National Survey of Upland Habitats 📿

(Phase 3, 2012-2013)

Site Report No. 10: Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo



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

February 2013

Commissioned by National Parks and Wildlife Service Department of Arts, Heritage and the Gaeltacht

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Cover photo: Dystrophic pools and upland blanket bog in Easkey Bog Nature Reserve, Co. Sligo, taken by Philip Perrin.

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EXECUTIVE SUMMARY

- Ox Mountains Bogs cSAC (002006) in Counties Mayo and Sligo was surveyed between April and July 2012 as part of the National Survey of Upland Habitats (NSUH).
- The area of the site is 105.7 km². Using GIS and aerial photograph interpretation, the site was divided into 2306 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, 45 Fossitt habitats and 95 provisional upland vegetation communities were recorded. Annex I habitats comprise 86.2% of the site. The Annex I upland habitats present which are primary focus habitats for the NSUH are *7130 Active blanket bogs (67.1%), 4010 Wet heaths (10.2%), 4030 Dry heaths (3.1%), 7130 Inactive blanket bogs (1.4%), 7150 *Rhynchosporion* depressions (0.5), 7140 Transition mires (0.3), 4060 Alpine and Boreal heath (0.3%), 7230 Alkaline fens (0.05%), 8110 Siliceous scree (0.02%), 8220 Siliceous rocky slopes (0.02%), Species-rich *Nardus* grasslands (0.005), and 8210 Calcareous rocky slopes (0.0002%).
- Rare and notable species recorded during the survey include *Saxifraga hirculus*, *Meesia triquetra*, *Tomentypnum nitens*, *Andreaea megistospora* and *Grimmia anomala*.
- Areas of particular botanical interest include base-enriched cliffs to the south of Easkey Bog Nature Reserve, rocks and boulders on the shores of, and slopes to the east of, Easky Lough, and iron-rich flushes found at a number of locations across the site. There are also extensive intact areas of very wet *7130 Active blanket bog at Letterunshin and Fiddandarry.
- The conservation status of the upland Annex I habitats that form the primary focus of the NSUH was assessed. A total of 86 monitoring stops were recorded in these habitats. The conservation status of 4030 Dry heaths, 4060 Alpine and Boreal heaths, 7140 Transition mires, 7150 *Rhynchosporion* depressions, 8210 Calcareous rocky slopes and 8220 Siliceous rocky slopes were assessed as Favourable. The remaining primary focus habitats were assessed as having an Unfavourable Bad conservations status.
- The main impacts/activities affecting the site are livestock grazing, peat erosion, burning and peat extraction.
- It is recommended that :

Whilst stock reductions implemented *c*. 2002 under 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 by sausage machine and machine-cutting of turf banks 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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FILES ACCOMPANYING REPORT

ESRI format polygon shapefile with habitat data ESRI format point shapefile with waypoint data ESRI format point shapefile with monitoring stop / relevé data ESRI format point shapefile with rare and notable species data Microsoft Excel format polygon attributes table Microsoft Excel format image databank Microsoft Access condition assessment database Turboveg relevé database Site, relevé and waypoint photographs

1. INTRODUCTION

Overview

- 1.1 The principal objectives of the National Survey of Upland Habitats (NSUH) are to classify and map the location and extent of upland habitats within a range of sites using the schemes of Fossitt (2000) and Annex I of the EU Habitats Directive, and to assess the conservation status of a suite of upland Annex I habitats. Selected sites largely comprise upland candidate Special Areas of Conservation (cSACs). The assessment procedure involves evaluation of habitat condition indicators at a network of monitoring stops (point samples) distributed across the range of these habitats at the surveyed sites.
- 1.2 These data are required to provide a scientific basis for the development of policies and management practices for the maintenance (or restoration) of favourable conservation status of Annex I habitats and to provide a scientific basis for monitoring of their status into the future. This site report should be read in conjunction with Irish Wildlife Manual No. 48 (Perrin *et al.*, 2010) and No. 79 (Perrin *et al.*, 2014) which detail the methodologies used for all aspects of this survey. These were initially devised during 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 Ox Mountains Bogs cSAC (002006) 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 April and July 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 Ox Mountains Bogs cSAC, Cos. Mayo and Sligo, (Fig. 1) is a large site, being 105.7 km² in extent. The site is centred on Easky Lough and it stretches from near Cloonacool in the southeast, to near Bunnyconnellan in the west and to near Dromore West in the north (O.S. Discovery Series maps 24 and 25). It consists of three main areas. To the west of Easky Lough are two extensive areas of relatively low-lying blanket bog at Letterunshin and Fiddandarry

whilst to the east of Easky Lough is the main upland area at Laughil. On the lower slopes in the northern part of the upland section the site encompasses Easkey Bog Nature Reserve (6.1km² in extent). The underlying geology is mainly schists, with limestone in the northwest near Letterunshin and a large granite intrusion forming the hillside to the east of Easky Lough. The highest peak within the site is close to Loughannatoran (alt. 512 m). The highest peak within the Site is close to Loughannatoran (alt. 512 m). The highest peak within the Ox Mountains, Knockalongy (alt. 544 m), lies outside the site to the northeast, and a substantial area of the Slieve Gamph range to the southwest is also not included.

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.

Conservation status, Glob. = Global Assessment.						
Annex I	Habitat	Area	Rep.	Surf.	Cons.	Glob.
code		(%)				
3110	Lowland oligotrophic lakes	2	В	С	В	В
3160	Dystrophic lakes	3	А	В	А	А
4010	Wet heaths	20	В	В	В	В
*7130/7130	Blanket bogs	59	А	В	А	А
7150	Rhynchosporion depressions	1	А	С	А	А

Table 1: Annex I habitat data from the Natura 2000 Standard Data Form for Ox Mountains Bogs cSAC. Data retrieved from <u>www.npws.ie</u> 23rd October 2013. Rep. = Representativity, Surf. = Relative Surface, Cons. =

2. FIELD SURVEY

Description of habitats

The upland plateau

- 2.1 The eastern portion of the site occupies a large, undulating plateau, covered by PB2 Upland blanket bog, as classified under Fossitt (2000). This bog is characterised by the presence of *Trichophorum germanicum* across most of the plateau, particularly in areas where there is little or no slope. In some areas, especially on sloping ground, the vegetation of the bog is characterised by *Calluna vulgaris* and *Eriophorum vaginatum*. In the wetter parts of the plateau there are frequent bog pools (FL1 Dystrophic lakes) and on exposed ridges there are tracts of PB5 Eroding blanket bog. There are pockets of PF2 Poor fen and flush and PF3 Transition mire and quaking bog scattered across the plateau, particularly in the numerous small valleys. The vegetation of the PF3 Transition mire and quaking bog is characterised by the presence of *Carex rostrata, Carex nigra* and *Sphagnum* spp. There are small areas of HH4 Montane heath and GS3 Dry-humid acid grassland, dominated by *Juncus squarrosus*, in places on the plateau. There are a number of FL2 Acid oligotrophic lakes on the south-western ridge of the plateau.
- 2.2 There is also much **PB2 Upland blanket bog** on the southeast-facing slopes above the village of Cloonacool. These slopes are incised by two wide, deep river valleys, of the River Moy and Mad River. The vegetation alongside these rivers is generally **GS3 Dry-humid acid grassland**, **GS4 Wet grassland** and **PF2 Poor fen and flush**. There are extensive areas of **HH4 Wet heath** along these slopes, particularly at the eastern end of the slope. This vegetation is characterised by the presence of *Molinia caerulea* and *Erica tetralix*. Elsewhere along this slope there are areas of **PF1 Rich fen and flush**, **PF2 Poor fen and flush**, **PF3 Transition mire and quaking bog**, **GS3 Dry-humid acid grassland** and **GS4 Wet grassland**. Towards the south-western end of this slope there are areas of **HD1 Dense bracken** and **HH1 Dry siliceous heath**, characterised by *Calluna vulgaris*, *Erica cinerea* and pleurocarpous mosses, including *Hylocomium splendens* and *Rhytidiadelphus loreus*.

Easkey Bog Nature Reserve and nearby areas

- 2.3 The Easkey Bog Nature Reserve is located north of the main upland plateau. Much of the slopes to the south of the Nature Reserve are covered by PB2 Upland blanket bog. The north-eastern portion of this slope is punctuated by an area of rocky outcrops, which are a mixture of ER1 Exposed siliceous rock and ER2 Exposed calcareous rock. The vegetation of the ER2 Exposed calcareous rock is characterised by the fern species *Asplenium viride, Cystopteris fragilis* and *Phegopteris connectilis*. The vegetation of the slopes between and below these crags is primarily a mixture of HH3 Wet heath and GS3 Dry-humid acid grassland.
- 2.4 The vegetation of the Nature Reserve is primarily PB2 Upland blanket bog, characterised by *Trichophorum germanicum, Calluna vulgaris* and *Eriophorum vaginatum*. There are a number of FL1 Dystrophic lakes among the bog. There is a steep slope on the northern margin of the Nature Reserve, which is incised by a number of deep stream gullies. The vegetation of this slope is primarily GS3 Dry-humid acid grassland and HD1 Dense bracken. Within the stream

gullies there are patches of **GS3 Dry-humid acid grassland** which are rich in species such as *Thymus polytrichus, Lotus corniculatus* and *Linum catharticum*. There are also tufa-forming **FP1 Calcareous springs** on the steep walls of the gullies, characterised by *Palustriella commutata* and *Carex panicea*.

2.5 To the west of the Nature Reserve, there is an isolated area comprised primarily of **PB2 Upland blanket bog** and **PB3 Lowland blanket bog**. This area contains the large **FL1 Dystrophic lake** of Lough Nafullow. To the north of this area is a small isolated portion of the site. This area is covered primarily by **PB2 Upland blanket bog** and **GS4 Wet grassland**, and contains an area of **PF1 Rich fen and flush**, characterised by *Carex viridula* subsp. *oedocarpa*, *Carex panicea*, *Schoenus nigricans* and *Scorpidium revolvens*.

Easky Lough and Masshill

- 2.6 Easky Lough sits in a wide valley running north to south. To the east of the lake there is a steep escarpment, which runs south past Masshill to the townland of Sessuegilroy. The slopes above Easky Lough are primarily covered by a mosaic of HH1 Dry siliceous heath, characterised by *Calluna vulgaris, Sphagnum capillifolium* and *Rhytidiadelphus loreus*, HH3 Wet heath, HD1 Dense bracken and GS3 Dry-humid acid grassland. There are also patches of PF1 Rich fen and flush and ER3 Siliceous scree and loose rock, in which *Racomitrium lanuginosum*, *Diplophyllum albicans* and *Hymenophyllum wilsonii* grow, on this slope.
- 2.7 South of the lake, the slope becomes shallower, where there is a broad river valley, and there is a high proportion of PB2 Upland blanket bog and HH3 Wet heath, characterised by *Trichophorum germanicum* and *Molinia caerulea*. South of this relatively gentle valley, the slope once again becomes steeper, and the vegetation is a mix of GS3 Dry-humid acid grassland, HD1 Dense bracken, HH1 Dry siliceous heath, characterised by *Vaccinium myrtillus*, and HH3 Wet heath. It is likely that the amount of HD1 Dense bracken occurring on this slope was underestimated, as the survey was carried out before the bracken plants had fully emerged. There are bands of ER1 Exposed siliceous rock on this slope, characterised by *Dryopteris dilatata* and *Hymenophyllum wilsonii*, below which patches of ER3 Siliceous scree and loose rock occur. The composition of the vegetation of this slope remains similar for its entire length, with occasional areas of PB2 Upland blanket bog present where the slope is less steep.
- 2.8 Easky Lough is classified as FL2 Acid oligotrophic lake and there is much PF2 Poor fen and flush along its shore and alongside the Easky River, which issues from the lake. The valley to both the north and south of Easky Lough is covered mainly by PB2 Upland blanket bog and some PB3 lowland blanket bog. Within this area there are many bog pools (FL1 Dystrophic lakes) and areas of PF3 Transition mires and quaking bog, characterised by *Carex limosa, Rhynchospora alba* and *Sphagnum* spp. There are a number of ridges of high ground to the west of this valley, which are mostly vegetated by PB2 Upland blanket bog, as well as HH1 Dry siliceous heath and HH3 Wet heath.

Letterunshin bog

2.9 There is broad, flat expanse at Letterunshin, which is primarily vegetated by **PB3 Lowland blanket bog**, characterised by *Calluna vulgaris*, *Eriophorum angustifolium*, *Eriophorum vaginatum*,

Narthecium ossifragum and *Sphagnum* spp. including *Sphagnum austinii*. This bog is extremely wet in places, and there are abundant bog pools and small lakes (**FL1 Dystrophic lakes**), with **PF3 Transition mire and quaking bogs** in places. Where conditions are drier, there are areas of **PB2 Upland blanket bog** and **HH3 Wet heath** and there are areas of **GS4 Wet grassland** and **PF2 Poor fen and flush** in stream valleys. Large parts of this area have been severely affected by burning. A short slope drops from the edge of the bogland to the valley of the Easky River. On this slope there are areas of **HH1 Dry siliceous heath**, **WS1 Scrub**, **WN2 Oak-ash-hazel woodland** and tufa-forming **FP1 Calcareous springs**, characterised by *Palustriella falcata*, *Carex viridula* subsp. *brachyrrhyncha* and *Eleocharis quinqueflora*.

Fiddandarry

- 2.10 Fiddandarry is a relatively level area, backed by a ridge of high ground. The vegetation of the lower areas is a mosaic of **PB2 Upland blanket bog**, **PB3 lowland blanket bog** and **HH3 Wet heath**. The vegetation of the areas of **PB3 Lowland blanket bog** is similar to that found in Letterunshin, and there are numerous pools of **FL1 Dystrophic lakes** throughout the bog. The areas of **PB2 Upland blanket bog** are characterised by *Calluna vulgaris*, *Eriophorum vaginatum* and *Trichophorum germanicum*. There are a number of areas of **PF1 Rich fen and flush** scattered through this area, in which grow species including *Schoenus nigricans*, *Carex rostrata*, *Scorpidium revolvens* and *Campylium stellatum*. Areas of **GS3 Dry-humid acid grassland** and **GS4 Wet grassland** mainly occur in river valleys in this area. There is much active peat cutting at the margins of this area, and there are expanses of **PB5 Eroding blanket bog** within the site that have been created by peat extraction.
- 2.11 The ridge to the east of Fiddandarry is covered in many parts by PB2 Upland blanket bog, which is characterised by *Calluna vulgaris* and *Eriophorum vaginatum*. There are also extensive areas of HH3 Wet heath, dominated by *Calluna vulgaris* and *Molinia caerulea*, and HH1 Dry siliceous heath, in which *Vaccinium myrtillus* is prominent. There are a number of broad valleys in which there is a high proportion of PF2 Poor fen and flush. In flat areas there are patches of PF3 Transition mire and quaking bog, characterised by *Carex rostrata*, *Carex lasiocarpa* and *Potamogeton polygonifolius*. On the highest part of this ridge there are small pockets of HH4 Montane heath, dominated by *Racomitrium lanuginosum*, *Calluna vulgaris* and *Juncus squarrosus*.
- 2.12 A selection of photographs taken during fieldwork of landscapes, habitats and species are presented in Appendix 2.

Habitat statistics

2.13 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 1-21).

