# National Survey of Upland Habitats

(Phase 2, 2011-2012)

Site Report No. 7: Mount Brandon cSAC (000375), Co. Kerry (Revision)



Philip M. Perrin, Jenni R. Roche, Simon J. Barron and Orla H. Daly January 2014

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

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Cover photo: The paternoster lakes valley, Mount Brandon, Co. Kerry, taken by John Conaghan.

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# **EXECUTIVE SUMMARY**

- Mount Brandon cSAC (000375), Co. Kerry was surveyed between May and August 2011 in Phase 2 of the National Survey of Upland Habitats (NSUH). This report supersedes the original report, produced in 2012 by the same authors, by updating the structure and functions assessment criteria for 8210 Calcareous rocky slopes to those finalised in Phase 3 of the NSUH (2012-2013).
- The area of the site is 143.6 km<sup>2</sup>. Using GIS and aerial photograph interpretation, the site was divided into 2,436 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 22 Annex I habitats, 61 Fossitt habitats and 95 provisional upland vegetation communities were recorded. Annex I habitats comprise 64.3% of the site. The Annex I upland habitats present which are primary focus habitats for the NSUH are 4010 Wet heath (28.3%), 4030 Dry heath (13.3%), \*7130 Active blanket bog (12.6%), 4060 Alpine and Boreal heath (3.6%), 8220 Siliceous rocky slopes (2.0%), 8110 Siliceous scree (1.8%), 7130 Inactive blanket bog (0.4%), \*6230 Species-rich *Nardus* grasslands (0.1%), 7230 Alkaline fens (0.1%), 7150 *Rhynchosporion* depressions (0.02%), 7140 Transition mires (0.01%), 8210 Calcareous rocky slopes (0.01%).
- Rare and notable species recorded during the survey include *Persicaria viviparum*, Alchemilla alpina, Trichomanes speciosum, Deschampsia cespitosa subsp. alpina, Saxifraga rosacea and Adelanthus lindenbergianus.
- Areas of particular botanical interest include: Masatiompan and Beenoskee, exposed peaks supporting high quality 4060 Alpine and Boreal heath with arctic-alpine species; Coimín na gCnámh and Com na Caillí, corries containing rare vascular plant species; Glanshanacuirp, a deeply glaciated valley containing a series of corries and paternoster lakes which is home to numerous rare bryophyte and vascular plant species; and Coumanare, a corrie which supports high quality 7140 Transition mires and a population of the rare plant *Sibthorpia europaea*.
- The conservation status of the upland Annex I habitats that form the primary focus of the NSUH was assessed. A total of 97 monitoring stops were recorded in these habitats. The conservation status of 7140 Transition mires, 8120 Calcareous scree, 8210 Calcareous rocky slopes and 8220 Siliceous rocky slopes was assessed as Favourable. The conservation status of 7150 *Rhynchosporion* depressions, 7230 Alkaline fens and 8110 Siliceous scree was assessed as Unfavourable Inadequate while that of the remaining primary focus habitats was assessed as Unfavourable Bad.
- The main impacts/activities affecting the site are sheep grazing, burning and peat erosion.
- It is recommended that:

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

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

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

Consideration should be given to increasing the area of Annex I 4030 Dry heath by allowing it to recolonise non-Annex I GS3 Dry-humid acid grassland.

\* Priority Annex I habitat

### **ACKNOWLEDGEMENTS**

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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. 79 (Perrin *et al.*, 2014) which details the methodologies used for all aspects of this survey and which is a revision of Irish Wildlife Manual No. 48 (Perrin *et al.*, 2010). The methodologies 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 Mount Brandon cSAC (000375) for the NSUH (Phase 2, 2011-12). It revises an original report, produced in 2012 by the same authors, by updating the structure and functions assessment criteria for 8210 Calcareous rocky slopes to those finalised during Phase 3 of the NSUH.
- 1.4 Section 2 of this report presents a detailed description of the habitats within the site, which should be read in conjunction with the relevant O.S. Discovery Series map and the figures associated with the report. It also contains summary statistics on the extent of each habitat type recorded and a compilation of rare and notable floral records for the site.
- 1.5 Section 3 presents a detailed account of the conservation assessment for the upland Annex I habitats that are the primary focus of the NSUH. This is presented on a habitat-by-habitat basis and for each habitat the parameters of area, structure and functions and future prospects are examined. Available data from the Commonage Framework Plan are also presented.
- 1.6 Section 4 of this report recommends amendments to the Natura 2000 Standard Data Form based on the results of this survey and makes additional recommendations in regard to monitoring and management.
- 1.7 NSUH fieldwork was conducted in Mount Brandon cSAC between May and August 2011. The boundary of the cSAC as used in this survey is the version that was provided by NPWS in September 2010.

#### **Background site information**

- 1.8 Mount Brandon cSAC, Co. Kerry, (Fig. 1) is a large site, being 143.6 km<sup>2</sup> in extent and covering much of the central part of the Dingle Peninsula. It stretches from the headland of Brandon Point in the north to Dingle town in the south and then eastwards to Arraglen on the lower slopes of Stradbally Mountain (O.S. Discovery Series map 70). The underlying geology is mainly Old Red Sandstone and Dingle Beds, with some areas of conglomerates. The main peaks are Brandon Mountain (alt. 952 m), Brandon Peak (alt. 840 m), Beenoskee (alt. 826 m), Stradbally Mountain (alt. 798 m), Masatiompan (alt. 763 m), Slievanea (alt. 670 m), An Cnapán Mor (alt. 649 m) and Ballysitteragh (alt. 623 m). The site also includes an area of lowland blanket bog along the Owenmore River. Within the site, on the eastern slopes of Masatiompan stretching as far as Sauce Creek lies Mount Brandon Nature Reserve (461.8 ha) owned by NPWS.
- 1.9 The site has been designated for a number of Annex I habitats (Table 1). The full category titles for Annex I habitats mentioned in this report are found in Appendix 1.

Table 1: Annex I habitat data from the Natura 2000 Standard Data Form for Mount Brandon cSAC. Data retrieved from <u>www.npws.ie</u> 26th October 2011. Rep. = Representativity, Surf. = Relative Surface, Cons. = Conservation status, Glob. = Global Assessment.

Annex I	Habitat	Area	Rep.	Surf.	Cons.	Glob.
code		(%)				
1230	Vegetated sea cliffs	2	В	В	В	В
3130	Upland oligotrophic lakes	1	А	В	А	А
4010	Wet heath	14	С	В	С	С
4060	Alpine and Boreal heath	1	В	С	В	В
*7130/7130	Blanket bog	16	В	С	В	В
8210	Calcareous rocky slopes	2	А	С	А	А
8220	Siliceous rocky slopes	2	А	С	А	А

# 2. FIELD SURVEY

#### **Description of habitats**

#### Masatiompan, Brandon Head and An Buaicín

- 2.1 Masatiompan is a very exposed peak on the northern edge of the site. The summit supports a high quality area of montane heath classified as **HH4 Montane heath** in the Fossitt (2000) classification scheme. This is composed of a springy carpet of *Calluna vulgaris, Vaccinium myrtillus* and *Racomitrium lanuginosum.* The arctic-alpines *Carex bigelowii* and *Cetraria islandica* are fairly frequent with the former being locally abundant in areas of montane vegetation in which dwarf shrubs are sparse. *Cladonia* spp. are frequent throughout.
- 2.2 The northern slopes of Masatiompan are extremely steep and covered in coastal heath with dense and leggy **HH1 Siliceous dry heath** that is dominated by *Calluna vulgaris*. In some places there has been extensive dieback of the heather. Below this area are steep **CS1 Rocky sea cliffs**. Between Masatiompan and Sauce Creek are areas of **HH3 Wet heath** composed largely of *C. vulgaris, Molinia caerulea, Erica tetralix, Sphagnum capillifolium* and *Nardus stricta*. On the ridges here are areas of **PB2 Upland blanket bog** dominated by *C. vulgaris, Eriophorum vaginatum* and *Trichophorum germanicum*.
- 2.3 Sauce Creek is a dramatic cove, forming a sudden indentation in the coastline. On each side of the creek are 300 m high CS1 Rocky sea cliffs. The back of the cove is slightly less steep and is a mixture of GS3 Dry-humid acid grassland, HH1 Dry siliceous heath and scree (ER3 Siliceous scree and loose rock). At the foot of the rear cliff is a small area of LS1 Shingle and gravel shore. Just outside Sauce Creek on the eastern side, there has been a major collapse of the sea cliff with a section approximately 30 m deep having recently fallen into the sea.
- 2.4 On the western side of Masatiompan are steep slopes covered in a mosaic of **HH4 Montane heath** and scree (**ER3 Siliceous scree and loose rock**). Below this is a concave section of coastline down through which numerous rushy stream gullies flow. The area is mostly dominated by species-poor **GS3 Dry-humid acid grassland**. There are however rocky areas where thin soils occur with some base-rich flushing and here a species-rich *Nardus stricta* grassland variant occurs.
- 2.5 Along the coast from this concavity to Brandon Point small areas of maritime grassland occur in the lower reaches of gullies where there is higher influence from sea spray. This is a very low-growing sward characterised by *Plantago maritima*, *Plantago coronopus* and *Armeria maritima* with *Agrostis capillaris* and *Festuca* spp. This habitat type is not well covered by the scheme of Fossitt (2000) but has been classified as being related to **GS1 Calcareous and neutral dry grassland**. Further up some of these gullies and elsewhere around the coast are dense areas of *Pteridium aquilinum* (HD1 Dense bracken).
- 2.6 The headland of An Buaicín is largely *Calluna*-dominated **HH1 Dry siliceous heath** on the northern seaward side. Much of this area has been burnt at various times in the recent past and is at different stages of recovery. On the southern side, on the slopes above Brandon Village, **HH3 Wet heath** becomes the main habitat type. This is a rather unusual variant composed

chiefly of *Molinia caerulea* with *Ulex gallii*, which is typically indicative of dry coastal heath, here an intimate component. *Schoenus nigricans* is locally abundant.

2.7 Between the spur at Faha and Sauce Creek is a broad valley through which the Owennafeanna River and tributaries flow. This area is a mosaic of vegetation communities attributable to **PB2 Upland blanket bog**, **PB3 Lowland blanket bog** and **HH3 Wet heath**. The blanket bog consists of a mixture of *Schoenus nigricans*, *Molinia caerulea*, *Trichophorum germanicum*, *Eriophorum angustifolium*, *Erica tetralix* and *Calluna vulgaris*. *Sphagnum papillosum*, *Sphagnum tenellum* and *Sphagnum capillifolium* form the majority of the bryophyte layer. The wet heath occurs on shallower peats and includes communities dominated by *S. nigricans* or *T. germanicum*. There is an active area of peat cutting in the northern part of the valley along the road that leads from the car park at Teer to the old hut at the nature reserve. Some of the rest of the valley bog has been impacted by farm tracks.

#### Brandon Mountain, Brandon Peak and Glanshanacuirp

- 2.8 Descending southeast from the peak of Brandon Mountain is Glanshanacuirp, a dramatic, deeply glaciated valley containing a series of corries and a string of loughs known as "paternoster lakes" (FL2 Acid oligotrophic lakes). This valley contains numerous rocky habitats and is the location for many of the rare plant species found in the cSAC. Most of the southwestern side of the valley is composed of steep rocky cliffs (ER1 Exposed siliceous rock). Herbertus aduncus dominates the orange-brown hepatic mats in which may also be found Bazzania pearsonii, Pleurozia purpurea, Diplophyllum albicans and Scapania gracilis. Tall herb communities of wet rocky ledges here contain species such as Festuca rubra, Festuca vivipara, Angelica sylvestris, Filipendula ulmaria, Valeriana officinalis, Saxifraga spathularis, Philonotis fontana and the rare Saxifraga rosacea. Drier rocky cleft communities are characterised by Saxifraga spathularis, Sedum rosea and Hymenophyllum wilsonii. Where there is some base-rich flushing of the rock, species typical of more calcareous conditions (ER2 Exposed calcareous rock) occur including Ctenidium molluscum, Thymus polytrichus, Linum catharticum, Asplenium trichomanes, Primula vulgaris and Tortella tortuosa. On the eastern side of the valley there are large expanses of scree (ER3 Siliceous scree and loose rock) in which a typical collection of scree species grows: Hymenophyllum wilsonii, S. spathularis, F. vivipara, Racomitrium lanuginosum and Racomitrium heterostichum. One of the main communities of the rocky floor of the valley is a montane wet heath (HH3 Wet heath) with Trichophorum germanicum, Nardus stricta and R. lanuginosum.
- 2.9 Descending east from Brandon Mountain is the long spur at Faha. High up, on the southern side of the spur, grazed montane vegetation (HH4 Montane heath) dominates. Better quality areas are mainly composed of *Calluna vulgaris, Vaccinium myrtillus* and *Racomitrium lanuginosum*, but in other areas *Nardus stricta* dominates alongside *Racomitrium*. Lower down on the southern side of the spur, on steep ground the land becomes enclosed by stone walls and fences and is a mosaic of *Agrostis capillaris* grassland (GS3 Dry-humid acid grassland) and HH1 Dry heath. The heath is strongly dominated by *Ulex gallii* with *Erica cinerea* only occurring sparsely where the gorse is dense. A rather eroded walking path leads through this heath towards the peak. On more gently sloping ground at the foot of the spur a HH3 Wet heath of

*Schoenus nigricans* and *Molinia caerulea* occurs. On the northern side of the spur higher up are high rock faces (**ER1 Exposed siliceous rock**) above terraces of **HH3 Wet heath** with *Trichophorum germanicum*, *N. stricta* and *R. lanuginosum*. Lower down on the northern side, to the east, the heath gives way to **GS3 Dry-humid acid grassland** with patches of **HD1 Dense bracken**.

- 2.10 The ridges and summits of Brandon Mountain and Brandon Peak are dominated by several variants of **HH4 Montane heath**. At 952 m, Brandon Mountain is the highest peak in the range. The montane vegetation at its summit is characterised by *Racomitrium lanuginosum* and the arctic-alpine *Carex bigelowii*. *Juncus squarrosus* is abundant in places. Cosán na Naomh (The Saints' Path), a popular walking route, runs up the southwestern slope to the summit and causes some localised erosion. The vegetation below the summit of Mount Brandon and on the high ridge leading to Brandon Peak is dominated by montane grass-heath with *Nardus stricta, Carex binervis* and *R. lanuginosum*. The summit of Brandon Peak supports montane heath with *Calluna vulgaris, Vaccinium myrtillus* and *R. lanuginosum*.
- 2.11 The low peak at Beennaman, on the northwestern edge of the site, supports **HH1 Siliceous dry heath** which is composed of dense, leggy *Calluna vulgaris*. The western side of Brandon Mountain is largely dominated by **HH3 Wet heath** and is intersected by numerous stream gullies. On the lower slopes, *Trichophorum germanicum* and *Eriophorum angustifolium* dominate with *Molinia caerulea* and *C. vulgaris* becoming frequent in places. At higher altitudes, these communities give way to the montane variant of wet heath, which is characterised by *T. germanicum*, *Nardus stricta* and *Racomitrium lanuginosum*, and species-poor **GS3 Dry-humid acid grassland** with *N. stricta*.
- 2.12 On the western side of Brandon Peak, the Feohanagh River flows through a deep U-shaped glacial valley. The valley floor is dominated by several variants of HH3 Wet heath. Old abandoned peat cuttings are present and contain small areas of PF3 Transition mire and quaking bog, which are characterised by *Carex echinata, Menyanthes trifoliata, Equisetum fluviatile, Succisa pratensis* and *Ranunculus flammula* with abundant *Molinia caerulea* and *Eriophorum angustifolium*. The bryophyte layer is dominated by *Sphagnum* spp., particularly *Sphagnum papillosum*. On the northern side of the valley is a steep spur, which supports a mosaic of ER3 Siliceous scree and loose rock and HH1 Siliceous dry heath with *Ulex gallii*. The eastern and southern sides of the valley feature dramatic corries, which form hanging valleys. Numerous streams form waterfalls as they spill from the corries into the main valley. The corrie floors are predominantly vegetated with species-poor GS3 Dry-humid acid grassland while the corrie walls feature considerable areas of ER1 Exposed siliceous rock. The rare plant species *Alchemilla alpina* and *Saussurea alpina* were recorded within the corrie known as Com na Caillí.

#### Ballysitteragh and Connor Hill

2.13 The summits and upper slopes of Ballysitteragh and Beennabrack support a relatively dry variant of **PB2 Upland blanket bog**, which is dominated by *Calluna vulgaris* and *Eriophorum* spp., with *Juncus squarrosus* becoming abundant in places. At lower altitudes, this community grades into **HH3 Wet heath** dominated by *Trichophorum germanicum*, *Eriophorum angustifolium* 

and *C. vulgaris,* with *Molinia caerulea* becoming abundant in places. The lower slopes of Ballysitteragh also support **HH1 Siliceous dry heath** composed of *C. vulgaris*.

- 2.14 A long spur runs southwest from Beennabrack to Dingle town. Its western side is dominated by **HH3 Wet heath** with *Ulex gallii* while its eastern side supports a mosaic of species-poor **GS3 Dry-humid acid grassland** and **HH1 Siliceous dry heath**. This coastal variant of dry heath is dominated by *U. gallii*, with a variable cover of *Calluna vulgaris* and *Erica cinerea*. The field layer is characterised by *Agrostis capillaris, Anthoxanthum odoratum* and *Potentilla erecta* and the bryophyte layer by *Hypnum jutlandicum*.
- 2.15 The broad valley of the Garfinny River lies to the southwest of Connor Hill. The Connor Pass road runs through the valley. The upper slopes on the northwestern side of the valley, below Beennabrack, support a mosaic of species-poor GS3 Dry-humid acid grassland and ER3 Siliceous scree and loose rock. The valley floor and lower slopes are dominated by HH3 Wet heath. *Molinia caerulea* is abundant here and *Ulex gallii* is frequent in places. The valley is bounded on its southeastern side by An Cnoc Maol Mór, the upper slopes of which are dominated by HH3 Wet heath with *Trichophorum germanicum*, *Eriophorum angustifolium*, *Calluna vulgaris* and *Juncus squarrosus*.

The Cloghane River, Owenmore River and associated lakes

- 2.16 An area of **GA1 Improved agricultural grassland** at Mullaghveal, at the head of the Owenmore River valley, is not in the cSAC. The slopes surrounding Mullaghveal feature several corries. On the southern side of the valley, the steep corrie walls below Ballysitteragh and Beennabrack and the Maughanblaher Cliffs below Connor Hill are composed of **ER1 Exposed siliceous rock**. Crevices are present containing *Saxifraga spathularis*, ferns such as *Blechnum spicant*, *Dryopteris aemula* and *Hymenophyllum* spp. and bryophytes such as *Isothecium myosuroides*, *Frullania tamarisci*, *Diplophyllum albicans*, *Hypnum jutlandicum* and *Kindbergia praelonga*. The corrie at Fallaghnamara and the lower slopes on the northern side of Connor Hill are largely vegetated by species-poor **GS3 Dry-humid acid grassland**. Elsewhere the slopes support a damp variant of **HH1 Siliceous dry heath**. This community is dominated by dense, leggy *Calluna vulgaris* with some *Erica cinerea*. The bryophyte layer is luxuriant and is dominated by *Rhytidiadelphus loreus*, *H. jutlandicum*, *Thuidium tamariscinum*, *Hylocomium splendens*, *Sphagnum capillifolium* and *Sphagnum subnitens*.
- 2.17 The corrie floors and the main valley contain several FL2 Acid oligotrophic lakes including Loch na mBan, An Loch Dubh, An Loch Geal, Clogharee Lough and Loch Atlea. The Cloghane River, a FW2 Depositing/lowland river, flows from An Loch Geal and joins the Owenmore River. It flows northeast through an area of PB3 Lowland blanket bog and into Brandon Bay at Cloghane. Species recorded in the lower reaches of the Owenmore River include *Oenanthe* sp., *Nasturtium officinale* and *Fontinalis antipyretica* and the river also supports a population of Freshwater Pearl Mussel (NPWS, 2009).
- 2.18 The relatively flat floor of the Owenmore River valley supports a mosaic of **PB3 Lowland blanket bog** and **HH3 Wet heath** vegetation. Turf cutting by hand is ongoing on this lowland valley bog. The field layer of the bog is variable but contains a mixture of *Molinia caerulea*, *Schoenus nigricans*, *Trichophorum germanicum*, *Eriophorum angustifolium* and *Narthecium*

*ossifragum*. The most frequent dwarf shrubs are *Calluna vulgaris* and *Erica tetralix*. *Sphagnum papillosum* dominates the bryophyte layer. *Rhynchospora alba* is locally frequent and occurs with *Menyanthes trifoliata, Drosera anglica, Drosera intermedia* and *Drosera rotundifolia*. The **HH3 Wet heath** vegetation is typified by the dominance of *M. caerulea. Ulex gallii* is locally frequent.

#### Slieveanea, Loch Adoon and associated corries

- 2.19 On the southern side of Slieveanea, the upper slopes are dominated by a dry variant of **PB2 Upland blanket bog**. The dwarf shrub cover consists of dense *Calluna vulgaris*. *Eriophorum vaginatum* and *Eriophorum angustifolium* dominate the graminoid component while *Sphagnum capillifolium* dominates the bryophyte layer. *Juncus squarrosus* is locally frequent. The lower slopes are dominated by species-poor **GS3 Dry-humid acid grassland**. The very steep back walls of the corries on the northern side of Slieveanea are composed of **ER1 Exposed siliceous rock** and both corries contain **FL2 Acid oligotrophic lakes**. The gentler slopes within and below the corries support **HH1 Siliceous dry heath** composed of *C. vulgaris*.
- 2.20 The two corries below Slievenalecka contain the FL2 Acid oligotrophic lakes Loch Adoon and Loch Chom Callain. The craggy western wall of Com Callain is composed of ER1 Exposed siliceous rock. Crevices are present containing *Carex pulicaris, Dryopteris affinis* and *Saxifraga spathularis* and bryophytes such as *Conocephalum conicum, Pseudotaxiphyllum elegans* and *Fissidens* spp. The eastern wall supports a mosaic of PB2 Upland blanket bog and HH3 Wet heath. The corrie walls around Loch Adoon are dominated by species-poor GS3 Dry-humid acid grassland. Beyond the corries, the lower slopes from Kilmore eastwards to Beenbo are largely dominated by HH3 Wet heath with *Molinia caerulea. Ulex gallii* is frequent in places. There are some active peat cuttings in this area at Ballyduff.

