National Survey of Upland Habitats

(Phase 3, 2012-2013)

Site Report No. 13:

Cuilcagh – Anierin Uplands cSAC (000584),

Cos. Cavan and Leitrim

Philip M. Perrin, Jenni R. Roche, Simon J. Barron, Orla H. Daly,
Rory L. Hodd, Caoimhe S. Muldoon and Kristi J. Leyden

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Commissioned by National Parks and Wildlife Service

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Cover photo: Cuilcagh, viewed from the bog at Tullynahunshin, taken by Philip Perrin.

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EXECUTIVE SUMMARY

- Cuilcagh – Anierin Uplands cSAC (000584), in Counties Cavan and Leitrim was surveyed between July and September 2012 during Phase 3 of the National Survey of Upland Habitats (NSUH).
- The area of the site is 97.4 km^2. Using GIS and aerial photograph interpretation, the site was divided into 1948 polygons, each representing areas of relatively homogeneous habitat mosaic. Each polygon was surveyed on the ground to create a habitat map for the site.
- A total of 18 Annex I habitats, 47 Fossitt habitats and 86 provisional upland vegetation communities were recorded. Annex I habitats comprise 71.5% of the site. The Annex I upland habitats present which are primary focus habitats for the NSUH are *7130 Active blanket bog (60.3%), 4030 Dry heath (7.9%), 4060 Alpine and Boreal heath (1.0%), 4010 Wet heath (0.8%), 7130 Inactive blanket bog (0.8%), 7140 Transition mires (0.2%), 8220 Siliceous rocky slopes (0.1%), 8110 Siliceous scree (0.1%), 7140 Alkaline fens (0.03%), *6230 Species-rich *Nardus* grassland (0.01%), 7150 *Rhynchosporion* depressions (0.001%) and 8210 Calcareous rocky slopes (0.0002%).
- Rare and notable species recorded during the survey include *Vaccinium vitis-idaea*, *Carex bigelowii, Hamatocaulis vernicosus*, *Bartramia ithyphylla*, *Dicranodontium asperulum*, *Philonotis arnellii*, *Sphagnum girgensohnii* and *Sphagnum russowii*.
- Areas of particular botanical interest include the springs and flushes on the eastern slopes of Cuilcagh at Commas, and steep flushed banks and rockfaces in deep river valleys at Mullaghlea Glen, east of the Playbank, and Bursan, south-west of Cuilcagh. A number of oceanic bryophyte species grow on the humid north-facing slopes and cliffs of the Playbank, and there is a large expanse of 4060 Alpine and Boreal heath on the summit ridge of Cuilcagh.
- The conservation status of the upland Annex I habitats that form the primary focus of the NSUH was assessed. A total of 75 monitoring stops were recorded in these habitats. The conservation status of 7140 Transition mires, 8210 Calcareous rocky slopes and 8220 Siliceous rocky slopes were assessed as Favourable. The conservation status of 4060 Alpine and Boreal heaths and 8110 Siliceous scree were assessed as Unfavourable – Inadequate while that of the remaining primary focus habitats was assessed as Unfavourable – Bad.
- The main impacts/activities affecting the site are livestock grazing, peat erosion, burning and peat extraction.
- It is recommended that:

  Whilst destocking levels implemented *c*. 2002, according to 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.

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

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

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

* Priority Annex I habitat

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ESRI format point shapefile with waypoint data

ESRI format point shapefile with monitoring stop / relevé data

ESRI format point shapefile with rare and notable species data

Microsoft Excel format polygon attributes table

Microsoft Excel format image databank

Microsoft Access condition assessment database

Turboveg relevé database

Site, relevé and waypoint photographs

1. INTRODUCTION

Overview

1.1 The principal objectives of the National Survey of Upland Habitats (NSUH) are to classify and map the location and extent of upland habitats within a range of sites using the schemes of Fossitt (2000) and Annex I of the EU Habitats Directive, and to assess the conservation status of a suite of upland Annex I habitats. Selected sites largely comprise upland candidate Special Areas of Conservation (cSACs). The assessment procedure involves evaluation of habitat condition indicators at a network of monitoring stops (point samples) distributed across the range of these habitats at the surveyed sites.

1.2 These data are required to provide a scientific basis for the development of policies and management practices for the maintenance (or restoration) of favourable conservation status of Annex I habitats and to provide a scientific basis for monitoring of their status into the future. This site report should be read in conjunction with Irish Wildlife Manual No. 48 (Perrin *et al*., 2010) and 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 Cuilcagh – Anierin Uplands cSAC (000584) for the NSUH (Phase 3, 2012-13). 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 July and September 2012. The boundary of the cSAC as used in this survey is the version that was provided by NPWS in April 2012.

Background site information

1.7 Cuilcagh – Anierin Uplands cSAC, Cos. Cavan and Leitrim, (Fig. 1) is a large site, being 97.4 km^2 in extent. It stretches from near Drumshanbo in the south to the border with Northern Ireland in the north (O.S. Discovery Series map 26). The site comprises three main upland sections. In the southern section, the main peaks are Slieve Anierin (alt. 585 m) and Bencroy/Gubnaveagh (alt. 513 m). The central section stretches from Benbrack (alt. 499 m) in

the east to The Playbank (alt. 543 m) in the west. The northern section is formed by Cuilcagh (alt. 666 m) and its long ridge. The underlying geology is mainly sandstone, siltstone and shale with some limestone in the extreme northeast 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 Cuilcagh – Anierin Uplands cSAC. Data retrieved from www.npws.ie 23rd October 2013. Rep. = Representativity, Surf. = Relative Surface, Cons. = Conservation status, Glob. = Global Assessment.

Annex I code	Habitat	Area (%)	Rep.	Surf.	Cons.	Glob.
3130	Upland oligotrophic lakes	1	C	C	B	C
3160	Dystrophic lakes	1	B	C	B	B
4010	Wet heaths	15	B	B	B	A
4030	Dry heaths	5	B	B	B	B
*6230	Species-rich *Nardus* grassland	1	C	C	C	C
*7130/7130	Blanket bogs	58	A	B	A	A
8220	Siliceous rocky slopes	1	B	C	A	B

2. FIELD SURVEY

Description of habitats

Slieve Anierin and Bencroy

2.1 Slieve Anierin and Bencroy form a broad ridge, running from south to north. The vegetation on both the summit and gentler slopes of this ridge consists primarily of **PB2 Upland blanket bog** under the classification system of Fossitt (2000). Where the topography is flat, the bog vegetation is usually dominated by *Trichophorum germanicum*, while in places where bog occurs on sloping ground, the vegetation is generally characterised by *Calluna vulgaris* and *Eriophorum vaginatum*. In a number of places, particularly around the summits of Slieve Anierin and Bencroy, there are extensive areas of **PB5 Eroding blanket bog**, and the bog is extensively burned in places. There are large expanses of **PF2 Poor fen and flush** on sloping ground, characterised by *Juncus* spp. and *Sphagnum* spp., interspersed with the blanket bog.

2.2 There is a steep escarpment along the eastern side of this ridge. In many places along this escarpment there is outcropping **ER1 Exposed siliceous rock**, on which little vegetation grows, except for occasional ferns, such as *Dryopteris dilatata*, and bryophytes, including *Pseudotaxiphyllum elegans* and *Diplophyllum albicans*. There is much **HH1 Dry siliceous heath** vegetation along and below this escarpment, characterised by *Calluna vulgaris* and pleurocarpous mosses, including *Hypnum jutlandicum* and *Rhytidiadelphus loreus*. There are also areas of **GS3 Dry-humid acid grassland** and **GS4 Wet grassland** in this area, and there is a lake, classified as **FL2 Acid oligotrophic lakes**, at the base of the escarpment. There are occasional patches of **ER3 Siliceous scree and loose rock** on this slope, sparsely vegetated by species such as *Racomitrium lanuginosum*, *Diplophyllum albicans* and *Hymenophyllum wilsonii*. Where the slope flattens out below the escarpment, the vegetation is once again a mix of **PB2 Upland blanket bog** and **PF2 Poor fen and flush**.

2.3 Similar to other parts of the mountain, the western slopes of Slieve Anierin are covered with **PB2 Upland blanket bog** and **PF2 Poor fen and flush** in many places. There are occasional areas of **PF3 Transition mire and quaking bog** scattered through the boggy areas, characterised by *Carex rostrata*, *Carex echinata* and *Sphagnum fallax*. The slopes here are incised by a number of deep river valleys, the vegetation of which are dominated by a mixture of **HH1 Dry siliceous heath** and **HD1 Dense bracken**. There are outcrops of **ER1 Exposed siliceous rock** scattered across these slopes, upon which ferns, including *Polypodium vulgare* and *Blechnum spicant* grow. Close to the edge of the site, there are areas of **GS3 Dry-humid acid grassland** and **GS4 Wet grassland**, as well as an expanse of **HH1 Dry siliceous heath**, characterised by *Calluna vulgaris* and *Sphagnum capillifolium*.

Slievenakilla to the Playbank

2.4 The Playbank is at the end of a ridge running north-west from the townland of Slievenakilla, north of Bencroy. The summit of this ridge is primarily covered by **PB2 Upland blanket bog**, characterised by *Trichophorum germanicum*, *Calluna vulgaris* and *Eriophorum vaginatum*. The southern slopes of the ridge have a large expanse of **PF2 Poor fen and flush**, characterised by

Juncus effusus, *Polytrichum commune* and *Sphagnum fallax*. There are a number of **FL2 Acid oligotrophic lakes** and areas of **PF3 Transition mire and quaking bog**, characterised by *Carex rostrata* and *Sphagnum denticulatum*, along the undulating summit of the ridge.

2.5 The northern slopes of this ridge are drained by a number of streams (**FW1 Eroding / upland rivers**), which have carved deep valleys into the mountainside, the most prominent of which is Mullaghlea Glen. The vegetation of these stream valleys is mainly **GS3 Dry-humid acid grassland**. The slopes between the stream valleys have a covering of **PF2 Poor fen and flush**, in which *Juncus effusus*, *Sphagnum fallax* and *Sphagnum palustre* are prominent. There are areas of **PB2 Upland blanket bog** on gentle parts of the slope, with hollows containing *Rhynchospora alba*. There is a low escarpment in places, where **ER1 Exposed siliceous rock** outcrops. Species growing on these rockfaces include *Asplenium adiantum-nigrum* and *Hymenophyllum wilsonii*.

2.6 The summit of the Playbank is covered primarily by **PB2 Upland blanket bog** and **HH4 Montane Heath**, characterised by *Calluna vulgaris* and *Racomitrium lanuginosum*. The area of **PB2 Upland blanket bog** extends down the southern and eastern slopes of the mountain. There are also extensive areas of **PF2 Poor fen and flush**, similar in composition to those already described, and **HH1 Dry siliceous heath**, characterised by *Calluna vulgaris*, *Vaccinium myrtillus* and pleurocarpous mosses, including *Rhytidiadelphus loreus* and *Hylocomium splendens*, on this slope.

2.7 To the north of the summit there is a steep area of cliff, consisting of **ER1 Exposed siliceous rock**. Species characteristic of the vegetation of these cliffs include *Dryopteris dilatata* and the bryophytes *Pseudotaxiphyllum elegans* and *Plagiochila spinulosa*. Upon and below these cliffs is extensive rocky, humid **HH1 Dry siliceous heath**, within which grows a variety of liverwort species, including *Anastrepta orcadensis* and *Bazzania tricrenata*. Below this area of heath the vegetation primarily consists of **PF2 Poor fen and flush,** interspersed with areas of **PB2 Upland blanket bog**, **GS3 Dry-humid acid grassland**, **GS4 Wet grassland** and **HD1 Dense bracken**.

Benbrack

2.8 Much of the summit of Benbrack is covered by **PB2 Upland blanket bog**, characterised by *Trichophorum germanicum*. This bog is eroded in places to **PB5 Eroding blanket bog** and **ED1 Exposed sand gravel or till**. There is a medium-sized lake (**FL2 Acid oligotrophic lakes**) to the north of the summit and there are a number of patches of **HH4 Montane heath**, characterised by *Calluna vulgaris*, *Erica cinerea* and *Racomitrium lanuginosum*, scattered across the summit area. The subsidiary peak to the north of the summit has a high proportion of **HH1 Dry siliceous heath** covering it, as well as some **HH3 Wet heath**.

2.9 There are low escarpments to both the north and south of the summit. The vegetation in these areas primarily consists of **HH1 Dry siliceous heath**, dominated by *Calluna vulgaris*, *Erica cinerea* and bryophytes including *Hypnum jutlandicum*. There are patches of **ER1 Exposed siliceous rock** and **ER3 Siliceous scree and loose rock** amongst the heath. This scree is sparsely vegetated primarily by bryophytes, with species including *Racomitrium lanuginosum* and *Diplophyllum albicans*. There is a small area of **HH3 Wet heath** below the southern escarpment, characterised by *Trichophorum germanicum* and *Molinia caerulea*. Elsewhere on the slopes and subsidiary ridges of Benbrack, **PB2 Upland blanket bog**, characterised by *Calluna vulgaris*,

Eriophorum vaginatum and *Trichophorum germanicum*, is dominant. There are also extensive tracts of **PF2 Poor fen and flush** on many slopes. There is a small amount of hydrophilous tall herb vegetation, characterised by *Crepis paludosa*, *Succisa pratensis* and *Luzula sylvatica*, in a river valley on the slopes of Benbrack.

Cuilcagh

2.10 The summit of Cuilcagh is located at the eastern end of a 4km long whale-back ridge. There is also a lower, curving ridge running south from the summit. The broad summit ridge is dominated by **HH4 Montane heath** vegetation, characterised by *Calluna vulgaris*, *Racomitrium lanuginosum*, *Carex bigelowii* and *Juncus squarrosus*. There are patches of **PB2 Upland blanket bog** interspersed with the montane heath. In many places on this ridge, the vegetation has been eroded to reveal **ER1 Exposed siliceous rock** and **ER3 Siliceous scree and loose rock**. The ridge running south from the summit is primarily covered by **PB2 Upland blanket bog**, with erosion leading to the formation of extensive **PB5 Eroding blanket bog**. There are some areas of **HH4 Montane heath** along this ridge, particularly at the southern end, where it is characterised by *C. vulgaris*, *R. lanuginosum* and *Empetrum nigrum*.

2.11 At the top of the slope to the south of the summit ridge, and on steeper areas of the slope, there are bands of **HH1 Dry siliceous heath**, characterised by *Calluna vulgaris*, *Vaccinium myrtillus*, *Sphagnum capillifolium* and *Sphagnum subnitens*. **PB2 Upland blanket bog** is the primary vegetation on much of this slope, and the slope to the west of the summit ridge, characterised by *C. vulgaris* and *Eriophorum vaginatum*. There are also extensive areas of **PF2 poor fen and flush** on these slopes, and occasional patches of **PF1 Rich fen and flush**, in which *Scorpidium revolvens* and *Calliergon giganteum* are prominent. The western slopes have been subject to a number of erosion events, resulting in areas of **ED1 Exposed sand gravel or till** and **ED2 Spoil and bare ground**. Near the margins of the site, there are areas of **GS3 Dry-humid acid grassland** and **GS4 Wet grassland**. In a number of stream valleys the **GS3 Dry-humid acid grassland** is rich in herb species, such as *Alchemilla glabra* and *Prunella vulgaris*.

2.12 There is a band of **GS3 Dry-humid acid grassland** on the higher parts of the slopes at the eastern end of the summit ridge. Interspersed with this grassland are bands of **ER1 Exposed siliceous rock**. There is little vegetation on these cliffs, with the exception of occasional patches of ferns, such as *Dryopteris dilatata* and *Blechnum spicant*, and bryophytes. There are patches of **ER3 Siliceous scree and loose rock** below these rocky slopes, on which sparse vegetation grows, consisting of species including *Racomitrium lanuginosum*, *Vaccinium myrtillus*, *Diplophyllum albicans* and *Dryopteris dilatata*. There is much **HH1 Dry siliceous heath** on these slopes, and also along the steep eastern slope of the ridge which runs south from the summit towards Bellavally Gap. This heath is characterised by the presence of *Calluna vulgaris*, *Vaccinium myrtillus* and pleurocarpous mosses including *Thuidium tamariscinum* and *Hylocomium splendens*. There is much erosion along the eastern slopes of the southward running ridge, leading to the exposure of **ED1 Exposed sand gravel or till** and **ED2 Spoil and bare ground**.

Commas, Alteen and adjacent townlands

2.13 East of the peak of Cuilcagh, the ground slopes gently down to a large bog-covered plateau. The ground sloping away from the base of Cuilcagh, in the townland of Commas, is incised by many steep-sided stream (**FW1 Eroding / upland rivers**) valleys. The vegetation on this slope is primarily a mixture of **PB2 Upland blanket bog**, characterised by *Calluna vulgaris* and *Eriophorum vaginatum* and **PF2 Poor fen and flush**, characterised by *Juncus* spp. and *Sphagnum* spp. Much of the **PB2 Upland blanket bog** in this area has been damaged by fire. To the south of this area, there is a large patch of **WD4 Conifer plantation**. The majority of this has been clear-felled and either replanted with **WS2 Immature woodland** or revegetated by **GS4 Wet grassland** and **PF2 Poor fen and flush**.

2.14 The plateau to the east of Commas, mainly within the townland of Alteen, is covered by an expanse of **PB2 Upland blanket bog**. This bog is characterised primarily by *Trichophorum germanicum* and is very wet in places, with many bog pools (**FL1 Dystrophic lakes**) present. **PF2 Poor fen and flush** and **GS4 Wet grassland** occur mainly within stream valleys in this area. To the north, there are pockets of **PF1 Rich fen and flush**, characterised by *Carex rostrata*, *Carex panicea*, *Scorpidium revolvens* and *Campylium stellatum*. There is also a small area of tufa-forming **FP1 Calcareous springs**, characterised by *Palustriella falcata* and *Hymenostylium recurvirostrum*. To the south of the plateau, where a bog road enables easy access, there is much evidence of former harvesting of peat both by hand and machine.

2.15 To the south and east of this plateau, the ground is relatively steeply sloping. There is much **PB2 Upland blanket bog** on this slope, which is heavily burned in places. There are also areas of **HH3 Wet heath**, characterised by *Trichophorum germanicum* and *Calluna vulgaris*, **HH1 Dry siliceous heath**, **GS3 Dry-humid acid grassland** and **PF2 Poor fen and flush** on this slope. Below this slope the vegetation primarily consists of **PB2 Upland blanket bog**, characterised by *Calluna vulgaris* and *Eriophorum vaginatum* and **PF2 Poor fen and flush**. Where there is no slope there are areas of **PF3 Transition mire and quaking bog**, characterised by *Carex nigra*, *Potamogeton polygonifolius*, *Menyanthes trifoliata* and *Sphagnum denticulatum*. The lower margins at the eastern edge of the site are, in contrast to the rest of the site, underlain by calcareous rock. These vegetation of these areas is primarily **WS1 Scrub**, **WN2 Oak-ash-hazel woodland** and **GS4 Wet grassland**.

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

Habitat statistics

2.17 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 1-20).

Table 2: Extent of Fossitt habitats within Cuilcagh-Anierin Uplands cSAC.

Fossitt code	Habitat	Area (ha)	% of site
BL1	Stone walls and other stonework	1.2	0.01
BL2	Earth banks	0.1	0.001
BL3	Buildings and artificial surfaces	6.8	0.1
ED1	Exposed sand, gravel or till	13.8	0.1
ED2	Spoil and bare ground	24.8	0.3
ED3	Recolonising bare ground	4.3	0.04
ER1	Exposed siliceous rock	45.7	0.5
ER2	Exposed calcareous rock	0.1	0.001
ER3	Siliceous scree and loose rock	77.4	0.8
ER4	Calcareous scree and loose rock	0.02	0.0002
FL1	Dystrophic lakes	11.2	0.1
FL2	Acid oligotrophic lakes	21.0	0.2
FP1	Calcareous springs	0.3	0.003
FP2	Non-calcareous springs	2.1	0.02
FS1	Reed and large sedge swamps	0.5	0.01
FS2	Tall-herb swamps	0.1	0.001
FW1	Eroding/upland rivers	30.1	0.3
FW4	Drainage ditches	5.5	0.1
GA1	Improved agricultural grassland	0.5	0.01
GM1	Marsh	0.04	0.0004
GS1	Dry calcareous and neutral grassland	0.02	0.0002
GS2	Dry meadows and grassy verges	0.1	0.001
GS3	Dry-humid acid grassland	487.2	5.0
GS4	Wet grassland	269.6	2.8
HD1	Dense bracken	21.8	0.2
HH1	Dry siliceous heath	777.2	8.0
HH2	Dry calcareous heath	0.01	0.0001
HH3	Wet heath	80.8	0.8
HH4	Montane heath	93.0	1.0
PB2	Upland blanket bog	5932.2	61.0
PB3	Lowland blanket bog	2.7	0.03
PB4	Cutover bog	5.8	0.1
PB5	Eroding blanket bog	78.5	0.8
PF1	Rich fen and flush	5.1	0.1
PF2	Poor fen and flush	1548.7	15.9
PF3	Transition mire and quaking bog	17.4	0.2
WD4	Conifer plantation	73.8	0.8
WD5	Scattered trees and parkland	3.6	0.04
WL1	Hedgerows	0.02	0.0002
WL2	Treelines	0.03	0.0003
WN1	Oak-birch-holly woodland	0.05	0.001
WN2	Oak-ash-hazel woodland	11.8	0.1

Table 2: continued.

Fossitt code	Habitat	Area (ha)	% of site
WN6	Wet willow-alder-ash woodland	0.1	0.001
WS1	Scrub	7.6	0.1
WS2	Immature woodland	51.6	0.5
WS3	Ornamental / non-native shrubs	0.001	0.00001
WS5	Recently-felled woodland	9.1	0.1
	Total site area	9723.1	

Table 3: Extent of Annex I habitats within Cuilcagh-Anierin Uplands cSAC. *denotes priority habitat.

Annex I code	Habitat	Area (ha)	% of site
3130	Upland oligotrophic lakes	21.0	0.2
3160	Dystrophic lakes	8.6	0.1
3260	Floating river vegetation	0.01	0.0001
4010	Wet heath	80.8	0.8
4030	Dry heath	770.5	7.9
4060	Alpine and Boreal heath	92.5	1.0
6150	Siliceous alpine and boreal grassland	0.01	0.0001
*6230	Species-rich *Nardus* grassland	1.4	0.01
6430	Hydrophilous tall herb communities	0.03	0.0003
*7130	Active blanket bog	5861.1	60.3
7130	Inactive blanket bog	73.7	0.8
7140	Transition mires	17.4	0.2
7150	*Rhynchosporion* depressions	0.05	0.001
*7220	Petrifying springs with tufa formation	0.1	0.001
7230	Alkaline fens	2.6	0.03
8110	Siliceous scree	8.5	0.1
8210	Calcareous rocky slopes	0.02	0.0002
8220	Siliceous rocky slopes	10.9	0.1
	non-Annex I habitats	2773.8	28.5
	Total site area	9723.1	
	Total area of Annex I habitats	6949.2	71.5

2.18 The most abundant habitat within a polygon is termed the primary habitat. The primary Fossitt habitat types for Cuilcagh – Anierin Uplands cSAC are shown in Fig. 2 and the primary Annex I habitat types are presented in Fig. 3. It is important to note that these maps do not convey the full complexity of habitats within the site. For full details of the habitat composition of each polygon refer to the polygon attribute table associated with the GIS. This information also accompanies this report in Microsoft Excel format.

2.19 A total of 47 Fossitt (2000) habitats were recorded during this survey within Cuilcagh – Anierin Uplands cSAC and details of their areas are presented in Table 2. **PB2 Upland blanket bog** was

the most extensive, covering 61.0% of the site, followed by **PF2 Poor fen and flush** at 15.9%, **HH1 Dry siliceous heath** at 8.0% and **GS3 Dry humid grassland** at 5.0%.

2.20 A total of 18 Annex I habitats were recorded during this survey within Cuilcagh – Anierin Uplands cSAC, covering 71.53% of the site (Table 3). The main Annex I habitat was ***7130 Active blanket bog**, which covered 60.3% of the site, followed by **4030 Dry heaths** and **4060 Alpine and Boreal heath** which covered 7.9% and 1.0% of the site respectively. The next most frequent habitats were **4010 Wet heath** and **7130 Inactive blanket bog**, both at 0.8%. 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 I habitats, be the target of restoration objectives or improve the coherence and connectivity between fragmented areas of Annex I habitat.

2.21 A total of 86 provisional upland vegetation communities and sub-communities (Perrin *et al.*, 2014) were recorded within Cuilcagh – Anierin Uplands cSAC. Details of their coverage are presented in Table 4.

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

Table 4: Extent of provisional vegetation communities (Perrin *et al.*, 2014) in Cuilcagh-Anierin Uplands 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	0.2	0.002	72.1
PO1b	aquatic sub-community	0.1	0.001	27.9
SW1	*Potamogeton polygonifolius* soakway	0.7	0.01	100
SPG1	*Philonotis fontana - Saxifraga stellaris* spring			
SPG1a	typical sub-community	0.8	0.01	34.2
SPG1b	species-poor *Sphagnum denticulatum* sub-community	1.3	0.01	52.9
SPG2	*Palustriella commutata* spring			
SPG2i	Annex I variant	0.1	0.001	2.6
SPG2ii	non-Annex I variant	0.3	0.003	10.3
PFLU1	*Carex nigra/echinata - Sphagnum denticulatum* flush	89.4	0.9	4.9
PFLU2	*Juncus effusus - Sphagnum cuspidatum/palustre* flush	1449.1	14.9	79.6
PFLU3	*Juncus acutiflorus/effusus - Calliergonella cuspidata* flush	262.7	2.7	14.4
PFLU4	*Molinia caerulea - Sphagnum palustre* flush			
PFLU4a	typical sub-community	2.2	0.02	0.1
PFLU5	*Carex rostrata – Sphagnum* spp. flush	15.9	0.2	0.9
RFLU1	*Carex viridula oedocarpa - Pinguicula vulgaris - Juncus bulbosus* flush			
RFLU1a	brown moss sub-community	2.3	0.02	36.7
RFLU1b	species-poor sub-community	2.5	0.03	38.8

Table 4: continued.

