Corliskea Bog (SAC 002110), Co. Galway/Roscommon

Executive Summary

This survey, carried out in February 2013, aimed to assess the conservation status of habitats listed on Annex I of the European Habitats Directive (92/43EEC) on the high bog at Corliskea Bog. Vegetation was described and mapped based on raised bog ecotope vegetation community complexes (Kelly and Schouten, 2002). The following Annex I habitats occur: Active Raised Bog, Degraded Raised Bog, Bog Woodland and Depressions on peat substrates of the Rhynchosporion.

Active Raised Bog covers 44.25 ha (16%) of the high bog area. High quality Active Raised Bog consists of central ecotope and active flush featuring *Sphagnum* lawns, hummocks and hollows. Sub-central ecotope is localised but frequent in both sections of the high bog and *Sphagnum* cover can be up to 75% in the best quality examples of this ecotope.

Degraded Raised Bog covers 231.67 ha (84.0%) of the high bog area. It is drier than Active Raised Bog and supports a lower density of *Sphagnum* mosses. It has a less developed micro-topography while permanent pools and *Sphagnum* lawns are generally absent. The habitat also includes some inactive flushes, most of them dominated by *Molinia caerulea*.

Depressions on peat substrates of the Rhynchosporion are found in both Active and Degraded Raised Bog, but tend to be best developed and most stable in the wettest areas of Active Raised Bog. On this site it was most frequent in the sub-central community complexes 4 + P, 3/35 and 9/7/10.

There have been no restoration works on this site during the reporting period 2004 to 2013.

Corliskea Bog features a small *Betula pubescens* dominated Bog Woodland covering 0.25ha with an abundant bryophyte layer and reasonably diverse *Sphagnum* species cover.

The current conservation objective for Corliskea Bog is to restore the area of Active Raised Bog and Bog Woodland to the area present when the Habitats Directive came into force in 1994. In the case of Active Raised Bog, the objective also includes the restoration of all of the sub-marginal ecotope present at the time, as this represents the area of Degraded Raised Bog most technically feasible to

restore. The Area objective for Bog Woodland is 0.25ha while that for Active Raised Bog is 131.92ha (which includes the area of Bog Woodland). The objective in relation to Structure and functions (S&Fs) is that at least half of the Active Raised Bog area should be made up of the central ecotope and active flush (i.e. the wetter vegetation communities). These values have been set as Favourable Reference Values or FRVs until more site-specific values can be set based on hydrological and topographical studies. The objective for Degraded Raised Bog is for the sub-marginal area to be restored to active peat forming communities as stated above and that no loss or degradation of any kind occurs. Although FRVs could not be established for the Rhynchosporion depressions, the objectives are to increase its extent and to improve its quality to values associated with a favourable conservation status of Active Raised Bog. Therefore, the habitat's objectives are indirectly associated with Active Raised Bog objectives.

There has been a decrease in the area of Active Raised Bog (4.25ha) at Corliskea Bog in the 2004 to 2013 reporting period. This has taken place across both sections of the high bog and is a result of drying out processes associated with peat cutting, drainage, afforestation and burning.

Some new peat forming areas have been described at the site, some of which are the result of a more comprehensive field mapping and vegetation re-interpretation. However, some newly mapped areas have resulted from fragmentation of sub-central areas due to habitat degradation.

Peat cutting, drainage, afforestation and burning are the most threatening current activities at the site. 2.25ha of high bog have been lost in the reporting period due to peat cutting. 5.760km of drains remain functional and 3.237km reduced functional. An estimated 70.6ha (25.6%) of the high bog showed signs of burning in the reporting period.

Active Raised Bog has been given an **Unfavourable Bad-Declining** conservation assessment. Habitat Area has decreased and quality (S&Fs) declined across the high bog and the current Area value and S&Fs are below favourable reference values. Future Prospects are considered **Unfavourable Bad-Declining,** as impacting factors are ongoing (peat cutting, drainage, afforestation and burning) and no restoration measures have been undertaken.

Bog Woodland has been given an **Unfavourable Inadequate-Declining** conservation status assessment.

Degraded Raised Bog has been given an **Unfavourable Bad-Declining** conservation status assessment and **Rhynchosporion depressions** has been given an **Unfavourable Bad-Declining** conservation status assessment.

The **overall raised bog** at **Corliskea SAC** has been given an **Unfavourable Bad-Declining conservation status** assessment.

A series of **recommendations** have been also given, these include: cessation of peat cutting; blocking of remaining high bog functional and reduced-functional drains, as well as cutover drains; undertake measures to reduce the frequency and intensity of fire events; assessment of the actual impact of forestry both on and adjacent to the high bog; restoration works on the high bog and cutover areas, including peat exploitation areas; further hydrological and topographical studies to ascertain more accurate FRVs; and further botanical monitoring surveys.

Site identification

SAC Site Code	002110	**6" Sheet:**	GY 1/2 & RN 26/33
Grid Reference:	M 670 740	**1:50,000 Sheet:**	39
High Bog area (ha):	276.03ha[1]		
Dates of Visit:	04 to 07/02/2013		
Townlands:	Corliskea, Bookalagh, Cloonfelliv, Annagh & Cloonfad		

[1] The current extent of the high bog is 276.03ha, while that reported in 2004 was 272.97ha (Fernandez *et al*., 2005). This discrepancy is the result of more accurate mapping of the high bog edge by using the higher resolution 2010 aerial images compared to those used in 2004, rather than any actual increase in high bog extent. In addition, a high bog area already within the SAC in 2004, which is located between both lobes, is now mapped and reported as part of the site's high bog. High bog area has in fact decreased in the 2004-2012 period due to peat cutting. The actual high bog extent in 2004 was 278.28ha (see tables 8.1 and 8.3 2004 (amended) figures).

Site location

Corliskea Bog is located approximately 6km south of Castlerea, Co. Roscommon and 3km northwest of Ballymoe. Co. Galway. The Galway/Roscommon border runs through the site. The road between Ballymoe and Dunmore runs by the south of the bog while the road from Ballymoe north towards Castlerea runs to the east. Kelly *et al*. (1995) grouped Corliskea with the raised bogs of NE Galway/NW Roscommon. It lies immediately east of Cloonfelliv Bog (part of the same SAC), immediately southeast of Corliskea (part of the same SAC) and 3-4km to the east of Moorfield Bog/Farm Cottage (part of the same SAC).

Access is easiest from the latter as a bog road off it runs the entire length of the northern edge. A small road also divides this site from Trien (also SAC 2110), which lies immediately to the northwest.

Description of the survey

The survey was carried out in February 2013 and involved a vegetation survey of the high bog at Corliskea Bog and the recording of impacting activities affecting high bog vegetation. A similar survey was carried out in 2004 by Fernandez *et al*. (2005). High bog vegetation was described and

mapped, based on raised bog ecotope vegetation community complexes developed by Kelly and Schouten (2002). Detailed notes were taken on each community complex and any flushed areas that were present. These included: species lists; estimation of % cover of dominant species; percentage *Sphagnum* cover; evidence of damage (due to burning, peat cutting or drainage); micro-topography; ground firmness; and presence of *Cladonia* species. A list of photographical records is given in Appendix II. The survey aimed to assess the conservation status of Habitats Directive (Council Directive 92/43/EEC) Annex I habitats on the high bog.

The entire high bog of Corliskea Bog was re-surveyed. Sections mapped as sub-marginal, sub-central and central ecotope in 2004 were surveyed in more detail. These are the areas where changes were likely to have occurred. Quadrats, which describe the micro-topographical features and indicator species, recorded in the 2004 project (Fernandez *et al*. 2005) were re-surveyed, including the Bod Woodland quadrat (see Appendix III). The size of quadrats was 4m x 4m for Active Raised Bog and 10m x 10m for Bog Woodland.

A GeoExplorer handheld GPS minicomputer (Trimble GeoXT) was used in the field to record quadrats, ecotope boundaries, location of vegetation complexes and other points of interest. The GPS positions of these features were logged and stored on Terrasync software (Trimble). Additional comments were stored as text fields in the device. Post processing of data was carried out, based on the Active GPS Network from Ordnance Survey Ireland, to obtain sub-metre accuracy of the data.

A digital vector format ecotope vegetation map was produced based on the spatial data collected during the survey using ArcGIS 9.3 and 2010 aerial photography. The Irish National Grid was used as the co-ordinate reference system. Vegetation complex and ecotope maps are given in Appendix IV.

Description of the high bog

Corliskea Bog is a Ridge Basin Bog and was classified as a Western Raised Bog by Douglas and Grogan in 1985. The shape is broadly rectangular but it has been split up in two sections as a result of severe peat cutting and the presence of a till mound where Doughery woodland lies. The western and larger section has been named section A and the eastern and smaller part section B, to facilitate the location of the community complex and the interpretation of the vegetation descriptions. Corliskea Bog is part of SAC 2110 that also includes Trien Bog and Cloonfelliv Bog.

Ecological Information

Raised Bog Annex I (Habitats Directive (92/43/EEC)) habitats

The following Raised Bog EU Annex I habitats, are found in Corliskea Bog:

- Active Raised Bog (EU code 7110),
- Degraded Raised Bog (EU code 7120),
- Bog Woodland (EU code 91D0) and
- Depressions on peat substrates of the Rhynchosporion (EU code 7150).

Active Raised Bog (7110)

The current area of Active Raised Bog (ARB) at Corliskea Bog is 44.25ha (16.0% of the high bog), which is a decrease of 19.41 ha since 1994.

Active Raised Bog includes sub-central ecotope, active flushes and Bog Woodland.

Central ecotope was found in one location (**C1**) (see Appendix IV, Map 1). Only one community complex was recorded (15). Complex 15 consisted of low hummocks, pools and flats. Inter-connecting pools were 26 to 33% and *Sphagnum* cover ranged from 36 to 50%. *Calluna vulgaris* and *Eriophorum vaginatum* were abundant throughout; *Sphagnum capillifolium* was dominant in the hummock layer with occasional *S. fuscum*. Pools were dominated by *S. cuspidatum* with occasional *S. denticulatum* and lawns were dominated by *S. papillosum*. Additional species that were frequent at low cover throughout include *Carex panicea, Racomitrium lanuginosum* and *Cladonia portentosa.*

Sub-central ecotope was found at 13 locations (**Sc1** to **Sc13**) (see Appendix IV, Map 1). Seven community complex types were recorded. The most widely distributed complex was 3 + P. This vegetation type was characterised by high *Carex panicea* cover (11-25%) with abundant pools (11-25%) and good overall *Sphagnum cover* (34-50%, lower where burnt). *Calluna vulgaris* and *Eriophorum vaginatum* were abundant with *Sphagnum capillifolium* dominant in the hummock layer. Pools had a low cover of *S. cuspidatum* and graded into lawns dominated by *S. papillosum*. Additional species that were frequent at low cover throughout included *Rhynchospora alba, Aulacomnium palustre* and *Cladonia portentosa.* Complex 9/7/10 was found in four sub-central areas across the high bog. *S. papillosum* lawns dominated this complex, with abundant *Calluna vulgaris, Eriophorum vaginatum* and *S. capillifolium* in hummocks. Overall *Sphagnum* cover was moderately high (34 to 50%). *Carex panicea, Rhynchospora alba* and *Narthecium ossifragum* were of low cover and pools were rare. 9/7 + P was frequent in the central area of the western high bog section. This

comprised hummocks, lawns and pools with overall *Sphagnum* cover of 51 to 75% and interconnecting pool cover of 11to 25%. *Calluna vulgaris* and *Eriophorum vaginatum* were abundant with *S. capillifolium* in hummocks. Pool had high *Sphagnum cuspidatum* cover with *S. papillosum* lawns at the edge and quaking vegetation. *Carex panicea* was frequent to abundant in the vegetation. The remaining complexes were found in only one or two locations. Complex 3/10 was characterised by abundant *Calluna vulgaris, Carex panicea* and *Eriophorum angustifolium, Sphagnum* cover of 34 to 50% and regular pools (4-10%) grading into *S. papillosum* lawns. Complex 3/35 had high cover of *Sphagnum* (51-75%), *Carex panicea* (5-10%) and interconnecting pools (11-25%) with locally abundant *S. austinii* and *S. fuscum* and occasional western indicators *Racomitrium lanuginosum* and *Campylopus atrovirens.* Complex 6/35 was similar to 3/35, but with lower overall *Sphagnum* cover (34-50%) and high *Narthecium ossifragum* cover (11-25%). Complex 4 + P was characterised by a moderate cover of *Sphagnum* (34-50%) and interconnecting pools (11-25%) with abundant *Calluna vulgaris* and *Eriophorum vaginatum* and high cover of *Rhynchospora alba* (11-25%).

There were four active flushes present: These were dominated either by *Molinia caerulea, Calluna vulgaris, Eriophorum vaginatum* or *E. angustifolium.* The *Sphagnum* layer ranged from 34 to 75% and was generally dominated by *S. papillosum* and *S. capillifolium.* Flush **FT** was dominated by *Molinia caerulea* (51-75%) with high total *Sphagnum* cover 51-75% and moderate *Calluna vulgaris* cover (5-10%). Flush **FW** had lower cover of *Molinia caerulea* (25-33%) and higher *Sphagnum* cover (51-75%). *Calluna vulgaris* and *Eriophorum vaginatum* were abundant. Flush **Z1** also had low *Molinia caerulea* cover (11-25%) and total *Sphagnum* cover ranged from 34 to 75%. *Calluna vulgaris* and *Eriophorum vaginatum* were dominant. *Molinia caerulea* was absent in Flush **Z** and the vegetation was characterised by a dominance of *Eriophorum angustifolium* (35-50%) with *Calluna vulgaris* (26-33%) and *Sphagnum* cover of 34-50%.

Degraded Raised Bog (7120)

The current area of Degraded Raised Bog at Corliskea Bog is 231.67ha (82.0% of the high bog).

It should be noted that the high bog edge has been remapped at a higher level of accuracy as part of the 2013 project and that this may cause discrepancies on the overall extent of high bog and particularly Degraded Raised Bog habitat.

Degraded Raised Bog includes the sub-marginal, marginal and face bank ecotope, as well as inactive flushes. Although some areas of Degraded Raised Bog have a relatively well-developed Raised Bog flora, they are affected by water loss to varying degrees, and are usually devoid of permanent pools.

The sub-marginal ecotope featured the most developed micro-topography within Degraded Raised Bog. Four community complexes and variants were recorded within the sub-marginal ecotope: 9a/7, 9/7/3, 9/7/6 + My and 6/3/2. 9a/7 and variant 9/7 were present in wetter areas of former sub-central ecotope or adjacent to flushes or open water. *Sphagnum* cover was 11-25% (locally 26-33%). *Calluna vulgaris* and either *Eriophorum vaginatum* or *E. angustifolium* were dominant, with *Sphagnum capillifolium* in low hummocks, *S. papillosum* in lawns and *S. cuspidatum* in occasional pools. 9/7/3 and variant 9/7/6 was the most frequent complex. This was characterised by abundant *Calluna vulgaris, Eriophorum vaginatum* and either *Narthecium ossifragum* or *Carex panicea. Sphagnum* cover was generally 11-25%, but lower where recently burnt. The two variants with frequent pools (9/7/3 + P and 9/7/6 + P) occurred in wetter areas and were often in areas adjacent to sub-central ecotope. In these areas, *Sphagnum cuspidatum* was dominant in pools, with *Sphagnum papillosum* forming a narrow lawn at the pool edge. The vegetation often graded into sub-central ecotope but the inter-pool *Sphagnum* cover was usually low and showed signs of seasonal drying. 9/7/6 + My occurred in one location in the western section of the high bog only. This had similar vegetation to 9/7/6, but *Sphagnum* cover was fairly low (5-10%) and the vegetation showed signs of slight flushing with frequent *Myrica gale* and occasional *Sphagnum palustre*. 6/3/2 also occurred in only one location, between two flushes. *Calluna vulgaris* and *Eriophorum angustifolium* were dominant with 11-25% *Sphagnum* cover (*S. capillifolium* and *S. papillosum*). Flush species *Molinia caerulea* was occasional and *Huperzia selago* present at low cover.

Marginal ecotope was slightly drier than sub-marginal ecotope and mainly occurred as a band near the margins of the high bog. The most frequent complex was 3/6, with localised 3/9a and 7/2 + Mo. micro-topography consisted of *Calluna vulgaris* hummocks, low *Sphagnum* hummocks, flats and occasional hollows and tear pools. The *Sphagnum* cover was lower than in the sub-marginal ecotope (5-10% or lower) and the vegetation was characterised by a higher cover of *Carex panicea, Narthecium ossifragum, Trichophorum germanicum,* and *Calluna vulgaris*.

Face bank ecotope was characterised by firm ground, tall *Calluna vulgaris*, poor *Sphagnum* cover and a flat micro-topography. This ecotope covered small areas around the edge of the high bog, usually adjacent to areas of past or current peat exploitation.

The high bog also featured ten inactive flushes (**FO**, **FP**, **FQ**, **FR**, **FS, FU, W**, **WN**, **FX** and **FZ**). Most of the flushes were dominated by *Molinia caerulea* with *Calluna vulgaris* and occasional *Erica tetralix, Eriophorum vaginatum, E. angustifolium, Myrica gale, Cladonia portentosa, Aulacomnium palustre, Polytrichum strictum, Vaccinium oxycoccos, V. myrtillus Pteridium aquilinum, Juncus effusus, Pleurozium schreberi* and *Hylocomium splendens. Sphagnum* cover was generally less than 4% (locally 5 to 10%)

with occasional, *S. papillosum* and *S. capillifolium.* Scrub species such as *Ulex europaeus, Salix* species, *Betula pubescens* and *Pinus* species were occasional to frequent.