#### Slievenalecka, Slievenagower, Beenbo, Coumanare and upland valley

- 2.21 Between Slievanea and Beenoskee a very broad, boggy upland valley occurs. At its western end at Coumanare, four small **FL2 Acid oligotrophic lakes** occur, An Loch Dubh, Loch Meáin, Loch Iarthair and Loch an Bharóidigh. The valley floor here is a mixture of **HH3 Wet heath** with *Molinia caerulea* and **PB2 Upland blanket bog** dominated by *Trichophorum germanicum* and *Eriophorum angustifolium*. The bog is severely eroded in places. These habitats stretch upslope to the peaks of Slievenalecka, Slievenagower and Beenbo. A stream flows out of An Loch Dubh and runs north across the bog towards the top of the corrie of Loch Adoon. Along its western bank is an area of **PF3 Transition mire and quaking bog** in which *Carex limosa, Sphagnum cuspidatum, Sphagnum denticulatum* and *Sphagnum papillosum* are abundant. *Menyanthes trifoliata, Drosera rotundifolia* and *Potamogeton polygonifolius* are also found here. This area constitutes the Coumanare site described by Mooney *et al.* (1991).
- 2.22 Further east within this broad valley are two unnamed hills with spot heights of 445 m and 383 m. Their summits are dominated by **HH1 Siliceous dry heath** composed of *Calluna vulgaris* while their slopes support **HH3 Wet heath** with *Molinia caerulea, Trichophorum germanicum* and *Eriophorum angustifolium*. The surrounding area, which extends to the slopes of Beenoskee, supports **PB2 Upland blanket bog** dominated by *T. germanicum* and *E. angustifolium*. The Glennahoo River and the Garrivagh River (**FW1 Eroding upland rivers**) rise within this area of bog.

#### An Cnapán Mor and Cnoc Mhaoilionáin

- 2.23 A high ridge extends eastwards for about 7 km from An Cnapán Mór to Cnoc Mhaoilionáin. The top of the ridge supports **HH4 Montane heath** which is largely dominated by *Calluna vulgaris* and *Racomitrium lanuginosum*, with *Juncus squarrosus* becoming frequent in places. On the northern side of the ridge, as the topography slopes down into the upland valley, the vegetation grades into the mixture of **HH3 Wet heath** and **PB2 Upland blanket bog** described in paragraphs 2.21 and 2.22.
- 2.24 On the southern side of the ridge, the upper slopes support species-poor **GS3 Dry-humid acid** grassland and **HH1 Dry siliceous heath** with *Calluna vulgaris*. *Ulex gallii* becomes frequent within the dry heath at lower altitudes. Loch Bhearna na Gaoithe (**FL2 Acid oligotrophic lakes**) is located within a corrie on the western side of Windy Gap. The slopes below Cnoc Mhaoilionáin are dominated by a dry variant of **PB2 Upland blanket bog** with *C. vulgaris* and *Eriophorum vaginatum* and *Eriophorum angustifolium*. The lower slopes throughout this area are dominated by **HH3 Wet heath** with mixtures of *Molinia caerulea*, *Trichophorum germanicum*, *E. angustifolium*, *U. gallii* and *Erica tetralix*.

#### Lough Anscaul and Glennahoo

- 2.25 Glennahoo is a very large, steep-sided valley on the northern side of the site. Along the flat valley floor winds the Glennahoo River (**FW1 Eroding upland rivers**) which is flanked by areas of rushy **GS4 Wet grassland**. The valley sides are dominated by **GS3 Dry-humid acid grassland** with, here and there, patches of **HD1 Dense bracken**. At the southern end of the valley where water pours down in a series of rivulets and waterfalls, there are some deep fissures in the rock (**ER1 Exposed siliceous rock**). On thin soils near the waterfall, species-rich grassland occurs with *Thymus polytrichus, Festuca ovina, Carex flacca, Aira praecox, Aira caryophyllea, Linum catharticum, Sibthorpia europaea* and *Anagallis tenella*. A trackway leads along Glennahoo, up onto the bog and down again towards Lough Anscaul.
- 2.26 Lough Anscaul (FL2 Acid oligotrophic lakes) lies in a large steep-sided valley on the southern side of the site. The Garrivagh River (FW1 Eroding upland rivers) flows off the high bog at the head of the valley and down through a series of waterfalls to the lough. The flat valley floor is largely fenced farmland but is not improved, comprising rushy grassland (GS4 Wet grassland) and flush (PF2 Poor fen and flush) with some areas of HH3 Wet heath dominated by *Molinia caerulea*. On the northern side of the valley are cliffs (ER1 Exposed siliceous rock), covered in GS3 Dry humid-acid grassland and HH1 Dry siliceous heath. At the foot of these cliffs are steep slopes supporting large areas of scree (ER3 Siliceous scree and loose rock) and HD1 Dense bracken. Amongst the scree can be found *Hymenophyllum wilsonii* and *Teucrium scorodonia*. The southern side of the valley is dominated by GS3 Dry-humid acid grassland and rocky crags (ER1 Exposed siliceous rock). There are some relatively large expanses of very species-rich grassland here with *Nardus stricta, Festuca rubra, Carex flacca, Viola riviniana, Leontodon autumnalis, Prunella vulgaris* and Euphrasia officinalis agg.

#### Beenoskee and Stradbally Mountain

- 2.27 The peak of Beenoskee is a mosaic of scree and loose rock (ER3 Siliceous scree and loose rock) and various montane habitats (HH4 Montane heath). The scree contains species such as *Saxifraga spathularis, Racomitrium lanuginosum* and *Herbertus aduncus*. Montane communities that occur on exposed, flatter ground near the peak support *Salix herbacea, Thymus polytrichus* and *Festuca vivipara*. Further down the mountain, montane heath is more plentiful. It comprises the usual mix of *Calluna vulgaris* and *Racomitrium lanuginosum* with some *Erica cinerea* and *Vaccinium myrtillus*. *Cetraria islandica* can also be found here. Below this on the southern side of the mountain is a zone of HH1 Dry siliceous heath dominated by *C. vulgaris* and on the less steep lower slopes HH3 Wet heath occurs with *Molinia caerulea* and *Trichophorum germanicum*.
- 2.28 The peak of Stradbally Mountain is separated from the peak of Beenoskee by a high corrie in which is found Loch an Choimin (FL2 Acid oligotrophic lakes). The peak is again dominated by scree and loose rock (ER3 Siliceous scree and loose rock) amongst which *Armeria maritima* and *Saxifraga stellaris* can be found. Below the peak, to the west, south and northeast, HH4 Montane heath with *Calluna vulgaris*, *Erica cinerea*, *Racomitrium lanuginosum* and *Cladonia* spp. becomes the primary habitat, with HH1 Dry siliceous heath in lower areas.
- 2.29 The eastern lower slopes of Stradbally Mountain at Arraglen comprise a very large expanse of HH3 Wet heath. *Molinia caerulea* is predominant lower down, with *Trichophorum germanicum* variants taking over on higher ground. Around Arraglen Lake there are some areas of HH1 Dry siliceous heath and HD1 Dense bracken on rockier and steeper ground. On low-lying ground at Cloghaneanode, *Myrica gale* and *Schoenus nigricans* occur in the wet heath and there are some areas of rather poor PB3 Lowland blanket bog with *Rhynchospora alba* locally abundant.
- 2.30 Part of Coillte's Glanteenassig Forest Park is included within the site along the eastern boundary. Lough Cam and An Dúloch (FL2 Acid oligotrophic lakes) occur here amongst WD4 Conifer plantation and lie at the foot of dramatic cliffs that cut into the side of Stradbally Mountain. A wooden boardwalk follows the shoreline of most of Lough Cam. Rocky clefts within the cliffs (ER1 Exposed siliceous rock) support communities containing *Saxifraga spathularis, Viola riviniana, Amphidium mougeotii, Trichostomum brachydontium, Marchesinia mackaii, Pellia epiphylla* and *Plagiochila bifaria*. Most of the cliffs and slopes here are clothed in *Molinia*-dominated HH3 Wet heath, in which *Ulex gallii* frequently occurs along with *Erica cinerea, Erica tetralix* and *Calluna vulgaris*. On the slopes here there are small patches of HD1 Dense bracken and some significant expanses of large boulder scree or talus (ER3 Siliceous scree and loose rock). The scree is poorly vegetated with little in the way of vascular plant cover. *Scapania gracilis, Scapania scandica, Gymnomitrium crenulatum* and *Campylopus atrovirens* occur amongst the rocks. On the cliffs and high slopes in the north of this area, HH1 Siliceous dry heath and HH4 Montane heath occur; *U. gallii* is noticeable here for being present at over 600 m.
- 2.31 Reamore townland is centred on a height that overlooks Lough Anscaul from the north. HH1 Dry siliceous heath covers the highest areas, but the main slope is dominated by HH3 Wet heath in which may be found *Molinia caerulea, Calluna vulgaris, Erica tetralix, Trichophorum*

*germanicum, Sphagnum capillifolium, Sphagnum palustre* and several other *Sphagnum* spp. In the broad saddle that is formed by this slope and the lower slopes of Beenoskee, is an area of blanket bog. Despite the altitude (some 350 m) most of this is **PB3 Lowland blanket bog** in nature with *Schoenus nigricans* being abundant alongside, *M. caerulea* and *Eriophorum angustifolium*.

- 2.32 To the west of Beenoskee lie two lesser peaks, An Com Bán and Binn an Tuair. The area between these two peaks and a large area on sloping ground to the south, around the upper reaches of Glennahoo valley is composed of **PB2 Upland blanket bog** that is dominated by *Eriophorum vaginatum* and *Trichophorum germanicum* with *Calluna vulgaris* and *Sphagnum capillifolium*. This area includes the site referred to as K42 in the report of Mooney *et al.* (1991). There is considerable peat erosion in this area particularly in the saddle between the two peaks.
- 2.33 To the north of An Com Bán, two deep stream valleys (containing FW1 Eroding / upland rivers) occur in the townlands of Scraggane and Cappateige. This area supports a mixture of habitats including PB2 Upland blanket bog, HH1 Dry siliceous heath and HH3 Wet heath. Areas of rushy flush (PF2 Poor fen and flush) occur along the streams. At the bottom of the site, near to the farms at Kilcummin there are substantial areas of GS4 Wet grassland and also an area of GA1 Improved grassland.
- 2.34 A selection of photographs taken during fieldwork of landscapes, habitats and species are presented in Appendix 2.

#### **Habitat statistics**

- 2.35 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 1-25).
- 2.36 The most abundant habitat within a polygon is termed the primary habitat. The primary Fossitt habitat types for Mount Brandon 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.
- 2.37 A total of 61 Fossitt (2000) habitats were recorded during this survey within Mount Brandon cSAC and details of their areas are presented in Table 2. HH3 Wet heath was the most extensive, covering 28.3% of the site, followed by GS3 Dry-humid acid grassland at 16.4%, HH1 Dry siliceous heath at 13.4% and PB2 Upland blanket bog at 11.2%.

Fossitt code	Habitat	Area (ha)	% of site
BL1	Stone walls and other stonework	14.0	0.10
BL2	Earth banks	0.4	0.003
BL3	Buildings and artificial surfaces	14.9	0.10
CB1	Shingle and gravel banks	0.04	0.0003
CC1	Sea walls, piers and jetties	0.2	0.001
CS1	Rocky sea cliffs	83.2	0.58
CS2	Sea stacks and islets	0.6	0.004
ED1	Exposed sand, gravel or till	32.4	0.23
ED2	Spoil and bare ground	44.6	0.31
ED3	Recolonising bare ground	7.6	0.05
ED4	Active quarries and mines	0.1	0.001
ER1	Exposed siliceous rock	495.1	3.45
ER2	Exposed calcareous rock	2.4	0.02
ER3	Siliceous scree and loose rock	796.9	5.55
ER4	Calcareous scree and loose rock	0.3	0.002
FL1	Dystrophic lakes	3.2	0.02
FL2	Acid oligotrophic lakes	172.5	1.20
FP1	Calcareous springs	0.1	0.001
FP2	Non-calcareous springs	8.2	0.06
FS1	Reed and large sedge swamps	6.3	0.04
FS2	Tall-herb swamps	2.8	0.02
FW1	Eroding/upland rivers	52.1	0.36
FW2	Depositing/lowland rivers	16.5	0.12
FW4	Drainage ditches	1.0	0.01
GA1	Improved agricultural grassland	64.4	0.45
GM1	Marsh	3.6	0.03
GS1	Dry calcareous and neutral grassland	31.8	0.22
GS2	Dry meadows and grassy verges	0.3	0.002
GS3	Dry-humid acid grassland	2357.0	16.42
GS4	Wet grassland	468.5	3.26
HD1	Dense bracken	231.0	1.61
HH1	Dry siliceous heath	1916.2	13.35
ННЗ	Wet heath	4056.3	28.26
HH4	Montane heath	1079.8	7.52
LR1	Exposed rocky shores	9.38	0.07
LR2	Moderately exposed rocky shores	0.4	0.003
LR3	Sheltered rocky shores	1.0	0.01
LR5	Sea caves	0.003	0.00002
LS1	Shingle and gravel shores	2.3	0.02
MW1	Open marine water	3.2	0.02
MW2	Sea inlets and bays	9.0	0.02
PB2	Unland blanket bog	1603.9	11 17
PB3	I owland blanket bog	281.8	1 96
PB4	Cutover hog	201.0	0.02
PB5	Freding blanket bog	56.0	0.02

Table 2: Extent of Fossitt habitats within Mount Brandon cSAC.

Fossitt code	Habitat	Area (ha)	% of site
PF1	Rich fen and flush	23.0	0.16
PF2	Poor fen and flush	295.3	2.06
PF3	Transition mire and quaking bog	1.8	0.01
WD1	(Mixed) broadleaved woodland	0.3	0.002
WD2	Mixed broadleaved/conifer woodland	1.6	0.01
WD3	(Mixed) conifer woodland	0.02	0.0002
WD4	Conifer plantation	58.5	0.41
WD5	Scattered trees and parkland	4.0	0.03
WL1	Hedgerows	0.1	0.0004
WL2	Treelines	0.5	0.004
WN1	Oak-birch-holly woodland	5.4	0.04
WN6	Wet willow-alder-ash woodland	10.9	0.08
WS1	Scrub	14.3	0.10
WS2	Immature woodland	1.9	0.01
WS3	Ornamental/non-native shrubs	0.4	0.003
WS5	Recently-felled woodland	2.8	0.02
	Total site area	14355.3	

Table	2:	continued
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Table 3: Extent of Annex I habitats within Mount Brandon cSAC. \*denotes priority habitat.

Annex I code	Habitat	Area (ha)	% of site
1230	Vegetated sea cliffs	83.8	0.58
3110	Lowland oligotrophic lakes	79.0	0.55
3130	Upland oligotrophic lakes	93.0	0.65
3160	Dystrophic lakes	2.3	0.02
3260	Floating river vegetation	5.7	0.04
4010	Wet heath	4056.3	28.26
4030	Dry heath	1903.6	13.26
4060	Alpine and Boreal heath	521.9	3.64
6150	Siliceous alpine and boreal grasslands	37.8	0.26
*6230	Species-rich Nardus grasslands	16.7	0.12
6430	Hydrophilous tall herb communities	0.5	0.004
*7130	Active blanket bog	1814.4	12.64
7130	Inactive blanket bog	62.8	0.44
7140	Transition mires	1.8	0.01
7150	Rhynchosporion depressions	3.2	0.02
7230	Alkaline fens	7.2	0.05
8110	Siliceous scree	252.0	1.76
8120	Calcareous scree	0.2	0.002
8210	Calcareous rocky slopes	0.8	0.01
8220	Siliceous rocky slopes	280.7	1.96
8330	Sea caves	0.003	0.00002
91A0	Old oak woodlands	5.4	0.04
	non-Annex I habitats	5126.1	35.71
	Total site area	14355.3	
	Total area of Annex I habitats	9229.2	64.29

Code	Provisional communities and sub-communities	Area (ha)	% of site	% of habitat
PO1	Menyanthes trifoliata - Carex limosa pool community			
PO1a	infilling pool sub-community	1.8	0.01	65.6
PO1b	aquatic sub-community	0.9	0.01	34.0
PO2	Littorella uniflora – Lobelia dortmanna lake community			
PO2i	upland variant	0.01	0.0001	0.3
PO2ii	lowland variant	0.002	0.00002	0.1
SW1	Potamogeton polygonifolius soakway	1.7	0.01	100.0
SPG1	Philonotis fontana - Saxifraga stellaris spring			
SPG1a	typical sub-community	5.0	0.04	60.6
SPG1b	species-poor Sphagnum denticulatum sub-community	2.9	0.02	34.5
SPG2	Palustriella commutata spring			
SPG2ii	non-Annex I variant	0.1	0.001	1.2
SPG3	Anthelia julacea - Sphagnum inundatum spring	0.3	0.002	3.7
PFLU1	Carex nigra/echinata - Sphagnum denticulatum flush	14.0	0.10	2.8
PFLU2	Juncus effusus - Sphagnum cuspidatum/palustre flush	221.9	1.55	44.9
PFLU3	Juncus acutiflorus/effusus - Calliergonella cuspidata flush	223.3	1.56	45.2
PFLU4	Molinia caerulea - Sphagnum palustre flush			
PFLU4a	typical sub-community	35.1	0.25	7.1
RFLU1	Carex viridula oedocarpa - Pinguicula vulgaris - Juncus bulbosus flush			
RFLU1a	brown moss sub-community	6.1	0.04	26.3
RFLU1b	species-poor sub-community	13.6	0.09	58.9
RFLU2	Eleocharis quinqueflora - Carex viridula flush	0.4	0.003	1.7
RFLU3	Carex panicea - Carex viridula subsp. oedocarpa flush	2.3	0.02	9.9
RFLU4	Schoenus nigricans – Scorpidium scorpioides flush	0.7	0.01	3.2
UG1	Agrostis capillaris - Festuca ovina upland grassland			
UG1a	typical sub-community	1230.5	8.57	47.6
UG1b	Sphagnum spp. sub-community	49.2	0.34	1.9
UG1c	species-rich calcareous sub-community	14.7	0.10	0.6
UG1d	<i>Juncus squarrosus</i> sub-community	91.1	0.63	3.5
UG2	Nardus stricta - Galium saxatile upland grassland			
UG2a	typical sub-community	629.8	4.39	24.3
UG2b	Sphagnum spp. sub-community	90.1	0.63	3.5
UG2c	species-rich sub-community	2.0	0.01	0.1
UG2d	<i>Juncus squarrosus</i> sub-community	248.1	1.73	9.6
UG4	Molinia caerulea – Anthoxanthum odoratum wet grassland	232.4	1.62	9.0
BK1	Pteridium aquilinum community	231.0	1.61	100.0
DH1	<i>Ulex gallii - Erica cinerea</i> dry heath	631.7	4.40	33.2
DH3	Calluna vulgaris - Erica cinerea dry heath	907.2	6.32	47.7
DH4	Calluna vulgaris - Sphagnum capillifolium dry/damp heath	344.4	2.40	18.1
DH6	Calluna vulgaris -Vaccinium myrtillus dry heath	19.0	0.13	1.0
WH1	Schoenus nigricans - Erica tetralix wet heath			
WH1a	continuous cover sub-community	194.9	1.36	4.8
WH1b	open sub-community	32.7	0.23	0.8
WH2	Trichophorum germanicum - Cladonia spp Racomitrium lanuginosum wet	3.3	0.02	0.1
	heath		–	-
WH3	Calluna vulgaris - Molinia caerulea - Sphagnum capillifolium wet/damp heath	1349.0	9.40	33.3

Table 4: Extent of provisional	vegetation communities	(Perrin et al., 2014	) within the Mou	nt Brandon cSAC.
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Code	Provisional communities and sub-communities	Area	% of	% of
		(ha)	site	habitat
WH4	Trichophorum germanicum- Eriophorum angustifolium wet heath			
WH4a	typical sub-community	406.9	2.83	10.0
WH4b	Calluna vulgaris sub-community	557.3	3.88	13.7
WH4c	Juncus squarrosus sub-community	72.6	0.51	1.8
WH5	Trichophorum germanicum - Nardus stricta - Racomitrium lanuginosum	361.3	2.52	8.9
	montane wet heath			
WH6	Schoenus nigricans – Molinia caerulea – Myrica gale wet heath	261.3	1.82	6.4
WH7	<i>Molinia caerulea – Ulex gallii</i> wet heath	816.8	5.69	20.1
MH1	Calluna vulgaris - Racomitrium lanuginosum montane heath			
MH1a	typical sub-community	260.2	1.81	24.1
MH1b	Juncus squarrosus sub-community	150.4	1.05	13.9
MH2	Vaccinium myrtillus - Racomitrium lanuginosum - Herbertus aduncus	14.3	0.10	1.3
	montane heath			
MH3	Vaccinium myrtillus - Rhytidiadelphus loreus - Anthoxanthum odoratum	95.6	0.67	8.9
	montane heath			
MH4	Calluna vulgaris - Juniperus communis subsp. nana montane heath	0.04	0.0003	0.003
MH5	Nardus stricta - Carex binervis - Racomitrium lanuginosum montane grass-	504.4	3.51	46.8
	heath			
MH6	Carex bigelowii - Racomitrium lanuginosum montane vegetation			
MH6a	typical sub-community	27.9	0.19	2.6
MH6b	Dicranum fuscescens sub-community	0.02	0.0001	0.002
MH6c	Juncus squarrosus sub-community	5.2	0.04	0.5
MH6d	Deschampsia flexuosa sub-community	0.02	0.0001	0.002
MH7	Nardus stricta - Carex bigelowii montane vegetation			
MH7a	typical sub-community	2.3	0.02	0.2
MH7c	Juncus squarrosus sub-community	2.4	0.02	0.2
MH8	<i>Festuca vivipara – Thymus polytrichus – Galium saxatile</i> montane vegetation	15.6	0.11	1.5
BB1	Schoenus nigricans - Eriophorum angustifolium bog			
BB1a	continuous cover sub-community	171.4	1.19	9.5
BB1b	open sub-community	62.0	0.43	3.4
BB2	Schoenus nigricans – Sphagnum spp. bog	26.9	0.19	1.5
BB3	Eriophorum vaginatum – Sphagnum papillosum bog	157.1	1.09	8.7
BB4	Trichophorum germanicum - Eriophorum angustifolium bog	707.7	4.93	39.2
BB5	Calluna vulgaris - Eriophorum spp. bog			
BB5a	typical sub-community	467.5	3.26	25.9
BB5b	Juncus squarrosus sub-community	210.1	1.46	11.7
BB6	Eriophorum angustifolium - Juncus squarrosus bog			
BB6a	typical sub-community	1.2	0.01	0.1
HW1	Sphagnum denticulatum/cuspidatum hollow			
HW1i	upland variant	8.5	0.06	8.2
HW1ii	lowland variant	2.1	0.02	2.0
HW1iii	flush variant	2.8	0.02	2.7
HW2	Eriophorum angustifolium - Sphagnum fallax hollow			
HW2i	upland variant	49.0	0.34	46.8
HW2ii	lowland variant	13.8	0.10	13.2
HW3	Rhynchospora alba hollow	3.2	0.02	3.1
HW4	Eleocharis multicaulis hollow			
HW4i	bog variant	2.4	0.02	2.3
HW4ii	flush variant	22.7	0.16	21.7

#### Table 4: continued.

Code	Provisional communities and sub-communities	Area	% of	% of
		(ha)	site	habitat
DP1	Campylopus introflexus - Polytrichum spp. degraded peat community	2.2	0.02	16.6
DP2	Nardus stricta – Eriophorum angustifolium degraded peat community	11.2	0.08	83.4
TH1	Luzula sylvatica - Vaccinium myrtillus tall herb vegetation			
TH1i	rock face variant	4.2	0.03	24.3
TH1ii	dry heath variant	12.6	0.09	72.7
TH3	Sedum rosea - Angelica sylvestris tall herb vegetation	0.5	0.004	3.0
SC1	Siliceous scree community	8.2	0.06	99.7
SC2	Calcareous scree community	0.03	0.0002	0.3
RS1	Saxifraga spathularis - Asplenium adiantum-nigrum rock cleft community	3.8	0.03	95.8
RS2	<i>Saxifraga aizoides - Asplenium</i> spp <i>Orthothecium rufescens</i> rock cleft community	0.2	0.001	4.2
HM1	Calluna mulgaris - Scanania gracilis bopatic mat			
HM1i	non-Anney I grassland variant	03	0.002	53
HM1iii	dry heath variant	0.0	0.002	4.8
HM1iv	wet heath variant	0.0	0.001	1.0
HM1v	montane heath variant	0.01	0.0001	0.2
HM1vi	non-Annex I siliceous rock face variant	0.02	0.0001	0.3
HM1vii	Annex I siliceous rock face variant	0.002	0.00001	0.03
HM1viii	siliceous scree variant	0.05	0.0003	0.9
HM2	<i>Calluna vulgaris - Herbertus aduncus</i> hepatic mat			
HM2i	non-Annex I grassland variant	1.4	0.01	24.2
HM2iii	dry heath variant	1.2	0.01	20.7
HM2iv	wet heath variant	0.3	0.002	4.4
HM2v	montane heath variant	1.3	0.01	23.4
HM2vi	non-Annex I siliceous rock face variant	0.1	0.001	1.6
HM2vii	Annex I siliceous rock face variant	0.6	0.004	9.8
HM2viii	siliceous scree variant	0.2	0.001	2.9
HM2ix	upland blanket bog variant	0.004	0.00003	0.1
	Total area of vegetation communities	12342.3	85.98	
	Not covered	349.9	2.44	
	Non-vegetation cover types	1663.1	11.59	
	Total site area	14355.3		

#### Table 4: continued.

2.38 A total of 22 Annex I habitats were recorded during this survey within Mount Brandon cSAC, covering 64.3% of the site (Table 3). The main Annex I habitat was **4010 Wet heath**, which covered 28.3% of the site, followed by **4030 Dry heath** and **\*7130 Active blanket bog** which covered 13.3 % and 12.6% of the site respectively. The next most frequent habitat was **4060 Alpine and Boreal heath** at 3.6%. 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.

