Knockacoller Bog (SAC 002333), Co. Laois

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 Knockacoller 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 (ARB) covers 4.79ha (8.99%) of the high bog area. High quality Active Raised Bog consists of central and sub-central ecotopes. Active flushes are absent. However, some species associated with flushes were noted in the central ecotope. The central occurs in three areas and is characterised by high *Sphagnum* (76-90%) cover in pools, lawns and hummocks with good *Sphagnum* diversity. The sub-central is fairly similar with lower *Sphagnum* cover and absence of lawns. Both have a tall robust cover of heather (*Calluna vulgaris)*, indicating an absence of burning in recent years.

Degraded Raised Bog (DRB) covers 48.51ha (91.01%) 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. Most of the DRB is comprised of sub-marginal ecotope with a band of marginal around the perimeter of the bog and face bank at the edges. All the DRB vegetation is characterised by a high cover of *Narthecium ossifragum.* The sub-marginal generally has a *Sphagnum* cover of 11-25% with less in the marginal ecotope 4-10%. There were no inactive flushes recorded on the bog.

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. *Rhynchospora alba* was recorded at 4-10% cover in each of the ARB ecotopes and in the sub-marginal vegetation. None was recorded in marginal or face bank areas.

No restoration works have taken place at this site. There is potential for drain blocking on the high bog and also in the cutover area adjacent to the high bog, notably on the south-eastern and western margins.

The current conservation objective for Knockacoller 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 39.3ha.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 and sub-central ecotopes (i.e. the wetter vegetation communities). These values have been set as Favourable Reference Values or FRVs until more accurate 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 slight decrease in the area of Active Raised Bog by (-) 0.43ha at Knockacoller Bog in the 2004 to 2012 period. This has mostly taken place in the sub-central ecotope at the south-eastern section where active peat cutting and associated drainage occurred. The subsidence around that location has resulted in drying out of the peat. The distribution of the ARB habitat has changed also. This is partly due to more comprehensive surveying and more accurate mapping of boundaries in 2012. This is most notable in the central ecotope which is now mapped as three separate patches in the same area of the bog instead of two in 2004.

Peat cutting and drainage are the most threatening current activities at the site. 0.22ha of high bog have been lost in the 2004-2010 period due to peat cutting and this activity is considered to be one of the reasons for the decline in Active Raised Bog along the eastern section of high bog. 0.177km of drains remain functional and 1.296km reduced functional. An active quarry, located to the north-east of the site, (not included as an impacting activity in the 1994 and 2004 reports), may have contributed to changes in the high bog hydrology with negative consequences on Active Raised Bog. No fire events have affected the bog in the reporting period. **Active Raised Bog** has been given an overall **Unfavourable Bad–Declining** conservation status assessment. The current Area value is below favourable reference values, and the S&Fs are also below favourable reference value. Habitat

Area has slightly decreased and quality remained stable in the reporting period. 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 overall **Unfavourable Bad-Declining** conservation assessment and **Rhynchosporion depressions** has been given an **Unfavourable Bad-Declining** conservation status assessment.

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

A series of **recommendations** have been also given, these include: cessation of peat cutting; restoration works such as blocking of drains on the high bog and cutover areas; assessment of the actual impact of quarrying activity adjacent to the north-eastern side of the high bog; hydrological and topographical studies to ascertain more accurate FRVs; further botanical surveys on the high bog and cutover to assess the habitats' conservation status and an impact assessment of maintenance works on adjacent land drainage with a view to the potential of blocking these drains.

Site identification

SAC Site Code	002333	**6" Sheet:**	LS16
Grid Reference:	S 309 911	**1:50,000 Sheet:**	54
High Bog area (ha):	53.30ha [1]		
Dates of Visit:	17-09-2012		
Townlands:	Knockacoller, Butterisland, Derryduff, Knockbrack and Rush Hall		

[1]The current extent of the high bog is 53.30ha, while that reported in 2004 was 53.10ha (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. High bog area has in fact decreased in the 2004-2012 period due to peat cutting. The actual high bog extent in 2004 was 53.52ha (see tables 8.1 and 8.3 2004 (amended) figures).

Site location

Knockacoller Bog is situated just north of the N7 between Mountrath and Borris in Ossory, Co. Laois, and south-eastof the Slieve Bloom mountains. The River Nore flows to the west of the bog. Knockacoller Bog is an isolated site and there are no other designated raised bogs nearby.

Access to the western side of the bog may be obtained by turning right off the N7, 6km south of Mountrath at a crossroads. Continue on the local road for 1.5km and take a right onto a small access road which leads to a farm house. Park off the road. The bog can be accessed by walking around the back of the farmhouse. It is advisable to introduce yourself at the farmhouse as this is probably a private road and the local farmer, whom we spoke to on 17.09.12, was not very happy about the perceived restrictions being imposed by the NPWS vis a vis drainage on his land.

Description of the survey

The survey was carried out in September 2012 and involved a vegetation survey of the high bog at Knockacoller 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 Knockacoller Bog was re-surveyed. Sections mapped as sub-marginal, sub-central and central ecotope in 2004/5 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. Four of the sixteen quadrats surveyed in 2004 were re-surveyed in 2012 (see Appendix III). The size of quadrats was 4m x 4m.

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

Knockacoller Bog is a small Midland Raised Bog, which consists of a single peat body geomorphologically classified as a Ridge River Bog (Cross, 1990). The high bog has a simple shape and it is almost square as a result of peat cutting all around its margin.

Ecological Information

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

The following Raised Bog EU Annex I habitats, are found in Knockacoller 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 Knockacoller Bog is 4.79ha (8.99% of the high bog), which is a decrease of 12.31ha since 1994. Active Raised Bog on Knockacoller Bog includes central and sub-central ecotopes. The central ecotope is located towards the north-western side of the bog and is made up of three areas; **C1, C2** and **C3.** They are all belonging to the same community complex 10/15. It is located in a slight depression with a mineral ridge underlying the vegetation nearby to the north-west. The micro-topography is well developed with a mosaic of high and low hummocks, hollows, lawns and pools. The ground is very soft with a high *Sphagnum* cover which is mostly (76-90%). Although *S. cuspidatum* (26-33%) and *S. magellanicum* (26-33%) are the main species, there is a good range of other *Sphagnum* species including localised patches of *S. austinii* and *S. fuscum*. Heather is notable in the vegetation and is 0.30-0.40m high. The occurrence of occasional *Aulacomnium palustre*, and *Vaccinium oxycoccos*, are suggestive of slight flushing in places. There is a notable absence of *Drosera anglica* in the pools. The total area of central ecotope has not changed since 2004.

The main sub-central ecotope **Sc1** surrounds the central ecotope. It is also located in a slight depression and tall heather is a feature of the vegetation too. The community complex 9/10 dominates this ecotope. The ground is soft and *Sphagnum* cover is somewhat less (51-75%) than in the central and has occasional pools. Although there is still a good *Sphagnum*, cover (51-75%), the diversity of *Sphagnum* spp. is less than in the central ecotope. A second smaller area of sub-central **Sc2** occurred at the south-east of the site where there has been peat cutting and drainage. **Sc2** was described as newly developed area in 2004 on the high bog where re-wetting took place after difco cutting ceased. The area of **Sc2** has decreased since 2004 and, the overall area of sub-central ecotope has declined slightly by 0.43ha since 2004.

No active peat forming flushed areas were recorded in 2004 or 2012.

Degraded Raised Bog (7120)

The current area of Degraded Raised Bog at Knockacoller Bog is 48.51ha (91.01% of the high bog).

Degraded Raised Bog includes the sub-marginal, marginal and face bank ecotope. 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 area of Degraded Raised Bog has increased slightly (+) 0.21ha since 2004.