Depressions on peat substrates of the Rhynchosporion (7150)

Rhynchosporion vegetation was found in both Active and Degraded Raised Bog, but was most frequent in the sub-central areas of the site and particularly community complex 4 + P. The Rhynchosporion vegetation occurred along *Sphagnum* pool edges and in lawns. Typical plant species included *Rhynchospora alba* (11-25%), *Narthecium ossifragum, Trichophorum germanicum, Sphagnum cuspidatum, S. papillosum* and *Eriophorum angustifolium*. Rhynchosporion vegetation was also frequent (<4%) in the sub-central community complexes 3+P, 3/10, 3/35, 6/35, 9/7/10 and 9/7/ + P.

Bog Woodland

Bog Woodland is found in one location on the high bog at Corliskea Bog (**Bw1**) and it covers 0.25ha.

The canopy comprised a few semi-mature trees of *Betula pubescens*, with frequent less mature trees and saplings. The trees were mostly less than 5m high and canopy cover was 30 to 40%. There was an abundance of epiphytic lichens and bryophytes on the trees. The field layer shows signs of having been recently burnt. The field layer was dominated by *Vaccinium myrtillus* (51-75%) and the bryophytes *Sphagnum palustre* (11-25%), *S. capillifolium* (5-10%), *Hylocomium splendens* (11-25%), *Polytrichum strictum* (5-10%), *S. fallax* (5-10%) and *Aulacomnium palustre* (5-10%). Additional species at lower cover (<4%) included *Dryopteris carthusiana, Molinia caerulea, Cladonia portentosa*, *Hypnum jutlandicum, Pleurozium schreberi, Pseudoscleropodium purum, Eriophorum vaginatum, Polytrichum commune, Diplophyllum albicans, Calluna vulgaris, Dicranum scoparium* and *Rubus fruticosus* agg. The non-native moss *Campylopus introflexus* was present occasionally in sparsely vegetated burnt areas. *Betula pubescens* saplings were regenerating in the shrub layer, possibly post-fire regeneration. At the edges the woodland transitioned to active flush with occasional *Betula* and *Pinus* saplings.

Detailed vegetation description of the high bog

A detailed description of high bog vegetation recorded during the 2013 survey of Corliskea Bog is given in Appendix I. Vegetation is divided into a number of community complexes, which are listed and described based on the dominant species. These community complexes are grouped into ecotope types. The distribution of the ecotopes is shown on the ecotope map (Appendix IV, Map 1). The community complexes are shown on the community complex map (Appendix IV, Map 2) and the quadrat details are given in Appendix III and their location in Appendix IV (Map 1).

Impacting activities

Table 6.1 below provides a list of activities impacting high bog vegetation at Corliskea Bog, according to their occurrence on the high bog or adjacent to the high bog; area or length affected, and whether they influence negatively (i.e. drainage, peat extraction) or positively (i.e. restoration works):

Table 6.1 Impacting activities

Code	Activity	Ranking	Influence	Area (ha) /Length(km)	Location	Habitat affected
C01.03	Peat extraction	H	-1	2.25ha high bog cut away	Inside High Bog: 43 different locations along most high bog sections	**71207110/7150**
C01.03	Peat extraction	M	-1	2.25ha high bog cut away	Inside High Bog: 43 different locations along most high bog sections	**91D0**
J02.07	Drainage	H	-1	8.997km[1]	Inside High Bog	**7110/7120**
J02.07	Drainage	M	-1	8.997km[1]	Inside High Bog	**7150/91D0**
J02.07	Drainage	L	-1	n/av	Outside High Bog	**7110/7120/7150/91D0**
J01	Fire	M	-1	70.6ha	Inside High Bog	**7110/7120/7150/91D0**
B01.02	Artificial planting on open ground (non-native trees)	H	-1	4.19ha	Inside High Bog	**7110**
B01.02	Artificial planting on open ground (non-native trees)	M	-1	4.19ha	Inside High Bog	**7120/7150**
B01.02	Artificial planting on open ground (non-native trees)	L	-1	7.5ha	Outside High Bog	**7110/7120/7150**

HB: High Bog; Ranking: H: High importance/impact; M: Medium importance/impact; L: Low importance/impact.

[1] This figure only includes functional and reduced-functional drains.

[2] This figure is estimated and represents the extent of trees across entire high bog

n/a: not applicable, n/av: not available

Peat cutting

This activity has taken place at 43 locations: along the southwest (7 locations (plots)), northwest (1 location), northeast (6 locations) and southeast (7 location) sections of western larger high bog section, and 21 location around the eastern smaller high bog in the 2004-2010 period, as well as one location on the north cutover between both high bog section (E168064/N274044). This has reduced the area of high bog by 2.25ha. The loss of high bog from peat cutting is calculated using aerial photography. As aerial photography is not available post 2010, it cannot be ruled out that cutting may have taken place in additional locations in the 2011-2013 period. Further high bog may therefore have been lost and the figure quoted should be considered a minimum value.

This activity is considered to have a high direct importance/impact on Degraded Raised Bog, Active Raised Bog and *Rhynchosporion* depressions habitats and a medium indirect importance/ impact on Bog woodland habitat. The continuation of these peat cutting will prevent the recovery of the high bog, and the recovery of ARB towards FRVs as restoration works cannot be employed until such activities stop. Old face banks and high bog and cutover drainage associated with past cutting continue to cause negative impacts on the high bog habitats.

Drainage

High bog drainage

Table 6.2 shows a slight decrease in functional drainage as a result of natural infilling of unblocked drains. The majority of drains in the high bog remain functional (6.968km). Functional and reduced functional drains are still impacting on high bog habitats and will continue to do so until they are blocked and become completely in-filled and thus non-functional.

High bog drainage is considered to have high importance/impact on Active Raised Bog and Degraded Raised Bog and medium importance/ impact on Bog woodland and *Rhynchosporion* depressions habitats.

Table 6.2 High bog drainage summary

Status	2004 (km) [1]	2013 (km)	Change
NB: functional	6.968	5.760	(-)1.208
NB: reduced functional	2.029	3.237	(+)1.208
NB: non- functional	3.157	3.157	0.000
B: functional	0.000	0.000	0.000
B: reduced functional	0.000	0.000	0.000
B: non- functional	0.000	0.000	0.000

B: Blocked; NB: Not blocked n/a: not applicable

[1] High bog drainage has been revised (e.g. re-digitised in cases) and figures above may vary slightly from those given by Fernandez *et al*. (2005)

Table 6.3 below provides a more detailed description of the drainage present on the high bog at Corliskea, including any change in drain functionality in the 2004 – 2013 reporting period (see Map 3).

Table 6.3 High bog drainage detail

Drain Name	Length (km)	2004 status	2013 status	Change	Comment
bA	0.697	NB: functional	NB: functional	No	Drain complex
bB	0.631	NB: non-functional	NB: non- functional	No	
bC	0.551	NB: functional	NB: reduced functional	Yes	Western drain of these two drains
bC	0.509	NB: functional	NB: functional	No	Eastern drain of these two drains
bD	0.099	NB: functional	NB: functional	No	
bD2	0.089	NB: reduced functional	NB: reduced functional	No	
bD3	0.218	NB: reduced functional	NB: reduced functional	No	Drain already present in 2004/5 but not mapped
bE	0.355	NB: functional	NB: functional	No	Inner sections of drain reduced functional
bF	0.355	NB: functional	NB: functional	No	Inner sections of drain reduced functional
bG	1.949	NB: non-functional	NB: non- functional	No	
bG	0.154	NB: reduced functional	NB: reduced functional	No	North-eastern section of drain was wrongly classified as non-functional in 2004
bG1	0.153	NB: functional	NB: functional	No	Drain wrongly classified as reduced-functional in 2004
bH	0.190	NB: functional	NB: functional	No	This drain is particularly large (1.5m wide x 0.75m deep) and drains the open water area on the high bog
bJ	0.424	NB: functional	NB: functional	No	
bR1-4	0.183	NB: functional	NB: functional	No	Drain complex
bS	0.036	NB: functional	NB: functional	No	Drain already present in 2004/5 but not

Drain Name	Length (km)	2004 status	2013 status	Change	Comment
					mapped
bT	0.054	NB: reduced functional	NB: reduced functional	No	””
bV	0.072	NB: reduced functional	NB: reduced functional	No	””
bW	0.202	NB: reduced functional	NB: reduced functional	No	””
bX	0.069	NB: reduced functional	NB: reduced functional	No	””
bY1-6	0.292	NB: reduced functional	NB: reduced functional	No	Drain complex already present in 2004/5 but not mapped
bZ1-2	0.824	NB: functional	NB: functional	No	””
DO	0.516	NB: functional	NB: functional	No	””
DP	0.393	NB: functional	NB: functional	No	Two drains
DP	0.178	NB: reduced functional	NB: reduced functional	No	Western drain of these two drains was wrongly classified as non-functional in 2004; eastern drain already present in 2004/5 but not mapped
b2A	0.097	NB: functional	NB: functional	No	Northern drains of this series of drains remain functional
b2A	0.147	NB: functional	NB: reduced functional	Yes	Middle drains of this series of drains now reduced functional
b2A	0.151	NB: reduced functional	NB: reduced functional	No	Southern drains of this series of drains remain reduced functional; drains already present in 2004/5 but not mapped
b2B	0.408	NB: functional	NB: functional	No	Drain complex
b2C	0.067	NB: reduced functional	NB: reduced functional	No	Drain wrongly classified as reduced functional in 2004
b2E	0.210	NB: non-functional	NB: non- functional	No	Inner section of drain non-functional
b2E	0.234	NB: reduced functional	NB: reduced functional	No	Outer section of drain reduced functional. This section was wrongly mapped as non-functional in 2004
b3E	0.081	NB: reduced functional	NB: reduced functional	No	Drain already present in 2004/5 but not

Drain Name	Length (km)	2004 status	2013 status	Change	Comment
					mapped
b4E	0.168	NB: reduced functional	NB: reduced functional	No	Drain already present in 2004/5 but not mapped
b2H	0.510	NB: functional	NB: reduced functional	Yes	Drain complex
b2J	0.367	NB: non-functional	NB: non- functional	No	
b2K	0.028	NB: functional	NB: functional	No	
b2L	0.199	NB: functional	NB: functional	No	
b3L	0.142	NB: functional	NB: functional	No	Drain already present in 2004/5 but not mapped
b2M	0.087	NB: functional	NB: functional	No	
b2N	0.065	NB: functional	NB: functional	No	

Bog margin drainage

The cutover areas were not surveyed for drains during 2013.

Drains associated with either currently active or no longer active peat cutting are present along the entire cutover. These drains continue to drain the high bog and impacting on high bog habitats.

Drainage maintenance on the adjacent agriculture land took place in the 2004/5-2010 to the SW of sites (E168641/N273042 200m); W (E166212/N274302) 200m; and S (E167203/N273466) 200m and (E166838/N273432) 300m, as well as on cutover areas where cutting has continued in the reporting period.

Bog margin drainage is considered to have a low importance/impact on high bog habitats.

Fire history

Fernandez *et al*. (2005) stated that there had been no recent fires during the 1995 to 2004 reporting period. In the current survey there was evidence of extensive recent burning (burnt stems and regeneration of *Calluna vulgaris*, damaged *Sphagnum* and *Polytrichum strictum* hummocks, burnt trees and bare soil). An estimated 70.6ha (25.6%) of high bog showed signs of recent burning in the 2004-2013 reporting period.

Burning is considered to have medium importance/impact on high bog habitats.

Invasive species

In the 2004 survey, occasional saplings of the native species *Pinus sylvestris* were recorded in the eastern section of the high bog (spreading from the mixed woodland to the east) and frequent plants of the non-native invasive species *Rhododendron ponticum* (spreading from the cutover) (Fernandez *et al*., 2005). These were present in the 2013 survey but did not show signs of recent spread.

The non-native moss *Campylopus introflexus* was recorded occasionally from the high bog, mainly in the marginal ecotopes. However, it was also present in small amounts within the sub-central community complex 3 + P in **Sc3** and in the bog woodland **BW1**. These areas had been recently burnt, with bare peat suitable for *C. introflexus*. *Campylopus introflexus* may invade recently burnt areas and become more frequent on the high bog.

Invasive species are considered to have no impact on high bog habitats.

Afforestation and forestry management

Fernandez *et al*. (2005) reported a conifer plantation of *Pinus contorta* (4.19ha) within the SAC on the northern-western part of the high bog (E 166426 / N274420). This was present in 2013.

Fernandez *et al*. (2005) also reported an area of conifer plantation of *Pinus contorta* (7.5ha) on land adjacent to the SAC, on cutover to the SW of the high bog (E 166207 / N273449).

Both forestry plantations have drains associated with them and, due to their proximity to the edge of the high bog it is likely that they are impacting upon high bog habitats.

Afforestation on the high bog is considered to have high importance/impact on Active Raised Bog and medium on Degraded Raised Bog and *Rhynchosporion* depressions habitats. Afforestation on the cutover is considered to have low importance/ impact on Active Raised Bog, Degraded Raised Bog and *Rhynchosporion* depressions habitats.

Other impacting activities

No significant impacting activities were noted or recorded in 2013 impacting high bog habitats in the 2004-2013 reporting period.

Conservation activities

No conservation activities were noted or recorded in 2013 impacting high bog habitats in the 2004-2013 reporting period.

Conservation status assessment

The assessment of the conservation status of Annex I Active and Degraded Raised Bog and Bog Woodland is based on the following (a more detailed description of conservation status assessment methods is given within the methods section of the project's Summary Report (Volume 1):

AREA - comparison of current habitat area with favourable reference values and its change in the reporting period to assess trends.

STRUCTURE & FUNCTION - comparison of central ecotope and active flush area (i.e. the higher quality wetter vegetation communities) for Active Raised Bog, and marginal and face bank ecotope area (i.e. the lower quality and drier vegetation communities) for Degraded Raised Bog against favourable reference values to assess their status and changes in their area in the reporting period to assess their trend. Community complex descriptions were also taken into account to evaluate changes in ecotope quality together with an analysis of the indicators recorded in the quadrats.

FUTURE PROSPECTS - an assessment of the influence of current and future activities both negative and positive (e.g. restoration works) affecting these habitats. Future Prospects for Active and Degraded Raised Bog are assessed at status and trend level based on the prospects for the habitat to reach favourable reference values in a two reporting period (12 years).

Active Raised Bog (7110)

Area

There has been a large decrease (4.25ha) in the area of ARB on the site in the 2004- 2013 period (Table 8.1).

More comprehensive mapping in 2013 led to slight changes in some sub-central section and flush boundaries, as the mapping accuracy increased. This means that some sections (**Sc5**, **Sc7, Sc10** and flush **FW**) changed slightly in area, but have actually been stable during the reporting period 2004 to 2013.

There were several new areas of sub-central ecotope mapped in 2013 that were the result of more comprehensive mapping. **Sc11** (0.18ha) and **Sc13** (1.97ha) were not comprehensively surveyed in 2004 and there may also have been some re-interpretation of vegetation in 2013. In addition there

were two areas that were newly mapped in 2013 as a result of the fragmentation of former sub-central areas: **Sc10** (1.04ha) and **Sc12** (0.45ha).

There were also several new areas of active flush mapped in 2013. A large section of the area formerly mapped as **Sc3** was mapped as active flush **FT** in 2013. This was due to more comprehensive surveying and re-interpretation of the vegetation. There were active flush points mapped in this area in 2004, but most of the active flush had been included within sub-central area **Sc3**. Active flush **Z1** was mapped as inactive flush in 2004. In 2004, only boundary points had been mapped for this area. The boundary of the flush is slightly drier than the rest of the flush vegetation and this may have led to interpretation of the vegetation as inactive flush in 2004. In 2013 the centre of the flush was surveyed and *Sphagnum* cover was found to be high throughout (34-50%, locally increasing to 51-75%). This is therefore likely to be due to more comprehensive survey in 2013. A small area of inactive flush **FZ** (0.09ha) was also mapped as active flush in 2013 due to more comprehensive survey (there were no mapping points in this area in the 2004 survey).

The central area **C1** had decreased in size as a result of drying out processes associated with peat cutting. This led to a loss of 0.20ha of central ecotope to sub-central ecotope in 2013. There were also several sub-central areas where sub-central ecotope had degraded to sub-marginal ecotope (with a loss of ARB). This was mainly the result of drying out processes associated with peat cutting: **Sc1** (loss of 0.15ha of ARB) and **Sc2** (loss of 0.30ha of ARB); but high bog drainage and adjacent forestry were contributing factors in some areas: **Sc8** (loss of 0.30ha of ARB) and **Sc9** (loss of 0.30ha of ARB). A small area of **Sc3**, on the western boundary, has decreased in size due damage from recent burning (loss of 0.20ha of ARB).

Two areas have decreased in size and fragmented into smaller areas of sub-central ecotope. Former **Sc4** was mapped as **Sc4** and **Sc10** in 2013, with a loss of 1.0ha ARB and **Sc6** was mapped as **Sc6** and **Sc12** in 2013, with a loss of 2.00ha of ARB.

The favourable reference value (FRV) for Area is considered to be the sum of ARB (central, sub-central ecotopes and active flush) plus sub-marginal ecotope when the Habitats Directive came into force in 1994 (see table 8.4). Therefore, ARB Area FRV is 131.92ha (based on 1994/5 Kelly (1995) figures amended by Fernandez *et al.* (2005), see tables 8.1 and 8.3 below). This FRV is only approximate until further hydrological and topographical studies are carried out in order to assess the maximum potential capacity of the high bog to support ARB. The current habitat Area value (44.25ha) is 66.46% below the FRV. A current Area value more than 15% below FRV falls into the **Unfavourable Bad** assessment category.