- 2.39 A total of 95 provisional upland vegetation communities and sub-communities (Perrin *et al.,* 2014) were recorded within Mount Brandon cSAC. Details of their coverage are presented in Table 4.
- 2.40 Gradated maps displaying the cover of Annex I habitats currently assessed under the NSUH plus **6150 Siliceous alpine and boreal grasslands** and **6430 Hydrophilous tall herb communities** are shown in Figs. 4a-o. 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

- 2.41 Rare and notable plant records for the site are listed in Table 5 and their locations, where accurately known, are presented in Figs. 5a and 5b. The list is compiled from records made during the present survey and existing records. For each species it is indicated whether it is listed on the Flora Protection Order, 1999 and/or the relevant Red Data List. For vascular plants this is Curtis & McGough (1988) and for bryophytes the provisional list of Lockhart *et al.* (2012) was used. For lichens a preparatory list provided by D. McFerran, National Museums Northern Ireland was used; this is very much provisional and IUCN status has not been assigned to these species. Notable records comprise plants which are not rare but are of particular interest in an upland context.
- 2.42 The rare arctic-alpines *Salix herbacea* and *Carex bigelowii* were recorded at numerous locations throughout the site, while *Persicaria viviparum* was refound at a previously known station close to the signal tower south of Masatiompan. Mount Brandon represents the most southerly station for this species in the British Isles (Preston *et al.*, 2002). *Alchemilla alpina* which is only known from two other locations in Ireland (Preston *et al.*, 2002) was recorded from Coimín na gCnámh and from the uppermost corrie of Glanshanacuirp, on the eastern side of Mount Brandon. It was also recorded from Com na Caillí, the western corrie below Gearhane, which falls within a 10km<sup>2</sup> grid square in which this species has not been recorded since 1986 (Preston *et al.*, 2002). The rare *Saussurea alpina* was also recorded there. *Sibthorpia europaea* was recorded from the northern facing slopes of Arraglen, the Glennahoo river valley and to the west of the Coumanare Lakes. In Ireland this species is only found on the Dingle peninsula (Webb *et al.*, 1996; Preston *et al.*, 2002). *Trichomanes speciosum*, which is both a Red Data Book and Annex II listed species, was refound during the NSUH at a previously known station, however due to the sensitive nature of this species this location cannot be disclosed.
- 2.43 Other notable species recorded during the NSUH included *Oxyria digyna, Deschampsia cespitosa* subsp. *alpina, Saxifraga hypnoides, Saxifraga rosacea* and the ferns *Cystopteris fragilis* and *Asplenium adiantum-nigrum.* All of these species were recorded in Glanshanacuirp, the deeply glaciated valley containing a series of corries and paternoster lakes.
- 2.44 Previous records of rare species from the site include *Poa alpina, Viola lactea* and the fern *Polystichum lonchitis.* Previous records of notable species include *Thalictrum alpinum, Subularia aquatica* and the ferns *Botrychium lunaria, Adiantum capillus-veneris, Asplenium viride* and *Dryopteris oreades.*

2.45 Rare bryophytes recorded from the present survey include *Adelanthus lindenbergianus* and *Bazzania pearsonii* from Glanshanacuirp, a previously known station for these species. *Cyclodictyon laetevirens* was recorded from Glanshanacuirp, an unnamed corrie south of Piaras Mór and on the south western facing slopes in Ballinloghig. *Douinia ovata* was recorded amongst scree east of Brandon Peak and in wet heath close to Loch Chom Calláin. Other rare bryophytes recorded during the survey included *Mastigophora woodsii, Radula carringtonii, Leptodontium flexifolium, Metzgeria leptoneura* and *Sphagnum strictum*. Notable species recorded

	Red Data		Annex	Year of	NOUL	Previous
Species	List	FPO	II	record (s)	NSUH	records
Vascular plants						
Adiantum capillus-veneris	-	-	-	?	-	10
Alchemilla alpina	RA	-	-	1894, ~1989, 1993, 1995,	•	1, 2, 3, 6
·				2011		
Asplenium adiantum-nigrum	-	-	-	2011	•	-
Asplenium viride	-	-	-	~1989	-	3, 6
Botrychium lunaria	-	-	-	?	-	2
Carex bigelowii	-	-	-	~1989, 2011	•	6
Cystopteris fragilis	-	-	-	~1989, 2011	•	3, 6
Deschampsia cespitosa subsp. alpina	-	-	-	1970, 1973, 2011	•	1, 3
Dryopteris oreades	-	-	-	1973	-	1
Oxyria digyna	-	-	-	~1989, 2011	•	3, 6
Persicaria viviparum	DD	•	-	1884, 1946, ~1989, 1997, 2011	•	1, 2, 3, 6
Poa alpina	RA	-	-	1885, ~1989, 1993	-	1, 2, 3, 6, 10
Polystichum lonchitis	RA	-	-	1844, 1884, ~1989, 1993, 1995	-	1, 2, 3, 6
Salix herbacea	-	-	-	~1989, 2011	•	3, 6
Saussurea alpina	RA	-	-	1856, 1884, 1983, ~1989,	•	1, 2, 3, 6
,				2011		
Saxifraga hypnoides	-	-	-	?, 2011	•	10
Saxifraga rosacea	-	-	-	1973, ~1989, 1990, 1999,	•	1, 3, 6
2.0				2011		
Sibthorpia europaea	RA	-	-	1888, 1890, 1907, 1985,	•	1, 2, 3
, ,				1994, 1999, 2002, 2006,		
				2011		
Subularia aquatica	-	-	-	1971, 1972	-	1
Thalictrum alpinum	-	-	-	~1887		11
Trichomanes speciosum	RA	٠	•	1881, 1886, 1900, 1914,	•	1, 2, 3, 6
				1961, 1963, 1967, 1977,		
				1983, 1988, 1993, 1995,		
				1997, 2006, 2011		
Viola lactea†	VU	•	-	1825	-	1
Bryophytes						
Acrobolbus wilsonii	VU	-	-	1961, 1967, 2006	-	1, 13, 14
Adelanthus lindenbergianus	VU	-	-	2008, 2009, 2011	•	1, 12
Amphidium lapponicum	VU	-	-	2009	-	12

Table 5: Records of rare and notable plant species from Mount Brandon cSAC.

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	Tab	ole 5: cc	ntinued			
Species	Red Data List	FPO	Annex II	Year of record (s)	NSUH	Previous records
Antitrichia curtipendula	NT	-	-	1864 , 1900, 1906	-	13
Barbilophozia barbata	CR	-	-	1881, 1877, 1897, 1898,	-	9, 13
,				1899		
Bartramia ithyphylla	VU	-	-	1935	-	8
Bazzania pearsonii	VU	-	-	1950, 1951, 1967, 2006,	•	1.7.13.14
				2008, 2011		_, _ , ,
Campylopus atrovirens var. falcatus	NT	-	-	2006	-	1
Campylopus schimperi	RE	-	-	1954	-	13
Campylopus shawii	NT	-	-	1936, 1967, 2008, 2009	-	1, 12, 13,
						14
Campylostelium saxicola	EN	-	-	1935	-	8, 13, 14
Cephaloziella elachista	DD	-	-	1864, 1875, 1898	-	9
Cyclodictyon laetevirens	NT	-	-	2009, 2011	•	12
Douinia ovata	NT	-	-	1873, 1875, 1881, 1887,	•	9
				1898, 1899, 2011		
Dumortiera hirsuta	NT	-	-	1829, 1875, 1897, 1899,	-	1, 7, 9, 12,
				1951, 1963, 1967, 2006,		13, 14
				2009		
Eremonotus myriocarpus	NT	-	-	1967, 1968	-	13
Grimmia donniana	NT	-	-	1935, 2008	-	1, 8
Grimmia funalis	NT	-	-	1905, 1951, 1967, 2006, 2008	-	1, 7, 13
Gumnomitrion corallioides	CR	-	-	1840 1881	-	9 13
Hageniella micans	NT	_	_	2009	_	12
Hedzvicia integrifolia	VII			2007		13 14
Humaum callichroum		-	-	: 1051	-	7
Leiseolea hautrimeie	IN I NT	-	-	1931	-	1.0
Leiocoleu buntriensis		-	-	1075,2000 1075 1001 1007 1000	-	1, 7
Lejeuneu juudu subsp. moorei	٧U	-	-	1900, 1955 1967 2006 2008	-	1, 9, 13, 14
Lejeunea hibernica	NT	-	-	1881, 1894, 1897, 1898, 1899, 1900, 1967, 2006, 2008	-	1, 9, 13, 14
Leieunea mandonii	FN	_	_	1968 1967 2006	_	1 13 14
Lentodontium flevifolium	NT	_	_	2011	•	-
Marcurella aducta	NT	-	-	1068	•	12
Marsupella enhacelata		-	-	1900	-	15
Masticomkova zvodoji		-	-	1074	•	7
www.ingophoru woousii	1 1 1	-	-	1929, 1860, 1900, 1933, 1955, 1967, 2006, 2008, 2011	•	1, 8, 9, 13, 14
Metzgeria leptoneura	NT	-	-	1865, 1897, 1881, 1898, 2008, 2011	•	1, 9
Orthothecium intricatum	-	-	-	2011	•	_
Pallavicinia Ivellii	EN	-	-	1865 1953 1954	-	9 13 16
Paralentodontium recurvifolium	NT	_	_	2009	_	12 14
Philopotis cornua	CR			2007		14
Philomotic rigida	VII			1870 1865		12
I monono riguu Diagiahruum ziari	V U NIT	-	-	1029, 1000	-	13
I ingioury and arises		-	-	1970	-	10
r ugiopus oeueriunus		-	-	10/2	-	10 10
rugiotnecium cuotfolium	V U NTT	-	-	1740, 2007 2004	-	12, 13
r ugioinecium denticulatum var. obtucifolium	1N1	-	-	2000	-	1
Pohlia elonoata var oreenii	EN	_	_	1935	-	8
- commencies with the ziccini	N			2700		5

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		Table	e 5: contir	nued.		
Species	Red Data List	FPO	Annex II	Year of record (s)	NSUH	Previous records
Radula carringtonii	NT	-	-	1894, 1898, 1899, 1900, 1961,	•	1, 9, 13, 14
				1967, 2006, 2008, 2011		
Radula holtii	NT	-	-	1961, 1967, 2006, 2008	-	1, 13
Rhabdoweisia crispata	NT	-	-	2008	-	1
Rhabdoweisia fugax	VU	-	-	1915	-	13
Scapania curta	VU	-	-	1897, 1898, 1899	-	9
Scapania gymnostomophila	VU	-	-	2008	-	1
Scapania nimbosa	EN	-	-	1813, 1951, 1955, 1961, 1967,	-	7, 9, 13, 14
				1968		
Scapania ornithopodioides	VU	-	-	1813, 1829, 1900, 1951, 2006,	•	1, 7, 9, 12
				2008, 2009, 2011		
Scapania subalpina	DD	-	-	1899	-	9
Schistidium strictum	NT	-	-	2006, 2008	-	1
Sematophyllum demissum	NT	-	-	1951	-	7,13
Sphagnum platyphyllum	NT	-	-	2006	-	1
Sphagnum strictum	DD	-	-	2011	•	-
Sphagnum subnitens var.	-	-	-	2011	•	-
ferrugineum						
Sphenolobopsis pearsonii	NT	-	-	1955, 2009	-	12, 13, 14
Tritomaria exsecta	VU	-	-	1966	-	13
Ulota drummondii	RE	-	-	1935	-	8, 13
Lichens						
Catapyrenium lachneum	•	-	-	1994	-	5
Cetraria islandica	-	-	-	2011	•	-
Cladonia phyllophora	•	-	-	1912	-	13
Cladonia rangiferina	•	-	-	1912	-	1
Collema dichotomum	•	-	-	1935	-	5
Cyphelium sessile	•	-	-	1948	-	13
Degelia atlantica	•	-	-	1994, 2007, 2008	-	4, 5
Dermatocarpon meiophyllizum	•	-	-	1994	-	5
Ephebe hispidula	•	-	-	1935	-	5, 13
Gyalidea hyalinescens	•	-	-	1963	-	5
Leptogium burgessii	•	-	-	1994, 2008	-	4, 5
Massalongia carnosa	•	-	-	2007	-	4
Parmelia endochlora	•	-	-	1912	-	13
Peltigera leucophlebia	•	-	-	1912-13	-	5
Pertusaria melanchora	-	-	-	1994	-	5
Polychidium muscicola	•	-	-	1994, 2008	-	4, 5
Porella cordaeana	•	-	-	1994	-	5
Pseudocyphellaria intricata	•	-	-	1840, 1994, 2008	-	4, 5, 13
Pseudocyphellaria norvegica	•	-	-	2007, 2008	-	4
Psoroma hypnorum	•	-	-	1860	-	13
Rinodina fimbriata	-	-	-	1994	-	5
Solorina crocea	•	-	-	~1865	-	5
Toninia thiospora	•	-	-	~1865, 1994, 2007, 2008	-	4,5
Umbilicaria arctica††	•	-	-	~1865, 1929	-	5, 13
Umbilicaria hyberborea††	-	-	-	~1865	-	5
Umbilicaria proboscidea	•	-	-	~1865, 1994	-	5

*t* Indicates that this record is regarded as dubious (M. Wyse Jackson, pers. comm.)

tt Indicates that these records are regarded as dubious by Gilbert & Fryday (1996)

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Previous records:	1, NPWS Recorder database and associated data	8, Watson (1937)	
	2, Natura 2000 Standard Data Form	9, McArdle (1900)	
	3, cSAC site synopsis	10, Praeger (1934)	
	4, LichenIreland database	11, Ley (1887)	
	5, Gilbert & Fryday (1996)	12, Bosanquet & Preston (2010)	
	6, Curtis (1993)	13, N. Stewart (unpub. data)	
	7, Crundwell (1952)	14, Averis & Stewart (1995)	
Red Data List:	CR, Critically Endangered	RA, Rare	
	EN, Endangered	NT, Near Threatened	
	VU, Vulnerable	DD, Data Deficient	
	RE, Regionally Extinct		

included *Orthothecium intricatum* and *Sphagnum subnitens* var. *ferrugineum*. The latter species was recorded from upland blanket bog north of Cnoc Mhaoilíonáin and on lowland blanket bog in Clogharee, constituting a new vice county record for South Kerry.

- 2.46 Previous rare bryophyte records for the site include the Critically Endangered *Barbilophozia barbata, Gymnomitrion corallioides, Philonotis cernua* and *Plagiopus oederianus.*
- 2.47 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.
- 2.48 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

- 2.49 Faunal records during this survey include Irish Hare (*Lepus timidus* subsp. *hibernicus*), Fox (*Vulpes vulpes*), Badger (*Meles meles*), Common Lizard (*Zootoca vivipara*), Common Frog (*Rana temporaria*) and feral goats. Choughs (*Pyrrhocorax pyrrhocorax*), a species listed on Annex I of the EU Birds Directive, were observed at several locations throughout the site. Other birds noted include Red Grouse (*Lagopus lagopus*), Gannets (*Morus bassanus*), Kestrels (*Falco tinnunculus*), Common Snipe (*Gallinago gallinago*), Mallards (*Anas platyrhynchos*), Skylarks (*Alauda arvensis*) and Grey Wagtails (*Motacilla cinerea*). The Kerry Slug (*Geomalacus maculosus*), an Annex II listed species of the EU Habitats Directive was also noted within the cSAC, along with the butterflies the Peacock (*Inachis io*) and Small Copper (*Lycaena phlaeas*).
- 2.50 Previous faunal records include the Otter (*Lutra lutra*) and Freshwater Pearl Mussel (*Margaritifera margaritifera*), which has been recorded from the Owenmore River. Both of these species are listed on Annex II of the EU Habitats Directive. The Peregrine Falcon (*Falco peregrinus*), a species listed on Annex I of the EU Birds Directive, breeds within the cSAC. Fulmars (*Fulmarus glacialis*) have previously been recorded from coastal sections of the site. Other vulnerable species present include the Arctic Charr (*Salvelinus alpinus*), which has been recorded from Lough Anscaul and the Large Heath Butterfly (*Coenonympha tullia*).

## **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 97 monitoring stops were recorded within Mount Brandon cSAC for this purpose (Fig. 6 and Table 6); 4 additional non-assessed relevés were recorded from the Annex I habitats **6150 Siliceous alpine and boreal grasslands**, **6430 Hydrophilous tall herb communities** and **8110 Siliceous scree**. The future prospects parameter examines current impacts/activities on the site that are affecting area and structure and functions, and predicts the future status of the habitat based on future trends where there is sufficient data. The future prospects parameter can also be informed by available data from the Commonage Framework Plan project (CFP).

Annex I code	Habitat	Number of stops
4010	Wet heath	25
4030	Dry heath	18
4060	Alpine and Boreal heath	10
*6230	Species-rich Nardus grasslands	3
*7130/7130	Blanket bog	18
7140	Transition mires	2
7150	Rhynchosporion depressions	2
7230	Alkaline fens	2
8110	Siliceous scree	8
8210	Calcareous rocky slopes	1
8220	Siliceous rocky slopes	8

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

#### **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 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 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 (MS), severely damaged (S) or very severely damaged (S\*). Further details of CFP methodology can be found in Anon. (1998) and use of this data by the NSUH has been reviewed by Perrin (2012).
- 3.3 Mount Brandon cSAC contains significant areas of commonage comprising 79.7 km<sup>2</sup> or 55.4% of the site. A baseline CFP survey of the majority of these areas occurred in 1999 and 2000 with

small additional areas surveyed in 2003. An interim destocking level of 30% was applied in Kerry prior to the CFP commencing. This was then adjusted using the CFP results *c*. 2002. Results from these surveys are shown in Fig. 7. Only one small agricultural unit (KE14-0) has been resurveyed, in 2008-2009. The condition of this unit was found to have improved as the destocking assessment was reduced from 51.0% to 25.3%.

3.4 The CFP baseline surveys recorded 109 subunits within or partially within Mount Brandon cSAC (Table 7). These indicate commonage within the site was fairly badly damaged at this time, with only 34.9% of the area being assessed as undamaged (U) and 12.3% of the area assessed as moderately to severely damaged (MS) or worse.

Damage level	Frequency	Area	
	( <i>n</i> = 109)	%	
U	32 (29.4%)	34.9	
MU	29 (26.6%)	37.3	
MM	27 (24.8%)	15.5	
MS	12 (11.0%)	10.8	
S/S*	9 (8.3%)	1.5	

Table 7: Frequency of CFP subunit damage levels in Mount Brandon cSAC baseline surveys.

3.5 The CFP baseline surveys recorded 56 stations within Mount Brandon cSAC (Table 8). These also indicate commonage within the site was fairly badly damaged at this time with only 28.6% of stations being undamaged (U) and 23.2% of stations being moderately to severely damaged (MS) or worse.

Table 8: Frequency of CFP station damage levels in Mount Brandon cSAC, baseline surveys. Percentages indicate proportion of stations within each column.

Damage level	Wet heath/Dry heath/ Blanket bog (n = 47)	Upland grassland and other habitats (n = 9)	All habitats ( <i>n</i> = 56)
U	15 (31.9%)	1 (11.1%)	16 (28.6%)
MU	13 (27.7%)	4 (44.4%)	17 (30.4%)
MM	8 (17.0%)	2 (22.2%)	10 (17.9%)
MS	6 (12.8%)	1 (11.1%)	7 (12.5%)
S/S*	5 (10.6%)	1 (11.1%)	6 (10.7%)

3.6 Summary data for some of the key indicators recorded at CFP stations are compared with NSUH data in Table 9. There appears to have been a slight decrease in bare peat cover and a possible increase in *Calluna* cover. There is evidence of significant increases in *Calluna* height and sward height since the baseline survey.