The sub-marginal ecotope covers most of the high bog and is characterised by low hummocks and hollows and flats of *Narthecium ossifragum* which are extensive in places (34-50%). The sub-marginal vegetation was mostly typical of community complex 9/7/6. *Sphagnum* cover is generally (11-25%), but *Sphagnum* species diversity is good, with small patches of *S. austinii* (<4%) and *S. fuscum* (<4%). Pools are generally absent, and where they do occur, *Sphagnum* cover is generally low. Tall heather is again a feature of this ecotope. A few wetter areas within this complex had an increased *Sphagnum* cover and bordered on being classed as sub-central ecotope (9/7/10). However, these patches were considered too small to map.

The marginal ecotope forms a ring around the perimeter of the bog and is widest on the north-western side. Like the sub-marginal ecotope, *Narthecium ossifragum* is also a key component of the vegetation (34-50%). Here the main community complex is 6/2. The marginal area is on a relatively steep slope and is much dryer than the sub-marginal. This is reflected in the absence of pools and low *Sphagnum* cover (4-10%), and the high cover of heather (26-33%). *Trichophorum germanicum* was a constant in this ecotope also.

The face bank ecotope forms a narrow band around parts of the edge of the bog (the north, north-east, north-west and southern sides), generally on steep dry slopes. There was localised cracking of the peat. The vegetation was dominated by tall rank heather (*Calluna vulgaris*), up to 50cms high. The other few species included mainly *Narthecium ossifragum* and *Erica tetralix.* Among the small patches of *Sphagnum* moss spp. were *Hypnum jutlandicum* occurring under the heather. Inactive flushes were not recorded on Knockacoller Bog.

Depressions on peat substrates of the Rhynchosporion (7150)

Rhynchosporion vegetation is widespread on Knockacoller Bog. It is found in both Active and Degraded Raised Bog, but tends to be best developed in the central and sub-central ecotopes. These are the most stable in the wettest areas of Knockacoller Bog. In these areas, the Rhynchosporion vegetation occurs within *Sphagnum* hollows and along *Sphagnum* pool edges and on lawns. Typical

plant species include *Rhynchospora alba*, *Sphagnum cuspidatum, S. magellanicum, S. papillosum*, *Drosera anglica* and *Eriophorum angustifolium*.

R. alba was also found within degraded raised bog, but always associated with wet features such as hollows in the sub-marginal ecotope. *Rhynchospora fusca* was not found on this site.

Detailed vegetation description of the high bog

A detailed description of high bog vegetation recorded during the 2012 survey of Knockacoller 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 Knockacoller 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	0.22haof the high bog cut away	Inside High Bog: 9different locations	**7110/7120/7150**
J02.07	Drainage	M	-1	1.47km [1]	Inside High Bog	**7110/7120/7150**
J02.07	Drainage	H	-1	n/av	Outside High Bog	**7110/7120/7150**
B01.02	Artificial planting on open ground (non-native trees)	L	-1	15ha	Outside High Bog to the north-east	**7110/7120/7150**
C01	Quarrying	M	-1	18ha	300mNE of 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 (0.177km) and reduced-functional (1.296km) drains.

n/av: not available

Peat cutting

This activity has taken place at 9 locations along the west (2 locations (plots)) and east (7 locations) sections of high bog in the 2004-2010 period. This has reduced the area of high bog by 0.22ha. Cutting is more intense along the south-eastern section. Fernandez *et al.* (2005) reported cutting at 15 locations in 2004. The activity has decreased in intensity along the western section. The loss of high bog from peat cutting is calculated using GIS techniques on aerial photography from 2004/05 and 2010. Information from the NPWS indicates that 0 plots were cut on the high bog at Knockacoller Bog in 2010-2013 period.

This activity is considered to have a high importance/impact on high bog habitats. In addition, old face banks and high bog and cutover drainage associated with cutting continue to cause negative impacts on the high bog habitats.

Drainage

High bog drainage

Table 6.2 shows a slight decrease in the length of functional drains (-) 0.253km, located at the eastern edge of the high bog, since 2004. This is due to peat cutting rather than to drain blocking. There is no change on the status of reduced functional drains on the high bog since 2004. The majority of drains in the high bog remain reduced functional (1.296km), or functional (0.177km). There are no non-functional drains on Knockacoller Bog. Significant water losses through the drains were noted at the eastern section from the short drains (d2) which are perpendicular to the edge of the bog. Reduced functional drains are still impacting on high bog habitats and include three parallel drains (d3) on the eastern side of the bog associated with former difco cutting which are infilling and the long drain (d1) that follows a townland boundary on the northern side of the bog. They will continue to have some adverse impact on the high bog hydrology and vegetation, until they are blocked and become completely in-filled and thus non-functional.

No blocking of drains has occurred to date. High bog drainage is considered to have medium importance/impact on high bog habitats.

Table 6.2 High bog drainage summary

Status	2004 (km) [1]	2012 (km)	Change
NB: functional	0.430	0.177	(-)0.253
NB: reduced functional	1.296	1.296	0.000
NB: non- functional	0.000	0.000	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 Knockacoller 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
d1	0.426	NB: reduced functional	NB: reduced functional	No	
d2	0.177	NB: reduced functional	NB: reduced functional	Yes	Drain complex (14 drains). Their length has been reduced as a result of peat cutting along the eastern section of high bog.
d3	0.870	NB: reduced functional	NB: reduced functional	No	Drain complex (4 drains).

Bog margin drainage

The cutover areas were not surveyed for drains during 2012.

Some maintenance on adjacent cutover drainage seems to have taken place at two locations NW (E230619/N191237- 152m) and W (E230520/N191004-200m) as illustrated on the 2010 aerial photographs.

Intensive drainage on the northern side of the bog has dried out gravel layers under the bog and is likely to have lead to increases in the area of marginal ecotope directly adjacent to the central ecotope (C2), as indicated by the expansion is marginal ecotope on this areas shown on the new 2012 ecotope map. Although this trend cannot be confirmed through field data and thus this change may be due to more comprehensive surveying in 2012. A continued drying out process within this section of the high bog seriously compromises the survival of Active Raised Bog on the middle section of the high bog.

The adjacent land drainage is considered to have a high adverse impact on high bog habitats.

Fire history

No fire events have been reported on the high bog in the 2004-2012 reporting period. The tall rank heather (up to 50cms high in places), is indicative of the absence of fire in recent years. Fernandez *et al*. (2004) referred to a burn on the western side of the site in 2000, which was reported by NPWS regional staff. Earlier evidence of burning on a regular basis was noted by Kelly *et al.* (1994).

Problematic native species

No invasive species have been recorded during this survey or the previous one in 2004. There is a Scots pine (*Pinus sylvestris*) tree growing in sub-marginal ecotope at the north-east side of the site. *Pinus sylvestris* is no longer considered an invasive species but rather a problematic native species. The tree is 7-8m tall, 25cm diameter at breast height and there are a number (30+) of *Pinus* saplings growing within a 20m radius of the tree. There are a few other smaller pine trees and an occasional birch (*Betula pubescens*) growing on the high bog. The 2004 report also reported a couple of *Betula* trees, but there was no mention of *Pinus sp.* They suggest that the site is dry enough to support the growth of these species. The numbers of trees are so few, that at present they are not considered to have any significant impact on the high bog habitats, but it will be worth noting if they increase in the future.

Afforestation and forestry management

There is no forestry planting on Knockacoller Bog high bog, but there is an extensive area of afforestation adjacent to the SAC boundary to the north-east of the site (over 15ha and 300m from high bog). Much of the conifer plantation has been planted on peat, which is visible on the 2000 aerial photo. The area has been afforested since before 1994 (see aerial photos 1994, 2000 and 2005). The trees have been felled and replanted in blocks, as can be seen on the aerial photos. The afforestation is likely to be having some indirect effect on the bog in particular, the drainage associated with the planting. This was not reported on in the 2004 report, but it is likely to be having a low impact on the Knockacoller Bog high bog habitats.

