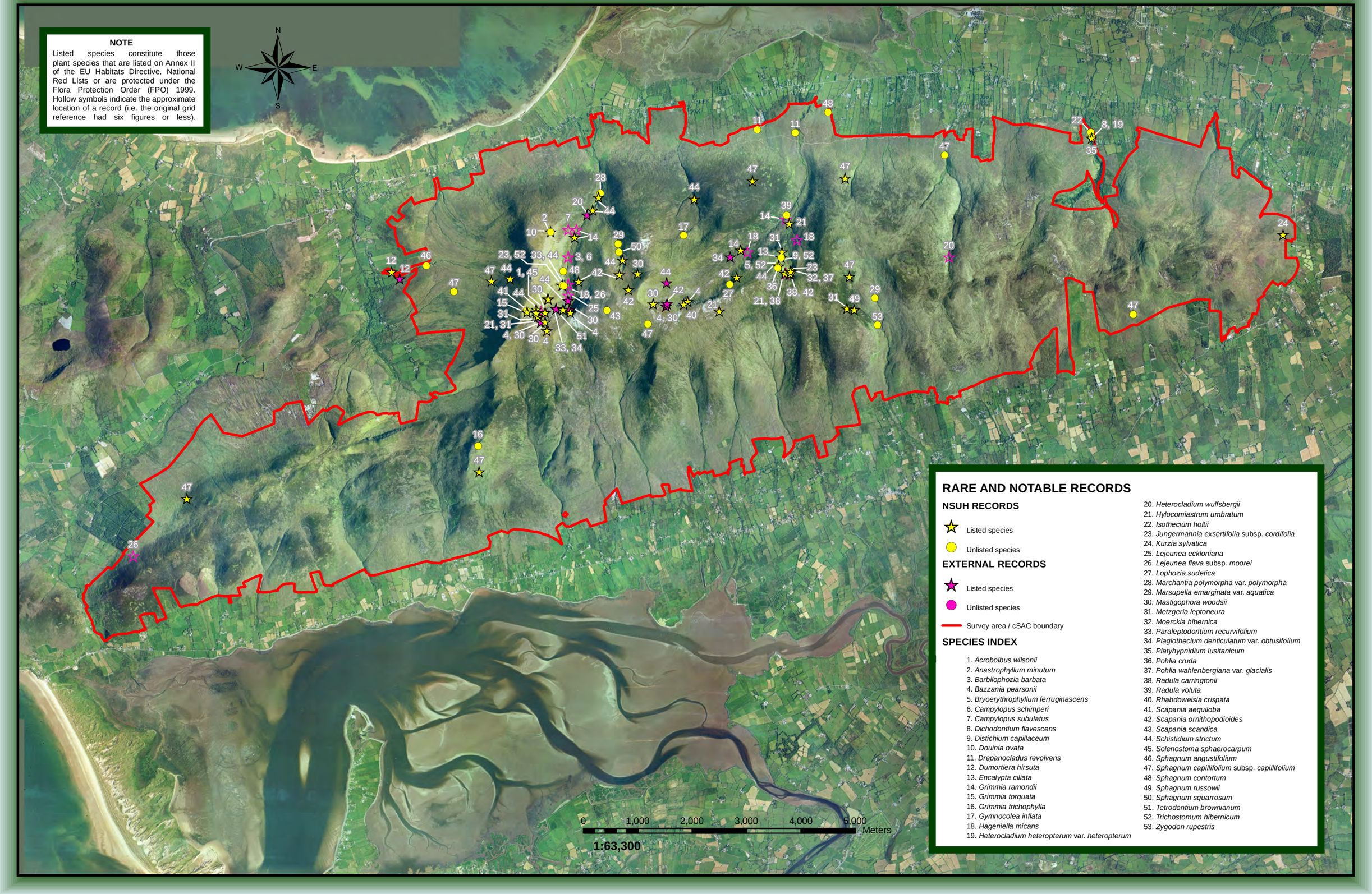
NSUH (Phase 4, 2013-2014) Site Report No. 15: Slieve Mish Mountains cSAC (002185), Co. Kerry. Map size A3.