3.7 With no substantial CFP resurvey since the baseline surveys it is difficult to draw many conclusions on trends. However there are indications, from the key indicator analysis, that vegetation structure is improving and bare peat cover decreasing. Also, the fact that a reduction of stock numbers occurred in 65.1% of commonage may in itself be seen as a positive trend for **4010 Wet heath**, **4030 Dry heath** and **\*7130/7130 Blanket bog** between 1999 and 2011.

Table 9: Mean values for key indicators from CFP stations in Mount Brandon cSAC (1999-2003), with related data from the NSUH survey (2011)

nom the Noorr survey (2011).				
	Wet heath/Dry	Upland grassland		
	bo	og	and other habitats	
	CFP	NSUH	CFP	
	(n = 36-47)	(n = 73)	( <i>n</i> =7-9)	
Bare peat cover (%)	4.6	2.1	2.7	
Sward height (cm)	17.9	27.7	11.8	
Calluna height (cm)	10.6	21.6 †	-	
Calluna cover				
D (>50%)	5 (10.6%)	20 (27.4%)	-	
A (26-50%)	12 (25.5%)	9 (12.3%)	-	
O or F (≤25%)	24 (51.1%)	34 (46.6%)	-	
Absent	5 (10.6%)	10 (13.7%)	-	
Not recorded	1 (2.1%)	0 (0.0%)	-	

+ Dwarf shrub height is used here as an estimate of Calluna height

#### 4010 Wet heath

Area

3.8 Changes in the area of **4010 Wet heath** were recorded for the period 1995 to 2011 through a combination of observations in the field and analysis of aerial photographs and satellite imagery available through Google Earth (Table 10). Only losses in habitat were found, there were no gains in habitat area. These data are restricted to obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. The main losses in area of **4010 Wet heath** were due to agricultural improvement (26.1 ha) and afforestation (30.1 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 A total of 25 monitoring stops were recorded within **4010 Wet heath** in Mount Brandon cSAC. In the assessment of structure and functions, 17 monitoring stops failed one criterion or more. Following a review of the ecological condition of those stops, expert judgement determined that three should pass because the failure was marginal or due to other mitigating circumstances. This reduced the number of stops that failed to 14, resulting in an overall failure rate of 56.0%. The structure and functions of **4010 Wet heath** were therefore assessed as Unfavourable – Bad.

Table 10. Impacts causing 00 vious 1055es in area of 4010 wet fleath, 1775-2011.					
Impact code	Impact	Area (ha)	Area (ha)	Area (ha)	Area (ha)
		1995-2000	2000-2005	2005-2011	1995-2011
A02.01	Agricultural intensification	22.99	1.73	1.34	26.07
B01.02	Artificial planting on open	11.59	19.35	0.00	30.94
	ground (non-native trees)				
C01.03.01	Hand cutting of peat	0.21	0.87	0.04	1.12
D01.01	Paths, tracks, cycling tracks	0.15	1.72	0.24	2.11
E01.03	Dispersed habitation	0.00	0.01	0.00	0.01
J01.01	Burning down	0.00	0.07	0.00	0.07
J02.07	Water abstractions from	0.00	0.05	0.06	0.10
	groundwater				
L05	Collapse of terrain	0.00	0.17	0.93	1.10
	landslide				
All impacts		34.94	23.96	2.62	61.51
% of habitat		0.86	0.59	0.06	1.52
% loss per year		0.17	0.12	0.01	0.09

Table 10: Impacts causing obvious losses in area of 4010 Wet heath, 1995-2011.

- 3.10 The vegetation composition of **4010 Wet heath** was poor, with multiple failures being recorded under several criteria (Table 11). The cover of ericoid species was inadequate at 52.0% of stops, while *Erica tetralix* was absent from the local vicinity of 8.0% of stops. The cover of *Cladonia* spp., *Sphagnum* spp. and pleurocarpous mosses was inadequate at 12.0% of stops while the cover of positive indicator species was inadequate at 20.0% of stops. The cover of the negative indicator species *Agrostis capillaris* was excessive at one stop (4.0%).
- 3.11 Browsing of dwarf shrubs by sheep is affecting the vegetation structure of **4010 Wet heath**, with 14.3% of monitoring stops being excessively browsed. All of these stops also exhibited an unfavourably low cover of ericoid species, which suggests that browsing has also exerted a negative impact on vegetation composition. Burning in sensitive areas was recorded in the local vicinity of one stop (4.0%).
- 3.12 The physical structure of **4010 Wet heath** has been impacted by drainage, with 16.0% of stops failing this criterion. Some disturbed bare ground was recorded but its cover was only deemed to be excessive at one stop (4.0%), both within the relevé and in the local vicinity. Both of these impacts are likely to have been primarily caused by trampling by sheep.
- 3.13 Grazing by sheep, along with associated impacts such as trampling, appears to be the most significant impact on the structure and functions of 4010 Wet heath in Mount Brandon cSAC. The effects of this impact are apparent in the vegetation composition, vegetation structure and physical structure of this habitat.
| Crite | eria   | Scale of       | Number of   | Number of | Failure  |
|-------|--|----------------|-------------|-----------|----------|
|       |  | assessment     | assessments | failures  | rate (%) |
| Vege  | etation composition  |                |             |           |          |
| 1     | Erica tetralix present   | 20 m radius    | 25          | 2         | 8.0      |
| 2     | Cover of positive indicator species $\geq 50\%$  | Relevé         | 25          | 5         | 20.0     |
| 3     | Total cover of <i>Cladonia</i> species, <i>Sphagnum</i> species., <i>Racomitrium lanuginosum</i> and pleurocarpous mosses ≥ 10%  | Relevé         | 25          | 3         | 12.0     |
| 4     | Cover of ericoid species and <i>Empetrum nigrum</i> ≥ 15%  | Relevé         | 25          | 13        | 52.0     |
| 5     | Cover of dwarf shrub species < 75%   | Relevé         | 25          | 0         | 0        |
| 6     | Cover of the following negative indicator<br>species: <i>Agrostis capillaris, Holcus lanatus,</i><br><i>Phragmites australis, Ranunculus repens</i><br>collectively < 1% | Relevé         | 25          | 1         | 4.0      |
| 7     | Cover of non-native species < 1%   | Relevé         | 25          | 0         | 0        |
| 8     | Cover of non-native species < 1%   | Local vicinity | 25          | 0         | 0        |
| 9     | Cover of scattered native trees and scrub ${<}20\%$  | Local vicinity | 25          | 0         | 0        |
| 10    | Cover of <i>Pteridium aquilinum</i> < 10%  | Local vicinity | 25          | 0         | 0        |
| 11    | Cover of Juncus effusus < 10%  | Local vicinity | 25          | 0         | 0        |
| Vege  | etation structure  |                |             |           |          |
| 12    | Crushed, broken and/or pulled up <i>Sphagnum</i> species < 10% of <i>Sphagnum</i> cover  | Relevé         | 23          | 0         | 0        |
| 13    | Last complete growing season's shoots of ericoids, <i>Empetrum nigrum</i> and <i>Myrica gale</i> showing signs of browsing collectively < 33%                            | Relevé         | 21          | 3         | 14.3     |
| 14    | No signs of <u>burning</u> into the moss, liverwort or<br>lichen layer, or exposure of peat surface due to<br>burning  | Local vicinity | 25          | 0         | 0        |
| 15    | No signs of <u>burning</u> inside boundaries of sensitive areas*   | Local vicinity | 25          | 1         | 4.0      |
| Phys  | sical structure  |                |             |           |          |
| 16    | Cover of <u>disturbed</u> bare ground < 10%  | Relevé         | 25          | 1         | 4.0      |
| 17    | Cover of <u>disturbed</u> bare ground < 10%  | Local vicinity | 25          | 1         | 4.0      |
| 18    | Area showing signs of <u>drainage</u> resulting from beauty trampling or tracking or ditches $\leq 10\%$   | Local vicinity | 25          | 4         | 16.0     |

Table 11: Monitoring	criteria and	l failure rates	for 4010 Wet h	eath $(n = 25)$ .
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heavy trampling or tracking or ditches < 10% \*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.

3.14 The failure rates recorded under the criteria relating to vegetation composition are much higher than those for vegetation structure or physical structure. The current impacts recorded under vegetation structure and physical structure do not, therefore, account for the high levels of failure under vegetation composition. The poor vegetation composition may be a legacy of previous damage. While destocking has undoubtedly reduced grazing pressure, this management intervention has not yet been manifested in the vegetation composition of **4010 Wet heath**, indicating that recovery still has some way to go.

### Future prospects

3.15 The impacts codes (Ssymank, 2009) and associated data recorded for **4010 Wet heath** are presented in Table 12. Fifteen impacts were recorded for this habitat.

### Agricultural intensification (A02.01)

3.16 Since 1995, there have been some losses of this habitat due to agricultural improvement. These occurred largely in the Ballinknockane area in the northwest of the site, close to the Dingle Way, with smaller apparent losses at Murririgane in the north and Maumagarrane in the southwest. However, there have been fewer losses in recent years therefore the trend for this impact is assessed as improving.

### Non-intensive cattle grazing (A04.02.01)

- 3. 17 The Mount Brandon cSAC Conservation Statement (NPWS, 2009) states that cattle grazing occurs but is not widespread throughout the site and the findings of the present survey were consistent with this. Evidence of cattle grazing was observed within **4010 Wet heath** at Glanshanacuirp and signs of damage, such as poaching, were apparent.
- 3.18 A conservation grazing programme involving cattle has been initiated within the statutory Nature Reserve at Arraglen. A herd of Dexter cattle was introduced in July 2011 in response to a perceived lack of grazing. Included within the programme is a study which aims to establish the level of grazing most beneficial to wildlife, with the expectation that control of *Molinia caerulea* will lead to increased biodiversity (Anon., 2011). This research is being conducted by NPWS in conjunction with Dr Geraldine Twamley Stein of IT Tralee and the Dexter Beef Company.
- 3.19 The intensity of this impact has been assessed as low. The effects of the grazing programme have yet to be determined but, given the poor condition of the cattle-grazed **4010 Wet heath** at Glanshanacuirp, the influence of this impact has been assessed overall as negative. The area of **4010 Wet heath** affected has been estimated to be 3%.

### Non-intensive sheep grazing (A04.02.02)

3.20 Sheep grazing occurs over most of the cSAC and is the dominant land use. The Conservation Statement (NPWS, 2009) states that to maintain and improve the ecological status of heath habitats a reduction in grazing pressure would be necessary in some areas. In addition to the destocking of commonages by up to 51% as a result of the CFP, stock reductions were implemented within the state-owned Nature Reserve, with sheep being excluded for 5-6 years prior to the publication of the Conservation Statement. Grazing of livestock above a sustainable density was listed as a notifiable action, i.e. an action which could cause damage to the site and for which prior approval is required. The Conservation Statement reports that some areas of **4010 Wet heath** have been extensively damaged by overgrazing, with the effects being particularly evident on the lower slopes, adjacent to enclosed land. Here, heather cover is poor and tightly cropped, and bare peat and poaching are common features.

3.21 Overgrazing by sheep appears to be an ongoing problem within this habitat. During the present survey, damage due to overgrazing and trampling by sheep was observed in **4010 Wet heath** within several polygons and, during the assessment of structure and functions, excessive levels of browsing were recorded within 14.3% of **4010 Wet heath** monitoring stops. The intensity of this impact was assessed as medium overall and its influence as negative, but the trend was assessed as improving due to the destocking levels implemented through the CFP.

		Insufficient	data.				
Impact	Impact	Intensity	Influence	Habitat	Source	Score	Trend
code				area			
A02.01	Agricultural intensification	High	Negative	<1%	Inside	-0.75	Imp
A04.02.01	Non-intensive cattle grazing	Low	Negative	3%	Inside	-0.50	Ins
A04.02.02	Non-intensive sheep grazing	Medium	Negative	100%	Inside	-3.00	Imp
A04.02.03	Non-intensive horse grazing	Low	Neutral	<1%	Inside	0.00	Ins
A04.02.04	Non-intensive goat grazing	Low	Positive	3%	Inside	0.50	Ins
B01.02	Artificial planting on open	High	Negative	<1%	Inside	-0.75	Imp
	ground (non-natives trees)						
C01.03.01	Hand cutting of peat	High	Negative	<1%	Inside	-0.75	Ins
D01.01	Paths, tracks, cycling tracks	High	Negative	<1%	Inside	-0.75	Ins
E01.03	Dispersed habitation	High	Negative	<1%	Inside	-0.75	Ins
G01.02	Walking, horseriding and non-	Low	Negative	<1%	Inside	-0.25	Ins
	motorized vehicles						
G01.03.02	Off-road motorised driving	Medium	Negative	<1%	Inside	-0.50	Ins
I01	Invasive non-native species	Low	Neutral	<1%	Inside	0.00	Ins
J01.01	Burning down	High	Negative	1.5%	Inside	-1.50	Ins
J02.07	Water abstractions from	High	Negative	<1%	Inside	-0.75	Dis
	groundwater						
L05	Collapse of terrain, landslide	High	Negative	<1%	Inside	-0.75	Ins
	Overall score					-10.50	

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

### Non-intensive horse grazing (A04.02.03)

3.22 Small groups of two or three horses were observed at the northern end of Clogharee Lough and at Mullaghveal. Their grazing was concentrated on nearby areas of grassland but the presence of horse dung suggested that some grazing also occurred in **4010 Wet heath**. Due to the small area affected and the low intensity of grazing this impact was deemed insignificant and recorded as a neutral influence.

### Non-intensive goat grazing (A04.02.04)

3.23 A herd of about 30 feral goats inhabits the northern margin of the site, including the statutory Nature Reserve. This grazing is very extensive in nature so its intensity has been assessed as low and its influence has been assessed as positive. The **4010 Wet heath** monitoring stop that was recorded within the affected area did not show any signs of excessive grazing.

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

3.24 There has been afforestation of this habitat with conifer species including *Picea sitchensis* and *Larix kaempferi* at Glanshanacuirp and on the eastern side of the Owenmore River at Lisnamovaun. There have been fewer losses in recent years therefore the trend for the impact is deemed to be improving.

# Hand cutting of peat (C01.03.01)

3.25 There has been some minor loss of this habitat due to turf cutting along the Owenmore River and at Slieveglass in the north of the site. Some of the **4010 Wet heath** that occurs in these areas is likely to be a secondary habitat that has developed as turf cutting has degraded the original **\*7130/7130 Blanket bog** habitat.

# Paths, tracks, cycling tracks (D01.01)

3.26 Minor losses of this habitat appear to have occurred at various locations across the site due to the construction farm tracks and the formalisation of walking routes, for example at Cappateige in the northeast of the site.

# Dispersed habitation (E1.03)

3.27 There has been some minor loss of this habitat due the construction of a house in the Owenmore valley.

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

3.28 The Dingle Way (Slí Corca Dhuibhne), which is a popular way-marked long-distance walking route, runs through the northern part of the site, including the statutory Nature Reserve. Cosán na Naomh (The Saints' Path), another popular way-marked walking route, runs up the southwest facing slope of Mount Brandon. The Pilgrims' Route runs through the centre of the site, along the road from Cloghane to Mullaghveal and over the saddle between Ballysitteragh and Geathane to Glin North. Numerous other informal walking routes are present within the site. Boardwalks were observed within **4010 Wet heath** at Glanteenassig and tracks have been built on some areas on the lower slopes. Elsewhere, however, paths cross the surface of **4010 Wet heath** and walking has resulted in localised erosion and trampling within this habitat. The intensity of this negative influence impact has been assessed as medium overall, due to the relatively high numbers of walkers using the site.

# Off-road motorised driving (G01.03.02)

3.29 Quad bike tracks were noted within **4010 Wet heath** at three locations, with damage to the vegetation and compaction of peat being apparent at one location. The intensity of this negative influence impact has been assessed as medium overall. The area of **4010 Wet heath** affected has been estimated to be less than 1%, due to the localised nature of this impact.

# Invasive non-native species (I01)

3.30 *Campylopus introflexus* is a non-native pioneer moss species of bare peat which can become abundant after disturbance such as peat cutting, burning or drainage (Atherton *et al.*, 2010). Carpets of the moss have been found to have a significant depressive effect on germination of

*Calluna vulgaris* seeds and therefore this species can impact on re-establishment of heather (Equiha & Usher, 1993; Bernth, 1998). Klinck (2010) defined it as a mild or temporary invasive species as it does not have long-term effects on biodiversity.

3.31 *Campylopus introflexus* was recorded in one of the **4010 Wet heath** monitoring stops. The degraded peat vegetation community DP1 *Campylopus introflexus – Polytrichum* spp. was recorded within 75 polygons dominated by **4010 Wet heath** during vegetation mapping. However, it was not recorded as forming extensive carpets; therefore this impact was assessed as being of neutral influence.

# Burning down (J01.01)

- 3.32 The Mount Brandon cSAC Conservation Statement (NPWS, 2009) stated that burning appeared to be widely used as a management tool and may have a detrimental effect on the vegetation of **4010 Wet heath**, particularly when combined with heavy grazing, and acknowledged that the practice of burning needed to be controlled. Burning areas of heath vegetation over 5 ha, or burning any area more often than once every 15 years, was listed as a notifiable action, i.e. an action which could cause damage to the site and for which prior approval is required.
- 3.33 Burning is an ongoing issue within Mount Brandon cSAC and evidence of burning was noted at numerous locations during the present survey. This high intensity impact was assessed as a negative influence as the aim appears to be promotion of grass species rather than management of the heath habitat. Approximately 1.5% of **4010 Wet heath** on the site is estimated to have been affected by burning within the last few years. Some permanent loss of habitat was also recorded.

# Water abstractions from groundwater (J02.07)

- 3.34 Drainage has been recorded under this impact category. Water is being drained from **4010 Wet heath** and diverted away by means of ditches. The intended purpose is not water abstraction but reclamation of the land. Although the impact category does not accurately describe the impact in question it is the most appropriate option available on the list recommended by the EU for Habitats Directive Article 17 assessments (Ssymank, 2009).
- 3.35 A shallow, recently dug drain was observed in **4010 Wet heath** near Ballinknockane. More substantial drainage works were observed in progress in a mosaic of **4010 Wet heath**, **GS4 Wet grassland** and **PF2 Poor fen and flush** near Mullaghveal (Plate 1). This activity results in the loss of Annex I habitat where the drain is dug and also in a lowering of the water table and subsequent vegetation change in surrounding habitats. The impact of this activity was assessed as high and its influence as negative. The area of **4010 Wet heath** affected has been estimated as less than 1%.
- 3.36 Some of these drains dug at Mullaghveal emptied directly into An Loch Dubh (Plate 1), a lake classified as **3110 Lowland oligotrophic lakes**. This lake is part of the Owenmore River catchment, which contains a population of the freshwater pearl mussel (*Margaritifera margaritifera*), a species listed on Annex II of the Habitats Directive. This declining and critically endangered species is highly sensitive to siltation as a result of drainage and these operations represent a significant threat to its conservation status.



Plate 1: Drainage works in a mosaic of 4010 Wet heath, GS4 Wet grassland and PF2 Poor fen and flush, draining directly into An Loch Dubh near Mullaghveal. The excavator is visible in the top right (Photo: BEC Consultants).

### Collapse of terrain, landslide (L05)

- 3.37 There have been some minor losses of habitat due to small-scale slippage at various locations, for example at Maumagarrane in the southeast of the site.
- 3. 38 The overall impacts score for **4010 Wet heath** has been calculated as -10.5. This is significantly below the nominal Favourable Reference Value of zero. The combined future trend for area and structure and functions is however deemed to be improving due to the indications that the condition of this habitat is gradually improving due to destocking (see paragraph 3.6), and due to a decreasing trend in habitat loss. The future prospects for this habitat were therefore assessed as Unfavourable Inadequate.

### 4030 Dry heath

Area

3.39 Changes in the area of **4030 Dry heath** were recorded for the period 1995 to 2011 through a combination of observations in the field and analysis of aerial photographs and satellite imagery (Table 13). Only losses in habitat were found, there were no gains in habitat area. These data are restricted to obvious changes in habitat; less obvious changes from one habitat type to another cannot be reliably identified by this process. The main losses in area of **4030** 

**Dry heath** were due to agricultural improvement (3.9 ha) and burning (2.7 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.

	I compared	A	A	A	A
Impact code	Impact	Area (na)	Area (na)	Area (na)	Area (na)
		1995-2000	2000-2005	2005-2011	1995-2011
A02.01	Agricultural intensification	3.87	0.00	0.07	3.94
B01 02	Artificial planting on open	0.02	0.00	0.00	0.02
D01.02	ground (non-native trees)				
D01.01	Paths, tracks, cycling tracks	0.36	0.47	0.11	0.94
D01.02	Roads and motorways	0.00	0.00	0.08	0.08
J01.01	Burning down	0.00	2.66	0.00	2.66
LOF	Collapse of terrain,	0.00	0.07	0.74	0.81
L03	landslide				
All impacts		4.25	3.20	1.01	8.45
% of habitat		0.22	0.17	0.05	0.44
% loss per year		0.04	0.03	0.01	0.03

Table 13: Impacts causing obvious losses in area of 4030 Dry heath, 1995-2011.

#### Structure and functions

- 3.40 A total of 18 monitoring stops were recorded in **4030 Dry heath** in Mount Brandon cSAC. In the assessment of structure and functions, ten stops failed one criterion or more. Following a review of the ecological condition of the stops that failed one criterion or more, expert judgement determined that no changes should be made, resulting in an overall failure rate of 55.6%. The structure and functions of **4030 Dry heath** were therefore assessed as Unfavourable Bad.
- 3.41 The vegetation composition of **4030 Dry heath** was poor in some cases. The proportion of dwarf shrub cover composed of *Ulex gallii* was excessive at 27.8% of stops (Table 14), all of which were classified as DH1 *Ulex gallii Erica cinerea* dry heath. This is likely to be due to a history of high intensity grazing which can disproportionately reduce the cover of ericoid shrubs in this habitat, eventually reducing the heath to scattered bushes of *U. gallii* occurring in a grassland matrix (Averis *et al.*, 2004) Both the number and cover of positive indicator species were inadequate at 5.6% of stops.
- 3.42 The vegetation structure of **4030 Dry heath** was poor. Burning in sensitive areas was recorded at 16.7% of stops, all of which were classified as DH1 *Ulex gallii Erica cinerea* dry heath. From a farming perspective *U. gallii* is perceived as an undesirable species in rough pasture and appears to be targeted for burning at this site.