Other impacting activities

There is an active quarry located to the north-eastern side of Knockacoller Bog. The quarry which according to the 2010 aerial photography is 18ha in extent is adjacent to the SAC boundary, and approximately 300m from the high bog. A small part of it was marked as a 'Quarry- disused' on the historic Ordnance Survey 25" map. The quarry has been operating since before 1994 as evidenced by the aerial photos. It was not mentioned in the 2004 report, and no impact assessments have been

carried out to evaluate the impact of quarrying on the high bog habitats. Given its proximity to Knockacoller Bog, it is likely that the quarry may be exerting a medium importance/impact on the high bog habitats.

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

Conservation activities

No physical management actions such as the blocking of drains or the restoration of the cutover areas, which would also require the blocking of drains, have been carried out to improve the conservation status of the high bog habitats. The current characteristics of the high bog at Knockacoller Bog (i.e. steep slopes caused by peat cutting and drainage) make the development of the targeted Active Raised Bog FRV on the high bog difficult to achieve. There is however, potential for the restoration of cutover along the high bog margin, particularly on the north-western and south-eastern margins, and this could play an essential role in the development and expansion of Active Raised Bog at the site.

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 that there has been a decrease of 0.43ha (8.24%) in the area of Active Raised Bog since 2004. The distribution of the central and sub-central ecotopes has also changed, but this is considered to be due to the more comprehensive surveying and more accurate mapping that took place in 2012. The central ecotope now consists of three separate central ecotope areas (**C1, C2** and **C3**) located in a slight depression with a mineral ridge underlying the vegetation immediately to the north. The sub-central ecotope has also changed in shape and there has been a slight actual reduction in area by (-) 0.43 ha since 2004.

C1 is the largest central area. **C2** is a much smaller area located north of **C1**. In 2004 both these areas were mapped as one continuous area. **C3** is located further north-east and has not changed much since 2004. The vegetation of the three central areas is characterised by the community complex 10/15. The ground is very soft with a varied micro-topography and a high *Sphagnum* cover (76-90%), with a good diversity of *Sphagnum* spp. The changes in area of the central ecotope between 2004 and 2012 are considered to be due to more comprehensive surveying and mapping and not a real change in the area.

Sc1 is the main sub-central area which surrounds the central ecotope. The boundary is more indented now due to more accurate mapping in 2012.

Sc2 was described in 2004 as newly developed area of sub-central located near the eastern margin of the high bog as a result of rewetting in an area formerly disturbed by difco cutting. The area of the Sc2 has decreased considerably since 2004. This is likely to be due to subsidence associated with drying out caused by peat cutting and drainage. There were also isolated patches of sub-central vegetation nearby which were too small to map.

The favourable reference value (FRV) for Area is considered to be the sum of Active Raised Bog (central and sub-central ecotopes), plus sub-marginal ecotope when the Habitats Directive came into force in 1994 (see table 8.4). Therefore, Active Raised Bog Area FRV is 39.3ha (based on 1994 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 (4.79ha) is 87.81% below the FRV. A current Area value more than 15% below FRV falls into the **Unfavourable Bad** assessment category. The long term (1994-2012) trend indicates a reduction in the area of Active Raised Bog at the site (12.31ha) (see table 8.1). The more recent and short term trend analysis (8years 2004-2012) indicates a slower rate of decline, with a 0.43ha (-) 8.24%decrease of Active Raised Bog during the reporting period. Thus, the habitat Area is given a **Decreasing** trend assessment.

The Area of Active Raised Bog at Knockacoller 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 active raised bog area to be made up of central and active flush, i.e. the higher quality wetter vegetation communities. This value is 2.4ha (half of 4.79ha, the current area of Active Raised Bog. The current value is 1.48ha which is 38.33 % below the FRV. Therefore S&Fs are given an **Unfavourable Bad** assessment. As there is no active flush on Knockacoller Bog, the assessment is based only on the area of central relative to the total area of Active Raised Bog. Although the area of central ecotope has decreased between 1994-2004, it has not changed during the reporting period (2004-2012) and therefore the S&Fs are given a **Stable** trend.

Quadrat analysis **(Qc1, Qsc1 Qsc2** and **Qsc4**) indicates the following:

Qc1: this quadrat was located close to the northern boundary of **C1** in 2004 and 2012, and changes are noted firstly in relation to pools which were absent in 2012 and recorded at 34-50% in 2004. However lawns covered an area of 26-33% in 2012 and were not recorded in 2004. This suggests that former pools may have become *Sphagnum* lawns. This is also reflected in the increase in *S. magellanicum* (a good lawn species) from 4-10% in 2004 to 26-33% in 2012. The total *Sphagnum* cover has remained the same (51-75%) in both surveys.

Qsc1: was located in the northern tip of **Sc1**. As with **C1**, no pools were noted in 2012 and 11-25% were recorded in 2004 with 11-25% *Sphagnum* pools in 2004 and 1-3% in 2012. This may suggest some drying out. Again the total *Sphagnum* cover remained the same in both reporting periods. High hummocks were absent in 2004 and 11-25% noted in 2012. Both surveys recorded the hummock indicators *S. austinii*, but *S. fuscum* was only recorded in 2004.

Qsc2 was located in a newly developed area of sub-central on a rewetted, former difco cut peat area. On both the 2004 and 2012 surveys, neither had any pools and the total *Sphagnum* cover was 51-75%. In 2012 *S. cuspidatum* was 11-25% and although it was recorded as absent in 2004, this may

be a mistake as the combined *Sphagnum* spp cover in 2004 (4-10% for three spp.) is less than 50%. The cover of *Calluna vulgaris* has increased from 4-10% in 2004 to 26-33% in 2012 and *Narthecium ossifragum* increased from 4-10% to 26-33%. This is to be expected in a regenerating cutover area. The area of **Sc2** has decreased during the reporting period, which is likely to be due to subsidence and drying out in the vicinity of the peat cutting.

Qsc4 There is a difference in the mircro-topography and corresponding *Sphagnum* spp. recorded in this quadrat in the two reporting periods. In 2004 **Qsc4** was recorded as being more hummocky and had a higher cover of *S. capillifolium* 11-25% and lower cover of *S. cuspidatum* 1-3% and *S. papillosum* 4-10% compared to 2012 with fewer hummocks 11-25% and lawns 4-10% and the *sphagnum* spp. cover reflected this lower micro-topography, with *S. capillifolium* 4-10%, *S.cuspidatum* 11-25% and *S. papillosum* 11-25%. The differences between the 2004 and 2012 are likely to be due to a slightly different quadrat location in the two years which indicate the mosaic nature of the topography and the vegetation. Just to note, that in 2012, although the dominant pool *Sphagnum* was recorded as *S. cuspidatum*, pools were recorded as absent. This is likely to have been an omission.

Typical good quality indicators and typical plant species are still found in central and sub-central ecotopes throughout the entire bog. **The Structure & Functions of Active Raised Bog at Knockacoller Bog are assessed as Unfavourable Bad- Stable** (see table 8.5).

Future Prospects

The new ecotope survey shows that although the central ecotope area has remained stable, the sub-central has continued to decline. Peat cutting on the eastern bog margin has resulted in subsidence and water loss and the area of **Sc2** has reduced since 2004. Although this activity has not taken place in the last few years (2010-2013), it cannot be confirmed that will not be reinitiated and thus continues to threaten to the habitat.

The 2012 survey noted the spread of *Pinus sylvestris* saplings in a few areas on the high bog as well as an occasional *Betula pubescens* tree. The spread of such trees is likely to be an indication of further drying out of the high bog.

