Shankill West name Bog (SAC 000326), Co. Galway

Executive Summary

This survey, carried out in October 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 Shankill West 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 13.31 ha (19.76%) of the high bog area. Central ecotope covers the central part of the bog surrounded by a ring of sub-central. More than half the ARB is comprised of central. There are three small areas of active flush. The Active Raised Bog consists of several community complexes featuring *Sphagnum* hummocks, hollows, lawns and pools. *Sphagnum* cover reaches 90% in certain locations on the eastern side of the site.

Degraded Raised Bog covers 54.02ha (80.24%) of the high bog area. It is drier than Active Raised Bog and supports a lower density of *Sphagnum* mosses. It has a less developed micro-topography while permanent pools and *Sphagnum* lawns are generally absent. The sub-marginal ecotope is in the middle part of the bog but extends to the edge at the south-western side. Although it has a reasonable *Sphagnum* cover (11-33%), and in places there are pools. *Narthecium ossifragum* and *Carex panicea* are constant species in the vegetation. *Myrica gale* is common on the east side where there is flushing. The marginal vegetation is associated with the edge of the bog and especially associated with drainage and peat cutting. It is most extensive on the northern and south-eastern side of the bog. Depressions on peat substrates of the Rhynchosporion are found in both Active and Degraded Raised Bog. It is best developed in the sub-central ecotope, within complex 10/14 where *Rhynchospora alba* cover is 11-25%. Most other community complexes have at least <4% cover. *Rhynchospora fusca* was found at one location on the site. Apart from the cessation of turf cutting which has occurred on some face banks, no conservation activities such as restoration work have been undertaken in the 2004-2012 reporting period.

The current conservation objective for Shankill West 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 43ha. 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 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 (0.44 ha) at Shankill West Bog in the 2004 to 2012 period. This is most notable along the south-western central/sub-central boundary, where an area of central (including a quadrat Qc1) as recorded in 2004 is now sub-central ecotope and the quadrat is re-classified as Q**sc1**. This is likely to be due to the effect of drainage from the network of drains to the south of this area and peat cutting. The boundaries of the ARB ecotopes are more indented. This is due to more comprehensive surveying and mapping in 2012 compared to 2004. The degraded raised bog (marginal ecotope) has increased which is likely to be due to drainage as well as the effects of a fire event which burnt most of the bog except the central and some of the sub-central ecotopes.

Peat cutting on the east side of the bog, and drainage inside and outside the high bog are the most threatening current activities at the site and 0.11ha of high bog have been lost in the 2004-2010 period due to peat cutting. This activity is considered to be one of the reasons for the decline in Active Raised Bog along the eastern section of high bog. 1.567km of drains remain functional and 3.385km reduced functional. A severe fire event occurred recently in 2011-2012 burning 70% of the high bog. This has had at least, a temporary negative effect on the vegetation. **Active Raised Bog** has been given an overall **Unfavourable Bad-Declining** conservation status assessment. Habitat area has slightly decreased in the reporting period. Current Area value is below favourable reference values, whereas S&Fs above the favourable, but declining, reference value. **Future Prospects** are considered **Unfavourable Bad-Declining** as impacting activities (peat cutting, drainage inside and outside the bog) 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 Shankill West 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 on the high bog and cutover areas, including blocking of functional and reduced functional drains, further hydrological and topographical studies to ascertain more accurate FRVs; further botanical monitoring surveys, 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	000326	**6" Sheet:**	GY 31
Grid Reference:	M 63 52	**1:50,000 Sheet:**	39
High Bog area (ha):	67.33ha		
Dates of Visit:	03,04,10-2012		
Townlands:	Shankill West, Annaghmore East and Annaghmore West.		

[1] The current extent of the high bog is 67.33ha, while that reported in 2004 was 67.10ha (Fernandez *et al*., 2005). This discrepancy is partially 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 an increase in high bog extent. High bog area has decreased by 0.11ha in the 2004/05-2010 period due to peat cutting. The actual high bog extent in 2004 was 67.44ha (see tables 8.1 and 8.3 2004 (amended) figures).

Site location

Shankill West Bog is located 6km NNW of Mount Bellew in east Co. Galway. Take the main Mount Bellew/Tuam road (N63) as far as Moylough. Turn right on to the R364 (heading north towards Kilkerrin) and after approximately 3-4km reach a T-junction with a small bog road straight ahead. Take this which then leads to the mid west corner of the bog. Kelly et al. (1995) grouped Shankill West with the raised bogs of East Galway. It lies approximately 3km to the north-west of Carrownagappul Bog (SAC 1242), 4km to the west-south-west of Curraghlehanagh Bog (SAC 2350).