Crit	arria	Scale of	Number of	Number of	Failura
Cin	ella	assassment	assessments	failures	rate (%)
Veg	etation composition	ussessment	ussessments	Turrares	Iute (70)
1	Number of bryophyte or non-crustose lichen	Relevé	18	0	0
1	species present, excluding <i>Campulonus</i> spp. and	iteleve	10	0	0
	Polutrichum spp. > 3				
2	Number of positive indicator species present	Relevé	18	1	5.6
	≥2				
3a	DH5 (Calcareous heaths): cover of positive	Relevé	0	n/a	n/a
	indicator species 50-75%				
3b	Siliceous heaths: cover of positive indicator	Relevé	18	1	5.6
	species ≥ 50%				
4	Proportion of dwarf shrub cover composed of	Relevé	18	5	27.8
	Myrica gale, Salix repens, Ulex gallii collectively				
	< 50%				
5	Cover of the following weedy negative	Relevé	18	0	0
	indicator species: Cirsium arvense, C. vulgare,				
	Ranunculus repens, large Rumex species (except				
	R. acetosa), Senecio jacobaea, Urtica dioica				
	collectively < 1%				
6	Cover of non-native species < 1%	Relevé	18	0	0
7	Cover of non-native species < 1%	Local vicinity	18	0	0
8	Cover of scattered native trees and scrub < 20%	Local vicinity	18	0	0
9	Cover of <i>Pteridium aquilinum</i> < 10%	Local vicinity	18	0	0
10	Cover of <i>Juncus effusus</i> < 10%	Local vicinity	18	0	0
Veg	etation structure				
11	Senescent proportion of <i>Calluna vulgaris</i> cover	Relevé	14	2	14.3
	< 50%				
12	Last complete growing season's shoots of	Relevé	14	0	0
	ericoids and <i>Empetrum nigrum</i> showing signs of				
	browsing collectively < 33%				
13	No signs of burning inside boundaries of	Local vicinity	18	3	16.7
	sensitive areas*				
14	Outside boundaries of sensitive areas, all	Local vicinity	11	3	27.3
	growth phases of Calluna vulgaris should occur				
	throughout, with $\geq 10\%$ of cover in mature				
	phase				
Phy	sical structure				
15	Cover of <u>disturbed</u> bare ground < 10%	Relevé	18	0	0
16	Cover of <u>disturbed</u> bare ground < 10%	Local vicinity	18	0	0

#### Table 14: Monitoring criteria and failure rates for 4030 Dry heath (n = 18).

\*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 1991a). These are heaths primarily composed of mixtures of *Calluna vulgaris* and *Vaccinium myrtillus* over a moist carpet of bryophytes that often has a high *Sphagnum* content. Within the provisional classification, these communities are comparable to DH4 and damper elements of DH6 respectively.

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

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

- 3.43 No failures due to excessive browsing of ericoid species were recorded at the monitoring stops where it was possible to assess criterion 12. This relates to stops recorded within DH3 *Calluna vulgaris Erica cinerea* dry heath and DH4 *Calluna vulgaris Sphagnum capillifolium* dry/damp heath communities. However, ericoids may be scarce or absent in the DH1 *Ulex gallii Erica cinerea* dry heath community, so some DH1 stops could not be assessed under criterion 12.
- 3.44 Poor structural diversity was recorded at 27.3% of the monitoring stops where criterion 14 was applicable, with some growth phases of *Calluna vulgaris* being absent. The cover of senescent *C. vulgaris* was excessive at two of the monitoring stops where criterion 11 was applicable (14.3%). Both were located on steep slopes that were relatively inaccessible to grazing animals and where *C. vulgaris* had become overgrown.
- 3.45 The physical structure of **4030 Dry heath** was good, with no failures being recorded under the relevant criteria.

#### Future prospects

3.46 The assessment for the future prospects of **4030 Dry heath** is presented in Table 15. Thirteen impacts were recorded for this habitat.

#### Agricultural intensification (A02.01)

3.47 There have been some losses of **4030 Dry heath** habitat due to the same improvement operations that have resulted in loss of **4010 Wet heath** (see paragraph 3.16). The trend for this impact is deemed to be improving due to the reduction in losses in recent years.

Impact	Impact	Intensity	Influence	Habitat	Source	Score	Trend
code				area			
A02.01	Agricultural intensification	High	Negative	<1%	Inside	-0.75	Imp
A04.02.01	Non-intensive cattle grazing	Low	Positive	1%	Inside	0.50	Ins
A04.02.02	Non-intensive sheep grazing	Low	Positive	80%	Inside	1.25	Imp
A04.02.03	Non-intensive horse grazing	Low	Neutral	<1%	Inside	0.00	Ins
A04.02.04	Non-intensive goat grazing	Low	Positive	15%	Inside	0.50	Ins
A04.03	Abandonment of pastoral	Low	Negative	20%	Inside	-0.50	None
	systems, lack of grazing						
B01.02	Artificial planting on open ground (non-native trees)	High	Negative	<1%	Inside	-0.75	Ins
D01.01	Paths, tracks, cycling tracks	High	Negative	<1%	Inside	-0.75	Ins
D01.02	Roads and motorways	High	Negative	<1%	Inside	-0.75	Ins
G01.02	Walking, horseriding and non- motorized vehicles	Low	Negative	<1%	Inside	-0.25	Ins
I01	Invasive non-native species	Low	Neutral	<1%	Inside	0.00	Ins
J01.01	Burning down	High	Negative	6%	Inside	-1.50	Ins
L05	Collapse of terrain, landslide	High	Negative	<1%	Inside	-0.75	Ins
	Overall score					-4.75	

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

### Non-intensive cattle grazing (A04.02.01)

3.48 Cattle grazing in **4030 Dry heath** is largely restricted to the Nature Reserve at Arraglen. The majority of this habitat there occurs on the very steep, north-facing slopes of Masatiompan that would be practically inaccessible to the Dexter cattle recently introduced to the Nature Reserve (see paragraph 3.18). The area of **4030 Dry heath** affected has therefore been estimated to be 1%. The intensity of this impact has been assessed as low and the influence as positive.

# Non-intensive sheep grazing (A04.02.02)

- 3.49 Sheep grazing occurs over most of the cSAC and is the dominant land-use (NPWS, 2009). As stated in paragraph 3.20, there has been substantial destocking within the site in recent years. During the present survey, none of the monitoring stops recorded within 4030 Dry heath were assessed by the criteria as exhibiting excessive grazing. However, it should be noted that it was not possible to assess grazing levels at many of the stops that were classified as DH1 *Ulex gallii Erica cinerea* dry heath due to the complete absence of ericoids. The dominance of *U. gallii* does indicate high grazing levels within this vegetation type, at least in the recent past.
- 3.50 Whilst sheep grazing pressure on **4030 Dry heath** would appear now to be at a more sustainable level than in the past, it remains to be seen if current stock levels will permit reestablishment of heath in areas where the habitat has been lost in the past due to excessive stocking. The intensity of this impact has been assessed as low overall and the area affected has been estimated to be 80%. The influence is tentatively assessed as positive and the trend has been assessed as improving due to CFP destocking.

# Non-intensive horse grazing (A04.02.03)

3.51 This impact was recorded in 4030 Dry heath at Mullaghveal and Kilcummin, although grazing was concentrated on nearby areas of non-Annex GS3 Dry-humid acid grassland or HD1 Dense bracken. Due to the small area affected and the low intensity of grazing this impact was deemed insignificant and recorded as a neutral influence.

# Non-intensive goat grazing (A04.02.04)

3.52 The herd of feral goats found in the northern part of the site (see paragraph 3.23), are likely to be the only animals that can access some of the steep, north-facing slopes of Masatiompán, most of which is covered in **4030 Dry heath**. This grazing is very extensive in nature so its intensity has been assessed as low and its influence as positive. None of the three **4030 Dry heath** monitoring stops that were recorded within this area showed signs of excessive grazing. Although some of the habitat would be inaccessible even to goats, the overall area of **4030 Dry heath** affected by goat grazing was estimated to be 15%.

# Abandonment of pastoral systems, lack of grazing (A04.03)

3.53 Lack of grazing was identified as an impact on the conservation status of **4030 Dry heath** due to the presence of leggy, overgrown heather on Beennaman and on the steep northern slopes of Masatiompan. The overall area of **4030 Dry heath** affected was estimated to be 20%. As this area is largely inaccessible to grazing animals the trend for this impact is unlikely to change over time.

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

3.54 There has been some minor loss of **4030 Dry heath** due to coniferous afforestation at Glanshanacuirp below Loch Cruite.

### Paths, tracks, cycling tracks (D01.01)

3.55 Minor losses of this habitat appear to have occurred at various locations across the site due to the formalisation of walking routes and the construction farm tracks, for example on Beenbo.

### Roads and motorways (D01.02)

3.56 Minor losses of this habitat are likely due to the widening of the Connor Pass road near the top car park on Connor Hill.

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

3.57 There are many walking routes within Mount Brandon cSAC (see paragraph 3.28). Tracks have been built on some areas on the lower slopes but, elsewhere, paths cross the surface of **4030 Dry heath** and walking has resulted in localised erosion and trampling within this habitat, for example on the path that leads up from the shrine at Faha to Brandon Mountain. The intensity of this impact has been assessed as medium overall, due to the relatively high numbers of walkers using the site, and the influence as negative. The area of the habitat affected has been estimated to be less than 1%, due to the localised nature of this impact.

### Invasive non-native species (I01)

3.58 As stated in paragraph 3.30, *Campylopus introflexus* is a non-native moss species that is a mild invasive of bare peat, and can impact on heather re-establishment. The degraded peat vegetation community DP1 *Campylopus introflexus – Polytrichum* spp. was recorded from within 13 polygons dominated by **4030 Dry heath** during vegetation mapping. However, it was not recorded as forming extensive carpets; therefore this impact was assessed as being of neutral influence.

### Burning down (J01.01)

3.59 Burning of heath within Mount Brandon cSAC is, as stated in paragraph 3.32, discussed in the Conservation Statement (NPWS, 2009) for the site. Burning is an ongoing issue within **4030 Dry heath** and evidence of burning was noted at numerous locations in this habitat during the present survey. Whilst burning can be a valuable management tool for heathland (Averis *et al.*, 2004), this high intensity impact was assessed as a negative influence as the aim appears to be promotion of grass species rather than management of the heath habitat. Based on the results of vegetation mapping, approximately 6% of **4030 Dry heath** on the site is estimated to have been affected by burning within the last few years. Some permanent loss of habitat was also recorded.

### Collapse of terrain, landslide (L05)

3.60 There have been minor losses of **4030 Dry heath** habitat in the east of the site due to small-scale slippage. A larger area of coastal dry heath near Sauce Creek has been lost recently due to the collapse of the sea cliff there, but this was still less than 1 ha.

3.61 The overall impacts score for **4030 Dry heath** has been calculated as -4.75. This is below the nominal Favourable Reference Value of zero. The combined future trend for area and structure and functions is however deemed to be improving due to the indications that the condition of this habitat is gradually improving due to destocking (see paragraph 3.6), and due to a decreasing trend in habitat loss, although uncontrolled burning remains a significant issue. The future prospects for this habitat were therefore assessed as Unfavourable – Inadequate.

### 4060 Alpine and Boreal heath

Area

3.62 Changes in the area of **4060 Alpine and Boreal heath** were examined for the period 1995 to 2011 through a combination of observations in the field and analysis of aerial photographs and satellite imagery. Some minor losses due to landslide/slippage were estimated (less than 0.05 ha), but these have very likely been outweighed by gains in this period as this habitat can also establish on rocky areas at high altitude where blanket peat has eroded away. As the area of habitat is deemed to be at least stable and probably increasing, the area status for this habitat was assessed as Favourable.

### Structure and functions

- 3.63 Ten monitoring stops were recorded within **4060** Alpine and Boreal heath in Mount Brandon cSAC. In the assessment of structure and functions, three stops failed. Following a review of the ecological condition of the stops that failed one criterion or more, expert judgement determined that no changes should be made, resulting in an overall failure rate of 30.0%. The structure and functions of **4060** Alpine and Boreal heath were therefore assessed as Unfavourable Bad.
- 3.64 The vegetation composition of **4060 Alpine and Boreal heath** was poor in the case of one stop (10.0%), which exhibited an inadequate cover of dwarf shrubs (Table 16). The vegetation structure of **4060 Alpine and Boreal heath** was affected by grazing, with excessive grazing recorded at 40.0% of the stops where this criterion was applicable. Physical structure was poor at one stop (10.0%), with excessive cover of bare ground being recorded both at the stop and in the local vicinity. These failures are likely to be due to ongoing grazing and trampling by sheep.

#### Future prospects

3.65 The impacts recorded for **4060 Alpine and Boreal heath** are presented in Table 17. Seven impacts were recorded for this habitat.

### Non-intensive cattle grazing (A04.02.01)

3.66 Although a substantial area of **4060 Alpine and Boreal heath** occurs within the Nature Reserve at Arraglen, the majority of this habitat is found on the steep upper slopes or exposed summit of Masatiompan and would be relatively unused by the Dexter cattle recently introduced to the

Nature Reserve (see paragraph 3.18). The intensity of this impact has been assessed as low and the area of **4060 Alpine and Boreal heath** affected by this impact has therefore been estimated to be 3%. As grazing is not required to maintain this habitat, the influence has been deemed neutral.

Cri	teria	Scale of	Number of	Number of	Failure
		assessment	assessments	failures	rate (%)
Veg	getation composition				
1	Number of bryophyte or non-crustose lichen species present≥3	Relevé	10	0	0
2	Cover of positive indicator species $\geq 66\%$	Relevé	10	0	0
3	Cover of dwarf shrubs $\geq 10\%$	Relevé	10	1	10.0
4	Cover of the following negative indicator species: <i>Agrostis capillaris, A. vinealis,</i> <i>Anthoxanthum odoratum, Deschampsia</i> <i>flexuosa, Festuca ovina, F. vivipara, Galium</i> <i>saxatile, Potentilla erecta</i> and <i>Poa</i> spp. (except <i>Poa alpina</i> ) collectively < 10%	Relevé	10	0	0
5	Cover of non-native species < 1%	Relevé	10	0	0
Veg	getation structure				
6	Live leaves of <i>Carex bigelowii, Deschampsia flexuosa, Festuca ovina, F. vivipara</i> showing signs of <u>grazing</u> collectively <10%	Relevé	5	2	40.0
7	Last complete growing season's shoots of ericoids and <i>Empetrum nigrum</i> showing signs of <u>browsing</u> collectively < 33%	Relevé	10	0	0
8	No signs of <u>burning</u> inside feature	Local vicinity	10	0	0
Phy	vsical structure				
9	Cover of <u>disturbed</u> bare ground < 10%	Relevé	10	1	10.0
10	Cover of <u>disturbed</u> bare ground < 10%	Local vicinity	10	1	10.0

Table 16: Monitoring criteria and failure rates for 4060 Alpine and Boreal heath (n = 10).

# Non-intensive sheep grazing (A04.02.02)

3.67 Sheep grazing occurs over most of the cSAC and is the dominant land-use (NPWS, 2009). As stated in paragraph 3.20, there was substantial destocking within the site *c*. 2002. However, during the assessment of structure and functions overgrazing was observed in 40% of **4060 Alpine and Boreal heath** monitoring stops. The intensity of this impact was assessed therefore as medium and its influence as negative. The trend was assessed as decreasing due to destocking. The level of this impact is also affected by fencing, which is assessed separately below.

# Non-intensive grazing by goats (A04.02.04)

3.68 The herd of feral goats found in the northern part of the site (see paragraph 3.23) are thought to graze at low intensity levels in the **4060 Alpine and Boreal heath** on Masatiompan; no signs of damage due to grazing or browsing were recorded at the monitoring stop that was located in

this area. The area of **4060 Alpine and Boreal heath** affected was estimated to be 20%. As grazing is not required to maintain this habitat, the impact has been assessed as neutral

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

3.69 There are many walking routes within Mount Brandon cSAC (see paragraph 3.28). Tracks have been built on some areas on the lower slopes but, at higher altitudes paths cross the surface of **4060 Alpine and Boreal heath** and walking has resulted in localised erosion and trampling within this habitat. Although the number of walkers using the site is quite high, the intensity of this impact has been assessed as low overall due to the relative resilience of the habitat. The area of **4060 Alpine and Boreal heath** affected has been estimated to be 1%.

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

Impact	Impact	Intensity	Influence	Habitat	Source	Score	Trend
code				area			
A04.02.01	Non-intensive cattle grazing	Low	Neutral	3%	Inside	0.00	Ins
A04.02.02	Non-intensive sheep grazing	Medium	Negative	100%	Inside	-3.00	Imp
A04.02.04	Non-intensive goat grazing	Low	Neutral	20%	Inside	0.00	Ins
G01.02	Walking, horseriding and non-motorized vehicles	Low	Negative	<1%	Inside	-0.25	Ins
G05.09	Fences, fencing	Medium	Positive	20%	Inside	1.00	Dis
I01	Invasive non-native species	Low	Neutral	<0.1%	Inside	0.00	Ins
L05	Landslide, collapse of terrain	High	Negative	<1%	Inside	-0.75	Ins
	Overall score					-3.00	

#### Fences, fencing (G05.09)

3.70 On Masatiompan, where a substantial area of **4060** Alpine and Boreal heath occurs, a fence marks the boundary of the statutory Nature Reserve. This is likely to relate to the stock reductions that were implemented within the Nature Reserve, with sheep being excluded for 5-6 years prior to the publication of the Conservation Statement. This stock reduction was successful, with a subsequent recovery being observed in the vegetation (NPWS, 2009). This is illustrated in Plate 2, where increased heather cover can be seen within the Nature Reserve. However, this fence is now broken down in places and is no longer stockproof. The intensity of this impact has been assessed as medium and its influence as positive, but the trend was assessed as decreasing due to the deteriorating condition of the fence.

#### Invasive non-native species (I01)

3.71 As stated in paragraph 3.30, *Campylopus introflexus* is a non-native moss species that is a mild invasive of bare peat, and can impact on heather re-establishment. The degraded peat vegetation community DP1 *Campylopus introflexus – Polytrichum* spp. was recorded from within nine polygons dominated by **4060 Alpine and Boreal heath** during vegetation mapping. However, it was not recorded as forming extensive carpets; therefore this impact was assessed as being of neutral influence.

# Landslide, collapse of terrain (L05)

- 3.72 Minor losses of this habitat were noted due to small-scale slippage.
- 3.73 The overall impacts score for **4060 Alpine and Boreal heath** has been calculated as -3.00. This is below the nominal Favourable Reference Value of zero. The combined future trend for area and structure and functions is however deemed to be improving due to the indications that the condition of this habitat is gradually improving due to destocking (see paragraph 3.6). The future prospects for this habitat were therefore assessed as Favourable.



Plate 2: 4060 Alpine and Boreal heath on the southern slope of Masatiompan, showing greater heather cover to the right of the fence (running vertically up the centre of the mountain) (Photo: Jenni Roche).

# \*6230 Species-rich *Nardus* grasslands

Area

3.74 Changes in the area of **\*6230 Species-rich** *Nardus* grasslands were examined for the period 1995 to 2011 through a combination of observations in the field and analysis of aerial photographs and satellite imagery. 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

- 3.75 Three monitoring stops were recorded within **\*6230 Species-rich** *Nardus* grasslands in Mount Brandon cSAC. In the assessment of structure and functions, two stops failed one criterion each. Following a review of the ecological condition of these stops, expert judgement determined that no changes should be made, resulting in an overall failure rate of 66.6%. The structure and functions of **\*6230 Species-rich** *Nardus* grasslands were therefore assessed as Unfavourable – Bad.
- 3.76 The small sample size of three monitoring stops reflects the relative rarity of this habitat within the site, where only 16.7 ha of **\*6230 Species-rich** *Nardus* grasslands were recorded, comprising 0.1% of the site.
- 3.77 One **\*6230 Species-rich** *Nardus* **grasslands** monitoring stop (33.3%) failed one criterion relating to vegetation composition (Table 18). Criterion 8 stipulates that the cover of scrub, bracken and heath within the stop should not exceed 5%. A cover score of 7% was recorded for bracken at the stop in question.

Cri	teria	Scale of	Number of	Number of	Failure
CII		assessment	assessments	failures	rate (%)
Ve	vetation composition	ussessment	ussessments	iunuics	Tute (70)
1	Number of high quality and general indicator species $\geq 7$	Relevé	3	0	0
2a*	UG1c/UG2c: Number of high quality species present $\geq 2$	Relevé	3	0	0
2b*	UG1e/UG2e: Number of high quality species present $\geq 1$	Relevé	0	n/a	n/a
3	Species richness $\geq 25$ species	Relevé	3	0	0
4	Cover of non-native species $\leq 10\%$	Relevé	3	0	0
5	Cover of the following negative indicator species: Arrhenatherum elatius, Bellis perennis, Cirsium arvense,	Relevé	3	0	0
	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 $\leq 10\%$				
6	Cover of the above negative indicator species collectively $\leq 20\%$	Relevé	3	0	0
7	Cover of <i>Sphagnum</i> species $\leq 10\%$ ,	Relevé	3	0	0
8	Cover of <i>Polytrichum</i> species $\leq 25\%$		3	0	0
9	Cover of scrub, bracken and heath $\leq 5\%$	Relevé	3	1	33.3
Veg	getation structure				
10	Forb component of forb : graminoid ratio 20-90%	Relevé	3	1	33.3
11	Proportion of the sward between 5-50 cm tall $\geq 25\%$	Relevé	3	0	0
12	Litter cover ≤ 20%	Relevé	3	0	0
Phy	vsical structure				
13	Cover of <u>disturbed</u> bare ground ≤ 10%	Relevé	3	0	0
14	Area of the habitat showing signs of serious <u>grazing</u> or <u>disturbance</u> < 20m <sup>2</sup>	Local vicinity	3	0	0

Table 18: Monitoring criteria and failure rates for \*6230 Species-rich Nardus grasslands (n = 3).

- 3.78 One monitoring stop failed one criterion relating to vegetation structure. Criterion 9 stipulates that the ratio of forbs to graminoids should be between 20 and 90%. A ratio of 15% was recorded at the stop in question, falling short of the threshold and failing the criterion.
- 3.79 The physical structure of **\*6230 Species-rich** *Nardus* grasslands was good, with no failures being recorded under the relevant criteria.

### Future prospects

3.80 The impacts recorded for **\*6230 Species-rich** *Nardus* **grasslands** are presented in Table 19. Three impacts were recorded for this habitat.