Code	Provisional communities and sub-communities	Area (ha)	% of site	% of habitat
RFEN	*Carex rostrata* fen			
RFEN1a	species-rich sub-community	0.3	0.003	3.9
RFEN1b	species-poor sub-community	1.3	0.01	20.5
UG1	*Agrostis capillaris - Festuca ovina* upland grassland			
UG1a	typical sub-community	99.5	1.0	20.4
UG1b	*Sphagnum* spp. sub-community	11.7	0.1	2.4
UG1c	species-rich sub-community	0.2	0.002	0.05
UG1d	*Juncus squarrosus* sub-community	178.0	1.8	36.5
UG2	*Nardus stricta - Galium saxatile* upland grassland			
UG2a	typical sub-community	77.1	0.8	15.8
UG2b	*Sphagnum* spp. sub-community	25.7	0.3	5.3
UG2c	species-rich sub-community	1.2	0.01	0.2
UG2d	*Juncus squarrosus* sub-community	93.7	1.0	19.2
UG4	*Molinia caerulea – Anthoxanthum odoratum* wet grassland	0.4	0.004	0.1
UG5	*Festuca ovina – Agrostis capillaris – Thymus praecox* calcareous grassland			
UG5b	herb-poor sub community	0.02	0.0002	0.003
BK1	*Pteridium aquilinum* community	21.8	0.2	100
DH3	*Calluna vulgaris - Erica cinerea* dry heath	511.4	5.3	66.4
DH4	*Calluna vulgaris - Sphagnum capillifolium* dry /damp heath	149.8	1.5	19.4
DH5	*Calluna vulgaris - Antennaria dioica* heath	0.01	0.0001	0.001
DH6	*Calluna vulgaris -Vaccinium myrtillus* dry heath	109.0	1.1	14.2
WH3	*Calluna vulgaris - Molinia caerulea - Sphagnum capillifolium* wet/damp heath	24.2	0.2	30.0
WH4	*Trichophorum germanicum- Eriophorum angustifolium* wet heath			
WH4a	typical sub-community	1.4	0.02	1.7
WH4b	*Calluna vulgaris* sub-community	48.6	0.5	60.2
WH4c	*Juncus squarrosus* sub-community	3.7	0.04	4.6
WH5	*Trichophorum germanicum - Nardus stricta - Racomitrium lanuginosum* montane wet heath	2.0	0.02	2.5
WH6	*Schoenus nigricans – Molinia caerulea – Myrica gale* wet heath	0.9	0.01	1.1
MH1	*Calluna vulgaris - Racomitrium lanuginosum* montane heath			
MH1a	typical sub-community	52.7	0.5	56.7
MH1b	*Juncus squarrosus* sub-community	31.6	0.3	34.0
MH3	*Vaccinium myrtillus - Rhytidiadelphus loreus - Anthoxanthum odoratum* montane heath	8.2	0.1	8.8
MH5	*Nardus stricta - Carex binervis - Racomitrium lanuginosum* montane grass-heath	0.4	0.004	0.4
MH6	*Carex bigelowii - Racomitrium lanuginosum* montane vegetation			
MH6a	typical sub-community	0.004	0.00004	0.004
MH6c	*Juncus squarrosus* sub-community	0.01	0.0001	0.01
BB3	*Eriophorum vaginatum – Sphagnum papillosum* bog	141.3	1.5	2.4
BB4	*Trichophorum germanicum - Eriophorum angustifolium* bog	1668.2	17.2	28.7
BB5	*Calluna vulgaris - Eriophorum* spp. Bog			
BB5a	typical sub-community	3565.0	36.7	61.4
BB5b	*Juncus squarrosus* sub-community	426.7	4.4	7.4
BB7	*Eriophorum angustifolium – Sphagnum austinii bog*	2.6	0.03	0.05

Table 4: continued.

Code	Provisional communities and sub-communities	Area (ha)	% of site	% of habitat
HW1	*Sphagnum denticulatum/cuspidatum* hollow			
HW1i	upland variant	57.2	0.6	41.4
HW1iii	flush variant	7.2	0.1	5.2
HW2	*Eriophorum angustifolium - Sphagnum fallax* hollow			
HW2i	upland variant	73.7	0.8	53.3
HW3	*Rhynchospora alba* hollow	0.05	0.0005	0.03
HW4	*Eleocharis multicaulis* hollow			
HW4ii	flush variant	0.004	0.00004	0.003
DP1	*Campylopus introflexus - Polytrichum* spp. degraded peat community	4.3	0.04	99.6
DP2	*Nardus stricta – Eriophorum angustifolium* degraded peat community	0.02	0.0002	0.4
TH1	*Luzula sylvatica - Vaccinium myrtillus* tall herb vegetation			
TH1i	rock face variant	1.3	0.01	15.8
TH1ii	dry heath variant	6.6	0.1	83.8
TH3	*Sedum rosea - Angelica sylvestris* tall herb vegetation	0.03	0.0003	0.4
SC1	Siliceous scree community	0.4	0.004	100
RS1	*Saxifraga spathularis - Asplenium adiantum-nigrum* rock cleft community	0.8	0.01	99.4
RS2	*Saxifraga aizoides - Asplenium* spp. - *Orthothecium rufescens* rock cleft community	0.01	0.0001	0.6
HM1	*Calluna vulgaris – Scapania gracilis* hepatic mat			
HM1i	non-Annex I grassland variant	0.01	0.0001	2.9
HM1iii	dry heath variant	0.3	0.003	66.0
HM1iv	Wet heath variant	0.003	0.00003	0.6
HM1v	montane heath variant	0.004	0.00004	0.8
HM1vi	non-Annex I siliceous rock variant	0.1	0.001	16.7
HM1vii	Annex I siliceous rock variant	0.1	0.001	11.0
HM1ix	upland bog variant	0.01	0.0001	2.1
	Total area of vegetation communities	9238.5	95.0	
	Not covered	177.0	1.8	
	Non-vegetation cover types	307.6	3.2	
	Total site area	9723.1		

Rare and notable flora

2.23 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 existing records. For each species it is indicated whether it is listed on the Flora (Protection) Order, 1999 and/or the relevant Red Data List. For vascular plants this is Curtis & McGough (1988) and for bryophytes Lockhart *et al*., (2012) was used. 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.

Table 5: Records of rare and notable plant species from Cuilcagh – Anierin Uplands cSAC.

Species	Red Data List	FPO	Annex II	Year of record (s)	NSUH	Previous records
Vascular plants						
Carex bigelowii^	-	-	-	1946, 1950, 1989, 1991, 2004, 2006, 2010, 2012	•	5
Cryptogramma crispa†	RA	•	-	1866		5
Diphasiastrum alpinum†	-	-	-	1991, 2010		5
Lycopodium clavatum†	-	-	-	1905, 1990		2, 3, 5
Salix herbacea†	-	-	-	1950, ?		5
Vaccinium vitis-idaea	-	-	-	?, 2012	•	3
Bryophytes						
*Anastrepta orcadensis**	-	-	-	2012	•	-
Andreaea rothii subsp. *rothii**	-	-	-	2012	•	-
*Bartramia ithyphylla**	VU	-	-	2012	•	-
*Bryum alpinum**	-	-	-	2012	•	-
*Calliergon giganteum**	-	-	-	2012	•	-
*Calypogeia sphagnicola**	-	-	-	2012	•	-
Cynodontium bruntonii	-	-	-	2001		1
Dicranodontium asperulum ‡	VU	-	-	1909, 1910, 1912, 1914, 1917, 1957, 1959, 1961, 1965, 2000, 2001, 2002, 2005, 2012	•	1, 2, 3, 4
*Ditrichum gracile**	-	-	-	2012	•	-
Discelium nudum	NT	-	-	1961, 2001, 2002		1, 4
*Hamatocaulis vernicosus**	NT	•	•	2012	•	-
*Hymenostylium recurvirostre**	-	-	-	2012	•	-
Isothecium myosuroides var. *brachythecioides**	-	-	-	2012	•	-
*Kurzia pauciflora**	-	-	-	2012	•	-
*Leiocolea bantriensis**	NT	-	-	2012	•	-
Marsupella sphacelata†	VU	-	-	1959		1
*Oligotrichum hercynicum**	-	-	-	2012	•	-
Philonotis arnellii	EN	-	-	2001, 2012	•	1, 4
Philonotis caespitosa‡	-	-	-	2001, 2009		1
*Philonotis calcarea**	-	-	-	2012	•	-
*Plagiochila spinulosa**	-	-	-	2012	•	-
Ptilidium ciliare^*	-	-	-	2009, 2012	•	1
*Racomitrium ericoides**	-	-	-	2012	•	-
*Rhabdoweisia crenulata**	-	-	-	2012	•	-
Scapania scandica	-	-	-	2012	•	-
*Schistidium apocarpum**	-	-	-	2012	•	-
*Scorpidium revolvens**	-	-	-	2012	•	-
*Scorpidium scorpioides**	-	-	-	2012	•	-
*Sphagnum angustifolium**	-	-	-	2012	•	-
Sphagnum capillifolium subsp. *capillifolium**	DD	-	-	2012	•	-
*Sphagnum contortum**	-	-	-	2012	•	-
*Sphagnum girgensohnii**	NT	-	-	2012	•	-
*Sphagnum magellanicum**	-	-	-	2012	•	-
*Sphagnum platyphyllum**	NT	-	-	2012	•	-
*Sphagnum russowii**	NT	-	-	2012	•	-
Sphenolobopsis pearsonii †	NT	-	-	2005		1, 4
*Tetraplodon mnioides**	-	-	-	2012	•	-
*Warnstorfia fluitans**	-	-	-	2012	•	-
*Warnstorfia sarmentosa**	-	-	-	2012	•	-

Table 5: continued.

Species	Red Data List	FPO	Annex II	Year of record (s)	NSUH	Previous records
Lichens						
*Bryoria fuscescens**	-	-	-	2012	•	-
*Bundophoron melanocarpum**	-	-	-	2012	•	-
Cladonia incrassata	•	-	-	?		2, 3
*Sphaerophorus fragilis**	-	-	-	2012	•	-

† Occurs just outside the site
‡ Some records from just outside the site
^ All records prior to NSUH outside the site
* Denotes new or updated vice county record from NSUH fieldwork

Previous records: 1, NPWS Recorder database and associated data; 2, NPWS Conservation Statement; 3, cSAC site synopsis; 4, Lockhart *et al.* (2012); 5, Forbes and Northridge (2012)

Red Data List: EN, Endangered; VU, Vulnerable; NT, Near Threatened; LC, Least Concern

2.24 Few notable vascular plant species were recorded during the NSUH. The most notable of these were *Vaccinium vitis-idaea* and *Carex bigelowii*. *C. bigelowii* was previously only recorded just outside the SAC, in Co. Fermanagh (Forbes and Northridge, 2012), and is locally frequent on the summit of Cuilcagh.

2.25 Previous records for rare plants are almost exclusively from outside the site, on the northern side of the summit of Cuilcagh in Co. Fermanagh. A number of arctic-alpine species have been recorded on these northern slopes, including *Diphasiastrum alpinum*, *Lycopodium clavatum* and *Salix herbacea*. The NPWS Conservation Statement for this site erroneously states that *Cryptogramma crispa* has been recorded from scree below the northern cliffs of The Playbank at Moneenterriff; this fern has been recorded from Cuilcagh, but only on the Fermanagh side of the mountain (M. Wyse-Jackson pers. comm., Forbes and Northridge, 2012).

2.26 A number of new records of rare and threatened bryophytes were made during this survey. Primary among there were the Annex II listed *Hamatocaulis vernicosus*, which was recorded from a spring on the eastern slopes of Cuilcagh at Commas and the Vulnerable *Bartramia ithyphylla*, which was discovered growing on a flushed rockface in Mullaghlea Glen, east of the Playbank. New localities were also found for the Vulnerable *Dicranodontium asperulum* and the Endangered *Philonotis arnellii*. *D. asperulum* is restricted in Ireland to two adjacent areas in West Cavan and Leitrim, and *P. arnellii* has only been seen recently in Ireland at one site on the western slopes of Cuilcagh. New vice-county records were also made for a number of Near Threatened and other bryophytes, as well as a number of lichen species.

2.27 Previous rare bryophyte records not refound during this survey were for *Discelium nudum*, *Marsupella sphacelata* and *Sphenolobopsis pearsonii*. The latter two species were not found within the site, the records being located on the north side of Cuilcagh in Co. Fermanagh.

2.28 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.

2.29 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

2.30 Faunal records during this survey include Badger (*Meles meles*), Irish hare (*Lepus timidus hibernicus*), Wood mouse (*Apodemus sylvaticus*) and Common lizard (*Zootoca vivipara*). Peregrine falcon (*Falco peregrinus*) and Golden plover (*Pluvialis apricaria*) species listed on Annex I of the EU Birds Directive were observed at the site, as were the following birds: Kestrel (*Falco tinnunculus*), Curlew (*Numenius arquata*), Dipper (*Cinclus cinclus*), Pheasant (*Phasianus colchicus*), Red grouse (*Lagopus lagopus*), Snipe (*Gallinago gallinago*) and Woodcock (*Scolopax rusticola*). The butterflies Painted lady (*Vanessa cardui*) and Red admiral (*Vanessa atalanta*) were also observed.

2.31 Previous faunal records include Merlin (*Falco columbarius*), and Hen harrier (*Circus cyaneus*) both listed as Annex I species of the Birds Directive. Other bird records include Ring ouzel (*Turdus torquatus*), Dunlin (*Calidris alpina*), Raven (*Corvus corax*), Skylark (*Alauda arvensis*), Common sandpiper (*Actitis hypoleucos*), and Wheatear (*Oenanthe oenanthe*). Other faunal records include: Fox (*Vulpes vulpes*), Smooth newt (*Triturus vulgaris)* and Common frog (*Rana temporaria* were also previously recorded at the site. Small Brown Trout (*Salmo trutta*) was found in a number of the upland lakes. In the Conservation Statement for the site (NPWS 2009) it states that Feral goats (*Capra* sp.) were once present but have not been seen on the site in recent years.

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 75 monitoring stops were recorded within Cuilcagh – Anierin Uplands cSAC for this purpose (Fig. 6 and Table 6); six additional relevés were recorded in habitats that were not assessed. The future prospects parameter examines the current impacts to the site that are affecting area and structure and functions, and predicts the future status of the habitat based on future trends where there is sufficient data. The future prospects parameter can also be informed by available data from the Commonage Framework Plan project (CFP).

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

Annex I code	Habitat	Number of stops
4010	Wet heath	2
4030	Dry heath	12
4060	Alpine and Boreal heath	5
*6230	Species-rich *Nardus* grassland	1
*7130/7130	Blanket bog	39
7140	Transition mires	4
7150	*Rhynchosporion* depressions	1
7230	Alkaline fens	2
8110	Siliceous scree	4
8220	Siliceous rocky slopes	5

Commonage Framework Plan

3.2 Surveys were initiated in 1998 to assess livestock impacts on commonages in Ireland and to devise Commonage Framework Plans (CFP) to improve commonage condition. Assessments were made on an area basis by dividing the commonage area into subunits which were 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 the CFP methodology can be found in Anon. (1998) and use of this data by the NSUH has been reviewed by Perrin (2012).

3.3 Cuilcagh – Anierin Uplands cSAC is predominantly commonage with these areas comprising 71.2 km² or 73.1% of the site. A baseline CFP survey of most of these areas occurred in 2000 with the small remaining areas being surveyed in 2004, 2008 and 2009. An interim destocking level of 30% had been applied in Leitrim prior to the CFP commencing. This was then adjusted

using available CFP results *c.*2002 when stock reductions were also applied in Cavan. Results from this survey are shown in Fig. 7. There has been no resurvey of this site.

3.4 The CFP baseline survey recorded 96 subunits within or partially within Cuilcagh – Anierin Uplands cSAC (Table 7). These indicate commonage within the site was in good condition at this time with 76.8% of the area being assessed as undamaged (U) and only 2.9% of the area being assessed as moderately to severely damaged (MS) or worse.

Table 7: Frequency of CFP subunit damage levels in the Cuilcagh – Anierin Uplands cSAC baseline survey

Damage level	**Frequency (*n* = 13)**	**Area %**
U	37 (38.5%)	76.8%
MU	36 (37.5%)	18.1
MM	8 (8.3%)	2.2
MS	9 (9.4%)	2.6
S/S*	6 (6.3%)	0.3

3.5 The CFP recorded 93 stations within Cuilcagh – Anierin Uplands cSAC but data were only available for 84 stations (Table 8). These indicate commonage within the site was in fairly good condition at this time with 69.0% of stations being undamaged (U) and only 6.0% of stations being moderately to severely damaged (MS) or worse.

Table 8: Frequency of CFP station damage levels in the Cuilcagh – Anierin Uplands cSAC baseline survey. Percentages indicate proportion of stations within each column.

Damage level	**Wet heath/Dry heath/ Blanket bog (*n* = 76)**	**Upland grassland and other habitats (*n* =8)**	**All habitats (*n* = 84)**
U	52 (68.4%)	6 (75.0%)	58 (69.0%)
MU	17 (22.4%)	1 (12.5%)	18 (21.4%)
MM	3 (3.9%)	0 (0.0%)	3 (3.6%)
MS	3 (3.9%)	1 (12.5%)	4 (4.8%)
S/S*	1 (1.3%)	0 (0.0%)	1 (1.2%)

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

3.7 The analysis of key indicator values is rather inconclusive and as there has been no CFP resurvey of this site it not possible to derive much from the other data. However, the fact that destocking occurred in over 23% 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

Table 9: Mean values for key indicators from CFP stations in the Cuilcagh – Anierin Uplands cSAC baseline survey with related data from NSUH survey.

	Wet heath/Dry heath/ Blanket bog		**Upland grassland and other habitats**
	CFP	**NSUH**	**CFP**
	(*n* = 56-76)	**(*n* =59)**	**(*n* = 6)**
Bare peat cover (%)	1.0	2.1	0.6
Sward height (cm)	28.8	32.1	79.2
Calluna height (cm)	25.8	26.6†	-
Calluna cover			
D (>50%)	49 (64.5%)	28 (47.5%)	-
A (26-50%)	10 (13.2%)	15 (25.4%)	-
O or F (≤25%)	15 (19.7%)	15 (25.4%)	-
Absent	2 (2.6%)	1 (1.7%)	-
Not recorded	0 (0.0%)	0 (0.0%)	-

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

4010 Wet heaths

Area

3.8 Changes in the area of **4010 Wet heaths** were recorded for the period 1995 to 2012 through a combination of observations in the field and analysis of aerial photographs and satellite imagery available through Google Earth (Table 10). Only losses in habitat were found, there were no gains in habitat area. These data are restricted to obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. Loss in area of **4010 Wet heaths** was recorded due to off-road motorized driving (0.06 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, 1995-2012.

Impact code	**Impact**	**Area (ha) 1995-2000**	**Area (ha) 2000-2005**	**Area (ha) 2005-2012**	**Area (ha) 1995-2012**
G01.03.02	Off-road motorized driving	0.06	0.00	0.00	0.06
All impacts		0.06	0.00	0.00	0.06
% of habitat		0.07	0.00	0.00	0.07
% loss per year		0.01	0.00	0.00	<0.01

Structure and functions

3.9 Two monitoring stops were recorded in **4010 Wet heaths** within the Cuilcagh – Anierin Uplands cSAC (Table 11). In the assessment of structure and functions, both 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 100.0%. The structure and functions of **4010 Wet heaths** were therefore assessed as Unfavourable – Bad.

3.10 The vegetation composition of both **4010 Wet heaths** monitoring stops was poor. Both stops failed due to an inadequate cover of *Cladonia* spp., *Sphagnum* spp., *Racomitrium lanuginosum* and pleurocarpous mosses. One monitoring stop also failed due to excessive cover of the non-native moss *Campylopus introflexus*, both within the monitoring stop and in the local vicinity. This monitoring stop also exhibited poor vegetation structure due to severe burning. The physical structure of **4010 Wet heaths** monitoring stops was good, with no failures being recorded under the relevant criteria.

Future prospects

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

Non-intensive sheep grazing (A04.02.02)

3.12 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that grazing by sheep was the main landuse within the site. Approximately 70% of the site was under commonage and approximately 70% of this area was assessed as being undamaged by grazing by the CFP, and destocking levels between 0 and 43.6% were recommended. During the assessment of structure and functions, grazing was not recorded within the two **4010 Wet heaths** monitoring stops assessed. During vegetation mapping, overgrazing was not recorded within **4010 Wet heaths**. However, it is likely that grazing by sheep occurs throughout **4010 Wet heaths** within the cSAC, albeit at very low levels in some areas. The intensity of this impact was assessed as low overall and its influence as positive. The trend was assessed as improving due to the CFP reduction in stock numbers.

Off-road motorised driving (G01.03.02)

3.13 Some minor loss of this habitat was recorded due to quad bikes.

Invasive non-native species (I01)

3.14 *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.

Table 11: Monitoring criteria and failure rates for 4010 Wet heaths (n = 2).

Criteria		Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition					
1	*Erica tetralix* present	20m radius	2	0	0
2	Cover of positive indicator species ≥ 50%	Relevé	2	0	0
3	Total cover of *Cladonia* species, *Sphagnum* species, *Racomitrium lanuginosum* and pleurocarpous mosses ≥ 10%	Relevé	2	2	100.0
4	Cover of ericoid species and *Empetrum nigrum* ≥ 15%	Relevé	2	0	0
5	Cover of dwarf shrub species < 75%	Relevé	2	0	0
6	Cover of the following negative indicator species: *Agrostis capillaris, Holcus lanatus, Phragmites australis, Ranunculus repens* collectively < 1%	Relevé	2	0	0
7	Cover of non-native species < 1%	Relevé	2	1	50.0
8	Cover of non-native species < 1%	Local vicinity	2	1	50.0
9	Cover of scattered native trees and scrub < 20%	Local vicinity	2	0	0
10	Cover of *Pteridium aquilinum* < 10%	Local vicinity	2	0	0
11	Cover of *Juncus effusus* < 10%	Local vicinity	2	0	0
Vegetation structure					
12	Crushed, broken and/or pulled up *Sphagnum* species < 10% of *Sphagnum* cover	Relevé	1	0	0
13	Last complete growing season's shoots of ericoids, *Empetrum nigrum* and *Myrica gale* showing signs of browsing collectively < 33%	Relevé	2	0	0
14	No signs of burning into the moss, liverwort or lichen layer, or exposure of peat surface due to burning	Local vicinity	2	1	50.0
15	No signs of burning inside boundaries of sensitive areas*	Local vicinity	2	0	0
Physical structure					
16	Cover of disturbed bare ground < 10%	Relevé	2	0	0
17	Cover of disturbed bare ground < 10%	Local vicinity	2	0	0
18	Area showing signs of drainage resulting from heavy trampling or tracking or ditches < 10%	Local vicinity	2	0	0

*Sensitive areas
(a) Vegetation severely wind-clipped, mostly forming a mat less than 10 cm thick.
(b) Areas where soils are thin and less than 5 cm deep.
(c) Slopes greater than 1 in 3 (18°) and all the sides of gullies.
(d) Ground with abundant, and/or an almost continuous carpet of *Sphagnum*, liverworts and/or lichens.
(e) Pools, wet hollows, 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.

3.15 *Campylopus introflexus* was recorded at both **4010 Wet heaths** monitoring stops (100%) (Table 11). One of these monitoring stops failed due to excessive cover of *C. introflexus*, with a cover score of 10%. At this monitoring stop, there was evidence of severe burning, which is likely to have facilitated the colonisation of *C. introflexus*. The degraded peat vegetation community DP1

Campylopus introflexus – Polytrichum spp. was recorded within five polygons dominated by **4010 Wet heaths** during vegetation mapping. The intensity of this impact was assessed as low. *C. introflexus* was recorded as forming extensive carpets; therefore this impact was assessed as being of negative influence. The area of **4010 Wet heaths** affected was estimated to be 0.4%, based on the mean cover of DP1 *Campylopus introflexus – Polytrichum* spp. within polygons dominated by **4010 Wet heaths**.

Burning down (J01.01)

3.16 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that burning is a regular occurrence within the site, with some areas being burned on an annual basis, and is conducted in an attempt to improve vegetation for sheep grazing. Frequent burning of vegetation can degrade upland habitats. Most of the fires noted within the Conservation Statement occurred during the bird nesting season.

3.17 In the assessment of structure and functions, one monitoring stop (50.0%) failed due to severe burning, which damaged the bryophyte and lichen layer or exposed the peat surface. Approximately 10.2% of **4010 Wet heaths** on the site were estimated to have been affected by burning within the last few years. The intensity of this impact has been assessed as high. Due to the level of damage caused, the timing and uncontrolled nature of the burning and the fact that burning is carried out to encourage grass growth rather than for conservation management purposes, the influence of this impact has been assessed as negative.

3.18 The overall impacts score for **4010 Wet heaths** was calculated as -0.75, which is marginally below the nominal Favourable Reference Value of zero. The combined future trend for area and structure and functions is deemed to be improving due to the CFP reduction in stock numbers though uncontrolled burning remains a significant issue. The future prospects for this habitat were therefore assessed as Unfavourable – Inadequate.

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

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Low	Positive	100%	Inside	1.5	Imp
G01.03.02	Off-road motorised driving	Medium	Negative	<1%	Inside	-0.50	Ins
I01	Invasive non-native species	Low	Negative	0.4%	Inside	-0.25	Ins
J01.01	Burning down	High	Negative	10.2%	Inside	-1.5	Ins
	Overall score					-0.75	

4030 Dry heaths

Area

3.19 Changes in the area of **4030 Dry heaths** were recorded for the period 1995 to 2012 through a combination of observations in the field and analysis of aerial photographs and satellite imagery available through Google Earth (Table 13). 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 loss in area of **4030 Dry heaths** was due to landslide (0.25 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 13: Impacts causing obvious losses in areas of 4030 Dry heaths, 1995-2012.