Habitat **Area** is currently 87.81% below FRV (see table 8.4) and a decreasing trend is foreseen. 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 38.33% 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 the remaining reduced-functional and functional drains both on the high bog and cutover, and cessation of peat cutting is necessary. Although there was no evidence of recent burning on the site in 2012, there is a history of burning events (Kelly *et.al* 1994 and Fernandez *et al.* 2004). It is important to reduce the frequency and intensity of fire events to minimise the impact on the area of Active Raised bog. The actual impact of quarrying activity adjacent to the high bog should be assessed.

Extensive cutover areas (particularly the south-western and north-eastern margins of the bog) could play an important role in the potential restoration of the habitat, as the current characteristics of the high bog (i.e. small size, 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 Knockacoller 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	4.9	2.4	1.48	1.48	0.00	0.00
Sub-central	12.2	3.67	3.74	3.31	(-)0.43	(-)11.50
Total	**17.10**	**6.07**	**5.22**	**4.79**	**(-)0.43**	**(-)8.24**

[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	Changes in boundary (former **C1** now consists of three separate central ecotope areas (**C1; C2; C3**) as a result of more comprehensive surveying in 2012 which resulted	Pools, recorded in 2004 were absent in 2012 but lawns with *S. Magellanicum* were not noted in 2004. Possibly due to the succession of pools to lawns. The

			in more accurate mapping.	total *Sphagnum* cover remained the same.
C2	None	Stable	""	
C3	None	Stable	""	
Sc1	Qsc1; 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.	Qsc1 The pools recorded in 2004 were absent in 2012. Total *Sphagnum* cover remained the same with *S. austinii* in both years. Qsc4. In 2004 this was a more hummocky quadrat with high *S. capillifolium* cover. There were less hummocks and increased lawns In 2012 with higher cover of *S. papillosum* and *S. magellanicum* and lower *S. capillifolium*. Total *Sphagnum* cover is the same. This quadrat may have been placed at a slightly different location.
Sc2	Qsc2	Decreasing	The former sub-central ecotope area has now been mapped mostly as sub-marginal ecotope. Only a much small sub-central ecotope and scattered patches remain. **Sc2** was described as a newly developed area in 2004 on the high bog and as an area where re-wetting took place after difco cutting ceased.	Qsc2 Total *Sphagnum* cover has not changed, but species composition has altered. *Calluna vulgaris* cover and Narthecium *ossifragum* have increased in both species.

Degraded Raised Bog (7120)

Area

The Degraded Raised Bog FRV for Area is 14ha at Knockacoller Bog. This value corresponds with the difference between the current high bog area (53.3ha) and the Active Raised Bog FRV (39.3ha) 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 246.5% bigger than FRV and therefore the habitat Area is given an **Unfavourable Bad** assessment (see table 8.4).

Table 8.3, shows that sub-marginal ecotope has increased by (+) 0.43ha. This is at the expense of sub-central ecotope which has reduced in certain locations. Although the marginal boundary has extended into what was formerly mapped as sub-marginal ecotope at the north-western side of the bog, this change is considered to be the result of a more comprehensive surveying and accurate

mapping. However, an increase in marginal ecotope caused by the quarrying activity to the northeast cannot be ruled out. The overall area of marginal has decreased by (-) 0.22ha due to peat cutting. No significant changes to face bank during the reporting period were recorded.

Table 8.3 indicates that there has been an overall increase in the area of Degraded Raised Bog by 0.21ha in the reporting period. Thus, the habitat Area is given an **Increasing** trend. However, this trend cannot be taken as positive as it is the result of further drying out processes within the high bog.

The Area of Degraded Raised Bog at Knockacoller 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 12.13ha (25% of 48.51ha, the current area of Degraded Raised Bog). The current marginal and face bank ecotopes area value (16.03ha) is 32.18% 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 does not show any change in the area of face bank ecotope, however marginal has decreased overall by 0.22ha due to peat cutting. Thus, the DRB's S&Fs at Knockacoller 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. Indeed, the comparison of 2004 versus 212 ecotope maps shows changes on the marginal ecotope extent along the northwest section of the high bog (NW of **C2**). The 2012 map shows a slightly larger marginal ecotope extending into the high bog near **C2**. Whether this discrepancy between both ecotope maps is a real or the result of more comprehensive surveying in 2012 cannot be confirmed through field data. However, it should be highlighted that a continued drying out process within this section of the high bog seriously compromises the survival of Active Raised Bog on the middle section of the high bog. Thus, particular attention should be given to this section of

the high bog in future surveys to monitoring actual changes on ecotope across the NW section of the high bog. The 2012 ecotope map also shows an isolated section of sub-marginal ecotope to the NW of **Sc1**. This area is slightly depressed and the presence of sub-marginal ecotope dots from the 2004 survey indicates that this discrepancy in the result of more comprehensive surveying in 2012 which allowed a more accurate ecotopes map.

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 Knockacoller Bog are assessed as Unfavourable Bad-Stable (see table 8.5).

Future Prospects

Degraded Raised Bog overall increased due to further drying processes within the high bog. In addition, there has been a loss of 0.22ha as result of peat cutting on the eastern side of the bog. Although this activity has not taken place in the last few years (2010-2013), it cannot be confirmed that will not be reinitiated and thus continues to threaten to the habitat. Furthermore, drainage on the high bog continues to damage the habitat and hinders 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. In addition, although the impacts of the quarrying activity to the north-east of the high bog are unknown, they may affect changes in water flow patterns within the high bog, and therefore potentially impacting adversely on the habitat. No restoration works have been undertaken at the site to counteract negative effects of impacting activities.

The 2012 survey noted the localised spread of *Pinus sylvestris* saplings on the high bog. The spread of pines is an indication of drying out of the high bog.

Habitat **Area** is currently 246.50% above FRV (see table 8.4) and an Increasing trend is expected in the following two reporting periods (12 years) associated with further Active Raised Bog losses caused by negatively impacting activities. 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-Increasing**. Habitat's **S&Fs** are currently 32.18% 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	22.2	30.42	32.05	32.48	(+)0.43	(+)1.34
Marginal	14.7	15.18	15.16	14.94	(-)0.22	(-)1.45
Face bank	n/a	1.43	1.09	1.09	0.00	0.00
Total	**36.9**	**47.03**	**48.30**	**48.51**	**(+)0.21**	**(+)0.43**

[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 8.3 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 Knockacoller 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 decreased in the reporting period by (-) 0.43ha. This sub-central ecotope has turned sub-marginal where Rhynchosporion depressions are also found. Although the highest habitat quality is generally associated with Active Raised Bog and this has slightly decreased. The overall Active

Raised Bog and sub-marginal ecotope extent has remained the same in the reporting period. 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 quarrying 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 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-Stable** assessment.

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

The conservation status of depressions on peat substrates of the Rhynchosporion at Knockacoller 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	39.3	4.79	87.81	2.40	1.48	38.33

[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	14.00	48.51	246.50	12.13	16.03	32.18

[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-Decreasing	Unfavourable Bad-Stable	Unfavourable Bad-Declining	Unfavourable Bad-Declining
7120	Unfavourable Bad-Increasing	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 9 locations along the west (2 locations (plots)) and east (7 locations) sections of high bog in the 2004-2012 reporting period. This has reduced the area of high bog by 0.22ha, and this activity is considered to be one of the reasons for the decline in Active Raised Bog along the eastern section of high bog in particular.
- The total length of drains on the bog is 1.47km, of which 1.296km are reduced functional and 0.18km are functional. Although the length of functional drains at the eastern edge of the bog has reduced slightly since 2004, this is a loss due to peat cutting rather than drain blocking.
- Cutover drainage (peripheral drainage) associated with either currently active or no longer active peat cutting continue to impact on the high bog habitats. In addition, maintenance works have been carried out in the reporting period on drains in agricultural land to the south-east and north-east of the high bog.