#### Non-intensive sheep grazing (A04.02.02)

3.81 Sheep grazing occurs over most of the cSAC and is the dominant land-use (NPWS, 2009). As stated in paragraph 3.20, there was substantial destocking within the site *c*. 2002. During the present survey sheep were observed grazing within this habitat but in the assessment of structure and functions no failures were recorded under criterion 14, which relates to overgrazing and disturbance in the local vicinity. The intensity of grazing was assessed as medium and its influence as positive.

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

Impact	Impact	Intensity	Influence	Habitat	Source	Score	Trend
code				area			
A04.02.02	Non-intensive sheep grazing	Medium	Positive	100%	Inside	1.50	Ins
A04.02.03	Non-intensive horse grazing	Low	Neutral	<0.1%	Inside	0.00	Ins
I02	Problematic native species	Low	Negative	33%	Inside	-0.75	Ins
	Overall score					0.75	

#### Non-intensive horses grazing (A04.02.03)

3.82 Horse dung was observed in **\*6230 Species-rich** *Nardus* grasslands to the southeast of Clogharee Lough and two horses were observed grazing nearby. Due to the small area affected and the low intensity of grazing this impact was deemed insignificant and recorded as a neutral influence.

#### Problematic native species (I02)

- 3.83 As stated in paragraph 3.77, the occurrence of bracken (*Pteridium aquilinum*) was problematic at one of the monitoring stops. There is insufficient data determine the trend of this impact, i.e. if bracken encroachment is an issue.
- 3.84 The overall impacts score for **\*6230 Species-rich** *Nardus* grasslands in Mount Brandon cSAC was calculated as 0.75 which is above the nominal Favourable Reference Value of zero. Although there is insufficient data to determine a trend for structure and functions the trend for area appears stable. The future prospects for this habitat were therefore assessed as Favourable.

#### \*7130/7130 Blanket bog

#### Area

3.85 Changes in the area of **\*7130/7130 Blanket bog** were recorded for the period 1995 to 2011 through a combination of observations in the field and analysis of aerial photographs and satellite imagery (Table 20). 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. Erosion has unquestionably resulted in loss of habitat, but due to the gradual and diffuse nature of this impact it was impractical to measure the area lost. Even when including the loss due to erosion it is estimated that the overall change in habitat area was a loss of less than 1% per year resulting in a status of Unfavourable – Inadequate. These impacts and trends are discussed later under future prospects.

Impact code	Impact	Area (ha) 1995-2000	Area (ha) 2000-2005	Area (ha) 2005-2011	Area (ha) 1995-2011
B01.02	Artificial planting on open ground (non-native trees)	0.31	1.70	0.00	2.02
C01.03.01	Turf cutting	0.06	0.61	0.04	0.71
D01.01	Paths, tracks, cycling tracks	0.01	0.13	0.14	0.28
J01.01	Burning down	0.00	0.09	0.00	0.09
J02.07	Excavation	0.00	< 0.01	< 0.01	< 0.01
K01.01	Erosion	n.m.	n.m.	n.m.	n.m.
L05	Collapse of terrain, landslide	0.00	0.04	0.45	0.49
All impacts		0.38	2.59	0.64	3.60
% of habitat		0.02	0.14	0.03	0.19
% loss per year		0.00	0.03	0.01	0.01

Table 20: Impacts causing obvious losse	s in area of *7130/71	30 Blanket bog	, 1995-2011.
n.m. indica	tes not measured.		

#### Structure and functions

- 3.86 A total of 18 monitoring stops were recorded within \*7130/7130 Blanket bog in Mount Brandon cSAC. All of these stops were located within \*7130 Active blanket bog rather than 7130 Inactive blanket bog. In the assessment of structure and functions, ten stops failed one criterion or more. Following a review of the ecological condition of these stops, expert judgement determined that no changes should be made, resulting in an overall failure rate of 55.6%. The structure and functions of \*7130/7130 Blanket bog 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 6.1%, which provides further support for the Unfavourable Bad assessment result.
- 3.87 The vegetation composition of **\*7130/7130 Blanket bog** was poor in some cases, with four stops (22.2%) failing one particular criterion (Table 21); the cover of *Calluna vulgaris* was excessive at

three of these stops and the cover of *Trichophorum germanicum* at one. The three stops with excessive *C. vulgaris* cover also failed criterion 15, which relates to peat erosion. This suggests that peat erosion and the resultant drainage of blanket bogs favour *C. vulgaris* and can cause the species to become overly dominant. One stop (5.6%) exhibited inadequate coverage of bryophytes and lichens.

Crit	eria	Scale of	Number of	Number	Failure
		assessment	assessments	of failures	rate (%)
Veg	etation composition				
1	Number of positive indicator species present $\geq$ 7	Relevé	18	0	0
2	Cover of bryophyte or lichen species, excluding Sphagnum fallax $\geq 10\%$	Relevé	18	1	5.6
3	Cover of <u>each</u> of the following species: <i>Calluna</i> vulgaris, Eleocharis multicaulis, Eriophorum vaginatum, Molinia caerulea, Schoenus nigricans, Trichophorum germanicum individually < 75%	Relevé	18	4	22.2
4	Cover of the following negative indicator species: Agrostis capillaris, Holcus lanatus, Phragmites australis, Pteridium aquilinum, Ranunculus repens collectively <1%	Relevé	18	0	0
5	Cover of non-native species < 1%	Relevé	18	0	0
6	Cover of non-native species < 1%	Local vicinity	18	0	0
7	Cover of scattered native trees and scrub < 10%	Local vicinity	18	0	0
Veg	etation structure	-			
8	Crushed, broken and/or pulled up <i>Sphagnum</i> species < 10% of <i>Sphagnum</i> cover	Relevé	18	1	5.6
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	17	0	0
10	No signs of <u>burning</u> into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Local vicinity	18	1	5.6
11	No signs of <u>burning</u> inside boundaries of sensitive areas*	Local vicinity	18	2	11.1
Phy	sical structure	5			
12	Cover of <u>disturbed</u> bare ground < 10%	Relevé	18	4	22.2
13	Cover of <u>disturbed</u> bare ground < 10%	Local vicinity	18	4	22.2
14	Area showing signs of <u>drainage</u> resulting from heavy trampling or tracking or ditches or peat cutting < 10%	Local vicinity	18	2	11.1
15	Cover of <u>erosion</u> gullies and eroded areas within the greater bog mosaic < 5%	Local vicinity	18	6	33.3

Table 21: Monitoring criteria and failure rates for 7130/7130 Blanket bog (n = 18).

\*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.

- 3.88 The vegetation structure of **\*7130/7130 Blanket bog** was also poor in some cases. The main issue in this respect was burning, with burning in sensitive areas being recorded at 11.1% of stops and burning into the bryophyte or lichen layer or peat exposure due to burning being recorded at 5.6% of stops. Excessive levels of disturbance were apparent in the *Sphagnum* layer at one stop (5.6%). No failures were recorded at the monitoring stops where it was possible to assess criterion 12, which relates to the level of browsing on *Calluna vulgaris*.
- 3.89 The physical structure of **\*7130/7130 Blanket bog** was particularly poor within Mount Brandon cSAC. Peat erosion was the most significant impact, with 33.3% of stops failing due to high coverage of erosion gullies and eroded areas within the local vicinity. Furthermore, 22.2% of stops failed due to high coverage of disturbed bare ground, both within the stop and in the local vicinity. Turf cutting was also an issue. Two stops (11.1%), which were both located on cutover bog, failed due to high levels of drainage.

### Future prospects

3.90 The impacts recorded for **\*7130/7130 Blanket bog** are presented in Table 22. Thirteen active impacts were recorded for this habitat.

		data.					
Impact	Impact	Intensity	Influence	Habitat	Source	Score	Trend
code				area			
A04.02.01	Non-intensive cattle grazing	Low	Negative	5%	Inside	-0.50	Ins
A04.02.02	Non-intensive sheep grazing	Medium	Negative	100%	Inside	-3.00	Imp
A04.02.04	Non-intensive goat grazing	Low	Neutral	3%	Inside	0.00	Ins
B01.02	Artificial planting on open	High	Negative	<1%	Inside	-0.75	Ins
	ground (non-native trees)						
C01.03.01	Hand cutting of peat	High	Negative	3%	Inside	-1.50	Ins
D01.01	Paths, tracks, cycling tracks	High	Negative	<1%	Inside	-0.75	Ins
G01.02	Walking, horseriding and non-	Medium	Negative	<1%	Inside	-0.50	Ins
C01 02 02		Maltan	Number	<10/	T 1.	0.50	<b>T</b>
G01.03.02	Off-road motorised driving	Medium	Negative	<1%	Inside	-0.50	Ins
I01	Invasive non-native species	Low	Neutral	0.1%	Inside	0.00	Ins
J01.01	Burning down	High	Negative	<1%	Inside	-0.75	Ins
J02.07	Water abstractions from	High	Negative	<1%	Inside	-0.75	Ins
	groundwater						
K01.01	Erosion	High	Negative	12%	Inside	-1.50	Ins
L05	Collapse of terrain, landslide	High	Negative	<1%	Inside	-0.75	Ins
	Overall score					-11.25	

Table 22: Assessment of impacts for \*7130/7130 Blanket bog. Under trend, Imp = Improving, Ins = Insufficient

# Non-intensive grazing by cattle (A04.02.01)

3.91 Dexter cattle have recently been introduced to the Nature Reserve at Arraglen as part of a grazing trial (see paragraph 3.18) which contains some areas of **\*7130/7130 Blanket bog** that are already in poor condition. Low intensity cattle grazing was also recorded within one polygon dominated by **\*7130/7130 Blanket bog** in the valley of the Owenmore River. The effects of the

grazing trial have yet to be determined but, given the fragile nature of **\*7130/7130 Blanket bog**, its vulnerability to grazing impacts and the fact that **\*7130/7130 Blanket bog** within the Nature Reserve has only recently recovered from overgrazing by sheep (see below), the influence of this impact has been assessed as negative. The area of **\*7130/7130 Blanket bog** affected has been estimated to be 5%.

# Non-intensive grazing by sheep (A04.02.02)

- 3.92 Sheep grazing occurs over most of the cSAC and is the dominant land-use. Some areas of **\*7130/7130 Blanket bog** have been extensively damaged by overgrazing. Bare peat and poaching are common features. Many areas of deep peat, previously greater than 2 m in some places, have been eroded down to bedrock. The damage appears to be caused initially by overgrazing and trampling by sheep and is exacerbated by erosion and further trampling (NPWS, 2009).
- 3.93 The Mount Brandon cSAC Conservation Statement (NPWS, 2009) stated that, to maintain and improve the ecological status of **\*7130/7130 Blanket bog**, a reduction of grazing pressure will be necessary in some areas. In addition to the destocking of commonages, stock reductions were implemented within the state-owned Nature Reserve, with sheep being excluded for 5-6 years prior to the publication of the Conservation Statement. In response to this much of the bog vegetation made a recovery. However, the Conservation Statement stated that it was unlikely that the most severely damaged areas of **\*7130/7130 Blanket bog** would recover completely within the medium term.
- 3.94 During the present survey, overgrazing by sheep was found to be an ongoing problem in parts of the site. Although excessive browsing was not recorded within any of the monitoring stops during the assessment of structure and functions, damage due to overgrazing and trampling was observed within **\*7130/7130 Blanket bog** in several polygons. The intensity of this impact was assessed as medium overall and its influence as negative, although due to destocking levels implemented under the CFP the trend was assessed as improving.

### Non-intensive goats grazing (A04.02.04)

3.95 The herd of feral goats found in the northern part of the site (see paragraph 3.23) are likely to exert only a low intensity impact on **\*7130/7130 Blanket bog** in this area. Due to the small area affected and the low intensity of grazing this impact was deemed insignificant and recorded as a neutral influence.

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

3.96 There has been a loss of approximately 2.0 ha of **\*7130/7130 Blanket bog** habitat due to afforestation at Lisnamovaun to the east of the Owenmore River and also nearby at Glanshancuirp.

# Hand cutting of peat (C01.03.01)

3.97 Both active and old revegetating cutover areas were recorded in numerous polygons. Hand cutting of peat is ongoing in four main areas: Baile na hAbha to the south of Beennaman, near Slieveglass to the south of Sauce Creek, the Owenmore River valley to the southeast of

Cloghane and Ballyhoneen at the northern foot of Slievenagower. There has been some loss of habitat due this impact.

# Mechanical removal of peat (C01.03.02)

3.98 The Mount Brandon cSAC Conservation Statement (NPWS, 2009) stated that mechanised turf cutting has caused drainage of, and damage to, some areas of **\*7130/7130 Blanket bog**. However, no evidence of recent mechanised turf cutting was observed by survey, therefore it appears that this impact has ceased and it is thus omitted from Table 22.

### Paths, tracks, cycling tracks (D01.01)

3.99 There has been minor losses of habitat due to the construction/improvement of farm tracks at several locations: along the top of the spur at Maumagarrane in the southeast of the site, across the saddle between Glin North and Mullaghveal in the west, within a stream valley at Cappateige in the north, and close to the road in the Connor Pass.

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

3.100 There are many walking routes within Mount Brandon cSAC (see paragraph 3.28). Tracks have been built on some areas on the lower slopes but elsewhere, however, paths cross the surface of **\*7130/7130 Blanket bog** and walking has resulted in localised erosion and trampling within this habitat. The intensity of this negative impact has been assessed as medium overall, due to the relatively high numbers of walkers using the site and the sensitive nature of the habitat. The area of **\*7130/7130 Blanket bog** affected has been estimated to be less than 1%, due to the localised nature of this impact.

# Off-road motorised driving (G01.03.02)

3.101 Quad bike tracks were noted within this habitat at several locations, on An Buaicín, at Lisnamovaun and above the head of Glennahoo, with damage to the vegetation being apparent on An Buaicín in particular. The intensity of this negative impact has been assessed as medium overall and the area of **\*7130/7130 Blanket bog** affected has been estimated to be less than 1%, due to its localised nature.

### Invasive non-native species (I01)

3.102 As stated in paragraph 3.30, *Campylopus introflexus* is a non-native moss species that is a mild invasive of bare peat, and can impact on heather re-establishment. The degraded peat vegetation community DP1 *Campylopus introflexus – Polytrichum* spp. was recorded from within 47 polygons dominated by **\*7130/7130 Blanket bog** during vegetation mapping. However, it was not recorded as forming extensive carpets; therefore this impact was assessed as being of neutral influence.

### Burning down (J01.01)

3.103 The Mount Brandon cSAC Conservation Statement (NPWS, 2009) stated that the **\*7130 Active blanket bog** within the site appeared to be in reasonable condition but its structure had been damaged to some extent by burning. It described burning as a widely-used management tool and acknowledged that burning needed to be controlled. Despite this, burning is an ongoing

issue within Mount Brandon cSAC and evidence of burning was noted at numerous locations during the present survey. The intensity of this impact was assessed as high and its influence as negative. The area of **\*7130/7130 Blanket bog** affected by burning within the last few years was estimated to be less than 1%.

### Water abstractions from groundwater (J02.07)

3.104 There has been some minor loss of habitat due to drainage, with associated impacts on surrounding bog.

### Erosion (K01.01)

3.105 The Mount Brandon cSAC Conservation Statement (NPWS, 2009) stated that the **\*7130 Active blanket bog** within the site appeared to be in reasonable condition, but its structure had been damaged to some extent by erosion. The Conservation Statement suggested that damage was initially caused by overgrazing and trampling by sheep and then exacerbated by weathering and further trampling. Hence, this impact has been partially discussed under non-intensive grazing by sheep (A04.02.02) and walking (G01.02).



Plate 3: PB5 Eroding blanket bog southwest of Beenoskee (Photo: Jenni Roche).

3.106 This survey has found that erosion of blanket peat is a major issue for several areas of **\*7130/7130 Blanket bog** within the site. The assessment of structure and functions recorded unfavourably high levels of erosion in **PB2 Upland blanket bog** on Cnoc Mhaoilionáin, Slievanea and Fallaghnamara and particularly around Slieveglass. Severe hagging was also

recorded during vegetation mapping on Binn an Tuair, Slievenalecka, Slievenagower and on the southwestern slopes of Beenoskee (Plate 3). Bare peat recorded as **PB5 Eroding blanket bog** covers 56.0 ha of the site, whilst **7130 Inactive blanket bog**, which represents eroded areas currently stabilised by *Eriophorum angustifolium*, covers a further 62.8 ha. There has inevitably been some loss of **\*7130/7130 Blanket bog** habitat since 1995, but most areas of eroding bog were already showing their current patternation of damage by this time.

3.107 Due to CFP destocking the number of sheep on this site has declined in recent years. However, once exposed by removal of the vegetation, areas of bare peat may continue to erode due to severe climatic conditions regardless of manipulation of grazing levels; the mean annual rainfall for this area was within the range of 2000-2800 mm per year for 1961-1990 (Met Éireann, 2011). Therefore, unless restoration measures are undertaken in badly eroded areas of **\*7130/7130 Blanket bog**, erosion is likely to continue. It was assessed that there is insufficient data to determine the trend for this impact. Approximately 12% of the area of **\*7130/7130 Blanket bog** is estimated to be under threat from erosion; this is the proportion of the habitat occurring in polygons with at least 5% PB5 Eroding blanket bog.

### Collapse of terrain, landslide (L05)

- 3.108 There appears to have been some minor losses of this habitat due to localised slippage at Maumagarrane in the southeast of the site
- 3.109 The overall impacts score for **\*7130/7130 Blanket bog** has been calculated as -11.25. This is significantly below the nominal Favourable Reference Value of zero. Whilst there are signs that the implemented destocking levels have resulted in localised decreased damage levels within this habitat (see paragraph 3.6), 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 erosion in the absence of restoration measures. 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

3.110 Changes in the area of **7140 Transition mires** were examined for the period 1995 to 2011 through a combination of observations in the field and analysis of aerial photographs and satellite imagery. 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

3.111 Two monitoring stops were recorded within **7140 Transition mires** in Mount Brandon cSAC. In the assessment of structure and functions, one stop failed one criterion (Table 23). Criterion 4 stipulates that the cover of certain negative indicator species should be less than 1%; a cover of 1% *Anthoxanthum odoratum* was recorded at the stop. Following a review of the ecological condition of that stop, expert judgement determined that it should pass because the failure was very marginal. As a result, all stops passed and the structure and functions of **7140 Transition mires** were assessed as Favourable.

Crit	eria	Scale of	Number of	Number of	Failure
		assessment	assessments	failures	rate (%)
Veg	etation composition				
1a	PO1a: number of positive indicator species from Groups i or ii present $\geq 3$	Relevé	2	0	0
1b	PFLU5: number of positive indicator species from Groups i or ii present $\geq 3$	Relevé	0	n/a	n/a
1c	RFEN1b: number of positive indicator species from Groups i or ii present≥6	Relevé	0	n/a	n/a
2	Number of species from Group i present $\geq 1$	Relevé	2	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	2	0	0
4	Cover of the following species: <i>Anthoxanthum</i> <i>odoratum, Epilobium hirsutum, Holcus lanatus</i> collectively < 1%	Relevé	2	1	50.0
5	Cover of non-native species < 1%	Relevé	2	0	0
Veg	etation structure				
6	*PFLU5/RFEN1: ≥ 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	1	0	0
Phys	sical structure				
7	Cover of disturbed bare ground < 10%	Relevé	2	0	0
8	Cover of <u>disturbed</u> bare ground < 10%	Local vicinity	2	0	0
9	Area showing signs of <u>drainage</u> resulting from heavy trampling or tracking or ditches or peat cutting < 10%	Local vicinity	2	0	0

Table 23: Monitoring criteria and failure rates for 7140 Transition mires (n = 2).

3.112 The small sample size of two monitoring stops reflects the relative rarity of this habitat within Mount Brandon cSAC, where only 1.8 ha of **7140 Transition mires** were recorded, comprising 0.01% of the site. The sample size is therefore likely to be adequate.

Future prospects

# Non-intensive grazing by sheep (A04.02.02)

3.113 The only impact recorded for this habitat was sheep grazing which occurs over most of the cSAC and is the dominant land-use on the site (NPWS, 2009). In the assessment of structure and functions, no failures were recorded under criteria 7 and 8, which relate to disturbance, but a low cover of disturbed bare ground (1%) was recorded at one monitoring stop. This is likely

to be due to trampling by sheep. Due to the low intensity of this impact it was assessed as insignificant and its influence assessed as neutral (Table 24).

Table 24. Assessment of impacts for 7140 fransition innes.								
Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend	
A04.02.02	Non-intensive sheep grazing	Low	Neutral	100%	Inside	0	None	
	Overall score					0		

Table 24: Assessment of impacts for 7140 Transition mires.

3.114 The overall impacts score for **7140 Transition mires** was calculated as zero which is equal to the nominal Favourable Reference Value. The combined future trend for area and structure and functions was deemed to be no change. The future prospects for this habitat were therefore assessed as Favourable.

# 7150 Rhynchosporion depressions

Area

3.115 Changes in the area of **7150** *Rhynchosporion* **depressions** were examined for the period 1995 to 2011 through a combination of observations in the field and analysis of aerial photographs and satellite imagery. 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

- 3.116 Two monitoring stops were recorded within **7150** *Rhynchosporion* **depressions** in Mount Brandon cSAC. In the assessment of structure and functions, one stop failed two criteria. Following a review of the ecological condition of this stop, expert judgement determined that no changes should be made, resulting in an overall failure rate of 50.0% (Table 25).
- 3.117 The small sample size of two monitoring stops reflects the relative rarity of this habitat within Mount Brandon cSAC, where only 3.2 ha of **7150** *Rhynchosporion* **depressions** were recorded, comprising 0.02% of the site. Although the overall failure rate for **7150** *Rhynchosporion* **depressions** was 50.0%, expert judgement would suggest that that the structure and functions of this habitat should be assessed as Unfavourable Inadequate rather than Unfavourable Bad due to the sample size.
- 3.118 The vegetation composition and vegetation structure of **7150** *Rhynchosporion* **depressions** were good, with no failures being recorded under the relevant criteria.
- 3.119 One stop (50.0%) exhibited poor physical structure. Criteria 11 and 12 stipulate that the cover of disturbed bare ground should be less than 10% within the stop and the local vicinity respectively. A result of 20% was recorded for both criteria at the stop in question. This disturbance may be due to trampling by sheep.

