National Survey of Upland Habitats

(Phase 4, 2013-2014)

Site Report No. 16:

Caha Mountains cSAC (000093), Cos. Cork and Kerry

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

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Commissioned by National Parks and Wildlife Service

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Cover photo: Glanrastel, Cushnaficulla and Knockowen, Caha Mountains, Co. Kerry, taken by Rory Hodd

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EXECUTIVE SUMMARY

- Caha Mountains cSAC (000093), in Counties Cork and Kerry, was surveyed between June and August 2014 as part of the National Survey of Upland Habitats (NSUH).
- The area of the site is 68.6 km^2. Using GIS and aerial photograph interpretation, the site was divided into 1274 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 91 provisional upland vegetation communities were recorded. Annex I habitats comprise 57.3% of the site. The Annex I upland habitats present which are primary focus habitats for the NSUH are 4010 Wet heaths (36.4%), *7130 Active blanket bogs (15.6%), 4030 Dry heatsh (1.2%), 8220 Siliceous rocky slopes (0.8%), 4060 Alpine and Boreal heaths (0.5%), 8110 Siliceous scree (0.4%), *6230 Species-rich *Nardus* grasslands (0.2%), 7130 Inactive blanket bogs (0.2%), *Rhynchosporion* depressions (0.2%), 8210 Calcareous rocky slopes (0.07%), 7140 Transition mires (0.06%), 7230 Alkaline fens (0.06%) and 8120 Calcareous scree (0.001%).
- Rare and notable species recorded during the survey include *Degelia atlantica*, *Hedwigia integrifolia*, *Leiocolea bantriensis*, *Minuartia recurva*, *Sticta fuliginosa*, *Sphagnum platyphyllum* and *Trichomanes speciosum*.
- The primary areas of botanical interest are the summits of Knockowen and Cushnaficulla, the cliffs below Droppa, around Glankeel Lough and the plateau on Glenlough Mountain which supports a mosaic of lakes, rock, wet heath and blanket bog.
- The conservation status of the upland Annex I habitats that form the primary focus of the NSUH was assessed. A total of 57 monitoring stops were recorded in these habitats. The conservation statuses of 4060 Alpine and Boreal heath, 7140 Transition mires, 7230 Alkaline fens and 8120 Calcareous scree were assessed as Favourable. 7150 *Rhynchosporion* depressions, 8110 Siliceous scree and 8220 Siliceous rocky slopes were assessed as Unfavourable – Inadequate. The remaining primary focus habitats were assessed as Unfavourable – Bad.
- The major impact/activity on this site is livestock grazing, whilst peat erosion and *Rhododendron* invasion are also of significant concern.
- 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.

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

  Management plans for the site should include measures for clearing areas invaded by *Rhododendron ponticum* and ensuring that these remain clear of re-invasion.

* Priority Annex I habitat

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Turboveg relevé database

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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 Caha Mountains cSAC (000093) 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 the report. It also contains summary statistics on the extent of each habitat type recorded and a compilation of rare and notable floral records for the site.

1.4 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 June and August 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 Caha Mountains cSAC, Cos. Cork and Kerry, (Fig. 1) is a medium sized site, 68.6 km^2 in extent. The site lies west of Glengarriff on the Beara Peninsula (O.S. Discovery Series maps 84 and 85). It extends from near the coast at Glengarriff Harbour in the southeast to the Healy Pass in the west. The peak of Coomnadiha is on the northern boundary, with a northeastern arm of the site reaching towards Esk Mountain. The underlying geology is Devonian old red sandstone. The

main peaks are Knockowen (alt. 658 m), Coomnadiha (644 m) and Caha (608 m). There are numerous lakes through the southern section of the site.

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 Caha 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.**
3130	Upland oligotrophic lakes	2	B	B	B	B
3160	Dystrophic lakes	1	B	C	B	B
4010	Wet heaths	15	B	B	C	C
4060	Alpine and Boreal heaths	2	C	C	A	C
*7130/7130	Blanket bogs	13	B	C	B	B
8220	Siliceous rocky slopes	7	B	B	A	B

2. FIELD SURVEY

Description of habitats

Baurearagh

2.1 The glen at Baurearagh is a large glacial valley on the northern side of the cSAC. Most of the slopes on the northwest side of the valley are not within the site. The southeastern slopes are topped by an undulating ridge running from Baurearagh Mountain towards Caha. In places along the base of this ridge, on the valley floor, there are areas of **WS5 Recently-felled woodland** (following Fossitt, 2000) and encroaching **WS3 Ornamental/non-native shrub**, comprising *Rhododendron ponticum***.** The vegetation of the valleyside is a mixture of **GS4 Wet grassland**, **PF2 Poor fen and flush**, **HD1 Dense bracken** and **HH3 Wet heath**, this last habitat being characterised by *Calluna vulgaris*, *Molinia caerulea*, *Trichophorum germanicum* and *Ulex gallii*. There is a band of **HH1 Dry siliceous heath** on the upper part of this slope, characterised by *C. vulgaris* and *Sphagnum capillifolium*. There are steep areas of **ER1 Exposed siliceous rock**, supporting *Saxifraga spathularis*, *Hymenophyllum wilsonii* and pleurocarpous mosses such as *Pseudotaxiphyllum elegans* and *Isothecium myosuroides*, on the backwall of the valley and along the eastern slopes. There is outcropping **ER2 Exposed calcareous rock** in places along the side of the valley, characterised by *Asplenium adiantum-nigrum*, *A. trichomanes*, *Saxifraga hirsuta*, *Neckera crispa* and *Tortella tortuosa*. The summits of Baurearagh Mountain and Killane Mountain are vegetated primarily with **PB2 Upland blanket bog** and **HH3 Wet heath**.

Crossterry and Barley Lake

2.2 The Rougham valley, to the south of the ridge running from Baurearagh Mountain to Caha, is bounded by distinctive walls of **ER1 Exposed siliceous rock**, with a strongly inclined, almost vertical, bedding plane in places. The vegetation of the walls and floor of this valley is a mixture of **HH3 Wet heath**, characterised by *Molinia caerulea*, *Trichophorum germanicum* and *Schoenus nigricans*, and **GS3 Dry-humid acid grassland**. In places, species-rich grassland is present, characterised by a high proportion of forb species. Barley Lake, classified as **FL2 Acid oligotrophic lake**, lies in a broad upland valley on Crossterry Mountain to the southeast of Rougham. The steep wall to the southwest of the lake has frequent outcrops of **ER1 Exposed siliceous rock** and **ER2 Exposed calcareous rock**, upon which *Asplenium trichomanes*, *Saxifraga hirsuta*, *Neckera crispa* and *Tortella tortuosa* grow. The area surrounding Barley Lake is primarily **HH3 Wet heath**, with some areas of **PB3 Lowland blanket bog**. *S. nigricans* and *M. caerulea* are abundant in this area. The vegetation of the broad slope running east from the lake, towards Derreenboy, is also covered by much wet heath, dominated by *M. caerulea*, with *S. nigricans* and *T. germanicum* prominent in places.

Coomerkane and Derrynafulla

2.3 Coomerkane is a long valley, containing two **FL2 Acid oligotrophic lakes**, Lough Derreenadarodia and Lough Eekenohoolikeaghaun. The lower part of this valley is infested by **WS3 Ornamental/non-native shrub**, consisting of *Rhododendron ponticum*, alongside extensive areas of **HD1 Dense bracken**. The vegetation of the valley floor and sides consists mostly of

HH3 Wet heath, characterised by *Molinia caerulea*, *Calluna vulgaris* and *Sphagnum subnitens*. *Myrica gale* and *Schoenus nigricans* occur within the heath in places. The northwestern side of the valley is bounded by a steep rocky slope, primarily consisting of **ER1 Exposed siliceous rock**, which also outcrops throughout the valley. There are occasional small patches of **ER2 Exposed calcareous rock** and **ER4 Calcareous scree and loose rock** scattered within the valley. An **FP1 Calcareous spring**, dominated by *Palustriella commutata*, occurs at the western end of the valley. The ridge to the south of Coomerkane is covered by a mixture of **HH3 Wet heath**, **HH1 Dry heath, PB2 Upland blanket bog** and **ER1 Exposed siliceous rock**.

2.4 There is a long ridge stretching east from Coomerkane, through Derrynafulla to Shrone Hill. There is much slabby **ER1 Exposed siliceous rock** along this ridge, interspersed with **HH3 Wet heath** dominated by *Molinia caerulea*, with *Schoenus nigricans* and *Myrica gale* in places and little *Calluna vulgaris*. There are patches of **GS4 Wet grassland** and **PF2 Poor fen and flush**, dominated by *M. caerulea*, occurring between the rocky slabs. An area of **PB3 Lowland blanket bog**, characterised by *Rhynchospora alba* and a high cover of *Sphagnum papillosum*, occurs to the south of Shrone Hill. At the edges of the site, there is encroaching **HD1 Dense bracken**, **WD4 Conifer plantation** and **WN1 Oak-birch-holly woodland**.

Glenlough and Glenkeel

2.5 Glenlough Mountain is a broad undulating plateau, and has a complex mosaic of **FL2 Acid oligotrophic lakes**, **ER1 Exposed siliceous rock**, **HH3 Wet heath** and **PB2 Upland blanket bog**. *Trichophorum germanicum* is dominant throughout much of the vegetation of this area, with cover of *Calluna vulgaris* generally sparse. Scattered throughout this plateau are areas of **PF3 Transition mire and quaking bog**, characterised by *Carex limosa*, *Carex rostrata* and *Sphagnum* spp. and **PF2 Poor fen and flush**, characterised by *Carex echinata* and *Sphagnum* spp. There are minor outcrops of **ER2 Exposed calcareous rock** across the plateau. The central area of the plateau is less rocky than the western and eastern ends, and contains a high proportion of **PB2 Upland blanket bog vegetation**.

2.6 From the western edge of the Glenlough plateau, the ground slopes gently down to Glenkeel Lough, which is an **FL2 Acid oligotrophic Lake**. The vegetation of these slopes is primarily **HH3 Wet heath**, **PB2 Upland blanket bog** and **PB3 Lowland blanket bog**. The slopes west of Glenkeel Lough are primarily covered by **GS3 Dry-humid acid grassland**, with large areas of **HD1 Dense bracken** and a steep band of **ER1 Exposed siliceous rock**. **PF1 Rich fen and flush**, characterised by *Scorpidium scorpioides* and *Sphagnum contortum*, is occasional on this slope. The ridge above this slope is clothed in **HH3 Wet heath** and **PB2 Upland blanket bog**, dominated by *Trichophorum germanicum*.

2.7 Southeast of Glenkeel Lough lies the valley of Glenlough. The walls of this valley are vegetated by a mixture of **HH3 Wet heath**, characterised by *Molinia caerulea* and *Schoenus nigricans*, **GS3 Dry-humid acid grassland** and **HD1 Dense bracken**, interspersed with much **ER1 Exposed siliceous rock**. There are also areas of **ER3 Siliceous scree**, sparsely vegetated with *Saxifraga spathularis* and *Racomitrium lanuginosum*, and **HH1 Dry heath**, characterised by *Calluna vulgaris*

and *Hypnum jutlandicum*. Part of the valley floor is within the site, and consists of **GA1 Improved agricultural grassland** surrounding an **FL4 Mesotrophic lake**.

Knockowen, Cushnaficulla and Knockeirky

2.8 Knockowen is the highest point within the site and is the apex of a high ridge running from the Caha Lakes to the Healy Pass. There is much sparsely-vegetated **ER1 Exposed siliceous rock** along this ridge, interspersed with **HH3 Wet heath** that is characterised by *Trichophorum germanicum* and *Molinia caerulea*, and **PB2 Upland blanket bog**, characterised either by *T. germanicum* or *Calluna vulgaris* and *Eriophorum vaginatum*. The rare species *Minuartia recurva* is frequent on siliceous rock in a small area to the east of Knockowen and on the summit of Cushnaficulla. **HH4 Montane heath** occurs in small quantities on the exposed summits, characterised by *C. vulgaris* and *Racomitrium lanuginosum*. The area to the west of the summit of Knockowen is heavily overgrazed, and the heath vegetation has been replaced by **GS3 Dry-humid acid grassland** and **ER1 Exposed siliceous rock**. Around the lower edges of the site to the south and west of Knockowen, there are extensive areas of **HD1 Dense bracken** and **PF2 Poor fen and flush**.

Knockastumpa

2.9 Knockastumpa is a small rocky peak rising to the north of Knockowen. The slopes to the south of the summit are **GS3 Dry-humid acid grassland** and there extensive areas of **HD1 Dense bracken** on the lower slopes. The areas to the west and north of the summit are steep and rocky, and consist of **ER1 Exposed siliceous rock** interspersed with **HH3 Wet heath**, characterised by *Molinia caerulea*, *Schoenus nigricans* and *Calluna vulgaris*. An area of **PB2 Upland blanket bog** occurs to the east of the summit, with a very wet area of **PB3 Lowland blanket bog** in its centre, within which *Rhynchospora alba*, *Rhynchospora fusca*, *Drosera intermedia*, *Drosera anglica*, *Sphagnum austinii* and *Sphagnum magellanicum* are frequent. The slope to the east of here is primarily **GS3 Dry-humid acid grassland**, with areas of encroaching **WS1 Scrub**, **WS3 Ornamental/non-native shrub** and **HD1 Dense bracken**.

Glanrastel, Glantrastal and Glantrasna

2.10 Glanrastel is a long deep valley that drops steeply from the summit of Knockowen. The valley is heavily grazed, and the lower parts are a mosaic of **PF2 Poor fen and flush**, characterised by *Juncus effusus* and *Sphagnum* spp., **GS3 Dry-humid acid grassland**, **HD1 Dense bracken** and **PB2 Upland blanket bog**. The southern slope of the valley has extensive steep cliffs of **ER1 Exposed siliceous rock**, characterised by *Saxifraga spathularis*, *Hymenophyllum wilsonii* and *Dryopteris* spp. The vegetation below and upon these cliffs is **GS3 Dry-humid acid grassland** and **HH3 Wet heath**. There are areas of **ER3 Siliceous scree** at the base of the cliffs, within which grow *Saxifraga spathularis*, *Dryopteris* spp. and a range of bryophytes. The upper reaches of the valley, Glantrastal, are clothed primarily in **HH3 Wet heath**, characterised by *Calluna vulgaris*, *Molinia caerulea* and *Schoenus nigricans*, interspersed with **ER1 Exposed siliceous rock**. There are also areas of **PB3 Lowland blanket bog**, characterised by *Rhynchospora alba* and *Sphagnum* spp.

2.11 A broad slope, clothed primarily in **HH3 Wet heath**, characterised by *Trichophorum germanicum* and *Molinia caerulea*, leads up from Glanrastel to the ridge of Cumeenbaun and Droppa, and around towards Glantrasna. Much of this wet heath is heavily grazed, with low cover of dwarf shrubs. Where the slope levels out, as on the summits of Pookeen and Cumeenbaun, there are areas of **PB2 Upland blanket bog**, characterised by *T. germanicum* and *Eriophorum angustifolium*. A stream valley to the north of Pookeen contains patches of species-rich **GS3 Dry-humid acid grassland**, characterised by *Thymus polytrichus* and *Prunella vulgaris*, and **PF1 Rich fen and flush**, characterised by *Carex panicea*, *Carex viridula* subsp. *oedocarpa*, *Scorpidium scorpioides* and *Drepanocladus revolvens*.

2.12 Glantrasna runs parallel to Glanrastel, to the north, and is similarly bounded by a steep cliff of **ER1 Exposed siliceous rock** on its southern side. There are outcrops of **ER2 Exposed calcareous rock**, characterised by *Asplenium viride*, *Asplenium adiantum-nigrum* and *Tortella tortuosa*, at the western end of this band of cliffs. There is much **HH3 Wet heath** upon these cliffs, dominated by *Calluna vulgaris* and *Molinia caerulea*. Wet heath is also dominant on the valley floor, and the slopes rising to the north, but has little dwarf shrub cover, due to grazing pressure. Within the lower valley, there are areas of **HD1 Dense bracken**, **GS3 Dry-humid acid grassland**, **PB2 Upland blanket bog** and **PF1 Rich fen and flush**. The upper reaches of the valley below the high peaks are primarily covered by **PB2 Upland blanket bog**, and there is a medium sized **FL2 Acid oligotrophic lake**, Lough Macournane.

Coomnadiha to Ram's Hill

2.13 A broad slope runs from Glantrasna up to the summit of Coomnadiha. The slope is primarily vegetated with **PB2 Upland Blanket bog**, characterised by *Calluna vulgaris*, *Eriophorum vaginatum* and *Sphagnum capillifolium*. There are also areas of **HH1 Dry heath**, dominated by *C. vulgaris*, **HH3 Wet heath**, **PF2 Poor fen and flush** and **ER1 Exposed siliceous rock** on this slope. The summit ridge and upper slopes have a high proportion of **HH4 Montane heath**, characterised by *C. vulgaris*, *Racomitrium lanuginosum* and *Juncus squarrosus*. Much of this montane heath is growing among **PB5 Eroding blanket bog**, with more intact **PB2 Upland blanket bog** becoming prevalent where there is less exposure.

2.14 A broad ridge runs south from Coomnadiha, over Caha, to Ram's Hill. This area is dominated by large swathes of **PB2 Upland blanket bog**, characterised primarily by *Calluna vulgaris* and *Eriophorum vaginatum*, or *Trichophorum germanicum* in places. On the higher, flatter, areas, there are areas of **PB5 Eroding blanket bog** present alongside areas of **HH4 Montane heath**. There are two **FL2 Acid oligotrophic lakes** on the summit of Ram's Hill and a number of areas of **PF3 Transition mire and quaking bog** to the east, characterised by *Carex rostrata*, *Menyanthes trifoliata* and *Sphagnum* spp.

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

Habitat statistics

2.16 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 1-11).

2.17 The most abundant habitat within a polygon is termed the primary habitat. The primary Fossitt habitat types for Caha Mountains 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.

Table 2: Extent of Fossitt habitats within Caha Mountains cSAC.

Fossitt code	Habitat	Area (ha)	% of site
BC2	Horticultural land	0.02	0.0003
BL1	Stone walls and other stonework	1.5	0.02
BL2	Earth banks	0.06	0.0009
BL3	Buildings and artificial surfaces	2.7	0.04
ED1	Exposed sand, gravel or till	10.3	0.2
ED2	Spoil and bare ground	29.6	0.4
ED3	Recolonising bare ground	1.9	0.03
ER1	Exposed siliceous rock	947.1	13.8
ER2	Exposed calcareous rock	8.9	0.1
ER3	Siliceous scree and loose rock	206.9	3.0
ER4	Calcareous scree and loose rock	0.5	0.008
FL1	Dystrophic lakes	5.7	0.08
FL2	Acid oligotrophic lakes	119.1	1.7
FL4	Mesotrophic lakes	0.8	0.01
FP1	Calcareous springs	0.1	0.002
FP2	Non-calcareous springs	1.8	0.02
FS1	Reed and large sedge swamps	5.4	0.08
FS2	Tall-herb swamps	1.1	0.02
FW1	Eroding/upland rivers	20.9	0.3
FW2	Depositing/lowland rivers	0.05	0.0007
FW4	Drainage ditches	0.1	0.001
GA1	Improved agricultural grassland	4.5	0.07
GS1	Dry calcareous and neutral grassland	0.06	0.0008
GS3	Dry-humid acid grassland	861.0	12.6
GS4	Wet grassland	95.6	1.4
HD1	Dense bracken	357.9	5.2
HH1	Dry siliceous heath	77.8	1.1
HH2	Dry calcareous heath	1.1	0.02

Table 2: continued.

Fossitt code	Habitat	Area (ha)	% of site
HH3	Wet heath	2495.1	36.4
HH4	Montane heath	35.7	0.5
PB2	Upland blanket bog	965.2	14.1
PB3	Lowland blanket bog	136.0	2.0
PB4	Cutover bog	0.08	0.001
PB5	Eroding blanket bog	18.4	0.3
PF1	Rich fen and flush	36.3	0.5
PF2	Poor fen and flush	318.9	4.7
PF3	Transition mire and quaking bog	4.0	0.06
WD2	Mixed broadleaved/conifer woodland	2.5	0.04
WD4	Conifer plantation	11.1	0.2
WD5	Scattered trees and parkland	2.8	0.04
WL2	Treelines	1.4	0.02
WN1	Oak-birch-holly woodland	9.3	0.1
WN2	Oak-ash-hazel woodland	0.04	0.0005
WN6	Wet willow-alder-ash woodland	3.9	0.06
WS1	Scrub	24.7	0.4
WS3	Ornamental / non-native shrubs	28.6	0.4
WS5	Recently-felled woodland	1.3	0.01
	Total site area	6857.8	

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

Annex I code	Habitat	Area (ha)	% of site
3130	Upland oligotrophic lakes	118.5	1.7
3160	Dystrophic lakes	3.8	0.06
3260	Floating river vegetation	0.8	0.01
4010	Wet heaths	2495.1	36.4
4030	Dry heaths	78.8	1.2
4060	Alpine and Boreal heaths	32.8	0.5
*6230	Species-rich *Nardus* grasslands	13.1	0.2
6430	Hydrophilous tall herb communities	0.3	0.005
7130	Inactive blanket bogs	15.5	0.2
*7130	Active blanket bogs	1068.2	15.6
7140	Transition mires	4.0	0.06
7150	*Rhynchosporion* depressions	10.5	0.2
*7220	Petrifying springs	0.02	0.0003
7230	Alkaline fens	4.2	0.06
8110	Siliceous scree	24.1	0.4
8120	Calcareous scree	0.1	0.001
8210	Calcareous rocky slopes	4.8	0.07
8220	Siliceous rocky slopes	52.6	0.8
*91E0	Alluvial forests	2.2	0.03
	non-Annex I habitats	2928.4	42.7
	Total site area	6857.8	
	Total area of Annex I habitats	3929.4	57.3

Table 4: Extent of provisional vegetation communities (Perrin *et al.,* 2014) within Caha 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	2.7	0.04	84.9
PO1b	aquatic sub-community	0.4	0.006	13.2
PO2	*Littorella uniflora – Lobelia dortmanna* lake community			
	upland variant	0.06	0.0009	1.9
SW1	*Potamogeton polygonifolius* soakway	6.4	0.09	100
SPG1	*Philonotis fontana - Saxifraga stellaris* spring			
SPG1a	typical sub-community	0.6	0.008	30.5
SPG1b	species-poor *Sphagnum denticulatum* sub-community	1.1	0.02	60.7
SPG2	*Palustriella commutata* spring			
	Annex I variant	0.02	0.0002	1.0
	non-Annex I variant	0.1	0.002	6.2
SPG2	*Anthelia julacea – Sphagnum inundatum* spring	0.03	0.0004	1.6
PFLU1	*Carex nigra/echinata - Sphagnum denticulatum* flush	33.0	0.5	10.5
PFLU2	*Juncus effusus - Sphagnum cuspidatum/palustre* flush	128.7	1.9	41.1
PFLU3	*Juncus acutiflorus/effusus - Calliergonella cuspidata* flush	36.9	0.5	11.8
PFLU4	*Molinia caerulea - Sphagnum palustre* flush			
PFLU4a	typical sub-community	113.6	1.7	36.3
PFLU5	*Carex rostrata – Sphagnum* spp. flush	0.8	0.01	0.3
RFLU1	*Carex viridula oedocarpa - Pinguicula vulgaris - Juncus bulbosus* flush			
RFLU1a	brown moss sub-community	2.1	0.03	5.5
RFLU1b	species-poor sub-community	32.1	0.5	81.6
RFLU2	*Eleocharis quinqueflora – Carex viridula flush*	0.03	0.0004	0.4
RFLU4	*Schoenus nigricans - Scorpidium scorpioides* flush	1.9	0.03	24.2
RFEN	*Carex rostrata* fen			
RFEN1a	brown moss sub-community	0.09	0.001	0.3
RFEN1b	species-poor sub-community	0.5	0.008	1.4
UG1	*Agrostis capillaris – Festuca ovina* upland grassland			
UG1a	typical sub-community	304.9	4.4	33.2
UG1b	*Sphagnum* spp. sub-community	6.9	0.1	0.8
UG1c	species-rich sub-community	8.8	0.1	1.0
UG1d	*Juncus squarrosus* sub-community	11.4	0.1	1.2
UG2	*Nardus stricta – Galium saxatile* upland grassland			
UG2a	typical sub-community	425.4	6.2	46.3
UG2b	*Sphagnum* spp. sub-community	24.3	0.4	2.6
UG2c	species-rich sub-community	4.3	0.06	0.5
UG2d	*Juncus squarrosus* sub-community	74.8	1.1	8.1
UG4	*Molinia caerulea – Anthoxanthum odoratum* wet grassland	57.2	0.8	6.2
BK1	*Pteridium aquilinum* community	357.9	5.2	100
DH1	*Ulex gallii - Erica cinerea* dry heath	9.6	0.1	12.2
DH3	*Calluna vulgaris – Erica cinerea* dry heath	59.6	0.9	75.9
DH4	*Calluna vulgaris – Sphagnum capillifolium* dry /damp heath	7.4	0.1	9.4
DH5	*Calluna vulgaris – Antennaria dioica* heath	1.1	0.02	1.4
DH6	*Calluna vulgaris – Vaccinium myrtillus* dry heath	0.9	0.01	1.1

Table 4: continued.

