Derrynabrock Bog (SAC 002298), Co.Roscommon/Mayo

Executive Summary

This survey, carried out in September 2012, aimed to assess the conservation status of habitats listed on Annex I of the European Habitats Directive (92/43EEC) on the high bog at Derrynabrock 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 and Depressions on peat substrates of the Rhynchosporion.

Active Raised Bog covers 6.60 ha (8.20%) of the high bog area. Active Raised Bog consists of central, sub-central and active flush ecotopes. The central has three separate areas, each with similar western type vegetation with pools and *Sphagnum* cover up to 75%. The central grades into the sub-central ecotope which is dryer and *Sphagnum* cover is lower (up to 50%). The sub-central ectotope is comprised of 12 areas and is quite fragmented across the bog. Bog asphodel (*Narthecium ossifragum)* is a conspicuous species in this ecotope. There is one small active flush, which is essentially a large pool with close to 100% *Sphagnum* cover surrounded by some large hummocks.

Degraded Raised Bog covers 73.89 ha (91.80%) 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. It consists of sub-marginal and marginal ecotopes and the habitat also includes a small inactive flush ecotope. The sub-marginal is the largest ecotope area. *Sphagnum* cover is generally less than 25%, and pools are few. *Narthecium ossifragum* is again a common species in flats between hummocks. The marginal ecotope is confined to the perimeter of the bog and is most extensive around the south and western sides, where there are functional drains. It is drier with *Sphagnum* cover <10%. The inactive flush is characterised by an abundance of Bog Myrtle (*Myrica gale*).

Depressions on peat substrates of the Rhynchosporion are found in both Active and Degraded Raised Bog. It was a constant in the central ecotope, but most frequent in the sub-central ecotope. It was found in the wetter vegetation of the sub-marginal and hardly at all in the marginal ecotope.

There is no Bog Woodland on Derrynabrock. No restoration works have taken place on this site.

The current conservation objective for Derrynabrock Bog is to restore the area of Active Raised Bog 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 Active Raised Bog is 44.98ha. 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 no change in the area of Active Raised Bog (6.60ha) at Derrynabrock in the 2004 to 2012 period. However, the distribution of the central and sub-central ecotopes did change as a result of more comprehensive surveying and accurate mapping. This resulted in an alteration to the shape of the three central areas and in the mapping of five new areas of sub-central ecotope which had been overlooked in the 2004 survey.

Peat cutting and drainage, notably around the eastern, southern and northern margin of the high bog are the most threatening current activities at the site. 0.08ha of high bog have been lost in the 2004-2010 period due to peat cutting. 3.248km of drains remain functional and 0.78km reduced functional. The conifer plantation situated adjacent to the north-east of the high bog, and its associated drains are likely to have induced changes in the high bog hydrology with negative consequences on Active Raised Bog. No fire events have affected the bog in the reporting period, but there is a history of burning in the past.

Active Raised Bog has been given an overall **Unfavourable Bad–Declining** conservation status assessment. Although both habitats' Area and quality have remained Stable in the reporting period, their current values are below favourable reference values. Future Prospects are

considered Unfavourable Bad-Declining as impacting activities (peat cutting, drainage and afforestation) continue to threaten the habitat.

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

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

A series of **recommendations** have been also given, these include: cessation of peat cutting; blocking of both functional and reduced functional drains on the high bog; an assessment of the actual impact of the conifer plantation adjacent to the high bog; restoration works on the high bog and cutover areas, further hydrological and topographical studies to ascertain more accurate FRVs and further botanical monitoring surveys.

Site identification

SAC Site Code	2298 (River Moy)	**6" Sheet:**	MO 63/64
Grid Reference:	E556251/N80317703	**1:50,000 Sheet:**	32
High bog area 2012 (ha):	80.55[1]		
Dates of Visit:	24 and 25/09/2012		
Townlands:	Derrynabrock, Calveagh Lower and Sragh Upper		

[1]The boundary of the high bog has been extended in 2012 to follow the current SAC boundary. This was not mapped previously. This has increased the high bog extent by 8.30ha.

Site location

Derrynabrock Bog is located approximately 10 km east of Charlestown, Co. Mayo. Derrynabrock Bog straddles the border with Co. Roscommon. Rivers run to the north, west and south of the bog, connecting to form the Owenlobnaglaur River. The southern section of the bog is in Co. Roscommon. A number of small bog roads lead towards the southern and eastern sides of the bog where access may be obtained. This site is located adjacent to Gowlan Bog and Kilgarriff Bog which are both part of the River Moy SAC (SAC 2298) and south of Tawnaghbeg Bog (SAC 000547).

Description of the survey

The survey was carried out in September2012 and involved a vegetation survey of the high bog at Derrynabrock 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 Derrynabrock 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, were recorded in the 2004 project (Fernandez *et al*. 2005). Some of these were re-surveyed and additional quadrats were recorded where necessary, (see Appendix III). The size of quadrats was 4m x 4m for Active Raised Bog.

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

This is a Western type or Intermediate Raised Bog indicating that it has many features similar to a blanket bog (Cross 1990). Derrynabrock Bog has also been classified as a Ridge Basin Bog by Kelly *et al.*, (1995). The most noticeable characteristic is the absence of a definite dome and the undulating nature of the site. The whole of the northern lobe of the site is approximately 2 m lower than the rest of the bog with a pronounced slope towards the river to the north of the high bog. The bog occurs on a ridge between two rivers.

Ecological Information

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

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

- Active Raised Bog (EU code 7110),

- Degraded Raised Bog (EU code 7120),
- Depressions on peat substrates of the Rhynchosporion (EU code 7150).

Active Raised Bog (7110)

The current area of Active Raised Bog at Derrynabrock Bog is 6.60ha (8.20% of the high bog), which is a decrease of 11.27ha since 1994.

Active Raised Bog includes central, sub-central and active flush ecotopes. Central ecotope was found at three locations (**C1, C2** and **C3**). **C1** and **C2** are situated close together in the north-eastern part of the site. **C3** is located in the western lobe of the site. The slightly different shapes and areas of the three central ecotopes is due to more comprehensive surveying and more accurate mapping in 2012 rather than a real change since 2004 due to impacting activities (see Appendix IV, Map 1). The western vegetation community complex 35 characterises all of the central ecotope, which is located on flat ground, which is very wet and quaking with pools (11-25%) and also a mosaic of hummocks and hollows. There are pools 11-25%, and a good *Sphagnum* cover (50-75%) in **C1, C2** and **C3**, consisting of pool species notably *S. cuspidatum* but also *S. denticulatum* and at the pool edges; *S. magellanicum*. Other pool species included *Menyanthes trifoliata* and *Drosera anglica*. The main hummock *Sphagnum* is *S. capillifolium*. The western indicators *Campylopus atrovirens* (<4%), *Pleurozia purpurea* (<4%), *Racomitrium lanuginosum (<4%)* are found notably in **C1** and **C2** where pools are more extensive (26-33%).

There are 12 areas of sub-central ecotope (**Sc1 – Sc12)**, five of which have been newly mapped in 2012. Although the total area of sub-central appeared to increase from the 2004 survey, this is believed to be due to more comprehensive survey and mapping and not a real change. Two western type community complexes typify this vegetation. The main one is complex 6/35. It characterises nearly all sub-central ecotope areas in the site. The ground is soft with pools (up to 25%) and hummocks and hollows. *Narthecium ossifragum* is widespread (26-33%) in the inter-pool areas. *Sphagnum* cover is generally 26-33% with a good diversity of *Sphagnum* spp; *S. capillifolium* (H; 11-25%), *S. tenellum* (H; <4%), *S. subnitens* (H; <4%), *S. austinii* (H; <4%), *S. fuscum* (H; <4%), *S. papillosum* (H & P; 4-10%), *S. magellanicum* (H & P; <4%), *S. denticulatum* (P; <4%), *S. cuspidatum* (P; 11-25%). as well as western indicators *Campylopus atrovirens* (<4%), *Pleurozia purpurea* (<4%), *Racomitrium lanuginosum* (< 4%) and *Leucobryum glaucum* (<4%).

The other (better quality) sub-central community complex 9/35 is localized in **Sc1** and also to the south of **Sc6**. This complex is similar to 6/35 but with increased *Eriophorum vaginatum*. This complex extends in a narrow band to the south where it appears to be flushed (possibly indicating

water movement) as indicated by the presence of *Molinia caerulea*, *Sphagnum fallax*, *S. palustre* and *Aulacomnium palustre*. Complex 9/35 (W) indicates this is a western type complex.

There was one active peat forming active flush **(Z)** located in the north-west of the western lobe. This flush is essentially a large pool with close to 100% *Sphagnum* cover (mostly *S. cuspidatum*) surrounded by some large hummocks. Other species indicative of flushing included *Vaccinium oxycoccos* (<4%), *Aulacomnium palustre* (<4%) and *Polytrichum strictum.*

Degraded Raised Bog (7120)

The current area of Degraded Raised Bog at Derrynabrock Bog is 73.89ha (91.80% of the high bog).