Fossitt code	Habitat	Area (ha)	% of site
BL1	Stone walls and other stonework	0.4	0.004
BL2	Earth banks	0.2	0.002
BL3	Buildings and artificial surfaces	8.5	0.1
ED1	Exposed sand, gravel or till	4.0	0.04
ED2	Spoil and bare ground	7.2	0.1
ED3	Recolonising bare ground	9.9	0.1
ED5	Refuse and other waste	0.01	0.0001
ER1	Exposed siliceous rock	47.9	0.5
ER2	Exposed calcareous rock	0.1	0.001
ER3	Siliceous scree and loose rock	41.0	0.4
FL1	Dystrophic lakes	176.2	1.7
FL2	Acid oligotrophic lakes	149.4	1.4
FP1	Calcareous springs	0.1	0.001
FP2	Non-calcareous springs	1.0	0.01
FS1	Reed and large sedge swamps	3.6	0.03
FS2	Tall-herb swamps	0.01	0.0001
FW1	Eroding/upland rivers	32.6	0.3
FW2	Depositing/lowland rivers	4.7	0.04
FW4	Drainage ditches	6.2	0.1
GA1	Improved agricultural grassland	0.4	0.004
GM1	Marsh	1.0	0.01
GS2	Dry meadows and grassy verges	0.5	0.01
GS3	Dry-humid acid grassland	453.8	4.3
GS4	Wet grassland	188.3	1.8
HD1	Dense bracken	58.6	0.6
HH1	Dry siliceous heath	335.0	3.2
HH3	Wet heath	1083.2	10.2
HH4	Montane heath	29.3	0.3
PB2	Upland blanket bog	6272.8	59.3
PB3	Lowland blanket bog	1027.2	9.7
PB4	Cutover bog	20.8	0.2
PB5	Eroding blanket bog	106.6	1.0
PF1	Rich fen and flush	19.0	0.2
PF2	Poor fen and flush	390.8	3.7
PF3	Transition mire and quaking bog	36.6	0.4
WD2	Mixed broadleaved/conifer woodland	0.8	0.01
WD4	Conifer plantation	35.6	0.3
WD5	Scattered trees and parkland	0.7	0.01
WL1	Hedgerows	0.03	0.0003
WL2	Treelines	0.1	0.001
WN2	Oak-ash-hazel woodland	1.8	0.02

Table 2: Extent of Fossitt habitats within Ox Mountains bogs cSAC.

Fossitt code	Habitat	Area (ha)	% of site
WS1	Scrub	7.1	0.1
WS2	Immature woodland	1.3	0.01
WS3	Ornamental / non-native shrubs	0.03	0.0003
WS5	Recently-felled woodland	8.3	0.1
	Total site area	10572.9	

Table 2. continued

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

Annex I code	Habitat	Area (ha)	% of site
3110	Lowland oligotrophic lakes	0.1	0.001
3130	Upland oligotrophic lakes	149.2	1.4
3160	Dystrophic lakes	173.2	1.6
3260	Floating river vegetation	3.7	0.04
4010	Wet heath	1083.2	10.2
4030	Dry heath	332.9	3.1
4060	Alpine and Boreal heath	29.2	0.3
*6230	Species-rich Nardus grassland	0.5	0.005
6430	Hydrophilous tall herb communities	0.01	0.0001
*7130	Active blanket bog	7097.3	67.1
7130	Inactive blanket bog	152.3	1.4
7140	Transition mires	36.6	0.3
7150	Rhynchosporion depression	49.6	0.5
*7220	Petrifying springs	0.03	0.0003
7230	Alkaline fens	4.8	0.05
8110	Siliceous scree	2.4	0.02
8210	Calcareous rocky slopes	0.02	0.0002
8220	Siliceous rocky slopes	2.3	0.02
	non-Annex I habitats	1455.3	13.8
	Total site area	10572.9	
	Total area of Annex I habitats	9117.6	86.2

- 2.14 The most abundant habitat within a polygon is termed the primary habitat. The primary Fossitt habitat types for Ox Mountains Bogs 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.
- 2.15 A total of 45 Fossitt (2000) habitats were recorded during this survey within Ox Mountains Bogs cSAC and details of their areas are presented in Table 2. PB2 Upland blanket bog was the most extensive, covering 59.33% of the site, followed by HH3 Wet heath at 10.2%, PB3 Lowland blanket bog at 9.7% and GS3 Dry-humid acid grassland at 4.3%.

Code	Provisional communities and sub-communities	Area (ha)	% of site	% of habitat
PO1	Menyanthes trifoliata - Carex limosa pool community			
PO1a	infilling pool sub-community	6.4	0.1	10.2
PO1b	aquatic sub-community	55.6	0.5	89.4
PO2	<i>Litorella uniflora – Lobelia dortmanna</i> lake community			
PO2i	upland variant	0.1	0.001	0.2
PO2ii	lowland variant	0.1	0.001	0.2
SW1	Potamogeton polygonifolius soakway	3.1	0.03	100
SPG1	Philonotis fontana - Saxifraga stellaris spring			
SPG1a	typical sub-community	0.3	0.003	25.4
SPG1b	species-poor <i>Sphagnum denticulatum</i> sub-community	0.7	0.01	61.3
SPG2	Palustriella commutata spring			
SPG2i	Annex I variant	0.03	0.0003	2.8
SPG2ii	non-Annex I variant	0.1	0.001	10.5
PFLU1	Carex nigra/echinata - Sphagnum denticulatum flush	59.9	0.6	11.6
PFLU2	Juncus effusus - Sphagnum cuspidatum/palustre flush	290.5	2.7	56.1
PFLU3	Juncus acutiflorus/effusus - Calliergonella cuspidata flush	106.1	1.0	20.5
PFLU4	Molinia caerulea – Sphagnum palustre flush			
PFLU4a	typical sub-community	31.3	0.3	6.0
PFLU5	Carex rostrata – Sphagnum spp. flush	29.6	0.3	5.7
RFLU1	Carex viridula oedocarpa - Pinguicula vulgaris - Juncus bulbosus flush			
RFLU1a	brown moss sub-community	36	0.03	18.3
RFLU1b	species-poor sub-community	14.1	0.00	71.9
RFLU3	Carex nanicea – Carex viridula subsp. oedocarna flush	0.1	0.001	0.5
RFLU4	Schoenus nioricans – Scornidium scornioides flush	0.1	0.001	2.8
RFEN	Carex rostrata fen	0.0	0.01	2.0
RFFN1a	species_rich sub_community	0.6	0.01	31
RFEN1b	species-poor sub-community	0.6	0.01	3.3
UC1	Agrestic capillaris - Easturg oping upland grassland			
UG1	typical sub-community	106.0	1.0	20.1
UG1a	Subscription sub-community	100.0	0.1	20.1
UC1c	species rich sub-community	0.0	0.1	1.7
UC1d	Species-rich sub-community	0.1	0.001	17.6
UGIU	Naudus straista. Colinum segurile unlend erossion d	92.4	0.9	17.0
UG2	tunical sub community	191	0.5	0.1
UGZa		40.1 22 F	0.5	9.1
UG20	Sprugnum spp. sub-community	55.5	0.5	0.4
UG2C	species-rich sub-community	0.4	0.004	0.1
UG20	<i>Juncus squarrosus</i> sub-community	164.3	1.6	31.2
UG4	Molinia caerulea – Anthoxanthum odoratum wet grassland	72.6	0.7	13.8
BK1	Pteridium aquilinum community	58.6	0.6	100
DH3	Calluna vulgaris - Erica cinerea dry heath	248.9	2.4	74.8
DH4	Calluna vulgaris - Sphagnum capillifolium dry /damp heath	49.1	0.5	14.8
DH6	Calluna vulgaris -Vaccinium murtillus dry heath	34.8	0.3	10.4

Table 4: Extent of provisional vegetation communities within Ox Mountains bogs cSAC	Гаble 4: Extent of provisional	vegetation communitie	es within Ox Mountains	bogs cSAC.
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Code i fovisional communities and sub-communities Afea		11
(ha)	cito hahi	tat
WH1 Schoenus nigricans - Frica tetralix wet heath	site navi	iai
WH1a continuous cover sub-community 5.5 0	1 05	
WH1b open sub-community 0.2 0	002 0.0	2
WH2 Trichonhorum germanicum - Cladonia spp Racomitrium lanuginosum wet 0.5 0.	01 0.0	5
heath	.01 0.0	0
WH3 Calluna zuloaris - Molinia caerulea - Sphaonum canillifolium wet/damp heath 7067 6	7 652	
WH4 Trichonhorum cermanicum- Erionhorum anoustifolium wet heath	., 00.2	
WH4a typical sub-community 67.9 0	6 63	
WH4b Callung vulgaris sub-community 139.5 1	.0 0.0 3 12.9	
WH4c Juncus sayarrosus sub-community 10.8 0	1 10	1
WH5 Trichonhorum germanicum - Nardus stricta - Racomitrium lanuginosum 3.2 0	03 03	
wins incloped an germanican - windes stricta - Racomartan anaginosan 5.2 0.	.00 0.0	
WH6 Schoenus nigricans – Molinia caerulea – Murica gale wet heath 148.8 1	4 137	
	.4 15.7	
MH1 Calluna vulgaris - Racomitrium lanuginosum montane heath		
MH1a typical sub-community 27.8 0.	.3 94.9	
MH1b Juncus squarrosus sub-community 1.4 0.	.01 4.7	
MH2 Vaccinium myrtillus – Racomitrium lanuginosum – Herbertus aduncus 0.01 0.	.0001 0.0	2
montane heath		
MH3 Vaccinium myrtillus - Rhytidiadelphus loreus - Anthoxanthum odoratum 0.04 0.	.0004 0.1	
montane heath		
MH5 Nardus stricta - Carex binervis - Racomitrium lanuginosum montane grass- 0.08 0.	.001 0.3	
heath		
BB1 Schoenus niericans – Erionhorum anoustifolium bog		
BB1a continuous cover sub-community 6.4 0.	.1 0.1	
BB1b open sub-community 0.04 0.	.0004 0.0	01
BB2 Schoenus niericans – Sphaenum spp. bog 2.1 0	.02 0.0	3
BB3 Eriophorum vaginatum – Sphagnum papillosum bog 2869 2	.7 4.1	0
BB4 Trichonhorum oermanicum - Erionhorum angustifolium bog 2502 9 23	7 358	
BB5 Calluna tuloaris - Erionhorum spp hog		
BB5a typical sub-community 3206.2 30	13 459	
BB5b <i>Juncus sauarrosus</i> sub-community 93.3 0	9 13	
BB7 Eriophorum anoustifolium – Sphaonum austinii bog 886.4 8	4 127	
	.1 12.7	
HW1 Sphagnum denticulatum/cuspidatum hollow		
HW1i upland variant 48.4 0.	.5 15.1	
HW1ii lowland variant 64.6 0.	.6 20.1	
HW1iii flush variant 2.1 0.	.02 0.6	
HW2 Eriophorum angustifolium - Sphagnum fallax hollow		
HW2i upland variant 135.2 1	3 42.0	
$HW2ii \qquad lowland variant \qquad 172 0$	2 53	
$\frac{11}{100}$.2 5.5 5 154	
HWS Knynchospora aloa hollow 49.0 0. HWA Eleastratic multicaulia hollow 49.0 0.	.5 15.4	
HW4 Electruris multiculus hollow	01 0.2	
$\begin{array}{ccc} HW4i & Dog Variant & 0.0 & 0. \\ HW4i & fluch variant & 2.0 & 0. \\ \end{array}$.01 0.3	
5.9 0.	.04 1.2	
DP1 Campulopus introflexus - Polutrichum spp. degraded peat community 94 0	.09 93.9	
DP2 Nardus stricta – Erionhorum anoustifolium degraded peat community 0.6 0	.01 61	
21 - Annune on teim Enopher unt unzueligen unt acquaced pear continuity 0.0 0.	0.1	
TH1 Luzula sylvatica - Vaccinium myrtillus tall herb vegetation		
TH1i rock face variant 0.2 0.	.002 8.9	
TH1iidry heath variant2.10.	.02 90.8	

Table 4: continued.

Code	Provisional communities and sub-communities	Area	% of	% of
		(ha)	site	habitat
TH3	Sedum rosea - Angelica sylvestris tall herb vegetation	0.01	0.0001	0.3
SC1	Siliceous scree community	0.2	0.002	100
RS1	Saxifraga spathularis - Asplenium adiantum-nigrum rock cleft community	0.3	0.003	99.0
RS2	Saxifraga aizoides - Asplenium spp Orthothecium rufescens rock cleft community	0.003	0.00003	1.0
HM1	Calluna vulgaris – Scapania gracilis hepatic mat			
HM1i	non-Annex I grassland variant	0.06	0.001	21.2
HM1iii	dry heath variant	0.1	0.001	43.3
HM1iv	wet heath variant	0.04	0.0003	13.5
HM1vi	non-Annex I siliceous rock variant	0.05	0.0005	18.5
HM1vii	Annex I siliceous rock variant	0.01	0.0001	3.4
	Total area of vegetation communities	9952.5	94.1	
	Not covered	100.1	1.0	
	Non-vegetation cover types	520.3	4.9	
	Total site area	10572.9		

Table 4: continued.

- 2.16 A total of 18 Annex I habitats were recorded during this survey within Ox Mountains Bogs cSAC, covering 86.2% of the site (Table 3). The main Annex I habitat was *7130 Active blanket bogs, which covered 67.1% of the site, followed by 4010 Wet heaths and 4030 Dry heaths which covered 10.2% and 3.1% of the site respectively. The next most frequent habitat was 3160 Dystrophic lakes at 1.6%. Note that significant areas of non-Annex habitats may occur within an SAC. These may occur in intimate mosaic with Annex I habitats. They may have an important protective or support function in relation to associated Annex habitats, be the target of restoration objectives or improve the coherence and connectivity between fragmented areas of Annex I habitat.
- 2.17 A total of 95 provisional upland vegetation communities and sub-communities (Perrin *et al.*, 2014) were recorded within Ox Mountains Bogs cSAC. Details of their coverage are presented in Table 4.
- 2.18 Gradated maps displaying the cover of Annex I habitats currently assessed under the NSUH plus **6430 Hydrophilous tall herb communities** are shown in Figs. 4a-m. These maps present the actual distributions of individual habitats within the site which may be masked in the primary habitat maps which show only the most extensive habitat in each polygon.

Rare and notable flora

2.19 Rare and notable plant records for the site are listed in Table 5 and their locations, where accurately known, are presented in Fig. 5. The list is compiled from records made during the present survey and from existing records. For each species it is indicated whether it is listed on the Flora Protection Order, 1999 and/or the relevant Red Data List. For vascular plants this is

Curtis & McGough (1988) and for bryophytes it is Lockhart *et al.* (2012). For lichens a preparatory list provided by D. McFerran, National Museums Northern Ireland was used; this is very much provisional and IUCN status has not been assigned to these species. Notable records comprise plants which are not rare but are of particular interest in an upland context.