A long-term (1994-2013) trend shows a decrease in the area of ARB at the site (19.41ha) (see table 8.1). A more recent and short-term trend analysis (9 years; 2004-2013) also shows a decrease of 4.25ha (-8.76%) of ARB. Therefore, the Area of ARB is given a **Decreasing** trend assessment.

The Area of Active Raised Bog at Corliskea Bog is assessed as Unfavourable Bad-Decreasing (see table 8.5).

Structure & Functions

The FRV for S&Fs is for at least half of the ARB area to be made up of central and active flush, i.e. the higher quality wetter vegetation communities. This value is 22.0ha (half of 44.0ha, the current area of ARB (excluding bog woodland)). The current value is 19.69ha, which is 11.03% below the FRV. A current central and active flush area value of 5 to 25% below the FRV falls into the **Unfavourable Inadequate** assessment category. It should be noted that although there were several large active flushes at Corliskea Bog, the active flush communities present were similar to sub-central complex 9/7/10, with flush species such as *Aulacomnium* palustre and *Polytrichum* strictum. This is not an example of the highest vegetation quality active flush communities (i.e. soaks).

Both the long-term (1994/5-2013) and short-term (9 years; 2004-2013) trends indicate a decrease in the area of central ecotope and active flush (loss 0.2ha of central ecotope since 2004). This was also supported by quadrat analysis (former sub-central quadrat **Qsc2** was sub-marginal ecotope in 2013 (**Qsm1**)). Therefore the S&Fs are given a **Declining** trend.

Quadrat analysis (**Qsc1, Qsc3, Qsc4** and **Qsm1**) indicates the following:

Qsc1: There was slight variation in the quadrat data compared to 2004: The complex was described as **4/15** in 2004 but as **9/7/10** in 2013. This is likely to be due to re-interpretation of the vegetation and not actual change (*Rhynchospora alba* cover was 4-10% in both years). The ground was described as quaking in 2004, but very soft in 2013. Although total *Sphagnum* cover was 51-75% in both years, *Sphagnum* hummocks had slightly higher cover in 2013 (34-50% compared to 11-25% in 2004). This suggests that *Sphagnum* cover may have been at the higher end of the 51-75% range in 2013. Pools had similar *Sphagnum* cover in both years (11-25%), but were described as inter-connecting in 2004 and regular in 2013. Other differences in 2013 included higher cover of *Sphagnum papillosum* (11-25%, compared with 4-10% in 2004) and lower cover of *S. cuspidatum* (11-25%, compared with 26-33% in 2004). The cover of the hummock forming *S. capillifolium* showed a large increase in cover in 2013 (26-33%, compared with 1-3 in 2004) and *Calluna vulgaris* increased to 26-33% from 11-25% in 2004. There was an infilling drain to the north of the quadrat which may

have been the original location of the quadrat and mistakenly described as an interconnecting pool. The slight difference in location would account for the increase in lawn and hummock species in 2013 and decrease in pool *Sphagna.* The area around the quadrat was examined and it was considered that these changes were due to differences in quadrat positioning between 2004 and 2013 and not due to changes in the vegetation.

Qsm1: This quadrat was previously described as sub-central ecotope 7/9/10 but was described as sub-marginal ecotope 9/7 in 2013. The vegetation had declined in quality since 2004: the ground was described as very soft in 2004 but soft in 2013. The cover of regular pools had decreased in 2013 (cover of 25-33% in 2004, but only 4-10% in 2013) and overall *Sphagnum* cover decreased from 34-50% to 26-33%. There was no change in cover of the hummock forming *Sphagnum capillifolium* between 2004 and 2013, but the cover of the pool species *S. cuspidatum* and *S. papillosum* decreased in 2013. In 2013 the dominant pool *Sphagnum* was *S. papillosum*, not *S. cuspidatum* as in 2004. There was an increase in *Calluna vulgaris* in 2013 (51-75%, compared with 26-33% in 2004) and *Cladonia* cover (34-50%, compared with 11-25% in 2004). The hummock indicator *S. austinii* was present in the quadrat in 2004 but was not present either in the quadrat or adjacent vegetation in 2013. The changes in the vegetation in 2013 were considered to be due to drying out associated with peat cutting and drainage (e.g. to the east).

Qsc3: There was slight variation in the quadrat data compared to 2004: the vegetation had been described as 6/3/35 in 2004 but as 9/7 + P in 2013. Although the western indicators *Racomitrium lanuginosum* and *Campylopus atrovirens* were present in the vegetation in 2013, they were not prominent and *Carex panicea* was absent. The difference in classification was considered to be due to re-interpretation of the vegetation rather than actual change. The ground was described as quaking in 2013 (not very soft as in 2004). In 2004 the pools were described as tear pools (26-33%), but in 2013 pools were considered to be inter-connecting (11-25%). *Rhynchospora alba* and *Narthecium ossifragum* both had high cover in 2004 (11-25%) but had lower cover in 2013. In addition, *Calluna vulgaris* cover increased to 26-33% (from 4-10% in 2004) and there were slight changes in *Sphagnum* species composition (increase in *S. cuspidatum* and *S. papillosum*) and a decrease in *S. denticulatum* and *S. capillifolium*. However, overall *Sphagnum* cover was the same in 2004 and 2013 (51-75%). The vegetation in 2013 was considered to be of almost central ecotope quality but was surrounded by sub-central ecotope. *Sphagnum fuscum* was present in adjacent vegetation. The area around the quadrat was examined and it was considered that these changes were due to differences in quadrat positioning between 2004 and 2013 and not due to changes in the vegetation.

Qsc4: There was slight variation in the quadrat data compared to 2004: the vegetation had been described as 9/7/10 + P in 2004, but as 3 + P in 2013. *Sphagnum* cover was similar in both years (35-50%), but *Carex panicea* cover was 4-10% in 2013 (not noted in 2004). *Cladonia* cover was higher in 2013 (26-33%, compared with 4-10% in 2004) suggesting that the area has not been recently burnt (which can lead to an increase in *Carex panicea*). The difference in classification was considered to be due to re-interpretation of the vegetation rather than actual change. The pools were described as regular pools in both years, but had lower cover in 2013 (4010%, compared with 11-25% in 2004). *Rhynchospora alba* and *Narthecium ossifragum* both had moderate cover in 2005 (4-10%) but lower cover in 2013. In addition, *Calluna vulgaris* cover increased to 26-33% (from 11-25% in 2004) and there were slight changes in *Sphagnum* species composition (decrease in *S. magellanicum*, *S. cuspidatum, S. papillosum* and *S. denticulatum*). The decrease in these *Sphagnum* species seemed to be related to the cover of *Sphagnum* pools. The area around the quadrat was examined and it was considered that these changes were due to differences in quadrat positioning between 2004 and 2013 and not due to changes in the vegetation.

Typical good quality indicators and typical plant species are still found in central and sub-central vegetation throughout the entire bog. However, there was a decline in habitat quality in one sub-central area and there has been a short and long term decline in the area of central and active flush ecotopes.

The Structure & Functions of Active Raised Bog at Corliskea Bog are assessed as Unfavourable Inadequate-Declining (see table 8.5).

Future Prospects

Overall there has been a large decrease in Area (4.25ha) and decline in S&Fs of ARB.

There is no restoration work currently being undertaken on the high bog and drying out due to extensive peat cutting, drainage and forestry are ongoing negative impacts at the site. It is therefore likely that the ARB at this site will continue to deteriorate in Area and S&Fs in the future.

To restore ARB bog on this site, cessation of peat cutting will be necessary and blocking of functional and reduced functional drains on the high bog, including those associated with the conifer plantations. The two functional parallel drains **bE** and **bF** drain **Sc2** and **C1** and blocking these drains will be important to prevent further declines to these ARB areas. In addition, some of the linear flushes (e.g. flush **FZ**) appear to act as drains and may in part have been created by past drain creation on the high bog. Drain **bJ** is also partly associated with flush **FZ**. Hydrological studies are required to determine whether any of these flushes should be considered as functional

drains that require blocking to aid restoration of ARB. Drains associated with cutover and forestry on the eastern section of the bog (e.g. drains **b2E**, **bD3** and **bD2**) are likely to be having a negative impact on **Sc8** and should be considered a priority for drain blocking.

It is also recommended that the two forestry plantations, on the high bog in the NW and on the cutover in the SW, be removed.

Cutover areas will also play a role in the restoration of ARB on this site, as the extent of previous cutting of the high bog margin may make it difficult to regenerate previous ARB values on the high bog alone. There is potential for restoration of cutover along the N, SW, SE, NE and middle section (between the two high bog sections).

Habitat **Area** is currently 66.46% below FRV (see table 8.4) and a Decreasing trend is foreseen due to the overriding influence of negatively impacting activities. The habitat Area is expected to be more than 15% below FRV in the following two reporting periods (12 years). Thus, habitat's **Area Future Prospects** are assessed as **Unfavourable Bad-Decreasing**. Habitat's **S&Fs** are currently 11.03% below FRV (see table 8.4) and a Declining trend is also foreseen. Therefore S&Fs are expected to be 5 to 25% below FRV in the following two reporting periods. **S&Fs Future Prospects** are assessed as **Unfavourable Inadequate-Declining**. **The overall habitat's Future Prospects are Unfavourable Bad-Declining** (see table 8.5). Blocking of reduced-functional and functional drains both on the high bog and cutover and cessation of peat cutting is necessary.

The overall conservation status of Active Raised Bog at Corliskea Bog is assessed as Unfavourable Bad-Declining (see table 8.5).

Table 8.1 Changes in Active Raised Bog area

Active Ecotopes	**1994**[1]	**2004**	**2004 (amended)**	**2013**	**Change (2004-2013)**	
	Area (ha)	**Area (ha)**	**Area (ha)**	**Area (ha)**	**Area (ha)**	**%**
Central	5.08	0.92	0.71	0.51	(-)0.20	(-)28.17
Sub-central	46.27	35.39	28.36	24.31	(-)4.05	(-)14.28
Active flush	9.85	9.85	19.18	19.18	0.00	0.00
Bog Woodland	0.25	0.25	0.25	0.25	0.00	0.00
Total	**61.45**	**46.41**	**48.5**	**44.25**	**(-)4.25**	**(-)8.76**

[1]These are the figures calculated from the vegetation map drawn by Kelly *et al.*, (1995) that was geo-referenced, digitised and in some cases adjusted as part of Fernandez *et al.* (2005) project.

Note: Table 8.1 includes 2004 figures and 2004 amended figures. The latter shows the ecotope area believed to be present in 2004 after surveying improvements in 2013. The comparison between 2004 (amended) and 2013 illustrates the actual changes in ecotope area in the 2004-2013 period. Any change in ecotope area between the 2004 and the 2004 (amended) values is due to improvement in mapping accuracy and/or the result of a more comprehensive survey in 2013 (see table 8.2 for further detail).

Table 8.2 Assessment of changes in individual Active Raised Bog areas

Area	Quadrats	Trend	Comment	Quadrats analysis
C1	None	Decreasing	This central ecotope has decreased as a result of drying out processes associated with peat cutting.	
Sc1	None	Decreasing	Southern section of this sub-central ecotope has decreased as a result of drying out processes associated with peat cutting	
Sc2	None	Decreasing	This sub-central ecotope has decreased on the NE margin as a result of drying out processes associated with peat cutting.	
Sc3	Qsc4	Decreasing	Slight changes in boundary (smaller). This change is the result of more comprehensive surveying in 2013, which resulted in more accurate mapping. However also re-interpretation of vegetation. Large sections of former Sc3 now mapped as active flush (FT). Western section of Sc3 declining in quality after a recent burn.	Re-classification of complex from 9/7/10 + P to 3 + P in 2013. Higher cover of *Cladonia, Calluna vulgaris* and *Carex panicea* in 2013 and lower cover of pools, *Rhynchospora alba* and *Narthecium ossifragum*. Slight changes in *Sphagnum* species composition. Changes due to differences in quadrat positioning and not actual vegetation change.
Sc4	None	Decreasing	The northern section of this sub-central ecotope has decreased as a result of drying out processes associated with peat cutting. Former Sc4 now consists of two separate SC ecotope areas (**Sc4** and **Sc10**).	
Sc5	None	Stable	Slight changes in boundary (larger). This change is the result of more comprehensive surveying in 2013, which resulted in more accurate mapping.	
Sc6	Qsm1	Decreasing	This sub-central ecotope has decreased as a result of drying out processes associated with peat cutting.	Qsm1 was former Qsc2. Qsc2 was previously described as sub-central ecotope 7/9/10 but was described as sub-marginal ecotope 9/7 in 2013. The vegetation had declined in quality since 2004 with lower pool and *Sphagnum* cover.

Area	Quadrats	Trend	Comment	Quadrats analysis
Sc7	Qsc3	Stable	Slight changes in boundary (smaller). This change is the result of more comprehensive surveying in 2013, which resulted in more accurate mapping.	Re-classification of complex from 6/3/35 to 9/7 + P in 2013. Higher cover of *Calluna vulgaris* and lower cover of *Rhynchospora alba* and *Narthecium ossifragum*. Slight changes in *Sphagnum* species composition. Changes due to differences in quadrat positioning and not actual vegetation change.
Sc8	Qsc1	Decreasing	The south-eastern and northern section of this sub-central ecotope have decreased in area and quality as a result of drying out processes associated with peat cutting.	Re-classification of complex from 4/15 to 9/7/10 in 2013. Higher cover of *Sphagnum papillosum, S. capillifolium* and *Calluna vulgaris* and lower cover of *S. cuspidatum*. Changes due to differences in quadrat positioning and not actual vegetation change.
Sc9	None	Decreasing	This sub-central ecotope has decreased as a result of drying out processes associated with adjacent forestry and drainage.	
Sc10	None	Decreasing	Slight changes in boundary. This change is the result of more comprehensive surveying in 2013 which, resulted in more accurate mapping. Former Sc4 now consists of two separate SC ecotope areas (**Sc4** and **Sc10**). Sc4 has decreased in extent due to drying out processes.	
Sc11	None	Unknown	This specific area was not comprehensively surveyed in 2004/5. This is likely to be the result of more comprehensive surveying in 2013, which resulted in more accurate mapping. However also and re-interpretation of vegetation.	
Sc12	None	Decreasing	This sub-central ecotope has decreased as a result of drying out processes associated with peat cutting. **Sc12** was part of former **Sc6**.	
Sc13	None	Unknown	This specific area was not comprehensively surveyed in 2004/5. This is likely to be the result of more comprehensive surveying in 2013, which resulted in more accurate mapping.	
Bw1	None	Stable	No changes in habitat boundary.	
FT	None	Stable	Changes in boundary (larger). This change is the result of more comprehensive surveying in 2013, which resulted in more accurate	

Area	Quadrats	Trend	Comment	Quadrats analysis
			mapping. However, there was also re-interpretation of the vegetation and large sections of former Sc3 now mapped as active flush (FT).	
FW	None	Stable	Slight changes in boundary. This change is the result of more comprehensive surveying in 2013 which resulted in more accurate mapping.	
FZ	None	Unknown	This is a small area of active flush within FZ that was mapped as inactive previously. This is likely to be due to more comprehensive surveying in 2013.	
Z1	None	Stable	This active flush was previously mapped as inactive. This is the result of re-interpretation of vegetation, but also more comprehensive surveying in 2013.	

Degraded Raised Bog (7120)

Area

The Degraded Raised Bog FRV for Area is 144.11ha at Corliskea Bog. This value corresponds with the difference between the current high bog area (276.03ha) and the Active Raised Bog FRV (131.92ha) for area. Degraded Raised Bog is a particular habitat type, for which a FRV smaller than the current value may be desirable in many sites. However any decrease in habitat area would only be considered positive, when it is the result of restoration to Active Raised Bog. Current habitat area is 60.76% bigger than FRV and therefore the habitat Area is given an **Unfavourable Bad** assessment (see table 8.4).

The un-adjusted area figures for 2004 in table 8.3 show that there was a large increase in sub-marginal ecotope and decrease in marginal ecotope from 2004 to 2013. Sub-marginal ecotope is now found to be dominating some areas that were previously mapped as marginal ecotope. However, most of this was due to more comprehensive surveying in 2013 and re-interpretation of the vegetation (e.g. in the SE lobe of the western high bog section). This has been taken into account in the 2004 (amended) figures in table 8.3.

Table 8.3 indicates that there has been an overall increase (2.0ha) in the area of Degraded Raised Bog since 2004. This increase is the result of loss of Active Raised Bog (sub-central ecotope degrading to sub-marginal ecotope (leading to an increase of 4.25ha of DRB) and a high bog loss of 2.25ha (0.28ha of facebank ecotope and 1.97ha of marginal ecotope) caused by peat cutting.

The long-term (1994-2013) trend also shows an increase in the area of DRB at the site (18.26ha), despite losses to peat cutting during this period (see table 8.1). Therefore, the Area of DRB is given an **Increasing** trend assessment. This should be taken as negative as indicates Active Raised Bog losses and thus drying out processes within the high bog.

The Area of Degraded Raised Bog at Corliskea Bog is assessed as Unfavourable Bad-Increasing (see table 8.5).

Structure & Functions

The FRV for S&Fs is for a maximum 25% of the Degraded Raised Bog area to be made up of marginal and face bank, i.e. the lower quality and drier vegetation communities. This value is 57.92ha (25% of 231.67ha, the current area of Degraded Raised Bog). The current marginal and face bank ecotopes area value (105.61ha) is 82.35% above the FRV (in the particular case of Degraded Raised Bog a current area value equal or smaller than FRV is desirable) (see Table 8.4). A current value more than 25% above FRV falls into the **Unfavourable Bad** assessment category.