- No fire events have damaged the high bog in the reporting period. A series of fires on Knockacoller Bog in the past have been reported by Kelly *et al.* (1994) and Fernandez *et al.* (2004) were reported.
- An active quarry is situated adjacent to the SAC boundary and 300m north east of the high bog. It is potentially having an impact on the high bog hydrology particularly along the north and eastern sections. Although any effects of the quarry have not yet been quantified, it is considered to have at least a medium importance/impact on high bog habitats.

Changes in active peat forming areas

- The area of Active Raised Bog has decreased overall by (-) 0.43ha (-) 8.24%), corresponding with sub-central ecotope losses during the reporting period. The area of central ecotope has remained the same, however, its distribution has changed, and this is due primarily to more comprehensive surveying and as a result more accurate mapping of the boundaries of the ecotopes. The central ecotope **C1** is now smaller and mapped as two separate areas **C1** and a smaller area **C2** to the north. **C3** has not changed significantly in area. The shape of the main **Sc1** area is somewhat different. This is partly due to more comprehensive surveying and more accurate mapping of the boundaries. But there has been a real loss of habitat at **Sc2** located on the eastern side of the bog. This is due to subsidence and drying out as a result of impacting activities (i.e. peat cutting and drainage).

- **Other changes**

  - The 2012 survey noted the spread of *Pinus sylvestris* saplings around a tree on Degraded Raised Bog, on the eastern side of the bog as well as a few others. Most plants are less than 1.2m high and may have germinated after the fire event reported by Fernandez *et al*. (2004). The spread of pines is likely to be an indication of further drying out of the high bog.

Quadrats analysis

- Quadrat **Qc1**: Pools, recorded in 2004 were absent in 2012 but lawns with *S. magellanicum* were not noted in 2004. This is possibly due to the succession of pools to lawns. The total *Sphagnum* cover remained the same.
- Quadrat **Qsc1:** The pools recorded in 2004 were absent in 2012. Total Sphagnum cover remained the same with *S. austinii* in both years.
- Quadrat **Qsc2**: Total Sphagnum cover has not changed, but species composition has altered. *Calluna vulgaris* cover and *Narthecium ossifragum* cover has increased in 2012.

- Quadrat **Qsc4:** In 2004 this was a more hummocky quadrat with high *S. capillifolium* cover. There were less hummocks and increased lawns in 2012 with higher cover of *S. papillosum* and *S. magellanicum* and lower *S. capillifolium*. Total Sphagnum cover is the same. This quadrat may have been placed at a slightly different location in 2012.

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 Knockacoller Bog. Habitat Area has slightly decreased in the reporting period. The combined central and sub-central area value (4.79ha) is below the FRV target of 39.3ha. This decrease is associated with the ongoing impacts of drainage and peat cutting on the eastern side of the bog mainly. Future Prospects are considered Unfavourable Bad-Declining as impacting activities (peat cutting, drainage and potentially quarrying) continue to threaten the habitat.
- **Degraded Raised Bog** has been given an **Unfavourable Bad-Declining** conservation status at Knockacoller Bog. Habitat Area has slightly increased due to an increase in the area of sub-marginal ecotope, but this was at the expense of sub-central ecotope. There was also some loss of DRB 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 Knockacoller Bog. Habitat Area and S&Fs have remained the same in the reporting period. However, the Future Prospects are considered Unfavourable Bad-Declining as a result of threatening impacting activities.

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

Recommendations

- **Cessation of peat cutting.**
- **Assessment of the actual impact of quarrying activity** located to the northeast of the high bog.

- **Restoration works** including blocking of high bog reduced-functional and functional drains, as well as cutover drains.
- **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. Restoration of cutover bog. The current characteristics of Knockacoller Bog (i.e. steep slopes caused by peat cutting and drainage) make the development of the targeted Active Raised Bog FRV on the high bog difficult to achieve. Thus the restoration of cutover and particularly cutover on the south-eastern and western margins could play an essential role in the development and expansion of Active Raised Bog at the site.
- **Further botanical monitoring surveys** on the high bog. Particular attention should be given to the area to the NW of the high bog (NW of C2) where Degraded Raised Bog may be expanding as a result of further drying out processes and thus compromise the survival of Active Raised Bog on the middle section of the high bog.

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Appendix I Detailed vegetation description of the high bog

Active Raised Bog (7110)

Central Ecotope Complex

COMPLEX 10/15

- **Location**: this complex characterizes the central ecotope areas (**C1, C2 and C3**) within the site
- **Ground**: very soft
- **Physical indicators**: absent
- ***Calluna* height**: 31-40cm
- ***Cladonia* cover**: largely absent though <4% in places
- **Macro-topography**: slight depression; a mineral ridge is underlying the vegetation immediately to the northwest
- **Pools**: 4-10% (11-25% in places)
- ***Sphagnum* cover**: 76-90% (51-75% in places)
- ***Narthecium* cover**: <4% (4-10% in places)
- **Micro- topography**: High and low hummocks/hollows/lawns and pools
- **Tussocks**: absent
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (26-33%), *Erica tetralix* (4-10%), *Eriophorum vaginatum* (4-10%), *E. angustifolium* (<4%), *Narthecium ossifragum* (<4%), *Rhynchospora alba* (<4%), *Andromeda polifolia* (<4%), *Vaccinium oxycoccos* (<4%), *Dicranum scoparium* (<4%), *Aulacomnium palustre* (<4%), *Sphagnum capillifolium* (H; 4-10%), *S. austinii* (H; <4%), *S. fuscum* (H; <4%), *S. papillosum* (H/P); 4-10%), *S. magellanicum* (L/P; 26-33%), *S. cuspidatum* (P; 26-33%).
- **Additional comments**: *Drosera anglica* is notable in its absence from this complex and indeed it was not recorded anywhere on the site during this survey.

Quadrat **Qc1** was recorded within this complex.

Sub-Central Ecotope Complexes

COMPLEX 9/10

- **Location**: this complex characterizes the main sub-central ecotope (**Sc1**) within the site
- **Ground**: soft
- **Physical indicators**: absent
- ***Calluna* height**: 31-40cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: slight depression
- **Pools**: 4-10%
- ***Sphagnum* cover**: 51-75%
- ***Narthecium* cover**: <4%
- **Micro- topography**: high & low hummocks/hollows and pools
- **Tussocks**: *Eriophorum vaginatum* (4-10%),
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (26-33%), *Erica tetralix* (4-10%), *Eriophorum vaginatum* (4-10%), *E. angustifolium* (<4%), *Rhynchospora alba* (4-10%), *Trichophorum germanicum* (<4%), *Andromeda polifolia* (<1%), *Vaccinium oxycoccos* (<4%), *Dicranum scoparium* (<4%), *Sphagnum capillifolium* (H; 11-25%), *S. papillosum* (H/Hl; 4-10%), *S. magellanicum* (P; 4-10%), *S. tenellum* (H; <4%), *S. cuspidatum* (P/Hl); 11-25%).
- **Additional comments:** This complex also occurs in a very small area (**Sc2**) in the east of the site. Lawns of *Sphagnum magellanicum* and *S. cuspidatum* dominate in this area which had been difco cut in the past and there was still evidence of that disturbance on the high bog (parallel ridges of *Calluna vulgaris* and tussocks of *Trichophorum germanicum*). There was also some cracking and slumping of the high bog in the area.

Quadrats **Qsc1, Qsc2 and Qsc3** were recorded within this complex.