- 2.20 Some rare vascular plants were recorded during the NSUH at this site. These include *Carex bigelowii, Asplenium viride* and *Cystopteris fragilis.* The latter two species grow on base-enriched cliffs to the south of Easkey Bog Nature Reserve. The Annex II listed species *Saxifraga hirculus* was discovered new to Sligo in a flush/spring system among the large area of bog in the northern part of the site.
- 2.21 Previous records for rare plants are sparse, but include *Hammarbya paludosa* close to Easky Lough and *Gnaphalium sylvaticum* near the margins of the site. Historical records for the endemic hawkweed, *Hieracium hartii*, from the Ox Mountains have been rejected following fieldwork and re-identification of voucher specimens as *Hieracium iricum* (Rich *et al.*, 2010).
- 2.22 A number of threatened or near threatened rare bryophytes were recorded during the survey. The moss *Meesia triquetra*, which was considered Regionally Extinct in Ireland, having been lost from its only previous Irish or British site in 1958, was discovered in an iron-rich flush, alongside the Vulnerable *Tomentypnum nitens*. Other threatened species recorded were *Andreaea megistospora* and *Grimmia anomala*, in the vicinity of Easky Lough. In addition, a number of Near Threatened species, including *Rhabdoweisia crispata* and *Sphagnum girgensohnii*, were recorded from across the site, and many new vice county records were made.
- 2.23 Previous rare bryophyte records were mainly from a quarry in the Masshill area, in the valley south of Easky Lough. The moss *Dicranella crispa* and the thallose liverwort *Fossombronia fimbriata* were found in this quarry in 1970, but have not been seen recently (Lockhart *et al.*, 2012).
- 2.24 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.
- 2.25 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

2.26 Faunal records during this survey include Badger (*Meles meles*), Fox (*Vulpes vulpes*), Pine marten (*Martes martes*), Irish hare (*Lepus timidus hibernicus*), Common lizard (*Zootoca vivipara*) and Common frog (*Rana temporaria*). Feral goats (*Capra* sp.) occur around the Easky Lough area. Birds noted at the site include Golden plover (*Pluvialis apricaria*), a species listed on Annex I of the EU Birds Directive. Other birds present include Common gull (*Larus canus*), Herring gull (*Larus argentatus*), Cuckoo (*Cuculus canorus*), Dipper (*Cinclus cinclus*), Mallard (*Anas platyrhynchos*), Raven (*Corvus corax*), Red grouse (*Lagopus lagopus*), Reed bunting (*Emberiza schoeniclus*), Sedge warbler (*Acrocephalus schoenobaenus*), Skylark (*Alauda arvensis*), Snipe (*Gallinago gallinago*), Swallow (*Hirundo rustica*) and Wheatear (*Oenanthe oenanthe*). Freshwater pearl mussel (*Margaritifera margaritifera*) an Annex II listed species of the EU Habitats Directive

	Red Date		A	Veeref		Browiers
Species	List	FPO	Annex II	record (s)	NSUH	records
Vascular plants	LISt					iccolus
Asnlenium miride	_	_	_	2012	•	-
Carex higelozuji	_	_		2012	•	_
Custonteris fragilis	_	_	_	2012	•	-
Gnanhalium sulvaticum	RA	•	_	1896		1 3
Hammarhua naludosa	RA	•	_	1999 2005		1,0
Salix herbacea	-	_		1896		3
Sarifraga hirculus*	FN	•	•	2012	•	-
Vaccinium vitis-idaea	-	_	_	1896 2012	•	3
Vuccintum ottis-iuucu				1090, 2012	•	5
Bryophytes						
Andreaea megistospora*	VU	-	-	2012	•	-
Andreaea rothii subsp. rothii*	-	-	-	2012	•	-
Dicranella crispa	EN	-	-	1970		1,5
Fossombronia fimbriata	VU	-	-	1970		1,5
Grimmia anomala	EN	-	-	2003, 2012	•	1,5
Leiocolea bantriensis	NT	-	-	2012	•	-
Marsupella emarginata var.	-	-	-	2012	•	-
aquatica*						
Meesia triquetra*	RE	-	-	2012	•	-
Rhabdoweisia crispata*	NT	-	-	2012	•	-
Schistidium rivulare*	-	-	-	2012	•	-
Sphagnum angustifolium*	-	-	-	2012	•	-
Sphagnum capillifolium subsp. capillifolium*	DD	-	-	2012	•	-
Sphagnum compactum*	-	-	-	2012	•	-
Sphagnum fimbriatum*	-	-	-	2012	•	-
Sphagnum fuscum*	-	-	-	2012	•	-
Sphagnum girgensohnii	NT	-	-	2012	•	-
Sphagnum inundatum*	-	-	-	2012	•	
Sphagnum platyphyllum*	NT	-	-	2012	•	-
Sphagnum strictum	DD	-	-	2008		1,5
Sphagnum subnitens var.	-	-	-	2012	•	-
ferrugineum*						
Sphagnum teres	NT	-	-	2012	•	-
Tomentypnum nitens*	VU	-	-	2012	•	-
Warnstorfia sarmentosa*	-	-	-	2012	•	-
Lichons						
Cladovia incrassata	•			2009		4
Cladonia ranoiferina	•	-	-	1989		т 1
Cinnonin rungijerinu	-	-	-	1707		T

Table 5: Records of rare and notable	plant species from	Ox Mountains cSAC.
	r · · · · · · · · · ·	

* Denotes new or updated vice county record from NSUH fieldwork

Previous records:	1, NPWS Recorder database and associated data	4, LichenIreland	
	2, Warren (1897)	5, Lockhart <i>et al.</i> (2012)	
	3, Colgan (1896)		
Red Data List:	RE, Regionally Extinct	RA, Rare	
	NT, Near Threatened	EN, Endangered	
	DD, Data Deficient	VU, Vulnerable	

was also noted, along with the butterflies Green hairstreak (*Callophrys rubi*), Orange-tip (*Anthocharis cardamines*) and Peacock butterfly (*Inachis io*)). Other invertebrates noted in the site include: Four-spotted chaser (*Libellula quadrimaculata*), Great diving beetle (*Dytiscus marginalis*) and Emperor moth (*Saturnia pavonia*).

2.27 Previous faunal records include Greenland white-fronted goose (*Anser albifrons flavirostris*), Merlin (*Falco columbarius*), Hen harrier (*Circus cyaneus*) and Peregrine falcon (*Falco peregrinus*) all listed on Annex I of the Birds Directive. Other birds recorded include Common gull (*Larus canus*), Teal (*Anas crecca*), Dipper (*Cinclus cinclus hibernicus*), Grey wagtail (*Motacilla cinerea*), Raven (*Corvus corax*), Snipe (*Gallinago gallinago*), Common sandpiper (*Actitis hypoleucos*), and Woodcock (*Scolopax rusticola*). Geyer's whorl snail (*Vertigo geyeri*), Otter (*Lutra lutra*) and Salmon (*Salmo salar*) occur and are all listed on Annex II of the Habitats Directive. Other records include Brown trout (*Salmo trutta*), Eel (*Anguilla anguilla*), Freshwater limpet (*Ancylus fluviatilis*) and Mink (*Mustela vison*).

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 86 monitoring stops were recorded within Ox Mountains Bogs cSAC for this purpose (Fig. 6 and Table 6); 3 additional relevés were recorded in habitats that were not assessed. Due to the sensitive nature of some of the species recorded, the location of the **7230 Alkaline fens** monitoring stops and one of the additional relevés have been omitted from Fig. 6. 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).

Annex I code	Habitat	Number of stops
4010	Wet heaths	11
4030	Dry heaths	7
4060	Alpine and Boreal heaths	1
*6230	Species-rich Nardus grassland	2
*7130/7130	Blanket bogs	47
7140	Transition mires	4
7150	Rhynchosporion depressions	3
7230	Alkaline fens	4
8110	Siliceous scree	2
8210	Calcareous rocky slopes	2
8220	Siliceous rocky slopes	3

Table 6: The number	of monitoring sto	ps recorded in	n primary focus	s Annex I habitats
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Commonage Framework Plan

3.2 Surveys were initiated in 1998 to assess livestock impacts on commonages in Ireland and to devise Commonage Framework Plans (CFP) to improve commonage condition. Assessments were made on an area basis by dividing the commonage into subunits based on areas of a consistent level of damage. Point sample assessments were made at a series of stations, of 10 x 10 m, within the subunits. The habitats identified by the CFP relevant to the NSUH sites were blanket bog, wet heath, dry heath and upland grassland. The damage assessment scale used was undamaged (U), moderately damaged to undamaged (MU), moderately damaged (MM), moderately to severely damaged (MS), severely damaged (S) or very severely damaged (S*). Further details of CFP methodology can be found in Anon. (1998) and use of these data by the NSUH has been reviewed by Perrin (2012).

- 3.3 Ox Mountains Bogs cSAC contains significant areas of commonage with these areas comprising 44.3 km² or 41.9% of the terrestrial area of the site. A baseline CFP survey of most of these areas occurred in 2000 and 2001 with the small remaining area being surveyed in 2005. An interim destocking level of 30% had been applied in Sligo prior to the CFP commencing. This was then adjusted using available CFP results *c*.2002. Results from this baseline survey are shown in Fig. 7. Only one agricultural unit (SL5-Q) has been resurveyed, in 2008-2009. The condition of this unit was found to have improved as the destocking assessment was reduced from 59.0% to 33.5%.
- 3.4 The CFP baseline survey recorded 53 subunits within or partially within Ox Mountains Bogs cSAC (Table 7). These indicate commonage within the site was in moderate condition at this time with 70.1% of the area being undamaged (U) but 11.3% of the area being moderately to severely damaged (MS) or worse.

5	0	0
Damage level	Frequency	Area
	(n = 53)	%
U	15 (28.3%)	70.1
MU	14 (26.4%)	4.8
MM	16 (30.2%)	13.8
MS	2 (3.8%)	0.2
S/S*	6 (11.3%)	11.1

Table 7: Frequency of CFP subunit damage levels in Ox Mountains Bogs cSAC baseline survey

3.5 The CFP recorded 41 stations within Ox Mountains Bogs cSAC but data was available only for 38 stations (Table 8). These indicate commonage within the site was in poor condition at this time with only 36.8% of stations being undamaged (U) and 13.1% of stations being moderately to severely damaged (MS) or worse.

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

	Wet heath/Dry		
Damage	heath/ Blanket bog	Upland grassland	All habitats
level	(n = 37)	(n = 1)	(n = 38)
U	13 (35.1%)	1 (100%)	14 (36.8%)
MU	8 (21.6%)	0 (0.0%)	8 (21.1%)
MM	9 (24.3%)	0 (0.0%)	9 (23.7%)
MS	1 (2.7%)	0 (0.0%)	1(2.6%)
S/S*	4 (10.8%)	0 (0.0%)	4 (10.5%)

3.6 Summary data for some of the key indicators recorded at CFP stations are compared with NSUH data in Table 9. They suggest that there has been a decrease in the area of bare peat, an

increase in sward height and an increase in *Calluna* height. However, the data also suggest a decrease in *Calluna* cover.

3.7 The analysis of key indicator values is rather inconclusive and as there has been no CFP resurvey of this site it is not possible to derive much from the other data. However, the fact that reduction of stock numbers under the CFP occurred in over 29% 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.

	Wet heath/Dry	Upland grassland	
	bog		and other habitats
	CFP	NSUH	CFP
	(n = 37)	(n = 69)	(n = 1)
Bare peat cover (%)	2.5	0.9	0.0
Sward height (cm)	18.1	27.4	10.0
Calluna height (cm)	15.7	22.4†	-
Calluna cover			
D (>50%)	9 (24.3%)	16 (23.2%)	-
A (26-50%)	12 (32.4%)	15 (11.3%)	-
O or F (≤25%)	15 (40.5%)	38 (55.1%)	-
Absent	1 (2.7%)	0 (0.0%)	-
Not recorded	0 (0.0%)	0 (0.0%)	-

Table 9: Mean values for key indicators from CFP stations in Ox Mountains Bogs cSAC baseline survey (2000-2005) with related data from NSUH survey (2012).

+ 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. Recordable losses in **4010 Wet heaths** were due to a landslide (<0.01 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.

Structure and functions

3.9 Eleven monitoring stops were recorded in **4010 Wet heaths** within Ox Mountains Bogs cSAC (Table 11). In the assessment of structure and functions, eight monitoring stops failed one criterion or more. Following a review of the ecological condition of those stops, expert judgement determined that two should pass because the failure was marginal or due to other mitigating circumstances. This reduced the number of monitoring stops that failed to six,

resulting in an overall failure rate of 54.5%. The structure and functions of **4010 Wet heaths** were therefore assessed as Unfavourable – Bad.

Table 10 impacts causing obvious losses in areas of 4010 wet hearis, 1995-2012.							
Impact code	Immediate	Area (ha)	Area (ha)	Area (ha)	Area (ha)		
	Impact	1995-2000	2000-2005	2005-2012	1995-2012		
L05	Collapse of terrain, landslide	0.00	0.00	< 0.01	< 0.01		
All impacts		0.00	0.00	< 0.01	< 0.01		
% of habitat		0.00	0.00	< 0.01	< 0.01		
% loss per year		0.00	0.00	< 0.01	< 0.01		

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

- 3.10 The vegetation composition of 4010 Wet heaths was poor in several cases, with failures being recorded under six criteria. The cover of positive indicator species was inadequate at 27.3% of monitoring stops. The cover of ericoid species was inadequate at 18.2% of monitoring stops, while the cover of dwarf shrub species was excessive at 18.2% of monitoring stops. One 4010 Wet heaths monitoring stop (9.1%) failed due to inadequate cover of *Cladonia* spp., *Sphagnum* spp., *Racomitrium lanuginosum* and pleurocarpous mosses. Another monitoring stop (9.1%) failed due to excessive cover of the negative indicator species *Agrostis capillaris* and another (9.1%) due to excessive cover of the non-native species *Campylopus introflexus* in the local vicinity.
- 3.11 The vegetation structure of **4010 Wet heaths** was poor in some cases, with 18.2% of monitoring stops failing due to excessive levels of grazing by sheep. One **4010 Wet heaths** monitoring stop failed due to evidence of severe burning (9.1%) and burning in sensitive areas of the habitat (11.1%).
- 3.12 The physical structure of one **4010 Wet heaths** monitoring stop (9.1%) was poor. It exhibited excessive cover of disturbed bare ground due to the presence of sheep paths in the local vicinity.

Future prospects

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

Non-intensive sheep grazing (A04.02.02)

3.14 The Ox Mountains Bogs cSAC Conservation Plan (NPWS, undated) stated that the dominant agricultural activity within the site was sheep grazing. Most of the site was subject to grazing, although grazing intensity varied throughout. The southern part of Laughil, the hillsides east of Easky Lough and parts of Lough Rumduff Bog were described as having some overgrazed areas. These are among the areas where **4010 Wet heaths** are most abundant within the site (Fig. 4a). Supplementary feeding of sheep was noted from a number of locations, particularly

the hillside east of Easky Lough where it resulted in damage from poaching, trampling and overgrazing.

Crit	teria	Scale of	Number of	Number of	Failure
CIII		assessment	assessments	failures	rate (%)
Veg	getation composition				
1	Erica tetralix present	20m radius	11	0	0
2	Cover of positive indicator species $\geq 50\%$	Relevé	11	3	27.3
3	Total cover of <i>Cladonia</i> species, <i>Sphagnum</i> species, <i>Racomitrium lanuginosum</i> and pleurocarpous mosses ≥ 10%	Relevé	11	1	9.1
4	Cover of ericoid species and <i>Empetrum nigrum</i> $\geq 15\%$	Relevé	11	2	18.2
5	Cover of dwarf shrub species < 75%	Relevé	11	2	18.2
6	Cover of the following negative indicator species: <i>Agrostis capillaris, Holcus lanatus,</i> <i>Phragmites australis, Ranunculus repens</i> collectively < 1%	Relevé	11	1	9.1
7	Cover of non-native species < 1%	Relevé	11	0	0
8	Cover of non-native species < 1%	Local vicinity	11	1	9.1
9	Cover of scattered native trees and scrub $< 20\%$	Local vicinity	11	0	0
10	Cover of <i>Pteridium aquilinum</i> < 10%	Local vicinity	11	0	0
11	Cover of <i>Juncus effusus</i> < 10%	Local vicinity	11	0	0
Veg	getation structure				
12	Crushed, broken and/or pulled up <i>Sphagnum</i> species < 10% of <i>Sphagnum</i> cover	Relevé	11	0	0
13	Last complete growing season's shoots of ericoids, <i>Empetrum nigrum</i> and <i>Myrica gale</i> showing signs of <u>browsing</u> collectively < 33%	Relevé	11	2	18.2
14	No signs of <u>burning</u> into the moss, liverwort or lichen layer, or exposure of peat surface due to burning	Local vicinity	11	1	9.1
15	No signs of <u>burning</u> inside boundaries of sensitive areas*	Local vicinity	9	1	11.1
Phy	vsical structure				
16	Cover of <u>disturbed</u> bare ground < 10%	Relevé	11	0	0
17	Cover of <u>disturbed</u> bare ground < 10%	Local vicinity	11	1	9.1
18	Area showing signs of <u>drainage</u> resulting from heavy trampling or tracking or ditches < 10%	Local vicinity	11	0	0

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

*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 During the present survey, excessive levels of grazing were recorded at two (18.2%) of 4010 Wet heaths monitoring stops, located in Fiddandarry Bog and Lough Rumduff Bog. The level of grazing varied across the site, with the proportion of dwarf shrub shoots showing signs of

grazing ranging from 0 - 50%. The intensity of this impact has been assessed as medium overall and its influence as negative. The trend was assessed as improving due to reduction of stock numbers under the CFP.

Non-intensive goat grazing (A04.02.04)

3.16 The Ox Mountains Bogs cSAC Conservation Plan (NPWS, undated) stated that herds of feral goats (*Capra hircus*) occurred in the Mass Hill area and around Easky Lough. During an NPWS visit to the state-owned land at Letterunshin, 25 goats were observed. On a previous occasion, up to 37 goats had been observed there. The dates of these visits were not given. During the present survey, a single goat was observed in **4010 Wet heaths** around Easky Lough. Due to the presence of a single individual, the intensity of this impact was assessed as low and its influence as neutral. The area of **4010 Wet heaths** affected has been estimated to be less than 1%. The number of goats within the site appears to have declined dramatically. As the hillside to the east of Easky Lough was subject to overgrazing in the past (NPWS, undated), the trend for this impact has been assessed as improving.