Code	Provisional communities and sub-communities	Area (ha)	% of site	% of habitat
WH1	*Schoenus nigricans – Erica tetralix* wet heath			
WH1a	continuous cover sub-community	399.0	5.8	16.0
WH1b	open sub-community	32.2	0.5	1.3
WH2	*Trichophorum germanicum – Cladonia* spp. *– Racomitrium lanuginosum* wet heath	0.02	0.0003	0.0009
WH3	*Calluna vulgaris – Molinia caerulea – Sphagnum capillifolium* wet/damp heath	878.1	12.8	35.2
WH4	*Trichophorum germanicum – Eriophorum angustifolium* wet heath			
WH4a	typical sub-community	185.8	2.7	7.4
WH4b	*Calluna vulgaris* sub-community	452.2	6.6	18.1
WH4c	*Juncus squarrosus* sub-community	16.9	0.2	0.7
WH5	*Trichophorum germanicum – Nardus stricta – Racomitrium lanuginosum* montane wet heath	56.2	0.8	2.3
WH6	*Schoenus nigricans – Molinia caerulea – Myrica gale* wet heath	273.6	4.0	11.0
WH7	*Molinia caerulea – Ulex gallii* wet heath	201.0	2.9	8.1
MH1	*Calluna vulgaris – Racomitrium lanuginosum* montane heath			
MH1a	typical sub-community	18.6	0.3	52.2
MH1b	*Juncus squarrosus* sub-community	14.1	0.2	39.6
MH2	*Vaccinium myrtillus – Racomitrium lanuginosum – Herbertus aduncus* montane heath	0.01	0.0001	0.03
MH3	*Vaccinium myrtillus – Rhytidiadelphus loreus – Anthoxanthum odoratum* montane heath	0.02	0.0003	0.05
MH4	*Calluna vulgaris – Juniperus communis* montane heath	0.0007	0.00001	0.002
MH5	*Nardus stricta – Carex binervis – Racomitrium lanuginosum* montane grass-heath	2.9	0.04	8.2
BB1	*Schoenus nigricans – Eriophorum angustifolium bog*			
BB1a	continuous cover sub-community	105.5	1.5	9.9
BB1b	open cover sub-community	0.2	0.004	0.02
BB2	*Schoenus nigricans – Sphagnum* spp. bog	8.1	0.1	0.8
BB3	*Eriophorum vaginatum – Sphagnum papillosum* bog	4.2	0.06	0.4
BB4	*Trichophorum germanicum – Eriophorum angustifolium* bog	587.4	8.6	55.2
BB5	*Calluna vulgaris – Eriophorum* spp. bog			
BB5a	typical sub-community	309.7	4.5	29.1
BB5b	*Juncus squarrosus* sub-community	45.1	0.7	4.2
BB7	*Eriophorum angustifolium – Sphagnum austinii* bog	3.7	0.05	0.4
HW1	*Sphagnum denticulatum/cuspidatum* hollow			
HW1i	upland variant	4.0	0.06	5.4
HW1ii	lowland variant	0.3	0.004	0.4
HW1iii	flush variant	0.7	0.01	0.9
HW2	*Eriophorum angustifolium – Sphagnum fallax* hollow			
HW2i	upland variant	14.9	0.2	20.0
HW2ii	lowland variant	0.6	0.009	0.8
HW3	*Rhynchospora alba* hollow	10.5	0.2	14.1
HW4	*Eleocharis multicaulis* hollow			
HW4i	bog variant	7.0	0.1	9.3
HW4ii	flush variant	36.6	0.5	49.1
DP1	*Campylopus introflexus – Polytrichum* spp. degraded peat community	1.1	0.02	36.1
DP2	*Nardus stricta – Eriophorum angustifolium* degraded peat community	1.9	0.03	63.9

Table 4: continued.

Code	Provisional communities and sub-communities	Area (ha)	% of site	% of habitat
TH1	*Luzula sylvatica – Vaccinium myrtillus* tall herb vegetation			
TH1i	rock face variant	0.2	0.003	27.1
TH1ii	dry heath variant	0.3	0.004	33.0
TH3	*Sedum rosea – Angelica sylvestris* tall herb vegetation	0.3	0.005	39.9
SC1	Siliceous scree community	2.1	0.03	98.5
SC2	Calcareous scree community	0.03	0.0004	1.5
RS1	*Saxifraga spathularis – Asplenium adiantum-nigrum* rock cleft community	2.7	0.04	82.7
RS2	*Saxifraga aizoides – Asplenium* spp. – *Orthothecium rufescens* rock cleft community	0.6	0.008	17.3
HM1	*Calluna vulgaris – Scapania gracilis* hepatic mat			
HM1i	non-Annex I grassland variant	0.02	0.0003	2.5
HM1iii	dry heath variant	0.04	0.0006	4.7
HM1iv	wet heath variant	0.005	0.00007	0.5
HM1vi	non-Annex I siliceous rock variant	0.03	0.0004	3.3
HM1vii	Annex I siliceous rock variant	0.01	0.0002	1.4
HM1viii	siliceous scree variant	0.1	0.002	13.4
HM1xi	siliceous loose rock variant	0.04	0.0006	4.8
HM2	*Calluna vulgaris – Herbertus aduncus* hepatic mat			
HM2i	non-Annex I grassland variant	0.08	0.001	9.4
HM2iii	dry heath variant	0.09	0.001	10.4
HM2iv	wet heath variant	0.2	0.003	24.5
HM2v	montane heath variant	0.002	0.00002	0.2
HM2vi	non-Annex I siliceous rock variant	0.06	0.0009	7.5
HM2vii	Annex I siliceous rock variant	0.09	0.001	10.2
HM2viii	siliceous scree variant	0.04	0.0006	5.1
HM2xi	siliceous loose rock variant	0.02	0.0002	2.0
	Total area of vegetation communities	5394.9	78.7	
	Not covered	99.9	1.5	
	Non-vegetation cover types	1363.0	19.9	
	Total site area	6857.8		

2.18 A total of 47 Fossitt (2000) habitats were recorded during this survey within Caha Mountains cSAC and details of their coverage are presented in Table 2. **HH3 Wet heath** was the most extensive habitat covering 36.4% of the site, followed by **PB2 Upland blanket bog** at 14.1%, **ER1 Exposed siliceous rock** at 13.8% and **GS3 Dry-humid acid grassland** at 12.6.

2.19 A total of 18 Annex I habitats were recorded during this survey within Caha Mountains cSAC, covering 57.3% of the site (Table 3). The main Annex I habitat was **4010 Wet heaths** which covered 36.4% of the site, followed by ***7130 Active blanket bogs** which covered 15.6%. The next most frequent habitats were **3130 Upland oligotrophic lakes** and **4030 Dry Heath** which covered 1.7% and 1.2% respectively. 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.

2.20 A total of 91 provisional upland vegetation communities and sub-communities (Perrin *et al.*, 2014) were recorded within Caha Mountains cSAC. Details of their coverage are presented in Table 4.

2.21 Gradated maps displaying the cover of Annex I habitats currently assessed under the NSUH plus **6430 Hydrophilous tall herb communities** are shown in Figs. 4a-n. 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

2.22 Rare and notable plant records for the site are listed in Table 5 and their locations, where accurately known, are presented in Fig. 5. The list is compiled from records made during the present survey and from existing records. For each species it is indicated whether it is listed on the Flora Protection Order, 1999, 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.

2.23 The most significant rare species previously recorded within the Caha Mountains is *Minuartia recurva*, which was recorded to the east of Knockowen and to the east of Cushnaficulla in 1964 (Moore, 1966). It has subsequently been refound on several occasions (Table 5) and the populations are considered stable (Preston *et al.*, 2002). The species was also discovered in the Comeragh Mountains of County Waterford in 2006. *Minuartia recurva* is red-listed and these are its only known stations within Ireland and Britain (Green, 2007). The populations at both peaks in this site were found during the present survey and estimated to be about 300 plants combined. These were growing mainly on large expanses of exposed, tilted bedrock that was not considered Annex I habitat.

2.24 During the present survey, the arctic-alpine *Salix herbacea* was noted from rock crevices near the summit of Knockowen, where it was observed in 1964 (Scannell, 1986). *Asplenium viride* was recorded from cliff faces in Glantrasna and *Cystopteris fragilis* was found on small rock faces at locations on Baurearagh Mountain; both are indicative of **8210 Calcareous rocky slopes**. Small, scattered specimens of *Juniperus communis* occur on rocky ground on Glenlough Mountain. Other notable vascular species found were *Antennaria dioica* (rare in the south of the country), *Carex aquatilis* (found growing in an oligotrophic lake on Glenlough Mountain) and *Rhynchospora fusca* (found in the soft bog on Knockastumpa).

2.25 *Trichomanes speciosum* also occurs within the site and was refound during the present study. Details of this species and two members of the family Orchidaceae are included in Table 5 but have not been mapped as the locations of these taxa are considered sensitive data.

2.26 Other previously recorded vascular plants include the rare and red-listed clubmoss *Lycopodiella inundata* which has been recorded in the vicinity of Knockowen and *Phegopteris connectilis*, a fern more commonly found in the north of Ireland (NPWS, 2009).

2.27 A number of new vice county bryophyte records were made during the present survey: *Cladopodiella fluitans*, *Leiocolea bantriensis*, *Orthothecium intricatum*, *Scapania scandica*, *Scapania aspera*, *Seligeria recurvata*, *Sphagnum platyphyllum*, *Sphagnum capillifolium* subsp. c*apillifolium* and *Mylia anomala*. The rediscovery of *L. bantriensis,* in a calcareous spring with some traces of tufa formation, is of particular importance as it has not been seen in its original vice county of West Cork since *c.* 1876. *Hedwigia integrifolia*, listed as Vulnerable in Lockhart *et al.* (2012), was found on south-facing cliffs in Coomerkane and above Magannagan Stream. Several other recorded bryophytes are listed as Near Threatened.

2.28 Four red-listed bryophyte species were recorded within the site during a British Bryological Society field meeting in 1983. *Cyclodictyon laetevirens* was found near the lip of the northern corrie of Knockowen and *Hylocomiastrum umbratum, Douinia ovata* and *Campylopus shawii* were recorded above the corrie (Rothero, 1983). The latter species has also been recorded more recently, in 2006, from Knockowen and Claddaghgarriff (NPWS, unpublished data). Of these species, all but *H. umbratum* were recorded during the NSUH survey. *C. shawii*, which is confined to the southwest of the country, was found at several locations around Knockowen, but also on Knockastumpa and Glenlough Mountain, in Glantrasna and at Derreenboy, east of Barley Lake.

2.29 The Caha Mountains currently exhibit poor diversity in terms of lichens but two red-listed lichens, *Degelia atlantica* and *Sticta fuliginosa*, were recorded during the present survey. Numerous lichen species that feature on the provisional Red Data List have previously been recorded from the Glengarriff area (NPWS/CEDaR, unpublished data) but the spatial resolution of these records is not sufficient to determine with certainty whether or not they are located within the Caha Mountains cSAC. The majority are associated with woodland or coastal habitats and are more likely to have been recorded from adjacent areas. These records have therefore been omitted from Table 5 and Fig. 5.

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

Species	Red Data List	FPO	Annex II	Year of record (s)	NSUH	Previous records
Vascular plants						
Antennaria dioica	-	-	-	2014	•	-
Asplenium viride	-	-	-	2014	•	3, 4
Carex aquatilis	-	-	-	2014	•	-
Cicendia filiformis	-	-	-	1829, 1871, 1890, 1904, 1936, 1973	-	1
Cystopteris fragilis	-	-	-	2014	•	3, 4
Dactylorhiza maculata subsp. *ericetorum*†	-	-	-	2006	-	1
Hammarbya paludosa†	RA	•	-	1894	-	1
Juniperus communis	-	-	-	2014	•	-

Table 5. continued.

Species	Red Data List	FPO	Annex II	Year of record (s)	NSUH	Previous records
Lycopodiella inundata	RA	•	-	2006		1
Minuartia recurva	RA	•	-	1964, 1977, 1985, 1986, 1991, 1996, 1999, 2006, 2014	•	1, 2, 3, 4, 5, 6, 7, 10
Phegopteris connectilis	-	-	-	-	-	4
Rhynchospora fusca	-	-	-	2014	•	-
Sagina subulata	-	-	-	1894, 2006, 1999, 2014	•	1, 11
Salix herbacea	-	-	-	1894, 1964, 2014	•	3, 6, 4, 11
Trichomanes speciosum†	RA	•	•	1898, 1996, 2014	•	1, 2, 3, 4
Bryophytes						
Antitrichia curtipendula	NT	-	-	2014	•	-
Campylopus pilifer	-	-	-	2014	•	-
Campylopus shawii	NT	-	-	1983, 2006, 2014	•	1, 2, 4, 8, 9
Cephalozia macrostachya	-	-	-	2014	•	-
*Cladopodiella flutians**	-	-	-	2014	•	-
Cyclodictyon laetevirens	NT	-	-	1983, 2014	•	2, 3, 4, 8, 9
Dichodontium flavescens	-	-	-	2014	•	-
Douinia ovata	NT	-	-	1983, 2014	•	9
Glyphomitrium daviesii	-	-	-	2014	•	-
Grimmia funalis	NT	-	-	2014	•	-
Grimmia lisae	-	-	-	2014	•	-
Grimmia ramondii	NT	-	-	2014	•	-
Hedwigia integrifolia	VU	-	-	2014	•	-
Hylocomiastrum umbratum	NT	-	-	1983	-	9
Hymenostylium recurvirostrum	NT	-	-	2014	•	-
*Leiocolea bantriensis**	NT	-	-	2014	•	-
Lejeunea hibernica	NT	-	-	2014	•	-
Marsupella emarginata var. *aquatica*	-	-	-	2014	•	-
*Mylia anomala**	-	-	-	2014	•	-
*Orthothecium intricatum**	-	-	-	2014	•	-
Pohlia elongata var. *elongata*	NT	-	-	2014	•	-
Rhabdoweisia crispata	NT	-	-	2014	•	-
*Scapania aspera**	-	-	-	2014	•	-
*Scapania scandica**	-	-	-	2014	•	-
Schistidium strictum	NT	-	-	2014	•	-
*Seligeria recurvata**	-	-	-	2014	•	-
Sphagnum capillifolium subsp. *capillifolium**	DD	-	-	2014	•	-
Sphagnum subnitens subsp. *ferrugineum*	-	-	-	2014	•	-
*Sphagnum platyphyllum**	NT	-	-	2014	•	-
Tetraplodon mnioides	-	-	-	2014	•	-
Lichens						
Degelia atlantica	•	-	-	2014	•	-
Sticta fuliginosa	•	-	-	2014	•	-

† Location considered sensitive data and omitted from Fig. 5

* Denotes new or updated vice county record from NSUH fieldwork

Previous records:	1, NPWS Recorder database and associated data	7, Green (2007)
	2, Natura 2000 Standard Data Form	8, Lockhart *et al.* (2012)
	3, cSAC site synopsis (1997)	9, Rothero (1983)
	4, NPWS Conservation Statement (2009)	10, J. Martin (unpublished data)
	5, Moore (1966)	11, Scully (1916)
	6, Scannell (1986)	
Red Data List:	VU, Vulnerable	DD, Data Deficient
	RA, Rare	NT, Near Threatened

2.30 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.

2.31 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

2.32 Faunal records during this survey include Chough (*Pyrrhocorax pyrrhocorax*), Peregrine (*Falco peregrinus*), White-tailed Eagle (*Haliaeetus albicilla*), Red Grouse (*Lagopus lagopus*), Kestrel (*Falco tinnunculus*), Dipper (*Cinclus cinclus*), Stonechat (*Saxicola torquata*), Pheasant (*Phasianus colchicus*), Snipe (*Gallinago gallinago*), Grey Heron (*Ardea cinerea*), Sika Deer (*Cervus nippon*), Irish Hare (*Lepus timidus hibernicus*), Feral Goat (*Capra hircus*), Common Frog (*Rana temporaria*), Common Lizard (*Zootoca vivipara*), Kerry Slug (*Geomalacus maculosus*), Wall (*Lasiommata megera*), Broom Moth (*Melanchra pisi*), Emperor Moth (*Saturnia pavonia*) and Satyr Pug (*Eupithecia satyrata*).

2.33 Previous records of other fauna for the site include Brown Trout (*Salmo trutta*), Hen Harrier (*Circus cyaneus*), Ring Ouzel (*Turdus torquatus*) and Otter (*Lutra lutra*).

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 57 monitoring stops were recorded within Caha Mountains cSAC for this purpose (Fig. 6 and Table 6); 3 additional relevés were recorded in habitats that were not assessed. The future prospects parameter examines the current impacts/activities 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	23
4030	Dry heaths	4
4060	Alpine and Boreal heaths	2
*6230	Species-rich *Nardus* grasslands	2
*7130/7130	Blanket bogs	12
7140	Transition mires	2
7150	*Rhynchosporion* depressions	2
7230	Alkaline fens	1
8110	Siliceous scree	3
8210	Calcareous rocky slopes	3
8220	Siliceous rocky slopes	3

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 Caha Mountains cSAC contains significant areas of commonage with these areas comprising 47.0 km^2 or 68.5% of the site. A baseline CFP survey of the majority of these areas

occurred in 1999, with smaller areas surveyed during the period 2000-2007. An interim destocking level of 30% had been applied in Cork and Kerry prior to the CFP commencing. This was then adjusted using available CFP results *c.*2002. A resurvey of a subset of stations and subunits occurred in 2006. Results from these surveys are shown in Figs. 7a and 7b.

3.4 Of the 241 subunits within or partially within the cSAC, only 44 subunits were resurveyed in 2006, comprising 55.7% of the commonage area (Table 7). The baseline survey indicates commonage within the site was in rather poor condition at this time with only 50.7% of the area being assessed as undamaged (U) and 26.4% of the area being assessed as moderately to severely damaged (MS) or worse. Pairwise comparison of the resurveyed subunits indicates that only 12 subunits (27.3%) improved, 24 subunits (54.5%) did not change significantly and 8 subunits (18.2%) disimproved. This resulted in a marked decrease in the area of severely damaged or very severely damaged (S/S*) subunits but also an increase in the area of moderately damaged (MM) subunits. The area of undamaged (U) subunits decreased slightly.

Table 7: Frequency of CFP subunit damage levels in Caha Mountains cSAC, baseline surveys and 2006 resurvey.

Damage level	**Baseline (*n* = 241)**		**Resurvey (*n* = 44)**	
	Frequency	Area %	Frequency	Area %
U	121 (50.2%)	50.7	13 (29.5%)	55.7
MU	43 (17.8%)	15.1	8 (18.2%)	9.6
MM	33 (13.7%)	7.8	11 (27.3%)	23.6
MS	33 (13.7%)	9.0	9 (20.5%)	8.1
S/S*	3 (4.6%)	17.4	2 (4.5%)	2.9

3.5 The CFP recorded 44 stations within Caha Mountains cSAC (Table 8). The baseline survey indicates commonage within the site was in poor condition at this time with only 22.7% of stations being undamaged (U) and 31.9% of stations being moderately severely damaged (MS) or worse. The main changes between the baseline survey and the resurvey in 2006 were an increase in the proportion of severely damaged or very severely damaged (S/S*) stations and a decrease in the proportion of moderately to severely damaged stations (MS).

3.6 Summary data for some of the key indicators recorded at CFP stations are compared with NSUH data in Table 9. Between the baseline surveys and the 2006 resurvey there appears to have been only minor changes in these measurements. Comparison of the 2006 resurvey data with the NSUH data suggests that bare peat cover has decreased, whilst *Calluna* height and sward height have increased. However, these data also suggest a decrease in *Calluna* cover.

Table 8: Frequency of CFP station damage level in Caha Mountains cSAC, baseline surveys and 2006 resurvey. Percentages indicate proportion of stations within each column.

	Wet heath/Dry heath/ Blanket bog		Upland grassland		All habitats	
Damage level	**Baseline (*n* =40)**	**Resurvey (*n* = 30)**	**Baseline (*n* = 4)**	**Resurvey (*n* = 4)**	**Baseline (*n* = 44)**	**Resurvey (*n* = 34)**
U	9 (22.5%)	7 (23.3%)	1 (25.0%)	2 (50.0%)	10 (22.7%)	9 (26.5%)
MU	10 (25.0%)	6 (20.0%)	2 (50.0%)	1 (25.0%)	12 (27.3%)	7 (20.6%)
MM	8 (20.0%)	6 (20.0%)	0 (0.0%)	0 (0.0%)	8 (18.2%)	6 (17.6%)
MS	9 (22.5%)	3 (10.0%)	0 (0.0%)	1 (25.0%)	9 (20.5%)	4 (11.8%)
S/S*	4 (10.0%)	8 (26.7%)	1 (25.0%)	0 (0.0%)	5 (11.4%)	8 (23.5%)

Table 9: Mean values for key indicators from CFP stations in Caha Mountains cSAC, baseline survey and the 2006 resurvey, with related data from NSUH survey.

	Wet heath/Dry heath/ Blanket bog			Upland grassland	
	Original (*n* = 39-40)	**Resurvey (*n* = 30)**	**NSUH (*n* = 44)**	**Original (*n* = 4)**	**Resurvey (*n* = 4)**
Bare peat cover (%)	3.0	3.3	2.2	2.8	1.3
Sward height (cm)	9.4	12.0	28.7	3.8	10.8
Calluna height (cm)	6.3	4.8	16.8†	-	-
Calluna cover					
D (>50%)	0 (0.0%)	3 (10.0%)	3 (6.8%)	-	-
A (26-50%)	7 (17.5%)	2 (6.7%)	6 (13.6%)	-	-
F (5-25%)	25 (62.5%)	21 (70.0%)	14 (31.8%)	-	-
O (<5%)	8 (20.0%)	4 (13.3%)	17 (38.6%)	-	-
Absent	0 (0.0%)	0 (0.0%)	4 (9.1 %)	-	-

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

3.7 Subunit and station data present conflicting trends for changes between 1999 and 2006. However, since 2006, there are tentative indications from the key indicator analysis that vegetation structure is improving. Also, the fact that stock reductions under the CFP occurred in over 49.3% of the commonage may 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 (Table 10). Only losses in habitat were found, there were no gains in habitat area. These data are restricted to obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. The main losses in area of **4010 Wet heaths** were due to new forestry (1.64 ha) and paths and tracks (1.27 ha). These impacts and trends are discussed later under future prospects. The overall change in habitat area was a loss of less than 1% per year resulting in a status of Unfavourable – Inadequate.

Table 10: Impacts causing obvious losses 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
B01.02	Artificial planting on open ground (non-native trees)	0.00	0.00	1.64	1.64
C01	Mining and quarrying	0.02	0.02	0.00	0.03
D01.01	Paths, tracks, cycling tracks	0.00	0.01	1.26	1.27
D01.02	Roads, motorways	0.00	0.08	0.32	0.40
E01.03	Dispersed habitation	0.17	0.06	0.00	0.24
G05	Other human intrusions and disturbances	0.03	0.20	0.81	1.05
J02.07	Water abstractions from groundwater	0.00	0.00	0.04	0.04
L05	Collapse of terrain, landslide	0.00	0.00	0.01	0.01
All impacts		0.22	0.38	4.08	4.68
% of habitat		0.01	0.02	0.16	0.19
% loss per year		0.002	0.003	0.02	0.01

Structure and functions

3.9 A total of 23 monitoring stops were recorded in **4010 Wet heaths** within the Caha Mountains cSAC (Table 11). In the assessment of structure and functions, 22 monitoring stops failed one criterion or more. Following a review of the ecological condition of those stops, expert judgement determined that no changes should be made, resulting in an overall failure rate of 95.7%. The structure and functions of **4010 Wet heaths** were therefore assessed as Unfavourable – Bad.

3.10 The vegetation composition was poor in many cases, with failures being recorded under seven criteria. In total, 73.9% of monitoring stops failed due to inadequate cover of ericoid species. Inadequate cover of positive indicator species and of *Cladonia* spp., *Sphagnum* spp., *Racomitrium lanuginosum* and pleurocarpous mosses both resulted in the failure of 47.8% of monitoring stops. Excessive cover of *Pteridium aquilinum* and the negative indicator species *Agrostis*

capillaris both resulted in the failure of 8.7% of monitoring stops. Single failures (4.3%) were recorded due to excessive cover of *Juncus effusus* and the non-native species *Campylopus introflexus*.

Table 11: Monitoring criteria and failure rates for 4010 Wet heaths (*n* = 23).

Criteria		Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition					
1	*Erica tetralix* present	20m radius	23	0	0
2	Cover of positive indicator species ≥ 50%	Relevé	23	11	47.8
3	Total cover of *Cladonia* species, *Sphagnum* species, *Racomitrium lanuginosum* and pleurocarpous mosses ≥ 10%	Relevé	23	11	47.8
4	Cover of ericoid species and *Empetrum nigrum* ≥ 15%	Relevé	23	17	73.9
5	Cover of dwarf shrub species < 75%	Relevé	23	0	0
6	Cover of the following negative indicator species: *Agrostis capillaris, Holcus lanatus, Phragmites australis, Ranunculus repens* collectively < 1%	Relevé	23	2	8.7
7	Cover of non-native species < 1%	Relevé	23	1	4.3
8	Cover of non-native species < 1%	Local vicinity	23	0	0
9	Cover of scattered native trees and scrub < 20%	Local vicinity	23	0	0
10	Cover of *Pteridium aquilinum* < 10%	Local vicinity	23	2	8.7
11	Cover of *Juncus effusus* < 10%	Local vicinity	23	1	4.3
Vegetation structure					
12	Crushed, broken and/or pulled up *Sphagnum* species < 10% of *Sphagnum* cover	Relevé	21	1	4.8
13	Last complete growing season's shoots of ericoids, *Empetrum nigrum* and *Myrica gale* showing signs of browsing collectively < 33%	Relevé	17	2	11.8
14	No signs of burning into the moss, liverwort or lichen layer, or exposure of peat surface due to burning	Local vicinity	23	2	8.7
15	No signs of burning inside boundaries of sensitive areas*	Local vicinity	21	0	0
Physical structure					
16	Cover of disturbed bare ground < 10%	Relevé	23	2	8.7
17	Cover of disturbed bare ground < 10%	Local vicinity	23	2	8.7
18	Area showing signs of drainage resulting from heavy trampling or tracking or ditches < 10%	Local vicinity	23	1	4.3

*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.

3.11 The vegetation structure of **4010 Wet heaths** was poor in some cases. Two monitoring stops (11.8% of monitoring stops to which this criterion was applicable) failed due to excessive levels of grazing and another two (8.7%) failed due to burning in the bryophyte and lichen layer or peat exposure due to burning. Another monitoring stop (4.8% of monitoring stops to which this criterion was applicable) failed due to excessive disturbance to *Sphagnum* cover.

3.12 The physical structure of **4010 Wet heaths** was also poor in some cases, with 8.7% of monitoring stops failing due to excessive cover of disturbed bare ground within the monitoring stops and in the local vicinity. One of these monitoring stops (4.3%) also failed due to excessive drainage. These results indicate that sheep grazing, and associated trampling, is the main impact affecting **4010 Wet heaths** within the Caha Mountains cSAC.