Degraded Raised Bog includes the sub-marginal, marginal and inactive flush. 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 features the most developed micro-topography within Degraded Raised Bog. There are three community complexes, the most widespread of which was complex 6/3+P which is often a gradation from complex 6/35, but with fewer pools (<4-10%) and less *Sphagnum* (11-25%) and a greater cover of *Narthecium ossifragum* of up to 34-50%, on the flats between pools and hummocks. The community complex 9/7 is much more localised on the eastern side of the site. It is characterised by the absence of pools and good *Sphagnum* cover (11-33%) of mainly hummock forming species notably *Sphagnum capillifolium* (11-25%) and with *Eriophorum vaginatum* a notable component of the vegetation (11-25%), forming tussocks and flats. Complex 9/7 grades into complex 9/7/6 where *Sphagnum* cover decreases, and there is a greater cover of *Narthecium ossifragum*, and some pools may be present. On the northern side of the western lobe, hummocks of *Racomitrium lanuginosum* are up to 80cms high. Towards the centre of the bog**,** *Sphagnum* cover can be quite variable. This complex grades into complex 9/7/3 in places where *Carex panicea* (>4%)

Marginal ecotope is slightly drier than sub-marginal ecotope and mainly occurs as a band near the margins of the high bog, being widest at the south and western margins and also in parts of the eastern margin where there was peat cutting. *Trichophorum germanicum* is a constant in this ecotope and where *Narthecium ossifragum* is abundant the community complex is 2/6, and the cover of *Narthecium* is up to 50% in places. Although complex 2/6 is the most common marginal community complex, in places, where *Narthecium ossifragum* decreases and *Trichophorum germanicum* increases, it becomes complex 2. Where *Carex panicea* increases, this grades into complex 2/3. At the south-western side of the site it was recorded as complex 2/6 +My, where a localised area of *Myrica gale* occurs. There was no face bank ecotope recorded on Derrynabrock Bog. The high bog also features

an inactive flush (**Y**). It is located on a gentle slope on the edge of north-eastern lobe of the bog. It is a small area with scattered *Myrica gale.* Beneath *Sphagnum* cover is (11-25%) with mainly *Sphagnum capillifolium*, and heather *Calluna vulgaris* (26-33%) is tall and robust.

Depressions on peat substrates of the Rhynchosporion (7150)

Rhynchosporion vegetation is widespread on Derrynabrock Bog. It is found in both Active and Degraded Raised Bog, but tends to be best developed and most stable in the wettest areas of Active Raised Bog. In these areas, the Rhynchosporion vegetation occurs within *Sphagnum* hollows and along *Sphagnum* pool edges and on lawns. It was a constant in the central ecotope complex 35 (<4%), and in the sub-central complex 9/35 (<4%), and more abundant in 6/35 (4-10%). In the sub-marginal ecotope it was only really found in complex 6/3+P and it hardly occurs in the marginal ecotope, too few to record. Typical plant species include *Rhynchospora alba, Sphagnum cuspidatum, S. magellanicum, S. papillosum, Drosera anglica* and *Eriophorum angustifolium. Rhynchospora fusca* was not found at the site.

Detailed vegetation description of the high bog

A detailed description of high bog vegetation recorded during the 2012 survey of Derrynavrock 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 Derrynabrock 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	0.08haof the high bog cut away	Inside High Bog: 2 locations	**7120**

					along eastern section	
C01.03	Peat extraction	L	-1	0.08haof the high bog cut away	Inside High Bog: 2 locations along eastern section	**7110/7150**
J02.07	Drainage	M	-1	4.028km [1]	Inside High Bog	**7110/7120/7150**
J02.07	Drainage	M	-1	n/av	Outside High Bog	**7110/7120/7150**
B01.02	Artificial planting on open ground (non-native trees)	M	+1	3.84ha	Outside High Bog adjacent to the NE boundary	**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.

n/av: not available

Peat cutting

This activity has taken place at 2 locations along the eastern section of high bog during the 2004-2010 period, and has reduced the area of high bog by 0.08ha. Peat cutting has also taken place in another two locations within the eastern not designated section of high bog (E156907/N302267 and E157109/N302653). 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 2011-2012 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 importance/impact on Degraded Raised Bog and low impact/importance on Active Raised Bog and Rhynchosporion depressions. 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. It should also be borne in mind that peat cutting has already had a serious negative impact over a long period at this site, indicated by the fact that ARB covers only a very small area (6.60ha or 8.20% of the high bog) and is 85.33% below the FRV target. In addition, the old face banks and multiple functional drains associated with cutting continue to impact on the high bog habitats in many areas.

Drainage

High bog drainage

Table 6.2 shows no change on the status of high bog drains. The majority of drains in the high bog remain functional (3.248km). These are located mainly around the southern and western bog margin and are both parallel and perpendicular to the edge of the high bog. Drain D17 is on the eastern margin in an area of associated peat cutting. There is one reduced functional drain; D6 (0.780km) which follows the county Mayo/Roscommon boundary across the centre of the bog in a north-south direction. Reduced functional drains are also 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. There are two non-functional drains (0.533km) at the north-eastern margin between the edge of the bog and the adjacent conifer plantation. High bog drainage is considered to have a medium importance/impact on high bog habitats. No blockage of drains has occurred to date.

Table 6.2 High bog drainage summary

Status	2004 (km) [1]	2012 (km)	Change
NB: functional	3.248	3.248	0.000
NB: reduced functional	0.780	0.780	0.000
NB: non- functional	0.533	0.533	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

[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 Derrynabrock Bog, including any change in their functionality in the 2004– 2012 reporting period (see Map 3).

Table 6.3 High bog drainage detail

Drain Name	Length (km)	2004 status	2012 status	Change	Comment
bB	0.613	NB: functional	NB: functional	No	This drain was wrongly classified as reduced functional in 2004
bB1	0.076	NB: functional	NB: functional	No	
bB3	0.161	NB: functional	NB: functional	No	

bB4	0.086	NB: reduced functional	NB: reduced functional	No	
bB5;6	0.274	NB: functional	NB: functional	No	Water running recorded within bB5 during fieldwork
bD	0.130	NB: functional	NB: functional	No	
bD1;2;2a;2b	0.790	NB: functional	NB: functional	No	bD2b already present in 2004 but not mapped; water running recorded within bD2 during fieldwork
bE	0.302	NB: functional	NB: functional	No	Eastern section reduced functional
bG	0.055	NB: functional	NB: functional	No	
bH	0.067	NB: non-functional	NB: non- functional	No	
D14;15;16a;16b;17;18;19	0.847	NB: functional	NB: functional	No	Drains D17;18;19already present in 2004 but not mapped
D4	0.466	NB: non-functional	NB: non- functional	No	
D6	0.694	NB: reduced functional	NB: reduced functional	No	This drain was wrongly classified as non-functional in 2004

Bog margin drainage

The cutover areas were not surveyed for drains during 2012. However, cutover drains associated with peat cutting are likely to have been maintained in the reporting period.

There was no obvious drainage maintenance on adjoining agricultural land evident on the 2010 aerial photograph. Drains recorded in cutover areas in 1995 by Kelly *et al.* were not examined in the 2004 survey (Fernandez *et al.* 2004)

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

Fire history

There is no evidence for recent burning on Derrynabrock Bog. There is a good cover (26-33% and locally up to 50%) of heather (*Calluna vulgaris*) and the lichen *Cladonia portentosa* is common and widespread. Both species are susceptible to burning. In the 2004 survey, Fernandez *et al*. reported no recent fires for the previous 3 years. There had been evidence of burning on the 2000 aerial photo. Kelly *et al.* (1995) noted evidence of a history of burning on the bog. So although no fire

events have been reported on the high bog in the 2004-2012 reporting period, there is a recorded history of periodic fire events on Derrynabrock Bog.

Invasive species

No invasive species were noted in the 2012 survey; neither were any invasive species reported in the earlier reports: Fernandez *et al*. (2004) and Kelly *et al*. (1994)

Afforestation and forestry management

There is no afforestation on the high bog. There is a conifer plantation adjacent to the east of the north-east lobe, outside the SAC, between the bog and the river. Part of this plantation may be on high bog and the 2010 aerial photograph shows areas which are likely to be rather wet and thus very adequate for Active Raised Bog habitat restoration if the plantation was felled. This plantation was not mentioned by Kelly *et al*., (1995) and probably was planted around or shortly after 1995. The plantation is barely visible on the 2000 aerial photograph, but the trees were mature enough to be visible on the 2005 aerial photo. These plantations and the associated drainage are likely to have an on-going influence on the hydrology of the high bog.

Afforestation adjacent to the high bog is considered to have a medium importance/impact on high bog habitats.

Other impacting activities

No other significant impacting activities were noted or recorded in 2012 impacting high bog habitats in the 2004-2012 reporting period.

Conservation activities

There have been no physical management actions such as the blocking of drains during the reporting period. The reduction in peat cutting since 2004 will slow down the rate of peat loss, but the impact of existing drains continues to degrade the high bog.

Conservation status assessment

The assessment of the conservation status of Annex I Active and Degraded Raised Bog 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

Table 8.1 indicates no overall change in the area of Active Raised Bog (ARB) during the reporting period. However the shape and distribution of ARB has changed, but this is due to more comprehensive surveying and more accurate mapping which give a truer picture of the habitats on the ground. So the amended 2004 figures and the 2012 figures are the same. The central areas **C1** and **C2,** located on the north-eastern part of the bog are very similar in shape to 2004; **C3** situated in the western lobe is smaller than in 2004, because some of the former community complex 35 was re-mapped as sub-central **complex 6/35.**

The sub-central ecotope has also slightly changed due to more comprehensive surveying rather than a real change. There are now 12 sub-central areas (**Sc1-Sc12**) of which five of them (**Sc8-Sc12**) have been newly mapped.

Sc1, Sc2 and **Sc5** are the sub-central areas that surround the three central ecotopes. They have generally expanded due to re-mapping of some central ectope in **C3** as sub-central and the re-

mapping of some sub-marginal ecotope west of **Sc5** now as sub-central. The others **Sc4, Sc6** and **Sc7** have also slightly expanded in area due to more accurate mapping. The recording of five newly mapped areas of sub-central is because they are small and were overlooked in the previous less comprehensive survey in 2004, which had very few mapping points at the locations where the new sub-central areas were mapped. The overall picture of sub-central ecotope on Derrynabrock Bog is a very fragmented one, with many small areas, which might suggest it was formerly more extensive. It has declined in area from 5.88ha in 1994 to 5.01ha in 2012.

The one active flush (**Z)** has decreased from 0.08ha in 1994 to 0.04 in 2012, but no significant change since 2004. However, this is also considered to be the result of more accurate mapping rather than an actual change.