Figure 5b. Location of rare and notable bryophyte records within and surrounding Slieve Mish Mountains cSAC (002185), Co. Kerry



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NSUH (Phase 4, 2013-2014) Site Report No. 15: Slieve Mish Mountains cSAC (002185), Co. Kerry. Map size A3.

Figure 6. Location and results of conservation assessment monitoring stops and other relevés within Slieve Mish Mountains cSAC (002185), Co.Kerry

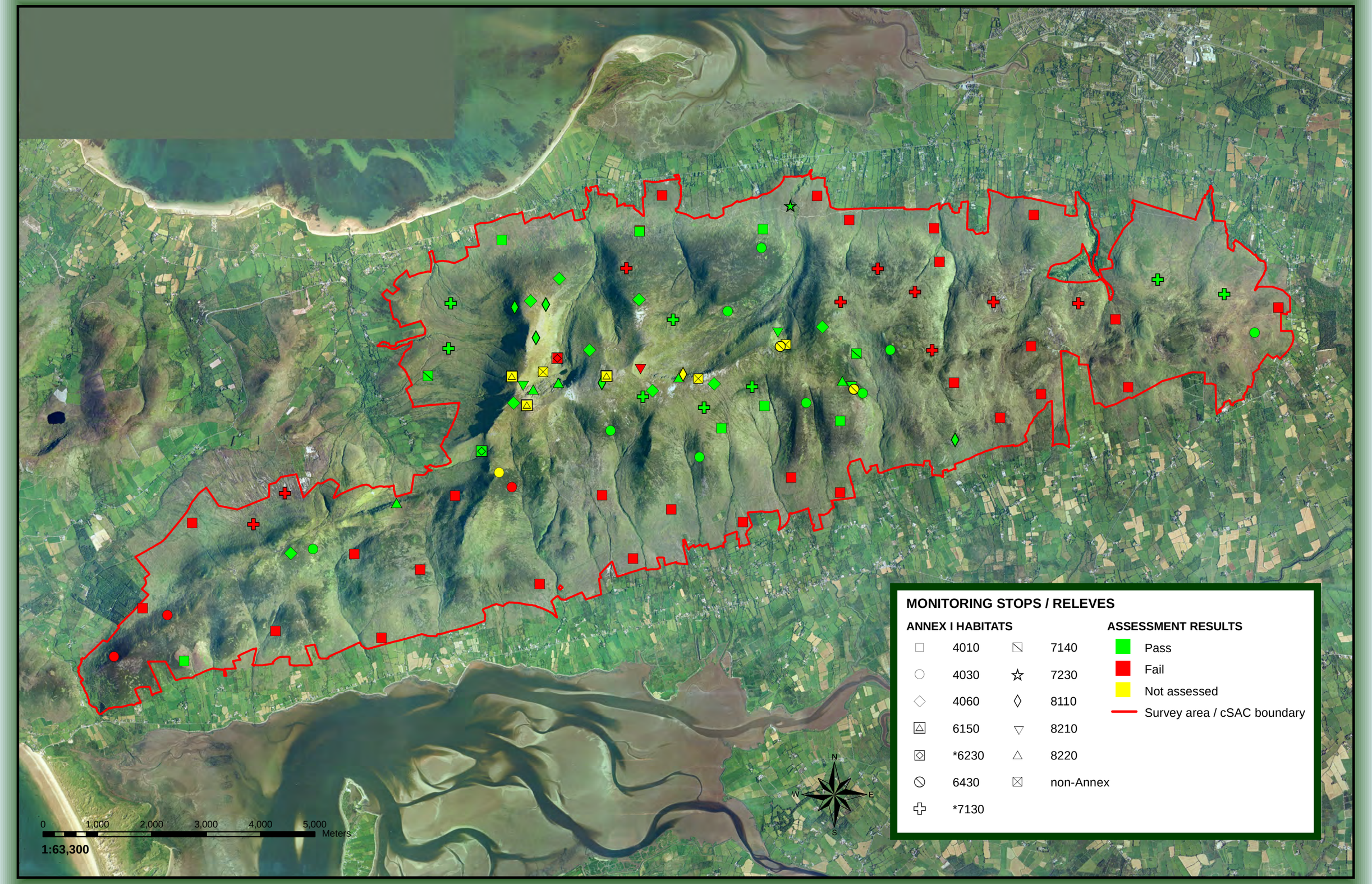

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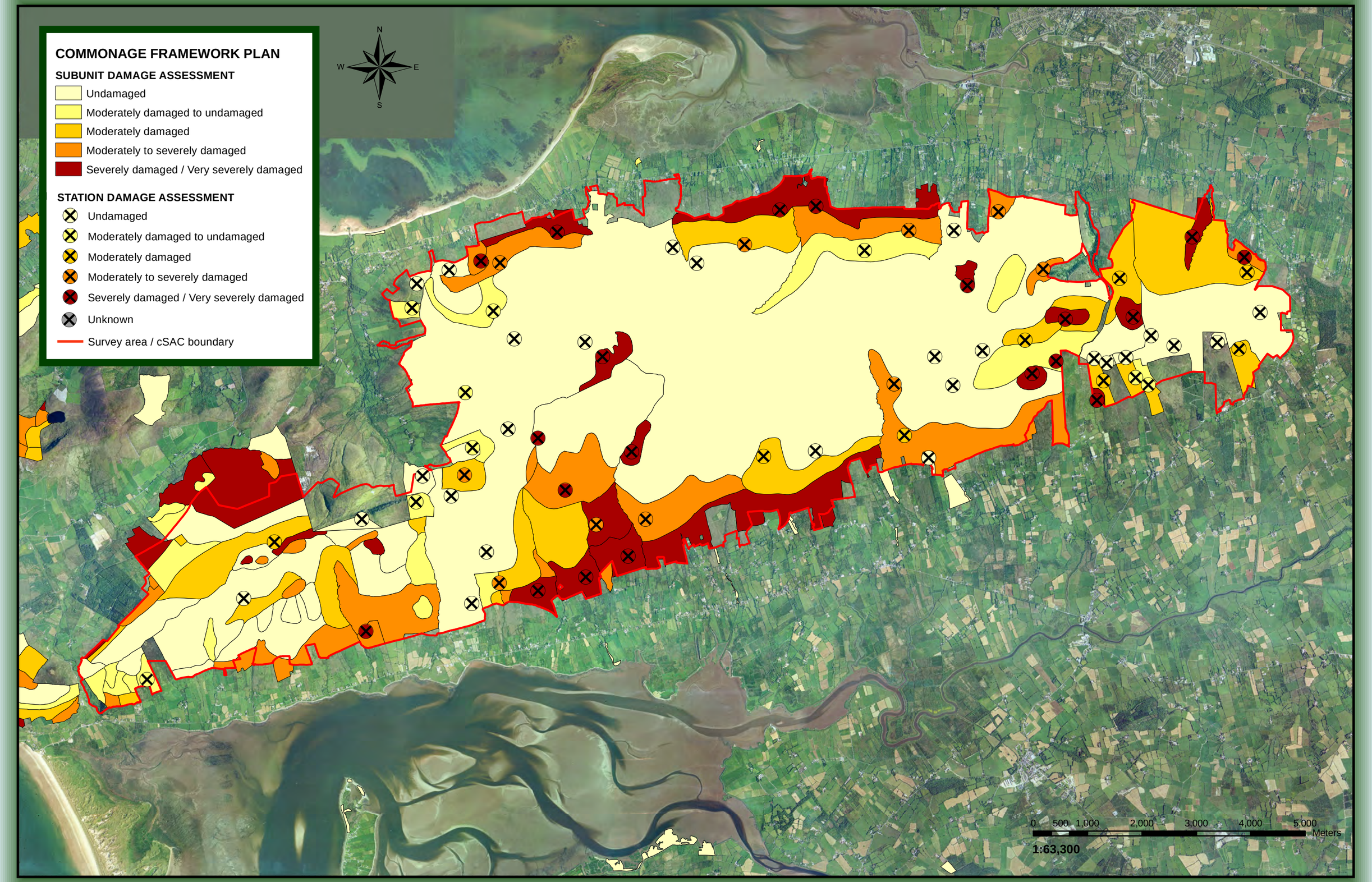
Figure 7. Commonage Framework Plan damage assessment (1999-2004) within and surrounding Slieve Mish Mountains cSAC (002185), Co. Kerry



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