Future prospects

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

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

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.01	Non-intensive cattle grazing	Medium	Negative	1.6%	Inside	-1.0	Imp
A04.02.02	Non-intensive sheep grazing	Medium	Negative	100%	Inside	-3.0	Imp
A04.02.03	Non-intensive horse grazing	Medium	Negative	0.9%	Inside	-0.5	Imp
A04.02.04	Non-intensive goat grazing	Medium	Negative	2.1%	Inside	-1.0	Ins
B01.02	Artificial planting on open ground (non-native trees)	High	Negative	<1%	Inside	-0.75	Ins
C01	Mining and quarrying	High	Negative	<1%	Inside	-0.75	Ins
D01.01	Paths, tracks, cycling tracks	High	Negative	<1%	Inside	-0.75	Ins
D01.02	Roads, motorways	High	Negative	<1%	Inside	-0.75	Ins
E01.03	Dispersed habitation	High	Negative	<1%	Inside	-0.75	Ins
G01.02	Walking, horseriding and non-motorized 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	High	Negative	<1%	Inside	-0.75	Dis
I02	Problematic native species	Medium	Negative	13.0%	Inside	-1.0	Ins
J01.01	Burning down	High	Negative	2.3%	Inside	-1.5	Ins
J02.07	Water abstractions from groundwater	High	Negative	<1%	Inside	-0.75	Ins
K01.01	Erosion	High	Negative	0.5%	Inside	-0.75	Ins
K02.01	Species composition change (succession)	High	Negative	0.01%	Inside	-0.75	Ins
L05	Collapse of terrain, landslide	High	Negative	<1%	Inside	-0.75	Ins
	Overall score					-17.75	

Non-intensive cattle grazing (A04.02.01)

3.14 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that cattle grazing occurred within the site. Grazing was identified as one of the main management issues within the site. Past overgrazing negatively impacted **4010 Wet heaths** and was exacerbated by trespassing livestock accessing the site from adjacent unfenced lands. The impacts of grazing have been assessed by the Commonage Framework Plan with destocking rates of between 13% and 50% recommended. It is anticipated that stock reductions under the CFP will reverse the negative impacts of overgrazing in **4010 Wet heaths**.

3.15 During the present survey, cattle-grazing was recorded within **4010 Wet heaths** on the lower slopes at Glanrastel, Currakillane and Crossterry, at the head of Coomerkane and on Coorannel Hill, with poaching occurring in places. The area affected has been estimated to be 1.6%, based on the extent of **4010 Wet heaths** present in polygons in which cattle grazing was noted. The intensity of this impact was assessed as medium overall and its influence as negative. The trend was assessed as improving due to stock reductions under the CFP.

Non-intensive sheep grazing (A04.02.02)

3.16 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that extensive grazing by sheep was the main land-use within the site. Grazing was identified as one of the main management issues within the site. Past overgrazing negatively impacted **4010 Wet heaths** and was exacerbated by trespassing livestock accessing the site from adjacent unfenced lands. The site was heavily grazed by sheep on many of the mountain slopes, particularly in the west of the site with severe overgrazing occurring adjacent to the Healy Pass. The impacts of grazing have been assessed by the Commonage Framework Plan with destocking rates of between 13% and 50% recommended. It is anticipated that stock reductions under the CFP will reverse the negative impacts of overgrazing in **4010 Wet heaths**.

3.17 The present survey indicates that grazing by sheep is the dominant land use within **4010 Wet heaths** in the Caha Mountains cSAC. This impact was recorded at the majority of **4010 Wet heaths** monitoring stops, with 11.8% 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 60%. Heather cover was generally low, with 73.9% 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 8.7% failing due to excessive cover of disturbed bare ground within the monitoring stop and in the local vicinity. During vegetation mapping, overgrazing and high levels of trampling by sheep were noted at several locations within the site. The intensity of this impact within **4010 Wet heaths** has been assessed as medium overall and its influence as negative. The trend was assessed as improving due to stock reductions under the CFP.

Non-intensive horse grazing (A04.02.03)

3.18 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that grazing by horses occurred within the site. Grazing was identified as one of the main management issues within the site and past overgrazing negatively impacted **4010 Wet heaths**. The impacts of grazing have been assessed by the Commonage Framework Plan with destocking rates of between 13% and 50% recommended. It is anticipated that stock reductions under the CFP will reverse the negative impacts of overgrazing in **4010 Wet heaths**.

3.19 During the present survey, grazing by horses and/or donkeys was recorded within **4010 Wet heaths** at Dromerkeen, Kilcaskan and Lyre. The area affected has been estimated to be 0.9%, based on the extent of **4010 Wet heaths** present in polygons in which grazing by horses and/or donkeys was noted. The intensity of this impact was assessed as medium overall and its influence as negative.

Non-intensive goat grazing (A04.02.04)

3.20 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that grazing by feral goats occurred within the site. Grazing was identified as one of the main management issues within the site. Past overgrazing negatively impacted **4010 Wet heaths** and was exacerbated by trespassing livestock accessing the site from adjacent unfenced lands.

3.21 During the present survey, grazing by feral goats was recorded within **4010 Wet heaths** at Coorannel, Shrone Hill, Glenlough and on the slopes west of Barley Lake. At least 20 feral goats were observed within the site near Barley Lake and on Shrone Hill. In addition landowners indicated their frequent presence at Baurearagh and Glantrasna. The area affected has been estimated to be 2.1%, based on the extent of **4010 Wet heaths** present in polygons in which goat grazing was noted, but this is likely to be an underestimate of the true area impacted due to the roaming nature of goats. The intensity of this impact was assessed as medium overall and its influence as negative.

Artificial planting on open ground (non-native trees) (B01.02)

3.22 A small area of **4010 Wet heaths** (<1%) at the edge of the site at Baurearagh has been recently fenced off and planted with conifers.

Mining and quarrying (C01)

3.23 An area of **4010 Wet heath** (<1%) appears to have been lost at a small quarrying site adjacent to the N71.

Paths, tracks, cycling tracks (D01.01)

3.24 A waymarked walking route, the Beara Way, passes through the south of the site leading up from the road at Coomerkane and up along the ridge to Toberavanaha Lough and beyond. This route has been bulldozed through **4010 Wet heaths** in recent years creating a broad track that is cut down to the rock in most places. There has also been minor track construction at Glanrastel, Fehanagh, Glenlough and Lyre. At Shrone, track clearance was associated with dumping of old cars. 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.

Roads, motorways (D01.02)

3.25 There have been small losses of area of **4010 Wet heaths** (<1%) due to road widening along the N71 and due to new road construction at Inchintaggart.

Dispersed habitation (E01.03)

3.26 A small area of **4010 Wet heaths** (<1%) at the edge of the site at Derryconnery has been lost due to house and garden development.

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

3.27 A waymarked walking route, the Beara Way, passes through the south of the site. Recreational walking also occurs in Glanrastel and around Barley Lake. The site is also utilised by hill walkers to a small extent. These walking routes traverse areas of **4010 Wet heaths** and path erosion is occurring in places. 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)

3.28 During the present survey, quad bike tracks were observed in **4010 Wet heaths** at several locations, for example by Barley Lake and Glenkeel Lough. These have a medium negative impact, but only on a small area (<1%).

Other human intrusions and disturbances (G05)

3.29 There were small losses of **4010 Wet heaths** habitat due to disturbance (e.g. bulldozing or land clearance) at various locations in the site including Fehanagh, Inchintaggart and along the N71.

Garbage and solid waste (H05.01)

3.30 During the present survey, several cars were noted to have been dumped in **4010 Wet heaths** on the margin of the site at Shrone. The intensity of this 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)

3.31 *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.

3.32 *Campylopus introflexus* was recorded within two monitoring stops (8.7%) but was not sufficiently abundant to cause either stop to fail. The mean cover of *C. introflexus* within **4010 Wet heaths** monitoring stops was 0.2%. The degraded peat vegetation community DP1

Campylopus introflexus – Polytrichum spp. was recorded within 80 polygons dominated by **4010 Wet heaths** during vegetation mapping with cover scores of up to 0.5%. It was therefore not recorded as forming extensive carpets.

3.33 The non-native shrub *Cotoneaster* sp. was noted within **4010 Wet heaths** in a heavily disturbed polygon at Fehanagh, near the site boundary.

3.34 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that thickets of the non-native invasive shrub *Rhododendron ponticum* occurred in places and identified this species as one of the main management issues within the site. Localised invasion by *R. ponticum* was considered a threat, notably at Fehanagh and Coomerkane.

3.35 During vegetation mapping, invasion by *Rhododendron ponticum* was found to be particularly severe at Coomerkane, on the northern slope of Baurearagh Mountain and at Fehanagh. The species was noted as having invaded and formed thickets within **4010 Wet heaths**, resulting in the loss of Annex I habitat. Scattered individuals of *R. ponticum* were also recorded at numerous other locations. 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. **WS3 Ornamental/non-native shrub** was recorded within 110 polygons in which **4010 Wet heaths** was the primary Annex I habitat, comprising an area of 11.3 ha. This is equivalent to 0.5% of the total area of **4010 Wet heaths**. One instance of *R. ponticum* being sprayed with herbicide was noted at Coomerkane.

3.36 The intensity of this impact has been assessed as high overall and its influence as negative. The area affected has been estimated to be less than 1%. *Rhododendron ponticum* is regenerating freely and forming thickets within **4010 Wet heaths** and, if control measures are not undertaken, additional areas of **4010 Wet heaths** are very likely to be lost. The trend for this impact was therefore assessed as disimproving.

Problematic native species (I02)

3.37 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that patches of **HD1 Dense bracken** occurred within the site, most notably on the slopes of Knockastumpa. During the present survey, bracken encroachment was noted within **4010 Wet heaths**. Two **4010 Wet heaths** monitoring stops (8.7%) failed due to excessive cover of *Pteridium aquilinum*, with cover scores of 10 and 35%. Another monitoring stop (4.3%) failed due to excessive cover of *Juncus effusus*, with a cover score of 10%. 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 13.0%.

Burning down (J01.01)

3.38 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that damaging activities, including burning, are carried out in association with the management of the area for grazing. The present survey indicates that burning has occurred in **4010 Wet heaths** within the site, with an estimated 2.3% 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)

3.39 New drainage ditches have been dug in **4010 Wet heaths** at Fehanagh and Inchintaggart. There has been a very small loss of habitat area, but additional areas will be impacted by drainage. 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).

Erosion (K01.01)

3.40 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that overgrazing is exacerbating soil erosion on many of the slopes. In places, the thin peaty soil has been eroded down to the mineral layer or bedrock. During vegetation mapping, peat erosion was recorded in **4010 Wet heaths**, particularly where heavy trampling by sheep had occurred. Due to the CFP recommendations, 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 2000-3600 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 **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)

3.41 During the present survey, succession from **4010 Wet heaths** to **WS1 Scrub** was noted at Fehanagh and in the Bauraragh Valley. This is likely to be related to localised undergrazing. The intensity of this impact is assessed as high, since it results in the replacement of an Annex I habitat with a non-Annex habitat, and its influence has been assessed as negative. The area of **4010 Wet heaths** affected was recorded as 0.01%.

Collapse of terrain, landslide (L05)

3.42 There has been small loss of area (<1%) due to land slippage on Baurearagh Mountain.

3.43 The overall impacts score for **4010 Wet heaths** has been calculated as -17.75. 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 stock reductions under the CFP, 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, burning and bracken and *Rhododendron ponticum* invasion. The future prospects for this habitat were therefore assessed as Unfavourable – Bad.

4030 Dry heaths

Area

3.44 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. No changes in area of habitat were noted; therefore the area status was assessed as Favourable.

Structure and functions

3.45 Four monitoring stops were recorded in **4030 Dry heaths** within the Caha Mountains cSAC (Table 13). In the assessment of structure and functions, two monitoring stops failed one criterion each. Following a review of the ecological condition of these stops, expert judgement determined that no changes should be made, resulting in an overall failure rate of 50.0%. The structure and functions of **4030 Dry heaths** were therefore assessed as Unfavourable – Bad.

3.46 The vegetation composition of **4030 Dry heaths** was poor in two cases. One monitoring stop (25.0%) failed due to an inadequate number of positive indicator species and another (25.0%) failed due to excessive cover of *Pteridium aquilinum*. The vegetation structure and physical structure of **4030 Dry heaths** was good with no failures being recorded under the relevant criteria.

Future prospects

3.47 Five impacts were recorded within **4030 Dry heaths** (Table 14).

Non-intensive sheep grazing (A04.02.02)

3.48 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that extensive grazing by sheep was the main land-use and identified grazing as one of the main management issues within the site. Past overgrazing negatively impacted **4030 Dry heaths** and was exacerbated by trespassing livestock accessing the site from adjacent unfenced lands. The site was heavily grazed by sheep on many of the mountain slopes, particularly in the west of the site with severe overgrazing occurring adjacent to the Healy Pass. The impacts of grazing have been assessed by the Commonage Framework Plan with destocking rates of between 13% and 50% recommended.

3.49 The present survey indicates that grazing by sheep is the dominant land use within **4030 Dry heaths** in the Caha Mountains cSAC. This impact was recorded at 50% of **4030 Dry heaths** monitoring stops but was not sufficiently intensive to cause any stop to fail. Grazing intensity varied across the site, with the proportion of dwarf shrub shoots showing signs of grazing ranging from 0 to 20%. Disturbed bare ground, which may be associated with trampling by sheep, was recorded at all monitoring stops but was not sufficiently extensive to cause any stop to fail. The intensity of this impact has been assessed as low overall and its influence as positive. The trend was assessed as improving due to stock reductions under the CFP.

Table 13: Monitoring criteria and failure rates for 4030 Dry heaths (n = 4).

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	4	0	0
2	Number of positive indicator species present ≥ 2	Relevé	4	1	25.0
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%		4	0	0
4	Proportion of dwarf shrub cover composed of *Myrica gale, Salix repens, Ulex gallii* collectively < 50%	Relevé	4	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	4	0	0
6	Cover of non-native species < 1%	Relevé	4	0	0
7	Cover of non-native species < 1%	Local vicinity	4	0	0
8	Cover of scattered native trees and scrub < 20%	Local vicinity	4	0	0
9	Cover of *Pteridium aquilinum* < 10%	Local vicinity	4	1	25.0
10	Cover of *Juncus effusus* < 10%	Local vicinity	4	0	0
Vegetation structure					
11	Senescent proportion of *Calluna vulgaris* cover < 50%	Relevé	4	0	0
12	Last complete growing season's shoots of ericoids and *Empetrum nigrum* showing signs of browsing collectively < 33%	Relevé	4	0	0
13	No signs of burning inside boundaries of sensitive areas*	Local vicinity	4	0	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	1	0	0
Physical structure					
15	Cover of disturbed bare ground < 10%	Relevé	4	0	0
16	Cover of disturbed bare ground < 10%	Local vicinity	4	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.

Table 14: 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	Low	Positive	50.0%	Inside	+0.75	Imp
G01.03.02	Off-road motorised driving	Medium	Negative	<1%	Inside	-0.5	Ins
I01	Invasive non-native species	Low	Neutral	0.03%	Inside	0	Ins
I02	Problematic native species	Medium	Negative	25.0%	Inside	-1.0	Ins
J01.01	Burning down	High	Negative	0.04%	Inside	-0.75	Ins
	Overall score					-1.5	

Off-road motorised driving (G01.03.02)

3.50 During the present survey, quad bike tracks were observed in **4030 Dry heaths** near the summit of Caha. This was deemed to have medium negative impact but only on a small area (<1%).

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 one monitoring stops (25.0%) but, with a cover score of 0.1%, it was not sufficiently extensive to cause the stop to fail. The mean cover of *C. introflexus* within **4030 Dry heaths** monitoring stops was 0.03%. The degraded peat vegetation community DP1 *Campylopus introflexus – Polytrichum* spp. was not recorded within any polygons dominated by **4030 Dry heaths** during vegetation mapping. It was therefore not recorded as forming extensive carpets. The intensity of this impact is assessed as low and its influence as neutral.

Problematic native species (I02)

3.53 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that patches of **HD1 Dense bracken** occurred within the site, most notably on the slopes of Knockastumpa. During the present survey, bracken encroachment was noted within **4030 Dry heaths**. One **4030 Dry heaths** monitoring stop (25.0%) failed due to excessive cover of *Pteridium aquilinum*, with a cover score of 15%. The intensity of this impact is assessed as medium and its influence as negative (Table 14).

Burning down (J01.01)

3.54 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that damaging activities, including burning, are carried out in association with the management of the area for grazing. During the present survey, burning was recorded in **4030 Dry heaths** on the ridge

north of Magannagan Stream. An estimated 0.04% of **4030 Dry heaths** are thought to have been affected by burning within the last few years. The intensity of this impact has been assessed as high and its influence as negative.

3.55 The overall impacts score for **4030 Dry heaths** has been calculated as -1.5. This is 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 stock reductions under the CFP. The future prospects for this habitat were therefore assessed as Unfavourable – Inadequate.

4060 Alpine and Boreal heaths

Area

3.56 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. 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

3.57 Two monitoring stops were recorded in **4060 Alpine and Boreal heaths** within the Caha Mountains cSAC (Table 15). 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.

Future prospects

3.58 The only impact recorded within **4060 Alpine and Boreal heaths** was non-intensive sheep grazing (Table 16).

Non-intensive sheep grazing (A04.02.02)

3.59 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that extensive grazing by sheep was the main land-use and identified grazing as one of the main management issues within the site. Past overgrazing negatively impacted **4060 Alpine and Boreal heaths** and was exacerbated by trespassing livestock accessing the site from adjacent unfenced lands. The impacts of grazing have been assessed by the Commonage Framework Plan with destocking rates of between 13% and 50% recommended.

3.60 The present survey indicates that grazing by sheep is the dominant land use within **4060 Alpine and Boreal heaths** in the Caha Mountains cSAC. This impact was recorded at 50% of **4060 Alpine and Boreal heaths** monitoring stops but was not sufficiently intensive to cause any stop to fail. Where grazing was recorded, the proportion of dwarf shrub shoots showing signs of grazing was 10%, which lies within acceptable limits. Disturbed bare ground, which may be associated with trampling by sheep, was recorded at all monitoring stops but was not

sufficiently extensive to cause any stop 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 stock reductions under the CFP.

Table 15: Monitoring criteria and failure rates for 4060 Alpine and Boreal heaths (n = 2).

Criteria		Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition					
1	Number of bryophyte or non-crustose lichen species present ≥ 3	Relevé	2	0	0
2	Cover of positive indicator species ≥ 66%	Relevé	2	0	0
3	Cover of dwarf shrubs ≥ 10%	Relevé	2	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	2	0	0
5	Cover of non-native species < 1%	Relevé	2	0	0
Vegetation structure					
6	Live leaves of *Carex bigelowii, Deschampsia flexuosa, Festuca ovina, F. vivipara* showing signs of grazing collectively < 10%	Relevé	0	n/a	n/a
7	Last complete growing season's shoots of ericoids and *Empetrum nigrum* showing signs of browsing collectively < 33%	Relevé	2	0	0
8	No signs of burning inside feature	Local vicinity	2	0	0
Physical structure					
9	Cover of disturbed bare ground < 10%	Relevé	2	0	0
10	Cover of disturbed bare ground < 10%	Local vicinity	2	0	0

Table 16: Assessment of impacts for 4060 Alpine and Boreal heaths. Under trend, Imp = Improving.

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Low	Neutral	50%	Inside	0	Imp
	Overall score					0	

3.61 The overall impacts score for **4060 Alpine and Boreal heaths** has been calculated as 0. This equals the nominal Favourable Reference Value of zero. The combined future trend for area and structure and functions is deemed to be improving. The future prospects for this habitat were therefore assessed as Favourable.

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

Area

3.62 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

3.63 Two monitoring stops were recorded in ***6230 Species-rich *Nardus* grasslands** within the Caha Mountains cSAC (Table 17). In the assessment of structure and functions, both monitoring stops failed one criterion or more. Following a review of the ecological condition of these stops, expert judgement determined that no changes should be made, resulting in an overall failure rate of 100.0%. The structure and functions of ***6230 Species-rich *Nardus* grasslands** were therefore assessed as Unfavourable - Bad.

Table 17: 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	1	50.0
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	1	50.0

3.64 The vegetation composition of one monitoring stop was poor, failing due to excessive cover of bracken and heath. The vegetation structure and physical structure of the other monitoring stop were poor. This other monitoring stop failed because the sward height was inadequate and an excessive area of the habitat showed signs of serious grazing by sheep.

Future prospects

3.65 Four impacts were recorded within ***6230 Species-rich *Nardus* grasslands** (Table 18).

Table 18: Assessment of impacts for *6230 Species-rich *Nardus* grasslands. Under trend, 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	Ins
I01	Invasive non- native species	Low	Negative	<1%	Inside	-0.25	Ins
102	Problematic native species	Low	Negative	2.5%	Inside	-0.5	Ins
K02.01	Species composition change (succession)	Low	Negative	3%	Inside	-0.5	Ins
	Overall score					-4.25	

Non-intensive sheep grazing (A04.02.02)

3.66 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that extensive grazing by sheep was the main land-use within the site. Grazing was identified as one of the main management issues within the site. Past overgrazing was exacerbated by trespassing livestock accessing the site from adjacent unfenced lands. The impacts of grazing have been assessed by the Commonage Framework Plan with destocking rates of between 13% and 50% recommended.

3.67 The present survey indicates that grazing by sheep is the dominant land use within ***6230 Species-rich *Nardus* grasslands** in the Caha Mountains cSAC. One ***6230 Species-rich *Nardus* grasslands** monitoring stop, located in Shinnagh, failed due to a low sward height caused by excessive grazing by sheep and signs of serious grazing or disturbance. The other, located in Rougham, failed due to excessive cover of *Pteridium aquilinum* and *Calluna vulgaris*, which may be a result of undergrazing. As a result of this over- and undergrazing, the intensity of this impact has been assessed as medium overall. 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 either monitoring stop. While reductions in grazing levels have been implemented due to stock reductions under the CFP, the trend was assessed as insufficient information due to variation in grazing levels.

Invasive non-native species (I01)

3.68 *Epilobium brunnescens* is a species of damp, stony places, especially in the mountains, which is localised but spreading in Ireland (Parnell & Curtis, 2012). During vegetation mapping, *E. brunnescens* was recorded within ***6230 Species-rich *Nardus* grasslands** at Pookeen. It was not recorded within the ***6230 Species-rich *Nardus* grasslands** monitoring stops. 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 of the habitat affected has been estimated to be less than 1%, due to the localised nature of this impact.

Problematic native species (I02)

3.69 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that patches of **HD1 Dense bracken** occurred within upland grassland, most notably on the slopes of Knockastumpa. During the present survey, bracken encroachment was noted within ***6230 Species-rich *Nardus* grasslands**. In one ***6230 Species-rich *Nardus* grasslands** monitoring stop (50.0%), located at Rougham, *Pteridium aquilinum* reached a cover score of 5%, which contributed to the failure of that stop due to excessive cover of bracken and heath. This may be related to undergrazing in this area (see 3.58 above). The intensity of this impact is assessed as low and its influence as negative. The area of the habitat affected has been estimated to be 2.5%, based on the mean cover score of *P. aquilinum* within ***6230 Species-rich *Nardus* grasslands** monitoring stops.

Species composition change (succession) (K02.01)

3.70 During the present survey, succession from ***6230 Species-rich *Nardus* grasslands** towards **4030 Dry heaths** was noted to be underway. In one ***6230 Species-rich *Nardus* grasslands** monitoring stop (50.0%), located at Rougham, *Calluna vulgaris* reached a cover score of 5%, which contributed to the failure of that stop due to excessive cover of bracken and heath. This may be related to undergrazing in this area (see 3.58 above). The intensity of this impact is assessed as low and its influence as negative. The area of the habitat affected has been estimated to be 3%, based on the mean cover score of *C. vulgaris* within ***6230 Species-rich *Nardus* grasslands** monitoring stops. It should be noted that the cover of *C. vulgaris* was not yet sufficiently high for the vegetation to be referable to **4030 Dry heaths**, so this impact has not been assessed for that habitat.

3.71 The overall impacts score for ***6230 Species-rich *Nardus* grasslands** has been calculated as -4.25. This is below the nominal Favourable Reference Value of zero. While stock reductions under the CFP should alleviate overgrazing in affected areas of ***6230 Species-rich *Nardus* grasslands**, it may exacerbate bracken and heath encroachment in undergrazed areas. The combined future trend for area and structure and functions was therefore assessed as no change. The future prospects for this habitat were therefore assessed as Unfavourable - Bad.

***7130/7130 Blanket bogs**

Area

3.72 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 19). Only losses in habitat were found, there were no gains in habitat area. These data are restricted to obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. The main measured loss of area of ***7130/7130 Blanket bogs** were due to peat extraction (combined area of 0.10 ha). 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.

Table 19: Impacts causing obvious losses 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
C01.03.01	Hand cutting of peat	0.02	0.02	0.06	0.10
D01.01	Paths, tracks, cycling tracks	0.00	0.00	0.02	0.02
K01.01	Erosion	n.m.	n.m.	n.m.	n.m.
All impacts		0.02	0.02	0.08	0.12
% of habitat		<0.01	<0.01	<0.01	0.01
% loss per year		<0.01	<0.01	<0.01	<0.01

Structure and functions

3.73 Twelve monitoring stops were recorded in ***7130/7130 Blanket bogs** within the Caha Mountains cSAC (Table 20). 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, two monitoring stops failed one criterion each. Following a review of the ecological condition of these stops, expert judgement determined that no changes should be made, resulting in an overall failure rate of 16.7%. The structure and functions of ***7130/7130 Blanket bogs** were therefore assessed as Unfavourable – Inadequate. Vegetation mapping indicated that the proportion of inactive, eroding and cutover bog within the total area of bog was 3.1%.

3.74 The vegetation composition of ***7130/7130 Blanket bogs** was good, with no failures being recorded under the relevant criteria. The vegetation structure of ***7130/7130 Blanket bogs** was poor in one case. One monitoring stop (9.1% of monitoring stops to which this criterion was applicable) failed due to excessive levels of grazing. The physical structure of ***7130/7130**

Blanket bogs was also poor in one case. One monitoring stop (8.3%) failed due to excessive levels of peat erosion.

Table 20: Monitoring criteria and failure rates for *7130/7130 Blanket bogs (*n* = 12).