To summarise: the appearance of the central and sub-central ecotopes is quite different in 2004 and 2012. There appears to have been a significant decrease in the area of central from 2.06ha (2004) to 1.55ha (2012) and a corresponding increase in sub-central from 4.52ha (2004) to 5.01ha (2012). The distribution of the habitat has changed considerably with the recording of five newly mapped areas of sub-central (**Sc8-Sc12**). These changes are in fact due to the more comprehensive surveying and more accurate mapping and not considered a real change.

The favourable reference value (FRV) for Area is considered to be the sum of Active Raised Bog (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, Active Raised Bog Area FRV is 44.98ha (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 Active Raised Bog. The current habitat Area value (6.6ha) is 85.33% below the FRV. A current Area value more than 15% below FRV falls into the **Unfavourable Bad** assessment category.

Although a long term (1994-2012) trend indicates a reduction in the area of Active Raised Bog at the site (11.27ha) (see table 8.1). A more recent and short term trend analysis (8years (2004-2012) gives a **Stable** trend with no change in the total ARB area of 6.6ha since 2004.

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

Structure & Functions

The FRV for S&Fs is for at least half of the active raised bog area to be made up of central and active flush, i.e. the higher quality wetter vegetation communities. This value is 3.3ha (half of 6.6ha, the

current area of Active Raised Bog. The current value is 1.59ha which is 51.82% below the FRV. Therefore S&Fs are given an **Unfavourable Bad** assessment.

The long term (1994-2012) trend showed a decrease in the area of central ecotope and active flush, although there was no change in the short term (8 years 2004-2012); thus S&Fs are given a **Stable** trend.

Quadrats analysis (**Qc1, Qc2, Qc3**, **Qsc1, Qsc2, Qsc4** and **Qsm1**) indicates the following:

Qc1 was given the same complex 35 in both years. In 2004, **Qc1** was wetter with pools (34-50%) and in 2012 (11-25%) and there was a higher cover of *Sphagnum cuspidatum* (26-33%) in 2004 compared to 11-25% in 2012. Lawns (4-10%) and *S. papillosum* (11-25%) in 2012 did not feature at all in 2004. *Narthecium ossifragum* was a lot higher (11-25%) in 2004 and <4% in 2012. *Calluna* cover was not recorded in 2004 (a likely omission), even though it was given a height value. In 2012 it was 26-33%. The 2004 quadrat was wetter with a higher cover of 'wet' species, but surprisingly it had a higher cover of *Narthecium ossifragum.*

Qc2: Like **Qc1** this quadrat has again been classified as complex 35 and also it seems dryer with fewer pools in 2012 (34-50%) compared to 2004 (51-75%), and a corresponding decline in the cover of *S. cuspidatum* from 51-75% in 2004 to 34-50% in 2012. Both have a cover of 11-25% of S. *capillofolium*. Surprisingly the total *Sphagnum* cover was higher in 2012 (76-90%) compared to (51-75%) in 2004.

Qc3 has also been classified as complex 35 In contrast to **Qc1** and **Qc2,** this quadrat seems wetter in 2012 with an increase in pools from (4-10%) in 2004 to (26-33%) in 2012, and an increase in the total *Sphagnum* cover in 2012.

Although the differences in the three central ecotope quadrats, suggest a trend towards slight drying out, these differences may also be due to slight differences in quadrat location between the two surveys.

There were four quadrats taken in the sub-central ecotope described below:

Qsc1: In 2004 it was classified as complex 4/2 + pools and in 2012 it was complex 6/35. They had many similarities; both had pools (4-10%). The *Sphagnum* spp. and cover was broadly similar. In both years, *Rhynchospora alba* which was present (4-10%) in 2012 was recorded absent in 2004 in the quadrat for which the species is named complex 4/2 + pools. This is probably an omission. It would seem no major change has occurred in spite of the change in name of the community complex.

Qsc2 was called complex 35/3 in 2004 and complex 6/35 in 2012. Both had a western influence as indicated by '35'. The quadrat was dryer in 2012 with less pools (4-10%) compared to 2004 (11-25%) and with a corresponding higher cover of pool *Sphagnum (S. cuspidatum*) in 2004 and a higher cover of hummock *Sphagnum* (*S.capillifolium*) in 2012. Although the total *Sphagnum* cover remained the same (26-33%). *Carex panicea*, as expected was higher in 2004 in complex 35/3 than in 2012 in complex 6/35 where *Narthecium ossifragum* was higher (26-33%) compared to 11-25% in 2004.

Qsc3 and **Qsc4** were two new sub-central quadrats done in 2012. **Qsc3** was classified as complex 9/35 while Qsc4 was complex 6/35. Complex 9/35 was wetter with 11-25% pools and a higher cover of *Sphagnum cuspidatum*. Both had good micro-topography with low hummocks (34-50%), but Qsc4 had some high hummocks with *S. austinii*. *Narthecium ossifragum* was a significant species in Qsc4, (to be expected) in community complex 6/35, and was absent in Qsc3. Although *Eriophorum* spp. are not recorded in the quadrat data, it is assumed it was higher in Qsc3.

Qsm1 in 2004 was named complex 7/3/4 +P and in 2012 it became **6/3+P**. **Qsm1** was wetter in 2004 with a higher *Sphagnum* cover. One of the key differences was the cover of *Narthecium ossifragum* which was 51-75% in 2012 compared to 11- 25% in 2004.

Typical good quality indicators and typical plant species are still found in sub-central and active flush throughout the entire bog.

The Structure & Functions of Active Raised Bog at Derrynabrock Bog are assessed as Unfavourable Bad -Stable (see table 8.5).

Future Prospects

Although the habitat Area was stable during the reporting period, the long term trend is a decrease in the Area of ARB and a decline in the S&Fs. There have been considerable changes in the distribution of the areas of central and sub-central ecotope with five newly mapped areas of sub-central. However, this is due to a more comprehensive survey and mapping in 2012, rather than any real changes due to impacting activities. Nevertheless, negatively impacting activities such as peat cutting and high bog and cutover drainage and forestry continue to threaten the habitats and directly reducing the high bog extent.

Habitat **Area** is currently 85.33% 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 51.82% below FRV (see table 8.4) and a Declining trend is also foreseen. Therefore S&Fs are expected to be

more than 25% below FRV in the following two reporting periods. **S&Fs Future Prospects** are assessed as **Unfavourable Bad-Declining**. **The overall habitat's Future Prospects are Unfavourable Bad-Declining** (see table 8.5).

Blocking of remaining reduced-functional and functional drains both on the high bog and cutover and cessation of peat cutting is necessary. The actual impact of the afforestation adjacent to the high bog on the north-east side should be assessed. Cutover areas (particularly along the eastern, southern and northern margins will play a major role in the restoration of the habitat as the current characteristics of the high bog (i.e. steep slopes caused by cutting and drainage) may make it difficult to regenerate previous Active Raised Bog values on the high bog.

The overall conservation status of Active Raised Bog at Derrynabrock 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)	2012	Change (2004-2012)	
	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	%
Central	11.97	2.06	1.55	1.55	0.00	0.00
Sub-central	5.88	4.52	5.01	5.01	0.00	0.00
Active flush	0.08	0.08	0.04	0.04	0.00	0.00
Total	**17.93**	**6.66**	**6.60**	**6.60**	**0.00**	**0.00**

[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 2012. The comparison between 2004 (amended) and 2012 illustrates the actual changes in ecotope area in the 2004-2012 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 2012 (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	Qc1	Stable	Slight changes in boundary (slightly larger). This change is the result of more comprehensive surveying in 2012 which resulted in	The three central quadrats (Qc1, Qc2 and Qc3) were classified as complex 35 in both survey periods. There are slight differences in wetness and Sphagnum species

			more accurate mapping.	diversity and cover, but overall there is much similarity
C2	Qc2	Stable	Slight changes in boundary (slightly smaller). This change is the result of more comprehensive surveying in 2012 which resulted in more accurate mapping.	””
C3	Qc3	Stable	Slight changes in boundary (slightly smaller). This change is the result of more comprehensive surveying in 2012 which resulted in more accurate mapping.	””
Sc1	Qsc1	Stable	Slight changes in boundary (slightly larger). This change is the result of more comprehensive surveying in 2012 which resulted in more accurate mapping.	Qsc1- In 2004 this was classified as ccomplex 4/2 +P and in 2012 it was 6/35. They had many similarities; the Sphagnum cover stayed the same. No major change in spite of the change in name of the community complex.
Sc2	Qsc2	Stable	Slight changes in boundary (slightly larger). This change is the result of more comprehensive surveying in 2012 which resulted in more accurate mapping.	Qsc2 was called 35/3 in 2004 and 6/35 in 2012. Both with a western influence as indicated by 35. The total Sphagnum cover remained the same.*Carex panicea* as expected was higher in 2004 in community complex 35/3 than in 2012, and in community complex 6/35, *Narthecium ossifragum* was higher compared to 2004.
Sc3	None	Stable	Slight changes in boundary (slightly larger). This change is the result of more comprehensive surveying in 2012 which resulted in more accurate mapping.	
Sc4	Qsc4	Stable	Slight changes in boundary (slightly smaller). This change is the result of more comprehensive surveying in 2012 which resulted in more accurate mapping.	Qsc4 was a new sub-central quadrat in 2012, classified as complex 6/35.
Sc5	None	Stable	Slight changes in boundary (slightly smaller). This change is the result of more comprehensive surveying in 2012 which resulted in more accurate mapping.	
Sc6	Qsc3	Stable	Slight changes in boundary (slightly larger). This change is the result of more comprehensive surveying in 2012 which resulted in more accurate mapping.	Qsc3 was a new sub-central quadrat in 2012, classified as complex 9/35.
Sc7	None	Unknown	This specific area was not surveyed in 2004. This is likely to be the result of more comprehensive surveying in 2011 which resulted in more accurate mapping.	