Electricity and phone lines (D02.01)

3.17 The use of heavy machinery to install a power cable caused damage to **4010 Wet heaths** at Carrowmurray. The area has revegetated following this disturbance, but can no longer be classified as **4010 Wet heaths**. The intensity of this impact has been assessed as high and its influence as negative. The area of **4010 Wet heaths** affected has been estimated to be less than 1% due to the localised nature of the impact.

Off-road motorised driving (G01.03.02)

3.18 The Ox Mountains Bogs cSAC Conservation Plan (NPWS, undated) stated that all terrain motorbikes (ATBs) were commonly used by farmers to check stock in areas previously accessible only on foot. Although it was acknowledged that ATBs can affect vegetation in wetter areas, they were not found to be causing significant damage at that time. Similarly, during the present survey, ATB tracks were noted within **4010 Wet heaths** but no significant damage was observed. The intensity of this impact has therefore been assessed as low and its influence as neutral. The area of **4010 Wet heaths** affected has been estimated to be less than 1% due to the localised nature of the impact.

Impact	Impact	Intensity	Influence	Habitat	Source	Score	Trend
code				area			
A04.02.02	Non-intensive sheep grazing	Medium	Negative	100%	Inside	-3	Imp
A02.04.04	Non-intensive goat grazing	Low	Neutral	<1%	Inside	0	Imp
D02.01	Electricity and phone lines	High	Negative	<1%	Inside	-0.75	Ins
G01.03.02	Off-road motorised driving	Low	Neutral	<1%	Inside	0	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	1.8%	Inside	-1.5	Ins
L05	Collapse of terrain, landslide	High	Negative	<1%	Inside	-0.75	Ins
	Overall score					-7	

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

Fences, fencing (G05.07)

3.19 The recent fencing of an adjacent coniferous forestry plantation resulted in damage to **4010 Wet heaths** at Tawnaneilleen. The intensity of this impact has been assessed as high and its influence as negative. The area of **4010 Wet heaths** affected has been estimated to be less than 1% due to the localised nature of the impact.

Invasive non-native species (I01)

- 3.20 Scattered, non-native conifers of approximately 1 to 1.5 m in height were observed to have selfseeded from adjacent plantations into **4010 Wet heaths** at Tullyvellia, but this was limited to a few individuals.
- 3.21 *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.
- 3.22 *Campylopus introflexus* was recorded at two **4010 Wet heaths** monitoring stops. One of these failed due to excessive cover of *C. introflexus* in the local vicinity, with a cover score of 20%. There was evidence severe burning at this monitoring stop, which is likely to have facilitated the colonisation of *C. introflexus*. The degraded peat vegetation community DP1 *Campylopus introflexus Polytrichum* spp. was recorded within 10 polygons dominated by **4010 Wet heaths** during vegetation mapping, but its cover score did not exceed 0.5%. The intensity of this impact was assessed as low and the area of **4010 Wet heaths** affected was estimated to be less than 1% overall. As *C. introflexus* was recorded as forming an extensive carpet at one monitoring stop, its influence was assessed as negative.

Burning down (J01.01)

3.23 In the assessment of structure and functions, failures were recorded at one monitoring stop due to severe burning, which affected the bryophyte and lichen layer or exposed the peat surface, and burning in sensitive areas of **4010 Wet heaths**. Approximately 1.8% of **4010 Wet heaths** on the site are 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.

Collapse of terrain, landslide (L05)

3.24 There were some apparent losses of this habitat due to a landslide.

^{3.25} The overall impacts score for **4010 Wet heaths** has been calculated as -7. This is below the nominal Favourable Reference Value of zero. The combined future trend for area and structure and functions is deemed to be improving due to reduction of stock numbers under the CFP though uncontrolled burning remains as a concern. The future prospects for this habitat were therefore assessed as Unfavourable – Inadequate.

4030 Dry heaths

Area

3.26 Changes in the area of **4030 Dry Heaths** were examined 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. There was no evidence of any change in habitat area although this procedure only identifies obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. As the area of this habitat appears to be stable the area status was assessed as Favourable.

Structure and functions

3.27 Seven monitoring stops were recorded in **4030 Dry heaths** within Ox Mountains Bogs cSAC (Table 13). 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 **4030 Dry heaths** were therefore assessed as Favourable.

Future prospects

3.28 Four impacts were recorded within **4030 Dry heaths** (Table 14).

Non-intensive sheep grazing (A04.02.02)

- 3.29 The Ox Mountains Bogs cSAC Conservation Plan (NPWS, undated) stated that the dominant agricultural activity within the site was sheep grazing. Most of the site was subject to grazing, although grazing intensity varied throughout. The hillsides east of Easky Lough, where **4030 Dry heaths** are most abundant within the site (Fig. 4b), were described as having some overgrazed areas. Supplementary feeding of sheep was noted also from that area, where it resulted in damage from poaching, trampling and overgrazing.
- 3.30 During the assessment of structure and functions, grazing was recorded at 85.7% of **4030 Dry heaths** monitoring stops. Grazing intensity varied, with the proportion of dwarf shrub shoots showing signs of grazing ranging from 0 to 20%, which is well within acceptable limits. Furthermore, the structural diversity of *Calluna vulgaris* was good throughout, with no failures being recorded under the relevant criterion, which indicates that neither overgrazing nor undergrazing occurred. During vegetation mapping, peat exposure due to trampling by sheep was recorded within one polygon dominated by **4030 Dry heaths**. However, the intensity of this impact was assessed as low overall and its influence as positive. The trend was assessed as improving due to reduction of stock numbers under the CFP.

Non-intensive goat grazing (A04.02.04)

3.31 The Ox Mountains Bogs cSAC Conservation Plan (NPWS, undated) stated that herds of feral goats (*Capra hircus*) occurred in the Mass Hill area and around Easky Lough. During an NPWS visit to the state-owned land at Letterunshin, 25 goats were observed. On a previous occasion, up to 37 goats had been observed there. The dates of these visits were not given. During the

Criteria		Scale of	Number of	Number of	Failure
V	tation composition	assessment	assessments	failures	rate (%)
vege		D1 /	-	0	0
1	Number of bryophyte or non-crustose lichen species present, excluding <i>Campylopus</i> spp. and <i>Polytrichum</i> spp. ≥ 3	Keleve	7	0	0
2	Number of positive indicator species present ≥ 2	Relevé	7	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%		7	0	0
4	Proportion of dwarf shrub cover composed of <i>Myrica gale, Salix repens, Ulex gallii</i> collectively < 50%	Relevé	7	0	0
5	Cover of the following weedy negative indicator species: <i>Cirsium arvense, C. vulgare,</i> <i>Ranunculus repens,</i> large <i>Rumex</i> species (except <i>R. acetosa), Senecio jacobaea, Urtica dioica</i> collectively < 1%	Relevé	7	0	0
6	Cover of non-native species < 1%	Relevé	7	0	0
7	Cover of non-native species < 1%	Local vicinity	7	0	0
8	Cover of scattered native trees and scrub < 20%	Local vicinity	7	0	0
9	Cover of <i>Pteridium aquilinum</i> < 10%	Local vicinity	7	0	0
10	Cover of <i>Juncus effusus</i> < 10%	Local vicinity	7	0	0
Vege	etation structure	2			
11	Senescent proportion of <i>Calluna vulgaris</i> cover < 50%	Relevé	6	0	0
12	Last complete growing season's shoots of ericoids and <i>Empetrum nigrum</i> showing signs of <u>browsing</u> collectively < 33%	Relevé	7	0	0
13	No signs of <u>burning</u> inside boundaries of sensitive areas*	Local vicinity	7	0	0
14	Outside boundaries of sensitive areas, all growth phases of <i>Calluna vulgaris</i> should occur throughout, with $\geq 10\%$ of cover in mature phase	Local vicinity	6	0	0
Phys	sical structure				
15	Cover of <u>disturbed</u> bare ground < 10%	Relevé	7	0	0
16	Cover of <u>disturbed</u> bare ground < 10%	Local vicinity	7	0	0

Table 13: Monitoring criteria and failure rates for 4030 Dry heaths (n = 7).

*Sensitive areas

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

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

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

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

(e) Areas with noticeably uneven structure, at a spatial scale of around 1 m² or less. The unevenness (e.g. more commonly found in very old heather stands) will relate to distinct, often large, spreading dwarf-shrub bushes. The dwarf-shrub canopy will not be completely continuous, and some of its upper surface may be twice as high as other parts. Layering is likely to be present and may be common.

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

present survey, a single feral goat was observed in **4030 Dry heaths** around Easky Lough. Due to the presence of a single individual, the intensity of this impact was assessed as low and its influence as neutral. The area of **4030 Dry heaths** affected has been estimated to be less than 1%. The number of goats within the site appears to have declined dramatically. As the hillside to the east of Easky Lough was subject to overgrazing in the past (NPWS, undated), the trend for this impact has been assessed as improving.

Table 14: Assessment of impacts for 4030 Dry heaths. Under trend, Imp = Improving, Ins = Insufficient data.

Impact	Impact	Intensity	Influence	Habitat	Source	Score	Trend
code				area			
A04.02.02	Non-intensive sheep grazing	Low	Positive	100%	Inside	1.5	Imp
A02.04.04	Non-intensive goat grazing	Low	Neutral	<1%	Inside	0	Imp
I01	Invasive non-native species	Low	Negative	<1%	Inside	-0.25	Ins
J01.01	Burning down	High	Negative	0.4%	Inside	-0.75	Ins
	Overall score					0.5	

Invasive non-native species (I01)

3.32 Scattered, non-native conifers were observed to have self-seeded from adjacent plantations into **4030 Dry heaths** at Tullyvellia, 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%.

Burning down (J01.01)

3.33 While severe burning or burning in sensitive areas were not recorded within **4030 Dry heaths** monitoring stops, burning was noted within **4030 Dry heaths** during vegetation mapping, particularly in the vicinity of Letterunshin Bog. Approximately 0.4% of **4030 Dry heaths** on the site are 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.

^{3.34} The overall impacts score for **4030 Dry heaths** has been calculated as 0.5. This is above the nominal Favourable Reference Value of zero. The combined future trend for area and structure and functions is deemed to be improving due to reduction of stock numbers under the CFP though uncontrolled burning remains as a concern. The future prospects for this habitat were therefore assessed as Favourable.

4060 Alpine and Boreal heaths

Area

3.35 Changes in the area of **4060 Alpine and Boreal heaths** were examined 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. There was no evidence of any change in habitat area although this procedure only identifies obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. As the area of this habitat appears to be stable the area status was assessed as Favourable.

Structure and functions

- 3.36 One monitoring stop was recorded in **4060 Alpine and Boreal heaths** within the Ox Mountains Bogs cSAC (Table 15). In the assessment of structure and functions, this monitoring stop did not fail any criteria, resulting in an overall failure rate of 0%. The structure and functions of **4060 Alpine and Boreal heaths** were therefore assessed as Favourable.
- 3.37 The small sample size of one monitoring stop reflects the relative rarity of this habitat within the Ox Mountains Bogs cSAC, where only 29.2 ha of **4060 Alpine and Boreal heaths** were recorded, comprising 0.3% of the site.

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

Table 15: Monitoring criteria and failure rates for 4060 Alpine and Boreal heaths (n = 1).

Future prospects

3.38 Non-intensive sheep grazing was the only impact recorded within **4060 Alpine and Boreal heaths** (Table 16).

Non-intensive sheep grazing (A04.02.02)

3.39 The Ox Mountains Bogs cSAC Conservation Plan (NPWS, undated) stated that the dominant agricultural activity within the site was sheep grazing. Most of the site was subject to grazing, although grazing intensity varied throughout. Grazing by sheep occurs throughout **4060 Alpine and Boreal heaths** within Ox Mountains Bogs cSAC. Within the **4060 Alpine and Boreal heaths** monitoring stop, the proportion of dwarf shrub shoots showing signs of grazing was 3%, which represents a low level of grazing and is well within acceptable limits. The influence of this impact has been assessed as neutral and the trend as improving due to reduction of stock numbers under the CFP.

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

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

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

*6230 Species-rich Nardus grasslands

Area

3.41 Changes in the area of ***6230 Species-rich** *Nardus* grasslands were examined 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. There was no evidence of any change in habitat area although this procedure only identifies obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. As the area of this habitat appears to be stable the area status was assessed as Favourable.

Structure and functions

3.42 Two monitoring stops were recorded in ***6230 Species-rich** *Nardus* grasslands within the Ox Mountains Bogs cSAC (Table 17). In the assessment of structure and functions, one monitoring stop failed one criterion relating to vegetation composition. 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 50.0%. The structure and functions of ***6230 Species-rich** *Nardus* **grasslands** were therefore assessed as Unfavourable - Bad.

3.43 While the vegetation structure and physical structure of ***6230 Species-rich** *Nardus* grasslands were good, the vegetation composition of one monitoring stop (50.0%) was poor. Criterion 9 stipulates that the cover of bracken, heath and scrub within the monitoring stop should be less than 5%. A cover score of 10% was recorded for *Calluna vulgaris*, exceeding the threshold by a wide margin and resulting in the failure of the monitoring stop. As 4030 Dry heaths occurred within close proximity to this monitoring stop, it may have been somewhat transitional, resulting in a relatively high cover of *C. vulgaris*.

Criteria		Scale of	Number of	Number	Failure
		assessment	assessments	of failures	rate (%)
Vegetation composition					
1	Number of high quality and general indicator species ≥ 7	Relevé	2	0	0
2a	UG1c/UG2c: Number of high quality species present ≥ 2	Relevé	2	0	0
2b	UG1e/UG2e: Number of high quality species present ≥ 1	Relevé	0	n/a	n/a
3	Species richness ≥ 25 species	Relevé	2	0	0
4	Cover of non-native species ≤ 1%	Relevé	2	0	0
5	Cover of the following negative indicator species:	Relevé	2	0	0
	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,				
	<i>Trifolium repens, Urtica dioica,</i> individually ≤ 10%				
6	Cover of the above negative indicator species collectively	Relevé	2	0	0
	$\leq 20\%$				
7	Cover of <i>Sphagnum</i> species $\leq 10\%$,	Relevé	2	0	0
8	Cover of <i>Polytrichum</i> species $\leq 25\%$		2	0	0
9	Cover of scrub, bracken and heath $\leq 5\%$	Relevé	2	1	50.0
Vegetation structure					
10	Forb component of forb : graminoid ratio 20-90%	Relevé	2	0	0
11	Proportion of the sward between 5-50 cm tall $\ge 25\%$	Relevé	2	0	0
12	Litter cover $\leq 20\%$	Relevé	2	0	0
Physical structure					
13	Cover of <u>disturbed</u> bare ground $\leq 10\%$	Relevé	2	0	0
14	Area of the habitat showing signs of serious grazing or	Local vicinity	2	0	0
	disturbance <20m ²	-			

Table 17: Monitoring criteria and failure rates for *6230 Species-rich Nardus grasslands (n = 2).

Future prospects

3.44 Two impacts were recorded within ***6230 Species-rich** *Nardus* grasslands within the Ox Mountains Bogs cSAC (Table 18).
Non-intensive sheep grazing (A04.02.02)

3.45 The Ox Mountains Bogs cSAC Conservation Plan (NPWS, undated) stated that the dominant agricultural activity within the site was sheep grazing. Most of the site was subject to grazing, although grazing intensity varied throughout. Grazing by sheep occurs throughout ***6230 Species-rich** *Nardus* **grasslands** within the Ox Mountains Bogs cSAC. The intensity of this impact was assessed as medium and its influence as positive, as grazing is required to maintain ***6230 Species-rich** *Nardus* **grasslands**. The trend was assessed as improving due to reduction of stock numbers under the CFP.