S&Fs trend is assessed based on actual changes within marginal and face banks ecotope (e.g. decreases due to rewetting processes or increases as a result of further drying out). Table 8.3 shows a decrease in the area of marginal ecotope (1.97 ha) and face bank of 0.28ha caused by loss due to peat cutting. Thus, the DRB's S&Fs at Corliskea Bog are given a **Stable** trend.

The mapping of boundary between marginal and sub marginal is difficult and decreases are only recorded where major changes in the vegetation are evident. Therefore, where no changes are shown, more subtle negative effects cannot be ruled out, and therefore negative changes may have been underestimated. The basic assumption is that were peat cutting has taken place subsidence will occur and will continue for some decades and this will dry out the adjacent areas of the bog.

Typical good quality indicators and typical plant species are still found throughout the entire bog on sub-marginal ecotope.

The Structure & functions of Degraded Raised Bog at Corliskea Bog are assessed as Unfavourable Bad-Stable (see table 8.5).

Future Prospects

Degraded Raised Bog has decreased as result of peat cutting and will continue to decrease unless there is a cessation of peat cutting. Furthermore, drainage on the high bog continues to damage the habitat and to hinder its recovery to FRVs, as well as minimising the chances to convert face bank

and marginal ecotope into sub-marginal and/or Active Raised bog. Habitat's S&Fs are likely to decline if these negatively impacting activities continue. There are no current restoration measures, which would contribute towards decreasing the area of DRB.

Habitat **Area** is currently 60.76% above FRV (see table 8.4) and a Decreasing trend is expected in the following two reporting periods (12 years). As a result habitat Area is expected to remain more than 15% above FRV. Thus, habitat's **Area Future Prospects** are assessed as **Unfavourable Bad-Decreasing**. Habitat's **S&Fs** are currently 82.35% above FRV (see table 8.4). A Declining trend is foreseen in the following two reporting periods, **S&Fs** are expected to remain more than 25% above FRV. Thus, habitat's **S&Fs Future Prospects** are assessed as **Unfavourable Bad-Declining**.

Therefore the Future Prospects for Degraded Raised Bog are considered to be Unfavourable Bad-Declining (see table 8.5).

The overall conservation status of Degraded Raised Bog at Corliskea Bog is assessed as Unfavourable Bad-Declining (see table 8.5).

Table 8.3 Changes in Degraded Raised Bog area

Inactive Ecotopes	**1994**[1]	**2004**	**2004 (amended)**	**2013**	**Change (2004-2013)**	
	Area (ha)	**Area (ha)**	**Area (ha)**	**Area (ha)**	**Area (ha)**	**%**
Sub-marginal	70.47	90.85	106.64	110.89	(+)4.25	(+)3.99
Marginal[2]	100.54	109.46	97.89	95.92	(-)1.97	(-)2.01
Face bank[2]	na	4.45	9.97	9.69	(-)0.28	(-)2.81
Inactive flush	36.85	14.94	10.98	10.98	0.00	0.00
Conifer plantation	5.66	4.54	4.19	4.19	0.00	0.00
Open water[3]	na	0.11	0.11	0.11	0.00	0.00
Total	**213.52**	**224.35**	**229.78**	**231.78**	(+)**2.00**	(+)**0.87**

[1]These are the figures calculated from the vegetation map drawn by Kelly *et al.*, (1995) that was geo-referenced, digitised and in some cases adjusted as part of Fernandez *et al.* (2005) project.

[2] Any 2013 marginal and face bank ecotope value given within the report should be taken as a maximum value. Their extent is based on the 2013 habitat survey and 2010 aerial photographs. It cannot be ruled out that further marginal and/or face bank ecotope losses may have taken place at the margin of the high bog in the 2011-2013 period associated with peat cutting.

[3] Open water is not counted as part of Degraded Raised Bog.

Note: Table 8.3 includes 2004 figures and 2004 amended figures. The latter shows the ecotope area believed to be present in 2004 after surveying improvements in 2013. The comparison between 2004

(amended) and 2013 illustrates the actual changes in ecotope area in the 2004-2013 period. Any change in ecotope area between the 2004 and the 2004 (amended) values is due to improvement in mapping accuracy and/or the result of a more comprehensive survey in 2013.

Depressions on peat substrates of the Rhynchosporion (7150)

Rhynchospora alba depressions are found across the entire bog in both Active and Degraded Raised Bog. The species is more frequently found and reaches its finest quality associated within wet features (*Sphagnum* pools, lawns and hollows) on Active Raised Bog.

The physical structure and distribution of the habitat across large sections of the high bog makes the process of calculating its area unfeasible and as a consequence makes the process of calculating realistic FRVs unfeasible. Thus, the assessment of the habitat Area conservation status is indirectly based on the assessment of Active Raised Bog habitat Area (a favourable assessment indicates that all sub-marginal ecotope has turned Active Raised Bog). The habitat Area is given an **Unfavourable Bad** assessment.

The Area trend assessment is based on the variation on Active Raised Bog and sub-marginal ecotope within Degraded Raised Bog in the reporting period. The area of Active Raised Bog decreased by 4.25ha (8.76%) in the reporting period. This was the result of a decrease in sub-central vegetation in both the western and eastern high bog sections (**Sc1**, **Sc2**, **Sc3**, **Sc4**, **Sc6**, **Sc8** and **Sc9**). The sub-central vegetation in **Sc5**, **Sc7**, **Sc8**, **Sc9** and **Sc11** supported the highest frequency of *R. alba* depressions (in sub-central community complexes **4 + P**, **3/35** and **9/7/10**), but they were present in all sub-central areas. There was an increase in sub-marginal ecotope (4.25ha), due to the loss of ARB, but the sub-marginal complexes did not support frequent *R. alba* depressions at this site. Therefore there was an overall decrease in habitat suitable to support *R. alba* depressions of ca. 4.25% (8.76%). As result habitat Area is given a **Decreasing** trend.

The habitat's Area Future Prospects status is equally based on the Active Raised Bog Area Future Prospects status assessment and the Area Future Prospects trend is based on the trend expected for Active Raised Bog and sub-marginal ecotope in the following two reporting periods. Impacting activities such as peat cutting, burning, extensive drainage and forestry on adjacent land continue to threaten Active and Degraded Raised Bog. Therefore, the habitat's Area Future Prospects are given an **Unfavourable Bad**-**Decreasing** assessment.

The S&Fs conservation assessment is also indirectly based on the Active Raised Bog S&Fs status and trend assessments, as Active Raised Bog supports the finest habitat quality type. Therefore, the habitat's S&Fs are given an **Unfavourable Inadequate**-**Declining** assessment.

The habitat's S&Fs Future Prospects status and trend are equally based on the Active Raised Bog S&Fs Future Prospects status and trend assessments in the following two reporting periods. Therefore, the habitat's S&Fs Future Prospects are given an **Unfavourable Inadequate-Declining** assessment.

The overall habitat's Future Prospects assessment is Unfavourable Bad-Declining.

The conservation status of depressions on peat substrates of the Rhynchosporion at Corliskea Bog is assessed as Unfavourable Bad-Declining (see table 8.5).

Bog Woodland (91D0)

Area

The favourable reference value (FRV) for Area is 0.25ha at Corliskea Bog. The FRV corresponds with the area of this habitat present when the Habitats Directive came into force in 1994 (see table 8.4) and therefore the Kelly *et al*. (1995) value. The current area is 0.25ha and therefore 0% below FRV. A current habitat area value of 0 – 5% below the FRV falls into the **Favourable** assessment category.

The area of Bog Woodland has not changed in the reporting period (see table 8.1). The long-term (1994-2013) has also been Stable (no change in area). Therefore the habitat Area is given a **Stable** trend assessment.

The Area of Bog Woodland at Corliskea Bog is assessed as Favourable-Stable (see table 8.5).

Structure & Functions

The FRV for S&Fs is assessed based on the one monitoring stop assessment in 2013 (see Appendix III). Given the small area of the bog woodland (0.25ha) it was not possible to undertake more than one monitoring stop.

Although the monitoring stop passed on the combined positive, negative indicator species and structural data assessment, it failed on structure at canopy height (too low) and shrub cover (too high). The monitoring stop also passed at *Betula pubescens* regeneration level but failed at overall dead wood (not of sufficient size) and *Betula pubescens* dbh distribution.

The bog woodland showed signs of recent burning and had high shrub cover (*Vaccinium myrtillus* 51-75%), but still had good regeneration of *Betula pubescens.* The canopy only contained *Betula pubescens*; hence there was no native tree regeneration. This is a small area of Bog Woodland (0.25ha) and dead wood was frequent on the ground. However the trees are quite small and so did

not reach the height and size required for live trees and dead wood. Apart from some recent burning, the woodland appeared to be in good condition, with frequent dead wood and high ground cover of bryophytes (26-33% *Sphagnum* cover).

The Bog Woodland was described as having trees of *Betula pubescens* up to 10m tall in 2004, but it is presumed that this was an error as there is no sign that trees of this size were formerly present. In 1994, trees up to 8m tall were also recorded at the edge of the wood (which was described as a wooded flush). However, the trees were described as being up to 5m tall in the centre of the woodland. The species composition described in both former surveys was similar to the 2013 survey, abundant bryophytes and shrubs.

Although the monitoring stop failed the assessment, the bog appeared to be in good condition for its size and type, with regeneration of *Betula pubescens* and frequent small diameter fallen dead wood. Given these considerations and the fact that the species composition and structure appears to have changed little since 1994, the habitat's S&Fs are therefore given a **Favourable-Stable** assessment.

The Structure & Functions of Bog Woodland at Corliskea Bog are assessed as Favourable-Stable (see table 8.5).

Future Prospects

Impacting activities such as peat cutting, drainage and afforestation on adjacent land are threatening Active and Degraded Raised Bog. The Bog Woodland showed signs of recent burning although there was still good ground flora cover and positive indicator species. The Bog Woodland is located to the north of the site and near to the northern margin. Its location within a flush may be isolating the woodland from the drying out processes that are affecting the sub-central vegetation to the east (**Sc6**). However, with continued impacts from drainage and peat cutting, there is likely to be future drying out of the Bog Woodland and potential increase in sensitivity to fire damage. It is important to reduce the frequency and intensity of fire events to minimise the impact on the area of Bog Woodland.

Habitat **Area** is currently equal to the FRV (see table 8.4) and a Decreasing trend is foreseen in the following two reporting periods (12 years). The habitat Area is expected to be 5% - 15% below FRV below FRV in the following two reporting periods. Thus, habitat's **Area Future Prospects** are assessed as **Unfavourable Inadequate-Decreasing**. Habitat's **S&Fs** are also considered to be threatened as drying out processes continue. Thus although FRVs have not been set for the habitat's S&Fs, this attribute Future Prospects are assessed as **Unfavourable Inadequate-Declining**.

Therefore, the Future Prospects for Bog Woodland are considered to be Unfavourable Inadequate-Declining (see table 8.5).

The overall conservation status of Bog Woodland at Corliskea Bog is assessed as Unfavourable Inadequate-Declining (see table 8.5).

Table 8.4 Habitats favourable reference values

Habitat	Area Assessment			Structure & Functions Assessment		
	FRV Target (ha) [1]	2013 value (ha) [2]	% below target	FRV 2013 Target (ha) [3]	2013 value (ha) [4]	% below target
7110	131.92	44.25	66.46	22.13	19.69	11.03

[1] 1994 central, sub-central, active flush, bog woodland and sub-marginal ecotope area.

[2] 2013 central, sub-central ecotope, active flush and bog woodland area.

[3] Half of the current central, sub-central ecotope and active flush area. The target is that the area of the highest vegetation quality (i.e. central ecotope and active flush) should be at least this figure.

[4] 2013 central ecotope and active flush area.

	FRV Target (ha) [5]	2013 value (ha) [6]	% above target	FRV 2013 Target (ha) [7]	2013 value (ha) [8]	% above target
7120	144.11	231.67	60.76	57.92	105.61	82.35

[5] Current high bog area minus 7110 area FRV.

[6] 2013 Degraded Raised Bog area.

[7] 25% of the current Degraded Raised Bog habitat area. The target is that the extent of marginal and face bank ecotopes should not be larger than 25% of the current Degraded Raised Bog habitat area.

[8] Current marginal and face bank ecotopes area.

	FRV Target (ha)	2013 value (ha)	% below target	FRV Target (ha)	2013 value (ha)	% change
91D0	0.25	0.25	0.00	na	na	na

na: not applicable

As table 8.5 below indicates, each individual EU habitat present on the high bog has been given the following overall conservation status assessment based on the three main parameters (Area, S&Fs and Future Prospects) individual assessments:

- **Active Raised Bog is assessed as being Unfavourable Bad–Declining.**
- **Degraded Raised Bog is assessed as being Unfavourable Bad–Declining.**
- **Rhynchosporion depressions is assessed as being Unfavourable Bad–Declining.**
- **Bog Woodland is assessed as being Unfavourable Inadequate–Declining.**

Table 8.5 Habitats conservation status assessments

Habitat	Area Assessment	Structure & Functions Assessment	Future Prospects Assessment	Overall Assessment

7110	Unfavourable Bad-Decreasing	Unfavourable Inadequate-Declining	Unfavourable Bad-Declining	Unfavourable Bad-Declining
7120	Unfavourable Bad-Increasing	Unfavourable Bad-Stable	Unfavourable Bad-Declining	Unfavourable Bad-Declining
7150	Unfavourable Bad-Decreasing	Unfavourable Inadequate-Declining	Unfavourable Bad-Declining	Unfavourable Bad-Declining
91D0	Favourable - Stable	Favourable-Stable	Unfavourable Inadequate-Declining	Unfavourable Inadequate-Declining

Conclusions

Summary of impacting activities

- Peat cutting still continues at the site and has taken place at 43 locations in the 2004-2013 reporting period. 2.25ha of high bog have been lost in this period due to peat cutting. Cutting is particularly intense along the southwest, northwest, northeast and southeast sections of western larger high bog section and most margins of the eastern smaller bog section.
- 5.760km of drains on the high bog remain functional and 3.237km reduced functional. Most of these are associated with the former peat exploitation but some are associated with adjacent and high bog afforestation. Functional and reduced functional drains are still impacting on high bog habitats and will continue to do so until they are blocked and become completely in-filled and thus non-functional.
- In the current survey there was evidence of extensive recent burning and an estimated 70.6ha (25.6%) of high bog showed signs of recent burning in the 2004-2013 reporting period.
- The problematic native species *Pinus sylvestris* and non-native invasive species *Rhododendron ponticum* and *Campylopus introflexus* were present occasionally on the bog, but are considered to have no impact on high bog habitats.
- There is one conifer plantation on the high bog (NW) and one conifer plantation adjacent to the SAC (on cutover to the SW of the high bog). Both are considered to likely to have a negative impact on high bog habitats.

Changes in active peat forming areas

- There has been a large decrease (4.25ha) in the area of ARB on the site. There has also been a decrease in habitat quality within the site. Central area **C1** and sub-central areas **Sc1**, **Sc2 Sc3**, **Sc8** and **Sc9** were reduced in size and two sub-central areas were fragmented into two smaller areas: **Sc4** (mapped as **Sc4** and **Sc10**) and **Sc6** mapped as **Sc6** and **Sc12**).
- More comprehensive mapping in 2013 led to slight changes in some sub-central section and flush boundaries, as the mapping accuracy increased. This means that some sections (**Sc5, Sc7, Sc10** and flush **FW**) changed slightly in area, but have actually been stable during the reporting period 2004 to 2013.
- There were several new areas of sub-central ecotope mapped in 2013 that were the result of more comprehensive mapping: **Sc11** and **Sc13**. Two areas that were newly mapped in 2013 as a result of the fragmentation of former sub-central areas were: **Sc10** and **Sc12**.
- There were several new areas of active flush mapped due to more comprehensive surveying and re-interpretation of the vegetation: a large section of the area formerly mapped as **Sc3** was mapped as active flush **FT** in 2013 and two areas formerly mapped as inactive flush (flush **Z1** and a small area of active flush **FZ**) were mapped as active flush in 2013.

Other changes

- None

Quadrat analysis

- Quadrat **Qsc1**: Re-classification of complex from 4/15 to 9/7/10 in 2013. Higher cover of *Sphagnum papillosum, S. capillifolium* and *Calluna vulgaris* and lower cover of *S. cuspidatum*. Changes due to differences in quadrat positioning and not actual vegetation change.
- Quadrat **Qsc3:** Re-classification of complex from 6/3/35 to 9/7 + P in 2013. Higher cover of *Calluna vulgaris* and lower cover of *Rhynchospora alba* and *Narthecium ossifragum*. Slight changes in *Sphagnum* species composition. Changes due to differences in quadrat positioning and not actual vegetation change.
- Quadrat **Qsc4:** Re-classification of complex from 9/7/10 + P to 3 + P in 2013**.** Higher cover of *Cladonia, Calluna vulgaris* and *Carex panicea* in 2013 and lower cover of pools, *Rhynchospora alba* and *Narthecium ossifragum*. Slight changes in *Sphagnum* species composition. Changes due to differences in quadrat positioning and not actual vegetation change.

- Quadrat **Qsm1:** Qsm1 was former Qsc2. Qsc2 was previously described as sub-central ecotope 7/9/10 but was described as sub-marginal ecotope 9/7 in 2013. The vegetation had declined in quality since 2004 with lower pool and *Sphagnum* cover.

Restoration works

- No restoration works have been carried out at the site.