Sc8	None	Unknown	This specific area was not surveyed in 2004. This is likely to be the result of more comprehensive surveying in 2011 which resulted in more accurate mapping.	
Sc9	None	Unknown	This specific area was not surveyed in 2004. This is likely to be the result of more comprehensive surveying in 2011 which resulted in more accurate mapping.	
Sc10	None	Unknown	This specific area was not surveyed in 2004. This is likely to be the result of more comprehensive surveying in 2011 which resulted in more accurate mapping.	
Sc11	None	Unknown	This specific area was not surveyed in 2004. This is likely to be the result of more comprehensive surveying in 2011 which resulted in more accurate mapping.	
Sc12	None	Unknown	This specific area was not surveyed in 2004. This is likely to be the result of more comprehensive surveying in 2011 which resulted in more accurate mapping.	
Z	None	Stable	Slight changes in boundary (slightly smaller). This change is the result of more comprehensive surveying in 2012 which resulted in more accurate mapping.	

Degraded Raised Bog (7120)

Area

The Degraded Raised Bog FRV for Area is 35.51ha at Derrynabrock Bog. This value corresponds with the difference between the current high bog area (80.49ha) and the Active Raised Bog FRV (44.98ha) 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 108.08% bigger than FRV and therefore the habitat Area is given an **Unfavourable Bad** assessment (see table 8.4).

There has been a decrease in the marginal ecotope by (-) 0.08ha due to peat cutting. No change to the inactive flush has taken place in the reporting period.

Table 8.3 indicates that there has been a decrease (0.08ha) in the area of Degraded Raised Bog. The decrease is caused by peat cutting. As a result the habitat is given a **Decreasing** trend.

The Area of Degraded Raised Bog at Derrynabrock Bog is assessed as Unfavourable Bad-Decreasing (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 18.47ha (25% of 73.89ha, the current area of Degraded Raised Bog). The current marginal and face bank ecotopes area value (26.73ha) is 44.70% 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 of 0.08ha (1.07%) exclusively due to peat cutting. Although the comparison of 2004 (not amended figures) against 2012 in Table 8.3, show an apparent increase in sub-marginal area. This is really due to more comprehensive surveying and more accurate mapping of this ecotope. The changes are particularly evident at the northern margin and southern margins of the site which were sparsely surveyed in 2004. Thus, the DRB's S&Fs at Derrynabrock 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 Derrynabrock Bog are assessed as Unfavourable Bad-Stable (see table 8.5).

Future Prospects

Degraded Raised Bog has decreased as result of peat cutting. This activity has not been phased out at the site and will continue to cause further habitat losses and potential S&Fs declines. 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 marginal ecotope into sub-marginal and/or Active Raised bog. The conifer plantation adjacent to the north-eastern boundary is likely to be having an adverse impact on the high bog. No restoration works have been undertaken at the site to counteract negative effects of impacting activities.

Habitat **Area** is currently 108.08% 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 44.70% above FRV (see table 8.4). A Declining trend is foreseen in the following two reporting periods, and thus **S&Fs** are expected to remain more than 25% above FRV. As a result, habitat's **S&Fs Future Prospects** are assessed as **Unfavourable Bad-Declining**.

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

Table 8.3 Changes in Degraded Raised Bog area

Inactive Ecotopes	**1994[1]**	**2004**	**2004 (amended)**	**2012**	**Change (2004-2012)**	
	Area (ha)	**Area (ha)**	**Area (ha)**	**Area (ha)**	**Area (ha)**	**%**
Sub-marginal	27.05	35.88	47.11	47.11	0.00	0.00
Marginal[2]	27.49	29.87	27.53	26.73	(-)0.80	(-)2.91
Inactive flush	0.05	0.05	0.05	0.05	0.00	0.00
Total	**54.59**	**65.8**	**74.69**	**73.89**	**(-)0.80**	**(-)1.07**

[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 2012 marginal and face bank ecotope value given within the report should be taken as a maximum value. Their extent is based in the 2012 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 2011-2012 period associated with peat cutting.

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 2012. The comparison between 2004 (amended) and 2012 illustrates the actual changes in ecotope area in the 2004-2012 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 2012.

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

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's 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 has remained Stable in the reporting period. Sub-marginal has not changed either. As result habitat Area is given a **Stable** 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, drainage and afforestation on adjacent land are threatening Active and Degraded Raised Bog. Logically this has to have a long term negative effect on Rhynchosporion depressions. 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 Bad-Stable** 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 Bad-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 Derrynabrock Bog is assessed as Unfavourable Bad-Declining (see table 8.5).

Table 8.4 Habitats favourable reference values

Habitat	Area Assessment			Structure & Functions Assessment		
	FRV Target (ha) [1]	2012 value (ha) [2]	% below target	FRV 2012 Target (ha) [3]	2012 value (ha) [4]	% below target
7110	44.98	6.60	85.33	3.30	1.59	51.82

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

[2] 2012 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] 2012 central ecotope and active flush area.

	FRV Target (ha) [5]	2012 value (ha) [6]	% above target	FRV 2012 Target (ha) [7]	2012 value (ha) [8]	% above target
7120	35.51	73.89	108.08	18.47	26.73	44.70

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

[6] 2012 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.

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.**

Table 8.5 Habitats conservation status assessments

Habitat	Area Assessment	Structure & Functions Assessment	Future Prospects Assessment	Overall Assessment
7110	Unfavourable Bad-Stable	Unfavourable Bad-Stable	Unfavourable Bad-Declining	Unfavourable Bad-Declining
7120	Unfavourable Bad-Decreasing	Unfavourable Bad-Stable	Unfavourable Bad-Declining	Unfavourable Bad-Declining
7150	Unfavourable Bad-Stable	Unfavourable Bad-Stable	Unfavourable Bad-Declining	Unfavourable Bad-Declining

Conclusions

Summary of impacting activities

- Peat cutting still continues at the site and has taken place at 2 locations along the eastern section in the 2004-2010 period. 0.08ha of high bog have been lost due to peat cutting in this period and thus this activity is the reason for the decline in Degraded Raised Bog along the eastern section of high bog.
- 3.248km of drains on the high bog remain functional and 0.780m reduced-functional. Most of these are associated with former peat cutting around the southern, western and northern margins of the bog as well as the active peat cutting area on the eastern side.
- Cutover drainage (peripheral drainage) associated with former and current peat cutting continue to impact on the high bog habitats. In addition drainage associated with the adjacent conifer plantation is likely to be having a negative impact on high bog habitats as well.
- No fire events have damaged the high bog in the reporting period. A number of fire events were recorded in the past by Fernandez *et al*. (2005) and Kelly *et al*. (1994)

Changes in active peat forming areas

- Although the comparison of 2004 (not amended) – 2012 figures show some changes in central and sub-central ecotope extent, this in fact was due to more comprehensive surveying and more accurate mapping in 2012, so the amended 2004 figures show no real change in the reporting period. The distribution shape of the three central areas was refined. The distribution of the sub-central in particular was different with five areas of sub-central (Sc8, Sc9, Sc10, Sc11 and Sc12) being newly mapped. These changes are also the result of more comprehensive surveying. There was no change in the area of active flush Z.

Other changes

- There was a decrease in the area of marginal ecotope by (-)0.08ha due to peat cutting

Quadrats analysis

- **Qc1, Qc2** and **Qc3** were classified as complex 35 in both survey periods. There are slight differences in wetness and *Sphagnum* species diversity and cover, but overall there is much similarity and it is difficult to say if these are real changes or due to a slight difference in location of the quadrat between 2004 and 2012.

- **Qsc1** and **Qsc2** were given different community complex names in 2004 and 2012. **Qsc1**; in 2004 it was classified as complex 4/2+P and in 2012 it was complex 6/35. They had many similarities in spite of the change in complex name, but there was an increase in *Narthecium* in 2012. **Qsc2** was called complex 35/3 in 2004 and complex 6/35 in 2012. *Carex panicea* was replaced by *Narthecium ossifragum* in 2012.
- **Qsc3** and **Qsc4** were two new sub-central quadrats done in 2012. **Qsc3** was classified as complex 9/35 while **Qsc4** was complex 6/35.
- **Qsm1** in 2004 was named complex 7/3/4 +P and in 2012 it became complex 6/3+P. Although they were similar in many ways, complex 6/3 +P had a much higher cover of *Narthecium ossifragum.*

Restoration works

- No restoration works have been undertaken at the site.

Summary of conservation status

- **Active Raised Bog** has been given an **Unfavourable Bad–Declining** conservation status at Derrynabrock Bog. There was no change in the habitat Area during the reporting period. However the ARB habitat area is 6.6ha (85.33%) below the FRV and Future Prospects are considered Unfavourable Bad-Declining as impacting activities (peat cutting and drainage) continue to threaten the habitat.
- **Degraded Raised Bog** has been given an **Unfavourable Bad-Declining** conservation status at Derrynabrock Bog. Habitat Area has slightly decreased due to losses associated with peat cutting. Habitat's S&Fs have remained stable. Habitat Area and S&FS are above FRVs, which is deemed negative for this habitat. Future Prospects are considered Unfavourable Bad-Declining due to threatening impacting activities.
- **Depressions on peat substrates of the Rhynchosporion** has been given an **Unfavourable Bad-Declining** conservation status at Derrynabrock Bog. Habitat Area and quality (S&Fs) are considered to have not changed in the reporting period. However, Future Prospects are considered Unfavourable Bad-Declining as a result of threatening impacting activities.

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

Recommendations

- **Cessation of peat cutting.**

- **Assessment of the actual impact of the afforestation** adjacent to the high bog.
- **Restoration works** including blocking of high bog and functional drains in particular those on the eastern side associated with peat cutting and those around the southern and western margin associated with former peat cutting. Also blocking of reduced-functional drains as well as cutover drains. There is potential for the restoration of cutover along the south-east section of the site.
- **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.