Invasive non-native species (I01)

3.46 *Epilobium brunnescens* is a species of damp, stony places, especially in the mountains, which is localised but spreading in Ireland (Parnell & Curtis, 2012). During the present survey, *E. brunnescens* was recorded within one ***6230 Species-rich** *Nardus* grasslands monitoring stop (50.0%). The intensity of this impact is assessed as low, since this species does not tend to transform the nature of the habitats in which it becomes established but, nonetheless, its influence has been assessed as negative (Table 18). The area affected has been estimated to be 0.25%, based on the average cover of *E. brunnescens* within ***6230 Species-rich** *Nardus* grasslands monitoring stops.

insumcient data.									
Impact	Impact	Intensity	Influence	Habitat	Source	Score	Trend		
code				area					
A04.02.02	Non-intensive sheep grazing	Medium	Positive	100%	Inside	3	Imp		
I01	Invasive non-native species	Low	Negative	0.25%	Inside	-0.25	Ins		
	Overall score					2.75			

Table 18: Assessment of impacts for *6230 Species-rich *Nardus* grasslands. Under trend, Imp = Improving, Ins = Insufficient data.

3.47 The overall impacts score for ***6230 Species-rich** *Nardus* grasslands has been calculated as 1.25, which exceeds the nominal Favourable Reference Value of zero. The combined future trend for area and structure and functions is deemed to be improving. The future prospects for this habitat were therefore assessed as Favourable.

*7130/7130 Blanket bogs

Area

3.48 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 19). Only losses in habitat were found, there were no gains in habitat area. These data are restricted to obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process.

The main losses in area of ***7130/7130 Blanket bogs** were due to peat extraction (combined area of 5.81ha) and new tracks (0.02 ha). This has almost certainly also resulted in the loss areas of **3160 Dystrophic lakes.** Erosion has unquestionably resulted in loss of ***7130/7130 Blanket bogs** 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

3.49 A total of 47 monitoring stops were recorded in *7130/7130 Blanket bogs within the Ox Mountains Bogs cSAC (Table 20). All of these monitoring stops were located within *7130 Active blanket bog rather than 7130 Inactive blanket bog. In the assessment of structure and functions, 18 monitoring stops failed one criterion or more. Following a review of the ecological condition of this stop, expert judgement determined that four should pass because the failure was marginal or due to other mitigating circumstances, resulting in an overall failure rate of 29.8%. The structure and functions of *7130/7130 Blanket bogs were therefore assessed as Unfavourable – Bad. Vegetation mapping indicated that the proportion of inactive, eroding and cutover bog within the total area of bog was 3.7%.

Impact code	Impact	Area (ha) 1995-2000	Area (ha) 2000-2005	Area (ha) 2005-2012	Area (ha) 1995-2012
C01.03	Peat extraction	3.52	1.75	0.19	5.46
C01.03.01	Hand cutting of peat	0.00	0.00	0.01	0.01
C01.03.02	Mechanical removal of	0.00	0.00	0.15	0.35
	peat				
D01.01	Paths, tracks and cycling	0.00	0.02	0.00	0.02
	tracks				
K01.01	Erosion	n.m.	n.m.	n.m.	n.m.
All impacts		3.52	1.77	0.55	5.83
% of habitat		0.05	0.02	0.01	0.08
% loss per year		0.01	< 0.01	< 0.01	0.02

Table 19: Impacts causing obvious losses in areas of *7130/7130 Blanket bogs, 1995-2012. n.m. indicates not measured.

3.50 The vegetation composition of ***7130/7130 Blanket bogs** within the Ox Mountains Bogs cSAC was poor in some cases, with failures being recorded under six criteria. The cover of bryophyte and lichen species was inadequate at 6.4% of monitoring stops. The cover of *Calluna vulgaris* or *Trichophorum germanicum* was excessive at 4.3% of monitoring stops, while the cover of the non-native *Campylopus introflexus* was excessive at 4.3% of monitoring stops. The cover of the

negative indicator species *Agrostis capillaris* was excessive at one monitoring stop (2.1%), while the number of positive indicator species was inadequate at one monitoring stop (2.1%).

- 3.51 The vegetation structure of ***7130/7130 Blanket bogs** within the Ox Mountains Bogs cSAC was poor in some cases, with failures being recorded under three criteria. Evidence of burning within sensitive areas of ***7130/7130 Blanket bogs** was observed at 10.3% of monitoring stops, while evidence of severe burning, which affected the bryophyte or lichen layer or exposed the peat surface, was observed at 6.4% of monitoring stops. Excessive levels of grazing by sheep were recorded at one monitoring stop (2.1%).
- 3.52 The physical structure of ***7130/7130 Blanket bogs** within the Ox Mountains Bogs cSAC was also poor in some cases, with failures being recorded under four criteria. Excessive levels of peat erosion were recorded at 12.8% of monitoring stops. One ***7130/7130 Blanket bogs** monitoring stop (2.1%) failed due to excessive levels of drainage and excessive cover of disturbed bare ground within the monitoring stop and in the local vicinity.

Future prospects

3.53 Thirteen impacts were recorded within ***7130/7130 Blanket bogs** (Table 21).

Non-intensive sheep grazing (A04.02.02)

- 3.54 The Ox Mountains Bogs cSAC Conservation Plan (NPWS, undated) stated that the dominant agricultural activity within the site was sheep grazing. Most of the site was subject to grazing, although grazing intensity varied throughout. During NPWS site visits (April/May), sheep were observed on all bogs, except for the very wet areas with pool systems. Parts of the **PB2 Upland blanket bog** at Laughil, particularly towards the south, were subject to high grazing pressure, which may have accelerated the rate of peat erosion. The hillsides east of Easky Lough and parts of the **PB3 Lowland blanket bog** south of Lough Rumduff, were described as having some overgrazed areas. Supplementary feeding of sheep was noted from a number of locations, particularly the hillside east of Easky Lough where it resulted in damage from poaching, trampling and overgrazing.
- 3.55 During the assessment of structure and functions, grazing was recorded within 63.8% of ***7130/7130 Blanket bogs** monitoring stops, with sheep avoiding the wetter areas containing pool systems. Grazing was only found to be excessive at one ***7130/7130 Blanket bogs** monitoring stop (2.1%), which was located south of Laughil. Grazing intensity varied across the site, with the proportion of dwarf shrub shoots showing signs of grazing ranging from 0-40%, but generally remaining low. During vegetation mapping, some trampling due to sheep was noted within ***7130/7130 Blanket bogs** at Fiddandarry and within Easkey Bog Nature Reserve. Severe erosion, partly due to trampling by sheep, was noted in one polygon at Laughil. However, the intensity of this impact has been assessed as low overall and its influence as neutral. The trend was assessed as improving due to reduction of stock numbers under the CFP.

Table 20: Monitoring	criteria and	l failure rate	s for *7130/7	7130 Blanket	bogs	(n = 47).
			,		()	<pre></pre>

Crit	aria	Scale of	Number of	Number of	Failuro
Chi	ella	Scale 01	nulliber of	failures	rate (%)
Veg	etation composition	assessment	assessments	Tantaics	14te (70)
1	Number of positive indicator species present	Polová	47	1	2.1
1	≥7	Releve	47	1	2.1
2	Cover of bryophyte or lichen species, excluding <i>Sphagnum fallax</i> \geq 10%	Relevé	47	3	6.4
3	Cover of <u>each</u> of the following species: <i>Calluna</i> <i>vulgaris, Eleocharis multicaulis, Eriophorum</i> <i>vaginatum, Molinia caerulea, Schoenus nigricans,</i> <i>Trichophorum germanicum</i> individually < 75%	Relevé	47	2	4.3
4	Cover of the following negative indicator species: <i>Agrostis capillaris, Holcus lanatus,</i> <i>Phragmites australis, Pteridium aquilinum,</i> <i>Ranunculus repens</i> collectively < 1%	Relevé	47	1	2.1
5	Cover of non-native species < 1%	Relevé	47	2	4.3
6	Cover of non-native species < 1%	Local vicinity	47	2	4.3
7	Cover of scattered native trees and scrub < 10%	Local vicinity	47	0	0
Veg	etation structure				
8	Crushed, broken and/or pulled up <i>Sphagnum</i> species < 10% of <i>Sphagnum</i> cover	Relevé	46	0	0
9	Last complete growing season's shoots of ericoids, <i>Empetrum nigrum</i> and <i>Myrica gale</i> showing signs of <u>browsing</u> collectively < 33%	Relevé	47	1	2.1
10	No signs of <u>burning</u> into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Local vicinity	47	3	6.4
9	No signs of <u>burning</u> inside boundaries of sensitive areas*	Local vicinity	39	4	10.3
Phy	sical structure				
12	Cover of <u>disturbed</u> bare ground < 10%	Relevé	47	1	2.1
13	Cover of <u>disturbed</u> bare ground < 10%	Local vicinity	47	1	2.1
14	Area showing signs of <u>drainage</u> resulting from heavy trampling or tracking or ditches or peat cutting < 10%	Local vicinity	47	1	2.1
15	Cover of <u>erosion</u> gullies and eroded areas within the greater bog mosaic < 5%	Local vicinity	47	6	12.8

*Sensitive areas

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

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

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

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

(e) Areas above 400 m in altitude.

(f) Areas within 50 m of functioning drains.

Non-intensive goat grazing (A04.02.04)

3.56 The Ox Mountains Bogs cSAC Conservation Plan (NPWS, undated) stated that herds of feral goats (*Capra hircus*) occurred in the Mass Hill area and around Easky Lough. During an NPWS visit to the state-owned land at Letterunshin, 25 goats were observed. On a previous occasion,

up to 37 goats had been observed there. The dates of these visits were not given. During the present survey, a single feral goat was observed in ***7130/7130 Blanket bogs** around Easky Lough. Due to the presence of a single individual, the intensity of this impact was assessed as low and its influence as neutral. The area of ***7130/7130 Blanket bogs** affected has been estimated to be less than 1%. The number of goats within the site appears to have declined dramatically. As the hillside to the east of Easky Lough was subject to overgrazing in the past (NPWS, undated), the trend for this impact has been assessed as improving.

Hand cutting of peat (C01.03.01)

3.57 The Ox Mountains Bogs cSAC Conservation Plan (NPWS, undated) stated that small amounts of turf cutting by hand was occurring at four locations within the site. During the present survey, a small amount turf cutting by hand was noted at Kilcummin. 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)

- 3.58 According to the Ox Mountains Bogs cSAC Conservation Plan, the majority of turf extraction within the site is carried out using tractor-mounted extrusion cutters or 'sausage' machines. Active sausage machine cutting was recorded in 14 locations, with abandoned sausage cutting areas present at numerous other locations. Active bank cutting by machine was recorded at four locations (NPWS, undated).
- 3.59 During the present survey, active turf extraction using sausage machines was noted at Fiddandarry Bog and Letterunshin Bog (Plate 1). Active bank cutting by machine was observed at Letterunshin Bog (Plate 2) and turf extraction and extrusion using an earth mover and tractor-mounted hopper was noted at Kilcummin. These mechanised methods of turf extraction resulted in severe damage to **7130/7130 Blanket bogs**, with loss of habitat and associated drainage impacts. The intensity of mechanical removal of peat was assessed as high and its influence as negative. The area of ***7130/7130 Blanket bogs** affected was estimated to be 0.3%, based on the area of **PB4 Cutover bog** recorded during vegetation mapping.

Paths, tracks cycling tracks (D01.01)

3.60 There were some apparent losses of this habitat due to tracks.

Electricity and phone lines (D02.01)

3.61 The use of heavy machinery to install a power cable caused damage to ***7130/7130 Blanket bogs** at Carrowmurray. The area has revegetated following this disturbance, but can no longer be classified as ***7130/7130 Blanket bogs**. The intensity of this impact has been assessed as high and its influence as negative. The area of ***7130/7130 Blanket bogs** affected has been estimated to be less than 1% due to the localised nature of the impact.

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

3.62 The Ox Mountains Bogs cSAC Conservation Plan (NPWS, undated) stated that the Ox Mountains are not heavily used for recreational purposes. Very few walkers were observed

within the cSAC during the present survey. A section of the Western Way and the Sligo Way passes across Lough Rumduff Bog. A boardwalk has been constructed in places, to protect fragile peatland habitats. The annual South Sligo Walking Festival has been established to promote hillwalking within the Ox Mountains (Ox Mountain Development Company, 2013). The intensity of this impact was assessed as low and its influence as neutral. The area affected has been estimated to be less than 1%, due to the localised nature of the impact.

Off-road motorised driving (G01.03.02)

3.63 The Ox Mountains Bogs cSAC Conservation Plan (NPWS, undated) stated that all terrain motorbikes (ATBs) were commonly used by farmers to check stock in areas previously accessible only on foot. Although it was acknowledged that ATBs can affect vegetation in wetter areas, they were not found to be causing significant damage at that time. During the present survey, ATB tracks were noted within ***7130/7130 Blanket bogs**. In most cases, no significant damage was noted but at Laughil, ATB tracks were seen to have caused the vegetation to shift from ***7130 Active blanket bogs** to **7130 Inactive blanket bogs**. The intensity of this impact has therefore been assessed as medium overall and its influence as negative. The area of ***7130/7130 Blanket bogs** affected has been estimated to be less than 1% due to the localised nature of the impact.

Garbage and solid waste (H05.01)

- 3.64 The Ox Mountains Bogs cSAC Conservation Plan (NPWS, undated) stated that a number of dumping sites existed within the cSAC, most of which were within turf cutting areas where tracks facilitate access. The waste observed included household refuse, domestic appliances, building rubble and farm waste. These observations are consistent with the findings of the present survey. The intensity of this impact has been assessed as low and its influence as negative. The area of ***7130/7130 Blanket bogs** affected has been estimated to be less than 1%, due to the small scale of the impact.
- 3.65 Scattered, non-native conifers, approximately 0.5 2 m in height and mainly *Picea sitchensis*, were observed to have self-seeded from adjacent plantations into *7130/7130 Blanket bogs at several locations, particularly near Tullyvellia.

Invasive non-native species (I01)

- 3.66 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.
- 3.67 Campylopus introflexus was recorded at 27.7% of *7130/7130 Blanket bogs monitoring stops, with 4.3% failing due to excessive cover of the species. The mean cover of *C. introflexus* within *7130/7130 Blanket bogs monitoring stops was 0.5%. A *C. introflexus* cover score of 20% was recorded within one monitoring stop. During vegetation mapping, the degraded peat vegetation community DP1 Campylopus introflexus Polytrichum spp. was recorded within 159

polygons dominated by ***7130/7130 Blanket bogs** at cover scores of up to 20%. Plate 1 shows an area of **7130 Inactive blanket bog**, which was severely damaged by peat extraction using a



Plate 1: 7130 Inactive blanket bog, severely damaged by sausage cutting, with *Campylopus introflexus* prominent, Tawnamore (Photo: BEC Consultants).



Plate 2: Active peat extraction by mechanical cutting, Rathgoonaun, Letterunshin (Photo: BEC Consultants).

sausage machine and has been colonised by *Campylopus introflexus*. While the intensity of this impact was assessed as low, its influence was assessed as negative because *C. introflexus* was recorded as forming extensive carpets.

Burning down (J01.01)

3.68 In the assessment of structure and functions, failures were recorded at 10.3% of ***7130/7130 Blanket bogs** monitoring stops due to burning in sensitive areas of the habitat and 6.4% of ***7130/7130 Blanket bogs** monitoring stops due to severe burning, which affected the bryophyte and lichen layer or exposed the peat surface. During vegetation mapping, large areas of **PB3 Lowland blanket bog** at Fiddandarry Bog and Letterunshin Bog (Plate 3), comprising approximately 4.5% of the area of ***7130/7130 Blanket bogs** on the site, were found to have been burned within the last few years. The intensity of this impact has been assessed as high and its influence as negative.

Water abstractions from groundwater (J02.07)

- 3.69 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. Although the impact category does not accurately describe the impact in question it is the most appropriate option available on the list recommended by the EU for Habitats Directive Article 17 assessments (Ssymank, 2009).
- 3.70 The Ox Mountains Bogs cSAC Conservation Plan (NPWS, undated) noted that drains had been cut in the northern part of Fiddandarry Bog to facilitate turf extraction. Forestry on flatter areas of *7130/7130 Blanket bogs adjacent to the site was noted as potentially having negative effects on the hydrology of *7130/7130 Blanket bogs within the site. The *7130/7130 Blanket bogs at Lough Nafullow appeared to be desiccating, due to the surrounding turbary and forestry.
- 3.71 During the present survey, substantial active drains accompanied by severe drainage were noted within *7130/7130 Blanket bogs in the northern part of Fiddandarry Bog, at Letterunshin Bog and Lough Nafullow. Recently dug drains were noted at Letterunshin Bog. The immature forestry on the western side of Easkey Bog Nature Reserve (Plate 4) was identified as a significant threat to the hydrology of *7130/7130 Blanket bogs within the cSAC. These bogs contain substantial areas of interconnecting pool systems (Plates 5 and 6), which are highly vulnerable to drainage. 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 0.7%, based on the area of *7130/7130 Blanket bogs within each polygon where drainage was recorded. The trend for this impact was assessed as disimproving due to the recent construction of new drains.