Impact code	Impact	Area (ha) 1995-2000	Area (ha) 2000-2005	Area (ha) 2005-2012	Area (ha) 1995-2012
L05	Collapse of terrain, landslide	0.23	0.00	0.03	0.25
All impacts		0.23	0.00	0.03	0.25
% of habitat		<0.01	0.00	<0.01	0.03
% loss per year		<0.01	0.00	<0.01	<0.01

Structure and functions

3.20 Twelve monitoring stops were recorded in **4030 Dry heaths** within the Cuilcagh – Anierin Uplands cSAC (Table 14). In the assessment of structure and functions, six monitoring stops failed one criterion each. Following a review of the ecological condition of these stops, expert judgement determined that one should pass because the failure was marginal, resulting in an overall failure rate of 41.7%. The structure and functions of **4030 Dry heaths** were therefore assessed as Unfavourable – Bad.

3.21 The vegetation composition of one **4030 Dry heaths** monitoring stop (8.3%) was poor, failing due to excessive cover of the non-native moss *Campylopus introflexus*. The vegetation structure of **4030 Dry heaths** monitoring stops was poor in some cases, with 18.2% failing due to burning in sensitive areas. A further 25.0% failed due to poor structural diversity of *Calluna vulgaris*, 16.6% due to a lack of pioneer-phase *C. vulgaris* and 8.3% due to an absence of mature *C. vulgaris.* The physical structure of **4030 Dry heaths** was good, with no failures being recorded under the relevant criteria.

Future prospects

3.22 Five impacts were recorded within **4030 Dry heaths** (Table 15).

Non-intensive sheep grazing (A04.02.02)

3.23 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that grazing by sheep was the main landuse within the site. Approximately 70% of the site was under commonage and approximately 70% of this area was assessed as being undamaged by grazing by the CFP, and destocking levels between 0 and 43.6% were recommended.

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

Criteria		Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition					
1	Number of bryophyte or non-crustose lichen species present, excluding *Campylopus* spp. and *Polytrichum* spp. ≥ 3	Relevé	12	0	0
2	Number of positive indicator species present ≥ 2	Relevé	12	0	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%		12	0	0
4	Proportion of dwarf shrub cover composed of *Myrica gale, Salix repens, Ulex gallii* collectively < 50%	Relevé	12	0	0
5	Cover of the following weedy negative indicator species: *Cirsium arvense, C. vulgare, Ranunculus repens,* large *Rumex* species (except *R. acetosa*), *Senecio jacobaea, Urtica dioica* collectively < 1%	Relevé	12	0	0
6	Cover of non-native species < 1%	Relevé	12	1	8.3
7	Cover of non-native species < 1%	Local vicinity	12	0	0
8	Cover of scattered native trees and scrub < 20%	Local vicinity	12	0	0
9	Cover of *Pteridium aquilinum* < 10%	Local vicinity	12	0	0
10	Cover of *Juncus effusus* < 10%	Local vicinity	12	0	0
Vegetation structure					
11	Senescent proportion of *Calluna vulgaris* cover < 50%	Relevé	12	0	0
12	Last complete growing season's shoots of ericoids and *Empetrum nigrum* showing signs of browsing collectively < 33%	Relevé	12	0	0
13	No signs of burning inside boundaries of sensitive areas*	Local vicinity	11	2	18.2
14	Outside boundaries of sensitive areas, all growth phases of *Calluna vulgaris* should occur throughout, with ≥ 10% of cover in mature phase	Local vicinity	12	3	25.0
Physical structure					
15	Cover of disturbed bare ground < 10%	Relevé	12	0	0
16	Cover of disturbed bare ground < 10%	Local vicinity	12	0	0

*Sensitive areas

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

(b) Hill slopes greater than 1 in 2 (26°), and all the sides of gullies.

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

(d) Areas of H21 and H22 heath as defined by the NVC (Rodwell 1991). These are heaths primarily composed of mixtures of *Calluna vulgaris* and *Vaccinium myrtillus* over a moist carpet of bryophytes that often has a high *Sphagnum* content. Within the provisional classification, these communities are comparable to DH4 and damper elements of DH6 respectively.

(e) Areas with noticeably uneven structure, at a spatial scale of around 1 m^2 or less. The unevenness (e.g. more commonly found in very old heather stands) will relate to distinct, often large, spreading dwarf-shrub bushes. The dwarf-shrub canopy will not be completely continuous, and some of its upper surface may be twice as high as other parts. Layering is likely to be present and may be common.

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

3.24 In the assessment of structure and functions, grazing by sheep was recorded within 58.3% of **4030 Dry heaths** monitoring stops. Grazing intensity varies across the site, with the proportion of dwarf shrub shoots showing signs of grazing ranging from 0 to 20% but remaining well within acceptable limits, with no failures recorded due to excessive grazing. Similarly, while disturbed bare ground was recorded at 33.3% of monitoring stops, its cover was consistently low and did not result in any failures. Indeed, two monitoring stops (16.6%), at Altnadarragh and below the ridge of Cuilcagh, failed due to an overabundance of leggy, mature *Calluna vulgaris* and an absence of pioneer-phase *C. vulgaris*, which may be indicative of undergrazing. During vegetation mapping, one instance of overgrazing and a heavily eroded sheep track were recorded within **4030 Dry heaths** on Cuilcagh Mountain. The intensity of this impact was assessed as low overall and its impact as positive. The trend was assessed as improving due to the CFP reduction in stock numbers.

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

3.25 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that, while recreational use of the area is quite low, a small but increasing number of hillwalkers venture onto the ridges and summits. Minor path creation by trampling was noted along sections of popular routes, such as above Moneenteriff cliffs and on Cuilcagh Mountain, where **4030 Dry heaths** may be found (Fig. 4b). During the present survey, relatively low numbers of hillwalkers were observed. The intensity of this impact was assessed as low and its influence as negative. The area of **4030 Dry heaths** affected was estimated to be less than 1% due to the localised nature of the impact.

Invasive non-native species (I01)

3.26 *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.

3.27 *Campylopus introflexus* was recorded within 25.0% of **4030 Dry heaths** monitoring stops, with one monitoring stop (8.3%) failing due to excessive cover of the species. The mean cover of *C. introflexus* within **4030 Dry heaths** monitoring stops was 0.5%. The degraded peat vegetation community DP1 *Campylopus introflexus – Polytrichum* spp. was recorded within 18 polygons dominated by **4030 Dry heaths** during vegetation mapping. The species was not recorded as forming extensive carpets.

3.28 Scattered, non-native conifers, mainly *Picea sitchensis*, were observed to have self-seeded from adjacent plantations into **4030 Dry heaths** in several locations within the cSAC, but this was limited to a few individuals. The intensity of this impact was assessed as low and its influence as negative. The area of **4030 Dry heaths** affected was estimated to be less than 1%.

Problematic native species (I02)

3.29 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that bracken encroachment onto **4030 Dry heaths** is a management issue within the site. However, this impact was not recorded during the present survey and is therefore omitted from Table 15.

Burning down (J01.01)

3.30 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that burning is a regular occurrence within the site, with some areas being burned on an annual basis. It was noted that frequent burning can degrade upland habitats. Burning was thought to be carried out in an attempt to improve vegetation for sheep grazing. Several fires, most of which occurred during the bird nesting season, were noted within the Conservation Statement. In 2000, a fire occurred west of the summit of Slievenakilla (The Playbank), where a relatively high proportion of the **4030 Dry heaths** within the cSAC are located (Fig. 4b).

3.31 In the assessment of structure and functions, burning in sensitive areas was recorded within the local vicinity of 18.2% of **4030 Dry heaths** monitoring stops, resulting in the failure of these monitoring stops. Plate 1 shows a large area of burned **4030 Dry heaths** on the south-eastern slopes of Cuilcagh Mountain. While controlled burning may be required in some cases to mitigate undergrazing, burning should not be carried out in sensitive areas of **4030 Dry heath** habitat.

3.32 Approximately 10.0% of **4030 Dry heaths** on the site were estimated to have been affected by burning within the last few years. The intensity of this impact has been assessed as high. Due to the timing and uncontrolled nature of the burning, the occurrence of burning in sensitive areas and the fact that burning is carried out to encourage grass growth rather than for conservation management of **4030 Dry heaths**, the influence of this impact has been assessed as negative.

Collapse of terrain, landslides (L05)

3.33 Minor losses of this habitat appear to have occurred through landslide.

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

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Low	Positive	58.3%	Inside	1	Imp
G01.02	Walking, horseriding and non-motorized vehicles	Low	Negative	<1%	Inside	-0.25	Ins
I01	Invasive, non-native species	Low	Negative	0.5%	Inside	-0.25	Ins
J01.01	Burning down	High	Negative	10.0%	Inside	-1.5	Ins
L05	Collapse of terrain, landslide	High	Negative	<1%	Inside	-0.75	Ins
	Overall score					-1.75	

3.34 The overall impacts score for **4030 Dry heaths** was calculated as -1.75, which 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 the CFP reduction in stock numbers though uncontrolled burning remains a significant issue. The future prospects for this habitat were therefore assessed as Unfavourable – Inadequate.

Plate 1: View of the steep south-eastern slopes below the summit of Cuilcagh. This slope is primarily covered by 4030 Dry heath, much of which has been burned, as well as 8110 Siliceous scree, 8220 Siliceous rocky slopes and GS3 Dry-humid acid grassland. Where the slope levels out, the vegetation is primarily *7130 Active blanket bog and PF2 Poor fen and flush (Photo: BEC Consultants).

4060 Alpine and Boreal heaths

Area

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

Structure and functions

3.36 Five monitoring stops were recorded in **4060 Alpine and Boreal heaths** within the Cuilcagh – Anierin Uplands cSAC (Table 16). 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 one should pass because the failure was marginal, resulting in an overall failure rate of 20.0%. The structure and functions of **4060 Alpine and Boreal heaths** were therefore assessed as Unfavourable – Inadequate.

Table 16: Monitoring criteria and failure rates for 4060 Alpine and Boreal heaths (n = 5).

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	5	0	0
2	Cover of positive indicator species ≥ 66%	Relevé	5	0	0
3	Cover of dwarf shrubs ≥ 10%	Relevé	5	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	5	0	0
5	Cover of non-native species < 1%	Relevé	5	0	0
Vegetation structure					
6	Live leaves of *Carex bigelowii, Deschampsia flexuosa, Festuca ovina, F. vivipara* showing signs of grazing collectively < 10%	Relevé	2	1	50.0
7	Last complete growing season's shoots of ericoids and *Empetrum nigrum* showing signs of browsing collectively < 33%	Relevé	5	1	20.0
8	No signs of burning inside feature	Local vicinity	5	0	0
Physical structure					
9	Cover of disturbed bare ground < 10%	Relevé	5	0	0
10	Cover of disturbed bare ground < 10%	Local vicinity	5	0	0

3.37 The vegetation composition and physical structure of **4060 Alpine and Boreal heaths** were good, with no failures being recorded under the relevant criteria. However, the vegetation structure of **4060 Alpine and Boreal heaths** was poor in some cases, with one stop (20.0%) failing due to excessive browsing of dwarf shrubs and another stop (50.0% of assessments) failing due to excessive grazing of graminoids.

Future prospects

3.38 Four impacts were recorded within **4060 Alpine and Boreal heaths** (Table 17).

Non-intensive sheep grazing (A04.02.02)

3.39 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that grazing by sheep was the main landuse within the site. Approximately 70% of the site was

under commonage and approximately 70% of this area was assessed as being undamaged by grazing by the CFP, and destocking levels between 0 and 43.6% were recommended.

3.40 In the assessment of structure and functions, grazing by sheep was recorded within 60.0% of **4060 Alpine and Boreal heaths** monitoring stops. Grazing intensity varied, with the proportion of dwarf shrub shoots showing signs of grazing ranging from 0 to 40%. Failures due to excessive levels of grazing by sheep were recorded at 40.0% of **4060 Alpine and Boreal heaths** monitoring stops. These stops were located on Cuilcagh Mountain. It is likely that grazing by sheep occurs throughout **4060 Alpine and Boreal heaths** within the cSAC, albeit at very low levels in some areas. The intensity of this impact was assessed as medium overall and its impact as negative. The trend was assessed as improving due to the CFP reduction in stock numbers.

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

3.41 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that, while recreational use of the area is quite low, a small but increasing number of hillwalkers venture onto the ridges and summits. Minor path creation by trampling was noted along sections of popular routes, such as above Moneenteriff cliffs and on Cuilcagh Mountain. A relatively high proportion of the **4060 Alpine and Boreal heaths** within the cSAC are located in these areas (Fig. 4c). During the present survey, relatively low numbers of hillwalkers were observed. The intensity of this impact was assessed as low and its influence as negative. The area of **4060 Alpine and Boreal heaths** affected was estimated to be less than 1% due to the localised nature of the impact.

Invasive non-native species (I01)

3.42 *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.

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

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Medium	Negative	100.0%	Inside	-3	Imp
G01.02	Walking, horseriding and non-motorized vehicles	Low	Negative	<1%	Inside	-0.25	Ins
I01	Invasive, non-native species	Low	Neutral	0.02%	Inside	0	Ins
J01.01	Burning down	High	Negative	0.7%	Inside	-0.75	Ins
	Overall score					-4	

3.43 *Campylopus introflexus* was recorded within one **4060 Alpine and Boreal heaths** monitoring stop (20.0%), although its cover was not sufficiently high to cause the stop to fail. The mean

cover of *C. introflexus* within **4060 Alpine and Boreal heaths** monitoring stops was 0.02% (Table 17). The degraded peat vegetation community DP1 *Campylopus introflexus – Polytrichum* spp. was recorded within two polygons dominated by **4060 Alpine and Boreal heaths** during vegetation mapping. As *C. introflexus* was not found to form extensive carpets, this impact was assessed as being of low intensity and neutral influence.

Burning down (J01.01)

3.44 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that burning is a regular occurrence within the site, with some areas being burned on an annual basis. It was noted that frequent burning can degrade upland habitats. Burning was thought to be carried out in an attempt to improve vegetation for sheep grazing. Several fires, most of which occurred during the bird nesting season, were noted within the Conservation Statement. Although, in the assessment of structure and functions, burning was not recorded within **4060 Alpine and Boreal heaths**, during vegetation mapping, approximately 0.7% of **4060 Alpine and Boreal heaths** on the site were estimated 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.

3.45 The overall impacts score for **4060 Alpine and Boreal heaths** was calculated as -4, which 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 the CFP reduction in stock numbers. The future prospects for this habitat were therefore assessed as Unfavourable – Inadequate.

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

Area

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

Structure and functions

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

3.48 The vegetation composition of the ***6230 Species-rich *Nardus* grassland** monitoring stop was poor. Criterion 4 stipulates that the cover of non-native species should be less than 1%. A cover of 15% was recorded for the non-native *Epilobium brunnescens*, greatly exceeding the threshold and causing the monitoring stop to fail. The vegetation structure and physical structure of the monitoring stop were good.

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

Criteria		Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition					
1	Number of high quality and general indicator species ≥ 7	Relevé	1	0	0
2a	UG1c/UG2c: Number of high quality species present ≥ 2	Relevé	1	0	0
2b	UG1e/UG2e: Number of high quality species present ≥ 1	Relevé	0	n/a	n/a
3	Species richness ≥ 25 species	Relevé	1	0	0
4	Cover of non-native species ≤ 1%	Relevé	1	1	100.0
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	1	0	0
6	Cover of the above negative indicator species collectively ≤ 20%	Relevé	1	0	0
7	Cover of *Sphagnum* species ≤ 10%,	Relevé	1	0	0
8	Cover of *Polytrichum* species ≤ 25%		1	0	0
9	Cover of scrub, bracken and heath ≤ 5%	Relevé	1	0	0
Vegetation structure					
10	Forb component of forb : graminoid ratio 20-90%	Relevé	1	0	0
11	Proportion of the sward between 5-50 cm tall ≥ 25%	Relevé	1	0	0
12	Litter cover ≤ 20%	Relevé	1	0	0
Physical structure					
13	Cover of disturbed bare ground ≤ 10%	Relevé	1	0	0
14	Area of the habitat showing signs of serious grazing or disturbance <20m²	Local vicinity	1	0	0

3.49 The small sample size of one monitoring stop reflects the relative rarity of this habitat within the Cuilcagh – Anierin Uplands cSAC, where only 1.4 ha of ***6230 Species-rich *Nardus* grasslands** were recorded, comprising 0.01% of the site.

Future prospects

3.50 Two impacts were recorded within ***6230 Species-rich *Nardus* grassland** (Table 19).

Non-intensive sheep grazing (A04.02.02)

3.51 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that grazing by sheep was the main landuse within the site. There were some signs of overgrazing at that time, such as poaching and soil slippage and terracing on steeper slopes at low altitudes.

Approximately 70% of the site was under commonage and approximately 70% of this area was assessed as being undamaged by grazing by the CFP, and destocking levels between 0 and 43.6% were recommended.

3.52 In the assessment of structure and functions, grazing by sheep was recorded within the ***6230 Species-rich *Nardus* grassland** monitoring stop. Grazing did not adversely affect the vegetation structure of this monitoring stop but the cover of disturbed bare ground within the monitoring stop (Plate 2) was recorded as 5%. This was not sufficiently high to cause the stop to fail but is indicative of trampling by sheep. Some tracking, terracing and soil exposure due to grazing by sheep was observed within ***6230 Species-rich *Nardus* grassland**. The intensity of this impact was assessed as medium and its impact as negative. The trend was assessed as improving due to the CFP reduction in stock numbers.

Plate 2: *6230 Species-rich *Nardus* grassland, in which *Carex panicea*, *Prunella vulgaris*, *Alchemilla glabra* and *Epilobium brunnescens* are prominent, Bursan, Cuilcagh. Some disturbed bare ground is visible. (Photo: BEC Consultants).

Invasive non-native species (I01)

3.53 *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 ***6230 Species-rich *Nardus* grassland** monitoring stop with a relatively high cover score of 15%. 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 19).

3.54 The overall impacts score for ***6230 Species-rich *Nardus* grassland** was calculated as -3.5, which is below the nominal Favourable Reference Value of zero. There is a positive trend due to the CFP reduction in stock numbers, however, the negative influence of invasive non-native species is likely to remain and potentially increase in the future. As a result 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.

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

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Medium	Negative	100%	Inside	-3	Imp
I01	Invasive, non-native species	Low	Negative	15%	Inside	-0.5	Ins
	Overall score					-3.5	

***7130/7130 Blanket bogs**

Area

3.55 Changes in the area of ***7130/7130 Blanket bogs** were recorded for the period 1995 to 2012 through a combination of observations in the field and analysis of aerial photographs and satellite imagery available through Google Earth (Table 20). Only losses in habitat were found,

Table 20: Impacts causing obvious losses in area of *7130/7130 Blanket bogs, 1995-2012. n.m. indicates not measured.

Impact code	Impact	Area (ha) 1995-2000	Area (ha) 2000-2005	Area (ha) 2005-2012	Area (ha) 1995-2012
C01.03	Peat extraction	1.07	1.08	0.41	2.56
C01.03.01	Hand cutting of peat	0.00	0.00	0.03	0.03
C01.03.02	Mechanical removal of peat	0.56	0.15	0.64	1.35
D01.01	Paths, tracks, cycling tracks	0.00	0.02	0.00	0.02
E04	Structures, buildings in the landscape	0.02	0.00	0.00	0.02
G01.03.02	Off-road motorized driving	1.00	0.00	0.07	1.07
J02.07	Water abstractions from groundwater	0.02	0.00	0.00	0.02
K01.01	Erosion	n.m.	n.m.	n.m.	n.m.
All impacts		2.67	1.25	1.16	5.08
% of habitat		0.04	0.02	0.02	0.09
% loss per year		0.01	<0.01	<0.01	0.01

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 losses in area of ***7130/7130 Blanket bogs** were due to peat extraction (combined area of 3.95 ha) and off-road motorized driving (1.07 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.

Structure and functions

3.56 A total of 39 monitoring stops were recorded in ***7130/7130 Blanket bogs** within the Cuilcagh – Anierin Uplands cSAC (Table 21). 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, 18 monitoring stops failed one criterion or more. Following a review of the ecological condition of these stops, expert judgement determined that three should pass because the failures were marginal, resulting in an overall failure rate of 38.5%. The structure and functions of ***7130/7130 Blanket bogs** were therefore assessed as Unfavourable – Bad. Vegetation mapping indicated that the proportion of inactive and eroding bog within the total area of bog was 2.6%.

3.57 The vegetation composition of ***7130/7130 Blanket bogs** was poor in some cases, with 12.8% of monitoring stops failing due to excessive cover of *Calluna vulgaris*, 7.7% failing due to an inadequate number of positive indicator species and 5.1% failing due to inadequate cover of bryophytes and lichens. The vegetation structure of ***7130/7130 Blanket bogs** was also poor in some cases, with 21.1% of monitoring stops failing due to burning in sensitive areas and 15.4% due to severe burning, which resulted in damage to the bryophyte and lichen layer or exposure of the peat surface.. The physical structure of ***7130/7130 Blanket bogs** was poor in some cases, with 7.7% of monitoring stops failing due to excessive levels of erosion and 5.1% failing due to excessive levels of drainage. One of these monitoring stops (2.6%) also failed due to excessive cover of disturbed bare ground within the monitoring stop and in the local vicinity.

Future prospects

3.58 Fifteen impacts were recorded within ***7130/7130 Blanket bogs** (Table 22).

<u>Non-intensive cattle grazing (A04.02.01)</u>

3.59 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that cattle were formerly grazed within the site. However, the present survey found that grazing by cattle was ongoing. This impact was recorded within ***7130/7130 Blanket bogs** to the east of Cuilcagh Mountain, at Monydoo, Aghaboy, Tullynahunshin and Alteen. The intensity of this

impact was assessed as high and its influence as negative, as heavy poaching was noted in places. The area of ***7130/7130 Blanket bogs** affected was recorded as 1.3%.

Table 21: Monitoring criteria and failure rates for *7130/7130 Blanket bogs (*n* = 39).

Criteria		Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition					
1	Number of positive indicator species present ≥ 7	Relevé	39	3	7.7
2	Cover of bryophyte or lichen species, excluding *Sphagnum fallax* ≥ 10%	Relevé	39	2	5.1
3	Cover of each of the following species: *Calluna vulgaris, Eleocharis multicaulis, Eriophorum vaginatum, Molinia caerulea, Schoenus nigricans, Trichophorum germanicum* individually < 75%	Relevé	39	5	12.8
4	Cover of the following negative indicator species: *Agrostis capillaris, Holcus lanatus, Phragmites australis, Pteridium aquilinum, Ranunculus repens* collectively < 1%	Relevé	39	0	0
5	Cover of non-native species < 1%	Relevé	39	0	0
6	Cover of non-native species < 1%	Local vicinity	39	0	0
7	Cover of scattered native trees and scrub < 10%	Local vicinity	39	0	0
Vegetation structure					
8	Crushed, broken and/or pulled up *Sphagnum* species < 10% of *Sphagnum* cover	Relevé	38	0	0
9	Last complete growing season's shoots of ericoids, *Empetrum nigrum* and *Myrica gale* showing signs of browsing collectively < 33%	Relevé	38	0	0
10	No signs of burning into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Local vicinity	39	6	15.4
9	No signs of burning inside boundaries of sensitive areas*	Local vicinity	38	8	21.1
Physical structure					
12	Cover of disturbed bare ground < 10%	Relevé	39	1	2.6
13	Cover of disturbed bare ground < 10%	Local vicinity	39	1	2.6
14	Area showing signs of drainage resulting from heavy trampling or tracking or ditches or peat cutting < 10%	Local vicinity	39	2	5.1
15	Cover of erosion gullies and eroded areas within the greater bog mosaic < 5%	Local vicinity	39	3	7.7

*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.

Non-intensive sheep grazing (A04.02.02)

3.60 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that grazing by sheep was the main landuse within the site. Approximately 70% of the site was under commonage and approximately 70% of this area was assessed as being undamaged by grazing by the CFP. Destocking levels between 0 and 43.6% were recommended.

3.61 In the assessment of structure and functions, grazing by sheep was recorded within 44.4% of ***7130/7130 Blanket bogs** monitoring stops. Grazing intensity varies across the site, with the proportion of dwarf shrub shoots showing signs of grazing ranging from 0 to 15% but remaining well within acceptable limits, with no failures recorded due to excessive grazing. Overgrazing by sheep was not recorded during vegetation mapping. The intensity of this impact has been assessed as low and its influence as neutral. It is likely that grazing by sheep occurs throughout ***7130/7130 Blanket bogs** within the cSAC, albeit at very low levels in some areas.

Non-intensive horse grazing (A04.02.03)

3.62 During the present survey, grazing by horses was recorded within ***7130/7130 Blanket bogs** at Monydoo, to the east of Cuilcagh Mountain. The intensity of this impact was assessed as high and its influence as negative, as heavy poaching and loss of ***7130/7130 Blanket bog** habitat were noted. The area of ***7130/7130 Blanket bogs** affected was recorded as 0.6%.

Hand cutting of peat (C01.03.01)

3.63 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that peat extraction was formerly carried out by hand (Plate 3) but is now carried out using mechanical methods. Hand cutting of peat was observed during the present survey above Edenmore, on the north-western side of the Cuilcagh ridge. Such small-scale, domestic cutting is permitted within protected areas (Douglas *et al.*, 2008). Although hand cutting of peat is less damaging than mechanical removal of peat, the intensity of this impact was assessed as high and its influence as negative. The area of ***7130/7130 Blanket bogs** affected was estimated to be less than 1%, due to the localised nature of the impact.

Mechanical removal of peat (C01.03.02)

3.64 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC stated that peat has been extracted from ***7130/7130 Blanket bogs** on the lower slopes of the site. While peat cutting was formerly carried out by hand, mechanised methods of peat extraction are now used. Hopper machines and, where slopes are gentle and access tracks have been built, sausage machines have been used to extract peat. The most affected areas were the lower eastern side of Cuilcagh Mountain and along the western section of the road that passes below Bencroy. Although the latter area had not been cut since 1995, revegetation was progressing slowly due to grazing pressure. Mechanical peat extraction was ongoing in the Tullydermot area, on the eastern side of Cuilcagh Mountain, resulting in the loss of ***7130/7130 Blanket bog** habitat and drainage of surrounding areas (NPWS, 2009).

Plate 3: Re-vegetating formerly cut areas of 7130 Inactive blanket bog, Aghnacollia (Photo: BEC Consultants).