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Appendix I Detailed vegetation description of the high bog

Active Raised Bog (7110)

Central Ecotope Complex

COMPLEX 35

- **Location**: this community complex characterizes all central ecotope areas in the site (**C1**; **C2** and **C3**)
- **Ground**: quaking
- **Physical indicators**: absent
- ***Calluna* height**: 21-30cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: flat
- **Pools**: 11-25%
- ***Sphagnum* cover**: 51-75%
- ***Narthecium* cover**: 4-10%
- **Micro- topography**: high and low hummocks/hollows and pools
- **Tussocks**: *Eriophorum vaginatum* (<4%)
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (11-25%), *Erica tetralix* (4-10%), *E. angustifolium* (<4%), *Rhynchospora alba* (<4%), *Drosera anglica* (<4%), *Menyanthes trifoliata* (<4%), *Sphagnum cuspidatum* (P; 11-25%), *S. denticulatum* (<4%), *S. magellanicum* (L & P; <4%), *S. papillosum* (H and P; 4-10%), *S. capillifolium* (H; 11-25%), *Hypnum jutlandicum* (<4%), *Aulacomnium palustre* (<4%).
- **Additional comments**: Interconnecting pools. Two other areas (**C1** and **C2**) of this complex are found in the north-eastern lobe with a higher cover of pools is 26-33%. In all central 35 the western indicators *Campylopus atrovirens* (<4%), *Pleurozia purpurea* (<4%), and *Racomitrium lanuginosum* (< 4%) occur. Other species present include, *Leucobryum glaucum* (<4%), *Sphagnum tenellum* (H; <4%), *S. austinii* (H; <4%) and *S. fuscum* (H; <4%). Towards the north of this complex, in the area where **Qc2** was taken, the micro-topography is better developed with higher hummocks and more extensive *Sphagnum*-filled pools. Here the pool cover is 34-50% and is dominated by *S. cuspidatum* (34-50%). *Calluna vulgaris* is taller (0.4-0.5m) and the cover of

Cladonia portentosa is higher (11-25%) while that of *Narthecium ossifragum* is lower (<4%). *Aulacomnium palustre*, *Vaccinium oxycoccos*, *Polytrichum strictum* and *Dicranum scoparium* are present in this area.

Quadrats **Qc1**, **Qc2** and **Qc3** were recorded within this complex.

Sub-Central Ecotope Complexes

COMPLEX 9/35

- **Location**: localised in **Sc1** and to the south of **Sc6**
- **Ground**: soft to quaking
- **Physical indicators**: absent
- ***Calluna* height**: 21-30cm
- ***Cladonia* cover**: 4-10%
- **Macro-topography**: flat to gentle slope
- **Pools**: 11-25%
- ***Sphagnum* cover**: 51-75%
- ***Narthecium* cover**: <4%
- **Micro- topography**: low hummocks/hollows/pools
- **Tussocks**: *Eriophorum vaginatum* (4-10%)
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (26-33%), *Erica tetralix* (<4%), *Eriophorum angustifolium* (<4%), *Eriophorum vaginatum* (4-25%), *Rhynchospora alba* (<4%), *Trichophorum germanicum* (<4%), *Molinia caerulea* (<4%), *Carex panicea (<4%), Menyanthes trifoliata (<4%), Drosera anglica <4%), Vaccinium oxycoccos (<4%), Aulacomnium palustre* (<1%), S*phagnum. cuspidatum* (P & Hl 11-25%), *S. denticulatum (*P; *<4%), S. magellanicum* (P; <4%), *S. capillifolium* (H; 4-10%), *S. papillosum* (H; <4%) and *S. tenellum* (H; 4-10%).
- **Additional comments:** Near **Qsc3**. This complex is similar to 6/35 but with increased *Eriophorum vaginatum*. This complex extends in a narrow band to the south where it appears to be flushed (possibly indicating water movement) as indicated by the presence of *Molinia caerulea*, *Sphagnum fallax*, *S. palustre* and *Aulacomnium palustre*. Complex 9/35 (W) indicates this is a western type complex

Quadrat **Qsc3** was recorded within this complex.

COMPLEX 6/35

- **Location**: this community complex characterises nearly all sub-central ecotope areas in the site (**Sc1** to **Sc12**)
- **Ground**: soft
- **Physical indicators**: absent
- ***Calluna* height**: 21-30cm
- ***Cladonia* cover**: <4% (4-10% in places)
- **Macro-topography**: gentle slope
- **Pools**: 11-25% (4-10% in places)
- ***Sphagnum* cover**: 26-33%
- ***Narthecium* cover**: 26-33%
- **Micro- topography**: low hummocks/hollows and pools
- **Tussocks**: absent
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Narthecium ossifragum* (26-33%), *Carex panicea* (11-25%), *Calluna vulgaris* (11-25%), *Erica tetralix* (4-10%), *Eriophorum vaginatum* (4-10%), *E. angustifolium* (<4%), *Rhynchospora alba* (4-10%), *Trichophorum germanicum* (<4%), *Drosera anglica* (<4%), *Menyanthes trifoliata* (<4%), *Campylopus atrovirens* (<4%), *Pleurozia purpurea* (<4%), *Racomitrium lanuginosum* (< 4%), *Leucobryum glaucum* (<4%), *Pedicularis palustris* (<4%), *Sphagnum capillifolium* (H; 11-25%), *S. tenellum* (H; <4%), *S. subnitens* (H; <4%), *S. austinii* (H; <4%), *S. fuscum* (H; <4%), *S. papillosum* (H & P; 4-10%), *S. magellanicum* (H & P; <4%), *S. denticulatum* (P; <4%), *S. cuspidatum* (P; 11-25%).
- **Additional comments:** This complex grades into the sub-marginal complex 6/3 + Pools where the cover of *Narthecium ossifragum* increases (34-50%) and the cover of *Eriophorum vaginatum* decreases (<4%). The cover of pools (4-10%) is also lower in the sub-marginal complex as is the overall *Sphagnum* cover (11-25%). Complex 6/35 also dominated the sub-central ecotope in the western lobe of Derrynabrock Bog. The newly described area of sub-central (**SC8**) in the western lobe is a borderline sub-marginal/sub-central complex. The inter-pool areas have a very poor *Sphagnum* cover and are dominated by *Narthecium ossifragum*. Thus, this area would be classed as sub-marginal but for the fact that there are some large pools with a good cover of *Sphagnum cuspidatum*. However, these pools occupy only a very small fraction of **SC8** and thus it is arguable whether this area should be mapped as sub-central or sub-marginal.
  Complex 6/35 (W) indicates this is a western type complex.

  Quadrats **Qsc1, Qsc2** and **Qsc4** were recorded within this complex.

FLUSH Z

- **Location**: in the north-west of the western lobe.
- **Ground**: very soft
- **Physical indicators**: absent
- ***Calluna* height**: 41-50cm
- ***Cladonia* cover**: 4-10%
- **Macro-topography**: flat
- **Pools**: this flush is essentially a large pool surrounded by some large hummocks
- ***Sphagnum* cover**: 51-75%
- ***Narthecium* cover**: <4%
- **Micro- topography**: large hummocks & pool
- **Tussocks**: absent
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (34-50%), *Erica tetralix* (<4%), *Eriophorum vaginatum* (4-10%), *E. angustifolium* (<4%), *Rhynchospora alba* (<4%), *Menyanthes trifoliata* (<4%), *Vaccinium oxycoccos* (<4%), *Aulacomnium palustre* (<4%), *Polytrichum strictum* (<4%), *Dicranum scoparium* (<4%), *Pleurozium schreberi* (<4%), *Juncus effusus* (<4%), *Sphagnum capillifolium* (H; 4-10%), *S. papillosum* (H; 4-10%), *S. austinii* (H; <4%), *S. magellanicum* (P; 4-10%), *S. cuspidatum* (P; 11-25%).
- **Additional comments:** This flush is essentially a large pool with close to 100% *Sphagnum* cover (mostly *S. cuspidatum*) surrounded by some large hummocks. It could alternatively be classed as central ecotope.

Degraded Raised Bog (7120)

Sub-Marginal Ecotope Complexes

COMPLEX 9/7

- **Location**: this complex is found on the eastern side of the site in localized areas.
- **Ground**: Firm to soft
- **Physical indicators**: absent
- ***Calluna* height**: 20-30cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: gentle slope to the edge
- **Pools**: absent

- ***Sphagnum* cover**: 11-25%, locally 26-33%
- ***Narthecium* cover**: <4%
- **Micro- topography**: low hummocks/hollows
- **Tussocks**: *Eriophorum vaginatum* 11-25%
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (26-33%), *Erica tetralix* (4-10%), *Eriophorum vaginatum* (11-25%), *E. angustifolium* (4-10%), *Narthecium ossifragum* (<4%), *Trichophorum germanicum* (<4%, locally 11-25%), *Carex panicea* (<4%), *Sphagnum capillifolium* (H; 11-25%), *S. papillosum* (H; <4%), *S. tenellum* (H; <4%), *Cladonia uncialis* (<1%).
- **Additional comments:** None.

COMPLEX 6/3+P

- **Location**: this complex is widespread in the sub-marginal ecotope and tends to be found around the sub-central ecotopes.
- **Ground**: firm to soft
- **Physical indicators**: absent
- ***Calluna* height**: 11-20cm
- ***Cladonia* cover**: 4-10%
- **Macro-topography**: flat
- **Pools**: 4-10%, sometimes <4%
- ***Sphagnum* cover**: 11-25%,
- ***Narthecium* cover**: 26-33%, locally 34-50%
- **Micro- topography**: low hummocks/hollows/pools, dominated by flats
- **Tussocks**: *Trichophorum germanicum* (<4%)
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (34-50%), *Erica tetralix* (<4%), *Eriophorum vaginatum* (<4%), *E. angustifolium* (4-10%), *Carex panicea* (4-10%), *Rhynchospora alba* (<4%), *Menyanthes trifoliata* (<4%), *Drosera anglica* (<4%), *Sphagnum cuspidatum* (<4%), *S. magellanicum* (<4%), *S. papillosum* (H; <4%), *S. capillifolium* (H; 4-10%), *S. tenellum* (H; 4-10%), *Racomitrium lanuginosum* (<4%), *Pleurozium purpurea* (<4%), forming nice patches. *Cladonia uncialis* (<4%).
- **Additional comments:** Extensive flat area. The inter-pool areas are often poor in *Sphagnum* cover and can be firm under-foot. This grades into sub-central 6/35, where *Narthecium* decreases and nice pools increase. At the south-eastern side it grades into 6/4 + P, where *Rhynchospora alba* increases to (4-10%) or more. This complex was also recorded on the western

lobe. This complex also grades into the poorer sub-marginal complex 6/3/2 + P where *Trichophorum germanicum* increases to 4-10% and the cover of *Sphagnum*, both in the pools and in the inter-pool areas is lower (overall cover generally <10%).