Summary of conservation status

- **Active Raised Bog** has been given an **Unfavourable Bad-Declining** conservation status assessment at Corliskea Bog. There has been a decline in the area of ARB (4.25ha) and a decline in habitat quality (S&Fs). Area and S&Fs are below the FRVs. No restoration works have been undertaken to date and peat cutting, afforestation, burning and drainage still impact the site. Therefore the Future Prospects are Unfavourable Bad-Declining.
- **Bog Woodland** has been given an **Unfavourable Inadequate – Declining** conservation status at Corliskea Bog. Habitat Area has not changed in the reporting period and is 100% of the FRV. Although some aspects of the habitat S&Fs failed the monitoring stop, the Bog Woodland was considered to be in good condition for its size and type. Therefore Area and S&Fs were considered to be **Favourable-Stable**. However, with continued impacts to adjacent high bog from drainage and peat cutting, there is likely to be future drying out of the woodland and potential increase in sensitivity to fire damage. Therefore the Future Prospects for the Bog Woodland are considered to be **Unfavourable Inadequate-Declining**.
- **Degraded Raised Bog** has been given an **Unfavourable Bad-Declining** conservation status. Habitat Area has decreased due to losses associated with peat cutting (2.25ha), but increased (4.25ha) due to degradation of ARB to DRB. This gives an overall increase in DRB of 2.0ha and habitat area is above the FRV. The short and long-term trend is for an increase in DRB. S&Fs have remained Stable. Due to continued peat cutting, afforestation and high bog drainage, the Future Prospects of DRB are considered to be Unfavourable Bad-Declining.
- **Depressions on peat substrates of the Rhynchosporion** has been given an **Unfavourable Bad-Declining** conservation status at Corliskea Bog. The area of Active Raised Bog decreased by 4.25ha in the reporting period. As there has been a decrease of ca. 8.76% in habitat suitable to support *R. alba* depressions, habitat Area has decreased and quality declined in the reporting period. Impacting activities such as peat cutting, burning,

extensive drainage and forestry on adjacent land are threatening Active and Degraded Raised Bog. Therefore the Future Prospects are considered Unfavourable Bad-Declining.

The **conservation status** of the **overall raised bog** at **Corliskea SAC** is assessed as being **Unfavourable Bad-Declining**.

Recommendations

- **Cessation of peat cutting.**
- **Assessment of the actual impact of forestry** both on and adjacent to the high bog.
- **Restoration works** including blocking of remaining high bog reduced-functional and functional drains, as well as cutover drains.
- Undertake measures to **reduce the frequency and intensity of fire events**.
- **Further hydrological and topographical studies** to ascertain the capacity of the high bog to support Active Raised Bog and thus estimate a more accurate favourable reference value.
- **Further botanical monitoring surveys** on the high bog in order to assess change in habitat's conservation status. If restoration works are undertaken on the cutover areas then these should be included in future botanical monitoring surveys.
- **Further restoration works are recommended** including the restoration of suitable cutover areas adjacent to the high bog.

References

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Appendix I Detailed vegetation description of the high bog

Active Raised Bog (7110)

Central Ecotope Complex

COMPLEX 15

- **Location**: within **C1** (**Sc2**) in western high bog section of the site
- **Ground**: very soft to quaking
- **Physical indicators**: <4%
- ***Calluna* height**: 11-20cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: flat to gentle slope
- **Pools**: interconnecting pools 26-33%
- ***Sphagnum* cover**: 36-50%
- ***Narthecium* cover**: <4%
- **Micro- topography**: Low hummocks, pools and flats
- **Tussocks**: absent
- **Degradation or regeneration evidence**: recently burnt
- **Species cover**: *Calluna vulgaris* (11-25%), *Eriophorum angustifolium* (5-10%), *Eriophorum angustifolium* (<4%), *Trichophorum germanicum* (<4%), *Sphagnum capillifolium* (11-25%), *S. cuspidatum* (5-10%), *S. papillosum* (11-25%), *S. denticulatum* (<4%), *S. fuscum* (<4%), *S. tenellum* (<4%), *Racomitrium lanuginosum* (<4%), *Carex panicea* (<4%), *Cladonia portentosa* (11-25%), *C. uncialis* (<4%).
- **Additional comments**: This area has been recently burnt (last few years) with burnt *Calluna*, stems, regenerating *Calluna*, damaged *Sphagnum* hummocks and low *Cladonia* cover. The overall *Sphagnum* cover was lower than in 2004 (70%) and was a maximum of 50%. Due to the burnt vegetation, it was difficult to map the central ecotope. Some areas were similar to sub-central ecotope (community complexes 3+P or 3/10) but were too small to exclude. These areas had reduced *Sphagnum* lawns and pool *Sphagna* cover, higher cover of *Carex panicea* and ground less quaking. The area to the south did not appear to have been burnt. An allowance was made for the burning damage to the *Sphagnum* layer and the area mapped as central ecotope was generous. Therefore the decrease in overall area is likely to be due to a decrease

in habitat quality. The central ecotope area slopes to the north and east, where there is a flush that drains to the north.

Sub-Central Ecotope Complexes

COMPLEX 4 + P

- **Location**: this complex dominates sub-central areas **Sc9**
- **Ground**: very soft to quaking
- **Physical indicators**: absent
- ***Calluna* height**: 11-20cm
- ***Cladonia* cover**: absent
- **Macro-topography**: flat
- **Pools**: interconnecting pools 11-25%
- ***Sphagnum* cover**: 34-50%
- ***Narthecium* cover**: <4%
- **Micro- topography**: low hummocks, pools, lawns and flats
- **Tussocks**: absent
- **Degradation or regeneration evidence**: recently burnt, decreased in area since 1994
- **Species cover**: *Calluna vulgaris* (11-25%), *Erica tetralix* (<4%), *Eriophorum angustifolium* (<4%), *E. vaginatum* (5-10%), *Rhynchospora alba* (11-25%), *Sphagnum capillifolium* (11-25%), *S. cuspidatum* (5-10%), *S. papillosum* (11-25%), *S. denticulatum* (5-10%) and *Myrica gale* (5-10%).
- **Additional comments:** This sub-central area is located on a flat area with forestry to the west and sloping ground to the east and south. The vegetation showed signs of recent burning and *Cladonia* was absent. Despite being located on a slight plateau, there were signs of flushing (*Myrica gale* frequent). This area has declined in extent since it was mapped in 1994 and this is likely to be due to the impact of the adjacent forestry and forestry drain, the flush/ drain (**flush U**) located to the south and burning. At the boundary the vegetation grades into 9/7/3 + P with lower inter-pool *Sphagnum* cover. These areas were previously mapped as sub-central ecotope and this suggests drying out.

COMPLEX 3 + P

- **Location**: this complex dominates sub-central areas **Sc1**, **Sc2**, **Sc3**, **Sc4, Sc7, Sc10** and **Sc13**
- **Ground**: soft to quaking
- **Physical indicators**: bare peat <4%

- ***Calluna* height**: 11-20cm
- ***Cladonia* cover**: <4% (locally higher where not recently burnt)
- **Macro-topography**: depression
- **Pools**: interconnecting pools 11-25%
- ***Sphagnum* cover**: 34-50% (lower where recently burnt)
- ***Narthecium* cover**: <4%
- **Micro- topography**: low hummocks, pools and lawns
- **Tussocks**: absent
- **Degradation or regeneration evidence**: recently burnt
- **Species cover**: *Calluna vulgaris* (11-25%), *Erica tetralix* (<4%), *Eriophorum angustifolium* (<4%), *E. vaginatum* (11-25%), *Narthecium ossifragum* (<4%), *Rhynchospora alba* (<4%), *Carex panicea* (11-25%), *Sphagnum capillifolium* (11-25%), *S. cuspidatum* (5-10%), *S. papillosum* (11-25%), *S. tenellum* (<4%), *Aulacomnium palustre* (<4%), *Hypnum jutlandicum* (<4%), *Cladonia portentosa* (<4%), *C. uncialis* (<4%).
- **Additional comments:** This vegetation type was characterised by high *Carex panicea* cover with abundant pools and good overall *Sphagnum cover.* Some areas in the north west of the site had been recently burnt and inter-pool *Sphagnum* cover was reduced, although pools supported good *Sphagnum* cover.
- **Sc2** – this area was previously mapped as 6/3/35 but *Narthecium ossifragum* and western indicators (e.g. *Campylopus atrovirens* and *Racomitrium lanuginosum)* were rare. *Cladonia portentosa* cover was higher than in **Sc1** (11-25%). *Sphagnum* cover was 34-50% but occasional lower (26-33%). Some areas to the NW had been recently burnt. In this area *Carex panicea* cover was higher, *Sphagnum* cover lower and vegetation graded into sub-central ecotope. The vegetation graded into sub-marginal ecotope in some areas (9/7/3 + P and 9/7/6 + P) with low inter-pool *Sphagna.* In the southern lobe the mapped area includes a mosaic of sub-central and sub-marginal ecotope.
- **Sc3** – this area was located on flat to gently sloping ground. There were occasional high hummocks in addition to the low hummocks, pools and lawns. Species composition was very similar to Sc1, but *Cladonia* cover was slightly higher (5-10%) and cover of *Eriophorum vaginatum* was slightly lower than in **Sc1** (5-10%). *Sphagnum* cover was also similar with the addition of small amounts of *S. denticulatum* (<4%) and occasional *S. fuscum* (<4%). Non-native *Campylopus introflexus* was present but rare. The vegetation grades into 9/7/3 + P at the edges and the boundary was sometimes difficult to map. The area was mapped as 9/7 + P, 9/7/10 + P and 6/3 + P in the 2004 survey. The change in community complex is likely to be due to

differences in interpretation. The eastern boundary had been recently burnt and there was loss of sub-central ecotope in this area. *Calluna vulgaris* cover was low in this area with patchy *Sphagnum* and low cover of pools but occasional patches of sub-central ecotope 3/10.

- **Sc4** – vegetation described from this area. The area of **Sc4** mapped in 2013 was smaller and this is likely to be due to deterioration in habitat quality. **Sc4** was mapped as a small area in the north-east of the area previously mapped as **Sc4**. The surrounding vegetation had deteriorated to the sub-marginal community complex 9/7/3+P. An area of sub-central ecotope in the south of the area was mapped as a new sub-central area **Sc10.**
- **Sc7** – 3 + P community complex was present in the eastern section of Sc7 (grading to 9/7/10 in the centre and 9/7 + P on the southern edge). The quadrat area had previously been mapped as 6/3/35 but *Racomitrium lanuginosum* had low cover and *Campylopus atrovirens* was rare. On the eastern boundary the 3 + P grades to sub-marginal ecotope (9/7/3). *Carex panicea* was abundant throughout. Overall *Sphagnum* cover was 34-50%, mainly in pools and lawns at the pool edges, with lower inter-pool *Sphagnum* cover.
- **Sc10** – vegetation similar to **Sc4**
- **Sc13** - newly mapped sub-central area to the west of Sc12. 3 + P vegetation was present at the edges of the sub-central area. This had high *Carex panicea cover* and graded to surrounding sub-marginal ecotope (9/7/3 + P or 9/7/3). There were no previous mapping points in this area and therefore this newly mapped sub-central area is due to increased mapping detail.

Quadrats **QSc3** (Sc7) and **Qsc4** (Sc3) were recorded within this complex.

COMPLEX 3/10

- **Location**: north of **Sc**2 and centre of **Sc3**
- **Ground**: soft – very soft
- **Physical indicators**: none
- ***Calluna* height**: 11-20 cm
- ***Cladonia* cover**: 26-33%
- **Macro-topography**: gentle slope
- **Pools**: 4-10% regular
- ***Sphagnum* cover**: 34-50%
- ***Narthecium* cover**: <4%
- **Micro- topography**: Low & high hummocks, pools, hollows, lawns
- **Tussocks**: *Eriophorum vaginatum* <4%, *Trichophorum germanicum* <4%
- **Degradation or regeneration evidence**: absent

- **Species cover**: *Calluna vulgaris* (26-33%), *Eriophorum angustifolium* (4-10%), *E. vaginatum* (4-10%), *Carex panicea* (4-10%), *Trichophorum germanicum* (<4%), *Rhynchospora alba* (<4%), *Narthecium ossifragum* (<4%), *Cladonia portentosa* (26-33%), *Sphagnum capillifolium* (11-25%), *S. papillosum* (11-25%), *S. tenellum* (<4%), *S. cuspidatum* (4-10%), *Sphagnum fuscum* (<4%).
- **Additional comments:** Distinguished by high cover of *Carex panicea* and *Eriophorum angustifolium*. Interpool areas softer than complex 3+P. Pools are smaller and grade into *Sphagnum papillosum* lawns.

COMPLEX 3/35

- **Location**: **Sc5** and **Sc8**
- **Ground**: soft
- **Physical indicators**: bare peat <4%
- ***Calluna* height**: 11-20cm
- ***Cladonia* cover**: 5-10%
- **Macro-topography**: flat
- **Pools**: interconnecting pools 11-25%
- ***Sphagnum* cover**: 51-75%
- ***Narthecium* cover**: 5-10%
- **Micro- topography**: high hummocks, low hummocks, pools and lawns
- **Tussocks**: *absent*
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (11-25%), *Eriophorum angustifolium* (<4%), *E. vaginatum* (5-10%), *Trichophorum germanicum* (<4%), *Carex panicea* (5-10%), *Sphagnum capillifolium* (11-25%), *S. cuspidatum* (11-25%), *S. papillosum* (11-25%), *S. austinii* (<4% - locally abundant), *S. fuscum* (<4% - locally abundant), *S. magellanicum* (<4% - occasional to locally abundant in lawns), *S. tenellum* (<4%), *S. subnitens* (<4%), *S. denticulatum* (<4%), *Campylopus atrovirens* (<4%), *Odontoschisma sphagni* (<4%), *Racomitrium lanuginosum* (<4% - occasional large hummocks), *Cladonia portentosa* (5-10%), *C. uncialis* (<4%).
- **Additional comments:** Previously mapped as 6/3/35 but little *Narthecium ossifragum* present. *Racomitrium lanuginosum* and *Campylopus atrovirens* were only present occasionally but were noticeably more frequent than over much of the site.
- **Sc8** – this was on flat ground on the highest point of the eastern high bog section. This was a wetter example of 3/35 with the ground very soft to quaking. There was a high cover of inter-connecting pools (25-33%) and overall *Sphagnum* cover (51-75%). However the vegetation

showed signs of degradation near the edges with frequent bare ground and low inter-pool *Sphagnum* cover (despite high pool cover). The frequent inter-pool bare ground patches also suggest seasonal drying and in these areas the *Sphagnum* hummocks showed signs of degradation. **Sc8** was previously mapped as 6/4 + P (2004) but in 2013 *Narthecium ossifragum* had low cover or was absent, although *Rhynchospora alba* had moderate cover (5-10%). It is likely that the change in description is partly due to vegetation interpretation but may also be linked to the decline in wetness in this area and increase in *Carex panicea* (5-10%). *Sphagnum papillosum* was the dominant pool *Sphagnum* (34-50%) with low hummocks of *S. capillifolium* and *S. cuspidatum* in pools (5-10%). There were occasional remnant hummocks of *S. austinii*. The vegetation graded to 9/7/3 + P at the edges and there were local patches of 3/35 in the adjacent sub-marginal ecotope.

COMPLEX 6/35

- **Location**: **Sc1**
- **Ground**: soft
- **Physical indicators**: none
- ***Calluna* height**: 11-20 cm
- ***Cladonia* cover**: 4-10%
- **Macro-topography**: gentle slope
- **Pools**: 11-25% interconnected
- ***Sphagnum* cover**: 34-50%
- ***Narthecium* cover**: 11-25%
- **Micro- topography**: Low & high hummocks, pools, hollows, lawns
- **Tussocks**: *Eriophorum vaginatum* <4%
- **Degradation or regeneration evidence**: some degrading *Racomitrium* and *Sphagnum fuscum* hummocks
- **Species cover**: *Calluna vulgaris* (11-25%), *Eriophorum angustifolium* (4-10%), *E. vaginatum* (4-10%), *Carex panicea* (4-10%), *Rhynchospora alba* (<4%, frequent), *Narthecium ossifragum* (11-25%), *Cladonia portentosa* (4-10%), *Sphagnum capillifolium* (11-25%), *S. papillosum* (11-25%), *S. cuspidatum* (4-10%), *S. fuscum* (<4% rare), *S. subnitens* (<4% occasional), *S. denticulatum* (<4% rare), *Racomitrium lanuginosum* (<4% occasional), *Pleurozia purpurea* (<4%, rare).
- **Additional comments:** Characterised by interconnected pools with occasional but prominent *Racomitrium lanuginosum* hummocks. *Eriophorum angustifolium* was slightly more abundant than *E. vaginatum*. *Narthecium ossifragum* was notably abundant. Approximately 40% of pools

were good quality *Sphagnum* pools; approximately 60% were of poorer quality. The vegetation graded to poorer 3 + P at the edges.