Criteria		Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition					
1	Number of positive indicator species present ≥ 7	Relevé	12	0	0
2	Cover of bryophyte or lichen species, excluding *Sphagnum fallax* ≥ 10%	Relevé	12	0	0
3	Cover of each of the following species: *Calluna vulgaris, Eleocharis multicaulis, Eriophorum vaginatum, Molinia caerulea, Schoenus nigricans, Trichophorum germanicum* individually < 75%	Relevé	12	0	0
4	Cover of the following negative indicator species: *Agrostis capillaris, Holcus lanatus, Phragmites australis, Pteridium aquilinum, Ranunculus repens* collectively < 1%	Relevé	12	0	0
5	Cover of non-native species < 1%	Relevé	12	0	0
6	Cover of non-native species < 1%	Local vicinity	12	0	0
7	Cover of scattered native trees and scrub < 10%	Local vicinity	12	0	0
Vegetation structure					
8	Crushed, broken and/or pulled up *Sphagnum* species < 10% of *Sphagnum* cover	Relevé	12	0	0
9	Last complete growing season's shoots of ericoids, *Empetrum nigrum* and *Myrica gale* showing signs of browsing collectively < 33%	Relevé	11	1	9.1
10	No signs of burning into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Local vicinity	12	0	0
9	No signs of burning inside boundaries of sensitive areas*	Local vicinity	12	0	0
Physical structure					
12	Cover of disturbed bare ground < 10%	Relevé	12	0	0
13	Cover of disturbed bare ground < 10%	Local vicinity	12	0	0
14	Area showing signs of drainage resulting from heavy trampling or tracking or ditches or peat cutting < 10%	Local vicinity	12	0	0
15	Cover of erosion gullies and eroded areas within the greater bog mosaic < 5%	Local vicinity	12	1	8.3

*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.

Future prospects

3.75 Nine impacts were recorded within ***7130/7130 Blanket bogs** (Table 21).

Table 21: 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	Medium	Negative	72.7%	Inside	-2.0	Imp
C01.03.01	Hand cutting of peat	High	Negative	<1%	Inside	-0.75	Ins
D01.01	Paths, tracks, cycling tracks	High	Negative	<1%	Inside	-0.75	Ins
G01.02	Walking, horseriding and non-motorized vehicles	Medium	Negative	<1%	Inside	-0.5	Ins
G01.03.02	Off-road motorised driving	Medium	Negative	<1%	Inside	-0.5	Ins
I01	Invasive non-native species	Low	Neutral	0.01%	Inside	0	Ins
J01.01	Burning down	High	Negative	0.1%	Inside	-0.75	Ins
J02.07	Water abstractions from groundwater	High	Negative	<1%	Inside	-0.75	Ins
K01.01	Erosion	High	Negative	2.4%	Inside	-1.5	Ins
	Overall score					-7.5	

Non-intensive sheep grazing (A04.02.02)

3.76 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that extensive grazing by sheep was the main land-use within the site and identified grazing as one of the main management issues. Past overgrazing negatively impacted ***7130/7130 Blanket bogs** and was exacerbated by trespassing livestock accessing the site from adjacent unfenced lands. The site was heavily grazed by sheep on many of the mountain slopes, particularly in the west of the site with severe overgrazing occurring adjacent to the Healy Pass. The impacts of grazing have been assessed by the Commonage Framework Plan with destocking rates of between 13% and 50% recommended.

3.77 The present survey indicates that grazing by sheep is the dominant land use within ***7130/7130 Blanket bogs** in the Caha Mountains cSAC. Grazing was recorded at 72.7% of ***7130/7130 Blanket bogs** monitoring stops, with 9.1% 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 50%. Disturbed bare ground, which may be associated with trampling by sheep, was recorded within the local vicinity of most monitoring stops, but was not sufficiently extensive to cause any to fail. During vegetation mapping, overgrazing and high levels of trampling by sheep were noted within ***7130/7130 Blanket bogs** at some locations. The intensity of this impact has been assessed as medium overall and its influence as negative. The trend was assessed as improving due to stock reductions under the CFP.

Hand cutting of peat (C01.03.01)

3.78 The Caha Mountains cSAC Conservation Statement stated that turf cutting by hand was confined to small areas within the site. **PB4 Cutover bog** occurred in the Baurearagh Valley, Knockastumpa and near Barley Lake, but the latter was the only location where turf cutting had occurred recently. This activity was said to be small-scale and very localised. This is consistent with the findings of the present survey, although recent small-scale turf cutting by hand was also noted at Rougham and on the north-eastern spur of Baurearagh Mountain. At Barley Lake, ancient *Pinus sylvestris* stumps had been exposed by recent turf cutting. The cut scraws had been replaced and the cutover was revegetating with a good cover of *Sphagnum* species and *Eriophorum angustifolium*. 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 areas. The area of ***7130/7130 Blanket bogs** affected was estimated to be less than 1%, due to the very localised nature of this impact.

Paths, tracks, cycling tracks (D01.01)

3.79 A section of track has been constructed through blanket bog on the northern side of Glanrastel. The area lost is less than 1% of the habitat area.

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

3.80 A waymarked walking route, the Beara Way, passes through the south of the site. Recreational walking also occurs in Glanrastel and around Barley Lake. These walking routes traverse areas of ***7130/7130 Blanket bogs** and path erosion is occurring in places. 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)

3.81 During the present survey, quad bike tracks were observed in ***7130/7130 Blanket bogs** at several locations, including on Glenlough Mountain, Droppa and Cummenbaun, and near Glenkeel Lough. This has caused peat exposure in some instances. 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)

3.82 *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.

3.83 *Campylopus introflexus* was not recorded within ***7130 Active blanket bogs** monitoring stops but the degraded peat vegetation community DP1 *Campylopus introflexus – Polytrichum* spp. was recorded within 22 polygons dominated by ***7130/7130 Blanket bogs** during vegetation

mapping, with cover scores of up to 0.3%. The area of DP1 *Campylopus introflexus – Polytrichum* spp. within these polygons was equivalent to 0.01% of the area of ***7130/7130 Blanket bogs**. *C. introflexus* was not recorded as forming extensive carpets; therefore this impact was assessed as being of low intensity and neutral influence.

Burning down (J01.01)

3.84 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that damaging activities, including burning, are carried out in association with the management of the area for grazing. During the present survey, burning was recorded in ***7130/7130 Blanket bogs** on the ridge north of Magannagan Stream and, at Knockastumpa, some hummocks of *Sphagnum austinii* showed signs of past burning. An estimated 0.1% of ***7130/7130 Blanket bogs** are thought to have 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)

3.85 Drainage has been recorded under this impact category. Water is being drained from ***7130/7130 Blanket bogs** and diverted away by means of ditches. The intended purpose is not water abstraction but reclamation of the land. Although the impact category does not accurately describe the impact in question it is the most appropriate option available. Small drainage ditches in bog were observed in Coomerkane. The intensity of this impact has been assessed as high and its influence as negative.

Erosion (K01.01)

3.86 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that overgrazing is exacerbating soil erosion on many of the slopes, although active peat formation is occurring on some of the plateaux. During vegetation mapping, peat erosion was recorded in ***7130/7130 Blanket bogs**, particularly where heavy trampling by sheep had occurred. Due to CFP recommendations, 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 2000-3600 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 2.4% 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**.

3.87 The overall impacts score for ***7130/7130 Blanket bogs** has been calculated as -7.5. This is well below the nominal Favourable Reference Value of zero. The combined future trend for area and structure and functions is deemed to be no change. While the trend for sheep-grazing is improving due to stock reductions under the CFP, 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, burning and peat extraction. The future prospects for this habitat were therefore assessed as Unfavourable – Bad.

7140 Transition mires

Area

3.88 Changes in the area of **7140 Transition mires** 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.

Table 22: 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	0	n/a	n/a
1b	PFLU5: number of positive indicator species from Groups i or ii present ≥ 3		1	0	0
1c	RFEN1b: number of positive indicator species from Groups i or ii present ≥ 6		1	1	100.0
	Combined results for Criteria 1a, 1b and 1c:		**2**	**1**	**50.0**
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	2	0	0
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

Structure and functions

3.89 Two monitoring stops were recorded in **7140 Transition mires** within the Caha Mountains cSAC (Table 22). 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

3.90 No impacts (Threats, Pressures and Activities code X) were recorded within **7140 Transition mires** within the Caha 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.

7150 *Rhynchosporion* depressions

Area

3.91 Changes in the area of **7150 *Rhynchosporion* depressions** 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

3.92 Two monitoring stops were recorded in **7150 *Rhynchosporion* depressions** within the Caha Mountains cSAC (Table 23). 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 **7150 *Rhynchosporion* depressions** were therefore assessed as Favourable.

Future prospects

3.93 Two impacts were recorded within **7150 *Rhynchosporion* depressions** (Table 24).

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

3.94 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that extensive grazing by sheep was the main land-use within the site and identified grazing as one of the main management issues. Past overgrazing negatively impacted ***7130/7130 Blanket bogs** and associated habitats and was exacerbated by trespassing livestock accessing the site from adjacent unfenced lands. The site was heavily grazed by sheep on many of the mountain slopes, particularly in the west of the site with severe overgrazing occurring adjacent to the

Healy Pass. The impacts of grazing have been assessed by the Commonage Framework Plan with destocking rates of between 13% and 50% recommended.

Table 23: Monitoring criteria and failure rates for 7150 *Rhynchosporion* depressions (n = 2).

Criteria		Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition					
1	Number of positive indicator species present ≥ 5	Relevé	2	0	0
2	Cover of *Rhynchospora* spp. ≥ 10%	Relevé	2	0	0
3	Cover of each of the following species: *Eleocharis multicaulis*, *Molinia caerulea, Schoenus nigricans, Trichophorum germanicum* individually < 35%	Relevé	2	0	0
4	Cover of the following negative indicator species: *Agrostis capillaris, Holcus lanatus, Phragmites australis, Pteridium aquilinum, Ranunculus repens* collectively < 1%	Relevé	2	0	0
5	Cover of non-native species < 1%	Relevé	2	0	0
6	Cover of scattered native trees and scrub < 10%	Local vicinity	2	0	0
Vegetation structure					
7	Crushed, broken and/or pulled up *Sphagnum* species < 10% of *Sphagnum* cover	Relevé	2	0	0
8	Last complete growing season's shoots of ericoids, *Empetrum nigrum* and *Myrica gale* shrubs showing signs of browsing collectively < 33%	Relevé	2	0	0
9	No signs of burning into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Local vicinity	2	0	0
10	No signs of burning inside boundaries of sensitive areas*	Local vicinity	2	0	0
Physical structure					
11	Cover of disturbed bare ground < 10%	Relevé	2	0	0
12	Cover of disturbed bare ground < 10%	Local vicinity	2	0	0
13	Area showing signs of drainage resulting from heavy trampling or tracking or ditches < 10%	Local vicinity	2	0	0
14	Cover of erosion gullies and eroded areas within the greater bog mosaic < 5%	Local vicinity	2	0	0

*Sensitive areas
(a) Ground with abundant and/or an almost continuous carpet of *Sphagnum.*
(b) Patterned areas (i.e. with pools and wet hollows).
(c) Areas within 50 m of functioning drains.
(d) Areas within 5-10 m of watercourses.

Table 24: Assessment of impacts for 7150 *Rhynchosporion* depressions. 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	50%	Inside	-1.5	Imp
G01.03.02	Off-road motorised driving	High	Negative	<1%	Inside	-0.75	Ins
	Overall score					-2.25	

3.95 The present survey indicates that grazing by sheep is the dominant land use within **7150 *Rhynchosporion* depressions** in the Caha Mountains cSAC. Grazing was recorded at one (50%) **7150 *Rhynchosporion* depressions** monitoring stop, located at Glanrastel. The proportion of dwarf shrub shoots showing signs of grazing was 30%, which is within acceptable limits. The intensity of this impact within **7150 *Rhynchosporion* depressions** has been assessed as medium overall and its influence as negative. The trend was assessed as improving due to stock reductions under the CFP.

Off-road motorised driving (G01.03.02)

3.96 During the present survey, quad bike tracks were observed in **7150 *Rhynchosporion* depressions** at Glanrastel. This impact causes damage to habitats by means of vegetation destruction and soil compaction (NPWS, 2009). 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.

3.97 The overall impacts score for **7150 *Rhynchosporion* depressions** has been calculated as -2.25, which is below the nominal Favourable Reference Value of zero. Although the trend for sheep grazing was deemed to be improving due to stock reductions under the CFP, off-road motorised driving is unlikely to cease in the near future. Therefore the overall trend has been deemed as no change and the future prospects for this habitat were assessed as Unfavourable - Inadequate.

7230 Alkaline fens

Area

3.98 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

3.99 One monitoring stop was recorded in **7230 Alkaline fens** within the Caha Mountains cSAC (Table 25). It was referable to the RFLU4 *Schoenus nigricans – Scorpidium scorpioides* flush 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.

3.100 The small sample size of one monitoring stop reflects the relative rarity of this habitat within the site, where only 4.1 ha of **7230 Alkaline fens** were recorded, comprising 0.1% of the site.

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	0	n/a	n/a
2b	RFLU4/RFEN1a: number of positive vascular indicator species present ≥ 3		1	0	0
3a	RFLU1a/RFLU2: vegetation cover of brown mosses and vascular indicator species ≥ 20%	Relevé	0	n/a	n/a
3b	RFLU4/RFEN1a: vegetation cover of brown mosses and vascular indicator species ≥ 75%		1	0	0
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

Future prospects

3.101 The only impact recorded within **7230 Alkaline fens** was non-intensive sheep grazing (Table 26).

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

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Low	Neutral	100%	Inside	0	Imp
	Overall score					0	

Non-intensive sheep grazing (A04.02.02)

3.102 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that extensive grazing by sheep was the main land-use within the site and identified grazing as one of the main management issues. Past overgrazing was exacerbated by trespassing livestock accessing the

site from adjacent unfenced lands. The site was heavily grazed by sheep on many of the mountain slopes, particularly in the west of the site with severe overgrazing occurring adjacent to the Healy Pass. The impacts of grazing have been assessed by the Commonage Framework Plan with destocking rates of between 13% and 50% recommended.

3.103 The present survey indicates that sheep utilise **7230 Alkaline fens** within the Caha Mountains cSAC. Very low levels of disturbance due to trampling by sheep were noted in the local vicinity of the **7230 Alkaline fens** monitoring stop, located at Shinnagh. The intensity of this impact has been assessed as low overall and its influence as neutral. The trend was assessed as improving due to stock reductions under the CFP.

3.104 The overall impacts score for **7230 Alkaline fens** has been calculated as 0, which equals the nominal Favourable Reference Value of zero. The combined future trend for area and structure and functions is deemed to be improving due to stock reductions under the CFP. The future prospects for this habitat were therefore assessed as Favourable.

8110 Siliceous scree

Area

3.105 Changes in the area of **8110 Siliceous scree** 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

3.106 Three monitoring stops were recorded in **8110 Siliceous scree** within the Caha 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.

Future prospects

3.107 Three impacts were recorded within **8110 Siliceous scree** (Table 28).

Non-intensive sheep grazing (A04.02.02)

3.108 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that extensive grazing by sheep was the main land-use within the site and identified grazing as one of the main management issues. Past overgrazing was exacerbated by trespassing livestock accessing the site from adjacent unfenced lands. The site was heavily grazed by sheep on many of the mountain slopes, particularly in the west of the site with severe overgrazing occurring adjacent to the Healy Pass. The impacts of grazing have been assessed by the Commonage Framework Plan with destocking rates of between 13% and 50% recommended.

Table 27: Monitoring criteria and failure rates for 8110 Siliceous scree (n = 3).

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	3	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	3	0	0
3	Proportion of vegetation composed of non-native species < 1%	Relevé	3	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	3	0	0
6	Cover of *Pteridium aquilinum*, native trees and scrub collectively < 25%	Local vicinity	3	0	0
Vegetation structure					
7	Live leaves of forbs and shoots of dwarf shrubs showing signs of grazing or browsing collectively < 50%	Relevé	3	0	0
Physical structure					
8	Ground disturbed by human & animal paths, scree running, vehicles < 10%	Relevé	3	0	0
9	Ground disturbed by human & animal paths, scree running, vehicles < 10%	Local vicinity	3	0	0

Table 28: Assessment of impacts for 8110 Siliceous scree. 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	66.7%	Inside	0	Imp
I01	Invasive non-native species	Low	Negative	0.03%	Inside	-0.25	Ins
I02	Problematic native species	High	Negative	0.2%	Inside	-0.75	Ins
	Overall score					-1.0	

3.109 During the assessment of structure and functions, grazing by sheep was recorded within 66.7% of **8110 Siliceous scree** monitoring stops but was not sufficiently intensive to cause any stop to fail. Grazing intensity varied across the site, with the proportion of live forb leaves and dwarf shrub shoots showing signs of grazing ranging from 0 to 20%. The intensity of this impact has been assessed as low overall and its influence as neutral. The trend was assessed as improving due to stock reductions under the CFP.

Invasive non-native species (I01)

3.110 *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 **8110 Siliceous scree** monitoring stop (33.3%) but, with a

cover score of 0.1% it was not sufficiently extensive to cause the stop to fail. 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 28). The area affected has been estimated to be 0.03%, based on the average cover of *E. brunnescens* within **8110 Siliceous scree** monitoring stops.

Problematic native species (I02)

3.111 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that patches of **HD1 Dense bracken** occurred within the site, most notably on the slopes of Knockastumpa. Bracken encroachment was noted during the present survey, with **8110 Siliceous scree** at Fehanagh having been completely invaded by *Pteridium aquilinum*. The intensity of this impact is assessed as high, since it results in the replacement of an Annex I habitat with a non-Annex habitat, and its influence is assessed as negative (Table 28). The area of **8110 Siliceous scree** affected was recorded as 0.2%.

3.112 The overall impacts score for **8110 Siliceous scree** has been calculated as -1.0, which is just 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.

8120 Calcareous scree

3.113 This habitat is represented at this site by extremely localised and rather marginal examples where some small piles of conglomerate rocks or boulders are found. A detailed conservation assessment was therefore not deemed appropriate. Expert judgement has been used to assess each of the three status aspects as Favourable.

8210 Calcareous rocky slopes

Area

3.114 Changes in the area of **8210 Calcareous rocky slopes** 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

3.115 Three monitoring stops were recorded in **8210 Calcareous rocky slopes** within the Caha Mountains cSAC (Table 29). 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

33.3%. The structure and functions of **8210 Calcareous rocky slopes** were therefore assessed as Unfavourable – Bad.

3.116 While the vegetation structure of **8210 Calcareous rocky slopes** was good, the vegetation composition of one monitoring stop was poor. Criterion 3 stipulates that the proportion of vegetation composed of non-native species should be less than 1%. A result of 4.7% was recorded due to the presence of the non-native *Epilobium brunnescens*, which caused the monitoring stop to fail.

Future prospects

3.117 The only impact recorded within **8210 Calcareous rocky slopes** was invasive non-native species.

Table 29: Monitoring criteria and failure rates for 8210 Calcareous rocky slopes (n = 3).

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	3	0	0
2	Number of positive indicator species present ≥ 3	Local vicinity	3	0	0
3	Proportion of vegetation composed of non-native species < 1%	Local vicinity	3	1	33.3
4	Cover of *Pteridium aquilinum*, native trees and scrub collectively < 25%	Local vicinity	3	0	0
Vegetation structure					
5	Live leaves of forbs and shoots of dwarf shrubs showing signs of grazing or browsing collectively < 50%	Local vicinity	3	0	0

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 the local vicinity of all three **8210 Calcareous rocky slopes** monitoring stops. *E. brunnescens* was recorded within one monitoring stop with a cover score of 3%, resulting in the failure of that stop. 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 30). The area affected has been estimated to be 1.0%, 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	1%	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 slopes** 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 Three monitoring stops were recorded in **8220 Siliceous rocky slopes** within the Caha 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.

Table 31: Monitoring criteria and failure rates for 8220 Siliceous rocky slopes (n = 3).

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

Future prospects

3.122 Two impacts were recorded within **8220 Siliceous rocky slopes** (Table 32).

Non-intensive sheep grazing (A04.02.02)

3.123 The Caha Mountains cSAC Conservation Statement (NPWS, 2009) stated that extensive grazing by sheep was the main land-use within the site and identified grazing as one of the main

management issues. Past overgrazing was exacerbated by trespassing livestock accessing the site from adjacent unfenced lands. The site was heavily grazed by sheep on many of the mountain slopes, particularly in the west of the site with severe overgrazing occurring adjacent to the Healy Pass. The impacts of grazing have been assessed by the Commonage Framework Plan with destocking rates of between 13% and 50% recommended.

3.124 During the assessment of structure and functions, grazing by sheep was recorded within 66.7% of **8220 Siliceous rocky slopes** monitoring stops but was not sufficiently intensive to cause any stop to fail. Grazing intensity was very low; the proportion of live forb leaves and dwarf shrub shoots showing signs of grazing was 0.3%. The intensity of this impact has been assessed as low overall and its influence as neutral. The trend was assessed as improving due to stock reductions under the CFP.

Invasive non-native species (I01)

3.125 *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 the local vicinity of two **8220 Siliceous rocky slopes** monitoring stops (66.7%) but it was not sufficiently extensive to cause any stop to fail. *E. brunnescens* was recorded within one monitoring stop with a cover score of 0.7%. 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 32). 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.

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

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Low	Neutral	66.7%	Inside	0	Imp
I01	Invasive non-native species	Low	Negative	0.2%	Inside	-0.25	Ins
	Overall score					-0.25	

3.126 The overall impacts score for **8220 Siliceous rocky slopes** has been calculated as -0.25, 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.

Summary of conservation assessment

3.127 The summary results for the conservation assessment of Annex I habitats in the Caha Mountains cSAC are presented in Table 33. Of the twelve habitats assessed, four habitats were assessed as Favourable, three as Unfavourable – Inadequate and five as Unfavourable – Bad.

Table 33: Summary of conservation status assessments for Annex I habitats in the Caha 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 - Bad	Unfavourable - Inadequate	Unfavourable - Bad
4060	Alpine and Boreal heaths	Favourable	Favourable	Favourable	Favourable
*6230	Species-rich *Nardus* grasslands	Favourable	Unfavourable - Bad	Unfavourable - Bad	Unfavourable - Bad
*7130/7130	Blanket bogs	Unfavourable - Inadequate	Unfavourable - Inadequate	Unfavourable - Bad	Unfavourable - Bad
7140	Transition mires	Favourable	Favourable	Favourable	Favourable
7150	*Rhynchosporion* depressions	Favourable	Favourable	Unfavourable - Inadequate	Unfavourable - Inadequate
7230	Alkaline fens	Favourable	Favourable	Favourable	Favourable
8110	Siliceous scree	Favourable	Favourable	Unfavourable - Inadequate	Unfavourable - Inadequate
8120	Calcareous scree	Favourable	Favourable	Favourable	Favourable
8210	Calcareous rocky slopes	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	Unfavourable - Bad
8220	Siliceous rocky slopes	Favourable	Favourable	Unfavourable - Inadequate	Unfavourable - Inadequate

4. DISCUSSION

Natura 2000 Standard Data Form

4.1 Twelve Annex I habitats were recorded in the cSAC that are currently not listed for the site on the Natura 2000 Standard Data Form, habitats 3260, 4030, *6230, 6430, 7140, 7150, *7220, 7230, 8110, 8120, 8210, *91E0. Sections of the Glanrastel River were classified as **3260 Floating river vegetation**. **4030 Dry heath** is relatively scarce on this site but there are significant areas on the higher slopes of the Baurearagh valley, in Glenlough and the upper parts of Coomerkane. There are several locations for ***6230 Species-rich *Nardus* grasslands** including Glenlough, the slopes below Cushnaficulla and near the upper reaches of the Kerry River. Rocky ledge assemblages classified as **6430 Hydrophilous tall herb communities** can be found in the Baurearagh valley, Glanrastel and overlooking Barley Lake. Several patches of **7140 Transition mires** occur in the rock-bog-lake mosaic on Glenlough Mountain. **7150 *Rhynchosporion* depressions** occur across the site with good examples at the feet of Shrone Hill and Knockastumpa and in Glanrastel. In the upper parts of both Coomerkane and the Baurearagh valley can be found habitat ***7220 Petrifying springs**; tufa formation is minor but is present. **7230 Alkaline fens** are represented by brown moss flushes. **8110 Siliceous scree** is found across the sites but is particularly well-developed in Glenlough and Glanrastel. The main examples of **8220 Siliceous rocky slopes** are in Glanrastel and Glantrasna. Areas of conglomerate bedrock supporting **8210 Calcareous rocky slopes** occur above Barley Lake, on Baurearagh Mountain, in Glanrastel and in Glantrasna. Patches classified as **8120 Calcareous scree** are all very small and marginal examples of the habitat. Stands of willow around Glenlough Lake were 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 heaths** to be 15% of the site whereas this survey has estimated it to be substantially higher at 36.4%. Whilst the form estimates the area of **8220 Siliceous rocky slopes** to be 7% of the site, the survey classified only 0.8% of the cSAC as this habitat.

4.3 The Natura 2000 Standard Data From for this site should be reviewed and updated in light of the data presented in this report in terms of the habitats listed, areas and ratings. It is obligatory that all Annex I habitats within an SAC are listed on this form even if they are subsequently ranked as having a non-significant presence.

Additional recommendations

4.4 Whilst a Conservation Statement exists for Caha 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 impact on this site is livestock grazing, whilst peat erosion and *Rhododendron* invasion are also of significant concern.

4.5 Levels of livestock grazing are being addressed through the CFP. Whilst stock reductions under the CFP appear 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 Erosion of upland blanket peat is an impact in ***7130/7130 Blanket bogs.** Whilst some areas of eroded peat may gradually revegetate as a result of stock reductions under the CFP, in areas of more severe erosion active restoration measures may be needed for this habitat to achieve Favourable status. These may include the damming of erosion gullies, stabilisation of bare peat with geotextiles or heather brash, the planting of *Eriophorum angustifolium*, and seeding of bare peat with *Sphagnum* propagules. The conservation of ***7130 Active blanket bog** should be prioritised as befitting its status.

4.7 *Rhododendron* control measures should be undertaken to restore invaded areas of **4010 Wet heaths** and to prevent further invasion. This would require co-ordinated management of areas both within and outside the cSAC to prevent re-invasion from nearby seed sources.