Quadrat **Qsm1** was recorded within this complex.

COMPLEX 9/7/6

- **Location**: this complex is found around most of the perimeter of the site near the marginal ecotope. It was described on the south-east side near the access track
- **Ground**: Firm to soft
- **Physical indicators**: absent
- ***Calluna* height**: 20-30cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: gentle slope to the edge
- **Pools**: 1-3% (few)
- ***Sphagnum* cover**: 11-25%
- ***Narthecium* cover**: 11-25%
- **Micro- topography**: low hummocks/hollows
- **Tussocks**: *Eriophorum vaginatum* (4-10%)
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (26-33%), *Erica tetralix* (4-10%), *Eriophorum vaginatum* (4-10% and 11-25% in places), *E. angustifolium* (4-10%), *Narthecium ossifragum* (11-25%), *Trichophorum germanicum* (<4%), *Carex panicea* (<4%), *S. cuspidatum* (Hl; <4%), *Sphagnum capillifolium* (H; 11-25%), *S. papillosum* (H; <4%), *S. tenellum* (H; <4%), *Racomitrium lanuginosum* (<4%), *Cladonia uncialis* (<1%).
- **Additional comments:** On the northern side of the western lobe, hummocks of *Racomitrium lanuginosum* are up to 80cms high**.** Towards the centre of the bog**,** *Sphagnum* cover can be quite variable. This complex grades into 9/7/3 in places where *Carex panicea* (>4%).

Marginal Ecotope Complexes

COMPLEX 2/6

- **Location**: this complex is found across the entire high bog marginal ecotope
- **Ground**: firm
- **Physical indicators**: bare peat (<4%)

- ***Calluna* height**: 20-30cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: gentle to steep slope
- **Pools**: absent
- ***Sphagnum* cover**: 4-10%
- ***Narthecium* cover**: 34-50%
- **Micro- topography**: low hummocks/*Narthecium ossifragum* flats/ hollows
- **Tussocks**: *Trichophorum germanicum* (4-10%)
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (26-33%), *Erica tetralix* (<4%), *Carex panicea* (<4-10%) *Sphagnum capillifolium* (H; <4%), *S. tenellum* (H; <4%).
- **Additional comments**: Although 2/6 is the most common marginal community complex, in places, where *Narthecium ossifragum* decreases and *Trichophorum germanicum* increases, it becomes Complex 2. See below. At the south-western side of the site it was recorded as 2/6 +My, where a localised area of *Myrica gale* occurs.

COMPLEX 2

- **Location**: eastern edge of north-eastern lobe
- **Ground**: firm
- **Physical indicators**: bare peat (<4%; 4-10% in places)
- ***Calluna* height**: 31-40cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: gentle to steep slope
- **Pools**: absent
- ***Sphagnum* cover**: 4-10% (11-25% in places)
- ***Narthecium* cover**: 4-10%
- **Micro- topography**: low hummocks/ hollows/ tussocks
- **Tussocks**: *Trichophorum germanicum* (4-10%; 11-25% in places)
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (11-25%), *Erica tetralix* (11-25%), *Carex panicea* (11-25%), *Eriophorum vaginatum* (<4%; 4-10% in places), *E. angustifolium* (<4%; 4-10%in places), *Sphagnum capillifolium* (H; <4%), *S. tenellum* (H; <4%), *S. papillosum* (H; <4%) and *S. cuspidatum* (Hl; <4%).
- **Additional comments**: Where *Carex panicea* increases, this grades into complex 2/3 and at one location on the south-east it became 2/3/9 where *Eriophorum vaginatum* was abundant.

Inactive flushes

FLUSH FY

- **Location**: eastern edge of north-eastern lobe
- **Ground**: soft
- **Physical indicators**: absent
- ***Calluna* height:** 31-40cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: gentle slope to high bog margin
- **Pools**: absent
- ***Sphagnum* cover**: 11-25%
- ***Narthecium* cover**: <4%
- **Micro- topography**: low hummocks/hollows
- **Tussocks**:
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (26-33%), *Erica tetralix* (4-10%), *Myrica gale* (11-25%), *Eriophorum vaginatum* (<4%), *E. angustifolium* (4-10%), *Narthecium ossifragum* (<4%), *Sphagnum capillifolium* (H; 11-25%), *S. papillosum* (H; 4-10%) and *S. tenellum* (H; <4%).
- **Additional comments:** this area is essentially a small area with scattered *Myrica gale.*

Depressions on peat substrates of the Rhynchosporion (7150)

The habitat occurs at Derrynabrock Bog in both Active and Degraded Raised Bog, but it is only occasionally found on degraded habitat. *Rhynchospora alba* was recorded within the 2012 survey in the following ecotopes; central 35, sub-central ecotope (9/35; 6/35); sub-marginal ecotope (9/7/6, 9/7; 6/3+P), Although it occurred rarely in the marginal ecotope, it was not recorded in the community description. The species is always found associated with wet features such as *Sphagnum* pools, *Sphagnum* lawns and hollows, along with *Sphagnum magellanicum*, *S. papillosum*, *S. cuspidatum*. It was also found within *Narthecium ossifragum* dominated hollows in sub-marginal complexes.

Appendix II Photographical records

Photograph Number	Aspect	Type	Feature	Date
0348	NE	Overview	Qc1	24/09/2012
0359	NE	Overview	Qc2	24/09/2012
0377	NE	Overview	Qc3	25/09/2012
0379	NE	Overview	Qsc1	25/09/2012
0347	NE	Overview	Qsc2	24/09/2012
0369	NE	Overview	Qsc3	25/09/2012
0381	NE	Overview	Qsc4	25/09/2012

Appendix III Quadrats

Ecotope type	Central	Central	Central	Central
Complex Name	35	35	35	35
Quadrat Name	Qc1	Qc1	Qc2	Qc2
Easting	156529	156529.28	156513	156518.53
Northing	303077	303076.91	303185	303178.10
Date	23/07/04	24/09/2012	23/07/04	24/09/2012
Firmness	very soft	Quaking	Quaking	Quaking
Burnt	No	No	No	No
Algae in hollows %	Absent	Absent	Absent	Absent
Algae in pools %	Absent	Absent	Absent	Absent
Bare peat %	Absent	Absent	Absent	Absent
High hummocks %	na	Absent	Na	4-10
Low hummocks %	11-25	26-33	4-10	11-25
Hollows %	1-3 (many indiv)	1-3 (many indiv)	1-3 (many indiv)	4-10
Lawns %	Absent	4-10	Absent	4-10
Pools %	34-50	11-25	51-75	34-50
Pool type	Interconnecting	Interconnecting	Interconnecting	Interconnecting
S.austinii hum type	na	Absent	Absent	Absent
S.austinii hum %	na	Absent	Absent	Absent
S.austinii height(cm)	na	Absent	Absent	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	Absent	Absent	1-3 (many indiv)	Absent
Trichophorum type	Tussocks	Flats	Absent	Absent
Trichophorum %	1-3 (many indiv)	1-3 (few indiv)	Absent	Absent
S.magellanicum %	1-3 (many indiv)	4-10	1-3 (many indiv)	Absent
S.cuspidatum %	26-33	11-25	51-75	34-50
S.papillosum %	na	11-25	4-10	4-10
S.denticulatum %	na	Absent	Na	Absent
S.capillifolium subsp. rubellum %	4-10	4-10	Na	11-25
S.tenellum %	na	4-10	Na	Absent
S.subnitens %	na	Absent	Na	Absent
R.fusca %	Absent		Absent	Absent
R.alba %	Absent	1-3 (many indiv)	Na	4-10

N.ossifragum %	11-25	1-3 (many indiv)	Absent	Absent
Sphag pools %	34-50	11-25	51-75	34-50
Dominant pool Sphag	S.cuspidatum	S.cuspidatum	S.cuspidatum	S.cuspidatum
Sphag lawns %	Absent	4-10	Absent	4-10
Sphag humm %	4-10	11-25	4-10	11-25
Sphag holl %	1-3 (many indiv)	Absent	1-3 (many indiv)	Absent
Total Sphag %	34-50	34-50	51-75	76-90
Hummocks indicators	na	Absent	na	Absent
Cladonia portent %	4-10	26-33	1-3 (many indiv)	11-25
Other Cladonia sp	na		na	
C. panicea %	na	1-3 (few indiv)	na	Absent
Calluna cover %	na	26-33	4-10	11-25
Calluna height(cm)	41-50	11-20	41-50	31-40
Other NotableSpecies	*Menyanthes Aulacomnium , Racomitrium,Pedicularis*	*Drosera ang Meny*	*Carex limosa?,D.rotundifolia*	*D. ang Meny Aulacom V.oxy*
Other comment		Erica 4-10 E.vag<4 ang <4. S.aust adj to quad		Carex sp in pool adj to quad

Ecotope type	Central	Central	Sub-central	Sub-central
Complex Name	35	35	4/2 + pools	6/35
Quadrat Name	Qc3	Qc3	Qsc1	Qsc1
Easting	155980	155983.83	156036	156034.58
Northing	302899	302896.75	302919	302919.70
Date	23/07/04	25/09/2012	23/07/04	25/09/2012
Firmness	quaking	Quaking	very soft	Soft
Burnt	No	No	No	No
Algae in hollows %	Absent	Absent	4-10	Absent
Algae in pools %	Absent	Absent	na	Absent
Bare peat %	Absent	Absent	Absent	1-3 (many indiv)
High hummocks %	na	Absent	na	Absent
Low hummocks %	11-25	51-75	4-10	11-25
Hollows %	4-10	1-3 (many indiv)	11-20	11-25
Lawns %	4-10	Absent	Absent	Absent
Pools %	4-10	26-33	4-10	4-10
Pool type	Interconnecting	Interconnecting	Tear	Regular
S.austinii hum type	na	Absent	Absent	Active
S.austinii hum %	4-10	Absent	Absent	1-3 (many indiv)
S.austinii height(cm)	na	Absent	Absent	0-10
S.fuscum hum type	na	Absent	na	Absent
S.fuscum hum %	4-10	Absent	1-3 (many indiv)	Absent