Active flushes

No active flushes were recorded at Knockacoller Bog

Degraded Raised Bog (7120)

Sub-Marginal Ecotope Complexes

COMPLEX 9/7/6

- **Location**: this complex dominates most of the high bog
- **Ground**: soft

- **Physical indicators**: absent
- ***Calluna* height**: 31-40cm
- ***Cladonia* cover**: <4% (4-10% in places)
- **Macro-topography**: gentle slope
- **Pools**: absent (<4% in places)
- ***Sphagnum* cover**: 11-25% (26-33% in places)
- ***Narthecium* cover**: 26-33% (34-50% in places)
- **Micro- topography**: low hummocks/hollows and flats
- **Tussocks**: absent
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (11-25%), *Erica tetralix* (4-10%), *Eriophorum vaginatum* (4-10%), *E. angustifolium* (<4%), *Narthecium ossifragum* (26-33%), *Rhynchospora alba* (4-10%), *Sphagnum capillifolium* (H; 4-10%), *S. papillosum* (H; 4-10%), *S. tenellum* (H; <4%), *S. subnitens* (H; <4%), *S. austinii* (H; <4%), *S. fuscum* (H; <4%), *S. cuspidatum* (Hl; <4%).
- **Additional comments:** Where pools occur they generally have a low *Sphagnum* cover. There were small localised patches (in the east and south of the site), within this complex that had an increased *Spahgnum* cover and bordered on being classed as sub-central ecotope (9/7/10). However, these patches were considered too small to map.

Marginal Ecotope Complexes

COMPLEX 6/2

- **Location**: this complex is found across the edges of the high bog
- **Ground**: firm
- **Physical indicators**: absent
- ***Calluna* height**: 31-40cm
- ***Cladonia* cover**: <4% (4-10% in places)
- **Macro-topography**: 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%), *Eriophorum vaginatum* (<4%), *E. angustifolium* (<4%), *Narthecium ossifragum* (34-50%), *Trichophorum germanicum* (4-10%; 11-25% in places), *Sphagnum capillifolium* (H; <4%), *S. tenellum* (H; <4%), *S. subnitens* (H; <4%), *S. papillosum* (H; <4%).
- **Additional comments**: none

Inactive flushes

No active flushes recorded at Knockacoller Bog

Face bank Complexes

COMPLEX 1

- **Location**: this complex was found along the bog margin
- **Ground**: firm
- **Physical indicators**: bare peat (4-10%)
- ***Calluna* height**: >50cm
- ***Cladonia* cover**: 4-10%
- **Macro-topography**: steep slope
- **Pools**: absent
- ***Sphagnum* cover**: <4%
- ***Narthecium* cover**: 4-10%
- **Micro- topography:** tall robust *Calluna vulgaris*/low hummocks
- **Tussocks:** *Trichophorum germanicum* (<4%)
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (76-90%), *Erica tetralix* (4-10%), *Trichophorum germanicum* (<1%), *Narthecium ossifragum* (4-10%), *Sphagnum capillifolium* (H; <1%), *S. tenellum* (H; <4%), *S. subnitens* (H; <4%), *Hypnum jutlandicum* (<4%).
- **Additional comments**: none

Depressions on peat substrates of the Rhynchosporion (7150)

The habitat occurs at Knockacoller Bog in both Active and Degraded Raised Bog, but it is only occasionally found on degraded habitat. Only *Rhynchospora alba* was recorded within the 2012 survey at this site. *Rhynchospora fusca* was not found.

R. alba is found in the wetter ecotopes in Knockacoller Bog, including central community complex (10/15), sub-central community complex (9/10) and sub-marginal community complexes (9/7/6 and 9/7/10). The cover of the species was fairly consistent at 4-10% in these community complexes. Although it was not recorded in the marginal community complex (6/2) and face bank community complex (1) descriptions, it does occur occasionally within these habitats. It is nearly 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 ecotope complex.

Appendix II Photographical records

Photograph Number	Aspect	Type	Feature	Date
17092012111	NE	Overview	Qc1	17/09/2012
17092012112	NE	Overview	Qsc1	17/09/2012
17092012116	NE	Overview	Qsc2	17/09/2012
17092012114	NE	Overview	Qsc4	17/09/2012

Appendix III Quadrats

Ecotope type	**Central**	**Central**	**Sub-central**	**Sub-central**
Complex Name	**10/15**	**10/15**	**10**	**9/10**
Quadrat Name	Qc1	Qc1	Qsc1	Qsc1
Easting	230852	230854.63	231066	231066.18
Northing	191067	191065.42	191219	191218.11
Date	01/07/2004	17/09/2012	01/07/2004	17/09/2012
Firmness	Quaking	Very soft	Soft	Very soft
Burnt	No	No	No	No
Algae in hollows %	Absent	Absent	1-3 (many indiv)	Absent
Algae in pools %	Absent	Absent	Absent	Absent
Bare peat %	Absent	Absent	Absent	Absent
High hummocks %	na	11-25	na	11-25
Low hummocks %	26-33	11-25	34-50	4-10
Hollows %	Absent	Absent	11-25	Absent
Lawns %	Absent	26-33	Absent	Absent
Pools %	34-50	Absent	11-25	4-10
Pool type	Interconnecting	Interconnecting	Regular	Regular
S.austinii hum type	na	Absent	na	Active
S.austinii hum %	na	1-3 (few indiv)	4-10	1-3 (many indiv)
S.austinii height(cm)	na	0-10	na	0-10
S.fuscum hum type	na	Absent	na	Absent
S.fuscum hum %	Absent	Absent	Absent	Absent
S.fuscum height(cm)	na	Absent	na	Absent
Leucobryum	Absent	Absent	Absent	Absent

Ecotope type	**Central**	**Central**	**Sub-central**	**Sub-central**
Complex Name	**10/15**	**10/15**	**10**	**9/10**
glaucum				
Trichophorum type	Absent	Absent	Tussocks	Flats
Trichophorum %	Absent	Absent	4-10	1-3 (few indiv)
S.magellanicum %	4-10	26-33	Absent	Absent
S.cuspidatum %	26-33	26-33	Absent	11-25
S.papillosum %	Absent	4-10	Absent	Absent
S.denticulatum %	Absent	Absent	Absent	Absent
S.capillifolium subsp. rubellum %	4-10	4-10	11-25	11-25
S.tenellum %	na	Absent	na	1-3 (several indiv)
S.subnitens %	Absent	Absent	Absent	Absent
R.fusca %	na	Absent	Absent	Absent
R.alba %	na	1-3 (several indiv)	Absent	4-10
N.ossifragum %	Absent	4-10	11-25	11-25
Sphag pools %	34-50	4-10	11-25	1-3 (many indiv)
Dominant pool Sphag	S.cuspidatum	S.cuspidatum	na	S.cuspidatum
Sphag lawns %	Absent	26-33	Absent	Absent
Sphag humm %	26-33	11-25	34-50	26-33
Sphag holl %	Absent	4-10	11-25	Absent
Total Sphag %	51-75	51-75	51-75	51-75
Hummocks indicators	S.austinii	S.austinii	S.austinii & S.fuscum	S.austinii
Cladonia portent %	Absent	Absent	Absent	Absent
Other Cladonia sp	na	None	na	
C. panicea %	Absent	Absent	Absent	Absent
Calluna cover %	na	26-33	11-25	26-33
Calluna height(cm)	21-40	31-40	21-40	31-40
Other NotableSpecies		Vaccinium 0xycoccus		Vacc ox, Dicranum scop
Other comment				