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

4.9 Future phases of monitoring should include assessment of **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 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 heaths
4030	European dry heaths	4030 Dry heaths
4060	Alpine and Boreal heaths	4060 Alpine and Boreal heath
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 bogs or 7130 Inactive blanket bogs or *7130/7130 Blanket bogs
7140	Transition mires and quaking bogs	7140 Transition mires
7150	Depressions on peat substrates of the *Rhynchosporion*	7150 *Rhynchosporion* depressions
7230	Alkaline fens	7230 Alkaline fens
8110	Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsetalia ladani*)	8110 Siliceous scree
8120	Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii*)	8120 Calcareous scree
8210	Calcareous rocky slopes with chasmophytic vegetation	8210 Calcareous rocky slopes
8220	Siliceous rocky slopes with chasmophytic vegetation	8220 Siliceous rocky slopes
91E0	*Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	*91E0 Alluvial forests

APPENDIX 2: PHOTOGRAPHS

Plate A1: *Minuartia recurva* on siliceous rock, Knockowen (Photo: Rory Hodd).

Plate A2: The Red Data List lichen *Sticta fuliginosa* on *Fraxinus excelsior*, Coomerkane (Photo: Jenni Roche).

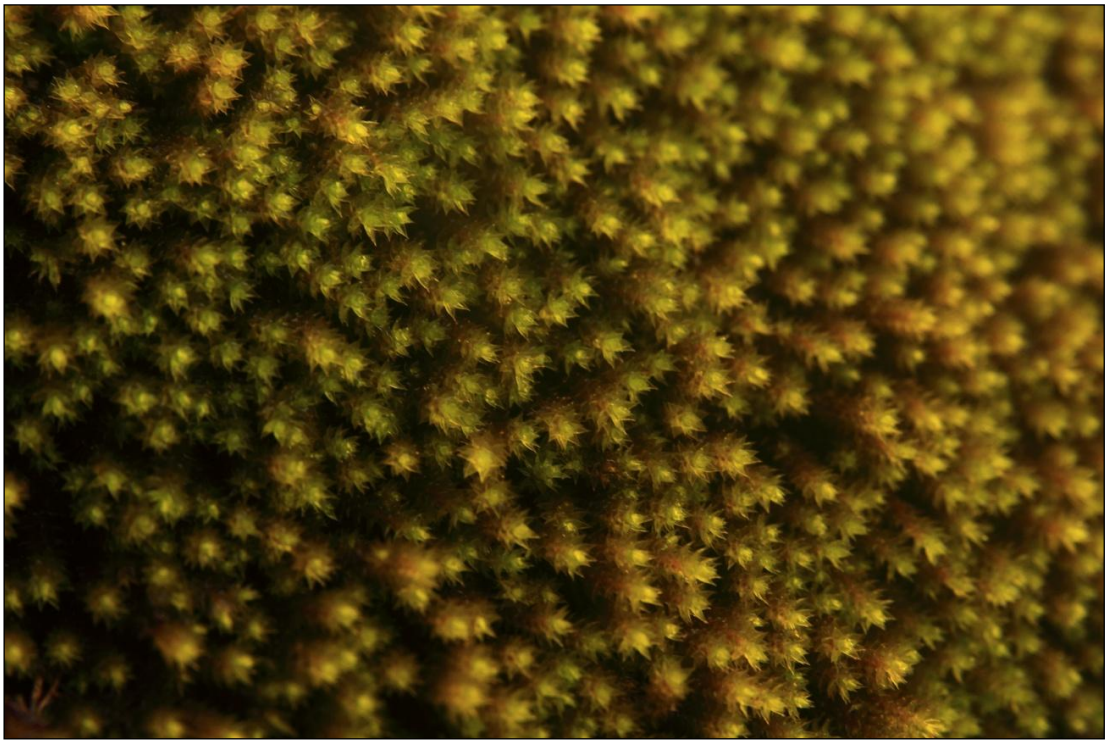


Plate A3: The Red Data List moss *Hedwigia integrifolia* on siliceous rock, Derrynafulla (Photo: Rory Hodd).

Plate A4: Kerry Slug (*Geomalacus maculosus*) on siliceous rock, Canshanavoe (Photo: Jenni Roche).

Plate A5: 4010 Wet heath, with *Myrica gale* and *Molinia caerulea*, Shrone Hill (Photo: Philip Perrin).

Plate A6: Wet *7130 Blanket bog, with *Trichophorum germanicum*, *Rhynchospora alba* and *Sphagnum austinii*, Knockastumpa (Photo: Eamonn O'Sullivan).

Plate A7: 4030 Dry heath with *Calluna vulgaris* and *Sphagnum capillifolium*, Killane Mountain (Photo: Philip Perrin).

Plate A8: 7150 *Rhynchosporion* depression, with *Rhynchospora alba* and *Sphagnum* spp., Derryconnery (Photo: Philip Perrin).

Plate A9: 8210 Calcareous rocky slope, with *Asplenium trichomanes*, *A. adiantum-nigrum*, *Saxifraga hirsuta* and *Neckera crispa*, Baureagh (Photo: Philip Perrin).

Plate A10: 8220 Siliceous rocky slope, with *Saxifraga spathularis* and *Hymenophyllum wilsonii*, Glanrastel (Photo: Rory Hodd).

Plate A11: 8110 Siliceous scree vegetation, with *Saxifraga spathularis* and *Dryopteris* spp., in block scree, Coomerkane (Photo: Rory Hodd).

Plate A12: 7140 Transition mire, with *Carex limosa*, *Carex rostrata* and *Sphagnum* spp., Ram's Hill (Photo: Rory Hodd).

Plate A13: View of Glenkeel Lough and Knockeirky (Photo: Jenni Roche).

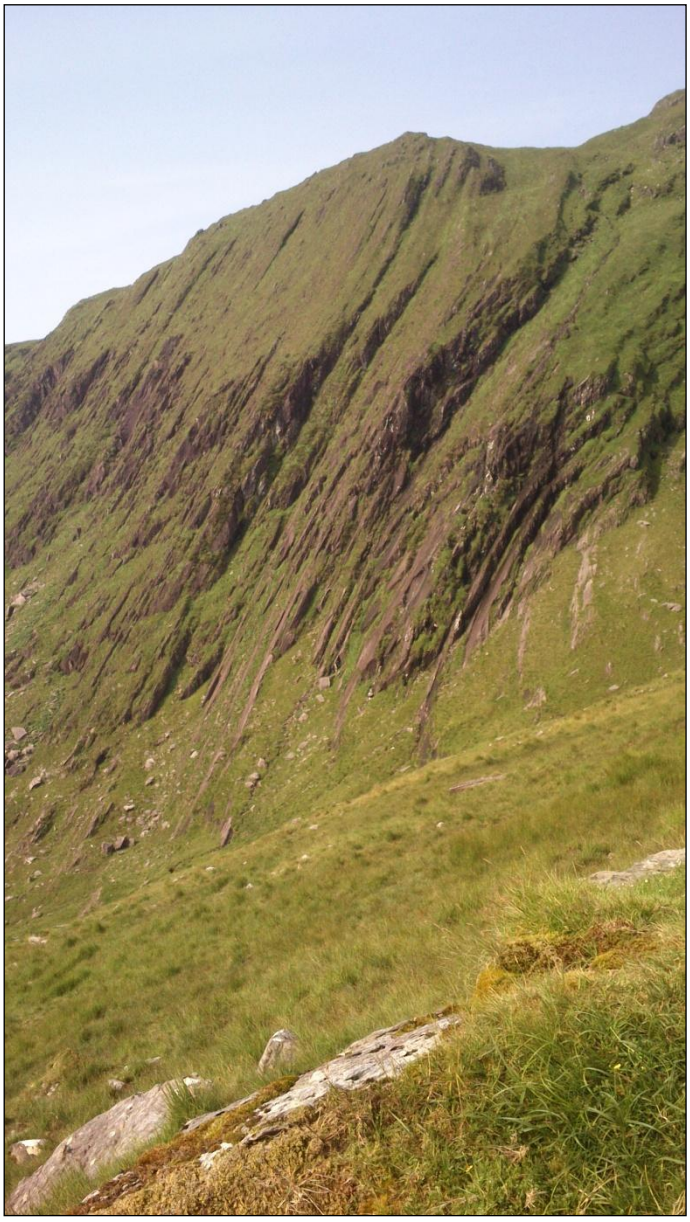


Plate A14: Uplifted rock strata at Rougham (Photo: Evelyn Joyce).

Plate A15: *Rhododendron ponticum* encroachment into wet heath, Coomerkane (Photo: Jenni Roche).

Plate A16: Small-scale extraction of turf by hand cutting, Barley Lake (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
Agrostis canina	Velvet Bent
Agrostis capillaris	Common Bent
Agrostis stolonifera	Creeping Bent
Agrostis vinealis	Brown Bent
Anagallis tenella	Bog Pimpernel
Angelica sylvestris	Wild Angelica
Antennaria dioica	Mountain Everlasting
Anthoxanthum odoratum	Sweet Vernal-grass
Asplenium adiantum-nigrum	Black Spleenwort
Asplenium ruta-muraria	Wall-rue
Asplenium trichomanes	Maidenhair Spleenwort
Asplenium viride	Green Spleenwort
Athyrium filix-femina	Lady-fern
Bellis perennis	Daisy
Betula pubescens	Downy Birch
Blechnum spicant	Hard-fern
Calluna vulgaris	Heather
Campanula rotundifolia	Harebell
Cardamine hirsuta	Hairy Bitter-cress
Carex aquatilis	Water Sedge
Carex binervis	Green-ribbed Sedge
Carex dioica	Dioecious Sedge
Carex echinata	Star Sedge
Carex flacca	Glaucous Sedge
Carex limosa	Bog-sedge
Carex nigra	Common Sedge
Carex panicea	Carnation Sedge
Carex paniculata	Greater Tussock-sedge
Carex pilulifera	Pill Sedge
Carex pulicaris	Flea Sedge
Carex rostrata	Bottle Sedge
Carex viridula	Yellow-sedge
Carex viridula subsp. *oedocarpa*	Yellow-sedge
Centaurea nigra	Common Knapweed
Cerastium fontanum	Common Mouse-ear
Cirsium dissectum	Meadow Thistle
Cirsium palustre	Marsh Thistle
Corlyus avellana	Hazel

VASCULAR SPECIES

Species name	Common name
Cotoneaster sp.	a Cotoneaster
Crataegus monogyna	Hawthorn
Cystopteris fragilis	Brittle Bladder-fern
Dactylis glomerata	Cock's-foot
Dactylorhiza maculata	Heath Spotted-orchid
Danthonia decumbens	Heath-grass
Deschampsia flexuosa	Wavy Hair-grass
Drosera anglica	Great Sundew
Drosera intermedia	Oblong-leaved Sundew
Drosera rotundifolia	Great Sundew
Dryopteris dilatata	Broad Buckler-fern
Dryopteris filix-mas	Male-fern
Eleocharis multicaulis	Many-stalked Spike-rush
Epilobium brunnescens	New Zealand Willowherb
Equisetum fluviatile	Water Horsetail
Erica cinerea	Bell Heather
Erica tetralix	Cross-leaved Heath
Eriophorum angustifolium	Common Cottongrass
Eriophorum vaginatum	Hare's-tail Cottongrass
Euphorbia hyberna	Irish Spurge
Euphrasia officinalis agg.	Eyebright
Festuca ovina	Sheep's-fescue
Festuca rubra	Red Fescue
Festuca vivipara	Viviparous Sheep's-fescue
Filipendula ulmaria	Meadowsweet
Fraxinus excelsior	Ash
Galium saxatile	Heath Bedstraw
Hedera helix	Ivy
Holcus lanatus	Yorkshire-fog
Huperzia selago	Fir Clubmoss
Hydrocotyle vulgaris	Marsh Pennywort
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
Juniperus communis	Juniper
Lathyrus linifolius	Bitter Vetch

VASCULAR SPECIES

Species name	Common name
Leontodon autumnalis	Autumn Hawkbit
Linum catharticum	Fairy Flax
Lobelia dortmanna	Water Lobelia
Lonicera periclymenum	Honeysuckle
Lotus corniculatus	Common Bird's-foot-trefoil
Luzula multiflora	Heath Wood-rush
Luzula sylvatica	Great Wood-rush
Lysimachia nemorum	Yellow Pimpernel
Menyanthes trifoliata	Bogbean
Minuartia recurva	Recurved Sandwort
Molinia caerulea	Purple Moor-grass
Myrica gale	Bog-myrtle
Nardus stricta	Mat-grass
Narthecium ossifragum	Bog Asphodel
Oreopteris limbosperma	Lemon-scented Fern
Oxalis acetosella	Wood-sorrel
Pedicularis sylvatica	Lousewort
Phegopteris connectilis	Beech Fern
Phyllitis scolopendrium	Hart's-tongue
Phragmites australis	Common Reed
Picea sp.	a Spruce
Pinguicula grandiflora	Large-flowered Butterwort
Plantago lanceolata	Ribwort Plantain
Polygala serpyllifolia	Heath Milkwort
Potamogeton polygonifolius	Bog Pondweed
Potentilla erecta	Tormentil
Primula vulgaris	Primrose
Prunella vulgaris	Selfheal
Pteridium aquilinum	Bracken
Quercus petraea	Sessile Oak
Ranunculus ficaria	Lesser Celandine
Ranunculus repens	Creeping Buttercup
Rhododendron ponticum	Rhododendron
Rhynchospora alba	White Beak-sedge
Rhynchospora fusca	Brown Beak-sedge
Rosa spinosissima	Burnet Rose
Rubus fruticosus agg.	Bramble
Rumex acetosa	Common Sorrel
Sagina subulata	Heath Pearlwort
Salix cinerea	Grey Willow
Salix herbacea	Dwarf Willow
Salix repens	Creeping Willow
Saxifraga hirsuta	Kidney Saxifrage

VASCULAR SPECIES

Species name	Common name
Saxifraga spathularis	St Patrick's-cabbage
Schoenus nigricans	Black Bog-rush
Scutellaria minor	Lesser Skullcap
Sedum rosea	Roseroot
Sedum anglicum	English Stonecrop
Sisyrinchium bermudiana	Blue-eyed-grass
Solidago virgaurea	Goldenrod
Sorbus aucuparia	Rowan
Sparganium emersum	Unbranched Bur-reed
Succisa pratensis	Devil's-bit Scabious
Taraxacum officinale agg.	Dandelion
Thymus polytrichus	Wild Thyme
Trichomanes speciosum	Killarney Fern
Trichophorum germanicum	Deergrass
Trifolium repens	White Clover
Ulex europaeus	Gorse
Ulex gallii	Western Gorse
Umbilicus rupestris	Navelwort
Vaccinium myrtillus	Bilberry
Viola palustris	Marsh Violet
Viola riviniana	Common Dog-violet

BRYOPHYTES

Species name	Common name
Adelanthus decipiens	Deceptive Featherwort
Amphidium mougeotii	Mougeot's Yoke-moss
Andreaea rothii	Dusky Rock-moss
Aneura pinguis	Greasewort
Anthelia julacea	Alpine Silverwort
Antitrichia curtipendula	Pendulous Wing-moss
Aphanolejeunea microscopica	Long-leaved Pouncewort
Atrichum undulatum	Common Smoothcap
Aulacomnium palustre	Bog Bead-moss
Bartramia pomiformis	Common Apple-moss
Bazzania tricrenata	Lesser Whipwort
Blasia pusilla	Common Kettlewort
Blindia acuta	Sharp-leaved Blindia
Brachythecium rutabulum	Rough-stalked Feather Moss
Breutelia chrysocoma	Golden-head Moss
Bryum capillare	Capillary Thread-moss
Bryum pseudotriquetrum	Marsh Bryum

BRYOPHYTES

Species name	Common name
Calliergon sarmentosum	Twiggy Spear-moss
Calliergonella cuspidata	Pointed Spear-moss
Calypogeia arguta	Notched Pouchwort
Calypogeia fissa	Common Pouchwort
Calypogeia muelleriana	Mueller's Pouchwort
Campylium stellatum	Yellow Starry-Feather Moss
Campylopus atrovirens	Bristly Swan-neck Moss
Campylopus brevipilus	Compact Swan-neck Moss
Campylopus flexuosus	Rusty Swan-neck Moss
Campylopus introflexus	Heath Star Moss
Campylopus pilifer	Stiff Swan-neck Moss
Campylopus pyriformis	Dwarf Swan-neck Moss
Campylopus setifolius	Silky Swan-neck Moss
Campylopus shawii	Shaw's Swan-neck Moss
Cephalozia bicuspidata	Snow Pincerwort
Cephalozia connivens	Forcipated Pincerwort
Cephalozia macrostachya	Bog Pincerwort
Cladopodiella fluitans	Bog Notchwort
Conocephalum sp.	Great Scented Liverwort or Snakewort
Cyclodictyon laetevirens	Bright Green Cave-moss
Cratoneuron filicinum	Fern-leaved Hook-moss
Ctenidium molluscum	Chalk Comb-moss
Dichodontium flavescens	Yellowish Fork-moss
Dicranella heteromalla	Silky Forklet-moss
Dicranella palustris	Marsh Forklet-moss
Dicranoweisia cirrata	Common Pincushion
Dicranum majus	Greater Fork-moss
Dicranum scoparium	Broom Fork-moss
Diplophyllum albicans	White Earwort
Douinia ovata	Waxy Earwort
Drepanocladus revolvens	Rusty Hook-moss
Drepanolejeunea hamatifolia	Toothed Pouncewort
Entosthodon attenuatus	Thin Cord-moss
Entosthodon obtusus	Blunt Cord-moss
Fissidens adianthoides	Maidenhair Pocket-moss
Fissidens dubius	Rock Pocket-moss
Fissidens osmundoides	Purple-stalked Pocket-moss
Fissidens taxifolius	Common or Great Pocket-moss
Frullania fragilifolia	Spotty Fingers
Frullania tamarisci	Tamarisk Scalewort
Glyphomitrium daviesii	Black-tufted Moss
Grimmia funalis	String Grimmia
Grimmia lisae	Lisa's Grimmia

BRYOPHYTES

Species name	Common name
Grimmia ramondii	Spreading-leaved Grimmia
Grimmia trichophylla	Hair-pointed Grimmia
Hedwigia integrifolia	Green Hoar-moss
Herbertus aduncus subsp. *hutchinsiae*	Juniper Prongwort
Heterocladium heteropterum var. *flaccidum*	Slender Tamarisk-moss
Heterocladium heteropterum var. *heteropterum*	Wry-leaved Tamarisk-moss
Homalothecium sericeum	Silky Wall Feather-moss
Hookeria lucens	Shining Hookeria
Hylocomium splendens	Glittering Wood-moss
Hymenostylium recurvirostrum	Hook-neak Tufa-moss
Hyocomium armoricum	Flagellate Feather-moss
Hypnum jutlandicum	Heath Plait-moss
Isothecium myosuroides var. *brachythecioides*	Slender Mouse-tail Moss
Isothecium myosuroides var. *myosuroides*	Slender Mouse-tail Moss
Kindbergia praelonga	Common Feather-moss
Kurzia pauciflora	Bristly Fingerwort
Kurzia trichoclados	Heath Fingerwort
Leiocolea bantriensis	Bantry Notchwort
Lejeunea cavifolia	Micheli's Least Pouncewort
Lejeunea hibernica	Irish Pouncewort
Lejeunea lamacerina	Western Pouncewort
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 ventricosa	Tumid Notchwort
Marsupella emarginata var. *aquatica*	Notched Rustwort
Marsupella emarginata var. *emarginata*	Notched Rustwort
Metzgeria conjugata	Rock Veilwort
Microlejeunea ulicina	Fairy Beads
Mnium hornum	Swan's-neck Thyme-moss
Mylia anomala	Anomalous Flapwort
Mylia taylorii	Taylor's Flapwort
Neckera crispa	Crisped Neckera
Nowellia curvifolia	Wood-rust
Orthothecium intricatum	Fine-leaved Leskea
Palustriella commutata var. *commutata*	Curled Hook-moss
Pellia endiviifolia	Endive Pellia
Pellia epiphylla	Overleaf Pellia
Pellia neesiana	Nee's Pellia
Plagiochila exigua	Petty Featherwort

BRYOPHYTES

Species name	Common name
Plagiochila porelloides	Lesser Featherwort
Plagiochila punctata	Spotty Featherwort
Plagiochila spinulosa	Prickly Featherwort
Plagiomnium rostratum	Long-beaked Thyme-moss
Plagiomnium undulatum	Hart's-tongue Thyme-moss
Plagiothecium succulentum	Juicy Silk-moss
Plagiothecium undulatum	Waved Silk-moss
Pleurozia purpurea	Purple Spoonwort
Pleurozium schreberi	Red-stemmed Feather-moss
Pohlia elongata var. *elongata*	Long-fruited Thread-moss
Polytrichum alpinum	Alpine Haircap
Polytrichum commune	Common Haircap
Polytrichum formosum	Bank Haircap
Preissia quadrata	Narrow Mushroom-headed Liverwort
Pseudotaxiphyllum elegans	Elegant Silk-moss
Racomitrium fasciculare	Green Mountain Fringe-moss
Racomitrium lanuginosum	Woolly Fringe-moss
Racomitrium sudeticum	Slender Fringe-moss
Radula aquilegia	Brown Scalewort
Rhabdoweisia crenulata	Greater Streak-moss
Rhabdoweisia crispata	Toothed Streak-moss
Rhytidiadelphus loreus	Little Shaggy-moss
Rhytidiadelphus squarrosus	Springy Turf-moss
Riccardia chamedryfolia	Jagged Germanderwort
Riccardia multifida	Delicate Germanderwort
Saccogyna viticulosa	Straggling Pouchwort
Scapania aspera	Rough Earwort
Scapania gracilis	Western Earwort
Scapania irrigua	Heath Earwort
Scapania nemorea	Grove Earwort
Scapania scandica	Norwegian Earwort
Scapania umbrosa	Shady Earwort
Schistidium strictum	Upright Brown Grimmia
Scleropodium purum	Neat Feather-moss
Scorpidium scorpioides	Hooked Scorpion-moss
Seligeria recurvata	Recurved Rock-bristle
Sphagnum austinii	Austin's 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
Sphagnum denticulatum	Cow-horn Bog-moss

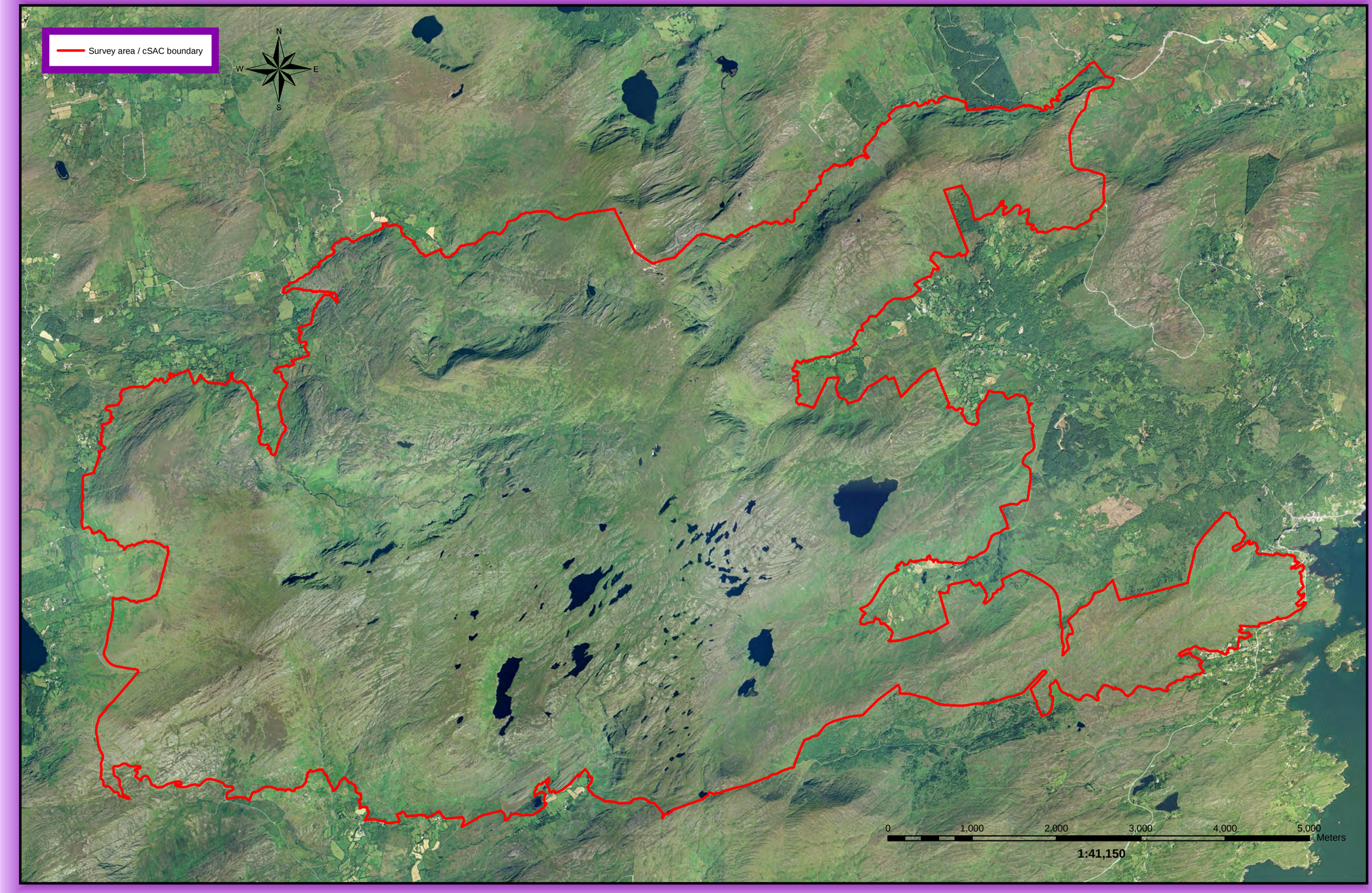
BRYOPHYTES

Species name	Common name
Sphagnum fallax	Flat-topped Bog-moss
Sphagnum inundatum	Lesser Cow-horn Bog-moss
Sphagnum magellanicum	Magellanic Bog-moss
Sphagnum molle	Blushing Bog-moss
Sphagnum palustre	Blunt-leaved Bog-moss
Sphagnum papillosum	Papillose Bog-moss
Sphagnum platyphyllum	Flat-leaved Bog-moss
Sphagnum quinquefarium	Five-ranked Bog-moss
Sphagnum subnitens var. *subnitens*	Lustrous Bog-moss
Sphagnum subnitens var. *ferrugineum*	Brownish Bog-moss
Sphagnum tenellum	Soft Bog-moss
Tetraplodon mnioides	Slender Cruet-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 tenuirostre	Narrow-fruited Crisp-moss
Tritomaria quinquedentata	Lyon's Notchwort

LICHENS

Species name	Species name
Cladonia uncialis subsp. *biuncialis*	*Normandina pulchella*
Degelia atlantica	*Pannaria rubiginosa*
Cladonia portentosa	*Sticta fuliginosa*
Cladonia subcervicornis	

Figure 1. Survey area / cSAC boundary of Caha Mountains cSAC (000093), Cos. Cork and Kerry



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NSUH (Phase 4, 2013-2014) Site Report No. 16: Caha Mountains cSAC (000093), Cos. Cork and Kerry. Map size A3.