S.fuscum height(cm)	na	Absent	na	Absent
Leucobryum glaucum	Absent	Absent	Absent	Absent
Trichophorum type	Absent	Flats	Flats	Flats
Trichophorum %	Absent	4-10	4-10	1-3 (few indiv)
S.magellanicum %	1-3 (many indiv)	1-3 (many indiv)	Absent	Absent
S.cuspidatum %	Absent	26-33	Absent	4-10
S.papillosum %	11-25	4-10	4-10	4-10
S.denticulatum %	Absent	1-3 (many indiv)	Absent	Absent
S.capillifolium subsp. rubellum %	11-25	11-25	4-10	4-10
S.tenellum %	na	Absent	na	1-3 (many indiv)
S.subnitens %	Absent	Absent	Absent	Absent
R.fusca %	1-3 (many indiv)	Absent	na	Absent
R.alba %	Absent	1-3 (many indiv)	Absent	4-10
N.ossifragum %	Absent	4-10	4-10	34-50
Sphag pools %	4-10	26-33	4-10	1-3 (many indiv)
Dominant pool Sphag	Absent	S.cuspidatum	Absent	S.cuspidatum
Sphag lawns %	4-10	Absent	Absent	Absent
Sphag humm %	11-25	26-33	4-10	11-25
Sphag holl %	1-3 (many indiv)	Absent	4-10	Absent
Total Sphag %	11-25	51-75	11-25	26-33
Hummocks indicators	S.austinii&S.fuscum	Absent	S.fuscum	S.austinii
Cladonia portent %	na	11-25	na	1-3 (few indiv)
Other Cladonia sp	Absent		Absent	c. uncialix
C. panicea %	Absent	Absent	Absent	1-3 (few indiv)
Calluna cover %	4-10	26-33	4-10	11-25
Calluna height(cm)	21-30	21-30	11-20	11-20
Other NotableSpecies		Raco Menyanthes Aulacom Vacc oxy		Raco Campy atro. Pedic pal. Pleuro purp. D.ang
Other comment		E.vag <4		Erica 11-25

Ecotope type	Sub-central	Sub-central	Sub-central	Sub-central
Complex Name	35/3	6/35	9/35	6/35
Quadrat Name	Qsc2	Qsc2	Qsc3	Qsc4
Easting	156456	156456.48	155951.70	155829.32
Northing	302897	302898.90	302706.90	302916.57
Date	23/07/04	24/09/2012	25/09/2012	25/09/2012
Firmness	soft	Soft	Soft	Soft
Burnt	No	No	No	No
Algae in hollows %	Absent	Absent	Absent	Absent

Algae in pools %	na	Absent	Absent	Absent
Bare peat %	na	1-3 (many indiv)	4-10	Absent
High hummocks %	na	Absent	Absent	4-10
Low hummocks %	11-25	11-25	34-50	34-50
Hollows %	1-3 (many indiv)	11-25	4-10	4-10
Lawns %	4-10	Absent	Absent	4-10
Pools %	11-25	4-10	11-25	1-3 (many indiv)
Pool type	Tear	Interconnecting	Interconnecting	Interconnecting
S.austinii hum type	na	Active	Active	Active
S.austinii hum %	na	1-3 (several indiv)	1-3 (several indiv)	4-10
S.austinii height(cm)	na	11-20	Absent	21-30
S.fuscum hum type	na	Absent	Absent	Active
S.fuscum hum %	na	Absent	Absent	1-3 (many indiv)
S.fuscum height(cm)	na	Absent	Absent	0-10
Leucobryum glaucum	Absent	Absent	Absent	Absent
Trichophorum type	Tussocks	Tussocks	Flats	Tussocks
Trichophorum %	4-10	1-3 (several indiv)	1-3 (several indiv)	1-3 (many indiv)
S.magellanicum %	4-10	1-3 (many indiv)	1-3 (several indiv)	4-10
S.cuspidatum %	4-10	4-10	11-25	1-3 (many indiv)
S.papillosum %	4-10	4-10	4-10	1-3 (many indiv)
S.denticulatum %	na	1-3 (few indiv)	Absent	1-3 (few indiv)
S.capillifolium subsp. rubellum %	4-10	11-25	11-25	11-25
S.tenellum %	na	1-3 (many indiv)	1-3 (many indiv)	1-3 (many indiv)
S.subnitens %	na	1-3 (many indiv)	Absent	Absent
R.fusca %	Absent	Absent	Absent	Absent
R.alba %	1-3 (many indiv)	1-3 (several indiv)	4-10	1-3 (many indiv)
N.ossifragum %	11-25	26-33	Absent	26-33
Sphag pools %	11-25	4-10	11-25	1-3 (many indiv)
Dominant pool Sphag	S.cuspidatum	S.cuspidatum	S.cuspidatum	S.cuspidatum
Sphag lawns %	4-10	Absent	Absent	4-10
Sphag humm %	4-10	11-25	11-25	26-33
Sphag holl %	1-3 (many indiv)	1-3 (several indiv)	1-3 (many indiv)	Absent

Total Sphag %	26-33	26-33	51-75	34-50
Hummocks indicators	na	S.austinii	Absent	S.austinii&S.fuscum
Cladonia portent %	1-3 (many indiv)	1-3 (many indiv)	4-10	4-10
Other Cladonia sp	Absent	c.uncialis	C. uncialis	C.uncialis
C. panicea %	26-33	4-10	1-3 (many indiv)	1-3 (few indiv)
Calluna cover %	11-25	26-33	34-50	26-33
Calluna height(cm)	21-30	11-20	21-30	21-30
Other NotableSpecies		D.ang Menyanthes Pedicularis	Menyanthes Aulacom Pedicularis Dicranum scop	Raco D.ang Meny Pedic pal
Other comment		Erica 4-10 E.vag 4-10 ang <4	Molinia adj to quad	C atro immed adj

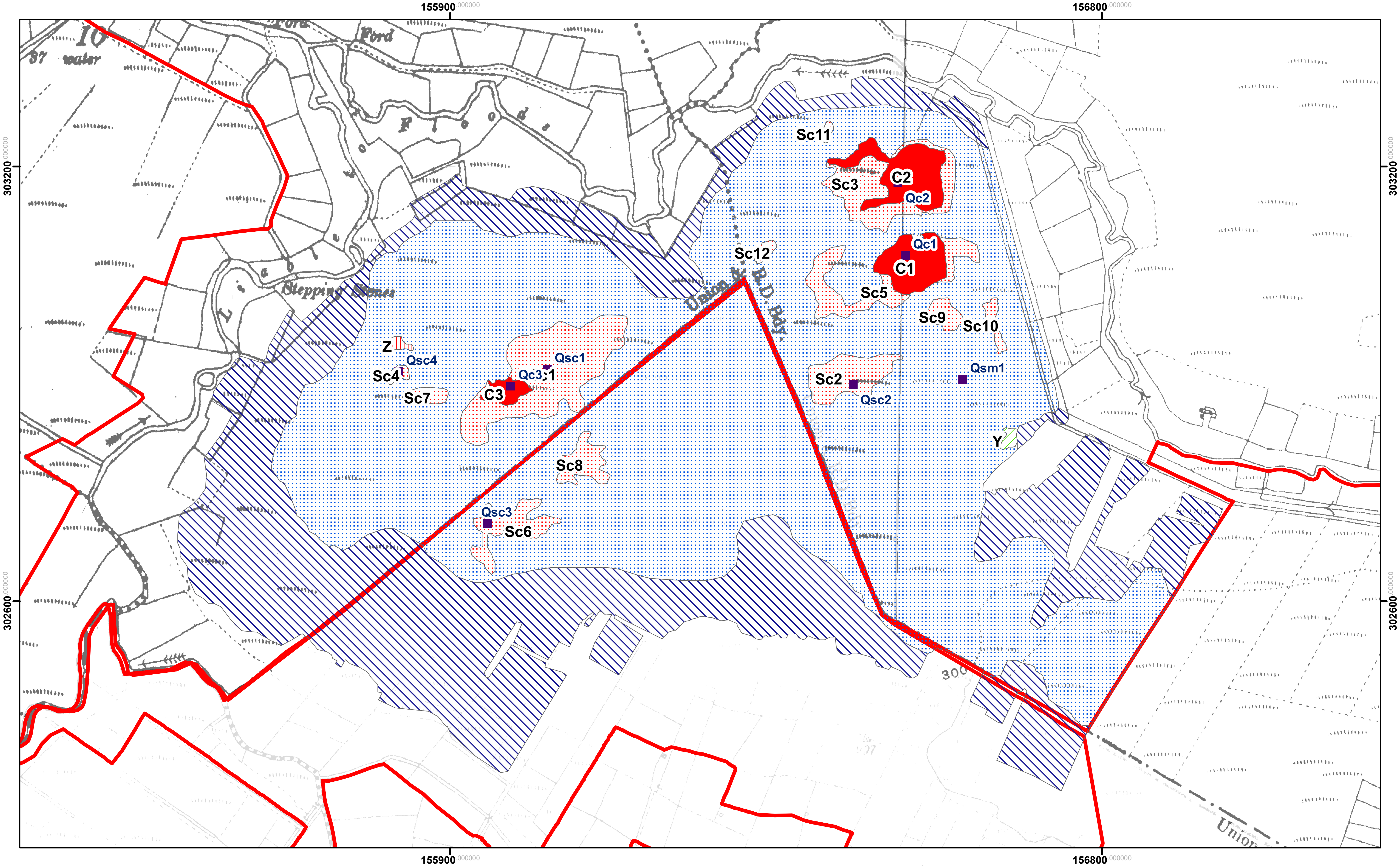
Ecotope type	**Sub-marginal**	**Sub-marginal**	**Sub-marginal**	**Sub-marginal**	**Sub-marginal**	**Marginal**
Complex Name	**7/3/4+P**	**6/3+P**	**4/2+TP**	**3/6/2+P**	**6/3/2**	**6/3+P**
Quadrat Name	Qsm1	Qsm1	Qsm2	Qsm3	Qsm4	Qm1
Easting	155951	156608.21	155833	155732	156629	156603
Northing	302707	302905.72	302915	302757	302858	302909
Date	23/07/04	24/09/2012	23/07/04	23/07/04	23/07/04	23/07/04
Firmness	firm	Soft	soft	soft	soft	very soft
Burnt	Yes	No	No	No	No	No
Algae in hollows %	11-25	Absent	4-10	4-10	Absent	Absent
Algae in pools %	4-10	Absent	Absent	Absent	Absent	Absent
Bare peat %	4-10	1-3 (many indiv)	Absent	Absent	Absent	Absent
High hummocks %	na	Absent	na	na	na	na
Low hummocks %	11-25	4-10	11-25	11-25	11-25	11-25
Hollows %	4-10	4-10	11-25	4-10	4-10	4-10
Lawns %	Absent	Absent	4-10	Absent	Absent	Absent
Pools %	11-25	1-3 (many indiv)	11-25	11-25	Absent	11-25
Pool type	Interconnecting	Regular	Tear	Tear	Absent	Interconnecting
S.austinii hum type	na	Absent	Absent	Absent	Absent	na
S.austinii hum %	na	Absent	Absent	Absent	Absent	na
S.austinii height(cm)	na	Absent	Absent	Absent	Absent	na
S.fuscum hum type	na	Absent	na	na	Absent	na
S.fuscum hum %	4-10	Absent	4-10	4-10	Absent	na