Crit	eria	Scale of	Number of	Number of	Failure
		assessment	assessments	failures	rate (%)
Veg	etation composition				
1	Number of positive indicator species present $\ge 5$	Relevé	2	0	0
2	Cover of <i>Rhynchospora</i> species $\geq 10\%$	Relevé	2	0	0
3	Cover of <u>each</u> of the following species: <i>Eleocharis</i> multicaulis, Molinia caerulea, Schoenus nigricans, Trichophorum germanicum individually < 75%	Relevé	2	0	0
4	Cover of the following negative indicator species: Agrostis capillaris, Holcus lanatus, Phragmites australis, Pteridium aquilinum, Ranunculus repens collectively < 1%	Relevé	2	0	0
5	Cover of non-native species < 1%	Relevé	2	0	0
6	Cover of scattered native trees and scrub < 10%	Local vicinity	2	0	0
Veg	etation structure				
7	Crushed, broken and/or pulled up <i>Sphagnum</i> species < 10% of <i>Sphagnum</i> cover	Relevé	2	0	0
8	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	2	0	0
9	No signs of <u>burning</u> into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Local vicinity	2	0	0
10	No signs of <u>burning</u> inside boundaries of sensitive areas	Local vicinity	2	0	0
Phy	sical structure				
11	Cover of <u>disturbed</u> bare ground < 10%	Relevé	2	1	50.0
12	Cover of <u>disturbed</u> bare ground < 10%	Local vicinity	2	1	50.0
13	Area showing signs of <u>drainage</u> resulting from heavy trampling or tracking or ditches or peat cutting < 10%	Local vicinity	2	0	0
14	Cover of <u>erosion</u> gullies and eroded areas within the greater bog mosaic < 5%	Local vicinity	2	0	0

# Table 25: Monitoring criteria and failure rates for 7150 *Rhynchosporion* depressions (n = 2).

\*Sensitive areas

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

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

(c) Areas within 50 m of functioning drains.

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

### Future prospects

### Non-intensive grazing by sheep (A04.02.02)

3.120 The only impact recorded for this habitat was sheep grazing which occurs over most of the cSAC and is the dominant land-use (NPWS, 2009). In the assessment of structure and functions, although no unfavourably high levels of grazing were observed at the two **7150** *Rhynchosporion* **depressions** monitoring stops, excessive cover of disturbed bare ground was observed within and in the local vicinity of one stop. This disturbance is likely to be due to trampling by sheep. The intensity of the impact was assessed as medium and its influence as negative. As stated in paragraph 3.20, there was substantial destocking within the site *c*. 2002, therefore the trend has been assessed as improving (Table 26).

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Medium	Negative	100%	Inside	-3.00	Imp
	Overall score					-3.00	

Table 26: Assessment of impacts for 7150 Rhynchosporion depressions. Under trend, Imp = Improving

3.121 The overall impacts score for **7150** *Rhynchosporion* **depressions** was calculated as -3.0 which is below to the nominal Favourable Reference Value of zero, but the combined future trend for area and structure and functions was deemed to be improving due to levels of destocking. The future prospects for this habitat were therefore assessed as Favourable.

### 7230 Alkaline fens

Area

3.122 Changes in the area of **7230** Alkaline fens were examined for the period 1995 to 2011 through a combination of observations in the field and analysis of aerial photographs and satellite imagery. Less obvious changes from one habitat type to another cannot be reliably identified by this process. There is some suggestion that widening of the walking track up the western side of Brandon Mountain may have impacted on alkaline flushes, but this was not assessed as significant. As the area of this habitat appears to be stable the area status was assessed as Favourable.

### Structure and functions

- 3.123 Two monitoring stops were recorded within **7230** Alkaline fens in Mount Brandon cSAC. In the assessment of structure and functions, one stop failed one criterion. Following a review of the ecological condition of this stop, expert judgement determined that no changes should be made, resulting in an overall failure rate of 50.0% (Table 27).
- 3.124 The small sample size of two monitoring stops reflects the relative rarity of this habitat within Mount Brandon cSAC, where only 3.2 ha of **7230 Alkaline fens** were recorded, comprising 0.02% of the site. Although the overall failure rate for **7230 Alkaline fens** was 50.0%, expert judgement would suggest that that the structure and functions of this habitat should be assessed as Unfavourable Inadequate rather than Unfavourable Bad due to the sample size.
- 3.125 The vegetation composition and vegetation structure of **7230 Alkaline fens** were found to be Favourable, with no failures being recorded under the relevant criteria.
- 3.126 The physical structure of one stop was found to be poor. Criterion 10 stipulates that the cover of disturbed bare ground should be less than 10% within the local vicinity of the stop; a result of 15% was recorded for this criterion.

Table 27: Monitoring	criteria and	failure rates	for 7230	Alkaline	fens $(n = 2)$ .
rabie = / filoratoring	criteria arte	runure ruces	101 / 200		<b></b>

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

### Future prospects

# Non-intensive grazing by sheep (A04.02.02)

3.127 The only impact recorded for this habitat was sheep grazing which occurs over most of the cSAC and is the dominant land-use (NPWS, 2009). During the assessment of structure and functions there was some trampling in this habitat recorded, probably by sheep. The trend has been assessed as improving due to implemented levels of destocking (Table 28).

Table 28: Assessment of impacts for 7230 Alkaline fens. Under trend, Imp = Improving.

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Medium	Negative	100%	Inside	-1.50	Imp
	Overall score					-1.5	

3.128 The overall impacts score for **7230 Alkaline fens** was calculated as -1.5 which is below the nominal Favourable Reference Value of zero, but the combined future trend for area and structure and functions was deemed to be improving due to implemented levels of destocking. The future prospects for this habitat were therefore assessed as Favourable.

#### 8110 Siliceous scree

Area

3.129 Changes in the area of **8110 Siliceous scree** were examined for the period 1995 to 2011 through a combination of observations in the field and analysis of aerial photographs and satellite imagery. 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

3.130 Eight monitoring stops were recorded within 8110 Siliceous scree in Mount Brandon cSAC. In the assessment of structure and functions (Table 29), two 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 25.0%. The structure and functions of 8110 Siliceous scree were therefore assessed as Unfavourable – Inadequate.

	Table 29: Monitoring criteria and failure f	ates for of 10 Since	eous scree (n = 8)		
Cri	teria	Scale of	Number of	Number of	Failure
		assessment	assessments	failures	rate (%)
Veg	getation composition				
1	Cover of bryophyte or non-crustose lichen species ≥ 5%	Relevé	8	1	12.5
2	Proportion of vegetation compose 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	8	0	0
3	Proportion of vegetation composed of non-native species < 1%	Relevé	8	0	0
4	Block scree: number of positive indicator species for 8220 present $\geq 1$	Local vicinity	5	0	0
5	Cover of grass species and dwarf shrubs collectively < 20%	Local vicinity	8	1	12.5
6	Cover of <i>Pteridium aquilinum,</i> native trees and scrub collectively < 25%	Local vicinity	8	0	0
Veg	getation structure				
7	Live leaves of forbs and shoots of dwarf shrubs showing signs of <u>grazing</u> or <u>browsing</u> collectively < 50%	Relevé	7	0	0
Phy	vsical structure				
8	Ground cover of <u>disturbed</u> by human & animal paths, scree running, vehicles < 10%	Relevé	8	0	0
9	Ground cover of <u>disturbed</u> by human & animal paths, scree running, vehicles < 10%	Local vicinity	8	0	0

Table 29: Monitoring criteria and failure rates for 8110 Siliceous scree (n = 8).

3.131 Two stops (25.0%) were found to have poor vegetation composition, with each stop failing a different criterion. Criterion 1 stipulates that the cover of bryophytes and non-crustose lichens within the stop should be at least 5%. Only 3% cover was recorded at one stop (12.5%), which

in addition contained no vascular plant species. This low level of vegetation cover is unlikely to be due to overgrazing, as the stop was recorded in block scree composed of very large boulders and was inaccessible to grazing animals.

- 3.132 Criterion 5 stipulates that the cover of grasses and dwarf shrubs in the local vicinity of the stop should be less than 10%; 37% cover was recorded at one stop (12.5%). Part of the scree slope where the stop was recorded was heathy in nature, with a high coverage of dwarf shrubs, which suggests either that it was a somewhat transitional example of **8110 Siliceous scree** or that there is encroachment of the Annex I habitat **4030 Dry heath** onto **8110 Siliceous scree**. Continued monitoring will be necessary to determine this.
- 3.133 The vegetation structure and physical structure of **8110 Siliceous scree** within Mount Brandon cSAC were found to be good, with no failures being recorded under the relevant stops.

# Future prospects

### Non-intensive grazing by sheep (A04.02.02)

3.134 This was the only impact recorded for this habitat. Although many areas of **8110 Siliceous scree** within Mount Brandon cSAC were not readily accessible to grazing animals due to steep topography and rough terrain, non-intensive grazing by sheep was recorded in some areas (Table 30). In the assessment of structure and functions, no failures were recorded due to this impact which was deemed to be insignificant and its influence assessed as neutral.

Impact code	Impact	Intensity	Influence	Habitat area	Source	Score	Trend
A04.02.02	Non-intensive sheep grazing	Low	Neutral	25%	Inside	0	None
	Overall score					0	
						-	

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

### 8120 Calcareous scree

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

### 8210 Calcareous rocky slopes

Area

3.137 Changes in the area of **8210 Calcareous rocky slopes** were examined for the period 1995 to 2011 through a combination of observations in the field and analysis of aerial photographs and

satellite imagery. 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

3.138 A single monitoring stop was recorded within **8210 Calcareous rocky slopes** in Mount Brandon cSAC and this stop did not fail any criteria (Table 31). The structure and functions of **8210 Calcareous rocky slopes** were therefore assessed as Favourable. The sample size reflects the rarity of this habitat within Mount Brandon cSAC, where only 0.8 ha of **8210 Calcareous rocky slopes** were recorded, comprising 0.006% of the site.

Table 31: Monitoring criteria and failure rates for 8210 Calcareous rocky slopes (n = 1).

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

#### Future prospects

#### 8220 Siliceous rocky slopes

Area

3.140 Changes in the area of **8220 Siliceous rocky slopes** were examined for the period 1995 to 2011 through a combination of observations in the field and analysis of aerial photographs and satellite imagery. 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.

<sup>3.139</sup> No impacts (Threats, Pressures and Activities code X of Ssymank, 2009) were recorded within **8210 Calcareous rocky slopes** in Mount Brandon cSAC. The future prospects of this habitat were therefore assessed as Favourable.

#### Structure and functions

3.141 Eight monitoring stops were recorded within 8220 Siliceous rocky slopes in Mount Brandon cSAC. No monitoring stops failed any of the criteria (Table 32). The structure and functions of 8220 Siliceous rocky slopes were therefore assessed as Favourable.

Table 32: Monitoring criteria and failure rates for 8220 Siliceous rocky	slop	pes (	n = 8	3).
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Criteria		Scale of assessment	Number of assessments	Number of failures	Failure rate (%)		
Veg	Vegetation composition						
1	Number of positive indicator species present $\geq 1$	Local vicinity	8	0	0		
2	Proportion of vegetation composed of non- native species < 1%	Local vicinity	8	0	0		
3	Cover of <i>Pteridium aquilinum</i> , native trees and scrub collectively < 25%	Local vicinity	8	0	0		
Vegetation structure							
4	Live leaves of forbs and shoots of dwarf shrubs showing signs of <u>grazing</u> or <u>browsing</u> collectively < 50%	Local vicinity	8	0	0		

### Future prospects

3.142 No threats, pressures or activities were recorded for **8220 Siliceous rocky slopes** in Mount Brandon cSAC. The future prospects of this habitat were therefore assessed as Favourable.

#### Summary of conservation assessment

- 3.143 The summary results for the conservation assessment of Annex I habitats in Mount Brandon cSAC are presented in Table 33. Of the twelve habitats assessed, four habitats were assessed as Favourable, three as Unfavourable Inadequate and five as Unfavourable Bad. The most frequent Annex I habitats within the site, 4010 Wet heath, 4030, Dry heath, 4060 Alpine and Boreal heath and \*7130/7130 Blanket bog, were all assessed as Unfavourable Bad.
- 3.144 Generally, habitats performed well in the area assessments with no major losses of habitat being readily apparent. There is clearly a general trend for heath and peatland habitats to perform poorly in the assessments of structure and functions, while rocky habitats perform better. Habitats tended to perform better under future prospects than under structure and function as it is expected that habitats will gradually recover as stock numbers have been reduced from previously higher levels.

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Annex I	Habitat	Area	Structure and	Future	Overall
code			functions	prospects	assessment
4010	Wet heath	Unfavourable	Unfavourable	Unfavourable	Unfavourable
		- Inadequate	- Bad	- Inadequate	- Bad
4030	Dry heath	Unfavourable	Unfavourable	Unfavourable	Unfavourable
		- Inadequate	- Bad	- Inadequate	- Bad
4060	Alpine and Boreal heath	Favourable	Unfavourable	Favourable	Unfavourable
			- Bad		- Bad
*6230	Species-rich Nardus grasslands	Favourable	Unfavourable	Favourable	Unfavourable
			- Bad		- Bad
*7130/7130	Blanket bog	Unfavourable	Unfavourable	Unfavourable	Unfavourable
		- Inadequate	- Bad	- Bad	- Bad
7140	Transition mires	Favourable	Favourable	Favourable	Favourable
7150	Rhynchosporion depressions	Favourable	Unfavourable	Favourable	Unfavourable
			- Inadequate		- Inadequate
7230	Alkaline fens	Favourable	Unfavourable	Favourable	Unfavourable
			- Inadequate		- Inadequate
8110	Siliceous scree	Favourable	Unfavourable	Favourable	Unfavourable
			- Inadequate		- Inadequate
8120	Calcareous scree	Favourable	Favourable	Favourable	Favourable
8210	Calcareous rocky slopes	Favourable	Favourable	Favourable	Favourable
8220	Siliceous rocky slopes	Favourable	Favourable	Favourable	Favourable

Table 33: Summary of conservation status assessments for Annex I habitats in Mount Brandon cSAC.

# **4.** DISCUSSION

# Natura 2000 Standard Data Form

- 4.1 Fourteen Annex I habitats were recorded in the cSAC that are currently not listed for the site on the Natura 2000 Standard Data Form, habitats 3110, 3160, 3260, 4030, 6150, \*6230, 6430, 7140, 7150, 7230, 8110, 8120, 8330 and 91A0. Lough Anascaul, Lough Adoon and several of the lakes in the Owenmore valley are 3110 Lowland oligotrophic lakes. 4030 Dry heath is common throughout the site and accounts for 13.3% of the site. An excellent patch of 7140 Transition mires occurs on the upland bog at Coumanare and there are small areas of 7150 *Rhynchosporion* depressions, for example, in the Owenmore valley. There are substantial areas of 8110 Siliceous scree in many of the valleys and corries, but areas referable to habitat 8120 Calcareous scree are much smaller. \*6230 Species-rich Nardus grasslands occurs near Lough Anascaul and Lough Adoon, near the river at Maghanaboe and on the lower western slopes of Masatiompan. On the summit of Brandon Mountain and near Piaras Mór are areas with arcticalpines referable to 6150 Siliceous alpine and boreal grasslands. The upland ledge aspects of 6430 Hydrophilous tall herb communities were recorded from several corrie walls. There are only small areas of 3160 Dystrophic lakes, 3260 Floating river vegetation, 8330 Sea caves and 91A0 Old oak woodlands.
- 4.2 The current version of the Natura 2000 Standard Data Form for this site estimates the area of **4010 Wet heath** to be 14% of the site whereas this survey has estimated it to be substantially higher at 28.3%. Similarly, the area of **4060 Alpine and Boreal heath** is estimated on the Form to be 1% but this survey found it to be 3.6%. The area of **8210 Calcareous rocky slopes** currently on the Form (2% of the site) appears to be a substantial overestimate, although the area of this habitat is very difficult to assess as it occurs in mosaic on corrie walls with **8220 Siliceous rocky slopes**.
- 4.3 The Natura 2000 Standard Data Form for this site should be reviewed and updated in light of the data presented in this report in terms of the habitats listed, areas and ratings. It is <u>obligatory</u> that all Annex I habitats within an SAC are listed on this Form even if they are subsequently ranked as having a non-significant presence.

# Additional recommendations

- 4.4 Whilst a Conservation Statement exists for Mount Brandon cSAC, a Conservation Plan is required which should utilise the information provided by this report. Management objectives in the plan need to address the impacts highlighted in this report if progress is to be made towards attaining Favourable status for the Annex I habitats. The three major impacts / activities are livestock grazing, burning and peat erosion.
- 4.5 Levels of livestock grazing are being addressed through the CFP. Whilst the destocking levels that occurred *c*. 2002 appear to have resulted in some improvement to Annex I habitats, these habitats are not currently attaining Favourable status. Continued monitoring is required to establish what would be sustainable levels of livestock for this site bearing in mind that there

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

- 4.6 Burning is a major impact on heath habitats in some areas of the cSAC. Whilst burning can be an important tool in heathland management, uncontrolled and too frequent burning can damage the long-term viability of heaths. Regulation of burning at a site level is required.
- 4.7 Erosion of blanket peat is a major impact in **\*7130/7130 Blanket bog.** Whilst some areas of eroded peat may gradually revegetate as a result of CFP destocking, in areas of more severe erosion active restoration measures may be needed for this habitat to achieve Favourable status. These may include the damming of erosion gullies, stabilisation of bare peat with geotextiles or heather brash, the planting of *Eriophorum angustifolium*, and seeding of bare peat with *Sphagnum* propagules. The conservation of **\*7130 Active blanket bog** should be prioritised as befitting its status.
- 4.8 Monitoring of the grazing trial with Dexter cattle in Mount Brandon Nature Reserve at Arraglen should continue. Continuation of this grazing regime and the stocking level should be guided primarily by the assessments of the Annex I habitats within this area, rather than simply a reduction in cover of *Molinia caerulea*.
- 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 habitats **6150 Siliceous alpine and boreal grasslands** and **6430 Hydrophilous tall herb communities**. Relevé data collected by this survey will allow these habitats to be, in part, retrospectively assessed.
- 4.11 Significant areas of the site (16.3%) are non-Annex I **GS3 Dry-humid acid grassland** that has largely developed from **4030 Dry heath** as a result of burning and heavy grazing. Consideration should be given to increasing the area of **4030 Dry heath** within the site by encouraging it to recolonise these areas.
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# APPENDIX 1: ANNEX I HABITATS

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

Annex I	Full name of Annex I habitat	Standard abbreviation
code		
1230	Vegetated sea cliffs of the Atlantic and Baltic coasts	1230 Vegetated sea cliffs
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 heath
4030	European dry heaths	4030 Dry heath
4060	Alpine and Boreal heaths	4060 Alpine and Boreal heath
6150	Siliceous alpine and boreal grasslands	6150 Siliceous alpine and boreal grasslands
6230	*Species-rich Nardus grasslands, on siliceous	*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
7230	Alkaline fens	7230 Alkaline fens
8110	Siliceous scree of the montane to snow levels	8110 Siliceous scree
	(Androsacetalia alpinae and Galeopsetalia ladani)	
8120	Calcareous and calcshist screes of the montane to	8120 Calcareous scree
	alpine levels (Thlaspietea rotundifolii)	
8210	Calcareous rocky slopes with chasmophytic	8210 Calcareous rocky slopes
	vegetation	
8220	Siliceous rocky slopes with chasmophytic	8220 Siliceous rocky slopes
	vegetation	
8330	Submerged or partially submerged sea caves	8330 Sea caves
91A0	Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the	91A0 Old oak woodlands
	British Isles	

# **APPENDIX 2: PHOTOGRAPHS**



Plate A1: The rare *Alchemilla alpina* growing in a corrie east of Brandon Mountain (Photo: John Conaghan).



Plate A2: The arctic-alpine *Salix herbacea*, close to the summit of Stradbally Mountain (Photo: John Conaghan).



Plate A3: The arctic-alpine *Persicaria viviparum*, close to the signal tower south of Masatiompan (Photo: John Conaghan).



Plate A4: *Pinguicula grandiflora* in flower, near Lough Doon (Photo: John Conaghan).



Plate A5: *Herbertus aduncus* on loose rock with *Vaccinium myrtillus* and *Racomitrium lanuginosum* in Glanshanacuirp, the valley containing the paternoster lakes (Photo: Kate McNutt).



Plate A6: 4060 Alpine and Boreal heath with *Calluna vulgaris* and *Racomitrium lanuginosum*, Stradbally Mountain (Photo: Philip Perrin).



Plate A7: 4010 Wet heath with *Schoenus nigricans*, *Molinia caerulea*, *Myrica gale* and *Narthecium ossifragum*, Slieveglass (Photo: Janice Fuller).



Plate A8: 4030 Dry heath with *Calluna vulgaris* and *Ulex gallii*, An Gabhlán Ard (Photo: Rory Hodd).



Plate A9: 7230 Alkaline fen with *Carex* panicea, Nardus stricta, Juncus bulbosus, Anagallis tenella and Drepanocladus revolvens, below Croaghskearda (Photo: Philip Perrin).



Plate A10: 8220 Siliceous rocky slopes, 8110 Siliceous scree and HD1 Dense bracken, near Lough Anscaul (Photo: John Conaghan).



Plate A11: 3160 Dystrophic lake and \*7130 Active blanket bog, near Lios na Caolbhaí (Photo: Orla Daly).



Plate A12: 3130 Upland oligotrophic lake, Lough Nalacken and associated waterfall (Photo: Jenni Roche).



Plate A13: View from Beenoskee over eroding upland blanket bog to Cnoc Mhaoilionáin and An Cnapán Mór (Photo: Jenni Roche).



Plate A14: Corrie walls in Glanshanacuirp, above the paternoster lakes (Photo: John Conaghan).



Plate A15: Die-back of *Calluna vulgaris* on the northwestern slopes of Masatiompan (Photo: Philip Perrin).



Plate A16: Active peat cutting, Cloichearaí (Photo: BEC Consultants).



Plate A17: Damage to \*7130 Active blanket bog due to quad biking, near Brandon Point (Photo: BEC Consultants).



Plate A18: Land slippage, Beennaman (Photo: Jenni Roche).



Plate A19: A Kerry slug (Geomalacus maculosus), near Reamore (Photo: Orla Daly).



Plate A20: Feral goat herd on sea cliffs, Beennaman (Photo: Jenni Roche).