Figure 2. Primary Fossitt habitats within Caha Mountains cSAC (000093), Cos. Cork and Kerry

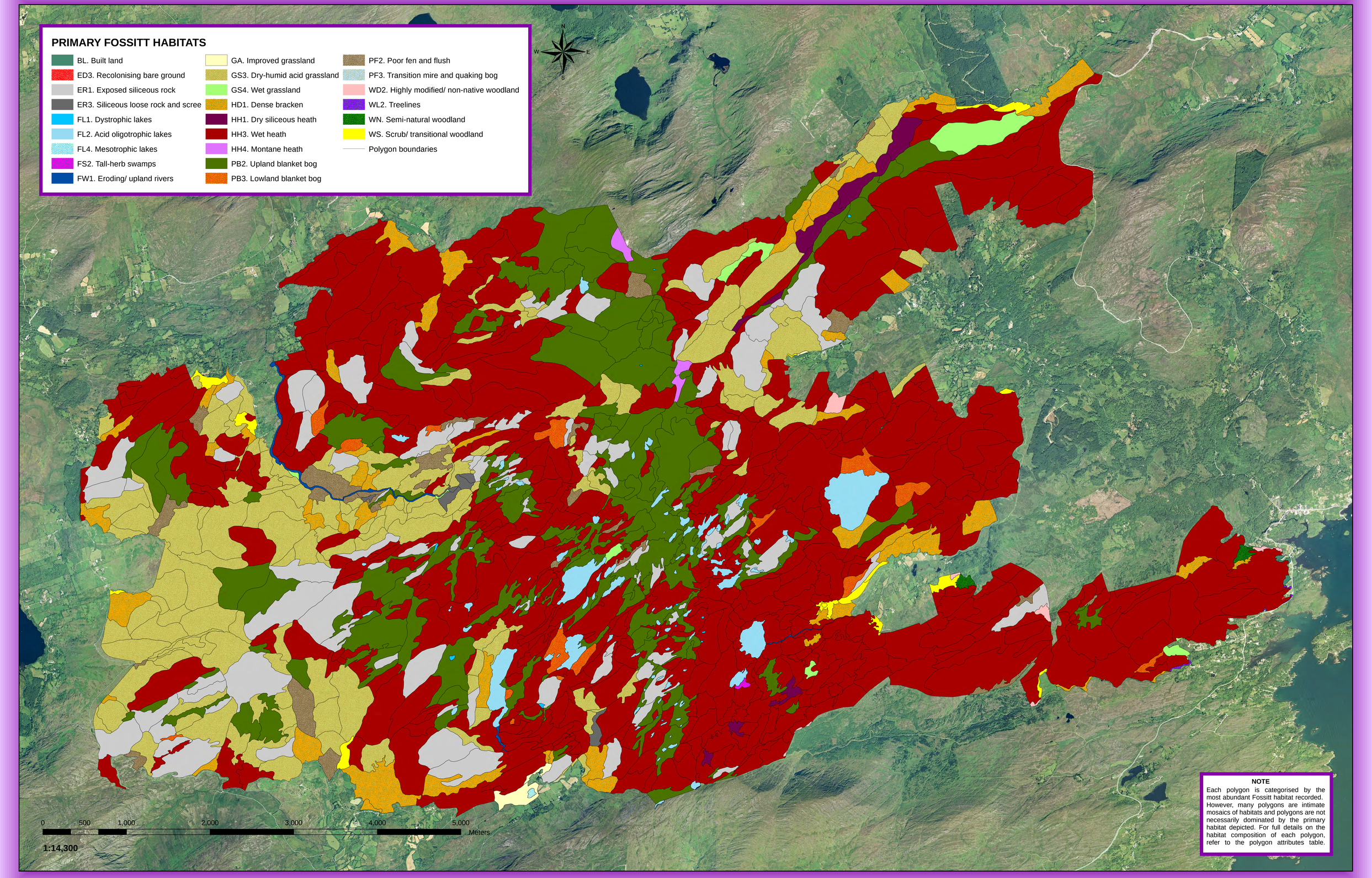

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Figure 3. Primary Annex I habitats within Caha Mountains cSAC (000093), Cos. Cork and Kerry.

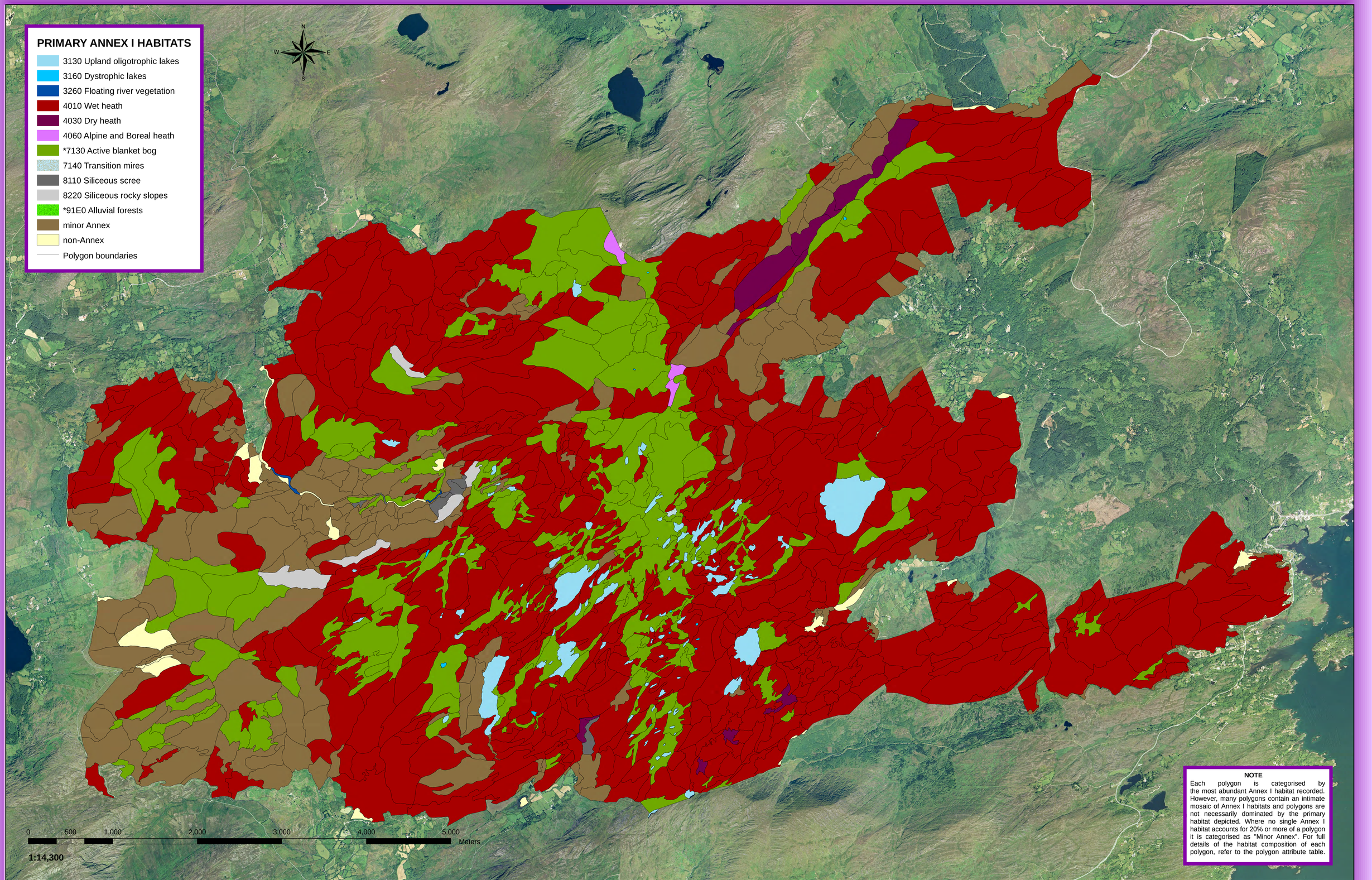

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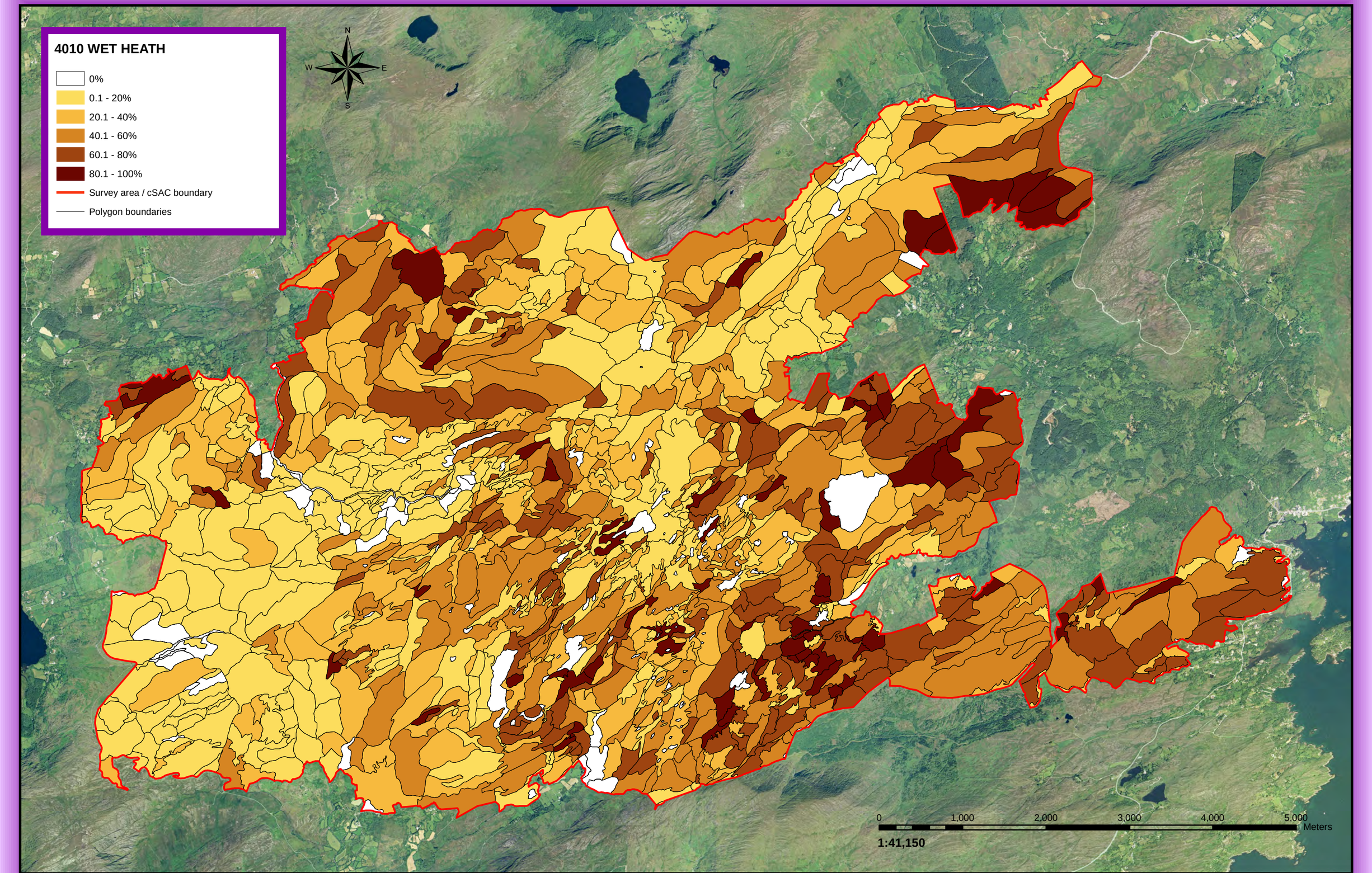
Figure 4a. Cover of 4010 WET HEATH within Caha Mountains cSAC (000093), Cos. Cork and Kerry



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NSUH (Phase 4, 2013-2014) Site Report No. 16: Caha Mountains cSAC (000093), Co. Kerry. Map size A3.

Figure 4b. Cover of 4030 DRY HEATH within Caha Mountains cSAC (000093), Cos. Cork and Kerry

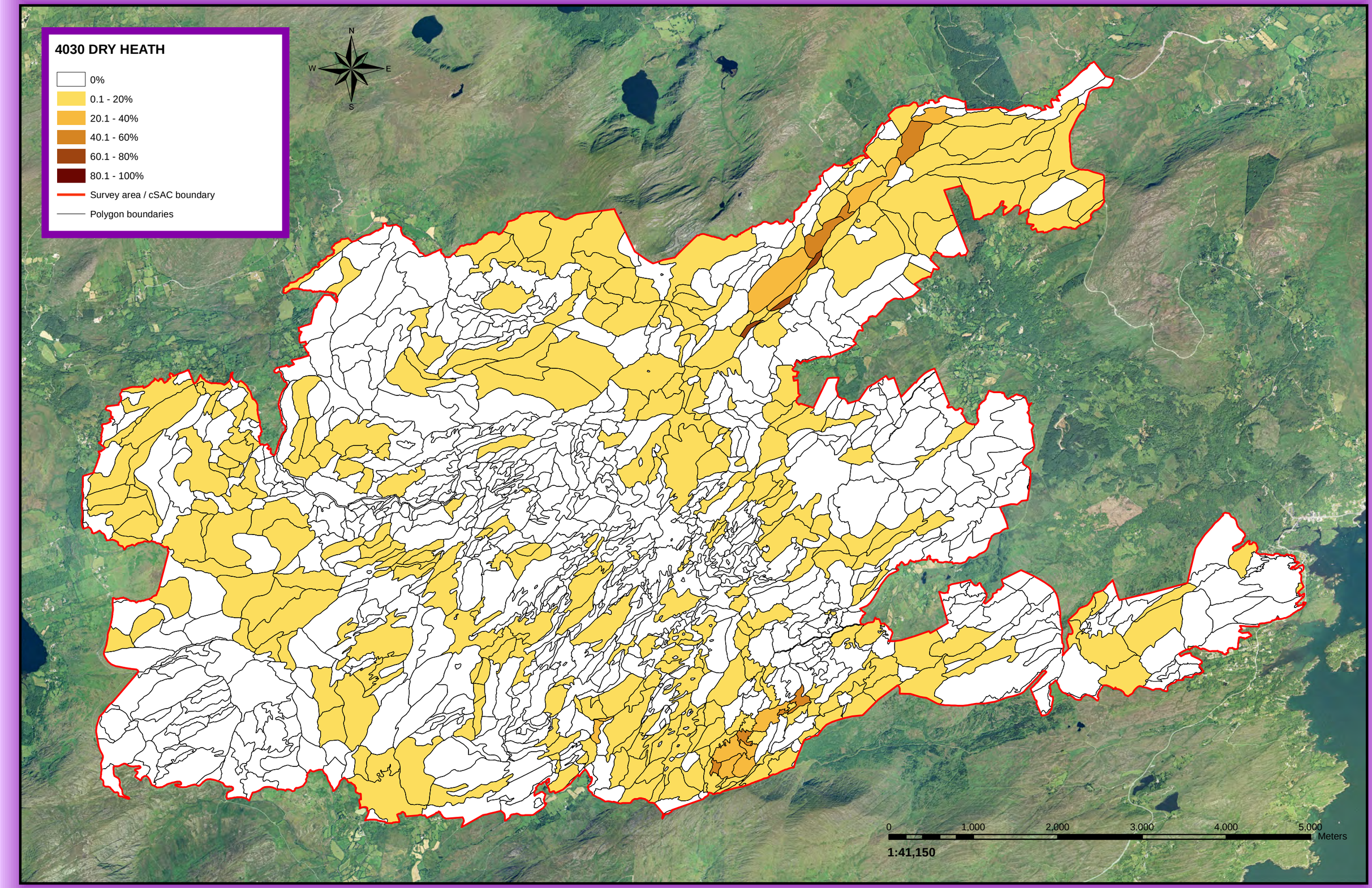

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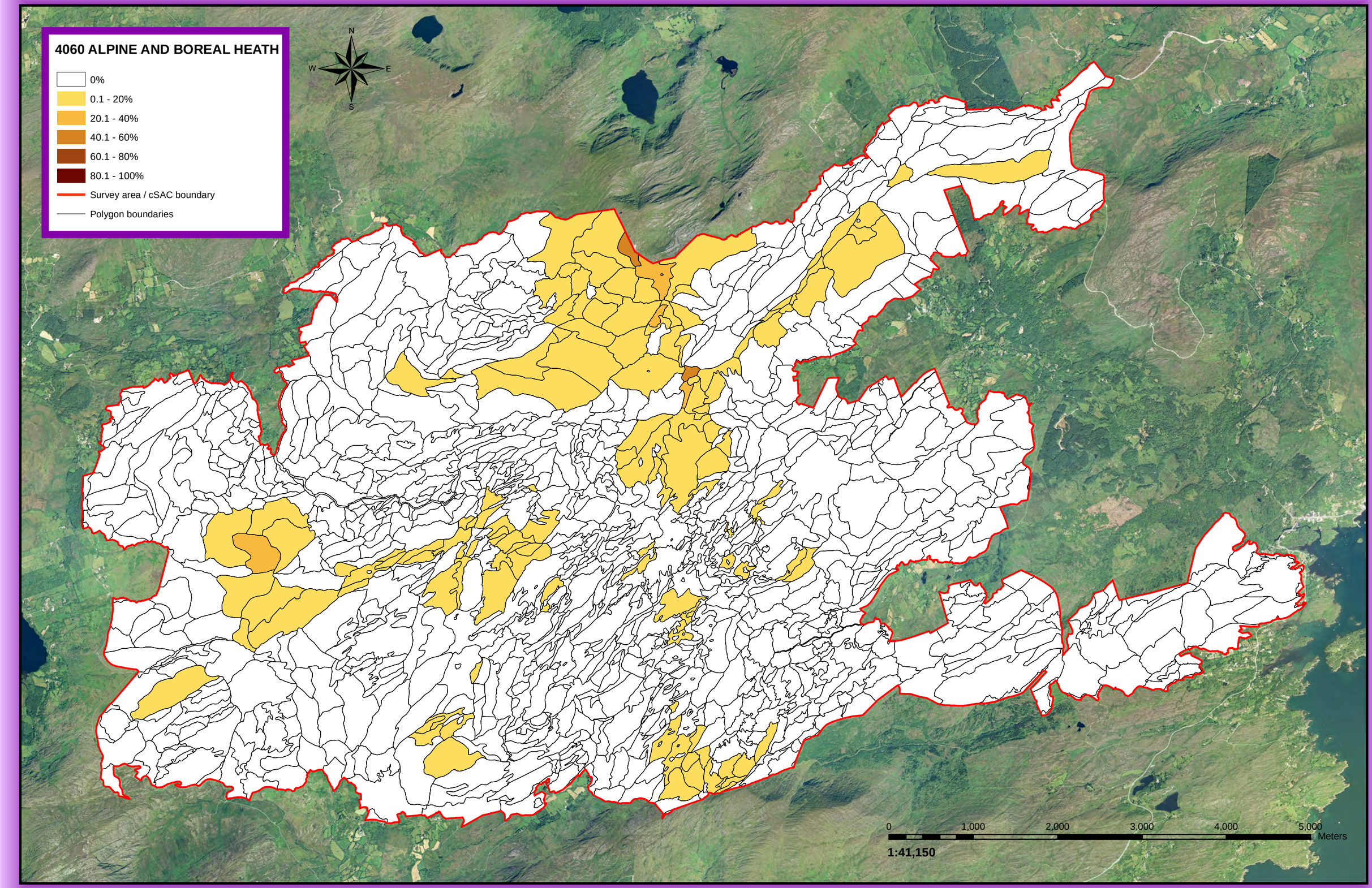
Figure 4c. Cover of 4060 ALPINE AND BOREAL HEATH within Caha Mountains cSAC (000093), Cos. Cork and Kerry



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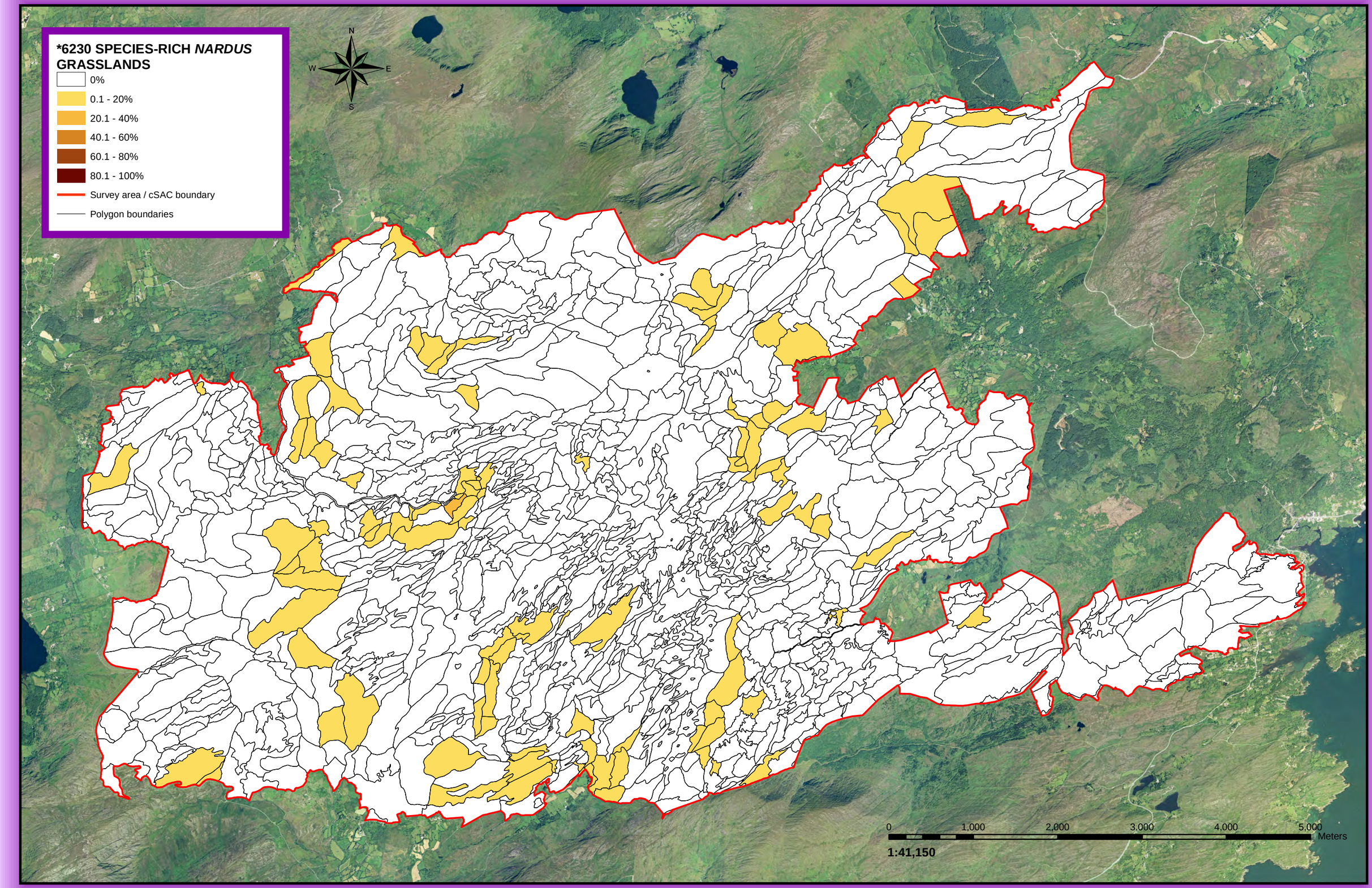
NSUH (Phase 4, 2013-2014) Site Report No. 16: Caha Mountains cSAC (000093), Co. Kerry. Map size A3.