Ecotope type	**Sub-central**	**Sub-central**	**Sub-central**	**Sub-central**	**Sub-central**
Complex Name	**10**	**9/10**	**10**	**10**	**9/10**
Quadrat Name	Qsc2	Qsc2	Qsc3	Qsc4	Qsc4
Easting	231241	231246.04	231160	230823	230827.88
Northing	190950	190949.83	190829	190919	190918.19
Date	01/07/2004	17/09/2012	01/07/2004	01/07/2004	17/09/2012
Firmness	quaking	Soft	soft	soft	Soft
Burnt	No	No	No	No	No
Algae in hollows %	Absent	Absent	Absent	4-10	Absent
Algae in pools %	Absent	Absent	1-3 (many indiv)	1-3 (many indiv)	Absent
Bare peat %	Absent	Absent	Absent	Absent	Absent
High hummocks %	na	Absent	na	na	34-50
Low hummocks %	34-50	34-50	11-25	34-50	11-25
Hollows %	Absent	4-10	11-25	4-10	4-10
Lawns %	11-25	11-25	Absent	Absent	4-10
Pools %	Absent	Absent	Absent	1-3 (many indiv)	Absent
Pool type	Absent	Absent	Absent	Regular	Regular
S.austinii hum type	na	Active	na	na	Absent
S.austinii hum %	Absent	1-3 (many indiv)	Absent	1-3 (many indiv)	Absent
S.austinii height(cm)	na	0-10	na	na	Absent
S.fuscum hum type	na	Absent	na	na	Absent
S.fuscum hum %	Absent	Absent	1-3 (many indiv)	na	Absent
S.fuscum height(cm)	na	Absent	na	na	Absent
Leucobryum glaucum	Absent	Absent	4-10	Absent	Absent
Trichophorum type	Absent	Flats	Absent	Tussocks	Absent
Trichophorum %	Absent	1-3 (few indiv)	Absent	1-3 (many indiv)	Absent
S.magellanicum %	4-10	1-3 (many indiv)	4-10	4-10	4-10
S.cuspidatum %	Absent	11-25	4-10	1-3 (many indiv)	11-25
S.papillosum %	Absent	4-10	4-10	4-10	11-25
S.denticulatum %	Absent	Absent	Absent	Absent	Absent
S.capillifolium subsp. rubellum %	4-10	4-10	Absent	11-25	4-10
S.tenellum %	na	Absent	na	na	1-3 (several indiv)

Ecotope type	**Sub-central**	**Sub-central**	**Sub-central**	**Sub-central**	**Sub-central**
Complex Name	**10**	**9/10**	**10**	**10**	**9/10**
S.subnitens %	Absent	Absent	Absent	Absent	Absent
R.fusca %	Absent	Absent	Absent	Absent	Absent
R.alba %	Absent	1-3 (few indiv)	4-10	4-10	4-10
N.ossifragum %	4-10	26-33	4-10	4-10	1-3 (several indiv)
Sphag pools %	Absent	Absent	Absent	1-3 (many indiv)	4-10
Dominant pool Sphag	na		S.cuspidatum	na	S.cuspidatum
Sphag lawns %	11-25	11-25	Absent	Absent	11-25
Sphag humm %	34-50	Absent	11-25	34-50	26-33
Sphag holl %	Absent	4-10	11-25	4-10	1-3 (many indiv)
Total Sphag %	51-75	51-75	34-50	34-50	76-90
Hummocks indicators	S.austinii & S.fuscum	S.austinii	S.austinii & S.fuscum	S.austinii & S.fuscum	Absent
Cladonia portent %	Absent	Absent	1-3 (many indiv)	1-3 (many indiv)	1-3 (many indiv)
Other Cladonia sp	na		na	na	C uncialis
C. panicea %	Absent	Absent	Absent	Absent	Absent
Calluna cover %	4-10	26-33	11-25	26-33	26-33
Calluna height(cm)	21-40	41-50	21-40	21-40	31-40
Other NotableSpecies		Vacc ox			
Other comment					This is nice 9/10 adjoining hab less good

Ecotope type	**Sub-marginal**	**Sub-marginal**	**Sub-marginal**	**Sub-marginal**	**Sub-marginal**
Complex Name	**6**	**6**	**6**	**6/2**	**2/6**
Quadrat Name	Qsm1	Qsm2	Qsm3	Qsm4	Qm1
Easting	231185	230998	230650	230904	231306
Northing	191133	191024	190973	190889	191227
Date	01/07/2004	01/07/2004	01/07/2004	01/07/2004	01/07/2004
Firmness	soft	firm	firm	soft	firm
Burnt	No	No	Yes	No	No
Algae in hollows %	Absent	1-3 (many indiv)	Absent	4-10	Absent
Algae in pools %	Absent	Absent	Absent	Absent	Absent
Bare peat %	Absent	Absent	Absent	Absent	1-3 (many indiv)
High hummocks %	na	na	na	na	na

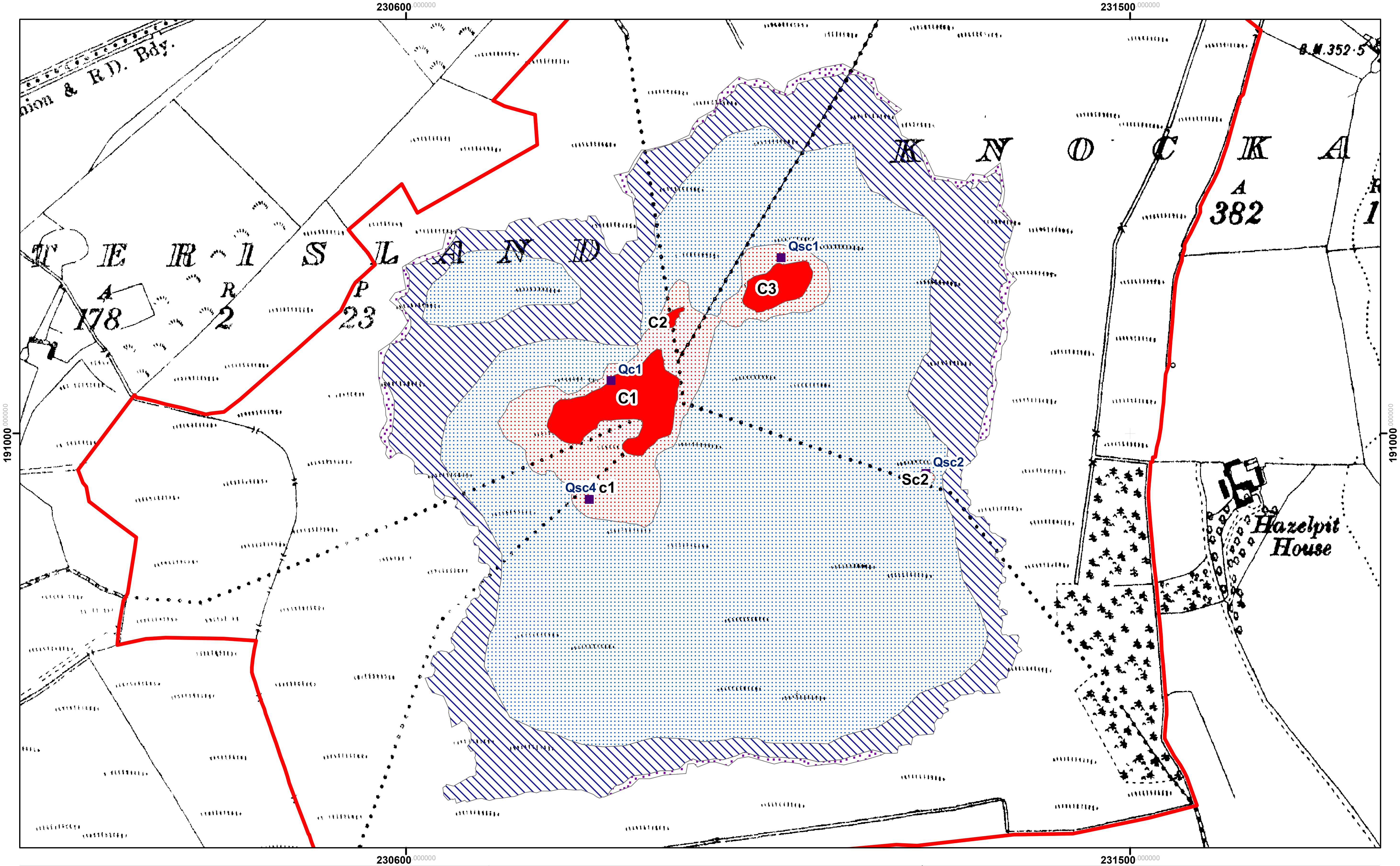
Low hummocks %	4-10	4-10	4-10	26-33	4-10
Hollows %	Absent	4-10	Absent	4-10	4-10
Lawns %	Absent	Absent	Absent	Absent	Absent
Pools %	Absent	4-10	Absent	Absent	Absent
Pool type	Absent	Regular	Absent	Absent	Absent
S.austinii hum type	na	na	na	na	na
S.austinii hum %	Absent	1-3 (many indiv)	Absent	Absent	Absent
S.austinii height(cm)	na	na	na	na	na
S.fuscum hum type	na	na	na	na	na
S.fuscum hum %	Absent	na	Absent	Absent	Absent
S.fuscum height(cm)	na	na	na	na	na
Leucobryum glaucum	Absent	Absent	Absent	Absent	Absent
Trichophorum type	Tussocks	Tussocks	Absent	Absent	Tussocks
Trichophorum %	1-3 (many indiv)	1-3 (many indiv)	Absent	Absent	34-50
S.magellanicum %	Absent	Absent	Absent	Absent	Absent
S.cuspidatum %	1-3 (many indiv)	Absent	Absent	Absent	Absent
S.papillosum %	Absent	na	1-3 (many indiv)	4-10	1-3 (many indiv)
S.denticulatum %	Absent	Absent	Absent	Absent	Absent
S.capillifolium subsp. rubellum %	na	na	4-10	4-10	Absent
S.tenellum %	na	na	na	na	na
S.subnitens %	Absent	Absent	Absent	Absent	Absent
R.fusca %	Absent	Absent	Absent	Absent	Absent
R.alba %	Absent	Absent	Absent	na	Absent
N.ossifragum %	34-50	34-50	34-50	34-50	11-25
Sphag pools %	Absent	4-10	Absent	Absent	Absent
Dominant pool Sphag	na	na	na	na	Absent
Sphag lawns %	Absent	Absent	Absent	Absent	Absent
Sphag humm %	4-10	4-10	4-10	26-33	4-10
Sphag holl %	Absent	4-10	Absent	4-10	4-10
Total Sphag %	4-10	4-10	4-10	34-50	4-10
Hummocks indicators	S.austinii	S.austinii & S.fuscum	na	na	Absent
Cladonia portent %	1-3 (many indiv)	1-3 (many indiv)	1-3 (many indiv)	1-3 (many indiv)	Absent
Other Cladonia sp	na	na	na	na	na
C. panicea %	Absent	Absent	Absent	Absent	Absent
Calluna cover %	4-10	4-10	11-25	4-10	11-25
Calluna height(cm)	41-50	21-40	11-20	21-40	21-40
Other NotableSpecies					
Other comment					