Plate 3: Recently burnt *7130 Active blanket bog and negatively impacted 3160 Dystrophic lake, Letterunshin (Photo: BEC Consultants).



Plate 4: Bog pool system (3160 dystrophic lakes) damaged by the planting of coniferous forestry, Dunowla (Photo: BEC Consultants).



Plate 5: Lowland *7130 Active blanket bog vegetation, with well-developed bog pool (3160 Dystrophic lakes) system, Tawnamore (Photo: Eamonn O'Sullivan).



Plate 6: View of complex of *7130 Active blanket bog and 3160 dystrophic lakes, Easkey Bog Nature Reserve, Dunowla (Photo: John Conaghan).

Erosion (K01.01)

- 3.72 The Ox Mountains Bogs cSAC Conservation Plan (NPWS, undated) noted that parts of Laughil Bog, particularly towards the south, are subject to high grazing pressures, which may be accelerating the rate of erosion especially on steeper slopes. Erosion was also noted within *7130/7130 Blanket bogs on the hillside east of Easky Lough, with numerous patches of bare peat being recorded.
- 3.73 Erosion of blanket peat was recorded within the local vicinity of 44.7% of *7130/7130 Blanket bogs monitoring stops, with 12.8% of *7130/7130 Blanket bogs monitoring stops failing due to excessive erosion. During vegetation mapping, erosion of *7130/7130 Blanket bogs was recorded within 29 polygons. Severe and widespread erosion, with deep erosion gullies and peat haggs, was noted around the summit south of Easkey Bog Nature Reserve (512 m a.s.l.) and around Laughil. The intensity of sheep grazing was relatively high in *7130/7130 Blanket bogs around Laughil, with the only *7130/7130 Blanket bogs monitoring stop within the cSAC that failed the assessment of structure and functions due to excessive grazing being located there. However, current grazing levels were not found to be excessive in other areas where erosion occurred, such as the 512 m summit south of Easkey Bog Nature Reserve. Once exposed, areas of bare peat may continue to erode due to climatic conditions. The summit of the Ox Mountains receives relatively high levels of rainfall, with an annual mean of 2000-2400 mm per year for 1981-2010 (Met Éireann, 2013). Therefore unless restoration measures are undertaken in badly eroded areas, erosion is likely to continue. The intensity of this impact is assessed as high and its influence as negative. Approximately 6.7% 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.

Impact	Impact	Intensity	Influence	Habitat	Source	Score	Trend
code				area			
A04.02.02	Non-intensive sheep grazing	Low	Neutral	63.8%	Inside	0	Imp
A04.02.04	Non-intensive goat grazing	Low	Neutral	<1%	Inside	0	Imp
C01.03.01	Hand cutting of peat	High	Negative	<1%	Inside	-0.75	Ins
C01.03.02	Mechanical removal of peat	High	Negative	0.3%	Inside	-0.75	Ins
D01.01	Paths, tracks, cycling tracks	High	Negative	<1%	Inside	-0.75	Ins
D02.01	Electricity and phone lines	High	Negative	<1%	Inside	-0.75	Ins
G01.02	Walking, horseriding and non- motorised vehicles	Low	Neutral	<1%	Inside	0	Ins
G01.03.02	Off-road motorised driving	Medium	Negative	<1%	Inside	-0.5	Ins
H05.01	Garbage and solid waste	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	4.5%	Inside	-1.5	Ins
J02.07	Water abstractions from groundwater	High	Negative	0.7%	Inside, outside	-0.75	Dis
K01.01	Erosion	High	Negative	6.7%	Inside	-1.5	Ins
	Overall score					-7.75	

Table 21: Assessment of impacts for *7130/7130 Blanket bogs. Under trend, Dis = Disimproving, Imp = Improving, Ins = Insufficient data.

3.74 The overall impacts score for ***7130/7130 Blanket bogs** has been calculated as -7.75. This is well below the nominal Favourable Reference Value of zero. Whilst there are signs that reduction of stock numbers under the CFP 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 negative 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

3.75 Changes in the area of **7140 Transition mires** were examined 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. There was no evidence of any change in habitat area although this procedure only identifies obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. As the area of this habitat appears to be stable the area status was assessed as Favourable.

Table 22: Monitoring criteria and failure rates for 7140 Transition mires (n = 4).

Crite	eria	Scale of	Number of	Number of	Failure
		assessment	assessments	failures	rate (%)
Vege	etation 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		3	0	0
1c	from Groups 1 or 11 present ≥ 3 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 <i>Carex</i> spp., <i>Equisetum fluviatile</i> , <i>Hydrocotyle vulgaris</i> , <i>Hypericum elodes</i> , <i>Mentha</i> <i>aquatica</i> , <i>Menyanthes trifoliata</i> , <i>Potentilla palustris</i> , <i>Sphagnum</i> spp. collectively $\geq 25\%$	Relevé	4	0	0
4	Cover of the following species: <i>Anthoxanthum</i> <i>odoratum, Epilobium hirsutum, Holcus lanatus</i> collectively < 1%	Relevé	4	0	0
5	Cover of non-native species < 1%	Relevé	4	0	0
Vege	etation structure				
6	PFLU5/RFEN1b: \geq 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	3	0	0
Dhue					
T fiys				2	0
/	Cover of <u>disturbed</u> bare ground < 10%	Keleve	4	U	0
8	Cover of <u>disturbed</u> bare ground < 10%	Local vicinity	4	U	U
9	Area showing signs of <u>drainage</u> resulting from heavy trampling or tracking or ditches < 10%	Local vicinity	4	0	0

Structure and functions

3.76 Four monitoring stops were recorded in **7140 Transition mires** within the Ox Mountains Bogs cSAC (Table 22). 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 **7140 Transition mires** were therefore assessed as Favourable.

Future prospects

3.77 No impacts (Threats, Pressures and Activities code X) were recorded within **7140 Transition mires** within the Ox Mountains Bogs cSAC. The overall impacts score for **7140 Transition mires** was therefore calculated as 0, which equals the nominal Favourable Reference Value. The combined future trend for area and structure and functions is deemed to be no change. The future prospects for this habitat were therefore assessed as Favourable.

7150 Rhynchosporion depressions

Area

3.78 Changes in the area of **7150** *Rhynchosporion* **depressions** were examined 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. There was no evidence of any change in habitat area although this procedure only identifies obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. As the area of this habitat appears to be stable the area status was assessed as Favourable.

Structure and functions

3.79 Three monitoring stops were recorded in **7150** *Rhynchosporion* **depressions** within the Ox Mountains Bogs cSAC (Table 23). 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 **7150** *Rhynchosporion* **depressions** were therefore assessed as Favourable.

Future prospects

3.80 Invasive non-native species was the only impact recorded within **7150** *Rhynchosporion* **depressions** (Table 24).

Invasive non-native species (I01)

3.81 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.

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

Table 23: Monitoring criteria and failure rates for 7150 *Rhynchosporion* depressions (n = 3).

*Sensitive areas

(a) Ground with abundant and/or an almost continuous carpet of Sphagnum.

(b) Patterned areas (i.e. with pools and wet hollows).

(c) Areas within 50 m of functioning drains.

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

Table 24. Assessment of im	pacts for 7150 Rh	unchosnorion de	pressions Under t	rend Ins=In	sufficient data
radic 21. radiced interne of fine	pueto 101 / 100 101	giveneoporton ac	pressions. Onaci is	101100/1110 111	builterer autu

	1	5 1	1	,			
Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
I01	Invasive non-native species	Low	Neutral	0.1%	Inside	0	Ins
	Overall score					0	

3.82 *Campylopus introflexus* was recorded within one **7150** *Rhynchosporion* **depressions** monitoring stop, although its cover was not sufficient to cause the stop to fail. The mean cover of *C*.

introflexus within **7150** *Rhynchosporion* **depressions** monitoring stops was 0.1%. *C. introflexus* was not recorded as forming extensive carpets; therefore this impact was assessed as being of neutral influence.

3.83 The overall impacts score for **7150** *Rhynchosporion* **depressions** has been calculated as zero, which equals the nominal Favourable Reference Value. The combined future trend for area and structure and functions is deemed to be no change. The future prospects for this habitat were therefore assessed as Favourable.

7230 Alkaline fens

Area

3.84 Changes in the area of **7230** Alkaline fens were examined 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. There was no evidence of any change in habitat area although this procedure only identifies obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. As the area of this habitat appears to be stable the area status was assessed as Favourable.

Structure and functions

- 3.85 Four monitoring stops were recorded in **7230** Alkaline fens within the Ox Mountains Bogs cSAC (Table 25). In the assessment of structure and functions, two monitoring stops failed one criterion or more. Following a review of the ecological condition of this 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.
- 3.86 The vegetation structure of **7230 Alkaline fens** monitoring stops was good, with no failures being recorded under the relevant criterion. The vegetation composition of two **7230 Alkaline fens** monitoring stops (50.0%) was poor. These monitoring stops both failed due to an inadequate cover of brown mosses and positive vascular indicator species. One of these monitoring stops (25.0%) also failed due to an inadequate number of positive vascular indicator species. It should be noted that the monitoring stops that failed were both examples of iron-rich flushes, so their vegetation composition may not conform fully to that of typical **7230 Alkaline fen** communities. However, the physical structure of these two monitoring stops was also poor, with both failing due to excessive levels of drainage caused by an old drainage ditch nearby.

Future prospects

3.87 Drainage was the only impact recorded within **7230** Alkaline fens (Table 26).

Crite	eria	Scale of	Number of	Number of	Failure
		assessment	assessments	failures	rate (%)
Vege	etation composition				
1	At least one brown moss species present	Relevé	4	0	0
2a	RFLU1a/RFLU2: number of positive vascular	Relevé	0	n/a	n/a
	indicator species present ≥ 2				
2b	RFLU4/RFEN1a: number of positive vascular		4	1	25.0
	indicator species present ≥ 3				
3a	RFLU1a/RFLU2: vegetation cover of brown	Relevé	0	n/a	n/a
	mosses and vascular indicator species $\ge 20\%$				
3b	RFLU4/RFEN1a: vegetation cover of brown		4	2	50.0
	mosses and vascular indicator species $\geq 75\%$				
4	Total cover of the following species:	Relevé	4	0	0
	Anthoxanthum odoratum, Epilobium hirsutum,				
	Holcus lanatus, Ranunculus repens < 1%				
5	Cover of non-native species < 1%	Relevé	4	0	0
6	Cover of scattered native trees and scrub	Local vicinity	4	0	0
	< 10%				
7	Total cover of Juncus effusus and Phragmites	Local vicinity	4	0	0
	australis < 10%				
Vege	etation structure				
8	At least 50% of the live leaves/flowering	Relevé	4	0	0
	shoots are more than 5 cm above ground				
	surface				
Phys	sical structure				
9	Cover of <u>disturbed</u> , bare ground < 10%	Relevé	4	0	0
10	Cover of <u>disturbed</u> , bare ground < 10%	Local vicinity	4	0	0
11	Area showing signs of <u>drainage</u> resulting from	Local vicinity	4	2	50.0
	ditches or heavy trampling or tracking < 10%				
12	Where tufa is present, <u>disturbed</u> proportion of	Local vicinity	1	0	0
	vegetation cover < 1%				

Table 25. Manitoring	anitania and	failure rates for	~ 7220	Allealing	famal	(a - 1)	
Table 25: Monitoring	criteria and	famure rates fo	or 7230 I	чкаше.	iens (n = 4	1.
					,	··· /	

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

Impact code Im	npact	Intensity	Influence	Habitat area	Source	Score	Trend
J02.07 Wa	ater abstractions from oundwater	Medium	Negative	50%	Inside	-1.5	Ins

Water abstractions from groundwater (J02.07)

- 3.88 Drainage has been recorded under this impact category. Water is being drained from **7230 Alkaline fens** and diverted away by means of ditches. The intended purpose is not water abstraction but desiccation of adjacent ***7130/7130 Blanket bogs** to facilitate turf cutting. Although the impact category does not accurately describe the impact in question it is the most appropriate option available.
- 3.89 During the assessment of structure and functions, an old but active drain was recorded in the local vicinity of two **7230 Alkaline fens** (50.0%) monitoring stops. These monitoring stops

failed due to excessive levels of drainage. The intensity of the impact was assessed as medium and its influence as negative.

3.90 The overall impacts score for **7230 Alkaline fens** was therefore calculated as -1.5, which is below the nominal Favourable Reference Value. The combined future trend for area and structure and functions is deemed to be no change. The future prospects for this habitat were therefore assessed as Unfavourable – Inadequate.

8110 Siliceous scree

Area

3.91 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. One area of habitat gain was recorded; there were no losses 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 increase in area of **8110 Siliceous scree** was due to a landslide (<0.01ha). These impacts and trends are discussed later under future prospects. The overall change in habitat area was an increase resulting in a status of Favourable.

Crit	eria	Scale of	Number of	Number	Failuro
CIII		assessment	assessments	of failures	rate (%)
Vec	retation composition	ussessment	ussessments	of fulfules	1410 (70)
1	Cover of bryophyte and non-crustose lichen species $\geq 5\%$	Relevé	2	0	0
2	Proportion of vegetation composed of following negative indicator species: <i>Cirsium arvense, C. vulgare,</i> <i>Rubus fruticosus</i> agg., large <i>Rumex</i> species (except <i>R.</i> <i>acetosa</i>), <i>Senecio jacobaea, Urtica dioica</i> collectively < 1%	Relevé	2	0	0
3	Proportion of vegetation composed of non-native species < 1%	Relevé	2	0	0
4	Block scree: number of positive indicator species for 8220 present ≥ 1	Local vicinity	1	0	0
5	Cover of grass species and dwarf shrubs collectively <20%	Local vicinity	2	1	50.0
6	Cover of <i>Pteridium aquilinum</i> , native trees and scrub collectively < 25%	Local vicinity	2	1	50.0
Veg	etation structure				
7	Live leaves of forbs and shoots of dwarf shrubs	Relevé	2	0	0
	showing signs of <u>grazing</u> or <u>browsing</u> collectively < 50%				
Phy	sical structure				
8	Ground <u>disturbed</u> by human & animal paths, scree running, vehicles < 10%	Relevé	2	0	0
9	Ground <u>disturbed</u> by human & animal paths, scree running, vehicles < 10%	Local vicinity	2	0	0

Table 27: Monitoring criteria and failure rates for 8110 Siliceous scree (n = 2).

Structure and functions

- 3.92 Two monitoring stops were recorded in **8110 Siliceous scree** within the Ox Mountains Bogs cSAC (Table 27). In the assessment of structure and functions, both monitoring stops failed one criterion each. 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 **8110 Siliceous scree** were therefore assessed as Unfavourable Bad.
- 3.93 The vegetation composition of both 8110 Siliceous scree monitoring stops was poor. One stop (50.0%) failed due to excessive cover of grasses and dwarf shrubs in the local vicinity, while the other stop failed due to excessive cover of bracken, native trees and scrub in the local vicinity. However, the vegetation structure and physical structure of both monitoring stops was good, with no failures being recorded under the relevant criteria.

Future prospects

3.94 Two impacts were recorded within **8110 Siliceous scree** (Table 28).

Non-intensive sheep grazing (A04.02.02)

- 3.95 Grazing by sheep was recorded at one **8110 Siliceous scree** monitoring stop (50.0%). The proportion of forb leaves and dwarf shrub shoots showing signs of grazing or browsing collectively was 5%, which represents a low level of grazing and would be deemed acceptable for standard examples of this habitat. However, **8110 Siliceous scree** within the Ox Mountains Bogs cSAC consists of marginal examples of the habitat comprising small areas of stable block scree which are particularly prone to colonisation by species atypical of scree. The local vicinity of both stops contained a relatively high proportion of *Calluna vulgaris* and *Pteridium aquilinum*, with one stop failing due to excessive cover of *Calluna vulgaris* and the other due to excessive cover of *Pteridium aquilinum*. It therefore appears that current grazing levels are insufficient to prevent succession of this habitat.
- 3.96 At this site under low levels of grazing **8110 Siliceous scree** appears to shift towards a mosaic of **4030 Dry heaths** and non-Annex **HD1 Dense bracken**, resulting in a net loss of Annex I habitat, the potential disappearance of **8110 Siliceous scree** from the site and reduced habitat diversity. Therefore this impact is assessed as negative and with a disimproving trend.