COMPLEX 9/7/10

- **Location**: **Sc7, Sc8**, **Sc11**, between Flush T and Flush Z and northwest of **Sc13**
- **Ground**: very soft
- **Physical indicators**: burnt *Calluna* stems
- ***Calluna* height**: 0-10 cm
- ***Cladonia* cover**: absent
- **Macro-topography**: depression
- **Pools**: <1%, regular and very small
- ***Sphagnum* cover**: 34-50%
- ***Narthecium* cover**: <4%
- **Micro- topography**: Low hummocks, pools, hollows
- **Tussocks**: *Eriophorum vaginatum* <4%, *Trichophorum germanicum* 4-10%
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (11-25%), *Eriophorum angustifolium* (11-25%, locally 34-50%), *E. vaginatum* (26-33%), *Carex panicea* (<4%), *Trichophorum germanicum* (4-10%), *Molinia caerulea* (<4%), *Narthecium ossifragum* (<4%), *Sphagnum capillifolium* (11-25%), *S. papillosum* (26-33%), *S. tenellum* (<4%), *S. cuspidatum* (<4%).
- **Additional comments:** Dominated by low hummocks and hollows, with the latter mainly flooded at the time of survey (February). Pools were very rare.
- **Sc11** - 9/7/10 vegetation was described from this sub-central area. This was situated in a local depression between flushes. The area had been recently burnt with low *Calluna* and many damaged *Sphagnum capillifolium* hummocks. *Leucobryum glaucum* was present.
- **Sc7 –** 9/7/10 occupies the central area of **Sc7**. This was previously mapped as 6/3/35 but *Racomitrium lanuginosum* and *Campylopus atrovirens* were rare. Pool cover was low and lawns of *Sphagnum papillosum* were dominant (34-50%). Total *Sphagnum* cover was high (51-75%). Low hummocks of *S. capillifolium* and *S. fuscum* were frequent and the vascular flora was dominated by *Calluna vulgaris* and *Eriophorum vaginatum. Rhynchospora alba* was frequent through most of the area and *Cladonia portentosa* locally abundant.
- **Sc8** – this was on flat ground on the highest point of the eastern high bog section. The northern part of the area was mapped as 3/35 (with signs of degradation). The southern area showed less signs of drying and was mapped as 9/7/10. *Sphagnum* cover was 51-75% with

S. papillosum dominant in lawns, low hummocks of *S. capillifolium* and *S cuspidatum* in pools. *Carex panicea* cover was lower than in the northern area (3/35) and was generally less than 4% (occasionally 5-10%). Inter-connecting pool cover was high (34-50%). **Sc8** was previously mapped as 6/4 + P (2004) but in 2013 *Narthecium ossifragum* had low cover or was absent, although *Rhynchospora alba* had moderate cover (5-10%). It is likely that the change in description in this area is mainly due to vegetation interpretation. There was a drain to the north of the quadrat location, which flowed south to north and may bring water into the sub-central area. This appeared to function as a linear bog pool. The quadrat was located near the drain, on the edge of the sub-central area and had less *Sphagnum* cover than adjacent vegetation. *Racomitrium lanuginosum* and *Campylopus atrovirens* were occasional.

Quadrat **QSc1** (Sc8) **was** recorded within this complex.

COMPLEX 9/7 + P

- **Location**: **Sc6**, **Sc7, Sc12** and **Sc13**
- **Ground**: soft to very soft
- **Physical indicators**: absent
- ***Calluna* height**: 21-40cm
- ***Cladonia* cover**: 11-25%
- **Macro-topography**: depression
- **Pools**: interconnecting pools 11-25%
- ***Sphagnum* cover**: 51-75%
- ***Narthecium* cover**: <4%
- **Micro- topography**: low hummocks, high hummocks, lawns and pools
- **Tussocks**: *Eriophorum vaginatum* <4%
- **Degradation or regeneration evidence**: reduced in size to small patch in NE of area previously mapped as Sc6
- **Species cover**: *Calluna vulgaris* (25-33%), *Carex panicea* (4-10%), *Eriophorum angustifolium* (<4%), *E. vaginatum* (11-25%), *Rhynchospora alba* (<4%), *Sphagnum capillifolium* (11-25%), *S. papillosum* (11-25%), *S. cuspidatum* (11-25%) and *Cladonia portentosa* (4-10%).
- **Additional comments:** *Sphagnum* cover 50% over most of area. Pool had high *Sphagnum* cover with lawns at the edge and quaking vegetation. Inter-pool areas generally had lower *Sphagnum* cover. *Carex panicea* is abundant in the northern part of the area and the vegetation is similar to 3 + P.

- **Sc7** – 9/7 + P dominated the southern edge of **Sc7**. Inter-connecting pools had high cover (up to 26-33%) with *Sphagnum cuspidatum* dominant. The ground was very soft to quaking. *Sphagnum* lawns with *Sphagnum papillosum* dominated the inter-pool vegetation, with low hummocks of *S. capillifolium*. *Sphagnum* cover was higher than in **Sc6** (up to 75%). *S. fuscum* and *S. austinii* were occasional. *Racomitrium lanuginosum* was locally frequent but of low overall cover. In the area of the quadrat location the vegetation almost graded to central ecotope. In one location this graded to central ecotope (complex 15) in a slight depression, but this was too small to map. In this area *Sphagnum* cover increased to 91-100% with *S. capillifolium* dominating inter-pool areas (34-50%), *S. papillosum* lawns (11-25%) and *S. cuspidatum* in pools (26-33%).
- **Sc12 –** this was a newly mapped area of SW in the former area of Sc6 (formed by fragmentation of the original Sc6 area). This was dominated by 9/7 + P. Long inter-connecting pools (11-25%) were dominated by *Sphagnum.* Low hummocks were dominated by *Calluna vulgaris, Eriophorum vaginatum* and some *E. angustifolium*. Pool margins graded into *S. papillosum* lawns with frequent *Rhynchospora alba.* Overall *Sphagnum* cover generally 34-50% with *S. austinii* and *S. fuscum* rare (<4%). This graded into 3 + P in the west and then into sub-marginal ecotope (9/7/3) and into 9/7/ in the east and north. The decline in Sc6 represents a real decline as many former sub-central points (2004) were mapped as sub-marginal in 2013.
- **Sc13** - newly mapped sub-central area to the west of Sc12. 9/7 + P vegetation was dominant in the centre of this sub-central area. This was dominated by low hummocks *Sphagnum capillifolium, S. papillosum* lawns at the edges of pools and *S. cuspidatum* in pools. There were no previous mapping points in this area and therefore this newly mapped sub-central area is due to increased mapping detail.

Active flushes

FLUSH FT

- **Location**: located to the west of the centre of the high bog (western high bog section,) NE of **Sc3**
- **Ground**: soft
- **Physical indicators**: absent
- ***Calluna* height**: 11-20cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: flat to gentle slope

- **Pools**: absent
- ***Sphagnum* cover**: 33-50%
- ***Narthecium* cover**: absent
- **Micro- topography**: low hummocks
- **Tussocks**: *Molinia caerulea* (51-75%)
- **Degradation or regeneration evidence**: northern area recently burnt
- **Species cover**: *Molinia caerulea* (51-75%), *Calluna vulgaris* (5-10%), *Vaccinium oxycoccos* (<4%), *Aulacomnium palustre* (<4%), *Sphagnum capillifolium* (11-25%), *S. cuspidatum* (<4%), *S. papillosum* (11-25%), *Polytrichum strictum* (5-10% - lower in burnt areas), *Pleurozium schreberi* (<4%) and *Cladonia portentosa* (<4%).
- **Additional comments:** This flush has increased in size, there were previous active flush points mapped in this area (2004) but the area was mapped as sub-central ecotope overall. This difference is likely to be due to more detailed mapping in 2013 and re-interpretation of the vegetation. In recently burnt areas there was low *Sphagnum* cover (transition to inactive flush), but these were very localised. In the burnt areas there was regenerating *Betula pubescens* saplings and remnant *Sphagnum capillifolium* and *Polytrichum strictum* hummocks.

FLUSH FW

- **Location**: located in the north of the high bog (western high bog section)
- **Ground**: soft to very soft
- **Physical indicators**: bare peat <4%
- ***Calluna* height**: 11-20cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: flat/ slight depression
- **Pools**: regular <4%
- ***Sphagnum* cover**: 51-75%
- ***Narthecium* cover**: absent
- **Micro- topography**: low hummocks, high hummocks, pools and hollows
- **Tussocks**: absent
- **Degradation or regeneration evidence**: recently burnt
- **Species cover**: *Molinia caerulea* (25-33%), *Calluna vulgaris* (11-25%), *Erica tetralix* (<4%), *Eriophorum vaginatum* (5-10%), *Carex panicea* (<4%), *Aulacomnium palustre* (<4%), *Sphagnum capillifolium* (26-33%), *S. cuspidatum* (<4%), *S. papillosum* (11-25%), *Polytrichum strictum* (<4%), *Pleurozium schreberi* (<4%), *Odontoschisma sphagni* (<4%), *Cladonia portentosa* (<4%).

- **Additional comments:** Some areas, particularly to the north, had been recently burnt and these areas had firmer ground and damaged *Sphagnum* hummocks. There were scattered *Betula* and *Pinus* saplings within the area.

FLUSH Z1

- **Location**: located in the centre-west of the high bog (eastern high bog section)
- **Ground**: soft
- **Physical indicators**: absent
- ***Calluna* height**: 21-40cm
- ***Cladonia* cover**: 11-25%
- **Macro-topography**: flat
- **Pools**: absent
- ***Sphagnum* cover**: 34-50% (locally 51-75%)
- ***Narthecium* cover**: absent
- **Micro- topography**: low and high hummocks
- **Tussocks**: *Eriophorum vaginatum* (<4%)
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Molinia caerulea* (11-25%), *Calluna vulgaris* (25-33%), *Eriophorum vaginatum* (11-25%), *E. angustifolium* (<4%), *Rhododendron ponticum* (<4% - rare), *Pteridium aquilinum* (<4%), *Vaccinium oxycoccos* (<4%), *Aulacomnium palustre* (<4%), *Sphagnum capillifolium* (26-33%), *S. subnitens* (<4%), *S. papillosum* (<4%), *Hypnum jutlandicum* (<4%), *Hylocomium splendens* (<4%), *Polytrichum strictum* (<4%), *Empetrum nigrum* (<4% - rare in *Betula* area) and *Cladonia portentosa* (11-25%).
- **Additional comments:** *Calluna vulgaris, Molinia caerulea* and *Sphagnum capillifolium* co-dominant with occasional flush species. *Pteridium aquilinum* was frequent in the east but localised. There were two small area of *Betula pubescens* but in the eastern area, many of the trees appeared to be dead. *Molinia caerulea* cover was patchy but even where it was absent there were flush species present within the bog vegetation. In the SE the *Sphagnum* cover was 34-50% (locally 51-75%). In the NW the *Sphagnum* cover was generally 34-50% but occasionally lower (26-33%) with less *Molinia caerulea.* This area was mapped as inactive flush in 2004. However, there were no flush points within the centre of the area. The boundary is slightly drier and more similar to inactive flush. The vegetation recorded in 2013 was similar to that described in 1994. Therefore the mapping of this area as active flush in 2013 is due to vegetation re-interpretation and more detailed mapping and not actual change.

FLUSH FZ

A narrow fringe of flush **FZ** by **Sc11** was active flush with 11-25% cover of *Sphagnum papillosum* amongst *Molinia caerulea*.

Degraded Raised Bog (7120)

Sub-Marginal Ecotope Complexes

COMPLEX 9A/7

- **Location**: SW of the bog pool within Flush **FS,** S of **Sc8**
- **Ground**: soft
- **Physical indicators**: absent
- ***Calluna* height**: 11-20cm
- ***Cladonia* cover**: 11-25%
- **Macro-topography**: flat
- **Pools**: absent
- ***Sphagnum* cover**: 11-25%
- ***Narthecium* cover**: <4%
- **Micro- topography**: low hummocks
- **Tussocks**: *Eriophorum vaginatum* (<4%)
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (26-33%), *Eriophorum vaginatum* (<4%), *E. angustifolium* (34-50%), *Narthecium ossifragum* (<4%), *Carex panicea* (5-10%), *Sphagnum capillifolium* (5-10%), *S. papillosum* (5-10%), *S. cuspidatum* (<4%), *Cladonia portentosa* (11-25%) and *Cladonia uncialis* (<4%).
- **Additional comments:**
  - Variant 1 – **9/7**: The northern section of the area previously mapped as **Sc6** was mapped as sub-marginal ecotope (9/7) in 2013. The ground was soft to very soft near pools and occurred in a slight depression. Regular pools had a cover of 4-10%(occasionally lower) with *Sphagnum* cover 26-33%. Some pools had open water and algal cover. Although the ground was locally wet, *Sphagnum* cover was too low for sub-central ecotope. *Calluna vulgaris* was slightly higher than 9a/7 (51-75%). *Sphagnum papillosum* was dominant in inter-pool areas (11-25%) with *S. cuspidatum* in pools (4-10%) and low hummocks of *S. capillifolium* (11-25%). There were signs of local flushing with *Vaccinium oxycoccos* (<4%) and *Aulacomnium palustre* (<4%).

Quadrat **Qsm1** (previously Qsc2 within **Sc6**) was recorded from 9/7.

COMPLEX 9/7/3

- **Location**: NW of **Sc6**, W of **Sc7** and **Sc13**, as well as surrounding **Sc8**
- **Ground**: soft
- **Physical indicators**: bare peat (<4%)
- ***Calluna* height**: 11-20cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: gentle slope
- **Pools**: tear pools (<4%)
- ***Sphagnum* cover**: 11-25%
- ***Narthecium* cover**: <4%
- **Micro- topography**: low hummocks, tear pools and flats
- **Tussocks**: *Trichophorum germanicum* (<4%), *Eriophorum vaginatum* (5-10%)
- **Degradation or regeneration evidence**: area in north and west of site has been recently burnt (heather regeneration, burnt stems and damaged *Sphagnum* hummocks).
- **Species cover**: *Calluna vulgaris* (11-25%), *Eriophorum vaginatum* (5-10%), *E. angustifolium* (5-10%), *Carex panicea* (5-10%), *Narthecium ossifragum* (<4%), *Erica tetralix* (<4%), *S. papillosum* (5-10%), *Sphagnum capillifolium* (5-10%), *Leucobryum glaucum* (<4%), *Cladonia portentosa* (<4%).
- **Additional comments:** widespread community complex across most of site where ground was slightly sloping. *Carex panicea* abundant throughout the site. Some areas that were previously mapped as marginal ecotope were mapped as sub-marginal ecotope in 2013.
  - Variant 1 – **9/7/6**: *Carex panicea* still abundant but higher cover of *Narthecium ossifragum* (5-10%). *Cladonia* cover also higher (11-25%) and in general this community complex did not show signs of recent burning.
  - Variant 2 – **9/7/3 + Ra**: Frequent large *Racomitrium lanuginosum* hummocks (5-10%), which were generally scarce in the site despite its relatively western location. These areas did not appear to have been burnt recently.
  - Variant 3 - **9/7/3+P**: This variant appeared to be a transitional community from sub-central ecotope (e.g. 3 + P) to sub-marginal community complex 9/7/3. It was recorded in some areas that had been previously mapped as sub-central ecotope (e.g. **Sc5** and **Sc6**) and also on the boundary between sub-central areas and adjacent sub-marginal ecotope. The inter-pool vegetation was similar to the description of 9/7/3, but there were frequent regular pools (11-25%) with good *Sphagnum* cover. *Sphagnum cuspidatum* was dominant in the

pools, with *Sphagnum papillosum* forming a narrow lawn at the pool edge. Sometimes the boundary between 9/7/3 + P and sub-central ecotope was not clear, but inter-pool *Sphagnum* cover was usually low and showed signs of seasonal drying. In the north west of the site this community complex variant was frequently burnt and here *Sphagnum* and *Cladonia* cover was lower.

- Variant 4 – **9/7/3+My**: Located to the east of the forestry plantation in the north-west of the high bog (western high bog section). Lower cover of *Eriophorum vaginatum* (<4%) than 9/7/3 and with frequent *Myrica gale.* *E. angustifolium* overall cover similar to 9/7/3 (<4%), but more frequent. Recently burnt.
- Variant 5 – **9/7/6 + P**: As with 9/7/3 + P, this variant appeared to be a transitional community from sub-central ecotope to sub-marginal community complexes 9/7/6 or 9/7/3. This was generally located on the boundary of sub-central areas and was occasionally almost sub-central quality but inter-pool *Sphagnum* cover was low. Pools supported abundant *Sphagnum cuspidatum*, with *Sphagnum papillosum* forming a narrow lawn at the pool edge. Inter-pool areas had abundant *Carex panicea* and *Calluna vulgaris* and frequent *Eriophorum vaginatum.* To the SE of the mound in the south-western part of the high bog (western high bog section), this community complex occurred in a mosaic with small patches of sub-central vegetation.
- Variant 6 – **9a/7/3:** This variant was similar to the typical 9/7/3 but *Eriophorum vaginatum* cover was higher (upper end of 5-10% or higher) and *Eriophorum vaginatum* lower (<4%).

COMPLEX 9/7/6+MY

- **Location**: to the southeast of **Sc9**
- **Ground**: soft
- **Physical indicators**: bare peat (<4%)
- ***Calluna* height**: 11-20cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: flat to gently sloping to south
- **Pools**: regular pools <4%
- ***Sphagnum* cover**: 5-10%
- ***Narthecium* cover**: <4%
- **Micro- topography**: low hummocks and hollows
- **Tussocks**: absent

- **Degradation or regeneration evidence**: recently burnt (burnt ground and degraded *Sphagnum* and regenerating *Calluna vulgaris*).
- **Species cover**: *Calluna vulgaris* (11-25%), *Eriophorum vaginatum* (5-10%), *E. angustifolium* (<4%), *Erica tetralix* (<4%), *Narthecium ossifragum* (5-10%), *Carex panicea* (5-10%), *Myrica gale* (5-10%), *Sphagnum capillifolium* (5-10%) and *S. palustre* (<4%).
- **Additional comments:** Vegetation showed signs of flushing with frequent *Myrica gale* and occasional *Sphagnum palustre.* Hollows were frequent and there was less *Carex panicea* and more *Narthecium ossifragum* than the 9/7/3 sub-marginal vegetation, which was frequent over much of the site.