Ecotope type	**Marginal**	**Marginal**	**Marginal**	**Marginal**	**Marginal**	**Marginal**
Complex Name	**7/6**	**7/2/6**	**2/6**	**4**	**6/2**	**6/2**
Quadrat Name	Qm2	Qm3	Qm4	Qm5	Qm6	Qm7
Easting	230699	231020	231244	231293	230625	230613
Northing	190829	190612	190672	190812	190993	191106
Date	01/07/2004	01/07/2004	01/07/2004	01/07/2004	01/07/2004	01/07/2004
Firmness	firm	firm	firm	firm	firm	firm
Burnt	No	No	No	No	Yes	Yes
Algae in hollows %	Absent	Absent	Absent	1-3 (many indiv)	Absent	Absent
Algae in pools %	Absent	Absent	Absent	Absent	Absent	Absent
Bare peat %	1-3 (many indiv)	4-10	1-3 (many indiv)	Absent	Absent	1-3 (many indiv)
High hummocks %	na	Na	na	na	na	na
Low hummocks %	Absent	Absent	Absent	4-10	Absent	4-10
Hollows %	na	1-3 (many indiv)	1-3 (many indiv)	1-3 (many indiv)	na	Absent
Lawns %	Absent	Absent	Absent	Absent	na	Absent
Pools %	Absent	Absent	Absent	Absent	Absent	Absent
Pool type	Absent	Absent	Absent	Absent	Absent	Absent
S.austinii hum type	na	Na	na	na	na	na
S.austinii hum %	Absent	Absent	Absent	Absent	Absent	Absent
S.austinii height(cm)	na	Na	na	na	na	na
S.fuscum hum type	na	Na	na	na	na	na
S.fuscum hum %	Absent	Absent	Absent	Absent	Absent	Absent
S.fuscum height(cm)	na	Na	na	na	na	na
Leucobryum glaucum	Absent	Absent	Absent	Absent	Absent	Absent
Trichophorum type	Absent	Tussocks	Tussocks	Tussocks	Absent	Tussocks
Trichophorum %	Absent	11-25	11-25	1-3 (many indiv)	Absent	26-33
S.magellanicum %	Absent	Absent	Absent	Absent	Absent	Absent
S.cuspidatum %	Absent	Absent	Absent	Absent	Absent	Absent
S.papillosum %	Absent	Absent	Absent	1-3 (many indiv)	Absent	1-3 (many indiv)
S.denticulatum %	Absent	Absent	Absent	Absent	Absent	Absent
S.capillifolium subsp. rubellum %	4-10	1-3 (many indiv)	1-3 (many indiv)	4-10	Absent	4-10
S.tenellum %	na	Na	na	na	na	na
S.subnitens %	Absent	Absent	Absent	Absent	Absent	Absent
R.fusca %	Absent	Absent	Absent	Absent	Absent	Absent
R.alba %	Absent	4-10	1-3 (many indiv)	26-33	Absent	Absent
N.ossifragum %	34-50	4-10	11-25	4-10	Absent	51-75
Sphag pools %	Absent	Absent	Absent	Absent	Absent	Absent
Dominant pool Sphag	Absent	Absent	Absent	Absent	Absent	Absent

Sphag lawns %	Absent	Absent	Absent	Absent	na	Absent
Sphag humm %	Absent	Absent	Absent	4-10	Absent	4-10
Sphag holl %	na	1-3 (many indiv)	1-3 (many indiv)	1-3 (many indiv)	na	Absent
Total Sphag %	4-10	4-10	Absent	11-25	Absent	4-10
Hummocks indicators	Absent	Absent	Absent	Absent	Absent	Absent
Cladonia portent %	Absent	1-3 (many indiv)	1-3 (many indiv)	Absent	Absent	Absent
Other Cladonia sp	na	Na	na	na	na	na
C. panicea %	Absent	Absent	Absent	Absent	Absent	Absent
Calluna cover %	34-50	11-25	4-10	11-25	na	4-10
Calluna height(cm)	21-40	21-40	21-40	21-40	41-50	21-40
Other NotableSpecies	V. oxycoccos					
Other comment						

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.

Knockacoller SAC (002333)
Co. Laois

1:4,500

0 55 110 220 330 440 Meters

N

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

230600.000000

231500.000000

191000.000000

Union & R.D. Bdy.

T E R I S L A N D

A 178 R 2 P 23

K N O C K A

A 382 R 1

B.M.352·5

Hazelpit House

Raised Bog Monitoring & Assessment Survey 2013

Map 2: Vegetation community complexes

Ecology and Environmental Consultants Ireland Ltd.

Knockacoller SAC (002333)
Co. Laois

1:4,500

N

0 62.5 125 250 375 500 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
- FB/SC
- F/SM
- M/SM
- SM/FB
- F/M
- M/FB
- F/FB
- Other
- SAC

230600.000000

231500.000000

191000.000000

Union & R.D. Bdy.

T E R I S L A N D

4 R P
178 2 23

K N O C K A

A R
382 1

B.M.352·5

d1

d3

d2

Hazelpit House

Raised Bog Monitoring & Assessment Survey 2013

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

Ecology and Environmental Consultants Ireland Ltd.

Knockacoller SAC (002333)
Co. Laois

1:4,500

N

0 55 110 220 330 440 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