Collapse of terrain, landslide (L05)

3.97 Some minor gains in this habitat were recorded as a result of landslide.

^{3.98} The overall impacts score for **8110 Siliceous scree** was therefore calculated as –3.75, which is below the nominal Favourable Reference Value of zero. The combined future trend for area and structure and functions is deemed to be disimproving due to reduction of stock numbers under the CFP. The future prospects for this habitat were therefore assessed as Unfavourable – Bad.

Impact	Impact	Intensity	Influence	Habitat	Source	Score	Trend
code				area			
A04.02.02	Non-intensive sheep grazing	High	Negative	100%	Inside	-4.5	Dis
L05	Collapse of terrain, landslide	High	Positive	<1%	Inside	0.75	Ins
	Overall score					-3.75	

Table 28: Assessment of impacts for 8110 Siliceous scree. Under trend, Dis = Disimproving, Ins = Insufficient.

8210 Calcareous rocky slopes

Area

3.99 Changes in the area of **8210** Calcareous rocky slopes were examined 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. There was no evidence of any change in habitat area although this procedure only identifies obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. As the area of this habitat appears to be stable the area status was assessed as Favourable.

Structure and functions

3.100 Two monitoring stops were recorded in **8210 Calcareous rocky slopes** within the Ox Mountains Bogs cSAC (Table 29). 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 **8210 Calcareous rocky slopes** were therefore assessed as Favourable.

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

Table 29: Monitoring criteria and failure rates for 8210 Calcareous rocky slopes (n = 2).

Future prospects

3.101 No impacts (Threats, Pressures and Activities code X) were recorded within **8210 Calcareous** rocky slopes. The overall impacts score for **8210 Calcareous rocky slopes** has been calculated as zero, which equals the nominal Favourable Reference Value. The combined future trend for

area and structure and functions is deemed to be no change. The future prospects for this habitat were therefore assessed as Favourable.

8220 Siliceous rocky slopes

Area

3.102 Changes in the area of **8220 Siliceous rocky slopes** were examined 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. There was no evidence of any change in habitat area although this procedure only identifies obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. As the area of this habitat appears to be stable the area status was assessed as Favourable.

Criteria		Scale of	Number of	Number of	Failure
		assessment	assessments	failures	rate (%)
Veg	getation composition				
1	Number of positive indicator species present	Local vicinity	3	0	0
	≥1				
2	Proportion of vegetation composed of non-	Local vicinity	3	0	0
	native species < 1%				
3	Cover of Pteridium aquilinum, native trees and	Local vicinity	3	0	0
	scrub collectively < 25%				
Veg	getation structure				
4	Live leaves of forbs and shoots of dwarf	Local vicinity	3	1	33.3
	shrubs showing signs of <u>grazing</u> or <u>browsing</u>				
	collectively < 50%				

Table 30: Monitoring criteria and failure rates for 8220 Siliceous rocky slopes (n = 3).

Structure and functions

- 3.103 Three monitoring stops were recorded in **8220 Siliceous rocky slopes** within the Ox Mountains Bogs cSAC (Table 30). In the assessment of structure and functions, one monitoring stop failed one criterion, the grazing criterion. Following a review of the ecological condition of this stop, expert judgement determined that this stop should pass, due to mitigating circumstances (see following paragraph), resulting in an overall failure rate of 0%. The structure and functions of **8220 Siliceous rocky slopes** were therefore assessed as Favourable.
- 3.104 The vegetation composition of **8220 Siliceous rocky slopes** was good, with no failures being recorded under the relevant criteria. The vegetation structure of one monitoring stop (33.3%) was poor. Criterion 4 stipulates that the proportion of live leaves of forbs and shoots of dwarf shrubs showing signs of grazing or browsing should collectively be less than 50%. A score of 60% was recorded at the monitoring stop in question. However, as it was only possible for surveyors to access the base of this particular **8220 Siliceous rocky slope**, this score is likely to be an overestimate. The remaining area of the habitat was inaccessible both to surveyors and herbivores and can therefore be assumed to be ungrazed.

Future prospects

3.105 Non-intensive grazing by sheep was the only impact recorded within **8220 Siliceous rocky slopes** (Table 31).

Non-intensive sheep grazing (A04.02.02)

3.106 Grazing by sheep was recorded at one 8220 Siliceous rocky slopes monitoring stop (33.3%). Although a high level of grazing was recorded, as discussed in paragraph 3.104 above, this is likely to be an overestimate. The intensity of this impact has been assessed as low overall. As 8220 Siliceous rocky slopes are thought to tolerate very light grazing (Hughes, 2008), the influence of this impact has been assessed as neutral. The trend was assessed as improving due to reduction of stock numbers under the CFP.

Table 31: Assessment of impacts for 8220 Siliceous rocky slopes. Under trend, Imp = Improving.

Impact	Impact	Intensity	Influence	Habitat	Source	Score	Trend
code				area			
A04.02.02	Non-intensive sheep grazing	Low	Neutral	33.3%	Inside	0	Imp
	Overall score					0	

3.107 The overall impacts score for **8220 Siliceous rocky slopes** has been calculated as zero, which equals the nominal Favourable Reference Value. The combined future trend for area and structure and functions is deemed to be improving. The future prospects for this habitat were therefore assessed as Favourable.

Summary of conservation assessment

- 3.108 The summary results for the conservation assessment of Annex I habitats in Ox Mountains Bogs cSAC are presented in Table 32. Of the eleven habitats assessed six habitats were assessed as Favourable and five as Unfavourable – Bad. *7130/7130 Blanket bogs and 4010 Wet heath combined make up almost 80% of the site and both these habitats were assessed as Unfavourable – Bad.
- 3.109 Generally, habitats performed well in the area assessments with no major losses of habitat being readily apparent, though the most widespread habitats (*7130/7130 Blanket bogs and 4010 Wet heath) performed the worst. These widespread habitats also performed poorly for structure and functions and future prospects, though other more restricted habitats also fared poorly for these assessments. 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.

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

Table 32: Summary of conservation status assessments for Annex I habitats in Ox Mountains Bogs cSAC.

4. DISCUSSION

Natura 2000 Standard Data Form

- 4.1 Twelve Annex I habitats were recorded in the cSAC that are currently not listed for the site on the Natura 2000 Standard Data Form, habitats 3130, 3260, 4030, 4060, *6230, 6430, 7140, *7220, 7230, 8110, 8210 and 8220. Many of the smaller lakes amongst the high bogland are 3130 Upland oligotrophic lakes and Easky Lough was also classified under this category as it occurs at about 185 m and in an upland landscape context. 3260 Floating river vegetation occurs in the Gowlan River in the west of the site. 4030 Dry heath occurs at low frequency throughout the site, but is locally abundant on the rocky slopes above Easky Lough and above Cloonacool. Areas of 4060 Alpine and Boreal heath vegetation are small and very marginal occurring predominantly as Racomitrium-dominated heath in degraded bog on dry peat. 7140 Transition mires occur across the site and whilst the overall cover is low, the frequency of this habitat was a significant characteristic of this cSAC. 7230 Alkaline fens occur in the form of brown moss flushes on the lower slopes and in stream or river valleys where examples of *6230 Species-rich Nardus grasslands and *7220 Petrifying springs can also be found. 8110 Siliceous scree and 8220 Siliceous rocky slopes occur as small, often marginal examples on the slopes along the Easky Lough road. 8210 Calcareous rocky slopes and 6430 Hydrophilous tall herb communities are to be found at a single location on a wet rock face above the upper reaches of the Owenduff River.
- 4.2 The current version of the Natura 2000 Standard Data Form for this site estimates the area of **4010 Wet heaths** to be 20% of the site whereas this survey has estimated it to be substantially lower at 10.2%. The area of ***7130/7130 Blanket bog** on the form is 59% and this is an underestimate with 68.5% being recorded during this survey. The form lists **3110 Lowland oligotrophic lakes** as 2% of the site, presumedly based on the area of Easky Lough. As explained above this lake was classified differently by this survey.
- 4.3 The Natura 2000 Standard Data Form for this site should be reviewed and updated in light of the data presented in this report in terms of the habitats listed, areas and ratings. It is <u>obligatory</u> that all Annex I habitats within an SAC are listed on this form even if they are subsequently ranked as having a non-significant presence.

Additional recommendations

- 4.4 Whilst a draft Conservation Plan exists for Ox Mountains Bogs cSAC, an up-to-date and finalised Conservation Plan is required which should utilise the information provided by this report. Management objectives in the plan need to address the impacts highlighted in this report if progress is to be made towards attaining Favourable status for the Annex I habitats. The 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 reduction of stock numbers under the CFP appears to have resulted in some improvement to Annex I habitats, these habitats are not currently attaining Favourable status. Continued monitoring is required to establish what would be sustainable levels of livestock for this site bearing in mind that there

may be a considerable delay between changes in livestock levels and a response in the vegetation. The available data do not support an increase in stocking levels.

- 4.6 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 reduction of stock numbers under the CFP, in areas of more severe erosion active restoration measures may be needed for this habitat to achieve Favourable status. These may include the damming of erosion gullies, stabilisation of bare peat with geotextiles or heather brash, the planting of *Eriophorum angustifolium*, and seeding of bare peat with *Sphagnum* propagules. The conservation of *7130 Active blanket bog should be prioritised as befitting its status.
- 4.7 Burning has had a major impact on ***7130/7130 Blanket bogs** in the lowland area of Letterunshin. Burning is not recognised as a valid management tool for lowland bog and burning at Letterunshin is widespread and uncontrolled. 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 **6430 Hydrophilous tall herb communities**. Relevé data collected by this survey will allow these habitats to be, in part, retrospectively assessed.

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APPENDIX 1: ANNEX I HABITATS

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

Annex I	Full name of Annex I habitat	Standard abbreviation
code		
3110	Oligotrophic waters containing very few minerals	3110 Lowland oligotrophic lakes
	of sandy plains (Littorelletalia uniflorae)	
3130	Oligotrophic to mesotrophic standing waters with	3130 Upland oligotrophic lakes
	vegetation of the Littorelletea uniflorae and/or of	
	the Isoëto-Nanojuncetea	
3160	Natural dystrophic lakes and ponds	3160 Dystrophic lakes
3260	Water courses of plain to montane levels with the	3260 Floating river vegetation
	Ranunculion fluitantis and Callitricho-Batrachion	
	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
6230	*Species-rich Nardus grasslands, on siliceous	*6230 Species-rich Nardus
	substrates in mountain areas (and submountain	grasslands
	areas, in Continental Europe)	
6430	Hydrophilous tall herb fringe communities of plains	6430 Hydrophilous tall herb
	and of the montane to alpine levels	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	8110 Siliceous scree
	(Androsacetalia alpinae and Galeopsetalia ladani)	
8210	Calcareous rocky slopes with chasmophytic	8210 Calcareous rocky slopes
	vegetation	
8220	Siliceous rocky slopes with chasmophytic	8220 Siliceous rocky slopes
	vegetation	

APPENDIX 2: PHOTOGRAPHS



Plate A1: Flower of *Vaccinium myrtillus* among *7130 Active blanket bog vegetation, Easkey Bog Nature Reserve, Dunowla (Photo: Mark O'Callaghan).



Plate A2: Flower head of *Eriophorum vaginatum* in *7130 Active blanket bog vegetation, Crowagh (Photo: John Conaghan).



Plate A3: Hummock of *Sphagnum fuscum* in *7130 Active blanket bog vegetation, Letterunshin (Photo: Jenni Roche).



Plate A4: 4060 Alpine and Boreal heath vegetation with *Racomitrium lanuginosum*, *Calluna vulgaris* and *Juncus squarrosus* growing between peat hags, Tullaghaglass, Fiddandarry (Photo: Rory Hodd).



Plate A5: 4010 Wet heath vegetation, dominated by *Molinia caerulea*, with *Erica tetralix* and *Myrica gale*, Carrowneden (Photo: Philip Perrin).



Plate A6: Upland *7130 Active blanket bog vegetation, dominated by *Trichophorum germanicum*, Derreens (Photo: Orla Daly).



Plate A7: 7140 Transition mire, with Carex rostrata and Sphagnum spp. (Photo: Kristi Leyden).



Plate A8: 7220 Petrifying spring, with *Palustriella* spp. and *Carex panicea*, in stream gully, Dunowla (Photo: Rory Hodd).



Plate A9: 7230 Alkaline fen, with *Carex viridula*, *C. panicea* and *Scorpidium revolvens*, Ballyglass (Photo: Eamonn O'Sullivan).



Plate A10: 8210 Calcareous rocky slope, with *Asplenium viride, Cystopteris fragilis* and *Phegopteris connectilis,* Dunowla (Photo: Philip Perrin).



Plate A11; Easky Lough, the largest lake in the site, which is 3130 Upland oligotrophic lake (Photo: Mark O'Callaghan).



Plate A12: Valley of the infant River Moy, Carrownacreevy, with *7130 Active blanket bog, 4010 Wet heath and PF2 Poor fen and flush vegetation (Photo: Annika Korsten).



Plate A13: Badger (Meles meles) in 7130 Inactive blanket bog, Tawnadremira (Photo: John Conaghan).



Plate A14: Freshwater pearl mussels (*Margaritifera margaritifera*) in Easky River, Letterunshin (Photo: Mark O'Callaghan).



Plate A15: Golden plover (Pluvialis apricaria) in *7130 Active blanket bog, Cloonacool (Photo: John Conaghan).



Plate A16: Emperor moth (Saturnia pavonia) resting on Molinia caerulea (Photo: Kristi Leyden).