COMPLEX 6/3/2

- **Location**: between inactive flushes **WN** and **W**
- **Ground**: soft
- **Physical indicators**: bare peat absent
- ***Calluna* height**: 11-25cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: depression
- **Pools**: absent
- ***Sphagnum* cover**: 11-25%
- ***Narthecium* cover**: 5-10%
- **Micro- topography**: frequent hollows
- **Tussocks**: *Trichophorum germanicum* (<4%)
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (11-25%), *Eriophorum angustifolium* (5-10%), *E. vaginatum* (<4%), *Trichophorum germanicum* (5-10%), *Carex panicea* (5-10%), *Huperzia selago* (<4%), *Molinia caerulea* (<4%), *Sphagnum capillifolium* (5-10%), *S. papillosum* (5-10%), *Cladonia portentosa* (<4%).
- **Additional comments:** previously mapped as part of inactive flush **WN** but in 2013 mapped as small area of sub-marginal ecotope between flushes **WN** and **N**. Characterised by relatively high *Eriophorum angustifolium* cover.

Marginal Ecotope Complexes

COMPLEX 3/9A

- **Location**: north of **Sc8**

- **Ground**: firm
- **Physical indicators**: bare peat (<4%)
- ***Calluna* height**: 21-40cm
- ***Cladonia* cover**: 4-10%
- **Macro-topography**: gentle slope
- **Pools**: absent
- ***Sphagnum* cover**: 11-25%
- ***Narthecium* cover**: 5-10%
- **Micro- topography**: occasional low hummocks and algal hollows
- **Tussocks**: absent
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (11-25%), *Carex panicea* (11-25%), *Narthecium ossifragum* (5-10%), *Eriophorum vaginatum* (<4%), *Sphagnum capillifolium* (11-25%), *S. papillosum* (<4%), *S. fuscum* (<4% - remnant hummocks), *Cladonia portentosa* (<4%).
- **Additional comments**: This is a higher quality marginal community and in some areas it approached sub-marginal ecotope but the ground was firm throughout with patchy *Sphagnum* cover overall. The ground was uneven with bare patches and graded into sub-marginal ecotope (9/7/3) on flatter ground, but the boundary was not always clear.
- Variant 1 – 3/9: This was located to the south-east of Sc8on flat ground near the edge of the high bog. *Calluna vulgaris* cover was high. Although *Eriophorum vaginatum* was frequent, the topography was poor and overall *Sphagnum* cover low, typical of marginal vegetation. *Narthecium ossifragum* was locally abundant and *Huperzia selago* frequent at the boundary with **Flush O**.
- Variant 2 – 3/9+TP: this was located to the east of drains associated with the western bog road (eastern high bog section). The vegetation was similar to 3/9 with frequent tear pools.

COMPLEX 3/6

- **Location**: found long high bog edge of eastern high bog section, as well as entire high bog edge of western larger high bog section but the southern edge
- **Ground**: firm
- **Physical indicators**: bare peat (5-10%)
- ***Calluna* height**: 11-20cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: gentle slope

- **Pools**: tear pools (11-25%)
- ***Sphagnum* cover**: <4%
- ***Narthecium* cover**: 11-25%
- **Micro- topography**: occasional low hummocks, hollows and flats
- **Tussocks**: *Trichophorum germanicum* (5-10%)
- **Degradation or regeneration evidence**: recently burnt
- **Species cover**: *Calluna vulgaris* (5-10%), *Carex panicea* (5-10%, locally higher), *Erica tetralix* (<4%), *Trichophorum germanicum* (5-10%), *Sphagnum capillifolium* (<4%), *S. subnitens* (<4%), *S. papillosum* (<4%), *S. tenellum* (<4%), *Campylopus introflexus* (<4%), *Cladonia portentosa* (<4%).
- **Additional comments**: Signs of burning in the last few years such as burnt *Calluna* stems, low *Cladonia* cover and dead *Sphagnum* hummocks. To the south of the site, this community complex did not appear to be burnt and had higher vegetation cover and *Cladonia portentosa* cover was higher (5-10%).
- Variant 1 – 3/2: Occasional around the margins of the high bog but less common than 3/6. *Narthecium ossifragum* cover was low or absent and vegetation is dominated by *Carex panicea* and *Trichophorum germanicum* (5-10%) with areas of bare peat.
- Variant 2 – 3/6/2: Recorded from the north-western area of the high bog, to the west of a forestry plantation. *Carex panicea, Narthecium ossifragum* and *Trichophorum germanicum* all prominent in vegetation.

COMPLEX 7/2+MO

- **Location**: Frequent in the north-western part of the high bog (north and southwest of flush P)
- **Ground**: firm
- **Physical indicators**: absent
- ***Calluna* height**: 11-20cm
- ***Cladonia* cover**: absent
- **Macro-topography**: flat
- **Pools**: occasional tear pools (<4%)
- ***Sphagnum* cover**: 5-10%
- ***Narthecium* cover**: <4%
- **Micro- topography**: low hummocks and hollows
- **Tussocks**: *Trichophorum germanicum* (11-25%)
- **Degradation or regeneration evidence**: recently burnt (low *Calluna vulgaris* cover, low *Cladonia* cover and burnt stems.

- **Species cover**: *Calluna vulgaris* (11-25%), *Myrica gale* (<4%), *Erica tetralix* (<4%), *Molinia caerulea* (5-10%), *Sphagnum capillifolium* (<4%), *S. cuspidatum* (<4%), *S. papillosum* (<4%), *Campylopus pyriformis* (<4%).
- **Additional comments**: Slightly flushed (*Molinia caerulea* frequent) but dominated by bog vegetation.
- Variant 1 – 7/2: located south of flush **Z**. This marginal community was dominated by *Calluna vulgaris* and *Trichophorum germanicum* with frequently *Betula pubescens* saplings. Bare ground was locally abundant (up to 10%) and the vegetation had been badly burnt. The non-native moss *Campylopus introflexus* was occasional (<4%). *Sphagnum* cover was low and patchy with occasional *S. capillifolium* (<4%) and *S. papillosum* (<4%). Algal pools were present on flatter ground (7/2 + AP).

Inactive flushes

FLUSH FO

- **Location**: in the south-east of the high bog (eastern high bog section)
- **Ground**: firm
- **Physical indicators**: absent
- ***Calluna* height**: 21-40cm
- ***Cladonia* cover**: 5-10%
- **Macro-topography**: flat/ slight depression
- **Pools**: absent
- ***Sphagnum* cover**: <4%
- ***Narthecium* cover**: absent
- **Micro- topography**: absent
- **Tussocks**: absent (*Molinia caerulea* not tussocky)
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (5-10%), *Molinia caerulea* (91-100%), *Pinus* species (<4% - rare), *Eriophorum angustifolium* (<4%), *E. vaginatum* (<4%), *Andromeda polifolia* (<4%), *Rhododendron ponticum* (<4% - rare), *Ulex europaeus* (<4% - rare), *Sphagnum capillifolium* (<4%), *S. papillosum* (<4%), *S. magellanicum* (<4% - rare), *Racomitrium lanuginosum* (<4%), *Cladonia portentosa* (5-10%) and *C. uncialis* (<4%).
- **Additional comments:** Previously mapped as marginal vegetation. Similar to 7/2 + Mo but with higher *Molinia caerulea* cover. The undulating ground appears to be cutover bog, with

degraded bog on higher ground and flush vegetation in channels. Vegetation is therefore a mosaic of marginal and flush vegetation, which grades in to marginal vegetation at the edges

FLUSH FP

- **Location**: in the north-west of the high bog (western high bog section)
- **Ground**: firm
- **Physical indicators**: absent
- ***Calluna* height**: 11-20cm
- ***Cladonia* cover**: absent
- **Macro-topography**: undulating
- **Pools**: absent
- ***Sphagnum* cover**: <4%
- ***Narthecium* cover**: absent
- **Micro- topography**: low hummocks and hollows
- **Tussocks**: *Molinia caerulea* (26-33%)
- **Degradation or regeneration evidence**: absent (no signs of burning)
- **Species cover**: *Calluna vulgaris* (5-10%), *Molinia caerulea* (26-33%), *Vaccinium myrtillus* (<4%), *Erica tetralix* (<4%), *Myrica gale* (<4%), *Trichophorum germanicum* (<4%), *Sphagnum capillifolium* (<4%).
- **Additional comments:** Previously mapped as marginal vegetation. Similar to 7/2 + Mo but with higher *Molinia caerulea* cover. The undulating ground appears to be cutover bog, with degraded bog on higher ground and flush vegetation in channels. Vegetation is therefore a mosaic of marginal and flush vegetation, which grades in to marginal vegetation at the edges.

FLUSH FQ

This was a small inactive flush dominated by *Molinia caerulea* (34-50% cover), *Cladonia portentosa* (34-50%) and *Calluna vulgaris* (26-33%). The flush was situated in a local depression. Ground was soft, but wet due to seasonal flooding. Frequently recorded species were *Erica tetralix, Eriophorum vaginatum, Vaccinium oxycoccos* and *Betula pubescens* (c. 4 saplings). Occasionally noted were *Pteridium aquilinum, Sphagnum capillifolium, Pleurozium schreberi, Polytrichum strictum* and *Hylocomium splendens.*

FLUSH FR

This was a *Molinia* dominated inactive flush. *Calluna vulgaris* was frequent to locally abundant; *Juncus effusus* and *Hypnum jutlandicum* were frequent. Occasionally occurring were scattered, bushy *Betula pubescens* about 1-2 m tall, *Sphagnum capillifolium* and *Galium palustre*. This flush occurred in a local depression with very tall (>50cm) *Calluna* on a central raised area surrounded by tussocky *Molinia*. Standing water was present in many places, and at time of survey, was c. 30 cm deep between tussocks. At one point, a *Rhododendron* bush about 1.3 m tall was recorded with 8-10 younger plants surrounding it.

FLUSH FS

- **Location**: running south to north across the western lobe of the high bog (western high bog section)
- **Ground**: firm
- **Physical indicators**: absent
- ***Calluna* height**: 41-60cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: flat in southern part of flush, depression to west
- **Pools**: absent
- ***Sphagnum* cover**: <4% (locally 5-10%)
- ***Narthecium* cover**: absent
- **Micro- topography**: high hummocks of *Molinia caerulea* in southern part of flush
- **Tussocks**: *Molinia caerulea* (91-100%)
- **Degradation or regeneration evidence**: absent (no signs of burning)
- **Species cover**: *Calluna vulgaris* (<4%), *Molinia caerulea* (91-100%), *Vaccinium myrtillus* (<4%), *Salix* species saplings (<4%), *Sphagnum capillifolium* (<4%), *S. papillosum* (<4%), *Pleurozium schreberi* (<4%), *Pseudoscleropodium purum* (<4%), *Pleurozium schreberi* (<4%), *Hylocomium splendens* (<4%) and *Cladonia portentosa* (<4%).
- **Additional comments:** There is a large pool located in the south of the flush. The vegetation around the pool was similar to that in most of the flush but *Juncus effusus* and *Eriophorum angustifolium* were more frequent. *Sphagnum* species typical of flushes were occasional around the bog pool (*Sphagnum fallax* and *S. palustre*) with *Sphagnum cuspidatum* in some areas.

FLUSH FU

- **Location**: in the centre-west of the high bog (western high bog section)

- **Additional comments:** In this small flush the bog vegetation grades into *Molinia caerulea* dominated vegetation surrounding swallow holes (with running water). *Molinia caerulea* is abundant (51-75%) with *Calluna vulgaris* (11-25%) and *Vaccinium myrtillus* (<4%) at the edge of the swallow holes. The vegetation between the swallow holes was burnt sub-marginal ecotope with degraded *Sphagnum* hummocks.

FLUSH W

- **Location**: in the centre-north of the high bog (western high bog section)
- **Ground**: firm to soft
- **Physical indicators**: absent
- ***Calluna* height**: 21-40cm
- ***Cladonia* cover**: absent
- **Macro-topography**: depression
- **Pools**: absent
- ***Sphagnum* cover**: <4%
- ***Narthecium* cover**: absent
- **Micro- topography**: high hummocks of *Molinia caerulea*
- **Tussocks**: *Molinia caerulea* (76-90%)
- **Degradation or regeneration evidence**: absent (no signs of burning)
- **Species cover**: *Calluna vulgaris* (5-10%), *Molinia caerulea* (91-100%), *Vaccinium myrtillus* (<4%), *Juncus effusus* (<4%), *Carex panicea* (<4%), *Betula pubescens* sapling (occasional), *Rubus fruticosus* agg. (occasional), *Sphagnum capillifolium* (<4%), *Polytrichum strictum* (5-10%).
- **Additional comments:** Previously mapped as southern part of inactive flush **WN** but separated from this flush by sub-marginal ecotope. Vegetation similar to flush **WN** but with lower cover of flush bryophyte species and higher cover of *Molinia caerulea*.

FLUSH WN

- **Location**: in the centre-north of the high bog (western high bog section)
- **Ground**: firm to soft
- **Physical indicators**: absent
- ***Calluna* height**: 21-40cm
- ***Cladonia* cover**: absent
- **Macro-topography**: depression
- **Pools**: absent

- ***Sphagnum* cover**: <4%
- ***Narthecium* cover**: absent
- **Micro- topography**: high hummocks of *Molinia caerulea*
- **Tussocks**: *Molinia caerulea* (76-90%)
- **Degradation or regeneration evidence**: absent (no signs of burning)
- **Species cover**: *Calluna vulgaris* (5-10%), *Molinia caerulea* (76-90%), *Vaccinium myrtillus* (<4%), *Juncus effusus* (occasional), *Dryopteris dilatata* (occasional), *Betula pubescens* sapling (occasional), *Rubus fruticosus* agg. (occasional), *Sphagnum capillifolium* (<4%), *S. papillosum* (5-10%), *Polytrichum strictum* (5-10%), *Pleurozium schreberi* (<4%), *Hylocomium splendens* (<4%), *Aulacomnium palustre* (<4%) and *Dicranum scoparium* (<4%).
- **Additional comments:** Relatively low species richness with *Molinia caerulea* tussocks dominant and occasional patches of *Sphagnum*. This had been previously mapped as a larger area, extending to the south. However, the area in the south is separated by an area of sub-marginal ecotope and has been mapped as a separate inactive flush (**W**).

FLUSH FX

At the centre of this flush was a natural channel with flowing water. This was probably once entirely subterranean. At the time of survey, it was open along some of its length, but was quite deep; water was heard but not seen. *Molinia caerulea* and *Pteridium aquilinum* were abundant on the channel slopes, with leggy *Calluna* on steeper and more exposed areas. Face bank vegetation occurs on some remnant peat "bridges" over the channel. The flush had been recently burnt and supported occasional dead birch and willow trees. The channel was bounded by typical *Molinia*-dominated inactive flush.

FLUSH FZ

- **Location**: in the north-west of the high bog (western high bog section)
- **Ground**: firm
- **Physical indicators**: absent
- ***Calluna* height**: 41-60cm
- ***Cladonia* cover**: absent
- **Macro-topography**: slight depression
- **Pools**: absent
- ***Sphagnum* cover**: <4%
- ***Narthecium* cover**: absent

- **Micro- topography**: high hummocks of *Molinia caerulea*
- **Tussocks**: *Molinia caerulea* (51-75%)
- **Degradation or regeneration evidence**: recently burnt with dead *Calluna vulgaris* stems
- **Species cover**: *Calluna vulgaris* (5-10%), *Molinia caerulea* (51-75%), *Myrica gale* (<4%), *Erica tetralix* (<4%), *Eriophorum angustifolium* (<4%) and *Sphagnum papillosum* (<4%).
- **Additional comments:** Part of flush **FZ** has previously been referred to as a 'river' but is actually a small stream, which appears to be an old ditch and is less than 1m wide. It has a deep channel in this area and flowing water. *Salix* saplings at the edge of the ditch had been damaged by fire.

Face bank Complexes

COMPLEX 1

- **Location**: NW,N and SE of eastern high bog section, as well as N and NW of western high bog section
- **Ground**: firm
- **Physical indicators**: <4%
- ***Calluna* height**: 21-40 cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: steep slope
- **Pools**: absent
- ***Sphagnum* cover**: generally absent but <4% in places
- ***Narthecium* cover**: absent
- **Micro- topography:** tall robust *Calluna vulgaris*
- **Tussocks:** absent
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (76-90%), *Cladonia portentosa* (<4%), *Eriophorum angustifolium* (<4%), *Carex panicea* (<4%), *Hypnum jutlandicum* (5-10%).
- **Additional comments**: none

COMPLEX 1

- **Location**: mineral mound in south eastern lobe of the high bog (western high bog section)
- **Ground**: firm
- **Physical indicators**: <4%

- ***Calluna* height**: 41-60 cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: steep slope at edge and flat on top
- **Pools**: absent
- ***Sphagnum* cover**: <4%
- ***Narthecium* cover**: absent
- **Micro- topography:** tall robust *Calluna vulgaris*
- **Tussocks:** absent
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (76-90%), *Eriophorum vaginatum* (<4%), *Vaccinium myrtillus* (<4%), *Phragmites australis* (<4%), *Hylocomium splendens* (11-25%), *Hypnum jutlandicum* (5-10%), *Pleurozium schreberi* (25-30%), *Sphagnum capillifolium* (<4% - occasional high hummocks), *Diplophyllum albicans* (<4%), *Dicranum scoparium* (<4%) and *Cladonia portentosa* (<4%).
- **Additional comments**: none

Bog Woodland (91D0)

Bog Woodland BW1

The bog woodland occupies a small area within the active flush **W**. The canopy comprised a few semi-mature trees of *Betula pubescens*, with frequent less mature trees and saplings. No other canopy species were recorded. The canopy was generally less than 5m high and canopy cover was 30 to 40%. There was an abundance of epiphytic lichens (e.g. *Usnea, Hypogymnia* and *Parmelia* species) and bryophytes (e.g. *Ulota, Orthotrichum* and *Hypnum* species). The ground was very soft and there was standing water in a few locations. The field layer shows signs of having been recently burnt. The field layer was dominated by *Vaccinium myrtillus* (51-75%) and the bryophytes *Sphagnum palustre* (11-25%), *S. capillifolium* (5-10%), *Hylocomium splendens* (11-25%), *Polytrichum strictum* (5-10%), *S. fallax* (5-10%) and *Aulacomnium palustre* (5-10%). Additional species at lower cover (<4%) included *Dryopteris carthusiana, Molinia caerulea, Cladonia portentosa, Hypnum jutlandicum, Pleurozium schreberi, Pseudoscleropodium purum, Eriophorum vaginatum, Polytrichum commune, Diplophyllum albicans, Calluna vulgaris, Dicranum scoparium* and *Rubus fruticosus* agg. The non-native moss *Campylopus introflexus* was present occasionally in sparsely vegetated burnt areas. *Betula pubescens* saplings were regenerating in the shrub layer, possibly post-fire regeneration. At the edges the woodland transitioned to active flush with occasional *Betula* and *Pinus* saplings.