S.fuscum height(cm)	na	Absent	na	na	Absent	na
Leucobryum glaucum	Absent	Absent	Absent	Absent	Absent	Absent
Trichophorum type	Tussocks	Tussocks	Flats	Flats	Tussocks	Tussocks
Trichophorum %	4-10	1-3 (many indiv)	4-10	na	1-3 (many indiv)	4-10
S.magellanicum %	11-25	1-3 (few indiv)	1-3 (many indiv)	Absent	na	4-10
S.cuspidatum %	Absent	1-3 (many indiv)	Absent	Absent	Absent	4-10
S.papillosum %	4-10	4-10	4-10	11-25	4-10	1-3 (many indiv)
S.denticulatum %	Absent	Absent	Absent	Absent	Absent	na
S.capillifolium subsp. rubellum %	4-10	4-10	4-10	1-3 (many indiv)	4-10	4-10
S.tenellum %	na	1-3 (many indiv)	na	na	na	na
S.subnitens %	Absent	1-3 (few indiv)	1-3 (many indiv)	Absent	1-3 (many indiv)	Absent
R.fusca %	1-3 (many indiv)	Absent	na	1-3 (many indiv)	Absent	na
R.alba %	Absent	1-3 (few indiv)	Absent	Absent	Absent	na
N.ossifragum %	11-25	51-75	1-3 (many indiv)	Absent	11-25	26-33
Sphag pools %	11-25	1-3 (many indiv)	11-25	11-25	Absent	11-25
Dominant pool Sphag	Absent	S.cuspidatum	Absent	Absent	Absent	S.cuspidatum
Sphag lawns %	Absent	Absent	4-10	Absent	Absent	Absent
Sphag humm %	11-25	4-10	11-25	11-25	11-25	11-25
Sphag holl %	1-3 (many indiv)	Absent	4-10	1-3 (many indiv)	1-3 (many indiv)	1-3 (many indiv)
Total Sphag %	11-25	4-10	11-25	11-25	11-25	11-25
Hummocks indicators	S.austinii&S. fuscum	Absent	S.fuscum	S.fuscum	Absent	na
Cladonia portent %	na	1-3 (several indiv)	na	na	1-3 (many indiv)	na
Other Cladonia sp	Absent	C.unciallis	Absent	Absent	na	C. floerkeana
C. panicea %	Absent	1-3 (few indiv)	Absent	Absent	11-25	na
Calluna cover %	11-25	34-50	4-10	4-10	4-10	4-10
Calluna height(cm)	11-20	11-20	11-20	21-30	21-30	21-30
Other NotableSpecies	menyanthes in pools	Raco D.ang Meny Pedic pal Erica 11-25 E. vag few ang several.				Racomitrium lanuginosum

		S.aus adj
Other comment	central area appears burnt	Dominated by Narth flats/hollows (was Qsm3)

Note: Data for those 2004 quadrats re-surveyed in 2012 is given to the right of the original 2004 quadrat data in table above. Not all quadrats reported in 2004 were re-surveyed in 2012. Nonetheless, all 2004 quadrat data is given above. Additional quadrats were recorded where necessary. Some 2004 quadrats may have been classified under a different ecotope category in 2012; further detail is given within the report.

Appendix IV Survey maps



Raised Bog Monitoring & Assessment Survey 2013

Map 1: Ecotopes Map and Quadrats

Ecology and Environmental Consultants Ireland Ltd.

Derrynabrock SAC (002298)
Co. Mayo/Co. Roscommon

1:5,000

N

0 60 120 240 360 480 Meters

Legend

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

155900 000000

156800 000000

303200 000000

302600 000000

Raised Bog Monitoring & Assessment Survey 2013

Map 2: Vegetation community complexes

Ecology and Environmental Consultants Ireland Ltd.

Derrynabrock SAC (002298)
Co. Mayo/Co. Roscommon

1:5,000

N

0 70 140 280 420 560 Meters

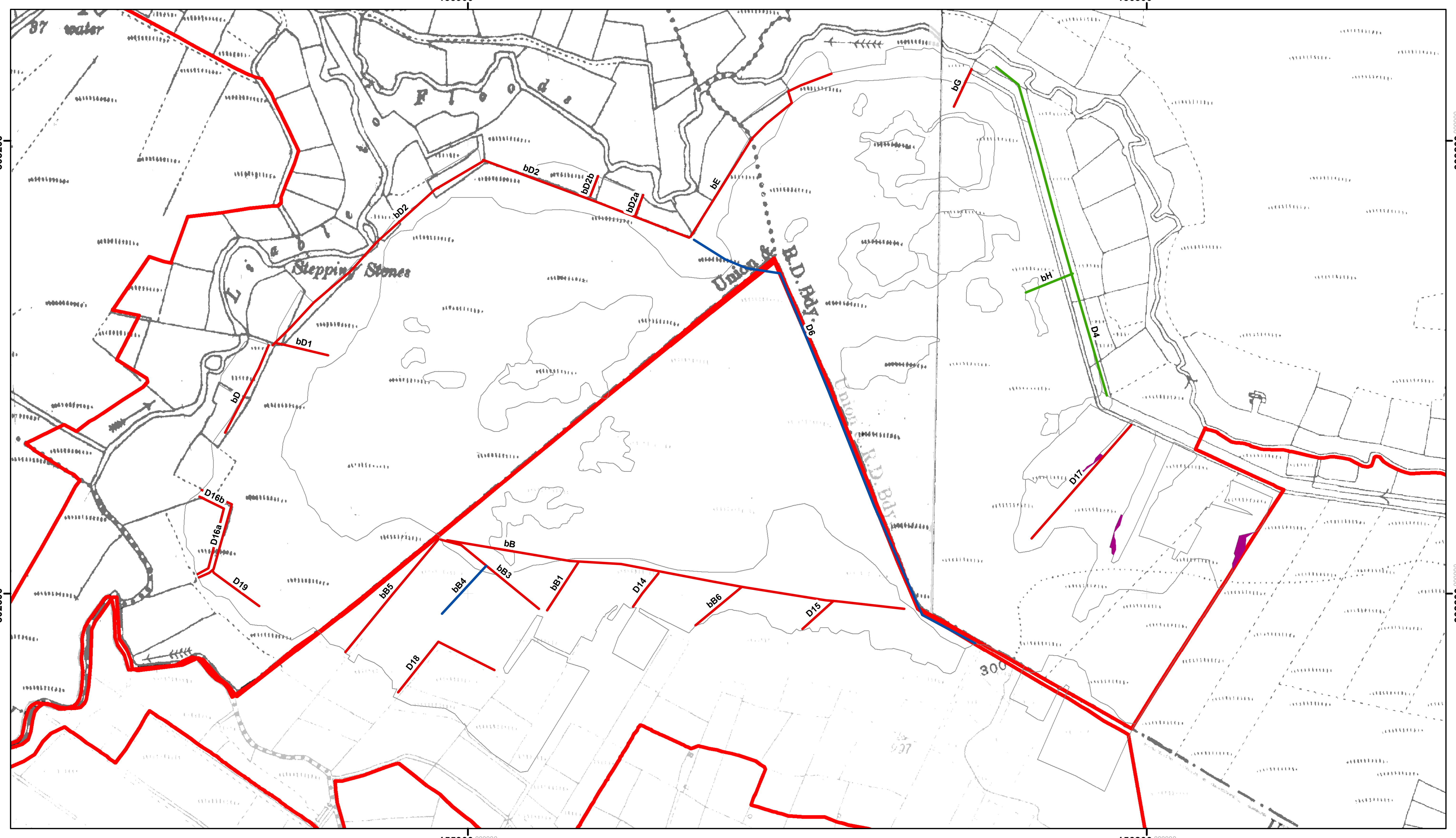
Legend

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)

Ordnance Survey Ireland Licence No EN 0059208

Ecology and Environmental Consultants Ireland Ltd.

Derrynabrock SAC (002298)

Co. Mayo/Co. Roscommon

1:4,760

N

0 60 120 240 360 480 Meters

Legend

High Bog drainage

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