APPENDIX 3: PLANT SPECIES LIST

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

VASCULAR SPECIES	
Species name	Common name
Agrostis canina	Velvet Bent
Agrostis capillaris	Common Bent
Agrostis stolonifera	Creeping Bent
Alchemilla filicaulis	a Lady's-mantle
Anagallis tenella	Bog Pimpernel
Anthoxanthum odoratum	Sweet Vernal-grass
Asplenium viride	Green Spleenwort
Bellis perennis	Daisy
Blechnum spicant	Hard-fern
Calluna vulgaris	Heather
Cardamine pratensis	Cuckooflower
Carex bigelowii	Stiff Sedge
Carex binervis	Green-ribbed Sedge
Carex diandra	Lesser Tussock-sedge
Carex dioica	Dioecious Sedge
Carex disticha	Brown Sedge
Carex echinata	Star Sedge
Carex flacca	Glaucous Sedge
Carex lasiocarpa	Slender Sedge
Carex limosa	Bog-sedge
Carex nigra	Common Sedge
Carex panicea	Carnation Sedge
Carex paniculata	Greater Tussock-sedge
Carex pilulifera	Pill Sedge
Carex pulicaris	Flea Sedge
Carex rostrata	Bottle Sedge
Carex viridula subsp. brachyrrhyncha	a Yellow-sedge
Carex viridula subsp. oedocarpa	a Yellow-sedge
Cerastium fontanum	Common Mouse-ear
Cirsium dissectum	Meadow Thistle
Cirsium palustre	Marsh Thistle
Cladium mariscus	Great Fen-sedge
Crataegus monogyna	Hawthorn
Cynosurus cristatus	Crested Dog's-tail
Crepis paludosa	Marsh Hawk's-beard
Cystopteris fragilis	Brittle Bladder-fern
Dactylorhiza maculata	Heath Spotted-orchid
Danthonia decumbens	Heath-grass
Deschampsia flexuosa	Wavy Hair-grass
Drosera anglica	Great Sundew
Drosera intermedia	Oblong-leaved Sundew
VASCULAR SPECIES

Species name	Common name
Drosera rotundifolia	Round-leaved Sundew
Dryopteris aemula	Hay-scented Buckler-fern
Dryopteris dilatata	Broad Buckler-fern
Dryopteris filix-mas	Male-fern
Eleocharis multicaulis	Many-stalked Spike-rush
Eleocharis palustris	Common Spike-rush
Eleocharis quinqueflora	Few-flowered Spike-rush
Empetrum nigrum	Crowberry
Epilobium brunnescens	New Zealand Willowherb
Epilobium palustre	Marsh Willowherb
Equisetum arvense	Field Horsetail
Equisetum palustre	Marsh Horsetail
Equisetum telmateia	Great Horsetail
Erica cinerea	Bell Heather
Erica tetralix	Cross-leaved Heath
Eriophorum angustifolium	Common Cottongrass
Eriophorum latifolium	Broad-leaved Cottongrass
Eriophorum vaginatum	Hare's-tail Cottongrass
Euphrasia officinalis agg.	Eyebright
Festuca ovina	Sheep's-fescue
Festuca rubra	Red Fescue
Festuca vivipara	Viviparous Sheep's-fescue
Filipendula ulmaria	Meadowsweet
Fuchsia magellanica	Fuchsia
Galium palustre	Common Marsh-bedstraw
Galium saxatile	Heath Bedstraw
Hedera helix	Ivy
Holcus lanatus	Yorkshire-fog
Huperzia selago	Fir Clubmoss
Hyacinthoides non-scripta	Bluebell
Hydrocotyle vulgaris	Marsh Pennywort
Hymenophyllum wilsonii	Wilson's Filmy-Fern
Hypericum perforatum	Perforate St John's-wort
Hypericum sp.	a St John's-wort
Iris pseudacorus	Yellow Iris
Juncus acutiflorus	Sharp-flowered Rush
Juncus articulatus	Jointed Rush
Juncus bulbosus	Bulbous Rush
Juncus effusus	Soft-rush
Juncus squarrosus	Heath Rush
Lathyrus palustris	Marsh Pea
Leontodon autumnalis	Autumn Hawkbit
Linum catharticum	Fairy Flax
Listera cordata	Lesser Twayblade

VASCUL	AR SP	ECIES
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Species name	Common name
Lotus corniculatus	Common Bird's-foot-trefoil
Luzula multiflora	Heath Wood-rush
Luzula sylvatica	Great Wood-rush
Lychnis flos-cuculi	Ragged-Robin
Lysimachia nemorum	Yellow Pimpernel
Melampyrum pratense	Common Cow-wheat
Mentha aquatica	Water Mint
Menyanthes trifoliata	Bogbean
Molinia caerulea	Purple Moor-grass
Montia fontana	Blinks
Myrica gale	Bog-myrtle
Myriophyllum alterniflorum	Alternate Water-milfoil
Nardus stricta	Mat-grass
Narthecium ossifragum	Bog Asphodel
Oxalis acetosella	Wood-sorrel
Parnassia palustris	Grass-of-Parnassus
Pedicularis palustris	Marsh Lousewort
Pedicularis sylvatica	Lousewort
Phegopteris connectilis	Beech Fern
Phragmites sp.	a Reed
Picea sitchensis	Sitka Spruce
Pilosella officinarum	Mouse-ear-hawkweed
Pinguicula vulgaris	Common Butterwort
Pinus contorta	Lodgepole Pine
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Polygala serpyllifolia	Heath Milkwort
Polygala vulgaris	Common Milkwort
Polypodium vulgare	Polypody
Potamogeton natans	Broad-leaved Pondweed
Potamogeton polygonifolius	Bog Pondweed
Potentilla erecta	Tormentil
Potentilla palustris	Marsh Cinquefoil
Potentilla sterilis	Barren Strawberry
Primula vulgaris	Primrose
Prunella vulgaris	Selfheal
Pteridium aquilinum	Bracken
Ranunculus acris	Meadow Buttercup
Ranunculus flammula	Lesser Spearwort
Rhynchospora alba	White Beak-sedge
Rubus fruticosus agg.	Brambles
Sagina nodosa	Knotted Pearlwort
<i>Salix</i> sp.	a Willow
Saxifraga hirculus	Marsh Saxifrage
Schoenoplectus lacustris	Common Club-rush

VASCULAR SPECIES

Species name	Common name
Schoenus nigricans	Black Bog-rush
Selaginella selaginoides	Lesser Clubmoss
Senecio jacobaea	Common Ragwort
Solidago virgaurea	Goldenrod
Sorbus aucuparia	Rowan
Stellaria palustris	Marsh Stitchwort
Succisa pratensis	Devil's-bit Scabious
Taraxacum officinale agg.	Dandelion
Thalictrum minus	Lesser Meadow-rue
Thymus polytrichus	Wild Thyme
Tomentypnum nitens	Woolly Feather-moss
Trichophorum germanicum	Deergrass
Trifolium pratense	Red Clover
Trifolium repens	White Clover
Triglochin palustre	Marsh Arrowgrass
Ulex europaeus	Gorse
Vaccinium myrtillus	Bilberry
Vaccinium oxycoccos	Cranberry
Vaccinium vitis-idaea	Cowberry
Viola palustris	Marsh Violet
Viola riviniana	Common Dog-violet

Species name	Common name
Andreaea megistospora	Big-spored Rock-moss
Andreaea rothii	Dusky Rock-moss
Andreaea rothii subsp. rothii	a Dusky Rock-moss
Aneura pinguis	Greasewort
Atrichum undulatum	Common Smoothcap
Aulacomnium palustre	Bog Groove-moss
Blindia acuta	Sharp-leaved Blindia
Brachythecium rivulare	River Feather-moss
Breutelia chrysocoma	Golden-head Moss
Bryoerythrophyllum ferruginascens	Rufous Beard-moss
Bryum pallens	Pale Thread-moss
Bryum pseudotriquetrum	Marsh Bryum
Calliergonella cuspidata	Pointed Spear-moss
Calypogeia arguta	Notched Pouchwort
Calypogeia fissa	Common Pouchwort
Calypogeia muelleriana	Mueller's Pouchwort
Campylium protensum	a Feather-moss

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Species name	Common name
Campylium stellatum	Yellow Starry Feather-moss
Campylopus atrovirens	Bristly Swan-neck Moss
Campylopus brevipilus	Compact Swan-neck Moss
Campylopus flexuosus	Rusty Swan-neck Moss
Campylopus introflexus	Heath Star Moss
Cephalozia bicuspidata	Snow Pincerwort
Cephalozia connivens	Forcipated Pincerwort
Cephaloziella divaricata	Common Threadwort
Cephaloziella sp.	a Threadwort
Ceratodon purpureus	Scarce Redshank
Cladopodiella fluitans	Bog Notchwort
Climacium dendroides	Tree-moss
Colura calyptrifolia	Fingered Cowlwort
Conocephalum conicum	Great Scented Liverwort
Cratoneuron filicinum	Fern-leaved Hook-moss
Ctenidium molluscum	Chalk Comb-moss
Dicranum bonjeanii	Crisped Fork-moss
Dicranum fuscescens	Dusky Fork-moss
Dicranum scoparium	Broom Fork-moss
Didymodon ferrugineus	Rusty Beard-moss
Didymodon insulanus	Cylindric Beard-moss
Diplophyllum albicans	White Earwort
Ditrichum gracile	Slender Ditrichum
Drepanocladus cossonii	Intermediate Hook-moss
Fissidens adianthoides	Maidenhair Pocket-moss
Fissidens osmundoides	Purple-stalked Pocket-moss
Fissidens taxifolius	Common Pocket-moss
Frullania tamarisci	Tamarisk Scalewort
Frullania teneriffae	Sea Scalewort
Grimmia anomala	a Grimmia
Gymnomitrion crenulatum	Western Frostwort
Hedwigia stellata	Starry Hoar-moss
Heterocladium heteropterum	Wry-leaved Tamarisk-moss
Hylocomium splendens	Glittering Wood-moss
Hypnum cupressiforme var. cupressiforme	Cypress-leaved Plait-moss
Hypnum cupressiforme var. lacunosum	Great 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
Kurzia pauciflora	Bristly Fingerwort

Species name	Common name
Kurzia trichoclados	Heath Fingerwort
Leiocolea bantriensis	Bantry Notchwort
Lejeunea cavifolia	Micheli's Least Pouncewort
Lepidozia reptans	Creeping Fingerwort
Leucobryum glaucum	Large White-moss
Lophocolea bidentata	Bifid Crestwort
Lophozia incisa	Jagged Notchwort
Lophozia sudetica	Hill Notchwort
Lophozia ventricosa	Tumid Notchwort
Marchantia polymorpha subsp. polymorpha	a Common Liverwort
Marsupella emarginata	Notched Rustwort
Marsupella emarginata var. aquatica	a Notched Rustwort
Meesia triquetra	Three-ranked Hump-moss
Mnium hornum	Swan's-neck Thyme-moss
Mylia taylorii	Taylor's Flapwort
Nardia scalaris	Ladder Flapwort
Odontoschisma sphagni	Bog Flapwort
Orthotrichum cupulatum	Hooded Bristle-moss
Oxyrrhynchium hians	Swartz's Feather-moss
Palustriella commutata	Curled Hook-moss
Palustriella falcata	Claw-leaved Hook-moss
Pellia endiviifolia	Endive Pellia
Pellia epiphylla	Overleaf Pellia
Philonotis calcarea	Thick-nerved Apple-moss
Philonotis fontana	Fountain Apple-moss
Plagiochila spinulosa	Prickly Featherwort
Plagiomnium elatum	Tall Thyme-moss
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
Polytrichum commune	Common Haircap
Polytrichum formosum	Bank Haircap
Polytrichum juniperinum	Juniper Haircap
Preissia quadrata	Narrow Mushroom-headed Liverwort
Pseudocrossidium hornschuchianum	Hornschuch's Beard-moss
Pseudoscleropodium purum	Neat Feather-moss
Pseudotaxiphyllum elegans	Elegant Silk-moss
Racomitrium aquaticum	Narrow-leaved Fringe-moss
Racomitrium fasciculare	Green Mountain Fringe-moss
Racomitrium heterostichum	Bristly Fringe-moss
Racomitrium lanuginosum	Woolly Fringe-moss

Species name	Common name
Rhabdoweisia crispata	Toothed Streak-moss
Rhizomnium pseudopunctatum	Felted Thyme-moss
Rhizomnium punctatum	Dotted Thyme-moss
Rhytidiadelphus loreus	Little Shaggy-moss
Rhytidiadelphus squarrosus	Springy Turf-moss
Rhytidiadelphus triquetrus	Big Shaggy-moss
Riccardia chamedryfolia	Jagged Germanderwort
Riccardia multifida	Delicate Germanderwort
Saccogyna viticulosa	Straggling Pouchwort
Sarmentypnum exannulatum	Ringless Hook-moss
Sarmentypnum sarmentosum	Twiggy Spear-moss
Scapania compacta	Thick-set Earwort
Scapania gracilis	Western Earwort
Scapania umbrosa	Shady Earwort
Schistidium rivulare	River Grimmia
Scorpidium revolvens	Rusty Hook-moss
Scorpidium scorpioides	Hooked Scorpion-moss
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	Red Bog-moss
Sphagnum compactum	Compact 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 fimbriatum	Fringed Bog-moss
Sphagnum fuscum	Rusty Bog-moss
Sphagnum girgensohnii	Girgensohn's Bog-moss
Sphagnum inundatum	Lesser Cow-horn Bog-moss
Sphagnum magellanicum	Magellanic Bog-moss
Sphagnum molle	Blushing Bog-moss
Sphagnum palustre	Blunt-leaved Bog-moss
Sphagnum papillosum	Papillose Bog-moss
Sphagnum quinquefarium	Five-ranked Bog-moss
Sphagnum subnitens	Lustrous Bog-moss
Sphagnum tenellum	Soft Bog-moss
Sphagnum teres	Rigid Bog-moss
Splachnum sphaericum	Round-fruited Collar-moss
Tetraplodon mnioides	Slender Cruet-moss
Thuidium delicatulum	Delicate Tamarisk-moss

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Species name	Common name
Thuidium tamariscinum	Common Tamarisk-moss
Tortella tortuosa	Frizzled Crisp-moss
Trichostomum brachydontium	Variable Crisp-moss
Tritomaria quinquedentata	Lyon's Notchwort
Ulota crispa	Crisped Pincushion
Ulota hutchinsiae	Hutchins' Pincushion

LICHENS	
Species name	Species name
Cladonia bellidiflora	Cladonia subcervicornis
Cladonia cervicornis	Cladonia uncialis
Cladonia ciliata	Cladonia uncialis subsp. biuncialis
Cladonia ciliata var. ciliata	Icmadophila ericetorum
Cladonia ciliata var. tenuis	Parmelia omphalodes
Cladonia coccifera	Parmelia saxatilis
Cladonia crispata var. cetrariiformis	Peltigera canina
Cladonia floerkeana	Peltigera rufescens
Cladonia furcata	Pycnothelia papillaria
Cladonia portentosa	Sphaerophorus globosus
Cladonia squamosa var. subsquamosa	Stereocaulon vesuvianum
Cladonia strepsilis	Usnea subfloridana

Figure 1. Survey area / cSAC boundary of Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo



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PRI	MARY FOSSITT HABITATS
	BL. Built land
	ED1. Exposed sand, gravel or till
	ED3. Recolonising bare ground
	FL1. Dystrophic lakes
	FL2. Acid oligotrophic lakes
	FS1. Reed and large sedge swamp
	FW1. Eroding/ upland rivers
	FW2. Depositing/ lowland rivers
	GS3. Dry-humid acid grassland
	GS4. Wet grassland
	HD1. Dense bracken
	HH1. Dry siliceous heath
	HH3. Wet heath
	HH4. Montane heath
	PB2. Upland blanket bog
	PB3. Lowland blanket bog
	PB4. Cutover bog
	PB5. Eroding blanket bog
	PF1. Rich fen and flush
	PF2. Poor fen and flush
	PF3. Transition mire and quaking bog
	WD. Highly modified/ non-native woodland
	WN. Semi-natural woodland
	WS. Scrub/ transitional woodland
	Polygon boundaries

NATIONAL SURVEY OF UPLAND HABITATS - BEC Consultants Ltd. 2013. Commissioned by National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

1:22,000

2,000

Figure 2. Primary Fossitt habitats within Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo



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PRIMARY ANNEX I HABITATS

3130 Upland oligotrophic lakes 3160 Dystrophic lakes 3260 Floating river vegetation 4010 Wet heath 4030 Dry heath 4060 Alpine and Boreal heath 7130 Inactive blanket bog *7130 Active blanket bog 7140 Transition mires 7150 Rhynchosporion depressions 7230 Alkaline fens minor Annex non-Annex Polygon boundaries

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1:22,000

2,000

Figure 3. Primary Annex I habitats within Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo



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Figure 4a. Cover of 4010 WET HEATH within Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo



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Figure 4b. Cover of 4030 DRY HEATH within Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo



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Figure 4c. Cover of 4060 ALPINE AND BOREAL HEATH within Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo



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Figure 4d. Cover of *6230 SPECIES-RICH NARDUS GRASSLANDS within Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo





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Figure 4e. Cover of 6430 HYDROPHILOUS TALL HERB COMMUNITIES within Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo



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Figure 4f. Cover of *7130 ACTIVE BLANKET BOG within Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo



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Figure 4g. Cover of 7130 INACTIVE BLANKET BOG within Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo



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Figure 4h. Cover of 7140 TRANSITION MIRES within Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo



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Figure 4i. Cover of 7150 RHYNCHOSPORION DEPRESSIONS within Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo



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Figure 4j. Cover of 7230 ALKALINE FENS within Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo



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Figure 4k. Cover of 8110 SILICEOUS SCREE within Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo



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Figure 4I. Cover of 8210 CALCAREOUS ROCKY SLOPES within Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo



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Figure 4m. Cover of 8220 SILICEOUS ROCKY SLOPES within Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo



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Figure 5. Location of rare and notable plant records within Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo



NOTE

Listed species constitute those plant species that are listed on Annex II of the EU Habitats Directive, National Red Lists or are protected under the Flora Protection Order (FPO) 1999. Hollow symbols indi-cate the approximate location of a record (i.e. the original grid reference had six figures or less). Additional species recorded during the NUSH include Saxifraga hirculus, Meesia triquetra and Tomentypnum nitens. However, due to the sensitive nature of these species their location cannot he disclosed

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