Appendix II Photographical records

Photograph Number	Aspect	Type	Feature	Date
P1060947	NE	Overview	Qbw1	04/02/2013
P1060948	NE	Detail	Qbw1	04/02/2013
P1060949	NE	Overview	Qsc4	04/02/2013
P1060961	NE	Overview	Qsm1	06/02/2013
P1060962	NE	Overview	Qsc3	06/02/2013
P1060963	NE	Overview	Qsc1	07/02/2013

Appendix III Quadrats

Ecotope type	**Sub-central**	**Sub-central**	**Sub-central**	**Sub-marginal**
Complex Name	**4/15**	**9/7/10**	**7/9/10**	**9/7**
Quadrat Name	Qsc1	Qsc1	Qsc2	Qsm1
Easting	169009	169012.00	167756	167760.19
Northing	273487	273486.10	273719	273723.90
Date	03/11/2004	07/02/2013	03/11/2004	06/02/2013
Firmness	quaking	Very soft	very soft	Soft
Burnt	No	No	No	No
Algae in hollows %	Absent	Absent	Absent	Absent
Algae in pools %	Absent	Absent	Absent	Absent
Bare peat %	Absent	1-3 (many indiv)	Absent	Absent
High hummocks %	na	Absent	na	Absent
Low hummocks %	11-25	34-50	11-25	51-75
Hollows %	4-10	11-25	11-25	11-25
Lawns %	Absent	1-3 (many indiv)	4-10	Absent
Pools %	26-33	11-25	26-33	4-10
Pool type	Interconnecting	Regular	Regular	Regular
S.austinii hum type	Absent	Absent	na	Absent
S.austinii hum %	Absent	Absent	1-3 (few indiv)	Absent
S.austinii height(cm)	Absent	Absent	na	Absent
S.fuscum hum type	na	Absent	na	Absent
S.fuscum hum %	na	Absent	na	Absent
S.fuscum height(cm)	na	Absent	Flats	Absent
Leucobryum glaucum	Absent	Absent	1-3 (few indiv)	Absent
Trichophorum type	Tussocks	Tussocks	4-10	Absent
Trichophorum %	4-10	1-3 (many indiv)	4-10	1-3 (many indiv)
S.magellanicum %	Absent	Absent	11-25	4-10
S.cuspidatum %	26-33	11-25	1-3 (few indiv)	Absent
S.papillosum %	4-10	11-25	na	Absent
S.denticulatum %	4-10	Absent	na	Absent
S.capillifolium%	1-3 (few indiv)	26-33	11-25	11-25
S.tenellum %	na	1-3 (many indiv)	na	1-3 (many indiv)
S.subnitens %	Absent	Absent	na	Absent
R.fusca %	Absent	Absent	na	Absent

Ecotope type	**Sub-central**	**Sub-central**	**Sub-central**	**Sub-marginal**
Complex Name	**4/15**	**9/7/10**	**7/9/10**	**9/7**
R.alba %	4-10	4-10	1-3 (few indiv)	1-3 (many indiv)
N.ossifragum %	4-10	4-10	4-10	1-3 (many indiv)
Sphag pools %	11-25	11-25	11-25	4-10
Dominant pool Sphag	S.cuspidatum	S.cuspidatum	S.cuspidatum	S.papillosum
Sphag lawns %	Absent	1-3 (many indiv)	4-10	Absent
Sphag humm %	11-25	34-50	11-25	11-25
Sphag holl %	4-10	1-3 (several indiv)	4-10	4-10
Total Sphag %	51-75	51-75	34-50	26-33
Hummocks indicators		Absent	S.austinii	Absent
Cladonia portent %	1-3 (few indiv)	1-3 (many indiv)	11-25	34-50
Other Cladonia sp	na	cladunci	na	Cladonia uncialis
C. panicea %	4-10	1-3 (many indiv)	na	Absent
Calluna cover %	11-25	26-33	26-33	51-75
Calluna height(cm)	21-30	11-20	31-40	21-30
Other Notable Species		Raco lanu, Camp intro		Vacc oxyc, Aula palu
Other comment		differences due to methodology; nearby drain seems to been missed		Prev 7/9/10 but Sphagnum cover lower & now SM 9/7. Q indicators not in vicinity. Former Qsc2

Ecotope type	**Sub-central**	**Sub-central**	**Sub-central**	**Sub-central**
Complex Name	**6/3/35**	**9/7+P**	**9/7/10+P**	**3+P**
Quadrat Name	Qsc3	Qsc3	Qsc4	Qsc4
Easting	167512	167512.65	166827	166833.76
Northing	273345	273338.94	273778	273780.85
Date	03/11/2004	06/02/2013	03/11/2004	04/02/2013
Firmness	very soft	Quaking	very soft	Very soft
Burnt	No	No	No	No
Algae in hollows %	1-3 (few indiv)	Absent	Absent	Absent
Algae in pools %	1-3 (few indiv)	Absent	Absent	Absent
Bare peat %	Absent	Absent	Absent	Absent
High hummocks %	na	Absent	na	11-25
Low hummocks %	34-50	26-33	26-33	34-50
Hollows %	4-10	1-3 (many indiv)	26-33	1-3 (many indiv)

Ecotope type	**Sub-central**	**Sub-central**	**Sub-central**	**Sub-central**
Complex Name	**6/3/35**	**9/7+P**	**9/7/10+P**	**3+P**
Lawns %	4-10	11-25	4-10	4-10
Pools %	26-33	11-25	11-25	4-10
Pool type	Tear	Interconnecting	Regular	Regular
S.austinii hum type	na	Absent	na	Absent
S.austinii hum %	na	Absent	na	Absent
S.austinii height(cm)	na	Absent	na	Absent
S.fuscum hum type	na	Absent	na	Absent
S.fuscum hum %	na	Absent	na	Absent
S.fuscum height(cm)	na	Absent	na	Absent
Leucobryum glaucum	na	Absent	na	Absent
Trichophorum type	Tussocks	Absent	Flats	Tussocks
Trichophorum %	4-10	Absent	4-10	1-3 (many indiv)
S.magellanicum %	4-10	Absent	4-10	Absent
S.cuspidatum %	4-10	11-25	4-10	1-3 (many indiv)
S.papillosum %	11-25	34-50	11-25	4-10
S.denticulatum %	4-10	Absent	4-10	Absent
S.capillifolium%	26-33	11-25	26-33	26-33
S.tenellum %	na	1-3 (many indiv)	na	1-3 (several indiv)
S.subnitens %	na	Absent	na	1-3 (few indiv)
R.fusca %	na	Absent	na	Absent
R.alba %	11-25	4-10	4-10	1-3 (many indiv)
N.ossifragum %	11-25	1-3 (many indiv)	4-10	1-3 (many indiv)
Sphag pools %	11-25	11-25	11-25	1-3 (many indiv)
Dominant pool Sphag	S.cuspidatum	S.cuspidatum	S.cuspidatum	S.cuspidatum
Sphag lawns %	4-10	11-25	4-10	4-10
Sphag humm %	34-50	26-33	26-33	26-33
Sphag holl %	4-10	1-3 (many indiv)	11-25	1-3 (many indiv)
Total Sphag %	51-75	51-75	34-50	34-50
Hummocks indicators		Absent		Absent
Cladonia portent %	1-3 (few indiv)	1-3 (many indiv)	4-10	26-33
Other Cladonia sp	na	Cladonia uncialis	na	Cladonia uncialis
C. panicea %	na	Absent	na	4-10
Calluna cover %	4-10	26-33	11-25	26-33
Calluna height(cm)	21-30	0-10	31-40	21-30
Other Notable Species		Camp atro, Raco lanu occasional		

Ecotope type	**Sub-central**	**Sub-central**	**Sub-central**	**Sub-central**
Complex Name	**6/3/35**	**9/7+P**	**9/7/10+P**	**3+P**
Other comment		Almost C ecotope but adjacent veg = SC, small differences due to Q locn = very HQ; S.fusc nearby		Very little change - due to Q position

Note: Data for those 2004 quadrats re-surveyed in 2013 is given to the right of the original 2004 quadrat data in table above. Additional quadrats were recorded where necessary. Some 2004 quadrats may have been given a different ecotope category in 2013; further detail justifying the re-classification is given within the report.

91D0 Bog woodland: Assessment sheet Corliskea Bog

Site name	Corliskea	**Recorders**	George Smith and Joanne Denyer	**Photo no.s**	106-0947; 106-0948
Stop Number	1	**Date**	04/02/2013	**Grid ref**	166980.274305

Positive indicator species	✓	**Negative indicator species**	**% Cover**
Trees and woody species		*Pteridium aquilinum*	0
Betula pubescens	✓	*Rubus* agg.	1%
Salix aurita	-		
Salix atrocinerea	-	*Rhododendron ponticum*	0
Dwarf shrubs, herbs & ferns			
Dryopteris dilatata	-	Non-native conifer species	0
D. carthusiana.	✓	List:	
Carex rostrata	-		
Juncus effusus	-		
Molinia caerulea	✓		
Vaccinium oxycoccos…	✓		
Empetrum nigrum	-	Others	0
Vaccinium myrtillus	-	List:	
Epilobium palustre…	✓		
Calluna vulgaris	-		
Potentilla erecta	✓		
Mosses			
Polytrichum commune	✓		
Sphagnum fimbriatum	-		
Sphagnum fallax	✓		
Sphagnum palustre	✓		
Hylocomium splendens	✓		
Aulacomnium palustre	✓		
Pass = *Betula pubescens*, *Sphagnum* species plus ≥5 of the other species	Pass	Pass = Negative indicator species <10%	Pass

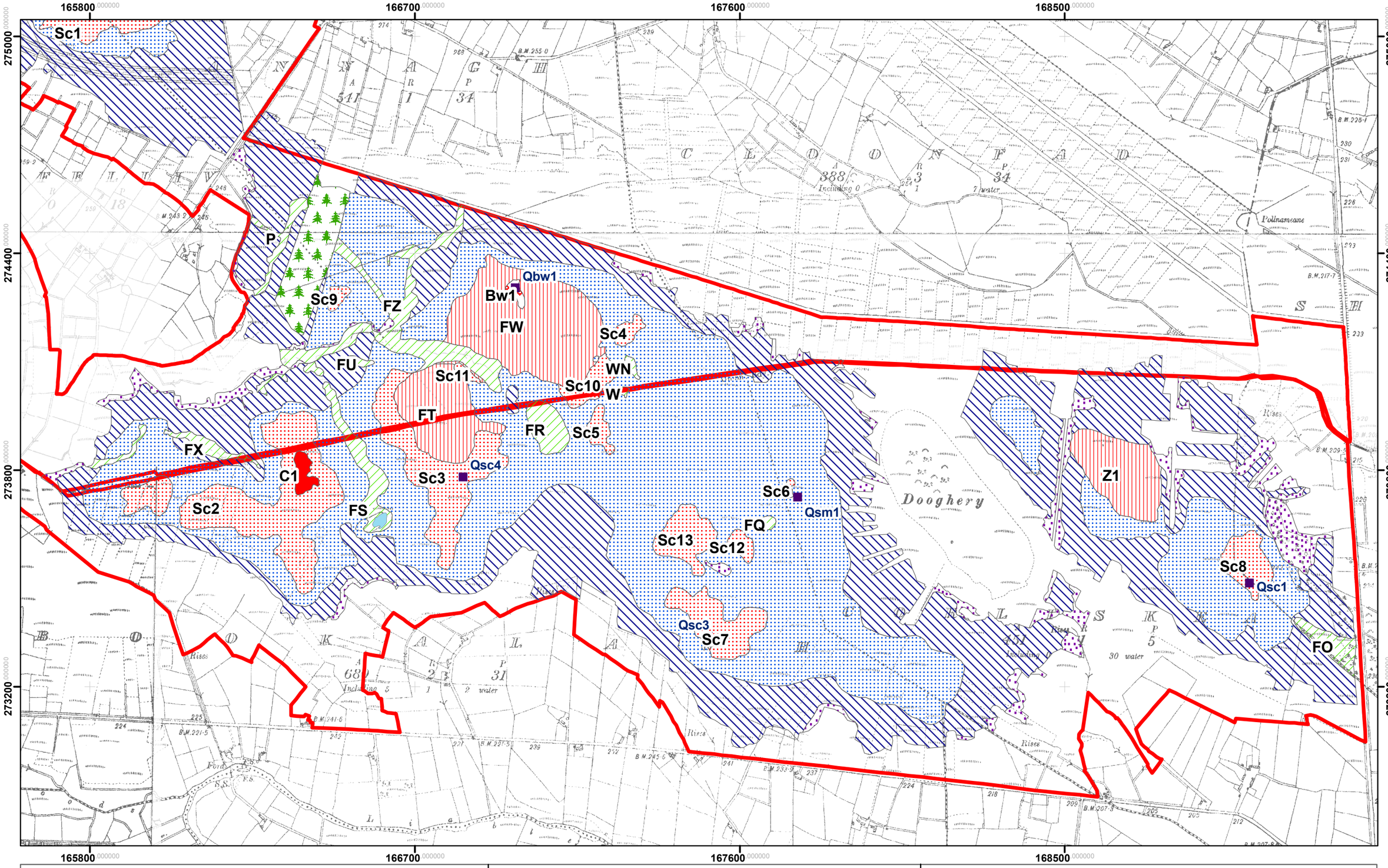
Structural data	**Result**	**Stop level**	**Passes**
Median canopy height >4m	F	≥7 passes = pass	
Total canopy cover >30% of plot	P	<7 passes = fail	
Betula pubescens >50% of canopy	P		
Dwarf shrub layer cover <50%	F	**Result=7**	Pass
Calluna cover <40%	P		
% *Sphagnum* cover (pass = ≥25%)	P		
% Bryophyte cover (pass = ≥50%)	P		

Note: *Pinus* spp. 0%

Target tree species dbh	✓	**Old trees & dead wood (any species)**	**Result**
Betula pubescens		No. of old/senescing trees or dead stems >10cm	1
5-10 cm	✓		
10-20 cm	✓	No. of standing dead trees >10cm	0
>20 cm	0	No. of fallen dead trees/branches >10cm	0

Target tree species dbh	✓	**Old trees & dead wood (any species)**	**Result**
Pass = Over all stops each size class represented	Fail	Pass = 1+ old/senescing trees (or dead stems) in >25% of stops and 4+ standing dead or fallen dead in total number of stops	Fail
Betula pubescens regeneration	✓		
Pass = ≥1 sapling >1m in all stops	Pass		

Appendix IV Survey maps



Raised Bog Monitoring & Assessment Survey 2013

Map 1: Ecotopes Map and Quadrats

Ecology and Environmental Consultants Ireland Ltd.

Corliskea SAC (002110)
Co. Galway/ Co. Roscommon

1:10,000

N

0 125 250 500 750 1,000 Meters

Legend

- Quadrat
- **Ecotope type**
  - Central
  - Sub-central
  - Bog Woodland
  - Active Flush
  - Sub-marginal
  - Marginal
  - Inactive Flush
  - Woodland
  - Face bank
  - Open water
  - Conifer plantation
  - Clear felled area
  - SAC

Raised Bog Monitoring & Assessment Survey 2013

Map 2: Vegetation community complexes

Ecology and Environmental Consultants Ireland Ltd.

Corliskea SAC (002110)
Co. Galway/ Co. Roscommon

1:10,000

N

0 137.5 275 550 825 1,100 Meters

Legend

Ecotope type
- Central ecotope complex
- Sub-central ecotope complex
- Sub-marginal ecotope complex
- Marginal ecotope complex
- Face bank ecotope complex

Boundary type
- Flush
- SC/C
- F/C
- SM/C
- M/C
- F/SC
- SM/SC
- M/SC
- FB/SC
- F/SM
- M/SM
- SM/FB
- F/M
- M/FB
- F/FB
- Other
- SAC

Raised Bog Monitoring & Assessment Survey 2013

Map 3: Impacts (High bog drainage; Turf cutting;Fire events)

Ecology and Environmental Consultants Ireland Ltd.

Corliskea SAC (002110)

Co. Galway/ Co. Roscommon

1:10,000

N

0 130 260 520 780 1,040 Meters

Legend

High Bog drainage

- Blocked:non-functional
- Blocked:reduced functional
- Not blocked:functional
- Not blocked:non-functional
- Not blocked:reduced functional
- SAC
- Burnt high bog (2004/05-12/13)
- High bog cutaway (2004/05-10)