3.65 During the present survey, mechanised turf cutting was concentrated within the area to the east of Cuilcagh Mountain. Peat extraction using a hopper was noted at Aghaboy and sausage cutting was observed at Aghnacollia and Binkeeragh. Sausage cutting was also observed on the lower slopes of Benbrack at Derrynananta Upper. As mechanised turf cutting causes severe damage to ***7130/7130 Blanket bogs**, the intensity of this impact was assessed as high and its influence as negative. The area of ***7130/7130 Blanket bogs** affected was estimated to be less than 1%.

Paths, tracks, cycling tracks (D01.01)

3.66 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that track construction, for access to forestry and peat cutting areas, and associated drainage caused degradation of ***7130/7130 Blanket bogs** within the site. During the present survey, track excavation in ***7130/7130 Blanket bogs** was noted around the forestry plantation at Doon, resulting in habitat loss and drainage. The intensity of this impact was assessed as high and its influence as negative. The area of ***7130/7130 Blanket bogs** affected was estimated to be less than 1%.

Structures, buildings in the landscape (E04)

3.67 There were some apparent losses of this habitat due to recently constructed buildings.

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

3.68 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that, while recreational use of the area is quite low, a small but increasing number of hillwalkers venture onto the ridges and summits. Minor path creation by trampling was noted along sections of popular routes, such as above Moneenteriff cliffs and on Cuilcagh Mountain, where ***7130/7130 Blanket bogs** may be found (Fig. 4g). During the present survey, relatively low numbers of hillwalkers were observed. The intensity of this impact was assessed as low and its influence as negative. The area of ***7130/7130 Blanket bogs** affected was estimated to be less than 1% due to the localised nature of the impact.

Off-road motorised driving (G01.03.02)

3.69 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that the use of All Terrain Vehicles (ATVs) was a management issue within the site as this activity can damage peatland vegetation. ATVs are used by farmers to access their livestock in upland areas. During the present survey, ATV tracks were observed within ***7130/7130 Blanket bogs** at several locations throughout the site. The level of damage to the habitat associated with ATVs was generally insignificant although, in one instance, major damage was caused to the surface of ***7130/7130 Blanket bogs** at Commas. Digger tracks, which resulted in the exposure of bare peat, were noted in ***7130/7130 Blanket bogs** at Tullinass. The intensity of this impact was assessed as medium overall and its influence as negative. The area of ***7130/7130 Blanket bogs** affected was estimated to be less than 1%, due to the localised nature of the impact.

Fences, fencing (G05.07)

3.70 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that fencing was a management issue within the site. Stock fencing was erected within large tracts of ***7130/7130 Blanket bogs**. Some of this was thought to form part of the landowners' Rural Environmental Protection Scheme (REPS) plans, but NPWS had not been consulted on the matter. Fencing within ***7130/7130 Blanket bogs** is listed as a notifiable action i.e. an action which could cause damage to the site, and for which prior approval is required before it can be carried out. Where fencing has been erected in upland habitats, erosion commonly occurs where livestock congregate along the line of the fence. During the present survey, cattle, horses and sheep were observed in areas of ***7130/7130 Blanket bogs** enclosed by fencing, to the east of Cuilcagh Mountain. Heavy poaching was observed along the line of the fence in places, where ***7130/7130 Blanket bogs** were too wet to withstand grazing and trampling by livestock. The intensity of this impact is assessed high as and its influence as negative. The area of ***7130/7130 Blanket bogs** affected has been estimated to be less than 1%.

Invasive non-native species (I01)

3.71 *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.

3.72 *Campylopus introflexus* was recorded within 33.3% of ***7130/7130 Blanket bogs** monitoring stops, but its cover was not sufficiently high to cause any of these stops to fail. The mean cover of *C. introflexus* within ***7130/7130 Blanket bogs** monitoring stops was 0.02%. The degraded peat vegetation community DP1 *Campylopus introflexus – Polytrichum* spp. was recorded within 183 polygons dominated by ***7130/7130 Blanket bogs** during vegetation mapping. *C. introflexus* was recorded as forming extensive carpets, covering up to 20% of the area of some polygons.

3.73 Scattered, seedlings and saplings of non-native conifers, mainly *Picea sitchensis*, were observed to have self-seeded from adjacent plantations into ***7130/7130 Blanket bogs** in numerous locations throughout the cSAC. The intensity of this impact was assessed as low and its influence as negative. The area of ***7130/7130 Blanket bogs** affected was estimated to be less than 1%.

Burning down (J01.01)

3.74 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that burning is a regular occurrence within the site, with some areas being burned on an annual basis. It was noted that frequent burning can degrade upland habitats. Burning was thought to be carried out in an attempt to improve vegetation for sheep grazing. Several fires within ***7130/7130 Blanket bogs** were noted within the Conservation Statement. In 1993/4 a fire burned 100-150 ha of ***7130/7130 Blanket bogs** in the Lough Cratty area, causing desiccation of the peat and changes in vegetation structure. The regeneration of *Sphagnum* spp. appeared to be progressing slowly. Two smaller fires occurred in 2000, at Commas Mountain and west of the summit of Slievenakilla (The Playbank). The fire at Commas was thought to be associated with turf cutting. In 2002, two very large fires occurred between Slieve Anierin and Bencroy. The more recent fires all occurred during the bird nesting season.

3.75 During the assessment of structure and functions, 21.1% of monitoring stops failed due to burning in sensitive areas and 15.4% due to severe burning, which resulted in damage to the bryophyte and lichen layer or exposure of the peat surface. During vegetation mapping, approximately 11.1% of ***7130/7130 Blanket bogs** on the site were estimated to have been affected by burning within the last few years (Plate 4). The intensity of this impact has been assessed as high. As burning is thought to be conducted with the aim of encouraging grass growth rather than for conservation management purposes, and due to its severity, timing and uncontrolled nature, with burning occurring in sensitive areas of ***7130/7130 Blanket bog** habitat, the influence of this impact has been assessed as negative.

Water abstractions from groundwater (J02.07)

3.76 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 desiccation of the peat to facilitate turf cutting and afforestation. Although the impact category does not accurately describe the impact in question it is the most appropriate option available.

Plate 4: Recently burned area of *7130 Active blanket bog, Aghaboy (Photo: BEC Consultants).

3.77 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC stated that drainage within the cSAC resulted from turf cutting, forestry and track construction activities. Drains were frequently excavated alongside access tracks to minimise subsidence. Drainage increases the rate of flow of water out of the uplands, causing desiccation and erosion of ***7130/7130 Blanket bogs**. Furthermore, some forestry plantations on adjacent land were hydrologically connected to the cSAC, such as the recent plantation at Leglass, north-west of the site (NPWS, 2009).

3.78 During the present survey, numerous drains associated with forestry were noted within ***7130/7130 Blanket bogs** at Doon and a large, active drain associated with forestry was noted on the southern spur of Cuilcagh Mountain. Numerous long, large drains associated with turf cutting were observed near the western section of the road that passes below Bencroy and at Aghaboy, east of Cuilcagh Mountain. The intensity of this impact was assessed as high and its influence as negative. The area of ***7130/7130 Blanket bogs** affected has been estimated to be 0.5%, based on the area of ***7130/7130 Blanket bogs** within each polygon where drains was recorded.

Erosion (K01.01)

3.79 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that peat erosion occurred within the site. During the assessment of structure and functions, erosion was recorded within the local vicinity of 35.9% of monitoring stops and 21.1% of monitoring stops failed due to excessive levels of erosion on Slieve Anierin and Bencroy. At one

monitoring stop on the summit of Slieve Anierin, the cover of erosion gullies and eroded areas reached 30%.

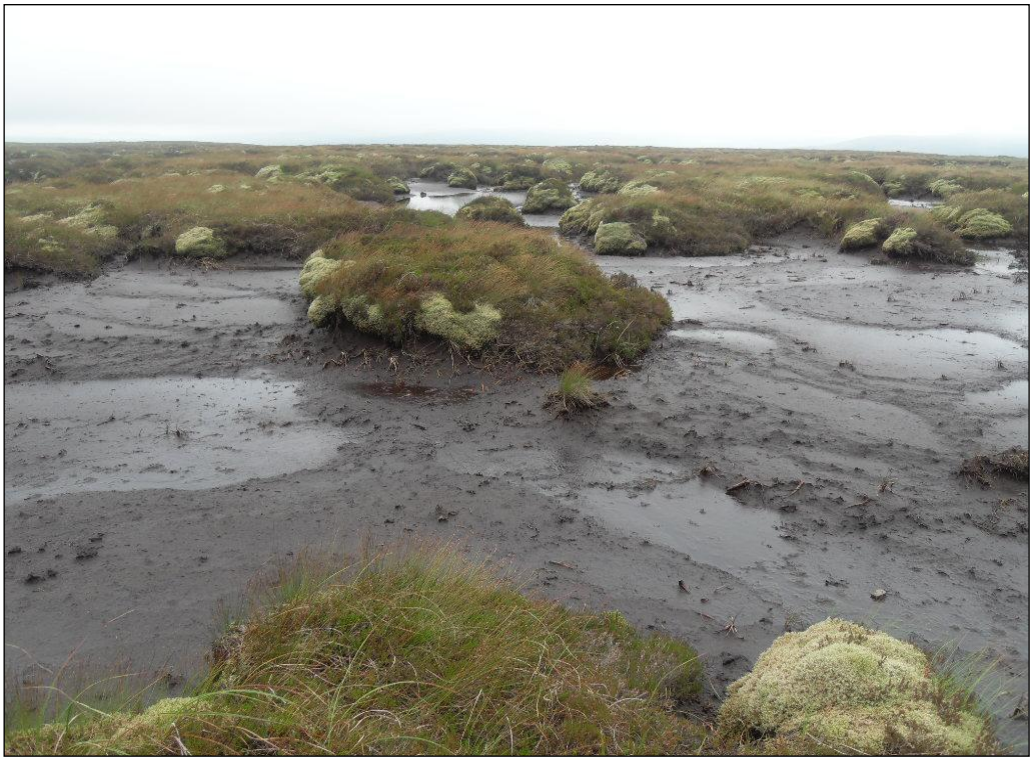

Plate 5: Heavily eroded 7130 Inactive blanket bog on the summit of Bencroy (Photo: BEC Consultants).

3.80 During vegetation mapping, widespread, severe erosion with large expanses of bare peat, peat haggs and large erosion gullies was noted on the broad, flat summit of Slieve Anierin. Severe erosion, with expanses of bare peat, was also recorded on the summit of Bencroy (Plate 5). Localised erosion was observed elsewhere. Eroded ***7130/7130 Blanket bogs** were observed below the summit of Knockgorm. Eroded sheep tracks were observed on the southern slope of Slieve Anierin and at Aghaboy, east of Cuilcagh Mountain. An area of good quality, wet **PB3 Lowland blanket bog** with *Sphagnum magellanicum* was located at Derrynananta Upper. This habitat is scarce within the Cuilcagh – Anierin Uplands cSAC, comprising just 0.03% of the site area. However, this area of **PB3 Lowland blanket bog** was seen to be rapidly eroding due to trampling by sheep and proximity to a stream and is likely to be lost unless restoration measures are undertaken.

3.81 Current grazing and hillwalking levels within ***7130/7130 Blanket bogs** were not found to be excessive. However, once exposed, areas of bare peat may continue to erode due to climatic conditions. The site receives relatively high levels of rainfall. The ridge of Cuilcagh Mountain receives an annual mean of 2000-2400 mm per year for 1981-2010, while other parts of the cSAC receive 1600-2000 mm per year (Met Éireann, 2013). Under present climatic conditions, peat erosion is an integral part of the blanket peatland system in mountain areas (Bradshaw & McGee, 1988). Therefore unless restoration measures are undertaken in badly eroded areas,

erosion is likely to continue. The intensity of this impact was assessed as high and its influence as negative. Approximately 3.7% 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**.

Collapse of terrain, landslide (L05)

3.82 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) acknowledged that landslides occur within the site. According to Dykes *et al.* (2008), Cuilcagh Mountain exhibited an unusually high spatial and temporal frequency of peat mass movements. This was attributed to the attainment of peat depth thresholds and inherent structural weaknesses, due to the unconformable deposition of thin layers of glacial till and blanket peat over weathered shale bedrock. Many of the landslides reported were also associated with heavy and intense rainfall events. This study concluded that most human activities probably had relatively little influence on peat stability at Cuilcagh Mountain, with the exception of cattle trampling and drainage ditches, although it should be noted that this study did not include an exhaustive analysis of landuse factors. During the present survey, a number of landslides were noted. Although these generally occurred within non-Annex habitats, primarily **PF2 Poor fen and flush**, bog slides were noted within ***7130/7130 Blanket bogs** below Benbrack and at Derrynananta Upper. The intensity of this impact was assessed as high and its influence as negative. The area affected has been estimated to be less than 1%, due to the localised nature of the impact.

Table 22: Assessment of impacts for *7130/7130 Blanket bogs. Under trend, Dis = Disimproving, Imp = Improving, Ins = Insufficient data.

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.01	Non-intensive cattle grazing	High	Negative	1.3%	Inside	-1.5	Ins
A04.02.02	Non-intensive sheep grazing	Low	Neutral	100%	Inside	0	Imp
A04.02.03	Non-intensive horse grazing	High	Negative	0.6%	Inside	-0.75	Ins
C01.03.01	Hand cutting of peat	High	Negative	<1%	Inside	-0.75	Ins
C01.03.02	Mechanical removal of peat	High	Negative	<1%	Inside	-0.75	Ins
D01.01	Paths, tracks, cycling tracks	High	Negative	<1%	Inside	-0.75	Ins
E04	Structures, buildings in the landscape	High	Negative	<1%	Inside	-0.75	Ins
G01.02	Walking, horseriding and non-motorised vehicles	Low	Negative	<1%	Inside	-0.25	Ins
G01.03.02	Off-road motorized driving	Medium	Negative	<1%	Inside	-0.5	Ins
G05.07	Fences, fencing	High	Negative	<1%	Inside	-0.75	Ins
I01	Invasive non-native species	Low	Negative	<1%	Inside	-0.25	Ins
J01.01	Burning down	High	Negative	11.1%	Inside	-1.5	Ins
J02.07	Water abstractions from groundwater	High	Negative	0.5%	Inside/ outside	-0.75	Ins
K01.01	Erosion	High	Negative	3.7%	Inside	-1.5	Ins
L05	Collapse of terrain, landslide	High	Negative	<1%	Inside	-0.75	Ins
	Overall score					-11.5	

3.83 The overall impacts score for **7130/7130 Blanket bogs** was calculated as -11.5, which is significantly below the nominal Favourable Reference Value of zero. Whilst there are signs that the CFP reduction in stock numbers has resulted in localised decreased damage levels within this habitat (see paragraph 3.7), it is not thought this will result in a significant change in the conservation status of the habitat overall within the next twelve years due to continued significant impacts such as erosion, burning, drainage and peat extraction. The combined future trend for area and structure and functions was therefore assessed as no change. The future prospects for this habitat were therefore assessed as Unfavourable – Bad.

7140 Transition mires

Area

3.84 Changes in the area of **7140 Transition mires** were recorded for the period 1995 to 2012 through a combination of observations in the field and analysis of aerial photographs and satellite imagery available through Google Earth. These data are restricted to obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. No changes in area of habitat were noted; therefore the area status was assessed as Favourable.

Structure and functions

3.85 Four monitoring stops were recorded in **7140 Transition mires** within the Cuilcagh – Anierin Uplands cSAC (Table 23). 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, resulting in an overall failure rate of 0.0%. The structure and functions of **7140 Transition mires** were therefore assessed as Favourable.

3.86 One monitoring stop failed one criterion relating to vegetation composition. Criterion 4 stipulates that the cover of the negative indicator species *Anthoxanthum odoratum*, *Epilobium hirsutum*, *Holcus lanatus* within the monitoring stop should be less than 1%. A cover of 1% of *A. odoratum* was recorded at the monitoring stop in question. As this failure was marginal, expert judgement determined that the monitoring stop should pass.

Future prospects

3.87 Three impacts were recorded within **7140 Transition mires** (Table 24).

Non-intensive cattle grazing (A04.02.01)

3.88 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that cattle were formerly grazed within the site. However, the present survey found that grazing by cattle was ongoing. This impact was recorded within **7140 Transition mires** in one polygon,

located at Alteen, to the east of Cuilcagh Mountain. The intensity of this impact was assessed as low and its influence as negative, as some poaching was noted. The area of **7140 Transition mires** affected was recorded as 2.8%.

Non-intensive horse grazing (A04.02.03)

3.89 During the assessment of structure and functions, grazing by horses was noted at one **7140 Transition mires** monitoring stop (25.0%) at Monydoo, to the east of Cuilcagh Mountain. Trampling occurred around the margins of the habitat. Some drainage and disturbance occurred in the local vicinity of the monitoring stop, but were not sufficiently severe to cause the monitoring stop to fail. The intensity of this impact was assessed as low and its influence as negative. The area of **7140 Transition mires** affected was recorded as 6.9%.

Table 23: Monitoring criteria and failure rates for 7140 Transition mires (*n* = 4).

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	1	0	0
1b	PFLU5: number of positive indicator species from Groups i or ii present ≥ 3		3	0	0
1c	RFEN1b: number of positive indicator species from Groups i or ii present ≥ 6		0	n/a	n/a
2	Number of species from Group i present ≥ 1	Relevé	4	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	4	0	0
4	Cover of the following species: *Anthoxanthum odoratum*, *Epilobium hirsutum*, *Holcus lanatus* collectively < 1%	Relevé	4	1	25.0
5	Cover of non-native species < 1%	Relevé	4	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	4	0	0
Physical structure					
7	Cover of disturbed bare ground < 10%	Relevé	4	0	0
8	Cover of disturbed bare ground < 10%	Local vicinity	4	0	0
9	Area showing signs of drainage resulting from heavy trampling or tracking or ditches < 10%	Local vicinity	4	0	0

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

3.90 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that recreational use of the site was quite low. However, during the assessment of structure and functions, a walking path was noted within the local vicinity of one **7140 Transition mires** monitoring stop (25.0%), near the road that runs below Bencroy. A cover of 3% disturbed bare

ground was recorded in the local vicinity of the monitoring stop, which was not sufficiently high to cause the monitoring stop to fail. The intensity of this impact was assessed as low and its influence as negative. The area of **7140 Transition mires** affected was estimated to be less than 1%, due to the localised nature of the impact.

Table 24: Assessment of impacts for 7140 Transition mires. Under trend, Ins = Insufficient data.

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.01	Non-intensive cattle grazing	Low	Negative	2.8%	Inside	-0.5	Ins
A04.02.03	Non-intensive horse grazing	Low	Negative	6.9%	Inside	-0.5	Ins
G01.02	Walking, horseriding and non-motorized vehicles	Low	Negative	<1%	Inside	-0.25	Ins
	Overall score					-1.25	

3.91 The overall impacts score for **7140 Transition mires** was calculated as -1.25 which is below the nominal Favourable Reference Value of zero. The combined future trend for area and structure and functions was deemed to be no change though the habitat may benefit from the general reductions in grazing through the CFP reduction in stock numbers (paragraph 3.7). The future prospects for this habitat were therefore assessed as Favourable.

7150 *Rhynchosporion* depressions

Area

3.92 Changes in the area of **7150 *Rhynchosporion* depressions** were recorded for the period 1995 to 2012 through a combination of observations in the field and analysis of aerial photographs and satellite imagery available through Google Earth. These data are restricted to obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. No changes in area of habitat were noted; therefore the area status was assessed as Favourable.

Structure and functions

3.93 One monitoring stop was recorded in **7150 *Rhynchosporion* depressions** within Cuilcagh – Slieve Anierin cSAC (Table 25). In the assessment of structure and functions, this monitoring stop failed two criteria. Following a review of the ecological condition of this stop, expert judgement determined that no changes should be made, resulting in an overall failure rate of 100.0%. The structure and functions of **7150 *Rhynchosporion* depressions** were therefore assessed as Unfavourable - Bad.

3.94 The vegetation composition and vegetation structure of the **7150 *Rhynchosporion* depressions** monitoring stop were good, with no failures being recorded under the relevant criteria.

However, its physical structure was poor, with failures being recorded due to excessive cover of disturbed bare ground in the local vicinity and excessive levels of erosion.

3.95 The small sample size of one monitoring stop reflects the relative rarity of this habitat within the Cuilcagh – Anierin Uplands cSAC, where only 0.05 ha of **7150 *Rhynchosporion* depressions** were recorded, comprising 0.001% of the site.

Table 25: Monitoring criteria and failure rates for 7150 *Rhynchosporion* depressions (n = 1).

Criteria		Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition					
1	Number of positive indicator species present ≥ 5	Relevé	1	0	0
2	Cover of *Rhynchospora* spp. ≥ 10%	Relevé	1	0	0
3	Cover of each of the following species: *Eleocharis multicaulis*, *Molinia caerulea, Schoenus nigricans, Trichophorum germanicum* individually < 35%	Relevé	1	0	0
4	Cover of the following negative indicator species: *Agrostis capillaris, Holcus lanatus, Phragmites australis, Pteridium aquilinum, Ranunculus repens* collectively < 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
Vegetation structure					
7	Crushed, broken and/or pulled up *Sphagnum* species < 10% of *Sphagnum* cover	Relevé	1	0	0
8	Last complete growing season's shoots of ericoids, *Empetrum nigrum* and *Myrica gale* shrubs showing signs of browsing collectively < 33%	Relevé	1	0	0
9	No signs of burning into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Local vicinity	1	0	0
10	No signs of burning inside boundaries of sensitive areas*	Local vicinity	1	0	0
Physical structure					
11	Cover of disturbed bare ground < 10%	Relevé	1	0	0
12	Cover of disturbed bare ground < 10%	Local vicinity	1	1	100.0
13	Area showing signs of drainage resulting from heavy trampling or tracking or ditches < 10%	Local vicinity	1	0	0
14	Cover of erosion gullies and eroded areas within the greater bog mosaic < 5%	Local vicinity	1	1	100.0

*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.

Future prospects

3.96 Three impacts were recorded within **7150 *Rhynchosporion* depressions** (Table 26).

Non-intensive sheep grazing (A04.02.02)

3.97 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that grazing by sheep was the main landuse within the site. Approximately 70% of the site was under commonage and approximately 70% of this area was assessed as being undamaged by grazing by the CFP. Destocking levels between 0 and 43.6% were recommended.

3.98 The **7150 *Rhynchosporion* depressions** monitoring stop failed the assessment of structure and functions. It exhibited excessive cover of disturbed bare ground in the local vicinity, with a cover score of 15% being recorded. This monitoring stop was located within an area of good quality, wet **PB3 Lowland blanket bog** containing *Sphagnum* magellanicum, located at Derrynananta Upper, which was being severely damaged by high levels of trampling by sheep. The intensity of this impact was assessed as high and its influence as negative. The area of **7150 *Rhynchosporion* depressions** affected was estimated to be 70.2%, based on the area of the habitat present within the polygon where this impact was recorded. The trend was assessed as improving due to the CFP reduction in stock numbers within the commonage.

Invasive non-native species (I01)

3.99 *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.

3.100 *Campylopus introflexus* was recorded within the **7150 *Rhynchosporion* depressions** monitoring stop with a cover score of 0.1%, which was not sufficient to cause the monitoring stop to fail. At this monitoring stop, high levels of disturbance were recorded and this is likely to have facilitated the colonisation of *C. introflexus*. As *C. introflexus* was not recorded as forming extensive carpets, this impact was assessed as being of low intensity and neutral influence.

Erosion (K01.01)

3.101 The **7150 *Rhynchosporion* depressions** monitoring stop failed the assessment of structure and functions. It exhibited excessive levels of erosion, with a cover score of 10% erosion gullies and eroded areas being recorded within the local vicinity. This monitoring stop was located in an area of good quality, wet **PB3 Lowland blanket bog** at Derrynananta Upper, which was being rapidly eroded due to high levels of trampling by sheep and proximity to a stream. **7150 *Rhynchosporion* depressions** are scarce within the Cuilcagh – Anierin Uplands cSAC, comprising just 0.001% of the site. This particular example comprised 70.2% of the area of **7150 *Rhynchosporion* depressions** recorded within the site. Unless restoration measures are implemented, it is threatened with imminent loss due to rapid and severe erosion, which would result in reduced habitat diversity within the site and a nett loss of Annex habitat. The

intensity of this impact was assessed as high and its influence as negative. The area of **7150 *Rhynchosporion* depressions** affected was estimated to be 70.2%, based on the area of the habitat present within the polygon where this impact was recorded.

Table 26: 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	High	Negative	70.2%	Inside	-3	Imp
I01	Invasive non-native species	Low	Neutral	0.1%	Inside	0	Ins
K01.01	Erosion	High	Negative	70.2%	Inside	-3	Ins
	Overall score					-6	

3.102 The overall impacts score for **7150 *Rhynchosporion* depressions** was calculated as -6 which is below to the nominal Favourable Reference Value of zero. While the combined future trend for area and structure and functions was deemed to be improving due to the CFP reduction in stock numbers, a substantial proportion of the **7150 *Rhynchosporion* depressions** within the Cuilcagh – Anierin Uplands cSAC are likely to be lost in the near future due to erosion unless restoration measures are implemented. The future prospects for this habitat were therefore assessed as Unfavourable – Bad.

7230 Alkaline fens

Area

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

Structure and functions

3.104 Two monitoring stops were recorded in **7230 Alkaline fens** within the Cuilcagh – Anierin Uplands cSAC (Table 27). In the assessment of structure and functions, one monitoring stop failed two criteria. Following a review of the ecological condition of this monitoring stop, expert judgement determined that no changes should be made, resulting in an overall failure rate of 50.0%. The structure and functions of **7230 Alkaline fens** were therefore assessed as Unfavourable – Bad.

3.105 The vegetation composition of one **7230 Alkaline fens** monitoring stop was poor, with failures recorded due to an inadequate number of positive vascular indicator species and inadequate

cover of brown mosses and vascular indicator species. The vegetation structure and physical structure of **7230 Alkaline fens** monitoring stops were good, with no failures being recorded under the relevant criteria.

Table 27: Monitoring criteria and failure rates for 7230 Alkaline fens (*n* = 2).