Figure 4d. Cover of *6230 SPECIES-RICH *NARDUS* GRASSLANDS within Caha Mountains cSAC (000093), Cos. Cork and Kerry



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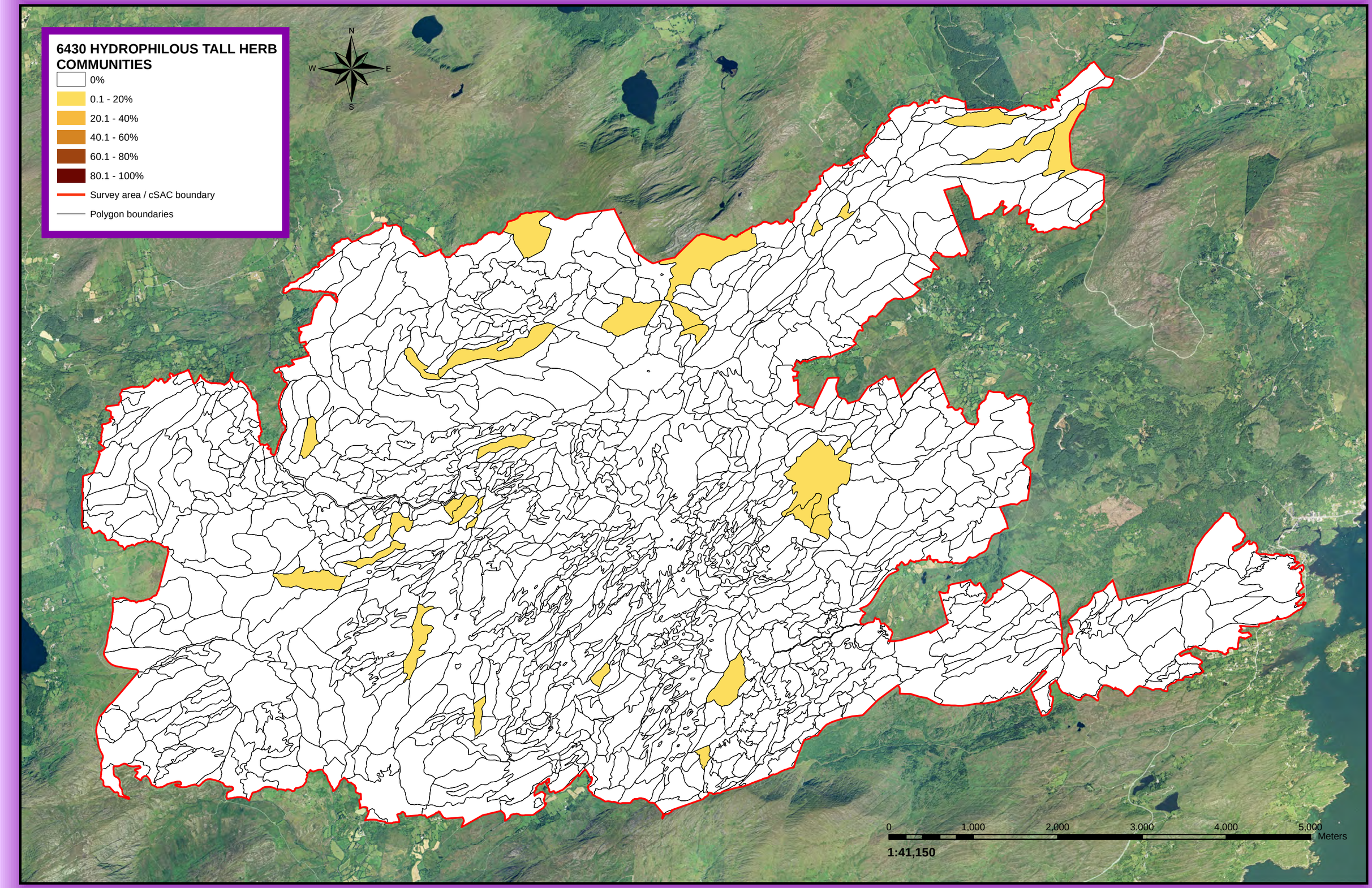
NSUH (Phase 4, 2013-2014) Site Report No. 16: Caha Mountains cSAC (000093), Co. Kerry. Map size A3.

Figure 4e. Cover of 6430 HYDROPHILOUS TALL HERB COMMUNITIES within Caha Mountains cSAC (000093), Cos. Cork and Kerry



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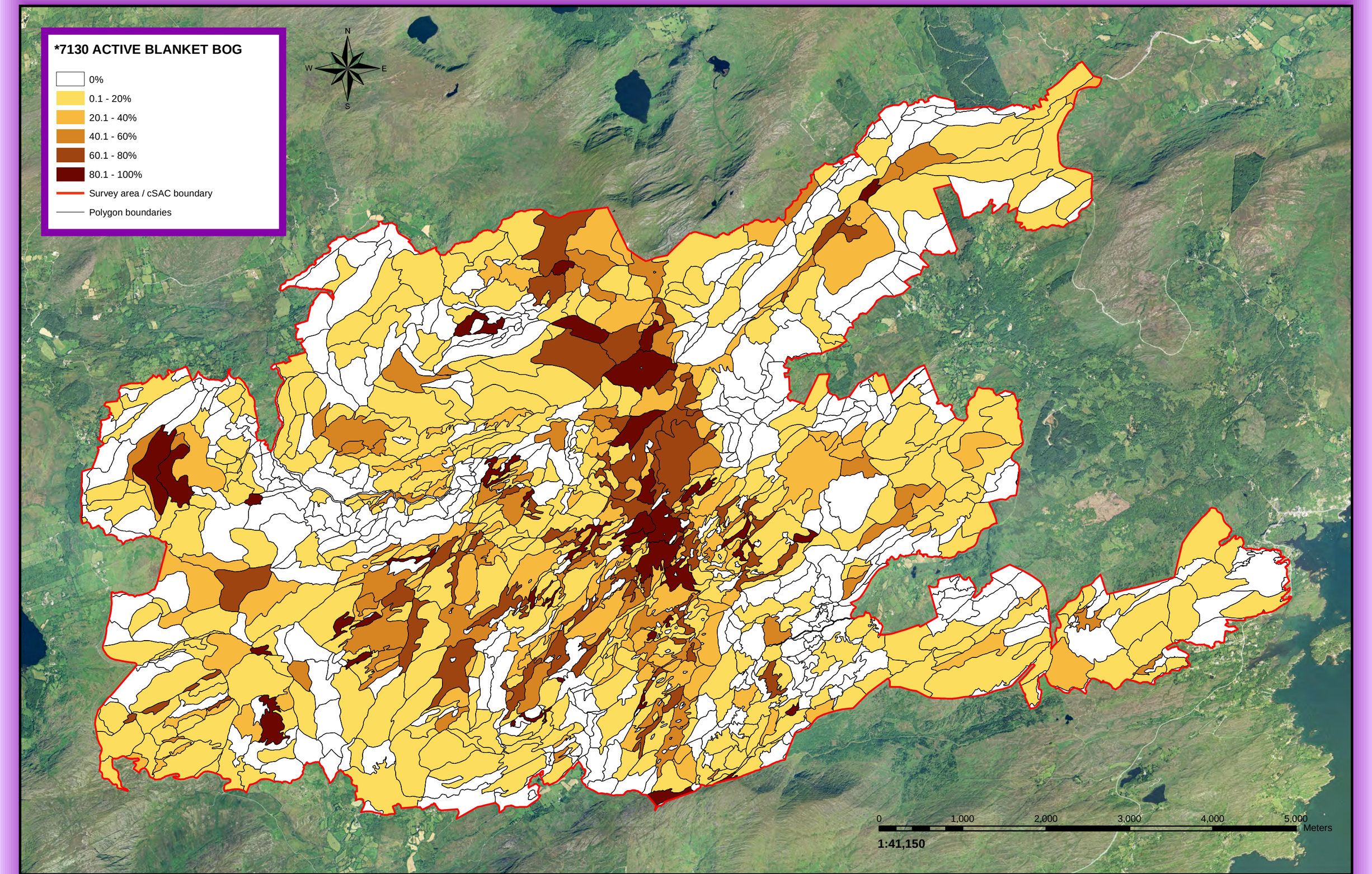
NSUH (Phase 4, 2013-2014) Site Report No. 16: Caha Mountains cSAC (000093), Co. Kerry. Map size A3.

Figure 4f. Cover of *7130 ACTIVE BLANKET BOG within Caha Mountains cSAC (000093), Cos. Cork and Kerry



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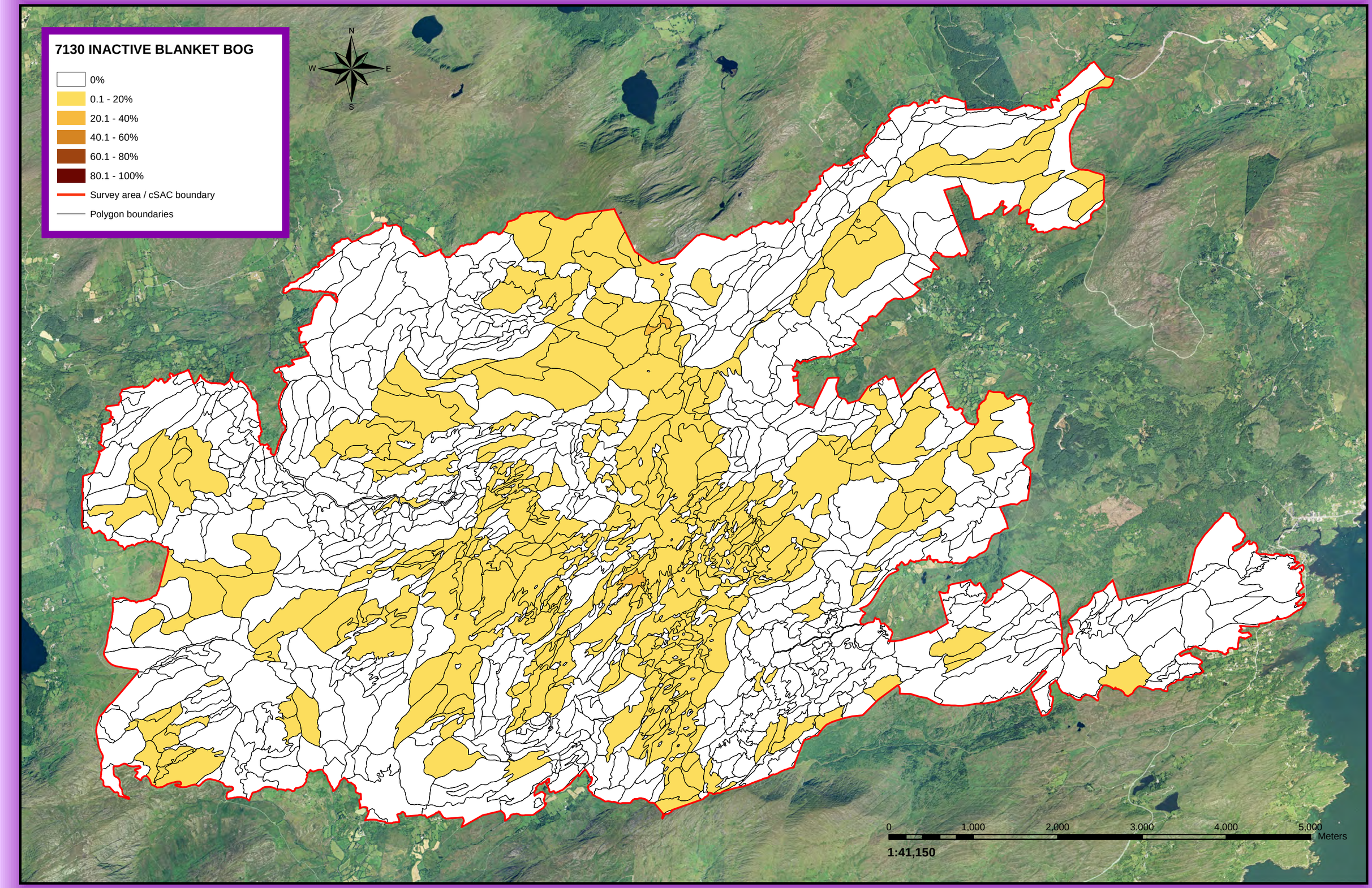
NSUH (Phase 4, 2013-2014) Site Report No. 16: Caha Mountains cSAC (000093), Co. Kerry. Map size A3.

Figure 4g. Cover of 7130 INACTIVE BLANKET BOG within Caha Mountains cSAC (000093), Cos. Cork and Kerry



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NSUH (Phase 4, 2013-2014) Site Report No. 16: Caha Mountains cSAC (000093), Co. Kerry. Map size A3.

Figure 4h. Cover of 7140 TRANSITION MIRES within Caha Mountains cSAC (000093), Cos. Cork and Kerry

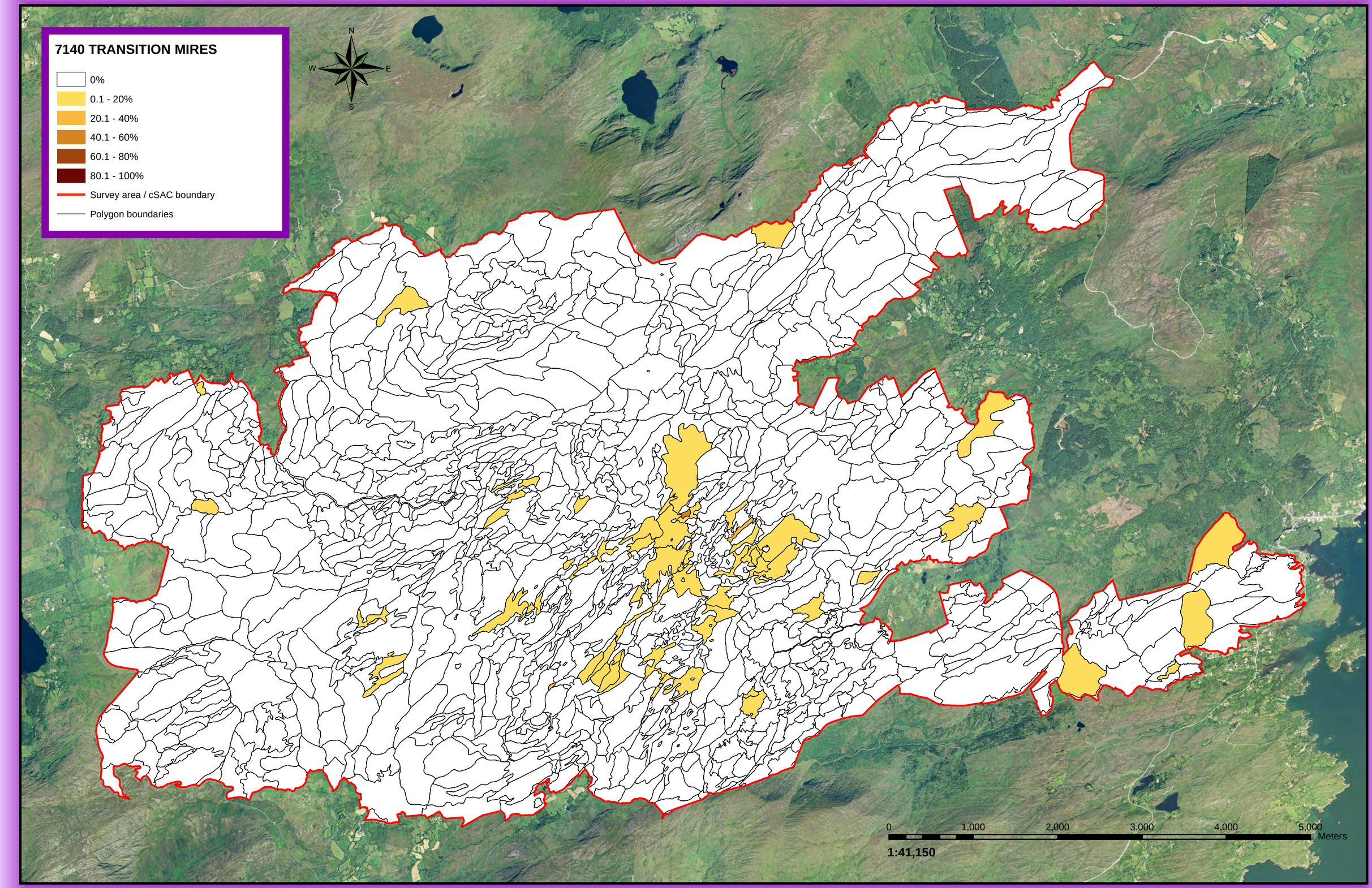

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Figure 4i. Cover of 7150 *RHYNCHOSPORION* DEPRESSIONS within Caha Mountains cSAC (000093), Cos. Cork and Kerry

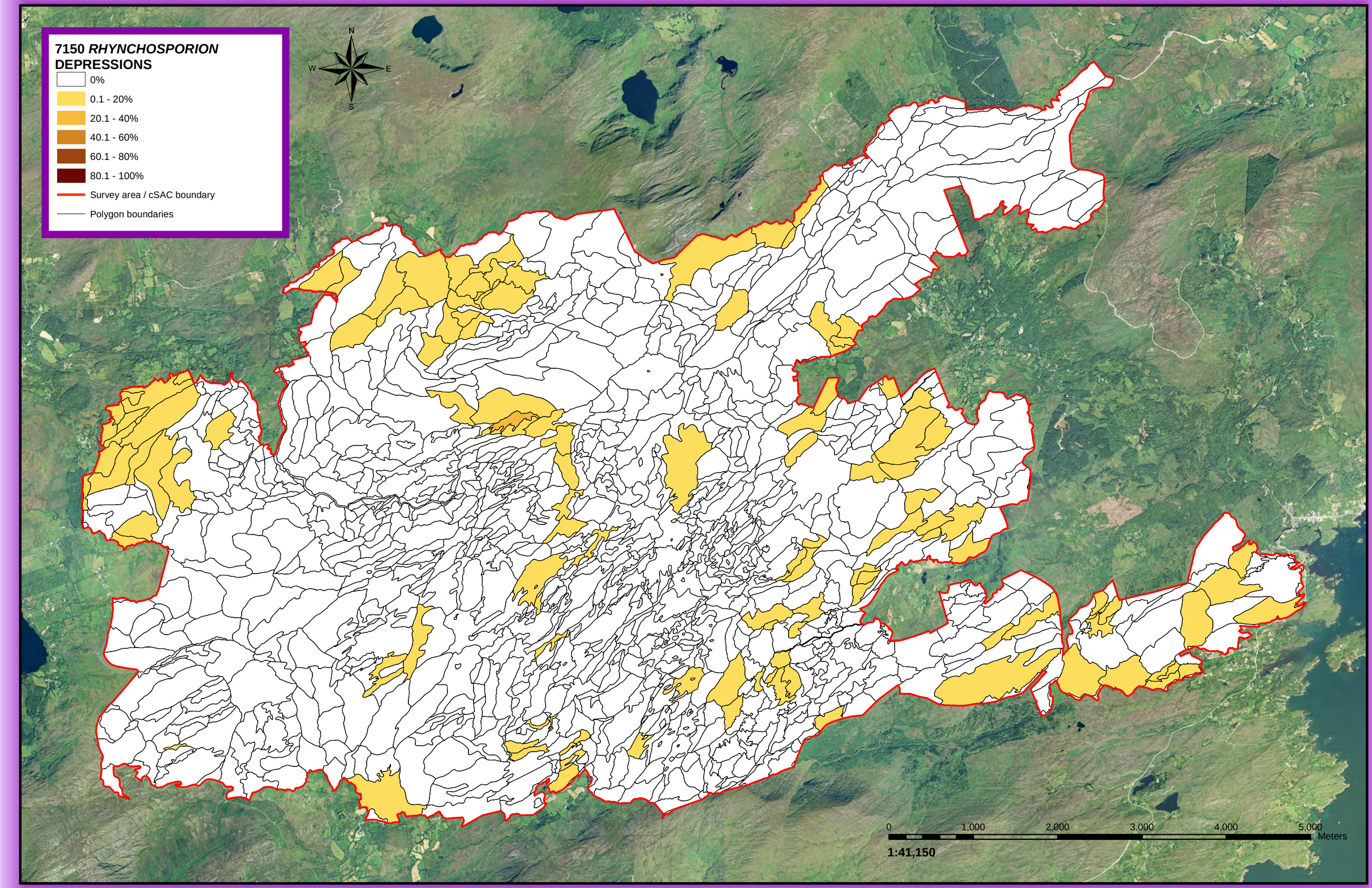

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Figure 4j. Cover of 7230 ALKALINE FENS within Caha Mountains cSAC (000093), Cos. Cork and Kerry

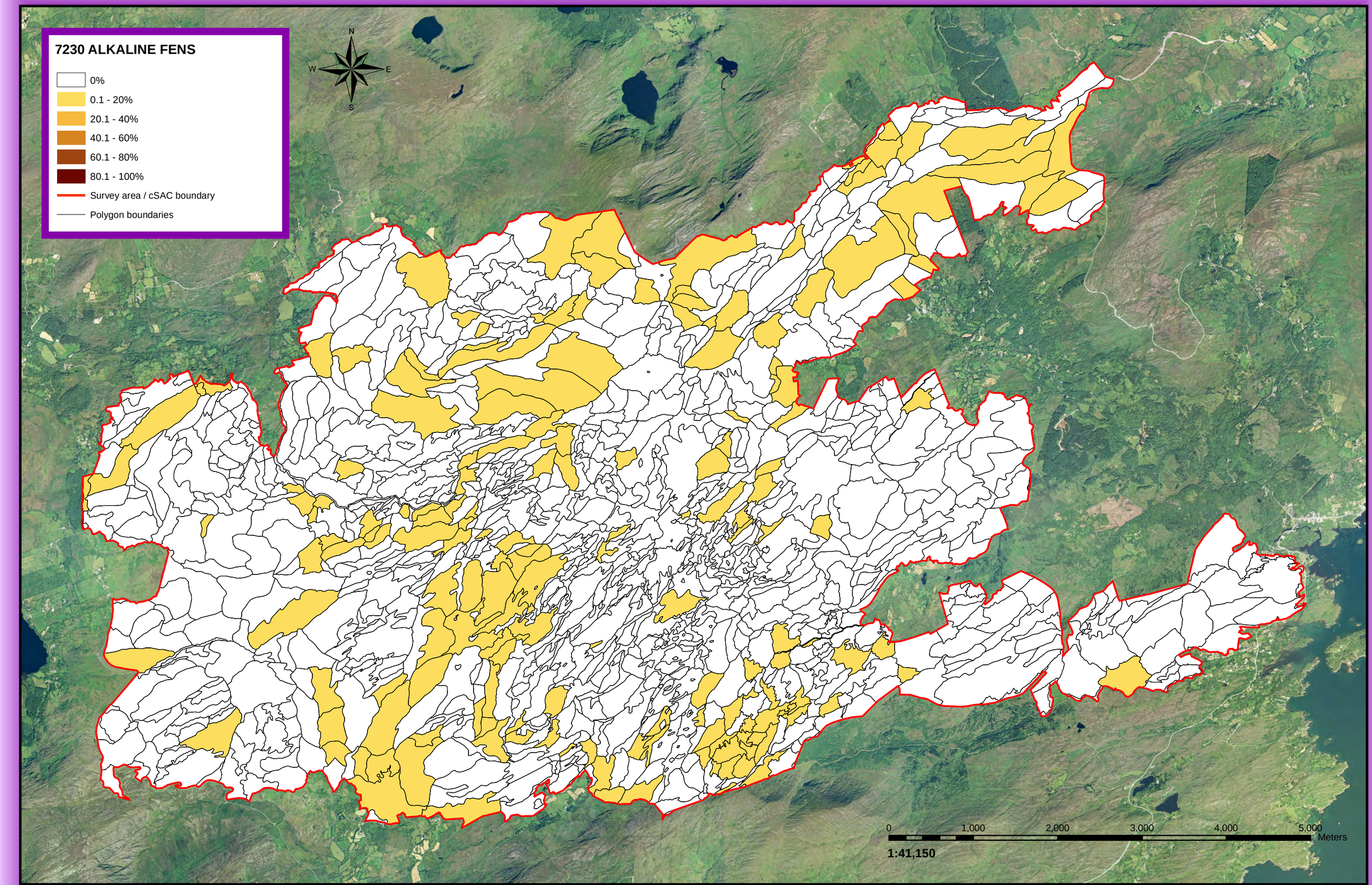

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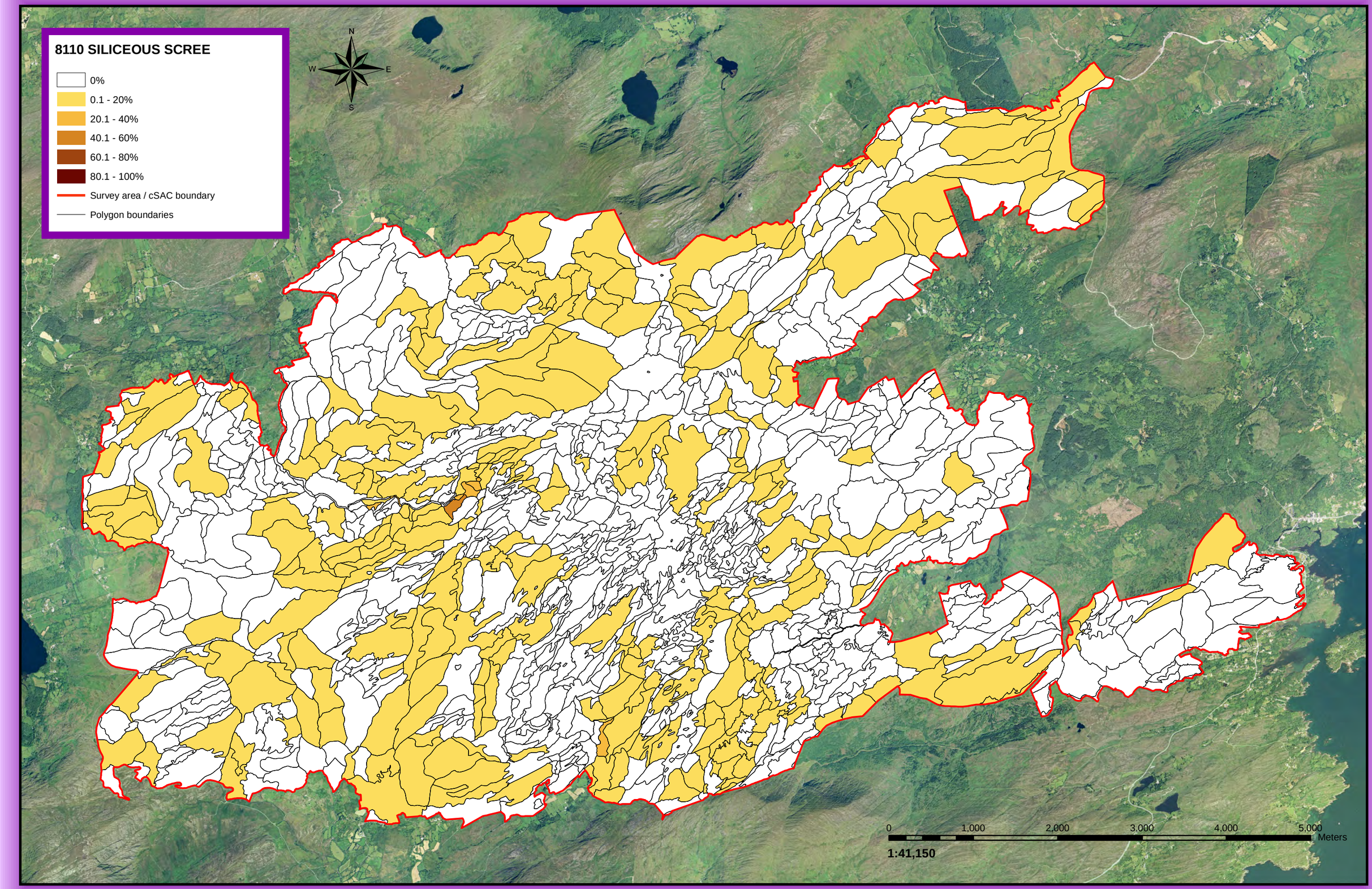
Figure 4k. Cover of 8110 SILICEOUS SCREE within Caha Mountains cSAC (000093), Cos. Cork and Kerry



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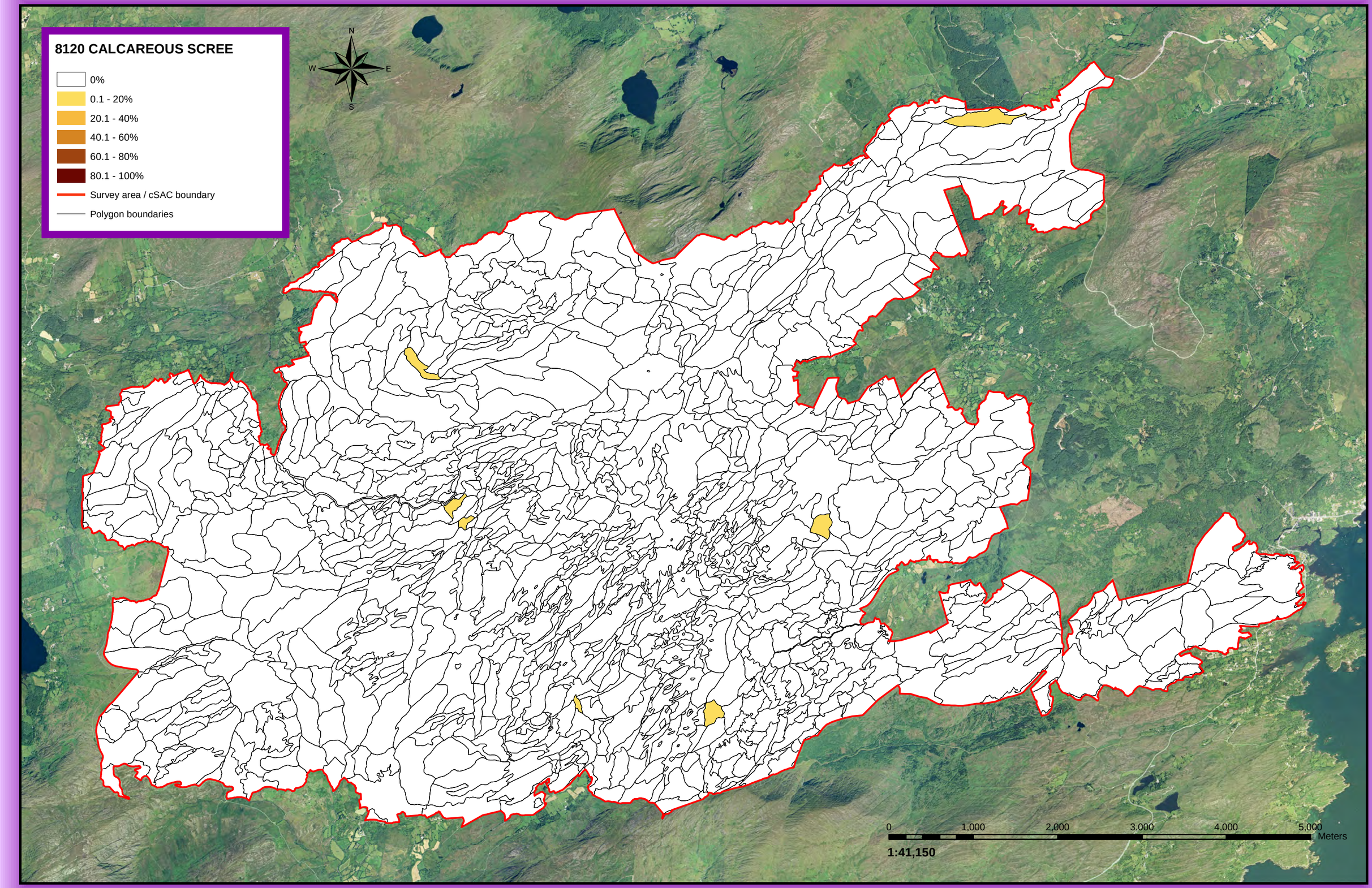
NSUH (Phase 4, 2013-2014) Site Report No. 16: Caha Mountains cSAC (000093), Co. Kerry. Map size A3.