# **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
Aesculus hippocastanum	Horse-chestnut
Agrostis canina	Velvet Bent
Agrostis capillaris	Common Bent
Agrostis stolonifera	Creeping Bent
Aira caryophyllea	Silver Hair-grass
Aira praecox	Early Hair-grass
Alchemilla alpina	Alpine Lady's-mantle
Alnus glutinosa	Alder
Anagallis tenella	Bog Pimpernel
Angelica sylvestris	Wild Angelica
Anthoxanthum odoratum	Sweet Vernal-grass
Armeria maritima	Thrift
Arrhenatherum elatius	False Oat-grass
Asplenium adiantum-nigrum	Black Spleenwort
Asplenium ruta-muraria	Wall-rue
Asplenium trichomanes	Maidenhair Spleenwort
Bellis perennis	Daisy
Betula pubescens	Downy Birch
Blechnum spicant	Hard-fern
Calluna vulgaris	Heather
Campanula rotundifolia	Harebell
Cardamine pratensis	Cuckooflower
Carex bigelowii	Stiff Sedge
Carex binervis	Green-ribbed Sedge
Carex echinata	Star Sedge
Carex flacca	Glaucous Sedge
Carex limosa	Bog-sedge
Carex nigra	Common Sedge
Carex panicea	Carnation Sedge
Carex paniculata	Greater Tussock-sedge
Carex pilulifera	Pill Sedge
Carex pulicaris	Flea Sedge

VASCULAR SPECIES	
Species name	Common name
Carex remota	Remote Sedge
Carex viridula subsp. oedocarpa	a Yellow-sedge
Chrysosplenium oppositifolium	Opposite-leaved Golden-saxifrage
Cirsium dissectum	Meadow Thistle
Cirsium palustre	Marsh Thistle
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Crocosmia × crocosmiiflora	Montbretia
Cynosurus cristatus	Crested Dog's-tail
Cystopteris fragilis	Brittle Bladder-fern
Dactylis glomerata	Cock's-foot
Dactylorhiza maculata	Heath Spotted-orchid
Danthonia decumbens	Heath-grass
Deschampsia cespitosa subsp. alpina	a Tufted Hair-grass
Deschampsia flexuosa	Wavy Hair-grass
Drosera anglica	Great Sundew
Drosera intermedia	Oblong-leaved Sundew
Drosera rotundifolia	Round-leaved Sundew
Dryopteris aemula	Hay-scented Buckler-fern
Dryopteris affinis	Scaly Male-fern
Dryopteris dilatata	Broad Buckler-fern
Eleocharis multicaulis	Many-stalked Spike-rush
Empetrum nigrum	Crowberry
Epilobium brunnescens	New Zealand Willowherb
Equisetum fluviatile	Water Horsetail
Erica cinerea	Bell Heather
Erica tetralix	Cross-leaved Heath
Eriophorum angustifolium	Common Cottongrass
Eriophorum vaginatum	Hare's-tail Cottongrass
Euphrasia officinalis agg.	Eyebrights
Festuca ovina	Sheep's-fescue
Festuca rubra	Red Fescue
Festuca vivipara	Viviparous Sheep's-fescue
Filipendula ulmaria	Meadowsweet
Fraxinus excelsior	Ash

VASCULAR SPECIES	
Species name	Common name
Fuchsia magellanica	Fuchsia
Galium saxatile	Heath Bedstraw
Gunnera tinctoria	Giant-rhubarb
Hedera helix	Ivy
Helictotrichon pubescens	Downy Oat-grass
Holcus lanatus	Yorkshire-fog
Huperzia selago	Fir Clubmoss
Hymenophyllum wilsonii	Wilson's Filmy-Fern
Hypericum pulchrum	Slender St John's-wort
Hypochaeris radicata	Cat's-ear
Ilex aquifolium	Holly
Iris pseudacorus	Yellow Iris
Jasione montana	Sheep's-bit
Juncus acutiflorus	Sharp-flowered Rush
Juncus articulatus	Jointed Rush
Juncus bulbosus	Bulbous Rush
Juncus effusus	Soft-rush
Juncus squarrosus	Heath Rush
Larix kaempferi	Japanese Larch
Leontodon autumnalis	Autumn Hawkbit
Linum catharticum	Fairy Flax
Listera cordata	Lesser Twayblade
Luzula campestris	Field Wood-rush
Luzula multiflora	Heath Wood-rush
Luzula sylvatica	Great Wood-rush
Lysimachia nemorum	Yellow Pimpernel
Menyanthes trifoliata	Bogbean
Molinia caerulea	Purple Moor-grass
Myrica gale	Bog-myrtle
Nardus stricta	Mat-grass
Narthecium ossifragum	Bog Asphodel
Osmunda regalis	Royal Fern
Oxalis acetosella	Wood-sorrel
Oxyria digyna	Mountain Sorrel
Pedicularis sylvatica	Lousewort

VASCULAR SPECIES	
Species name	Common name
Persicaria vivipara	Alpine Bistort
Phragmites australis	Common Reed
Picea sitchensis	Sitka Spruce
Pinguicula grandiflora	Large-flowered Butterwort
Pinguicula lusitanica	Pale Butterwort
Pinguicula vulgaris	Common Butterwort
Pinus sp.	a Pine
Plantago lanceolata	Ribwort Plantain
Poa annua	Annual Meadow-grass
Poa pratensis	Smooth Meadow-grass
Polygala serpyllifolia	Heath Milkwort
Polygala vulgaris	Common Milkwort
Polypodium vulgare	Polypody
Potamogeton polygonifolius	Bog Pondweed
Potentilla erecta	Tormentil
Potentilla palustris	Marsh Cinquefoil
Primula vulgaris	Primrose
Prunella vulgaris	Selfheal
Prunus laurocerasus	Cherry Laurel
Prunus spinosa	Blackthorn
Pteridium aquilinum	Bracken
Ranunculus acris	Meadow Buttercup
Ranunculus ficaria	Lesser Celandine
Ranunculus flammula	Lesser Spearwort
Rhododendron ponticum	Rhododendron
Rhynchospora alba	White Beak-sedge
Rubus fruticosus agg.	Brambles
Rumex acetosa	Common Sorrel
Salix aurita	Eared Willow
Salix cinerea	Grey Willow
Salix herbacea	Dwarf Willow
Saussurea alpina	Alpine Saw-wort
Saxifraga hirsuta	Kidney Saxifrage
Saxifraga spathularis	St Patrick's-cabbage
Saxifraga rosacea	Irish Saxifrage

VASCULAR SPECIES	
Species name	Common name
Saxifraga stellaris	Starry Saxifrage
Saxifraga × polita	False Londonpride
Schoenoplectus lacustris	Common Club-rush
Schoenus nigricans	Black Bog-rush
Sedum anglicum	English Stonecrop
Sedum rosea	Roseroot
Sibthorpia europaea	Cornish Moneywort
Solidago virgaurea	Goldenrod
Sorbus aucuparia	Rowan
Succisa pratensis	Devil's-bit Scabious
Taraxacum officinale agg.	Dandelions
Teucrium scorodonia	Wood Sage
Thymus polytrichus	Wild Thyme
Trichophorum germanicum	Deergrass
Trifolium dubium	Lesser Trefoil
Trifolium pratense	Red Clover
Ulex europaeus	Gorse
Ulex gallii	Western Gorse
<i>Utricularia</i> sp.	a Bladderwort
Vaccinium myrtillus	Bilberry
Valeriana officinalis	Common Valerian
Viola palustris	Marsh Violet
Viola riviniana	Common Dog-violet
Viola sp.	a Violet

BRYOPHYTES	Common name
Species name	
Adelanthus decipiens	Deceptive Featherwort
Adelanthus lindenbergianus	Featherwort
Amphidium mougeotii	Mougeot's Yoke-moss
Anastrepta orcadensis	Orkney Notchwort
Andreaea rothii subsp. falcata	Hunt's Rock-moss
Aneura pinguis	Greasewort
Anoectangium aestivum	Summer moss
Anomobryum julaceum	Slender Silver-moss

BRYOPHYTES	
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Species name	Common name
Atrichum undulatum	Smoothcap
Aulacomnium palustre	Bog Groove-moss
Barbilophozia floerkei	Common Pawwort
Bazzania pearsonii	a Whipwort
Bazzania tricrenata	Lesser Whipwort
Blindia acuta	Sharp-leaved Blindia
Brachythecium albicans	Whitish Feather-moss
Brachythecium rivulare	River Feather-moss
Brachythecium rutabulum	Rough-stalked Feather-moss
Breutelia chrysocoma	Golden-head Moss
Bryoerythrophyllum ferruginascens	Rufous Beard-moss
Bryum capillare	Capillary Thread-moss
Bryum pseudotriquetrum	Marsh Bryum
Calliergon sarmentosum	Twiggy Spear-moss
Calliergonella cuspidata	Pointed Spear-moss
Calypogeia arguta	Notched Pouchwort
Calypogeia fissa	Common Pouchwort
Calypogeia muelleriana	Mueller's Pouchwort
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 fragilis	Brittle Swan-neck Moss
Campylopus introflexus	Heath Star-moss
Campylopus pyriformis	Dwarf Swan-neck Moss
Campylopus setifolius	Silky Swan-neck Moss
Cephalozia bicuspidata	Two-horned Pincerwort
Cephalozia connivens	Forcipated Pincerwort
Cephaloziella divaricata	Common Threadwort
Ceratodon purpureus	Redshank
Chiloscyphus polyanthos	St Winifred's Moss
Cladopodiella fluitans	Bog Notchwort
Cololejeunea minutissima	Minute Pouncewort
Colura calyptrifolia	Fingered Cowlwort
Conocephalum conicum	Great Scented Liverwort

BRYOPHYTES
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Species name	Common name
Cratoneuron filicinum	Fern-leaved Hook-moss
Ctenidium molluscum	Comb-moss
Cyclodictyon laetevirens	Bright Green Cave-moss
Dicranella palustris	Marsh Forklet-moss
Dicranum majus	Greater Fork-moss
Dicranum scoparium	Broom Fork-moss
Didymodon sp.	a Beard-moss
Diplophyllum albicans	White Earwort
Douinia ovata	Waxy Earwort
Drepanocladus revolvens	Rust Hook-moss
Eurhynchium hians	Swartz's Feather-moss
Eurhynchium striatum	Common Striated Feather-moss
Fissidens adianthoides	Maiden Pocket-moss
Fissidens dubius	Rock Pocket-moss
Fissidens osmundoides	Purple-stalked Pocket-moss
Fissidens taxifolius	Great/Common Pocket-moss
Fontinalis antipyretica	Greater Water-moss
Frullania fragilifolia	Spotty Fingers
Frullania microphylla	Lesser Scalewort
Frullania tamarisci	Tamarisk Scalewort
Gymnomitrion crenulatum	Western Frostwort
Harpalejeunea molleri	Pointed Pouncewort
Herbertus aduncus subsp. hutchinsiae	Juniper Prongwort
Heterocladium heteropterum	Wry-leaved Tamarisk-moss
Homalothecium sericeum	Silky Wall Feather-moss
Hookeria lucens	Shining Hookeria
Hylocomium splendens	Glittering Wood-moss
Hyocomium armoricum	Flagellate Feather-moss
Hypnum cupressiforme	Cypress-leaved Plait-moss
Hypnum jutlandicum	Heath Plait-moss
Hypnum lacunosum var. lacunosum	Great Plait-moss
Isopterygiopsis pulchella	Neat Silk-moss
Isothecium myosuroides	Mouse-tail Moss
Isothecium myosuroides var. brachythecioides	Thicker Mouse-tail Moss
Jungermannia exsertifolia subsp. cordifolia	Cordate Flapwort

BRYOPHYTES	
Species name	Common name
Kindbergia praelonga	Common Feather-moss
Kurzia pauciflora	Bristly Fingerwort
Kurzia trichoclados	Heath Fingerwort
Lejeunea cavifolia	Micheli's Least Pouncewort
Lejeunea lamacerina	Western Pouncewort
Lejeunea patens	Pearl Pouncewort
Lepidozia pearsonii	a Fingerwort
Lepidozia reptans	Creeping Fingerwort
Leptodontium flexifolium	Bent-leaved Beard-moss
Leucobryum glaucum	Large White-moss
Lophocolea bidentata	Bifid Crestwort
Lophozia ventricosa	Tumid Notchwort
Marchesinia mackaii	Mackay's Pouncewort
Marsupella emarginata	Notched Rustwort
Mastigophora woodsii	Wood's Whipwort
Metzgeria conjugata	Rock Veilwort
Metzgeria furcata	Forked Veilwort
Metzgeria leptoneura	Hooked Veilwort
Mnium hornum	Swan's-neck Thyme-moss
Mylia taylorii	Taylor's Flapwort
Odontoschisma denudatum	Matchstick Flapwort
Odontoschisma sphagni	Bog-moss Flapwort
Orthothecium intricatum	Fine-leaved Leskea
Palustriella falcata	Claw-leaved Hook-moss
Pellia epiphylla	Overleaf Pellia
Philonotis fontana	Fountain Apple-moss
Plagiochila bifaria	Killarney Featherwort
Plagiochila exigua	Petty Featherwort
Plagiochila porelloides	Lesser Featherwort
Plagiochila punctata	Spotty Featherwort
Plagiochila spinulosa	Prickly Featherwort
Plagiomnium undulatum	Hart's-tongue Thyme-moss
Plagiothecium undulatum	Waved Silk-moss
Pleurozia purpurea	Purple Spoonwort
Pleurozium schreberi	Red-stemmed Feather-moss

BRYOPHYTES	
Species name	Common name
Pogonatum urnigerum	Urn Haircap
Pohlia nutans	Nodding Thread-moss
Polytrichum commune	Common/Dense Haircap
Polytrichum formosum	Bank Haircap
Polytrichum juniperinum	Juniper Haircap
Polytrichum piliferum	Bristly Haircap
Preissia quadrata	Narrow Mushroom-headed Liverwort
Pseudotaxiphyllum elegans	Elegant Silk-moss
Ptychomitrium polyphyllum	Long-shanked Pincushion
Racomitrium aciculare	Yellow Fringe-moss
Racomitrium affine	Lesser Fringe-moss
Racomitrium ellipticum	Oval-fruited Fringe-moss
Racomitrium fasciculare	Green Mountain Fringe-moss
Racomitrium heterostichum	Bristly Fringe-moss
Racomitrium lanuginosum	Wooly Fringe-moss
Radula carringtonii	Carrington's Scalewort
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
Scapania gracilis	Western Earwort
Scapania nimbosa	Grove Earwort
Scapania ornithopodioides	Bird's-foot Earwort
Scapania scandica	Norwegian Earwort
Scapania undulata	Water Earwort
Schistidium apocarpum	Sessile Grimmia
Scleropodium purum	Neat Feather-moss
Sphagnum capillifolium	Acute-leaved/Red Bog-moss
Sphagnum capillifolium subsp. rubellum	Red Bog-moss
Sphagnum compactum	Compact Bog-moss
Sphagnum contortum	Twisted Bog-moss
Sphagnum cuspidatum	Feathery Bog-moss

DRIGHTIES	
Species name	Common name
Sphagnum denticulatum	Cow-horn Bog-moss
Sphagnum fallax	Flat-topped Bog-moss
Sphagnum inundatum	Lesser Cow-horn Bog-moss
Sphagnum magellanicum	Magellanic Bog-moss
Sphagnum palustre	Blunt-leaved Bog-moss
Sphagnum papillosum	Papillose Bog-moss
Sphagnum quinquefarium	Five-ranked Bog-moss
Sphagnum squarrosum	Spiky Bog-moss
Sphagnum strictum	Pale Bog-moss
Sphagnum subnitens var. ferrugineum	Brownish Bog-moss
Sphagnum subnitens var. subnitens	Lustrous Bog-moss
Sphagnum tenellum	Soft Bog-moss
Thamnobryum alopecurum	Fox-tail Feather-moss
Thuidium assimile	Philibert's Tamarisk-moss
Thuidium delicatulum	Delicate Tamarisk-moss
Thuidium tamariscinum	Common Tamarisk-moss
Tortella tortuosa	Fizzled Crisp-moss
Trichostomum brachydontium	Variable Crisp-moss
Trichostomum tenuirostre	Narrow-fruited Crisp-moss
Tritomaria quinquedentata	Lyon's Notchwort
Ulota hutchinsiae	Hutchin's Pincushion

# BRYOPHYTES

# LICHENS

Species name	Species name
Cetraria islandica	Cladonia pyxidata
Cladonia arbuscula	Cladonia ramulosa
Cladonia ciliata	Cladonia squamosa
Cladonia coniocraea	Cladonia subcervicornis
Cladonia crispata var. cetrariiformis	Cladonia uncialis
Cladonia furcata	Cladonia uncialis subsp. biuncialis
Cladonia pocillum	Peltigera membranacea
Cladonia portentosa	



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

# Figure 2. Primary Fossitt habitats within Mount Brandon cSAC (000375), Co. Kerry



FS1. Reed and large sedge swamps	
FW1. Eroding/ upland rivers	
FW2. Depositing/ lowland rivers	
GA1. Improved agricultural grassland	
GM1. Marsh	
GS1. Dry calcareous and neutral grassland	
GS3. Dry-humid acid grassland	
GS4. Wet grassland	
HD1. Dense bracken	
HH1. Dry siliceous heath	
UU2 Matheath	

# HH4 Montane heath

HH4. Montane neath
LR. Littoral rock
LS1. Shingle and gravel shores
MW. Marine water body
PB2. Upland blanket bog
PB3. Lowland blanket bog
PB5. Eroding blanket bog
PF2. Poor fen and flush
WD. Highly modified/ non-native woodlar
WN. Semi-natural woodland
WS. Scrub/ transitional woodland
 Polygon boundaries



Each polygon is categorised by the most abundant Fossitt habitat recorded. However, many polygons are intimate mosaics of habitats and polygons are not necessarily dominated by the primary habitat depicted. For full details on the habitat composition of each polygon, refer to the polygon attributes table.

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# Figure 3. Primary Annex I habitats within Mount Brandon cSAC (000375), Co. Kerry



# PRIMARY ANNEX I HABITATS

- 1230 Vegetated sea cliffs 3110 Lowland oligotrophic lakes 3130 Upland oligotrophic lakes
- 3160 Dystrophic lakes 3260 Floating river vegetation
- 4010 Wet heath
- 4030 Dry heath
  - 4060 Alpine and Boreal heath
  - 6150 Siliceous alpine and boreal grasslands –

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1:23,000

*6230 Species-rich Nardus grasslands
7130 Inactive blanket bog
*7130 Active blanket bog
8110 Siliceous scree
8220 Siliceous rocky slopes
91A0 Old oak woodlands
minor Annex
non-Annex
Polygon boundaries



NOTE

Each polygon is categorised by the most abundant Annex I habitat recorded.

However, many polygons contain an intimate mosaic of Annex I habitats and polygons are not necessarily dominated by the primary habitat depicted. Where no single Annex I habitat accounts for 20% or more of a polygon it is categorised as "Minor Annex". For full details of the habitat composition of each polygon, refer to the polygon attribute table.

# Figure 4a. Cover of 4010 WET HEATH within Mount Brandon cSAC (000375), Co. Kerry



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# Figure 4b. Cover of 4030 DRY HEATH within Mount Brandon cSAC (000375), Co. Kerry



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# Figure 4c. Cover of 4060 ALPINE AND BOREAL HEATH within Mount Brandon cSAC (000375), Co. Kerry



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# Figure 4d. Cover of 6150 SILICEOUS ALPINE AND BOREAL GRASSLANDS within Mount Brandon cSAC (000375), Co. Kerry





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# Figure 4e. Cover of \*6230 SPECIES-RICH NARDUS GRASSLANDS within Mount Brandon cSAC (000375), Co. Kerry





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# Figure 4f. Cover of 6430 HYDROPHILOUS TALL HERB COMMUNITIES within Mount Brandon cSAC (000375), Co. Kerry





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# Figure 4g. Cover of \*7130 ACTIVE BLANKET BOG within Mount Brandon cSAC (000375), Co. Kerry



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# Figure 4h. Cover of 7130 INACTIVE BLANKET BOG within Mount Brandon cSAC (000375), Co. Kerry



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# Figure 4i. Cover of 7140 TRANSITION MIRES within Mount Brandon cSAC (000375), Co. Kerry



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# Figure 4j. Cover of 7150 RHYNCHOSPORION DEPRESSIONS within Mount Brandon cSAC (000375), Co. Kerry



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# Figure 4k. Cover of 7230 ALKALINE FENS within Mount Brandon cSAC (000375), Co. Kerry



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# Figure 4I. Cover of 8110 SILICEOUS SCREE within Mount Brandon cSAC (000375), Co. Kerry



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# Figure 4m. Cover of 8120 CALCAREOUS SCREE within Mount Brandon cSAC (000375), Co. Kerry



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# Figure 4n. Cover of 8210 CALCAREOUS ROCKY SLOPES within Mount Brandon cSAC (000375), Co. Kerry



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# Figure 40. Cover of 8220 SILICEOUS ROCKY SLOPES within Mount Brandon cSAC (000375), Co. Kerry



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## Figure 5a. Location of rare and notable vascular plant records within Mount Brandon cSAC (000375), Co. Kerry



8 - Salix herbacea

- 9 Saussurea alpina
- 10 Saxifraga hypnoides
- 11 Saxifraga rosacea
- 5 Deschampsia cespitosa subsp. alpina 12 Sibthorpia europaea
  - 13 Subularia aquatica

NOTE Listed species constitute those plant species that are listed on Annex II of the EU Habitats Directive, National Red Lists or are protected under the Flora Protection Order (FPO) 1999. Hollow symbols indicate where the ocations of records are approximate

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## Figure 5b. Location of rare and notable bryophyte and lichen records within Mount Brandon cSAC (000375), Co. Kerry



- 25 Marsupella sphacelata
- 26 Massalongia carnosa
- 27 Mastigophora woodsii
- 28 Metzgeria leptoneura
- 29 Orthothecium intricatum
- 30 Palustriella falcata
- 31 Plagiothecium denticulatum var. obtusifolium
- 32 Pohlia elongata var. greenii
- 33 Polychidium muscicola
- 34 Pseudocyphellaria intricata
- 35 Pseudocyphellaria norvegica
- 36 Radula carringtonii 37 - Radula holtii
- 38 Rhabdoweisia crispata 39 - Scapania curta
- 40 Scapania gymnostomophila
- 41 Scapania nimbosa

### 42 - Scapania ornithopodioides

- 43 Scapania subalpina
- 44 Schistidium strictum
- 45 Sphagnum contortum
- 46 Sphagnum platyphyllum
- 47 Sphagnum squarrosum
- 48 Sphagnum strictum
- 49 Sphagnum subnitens var. ferrugineum
- 50 Toninia thiopsora
- 51 Ulota drummondii

### NOTE

Listed species constitute those plant species that are listed on Annex II of the EU Habitats Directive, National Red Lists or are protected under the Flora Protection Order (FPO) 1999. Hollow symbols indicate where the ocations of records are approximate.

Figure 6. Location and results of conservation assessment monitoring stops and other relevés within Mount Brandon cSAC (000375), Co. Kerry



ASSESSMENT RESULTS	
	Pass
	Fail
	Not assessed
_	Survey area / cSAC boundary

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Figure 7. Commonage Framework Plan damage assessment (1999-2003) within and surrounding Mount Brandon cSAC (000375), Co. Kerry



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