Criteria		Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition					
1	At least one brown moss species present	Relevé	2	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		2	1	50.0
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%		2	1	50.0
4	Total cover of the following species: *Anthoxanthum odoratum, Epilobium hirsutum, Holcus lanatus, Ranunculus repens* < 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
7	Total cover of *Juncus effusus* and *Phragmites australis* < 10%	Local vicinity	2	0	0
Vegetation structure					
8	At least 50% of the live leaves/flowering shoots are more than 5 cm above ground surface	Relevé	2	0	0
Physical structure					
9	Cover of <u>disturbed</u>, bare ground < 10%	Relevé	2	0	0
10	Cover of <u>disturbed</u>, bare ground < 10%	Local vicinity	2	0	0
11	Area showing signs of <u>drainage</u> resulting from ditches or heavy trampling or tracking < 10%	Local vicinity	2	0	0
12	Where tufa is present, <u>disturbed</u> proportion of vegetation cover < 1%	Local vicinity	0	n/a	n/a

Future prospects

3.106 Non-intensive grazing by cattle was the only impact recorded within **7230 Alkaline fens** (Table 28).

<u>Non-intensive cattle grazing (A04.02.01)</u>

3.107 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that cattle were formerly grazed within the site. However, the present survey found that grazing by cattle was ongoing. Trampling by cattle was recorded at one **7230 Alkaline fens** monitoring stop (50.0%), located at Tullynahunshin, to the east of Cuilcagh Mountain. Some drainage and disturbance occurred in the local vicinity of the monitoring stop, but were not sufficiently severe to cause the monitoring stop to fail. The intensity of this impact was assessed as low and

its influence as negative. During vegetation mapping, grazing by cattle was also recorded at Alteen, Monydoo and Aghaboy. The area of **7230 Alkaline fens** affected was estimated to be 54.7%, based on the area of **7230 Alkaline fens** recorded within the part of the site that was grazed by cattle.

Table 28: Assessment of impacts for 7230 Alkaline fens. Under trend, Ins = Insufficient data.

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.01	Non-intensive cattle grazing	Low	Negative	100%	Inside	-1.5	Ins
	Overall score					-1.5	

3.108 The overall impacts score for **7230 Alkaline fens** was calculated as -1.5 which is below the nominal Favourable Reference Value of zero. The combined future trend for area and structure and functions was deemed to be no change though the habitat may benefit from the general reductions in grazing through the CFP reduction in stock numbers (paragraph 3.7). The future prospects for this habitat were therefore assessed as Unfavourable – Inadequate.

8110 Siliceous scree

Area

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

Structure and functions

3.110 Four monitoring stops were recorded in **8110 Siliceous scree** within Cuilcagh – Anierin Uplands cSAC (Table 29). 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 one should pass because the failure was marginal, resulting in an overall failure rate of 25.0%. The structure and functions of **8110 Siliceous scree** were therefore assessed as Unfavourable – Inadequate.

3.111 The vegetation composition of two **8110 Siliceous scree** monitoring stops was poor, with one (25.0%) failing due to excessive cover of the non-native moss species *Campylopus introflexus* and another (25.0%) failing due to excessive cover of grasses and dwarf shrubs. The vegetation structure and physical structure of **8110 Siliceous scree** were good, with no failures being recorded under the relevant criteria.

Future prospects

3.112 Three impacts were recorded within **8110 Siliceous scree** (Table 30).

Non-intensive sheep grazing (A04.02.02)

3.113 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that grazing by sheep was the main landuse within the site. Approximately 70% of the site was under commonage and approximately 70% of this area was assessed as being undamaged by grazing by the CFP. Destocking levels between 0 and 43.6% were recommended.

3.114 In the assessment of structure and functions, grazing by sheep was recorded within 50.0% of **8110 Siliceous scree** monitoring stops. Grazing intensity varied, with the proportion of forb leaves and dwarf shrub shoots showing signs of grazing ranging from 0 to 20% but remaining well within acceptable limits, with no failures recorded due to excessive grazing. Although grazing is probably not required for the maintenance of **8110 Siliceous scree**, the habitat is believed to tolerate very light grazing (Hughes, 2008). The intensity of this impact was assessed as low and its influence as neutral. The trend was assessed as improving due to the CFP reduction in stock numbers.

Table 29: Monitoring criteria and failure rates for 8110 Siliceous scree (*n* = 4).

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	4	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	4	0	0
3	Proportion of vegetation composed of non-native species < 1%	Relevé	4	1	25.0
4	Block scree: number of positive indicator species for 8220 present ≥ 1	Local vicinity	2	0	0
5	Cover of grass species and dwarf shrubs collectively < 20%	Local vicinity	4	1	25.0
6	Cover of *Pteridium aquilinum*, native trees and scrub collectively < 25%	Local vicinity	4	0	0
Vegetation structure					
7	Live leaves of forbs and shoots of dwarf shrubs showing signs of grazing or browsing collectively < 50%	Relevé	4	0	0
Physical structure					
8	Ground disturbed by human & animal paths, scree running, vehicles < 10%	Relevé	4	0	0
9	Ground disturbed by human & animal paths, scree running, vehicles < 10%	Local vicinity	4	0	0

Invasive non-native species (I01)

3.115 *Campylopus introflexus* is a non-native pioneer moss species of bare peat (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.

3.116 *Campylopus introflexus* was recorded within one **8110 Siliceous scree** monitoring stop (25.0%) with a cover score of 0.3%, which caused the monitoring stop to fail. The mean cover of *C. introflexus* within **8110 Siliceous scree** monitoring stops was 0.1% (Table 30). As *C. introflexus* is not considered invasive within this habitat, this impact was assessed as being of low intensity and neutral influence.

Species composition change (succession) (K02.01)

3.117 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that the **8110 Siliceous scree** below Moneenterriff cliffs was quite stable, with good lichen cover and mostly heathy vegetation in crevices, while finer, looser, unvegetated scree was found under cliffs around Cuilcagh Mountain and in steep gorges.

3.118 In the assessment of structure and functions, one **8110 Siliceous scree** monitoring stop (25.0%) failed due to poor vegetation composition as a result of succession. The local vicinity of the monitoring stop contained a relatively high proportion of *Calluna vulgaris*. Much of the **8110 Siliceous scree** within the Cuilcagh – Anierin Uplands cSAC consists of relatively stable block scree, which is prone to colonisation by species atypical of scree and consequent succession. The **8110 Siliceous scree** appears to shift towards **4030 Dry heath**. The intensity of this impact has been assessed as medium. Although **4030 Dry heath** is also an Annex I habitat, **8110 Siliceous scree** is relatively scarce within the site so the influence of this impact has been assessed as negative. As block scree impedes access by herbivores, the manipulation of grazing levels is unlikely to affect the trend of this impact in these areas.

3.119 The overall impacts score for **8110 Siliceous scree** was calculated as -1 which is below the nominal Favourable Reference Value of zero. The combined future trend for area and structure and functions was deemed to be disimproving due to successional changes in the habitat. The future prospects for this habitat were therefore assessed as Unfavourable - Inadequate.

Table 30: Assessment of impacts for 8110 Siliceous scree.
Under trend, Dis = Disimproving, Imp = Improving, Ins = Insufficient data.

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Low	Neutral	50.0%	Inside	0	Imp
I01	Invasive non-native species	Low	Neutral	0.1%	Inside	0	Ins
K02.01	Species composition change (succession)	Medium	Negative	25.0%	Inside	-1	Dis
	Overall score					-1	

8210 Calcareous rocky slopes

3.120 This habitat was recorded as marginal examples in just two polygons on the eastern boundary of the cSAC. As such detailed conservation assessment was not deemed appropriate. Expert judgement has been used to assess each of the three status aspects as Favourable.

8220 Siliceous rocky slopes

Area

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

Structure and functions

3.122 Five monitoring stops were recorded in **8220 Siliceous rocky slopes** within the Cuilcagh – Anierin Uplands cSAC (Table 31). In the assessment of structure and functions, these 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 = 5).

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

Future prospects

3.123 Non-intensive grazing by sheep was the only impact recorded within **8220 Siliceous rocky slopes** (Table 32).

Non-intensive sheep grazing (A04.02.02)

3.124 The Conservation Statement for Cuilcagh – Anierin Uplands cSAC (NPWS, 2009) stated that grazing by sheep was the main landuse within the site. Approximately 70% of the site was under commonage and approximately 70% of this area was assessed as being undamaged by grazing by the CFP. Destocking levels between 0 and 43.6% were recommended.

3.125 In the assessment of structure and functions, grazing by sheep was recorded within one **8220 Siliceous rocky slopes** monitoring stop (20.0%). The proportion of forb leaves and dwarf shrub shoots showing signs of grazing was 10%, which was well within acceptable limits. Although grazing is probably not required for the maintenance of **8220 Siliceous rocky slopes**, the habitat is believed to tolerate very light grazing (Hughes, 2008). The intensity of this impact was assessed as low and its influence as neutral. The trend was assessed as improving due to the CFP reduction in stock numbers.

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

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Low	Neutral	20.0%	Inside	0	Imp
	Overall score					0	

3.126 The overall impacts score for **8220 Siliceous rocky slopes** has been calculated as 0, which equals the nominal Favourable Reference Value. 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.

Summary of conservation assessment

3.127 The summary results for the conservation assessment of Annex I habitats in Cuilcagh – Anierin Uplands cSAC are presented in Table 33. Of the eleven habitats assessed, three habitats were assessed as Favourable, two as Unfavourable – Inadequate and six as Unfavourable – Bad.

3.128 Generally, habitats performed well in the area assessments with no major losses of habitat being readily apparent. Peatland habitats tended to perform poorly in the assessments of structure and functions, while rocky habitats perform better. Habitats tended to perform better under future prospects than under structure and function as it is predicted that habitats will gradually recover from previous high stocking levels.

Table 33: Summary of conservation status assessments for Annex I habitats in Cuilcagh – Anierin Uplands cSAC.

Annex I code	**Habitat**	**Area**	**Structure and functions**	**Future prospects**	**Overall assessment**
4010	Wet heaths	Unfavourable - Inadequate	Unfavourable - Bad	Unfavourable - Inadequate	Unfavourable - Bad
4030	Dry heaths	Unfavourable - Inadequate	Unfavourable - Bad	Unfavourable - Inadequate	Unfavourable - Bad
4060	Alpine and Boreal heaths	Favourable	Unfavourable - Inadequate	Unfavourable - Inadequate	Unfavourable - Inadequate
*6230	Species-rich *Nardus* grassland	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	Unfavourable - Bad
*7130/7130	Blanket bogs	Unfavourable - Inadequate	Unfavourable - Bad	Unfavourable - Bad	Unfavourable - Bad
7140	Transition mires	Favourable	Favourable	Favourable	Favourable
7150	*Rhynchosporion* depressions	Favourable	Unfavourable - Bad	Unfavourable - Bad	Unfavourable - Bad
7230	Alkaline fens	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	Unfavourable - Bad
8110	Siliceous scree	Favourable	Unfavourable - Inadequate	Unfavourable - Inadequate	Unfavourable - Inadequate
8210	Calcareous rocky slopes	Favourable	Favourable	Favourable	Favourable
8220	Siliceous rocky slopes	Favourable	Favourable	Favourable	Favourable

4. DISCUSSION

Natura 2000 Standard Data Form

4.1 Ten 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, 4060, 6150, 6430, 7140, 7150, *7220, 7230, 8110 and 8210. **3260 Floating river vegetation** occurs in the Cladagh or Swanlinbar River at Commas. Examples of **4060 Alpine and Boreal heaths** are found on the higher peaks and this habitat is abundant on the ridge on the top of Cuilcagh where small examples of **6150 Siliceous alpine and boreal grasslands** are also to be found. **6430 Hydrophilous tall herb communities** occur on Slieve Anierin and near Benbrack. **7140 Transition mires** were found across the site and whilst the overall cover is low, the frequency of this habitat was a significant characteristic of the site. **7150 *Rhynchosporion* depressions** were recorded from just two polygons. ***7220 Petrifying springs** were recorded from eight polygons, mainly from around the Cuilcagh massif. **7230 Alkaline fens** were found throughout the site but again, primarily from the Cuilcagh area. **8110 Siliceous scree** is found throughout the site while **8210 Calcareous rocky slopes** are found in just two locations on the eastern boundary of the site.

4.2 The current version of the Natura 2000 Standard Data Form for this site estimates the area of **4010 Wet heath** to be 15% of the site whereas this survey has estimated it to be substantially lower at 0.8%. The area of ***7130/7130 Blanket bog** given on the form is 58% of the site which is a slight underestimate with 61.1% being recorded for the current study. **4030 Dry heath** was noted on the form as covering 5% of the site and the current survey recorded this from 7.9% of the site.

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

Additional recommendations

4.4 Whilst a Conservation Statement exists for Cuilcagh – Anierin Uplands cSAC (NPWS 2009), a Conservation Plan is required which should utilise the information provided by this report. Management objectives in the plan need to address the impacts highlighted in this report if progress is to be made towards attaining Favourable status for the Annex I habitats. The four major impacts are livestock grazing, burning, turf-cutting by machine and peat erosion.

4.5 Levels of livestock grazing are being addressed through the CFP. Whilst CFP reductions in stock numbers 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 a major impact in ***7130/7130 Blanket bogs.** Whilst some areas of eroded peat may gradually revegetate as a result of the CFP reductions in stock

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

4.7 Burning is a major impact on peatland habitats in some areas of the cSAC. Whilst burning can be an important tool in heathland management, uncontrolled and too frequent burning can damage the long-term viability of heaths. Burning is not recognised as a valid management tool for blanket bog but has been used in the past and was recorded during the current survey. Regulation of burning at a site level is required.

4.8 Active turf-cutting by sausage machine and machine-cutting of turf banks is occurring at several locations within the site having a major localised impact on ***7130/7130 Blanket bogs**. Appropriate regulation of turf-cutting is required within the site.

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

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

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APPENDIX 1: ANNEX I HABITATS

The following standard abbreviations are used throughout this report for Annex I habitats. With the exception of habitats 4060, 6150 and 7130, these follow the abbreviations used in NPWS (2008).

Annex I code	Full name of Annex I habitat	Standard abbreviation
3130	Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*	3130 Upland oligotrophic lakes
3160	Natural dystrophic lakes and ponds	3160 Dystrophic lakes
3260	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	3260 Floating river vegetation
4010	Northern Atlantic wet heaths with *Erica tetralix*	4010 Wet heaths
4030	European dry heaths	4030 Dry heaths
4060	Alpine and Boreal heaths	4060 Alpine and Boreal heaths
6150	Siliceous alpine and boreal grasslands	6150 Siliceous alpine and boreal grasslands
6230	*Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)	*6230 Species-rich *Nardus* grasslands
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	6430 Hydrophilous tall herb communities
7130	Blanket bogs (* if active bog)	*7130 Active blanket bog or 7130 Inactive blanket bog or *7130/7130 Blanket bog
7140	Transition mires and quaking bogs	7140 Transition mires
7150	Depressions on peat substrates of the *Rhynchosporion*	7150 *Rhynchosporion* depressions
7220	*Petrifying springs with tufa formation (*Cratoneurion*)	*7220 Petrifying springs
7230	Alkaline fens	7230 Alkaline fens
8110	Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsetalia ladani*)	8110 Siliceous scree
8210	Calcareous rocky slopes with chasmophytic vegetation	8210 Calcareous rocky slopes
8220	Siliceous rocky slopes with chasmophytic vegetation	8220 Siliceous rocky slopes

APPENDIX 2: PHOTOGRAPHS

Plate A1: *Listera cordata* in *7130 Active blanket bog, Tullynahaia, Bencroy (Photo: Philip Perrin).

Plate A2: 4060 Alpine and boreal heath, with *Calluna vulgaris*, *Racomitrium lanuginosum* and *Huperzia selago*, which clothes the summit ridge of Cuilcagh (Photo: Philip Perrin).

Plate A3: Rocky 4030 Dry heath, with *Calluna vulgaris* and a high cover of pleurocarpous mosses, on the slopes of Cuilcagh, Eshveagh (Photo: Rory Hodd).

Plate A4: 4010 Wet heath vegetation, with *Trichophorum germanicum*, *Calluna vulgaris*, *Erica tetralix* and *E. cinerea*, Commas (Photo: Philip Perrin).

Plate A5: *7130 Active blanket bog, with *Calluna vulgaris* and *Eriophorum vaginatum*, Barnameenagh, Slieve Anierin (Photo: Rory Hodd).

Plate A6: PF2 Poor fen and flush, dominated by *Juncus effusus*, with *Polytrichum commune* and *Sphagnum fallax*, Slievenakilla (Photo: Eamonn O'Sullivan).

Plate A7: 7140 Transition mire, with *Carex rostrata* and *Sphagnum fallax*, Knockacullion (Photo: Philip Perrin).

Plate A8: 7230 Alkaline fen, with *Carex rostrata*, *C. panicea* and abundant brown mosses, including *Scorpidium revolvens* and *Campylium stellatum*, Alteen (Photo: Rory Hodd).

Plate A9: 8110 Siliceous scree, with a few species including *Racomitrium lanuginosum*, *Vaccinium myrtillus* and *Dryopteris dilatata*, south of summit of Cuilcagh (Photo: Philip Perrin).

Plate A10: 8220 Siliceous rocky slope, on which *Polypodium vulgare* and *Scapania gracilis* grow, Greaghnaguillaun, Slieve Anierin (Photo: Eamonn O'Sullivan).

Plate A11: View to Lough Allen and Seltannasaggart from Slieve Anierin, with a large swathe of PF2 Poor fen and flush, dominated by *Juncus effusus*, in the foreground (Photo: Jenni Roche).

Plate A12: View of Benbrack from the area of *7130 Active blanket bog to its east. The bog in the foreground is dominated by *Trichophorum germanicum* and *Calluna vulgaris* (Photo: Philip Perrin).

Plate A13: View of the northern slopes of Cuilcagh from Alteen. The *7130 Active blanket bog in the foreground is dominated by *Trichophorum germanicum* (Photo: Rory Hodd).

Plate A14: View across the *7130 Active blanket bog-covered plateau at Alteen from the eastern slopes of Cuilcagh (Photo: Rory Hodd).

Plate A15: Large area of forestry within the SAC, Commas (Photo: Philip Perrin).

APPENDIX 3: PLANT SPECIES LIST

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

VASCULAR SPECIES

Species name	Common name
Acer pseudoplatanus	Sycamore
Agrostis canina	Velvet Bent
Agrostis capillaris	Common Bent
Agrostis stolonifera	Creeping Bent
Alchemilla glabra	a Lady's-mantle
Anthoxanthum odoratum	Sweet Vernal-grass
Bellis perennis	Daisy
Betula pubescens	Downy Birch
Blechnum spicant	Hard-fern
Calluna vulgaris	Heather
Cardamine pratensis	Cuckooflower
Carex bigelowii	Stiff Sedge
Carex binervis	Green-ribbed Sedge
Carex dioica	Dioecious Sedge
Carex echinata	Star Sedge
Carex limosa	Bog-sedge
Carex nigra	Common Sedge
Carex panicea	Carnation Sedge
Carex pilulifera	Pill Sedge
Carex pulicaris	Flea Sedge
Carex rostrata	Bottle Sedge
Carex viridula	Yellow-sedge
Carex viridula subsp. *brachyrrhyncha*	a Yellow-sedge
Carex viridula subsp. *oedocarpa*	a Yellow-sedge
Cerastium fontanum	Common Mouse-ear
Chrysosplenium oppositifolium	Opposite-leaved Golden-saxifrage
Cirsium dissectum	Meadow Thistle
Cirsium palustre	Marsh Thistle
Cirsium vulgare	Spear Thistle
Cynosurus cristatus	Crested Dog's-tail
Deschampsia flexuosa	Wavy Hair-grass
Drosera anglica	Great Sundew
Drosera rotundifolia	Round-leaved Sundew
Dryopteris dilatata	Broad Buckler-fern
Empetrum nigrum	Crowberry
Epilobium brunnescens	New Zealand Willowherb
Epilobium palustre	Marsh Willowherb
Equisetum palustre	Marsh Horsetail
Erica cinerea	Bell Heather

VASCULAR SPECIES

Species name	Common name
Erica tetralix	Cross-leaved Heath
Eriophorum angustifolium	Common Cottongrass
Eriophorum vaginatum	Hare's-tail Cottongrass
Euphrasia officinalis agg.	Eyebright
Festuca ovina	Sheep's-fescue
Festuca rubra	Red Fescue
Fraxinus excelsior	Ash
Fuchsia magellanica	Fuchsia
Galium palustre	Common Marsh-bedstraw
Galium saxatile	Heath Bedstraw
Hedera helix	Ivy
Holcus lanatus	Yorkshire-fog
Huperzia selago	Fir Clubmoss
Hymenophyllum wilsonii	Wilson's Filmy-Fern
Hypericum pulchrum	Slender St John's-wort
Ilex aquifolium	Holly
Juncus acutiflorus	Sharp-flowered Rush
Juncus bulbosus	Bulbous Rush
Juncus effusus	Soft-rush
Juncus squarrosus	Heath Rush
Linum catharticum	Fairy Flax
Listera cordata	Lesser Twayblade
Luzula campestris	Field Wood-rush
Luzula sylvatica	Great Wood-rush
Menyanthes trifoliata	Bogbean
Molinia caerulea	Purple Moor-grass
Nardus stricta	Mat-grass
Narthecium ossifragum	Bog Asphodel
Oxalis acetosella	Wood-sorrel
Parnassia palustris	Parnassia palustris
Phegopteris connectilis	Beech Fern
Picea sitchensis	Sitka Spruce
Pinguicula vulgaris	Common Butterwort
Pinus sp.	a Pine
Poa pratensis	Smooth Meadow-grass
Polygala serpyllifolia	Heath Milkwort
Polypodium vulgare	Polypody
Potamogeton polygonifolius	Bog Pondweed
Potentilla erecta	Tormentil
Prunella vulgaris	Selfheal
Ranunculus flammula	Lesser Spearwort
Ranunculus repens	Creeping Buttercup
Rhynchospora alba	White Beak-sedge

VASCULAR SPECIES

Species name	Common name
Rumex acetosa	Common Sorrel
Sagina procumbens	Procumbent Pearlwort
Salix cinerea	Grey Willow
Sorbus aucuparia	Rowan
Stellaria palustris	Marsh Stitchwort
Succisa pratensis	Devil's-bit Scabious
Taraxacum officinale agg.	Dandelion
Taxus baccata	Yew
Trichophorum germanicum	Deergrass
Trifolium repens	White Clover
Triglochin palustre	Marsh Arrowgrass
Ulex europaeus	Gorse
Vaccinium myrtillus	Bilberry
Vaccinium oxycoccos	Cranberry
Vaccinium vitis-idaea	Cowberry
Veronica beccabunga	Brooklime
Veronica chamaedrys	Germander Speedwell

BRYOPHYTES

Species name	Common name
Anastrepta orcadensis	Orkney Notchwort
Andreaea rothii	Dusky Rock-moss
Andreaea rupestris	Black Rock-moss
Aneura pinguis	Greasewort
Asplenium adiantum-nigrum	Black Spleenwort
Aulacomnium palustre	Bog Groove-moss
Barbilophozia floerkei	Common Pawwort
Bartramia ithyphylla	Straight-leaved Apple-moss
Bazzania tricrenata	Lesser Whipwort
Breutelia chrysocoma	Golden-head Moss
Bryum alpinum	Alpine Thread-moss
Bryum pseudotriquetrum	Marsh Bryum
Calliergon giganteum	Giant 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 flexuosus	Rusty Swan-neck Moss
Campylopus introflexus	Heath Star Moss
Campylopus pyriformis	Dwarf Swan-neck Moss

BRYOPHYTES

Species name	Common name
Cephalozia bicuspidata	Two-horned Pincerwort
Cephalozia catenulata	Chain Pincerwort
Cephalozia connivens	Forcipated Pincerwort
Cephaloziella divaricata	Common Threadwort
Cephaloziella hampeana	Hampe's Threadwort
Chiloscyphus polyanthos	St Winifrid's Moss
Cratoneuron filicinum	Fern-leaved Hook-moss
Crepis paludosa	Marsh Hawk's-beard
Ctenidium molluscum	Chalk Comb-moss
Dichodontium pellucidum	Transparent Fork-moss
Dicranella heteromalla	Silky Forklet-moss
Dicranella varia	Variable Forklet-moss
Dicranodontium asperulum	Orange Bow-moss
Dicranodontium denudatum	Beaked Bow-moss
Dicranum fuscescens	Dusky Fork-moss
Dicranum scoparium	Broom Fork-moss
Didymodon ferrugineus	Rusty Beard-moss
Didymodon insulanus	Cylindric Beard-moss
Didymodon spadiceus	Brown Beard-moss
Diplophyllum albicans	White Earwort
Ditrichum gracile	Slender Ditrichum
Drepanocladus aduncus	Kneiff's Hook-moss
Fissidens adianthoides	Maidenhair Pocket-moss
Fissidens taxifolius	Common Pocket-moss
Gymnocolea inflata	Inflated Notchwort
Hamatocaulis vernicosus	Varnished Hook-moss
Hylocomium splendens	Glittering Wood-moss
Hymenostylium recurvirostrum var. *recurvirostrum*	Hook-beak Tufa-moss
Hypnum cupressiforme var. *cupressiforme*	a Plait-moss
Hypnum jutlandicum	Heath Plait-moss
Isothecium myosuroides	Slender Mouse-tail Moss
Isothecium myosuroides var. *brachythecioides*	a Slender Mouse-tail Moss
Jungermannia atrovirens	Dark-green Flapwort
Kindbergia praelonga	Common Feather-moss
Kurzia pauciflora	Bristly Fingerwort
Kurzia sp.	a Fingerwort
Kurzia trichoclados	Heath Fingerwort
Leiocolea badensis	Scarce Notchwort
Leiocolea bantriensis	Bantry Notchwort
Lepidozia cupressina	Rock Fingerwort
Lepidozia reptans	Creeping Fingerwort
Lophocolea bidentata	Bifid Crestwort
Lophozia incisa	Jagged Notchwort