Figure 4l. Cover of 8120 CALCAREOUS SCREE within Caha Mountains cSAC (000093), Cos. Cork and Kerry



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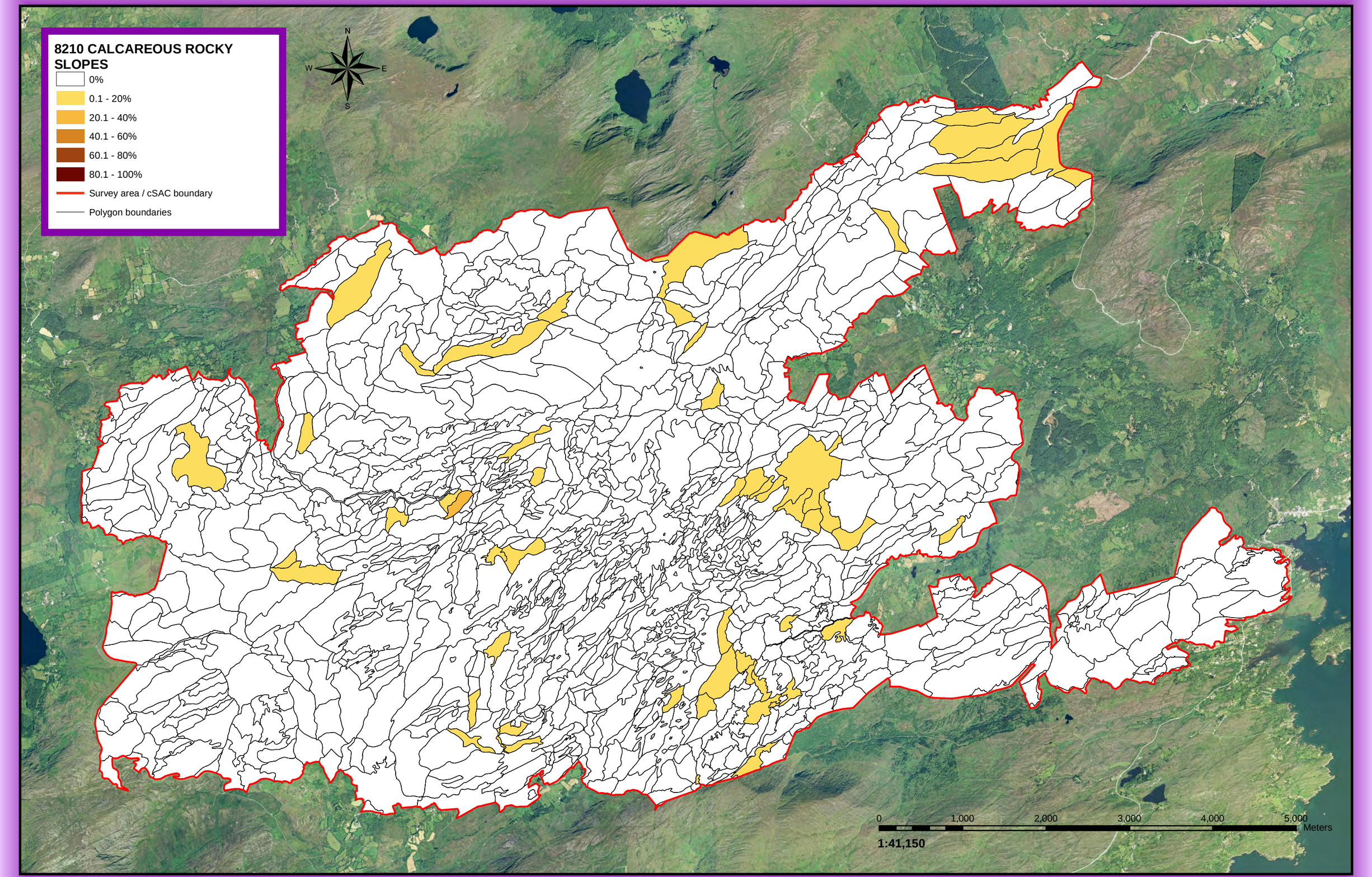
NSUH (Phase 4, 2013-2014) Site Report No. 16: Caha Mountains cSAC (000093), Co. Kerry. Map size A3.

Figure 4m. Cover of 8210 CALCAREOUS ROCKY SLOPES within Caha Mountains cSAC (000093), Cos. Cork and Kerry



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NSUH (Phase 4, 2013-2014) Site Report No. 16: Caha Mountains cSAC (000093), Co. Kerry. Map size A3.

Figure 4n. Cover of 8220 SILICEOUS ROCKY SLOPES within Caha Mountains cSAC (000093), Cos. Cork and Kerry

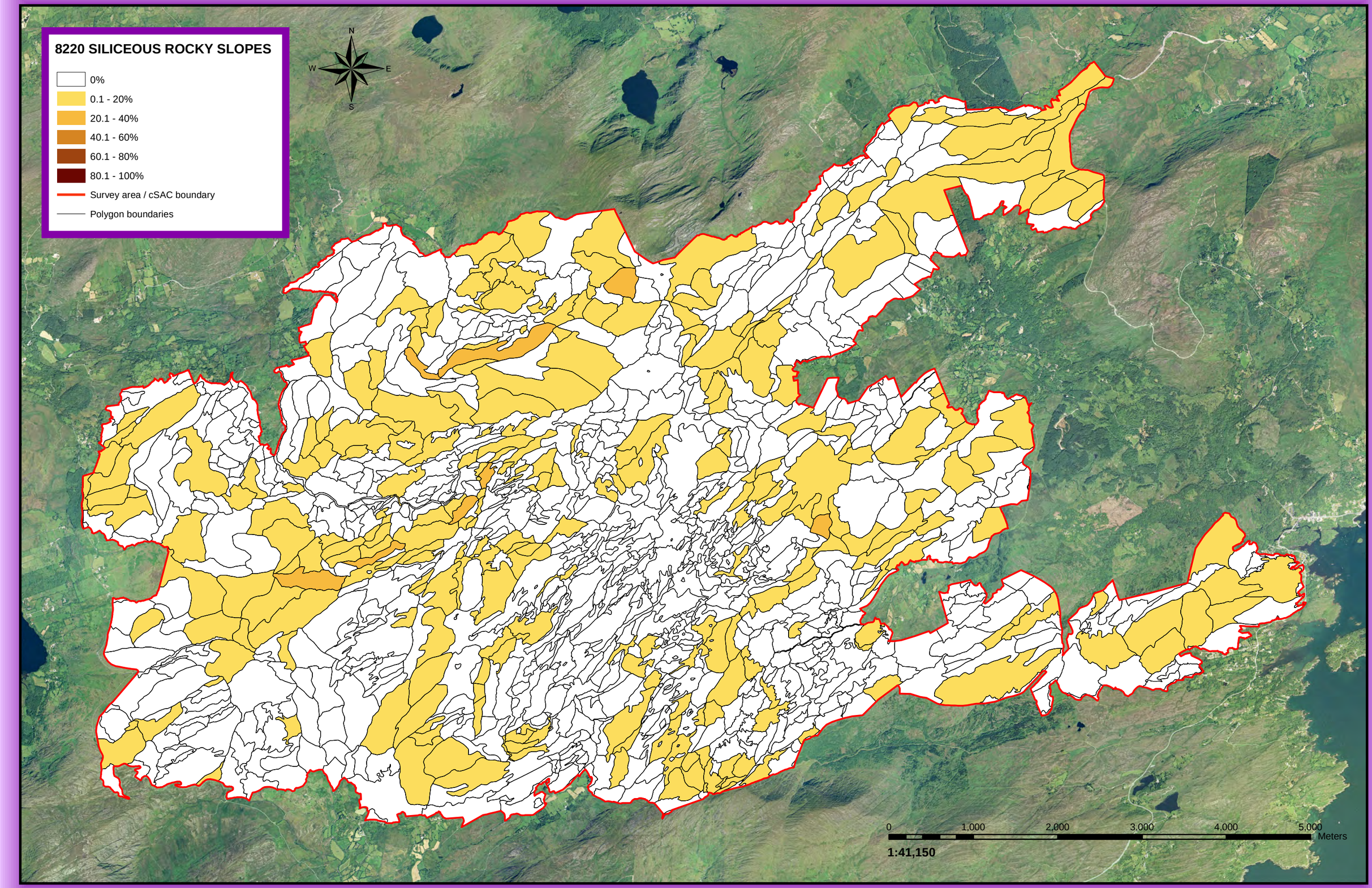

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Figure 5. Location of rare and notable plant records within and surrounding Caha Mountains cSAC (000093), Cos. Cork and Kerry

RARE AND NOTABLE RECORDS

NSUH RECORDS

- Listed species
- Unlisted species

EXTERNAL RECORDS

- Listed species
- Unlisted species
- Survey area / cSAC boundary

SPECIES INDEX

1. *Antennaria dioica*
2. *Antitrichia curtipendula*
3. *Asplenium viride*
4. *Campylopus pilifer*
5. *Campylopus shawii*
6. *Carex aquatilis*
7. *Cephalozia macrostachya*
8. *Cicendia filiformis*
9. *Cladopodiella fluitans*
10. *Cyclodictyon laetevirens*
11. *Cystopteris fragilis*
12. *Degelia atlantica*
13. *Dichodontium flavescens*
14. *Douinia ovata*
15. *Glyphomitrium daviesii*
16. *Grimmia funalis*
17. *Grimmia lisae*
18. *Grimmia ramondii*
19. *Hedwigia integrifolia*
20. *Hylocomiastrum umbratum*
21. *Hymnenostylium recurvirostrum*
22. *Juniperus communis*
23. *Leiocolea bantriensis*
24. *Lejeunea hibernica*
25. *Lycopodiella inundata*
26. *Marsupella emarginata* var. *aquatica*
27. *Minuartia recurva*
28. *Mylia anomola*
29. *Orthothecium intricatum*
30. *Pohlia elongata var. elongata*
31. *Rhabdoweisia crispata*
32. *Rhychospora fusca*
33. *Sagina subulata*
34. *Salix herbacea*
35. *Scapania aspera*
36. *Scapania scandica*
37. *Schistidium strictum*
38. *Seligeria recurvata*
39. *Sphagnum capillifolium* subsp. *capillifolium*
40. *Sphagnum platyphyllum*
41. *Sphagnum subnitens* var. *ferrugineum*
42. *Sticta fuliginosa*
43. *Tetraplodon mnioides*

N W E S

0 1,000 2,000 3,000 4,000 5,000 Meters

1:41,150

NOTE

Listed species constitute those plant species that are listed on Annex II of the EU Habitats Directive, National Red Lists or are protected under the Flora Protection Order (FPO) 1999. Hollow symbols indicate the approximate location of a record (i.e. the original grid reference had six figures or less). Some *Minuarta recurva* records from the summit of Knockowen omitted for sake of clarity.

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Figure 6. Location and results of conservation assessment monitoring stops and other relevés within Caha Mountains cSAC (000093), Cos. Cork and Kerry

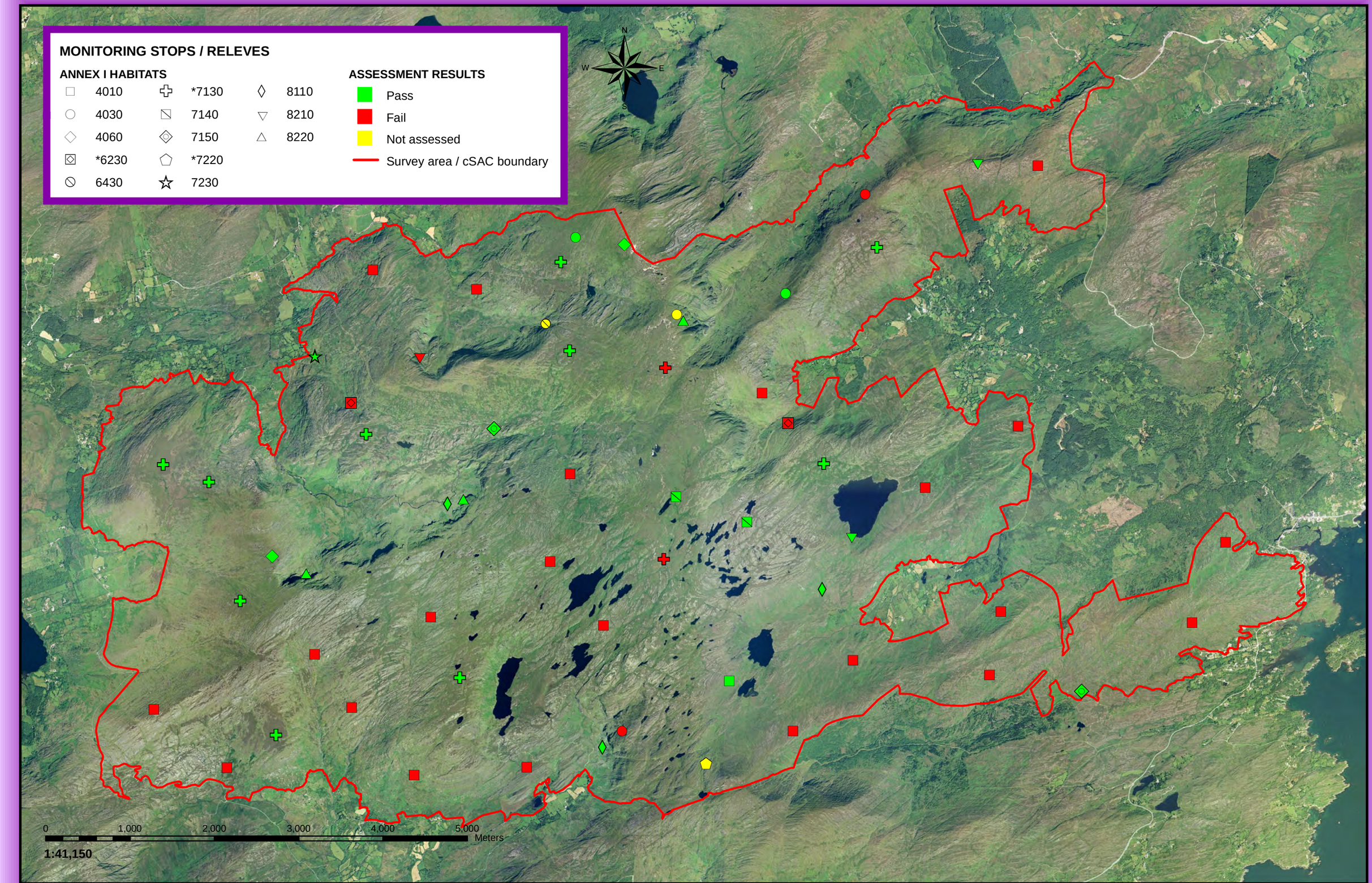

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Figure 7a. Commonage Framework Plan damage assessment (1999-2007) within and surrounding Caha Mountains cSAC (000093), Cos. Cork and Kerry

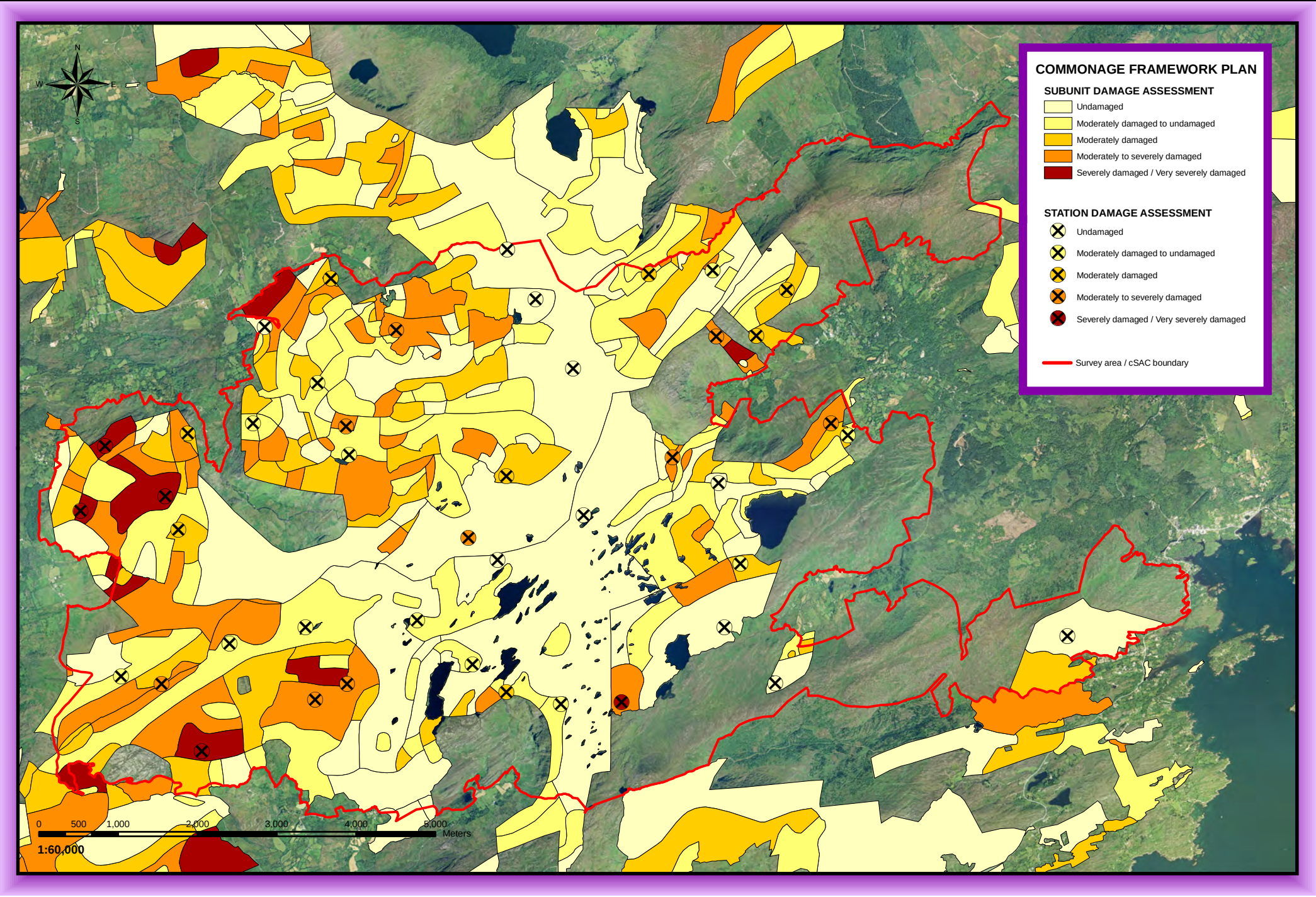
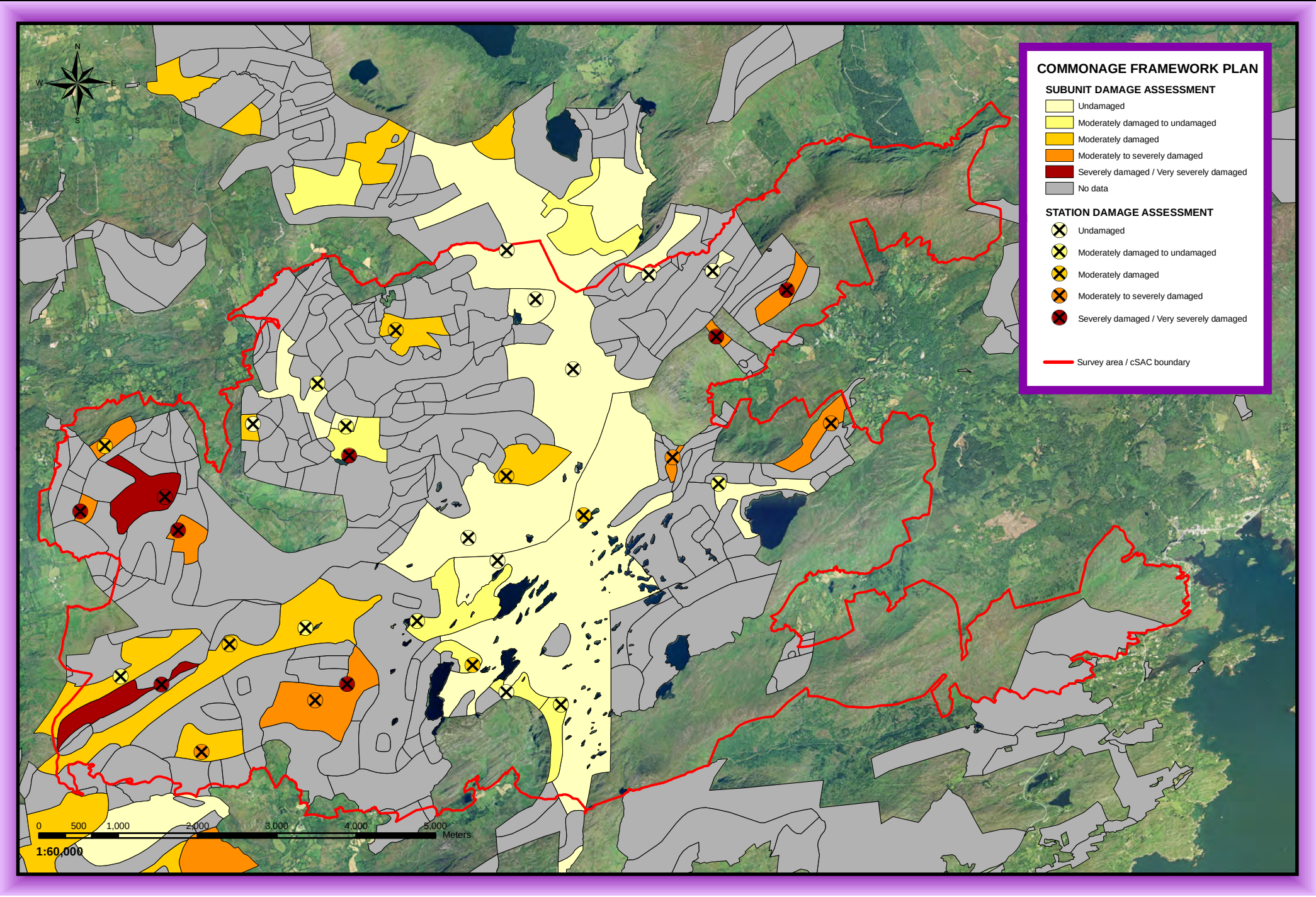


Figure 7b. Commonage Framework Plan damage assessment (2006) within and surrounding Caha Mountains cSAC (000093), Cos.Cork and Kerry



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