BRYOPHYTES

Species name	Common name
Lophozia ventricosa	Tumid Notchwort
Metzgeria furcata	Forked Veilwort
Mylia taylorii	Taylor's Flapwort
Odontoschisma denudatum	Matchstick Flapwort
Odontoschisma sphagni	Bog-m Flapwort
Oligotrichum hercynicum	Hercynian Haircap
Palustriella falcata	Claw-leaved Hook-moss
Pellia endiviifolia	Endive Pellia
Pellia epiphylla	Overleaf Pellia
Philonotis arnellii	Arnell's Apple-moss
Philonotis calcarea	Thick-nerved Apple-moss
Philonotis fontana	Fountain Apple-moss
Plagiochila spinulosa	Prickly Featherwort
Plagiomnium undulatum	Hart's-tongue Thyme-moss
Plagiothecium undulatum	Waved Silk-moss
Pleurozia purpurea	Purple Spoonwort
Pleurozium schreberi	Red-stemmed Feather-moss
Pohlia wahlenbergii	Pale Glaucous Thread-moss
Polytrichastrum alpinum	Alpine Haircap
Polytrichum commune	Common Haircap
Polytrichum formosum	Bank Haircap
Polytrichum juniperinum	Juniper Haircap
Polytrichum strictum	Strict Haircap
Pseudoscleropodium purum	Neat Feather-moss
Pseudotaxiphyllum elegans	Elegant Silk-moss
Ptilidium ciliare	Ciliated Fringewort
Racomitrium ericoides	Dense Fringe-moss
Racomitrium fasciculare	Green Mountain Fringe-moss
Racomitrium lanuginosum	Woolly Fringe-moss
Racomitrium sudeticum	Slender Fringe-moss
Rhabdoweisia crenulata	Greater Streak-moss
Rhizomnium punctatum	Dotted Thyme-moss
Rhytidiadelphus loreus	Little Shaggy-moss
Rhytidiadelphus squarrosus	Springy Turf-moss
Riccardia chamedryfolia	Jagged Germanderwort
Sarmentypnum exannulatum	Ringless Hook-moss
Sarmentypnum sarmentosum	Twiggy Spear-moss
Scapania compacta	Thick-set Earwort
Scapania gracilis	Western Earwort
Scapania scandica	Norwegian Earwort
Schistidium apocarpum	Sessile Grimmia
Scorpidium revolvens	Rusty Hook-moss
Scorpidium scorpioides	Hooked Scorpion-moss

BRYOPHYTES

Species name	Common name
Sphagnum angustifolium	Fine Bog-moss
Sphagnum austinii	Austin's Bog-moss
Sphagnum capillifolium	Red Bog-moss
Sphagnum capillifolium subsp. *capillifolium*	Acute-leaved Bog-moss
Sphagnum capillifolium subsp. *rubellum*	a Red Bog-moss
Sphagnum contortum	Twisted Bog-moss
Sphagnum cuspidatum	Feathery Bog-moss
Sphagnum denticulatum	Cow-horn Bog-moss
Sphagnum fallax	Flat-topped Bog-moss
Sphagnum girgensohnii	Girgensohn's Bog-moss
Sphagnum inundatum	Lesser Cow-horn Bog-moss
Sphagnum magellanicum	Magellanic Bog-moss
Sphagnum palustre	Blunt-leaved Bog-moss
Sphagnum papillosum	Papillose Bog-moss
Sphagnum russowii	Russow's Bog-moss
Sphagnum squarrosum	Spiky Bog-moss
Sphagnum subnitens	Lustrous Bog-moss
Sphagnum subnitens var. *ferrugineum*	a Lustrous Bog-moss
Sphagnum tenellum	Soft Bog-moss
Splachnum sphaericum	Round-fruited Collar-moss
Straminergon stramineum	Straw Spear-moss
Tetraphis pellucida	Pellucid Four-tooth Moss
Thuidium tamariscinum	Common Tamarisk-moss
Tortella tortuosa	Frizzled Crisp-moss
Ulota sp.	a Pincushion
Warnstorfia fluitans	Floating Hook-moss

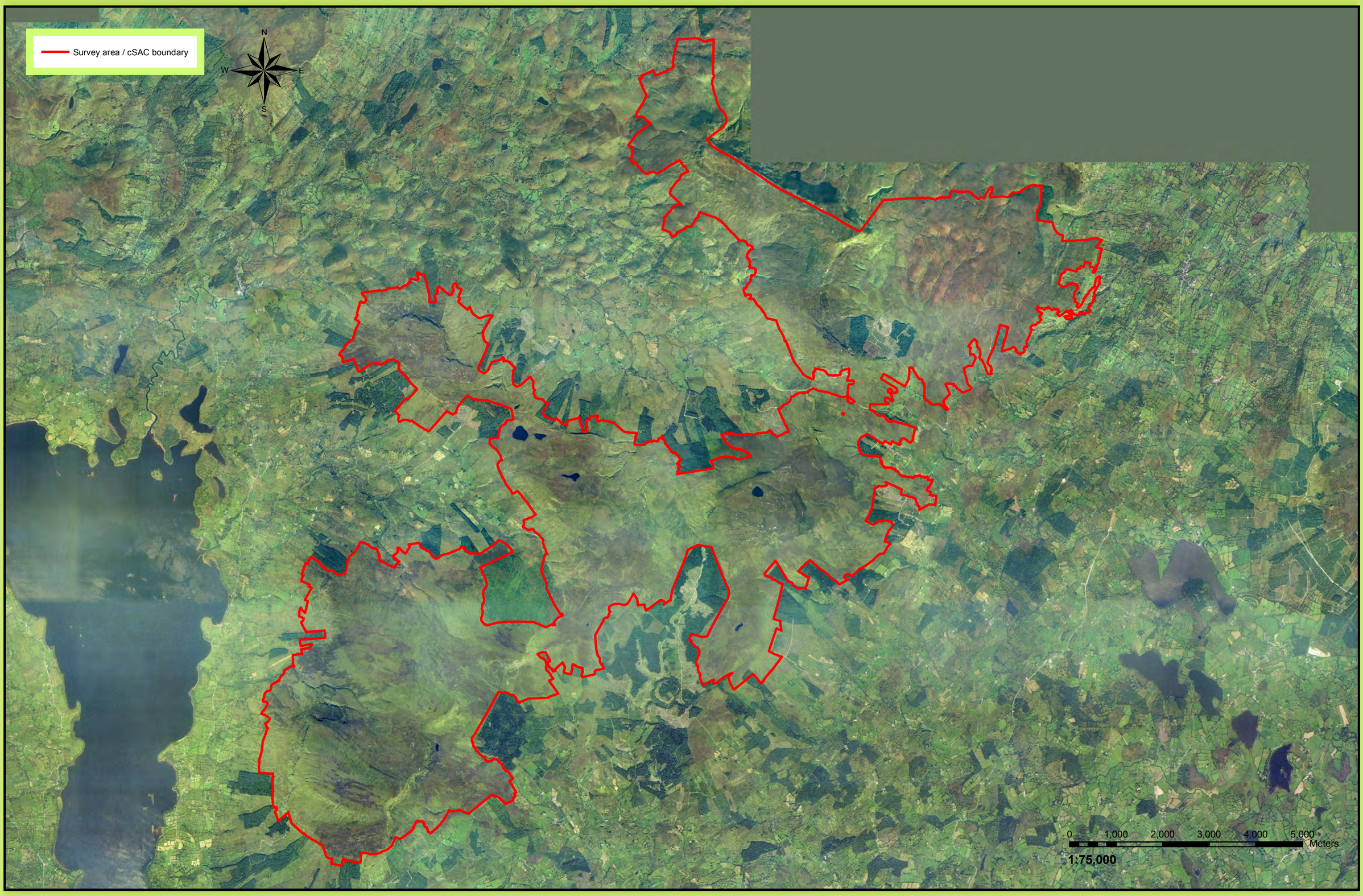
LICHENS

Species name	Species name
Bryoria fuscescens	*Cladonia portentosa*
Bunodophoron melanocarpum	*Cladonia ramulosa*
Cladonia arbuscula	*Cladonia species*
Cladonia arbuscula subsp. *squarrosa*	*Cladonia squamosa*
Cladonia asahinae	*Cladonia squamosa* var. *subsquamosa*
Cladonia bellidiflora	*Cladonia subcervicornis*
Cladonia cervicornis subsp. *verticillata*	*Cladonia uncialis* subsp. *biuncialis*
Cladonia ciliata var. *tenuis*	*Hypogymnia physodes*
Cladonia coccifera	*Parmelia discordans*
Cladonia crispata var. *cetrariiformis*	*Parmelia omphalodes*
Cladonia furcata	*Parmelia saxatilis*
Cladonia polydactyla	*Sphaerophorus fragilis*

CHAROPHYTES

Species name	Common name
Chara sp.	a Stonewort

Figure 1. Survey area / cSAC boundary of Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim



NATIONAL SURVEY OF UPLAND HABITATS - BEC Consultants Ltd. 2013.
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Figure 2. Primary Fossitt habitats within Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim

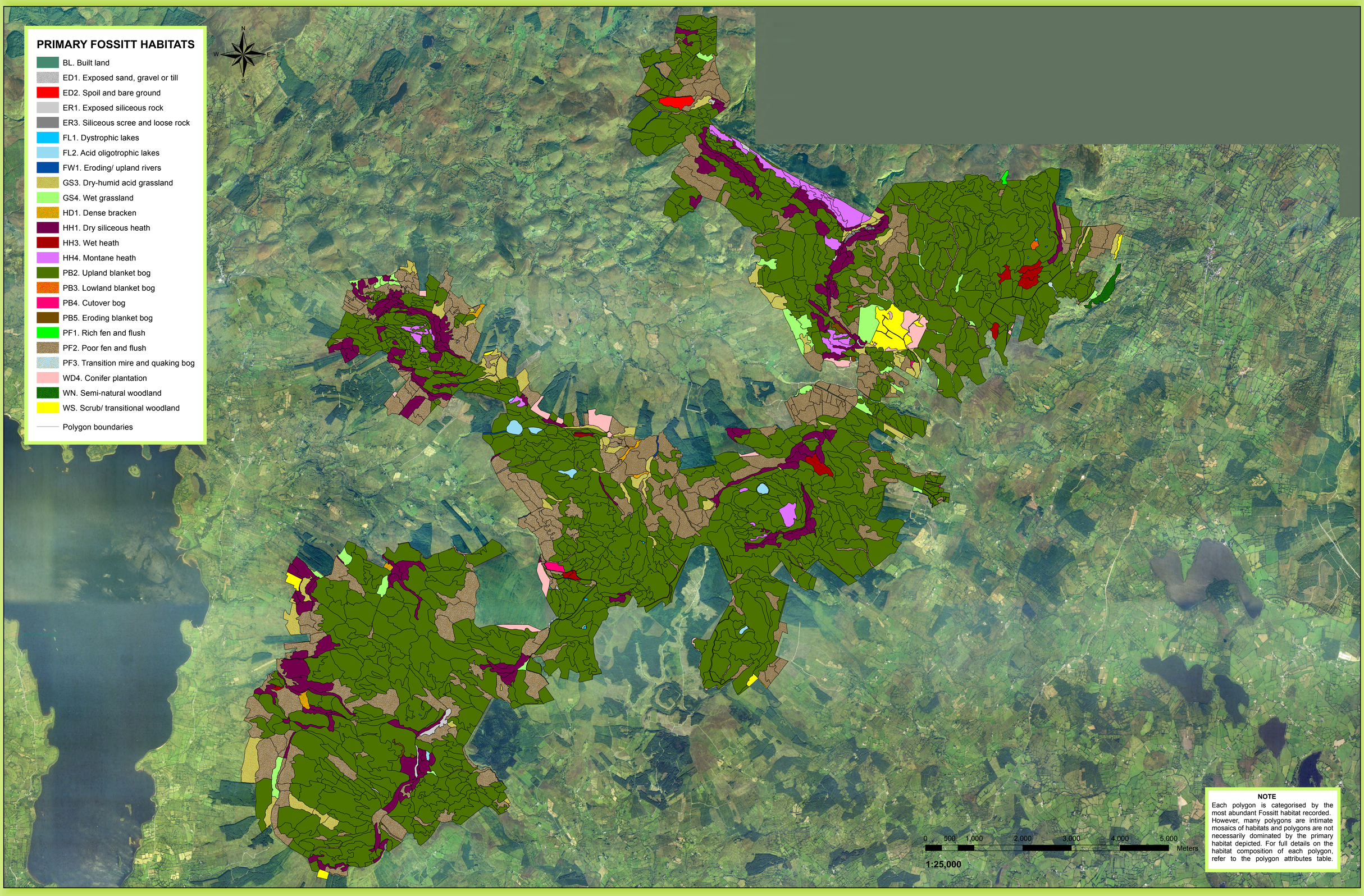

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Figure 3. Primary Annex I habitats within Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim

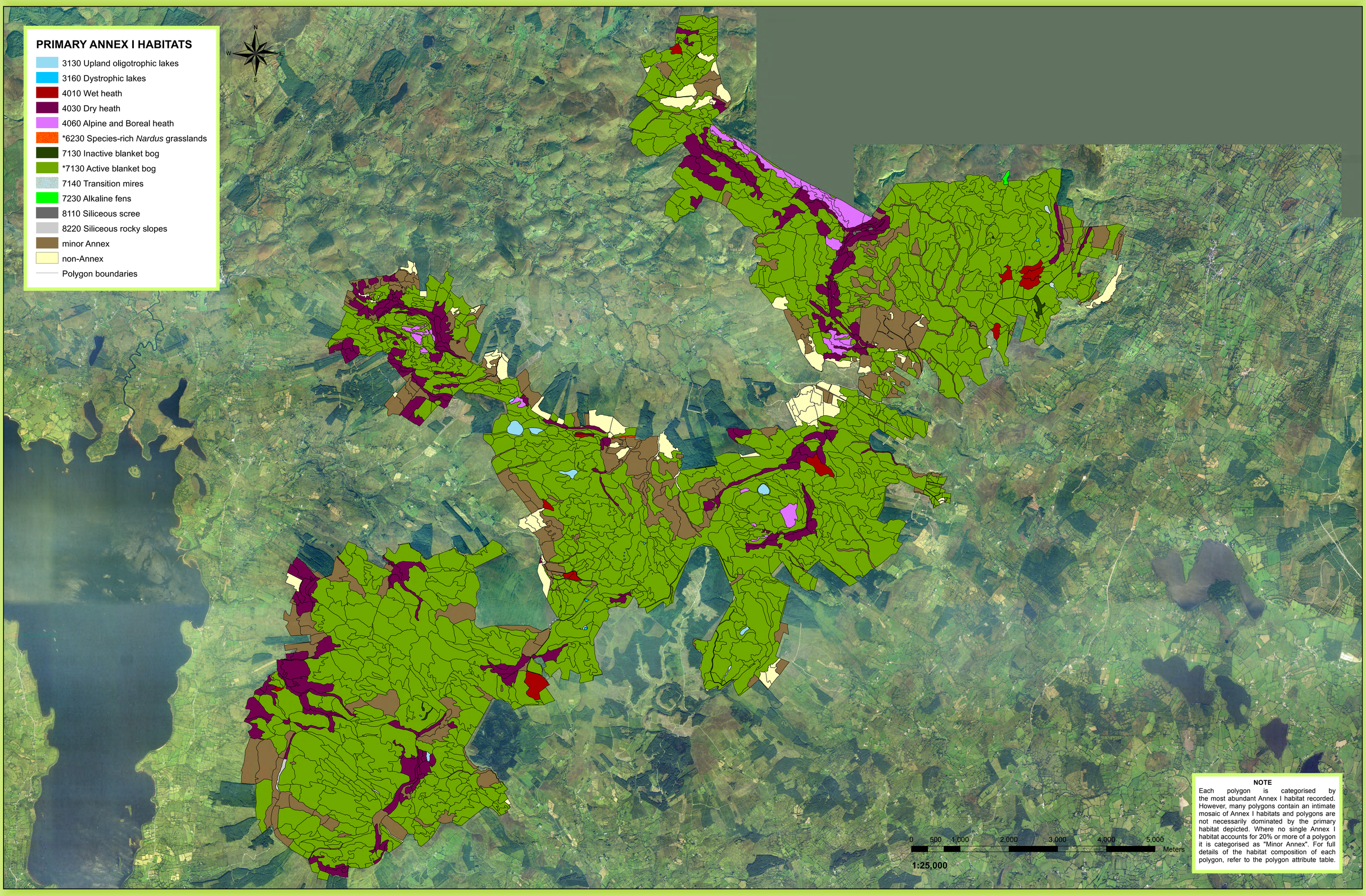

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Figure 4a. Cover of 4010 WET HEATH within Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim

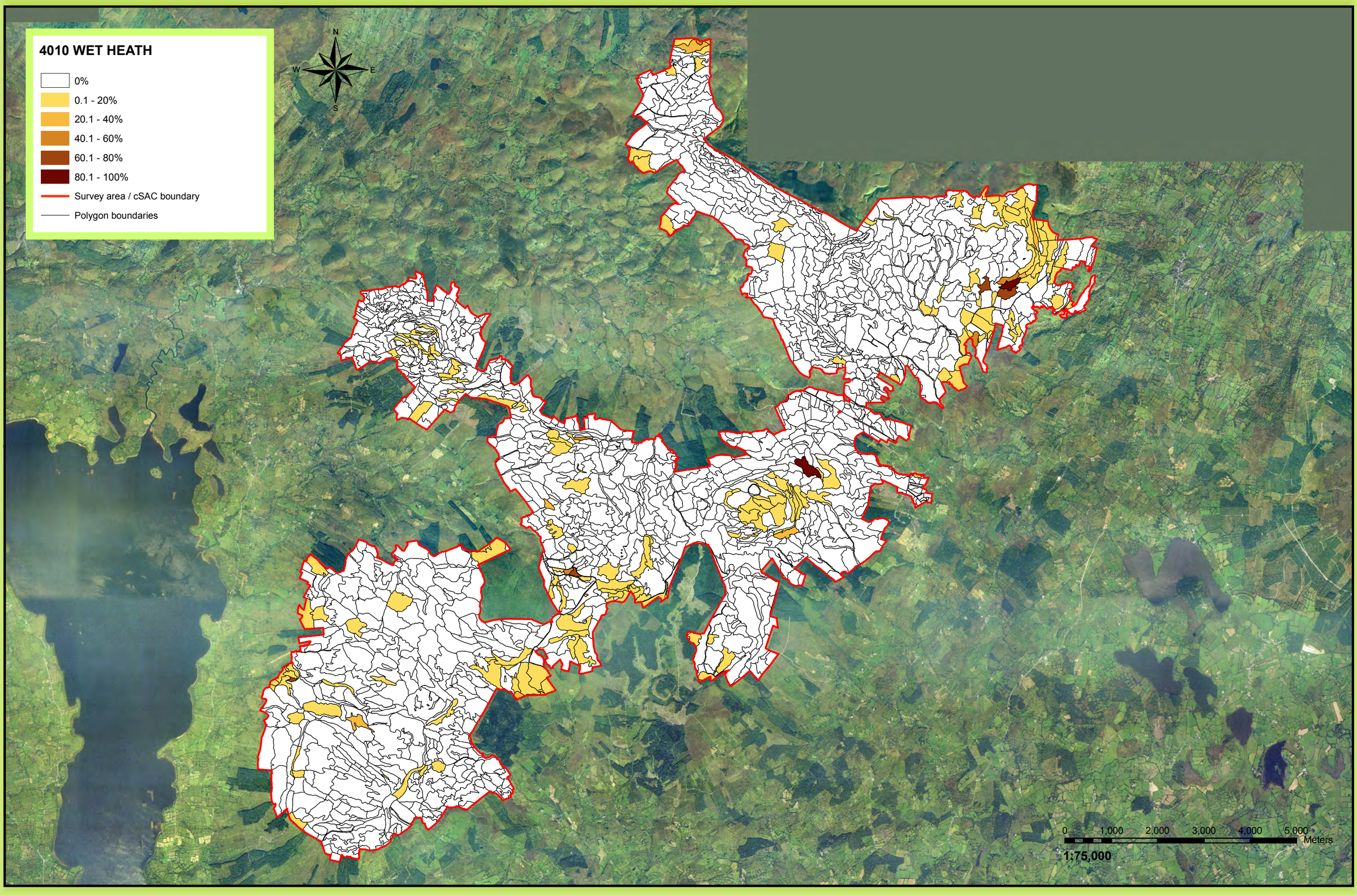

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Figure 4b. Cover of 4030 DRY HEATH within Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim

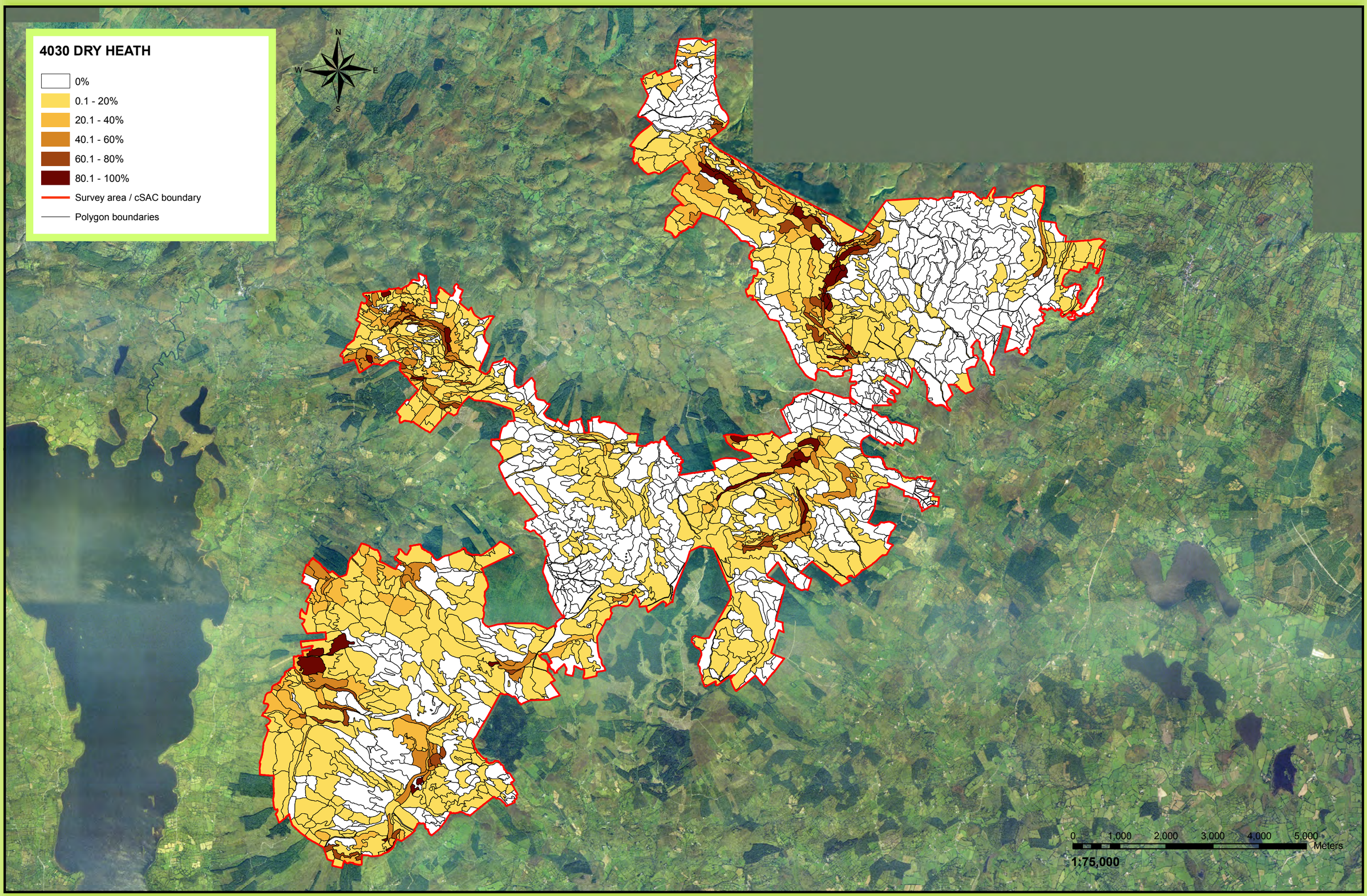

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Figure 4c. Cover of 4060 ALPINE AND BOREAL HEATH within Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim

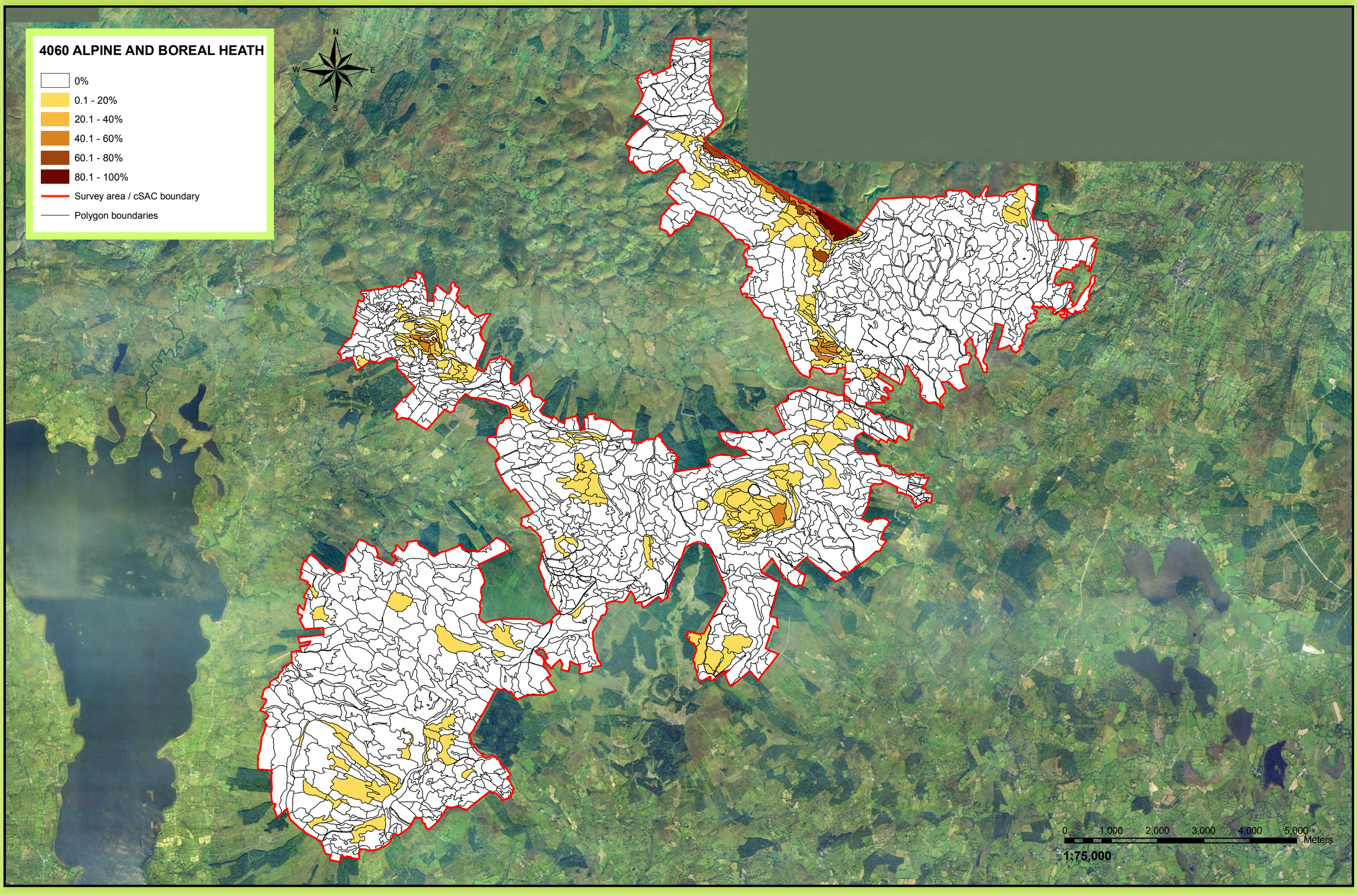

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Figure 4d. Cover of 6150 SILICEOUS ALPINE AND BOREAL GRASSLANDS within Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim

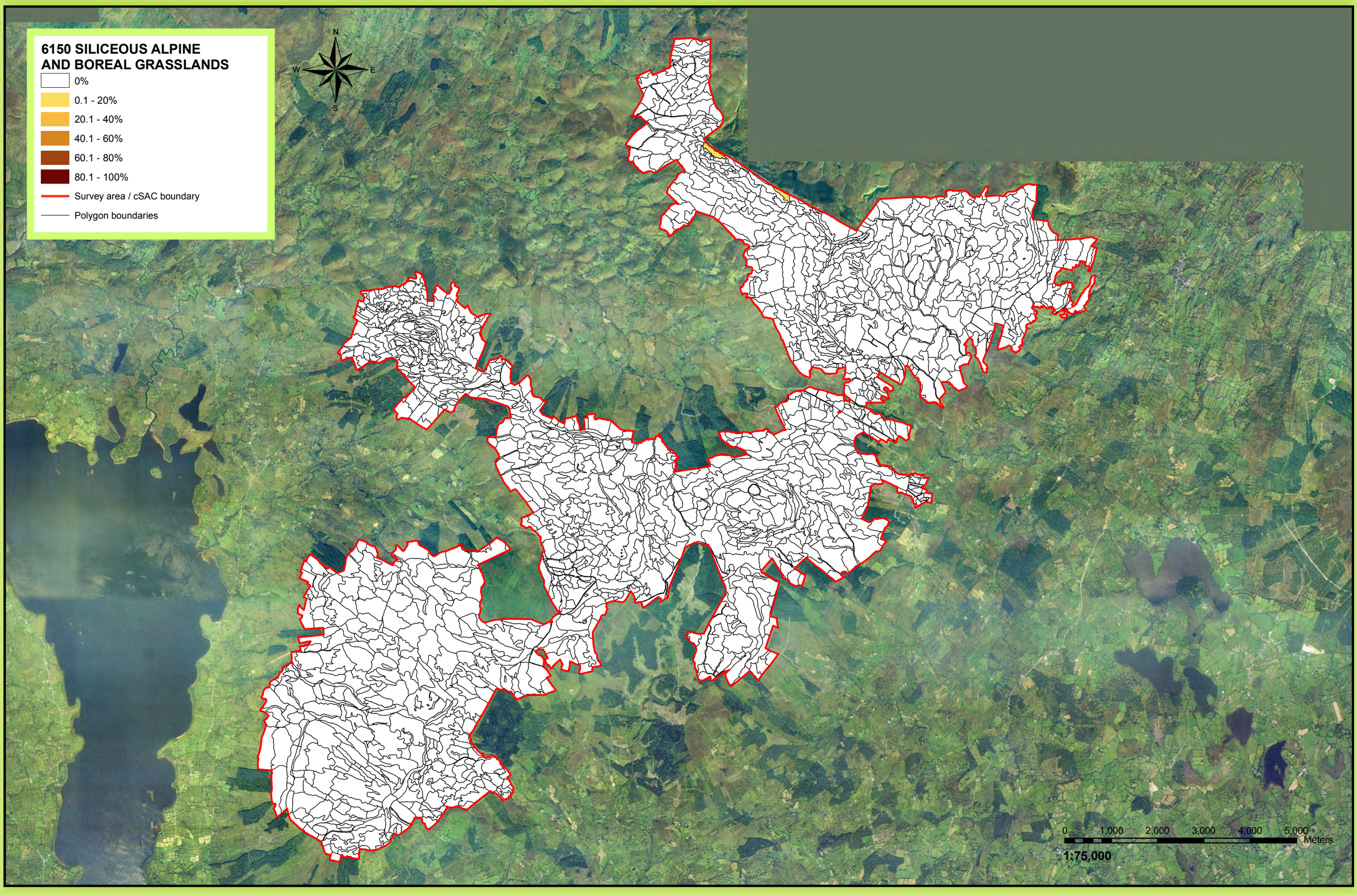

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Figure 4e. Cover of *6230 SPECIES-RICH *NARDUS* GRASSLANDS within Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim

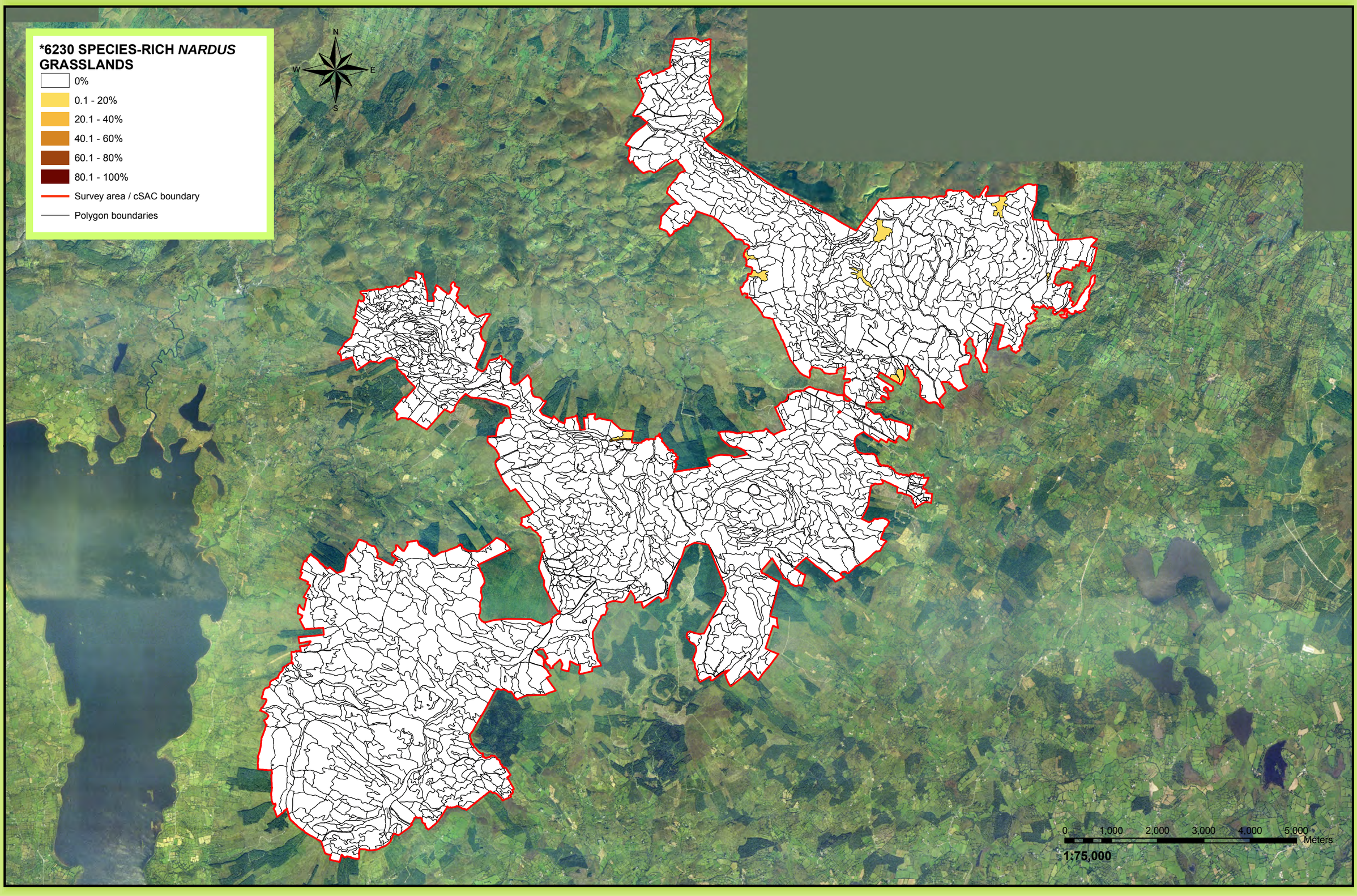

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Figure 4f. Cover of 6430 HYDROPHILOUS TALL HERB COMMUNITIES within Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim

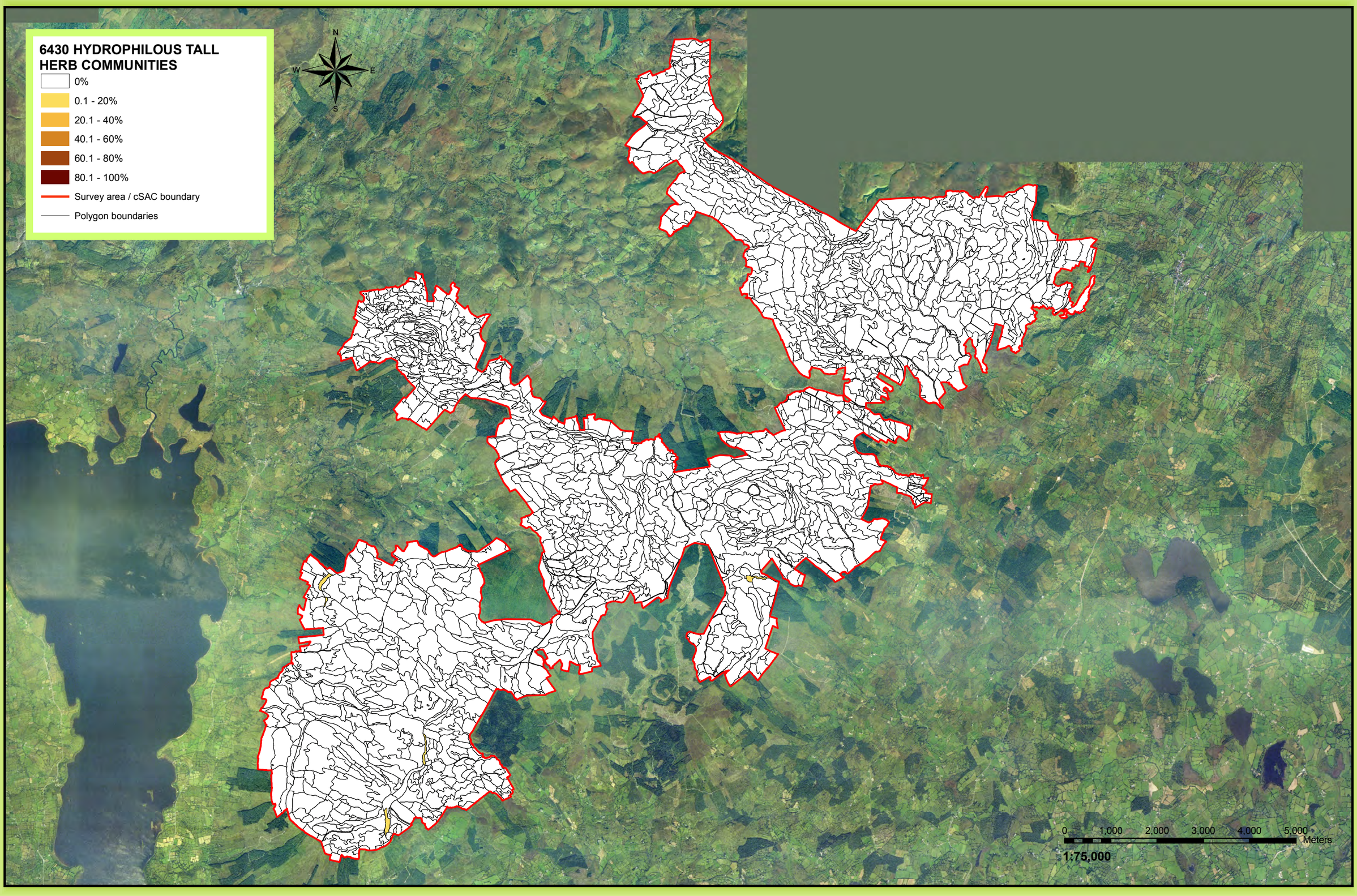

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Figure 4g. Cover of *7130 ACTIVE BLANKET BOG within Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim

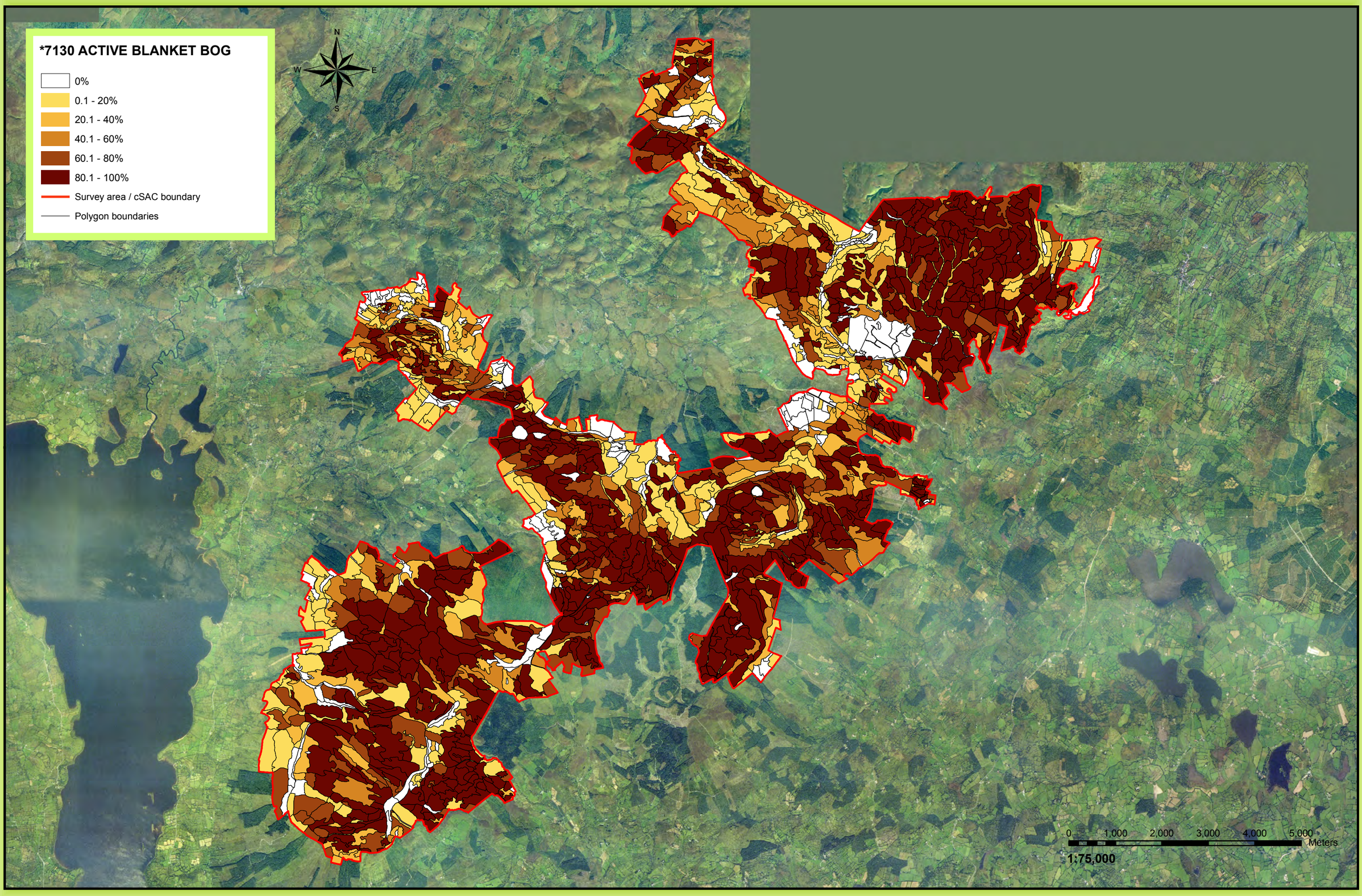

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Figure 4h. Cover of 7130 INACTIVE BLANKET BOG within Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim

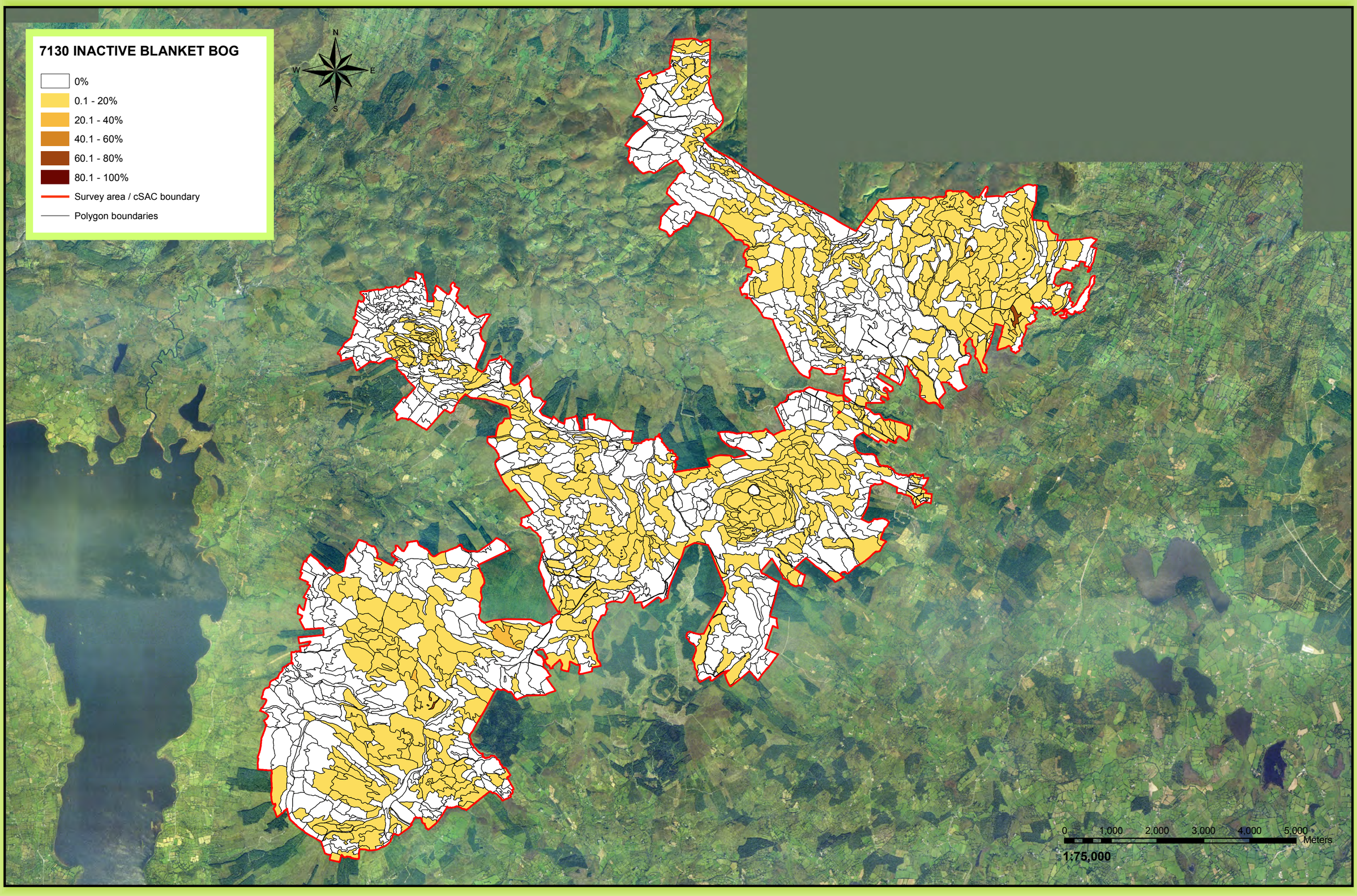

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Figure 4i. Cover of 7140 TRANSITION MIRES within Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim

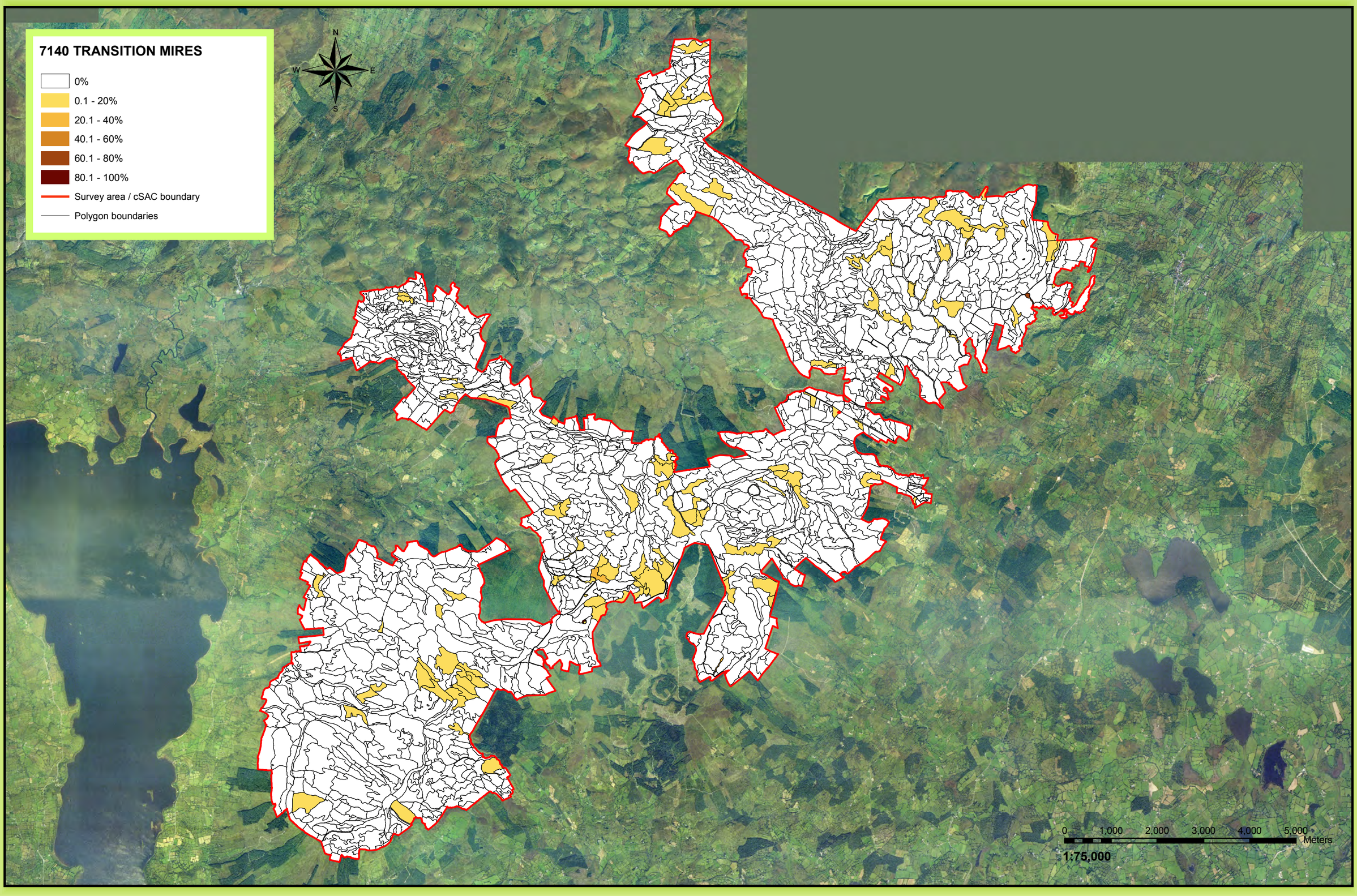

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Figure 4j. Cover of 7150 *RHYNCHOSPORION* DEPRESSIONS within Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim

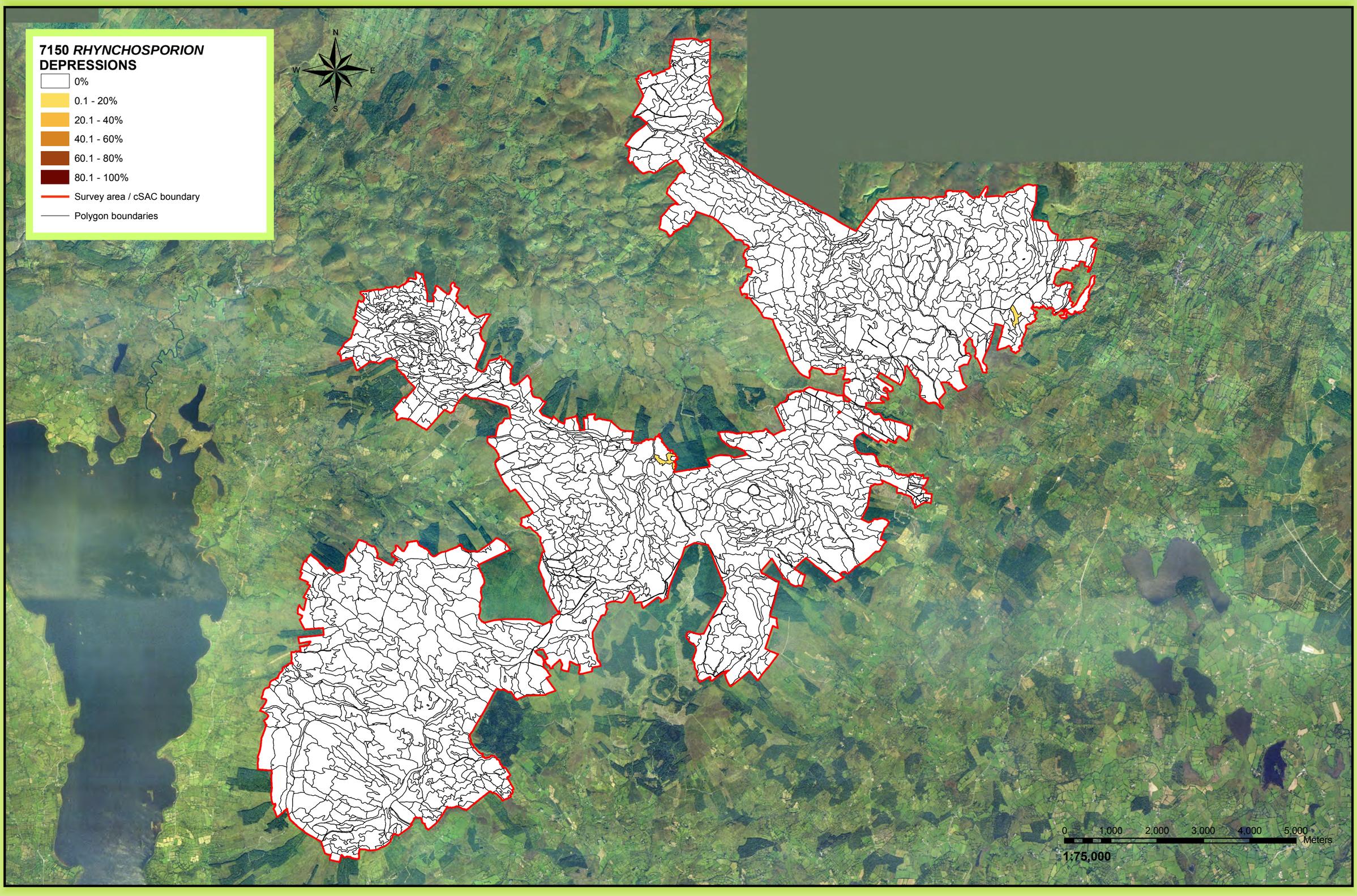

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Figure 4k. Cover of 7230 ALKALINE FENS within Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim

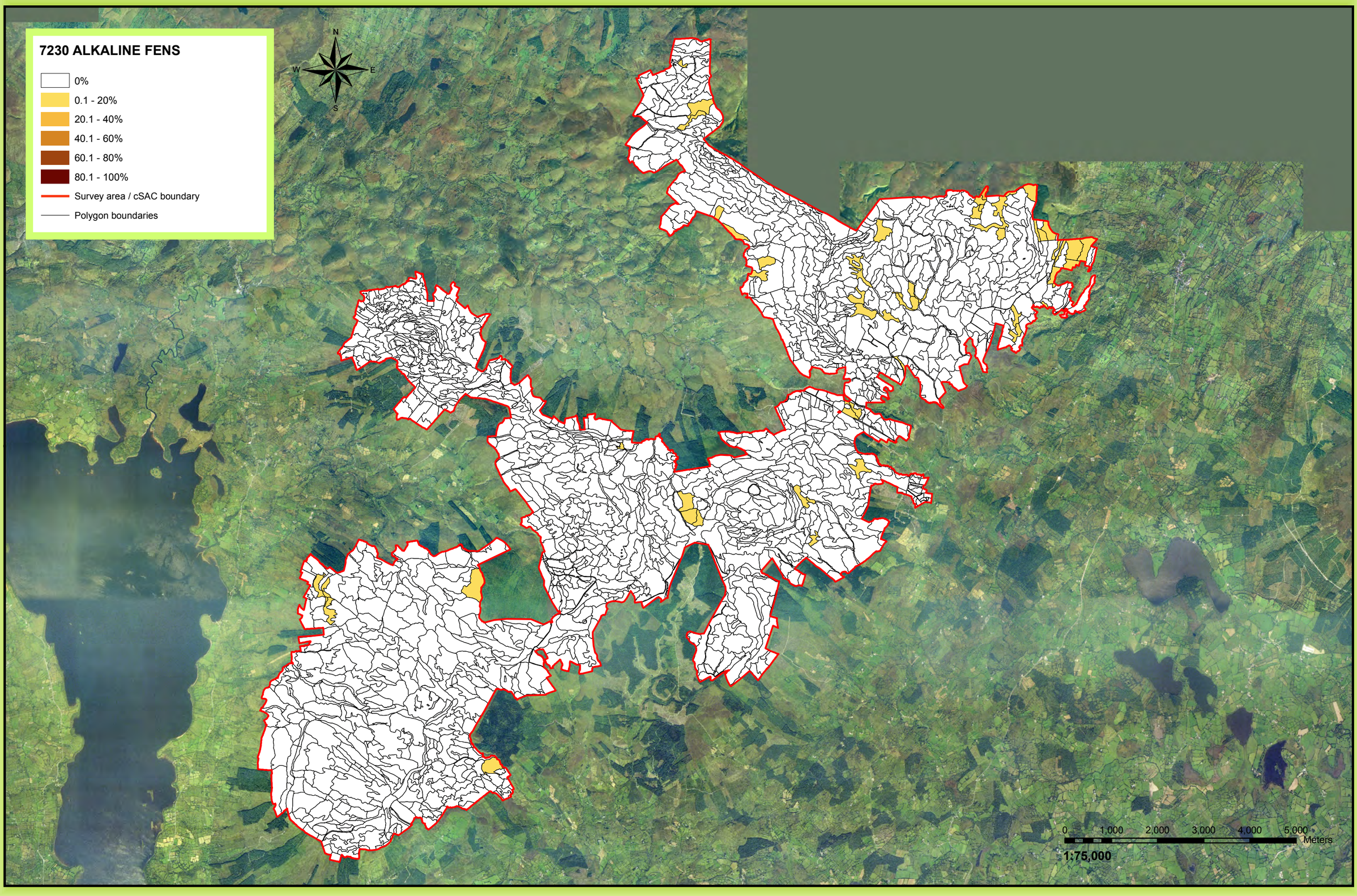

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Figure 4l. Cover of 8110 SILICEOUS SCREE within Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim

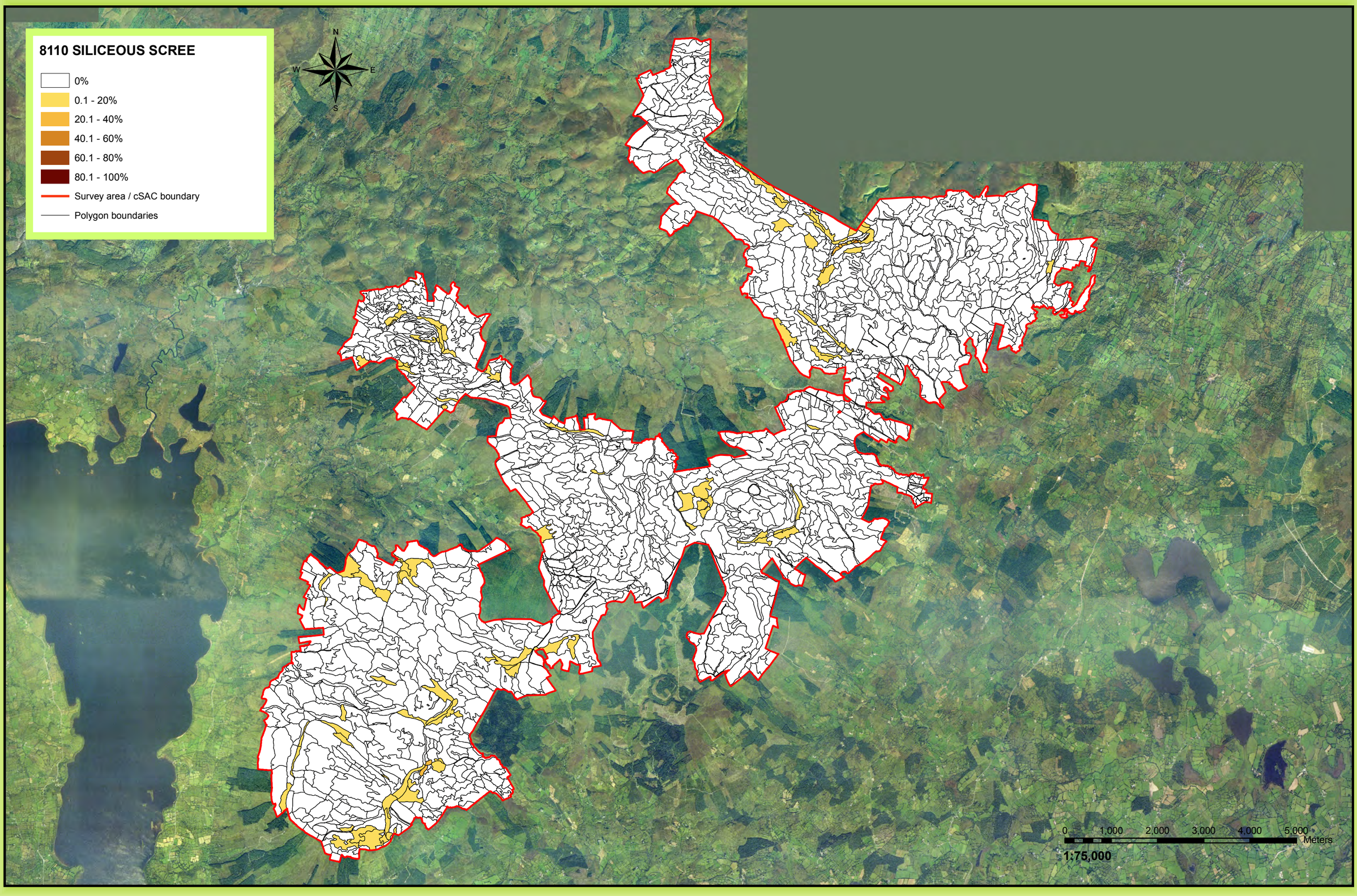

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Figure 4m. Cover of 8210 CALCAREOUS ROCKY SLOPES within Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim

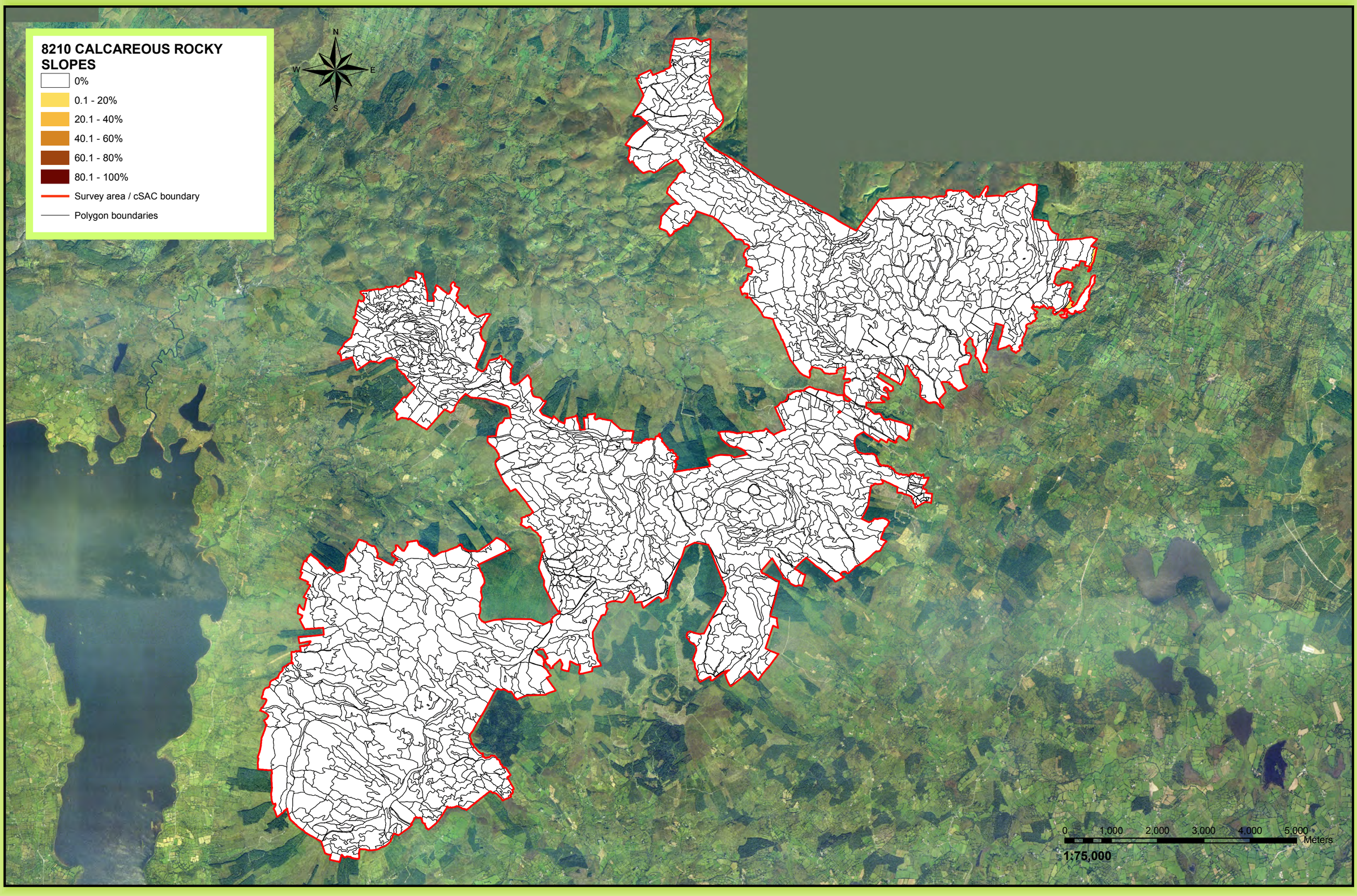

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Figure 4n. Cover of 8220 SILICEOUS ROCKY SLOPES within Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim

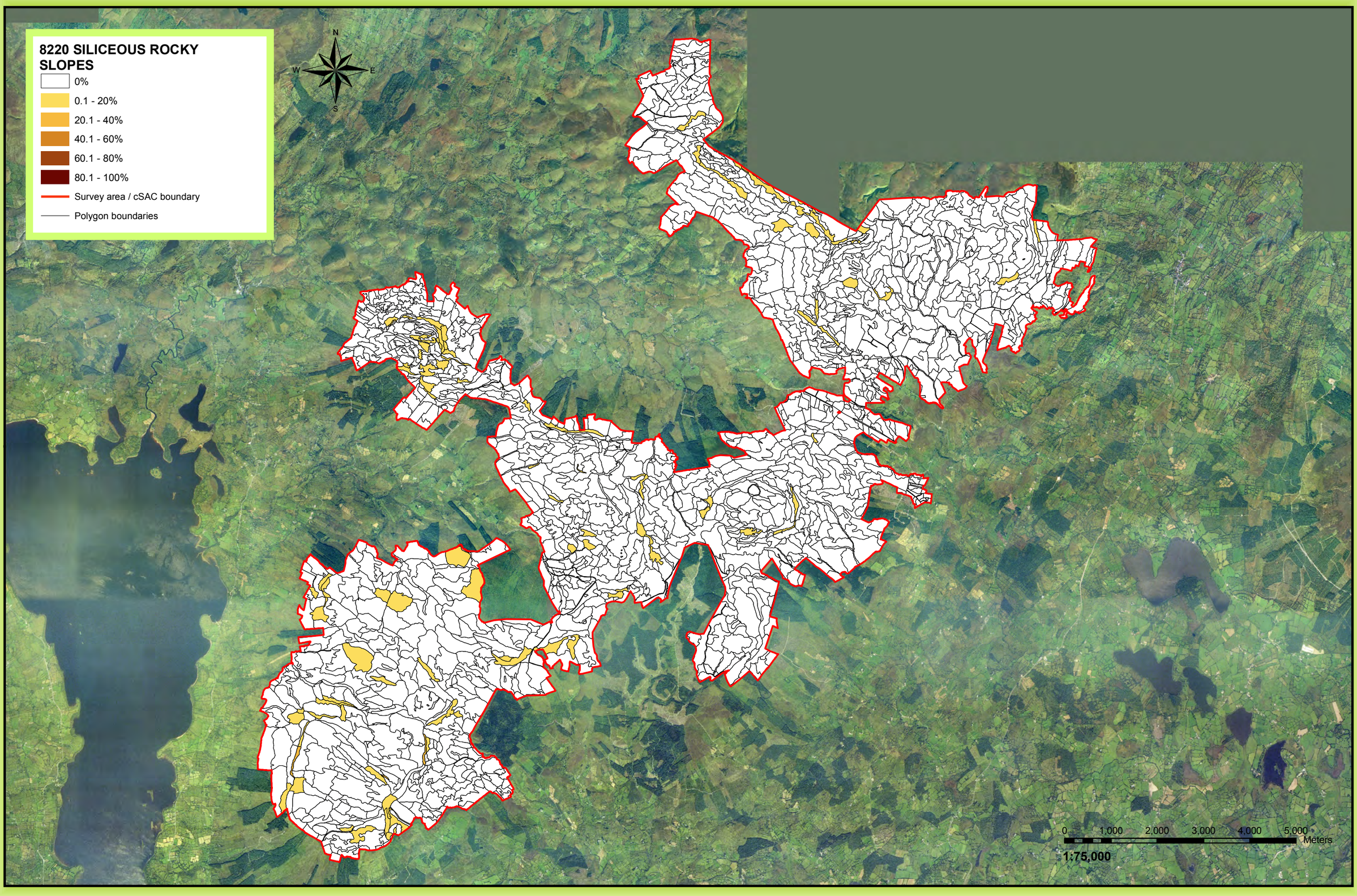

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Figure 5. Location of rare and notable plant records within and surrounding Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim

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Figure 6. Location and results of conservation assessment monitoring stops and other relevés within Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim

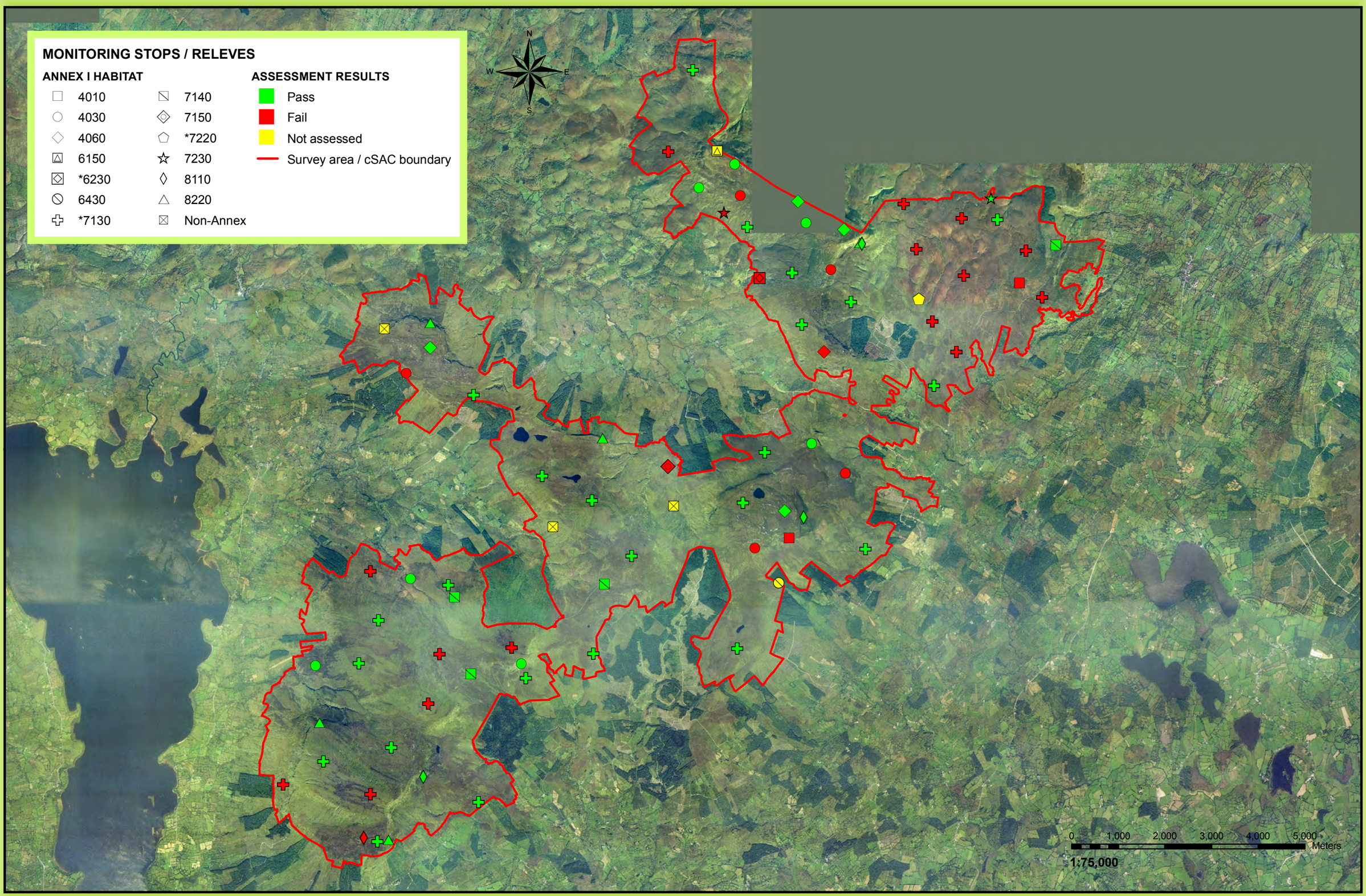

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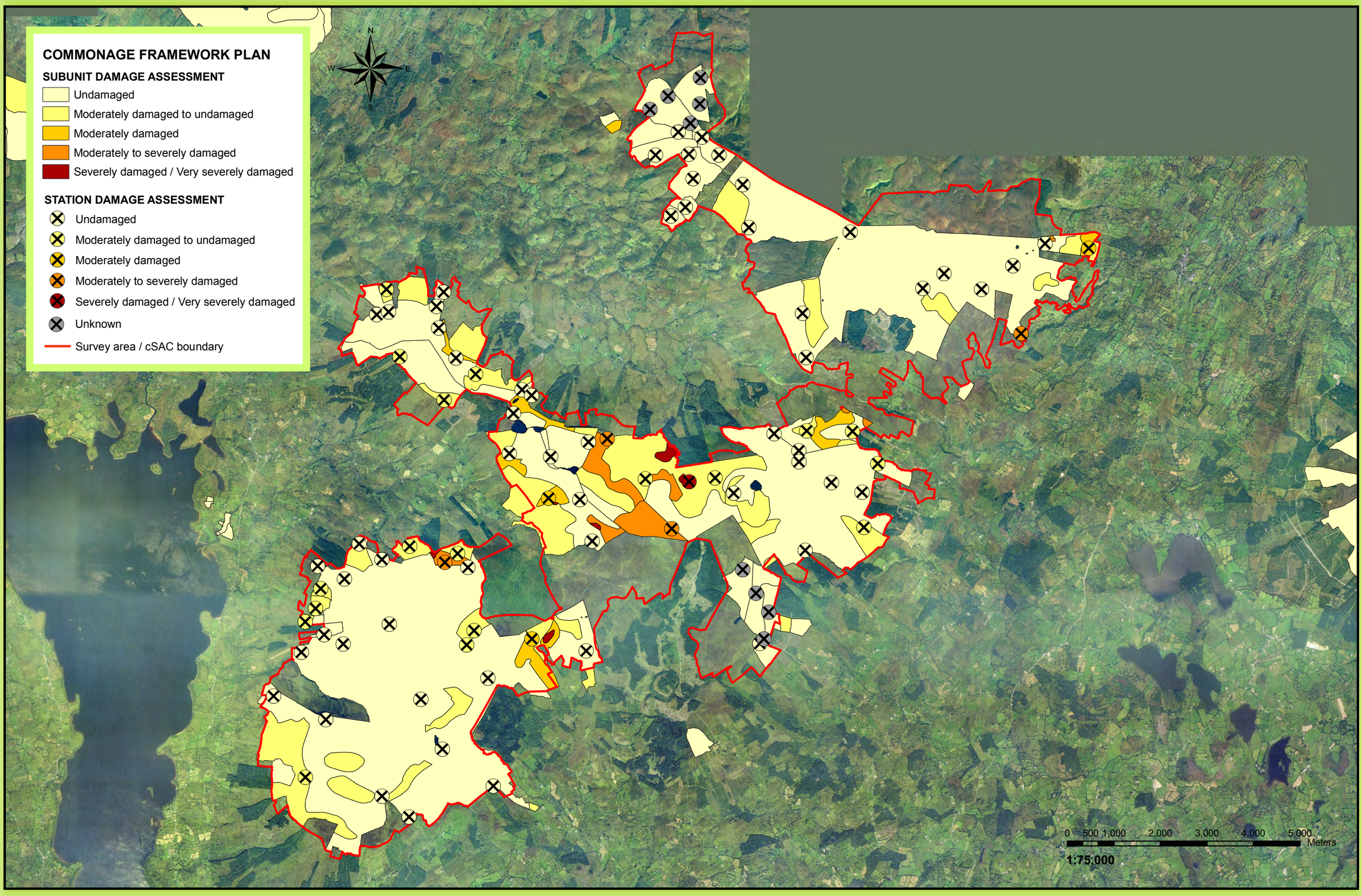
Figure 7. Commonage Framework Plan damage assessment (2000-2009) within and surrounding Cuilcagh – Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim



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