Description of the survey

The survey was carried out in October 2012 and involved a vegetation survey of the high bog at Shankill West 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 Shankill West 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. The Quadrat, which described the micro-topographical features and indicator species, recorded in the 2004 project (Fernandez *et al*. 2005) was re-surveyed. The size of quadrat 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

Shankill West Bog is a small intermediate/western raised bog (Cross, 1990), which consists of a single peat body geomorphically classified as a basin bog surrounded by two low relief drumlins composed of sandy/silty till (Kelly *et al*., 1995). The bog is approximately pentagonal shaped and occupies a small basin surrounded by drumlin ridges. To the north, peat has encroached onto the drumlin with a natural gradation from bog to mineral soil. Here there are areas of infiltration lagg influenced by upwelling, base-rich water at the base of the drumlin, which gives rise to an area of alkaline fen. This fen vegetation is of high ecological interest and adds greatly to the overall interest of the site. The fen is situated in a depression around Attidavock Lough, which is the discharge area for regional groundwater (Kelly *et al*., 1995).

Ecological Information

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

The following Raised Bog EU Annex I habitats, are found in Shankill West 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 Shankill West Bog is 13.31ha (19.76% of the high bog), which is a decrease of 0.83ha since 1994. Active Raised Bog includes central, sub-central, and active flush ecotopes.

Central ecotope occupies the central part of the site covering about a quarter of the high bog area. Two community complexes were recorded in this ecotope. Complex 14 covers most of the north, west and south part of the central ecotope. It is characterised by a varied micro-topography of high and low hummocks, lawns and pools. *Sphagnum* cover is 51-75% and *S. cuspidatum* is the dominant one. *S. capillifolium* is the main hummock former but good indicators such as *S. fuscum* and *S. austinii* are present in small amounts. *Narthecium ossifragum* is locally abundant in the inter-pool areas. The second central complex 10/15 +My is located in the north-east and eastern side of the central ecotope. It is characterised by a fairly flat soft spongy carpet of colourful *Sphagnum spp*. and much fewer pools <10%. Although *Sphagnum cuspidatum* is still an important component of the bog moss flora, *S. papillosum* and *S. magellanicum* form extensive lawns in this complex. *Myrica gale* is scattered throughout and the occasional occurrence of *Aulacomnium palustre* and *Vaccinium oxycoccus* suggests some flushing in this area. *Narthecium ossifragum* forms localised flats.

The sub-central ecotope forms a ring around the central, and it covers a smaller area, about 2/3 of the central ecotope. Two very small areas of sub-central are located just outside the **Sc1** perimeter, to the north-west (**Sc2**) and to the south-west (**Sc3**). Two community complexes were recorded in sub-central. Complex 6+P is the main one in all sub-central areas. It has interconnecting pools with *Sphagnum cuspidatum* and *S. papillosum* and *S. magellanicum* around the edges, but algae was present in some of the pools. Overall there was a good diversity of *Sphagnum spp*. and also the Western indicator bryophytes; *Campylopus atrovirens* and *Racomitrium lanuginosum*. The inter-pool areas had frequent *Narthecium ossifragum* and low *Sphagnum* cover. The other sub-central complex is 10/4 +My located mainly on the eastern side of **Sc1**. *Sphagnum* cover is good (51-75%) forming lawns and hollows and there are no pools. *Rhynchospora alba* is also frequent in hollows and there is a scattering of *Myrica gale* throughout. This complex has been burnt in places.

There is an active flush **V** along an infilling drain bF within **Sc1**. *Sphagnum* cover is >90%. Flush **W** is located on the north-side of the central ecotope. A much smaller area of active flush occurs within a larger inactive flush (**Y**) at the southern edge of the high bog. Another area of active flush (**Z**) that was recorded in 2004 is now considered to be part of **Sc1**.

Degraded Raised Bog (7120)

The current area of Degraded Raised Bog at Shankill West Bog is 54.02ha (80.24% of the high bog).

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

The sub-marginal ecotope features the most developed micro-topography within Degraded Raised Bog. The main sub-marginal community complex is 6/3+P. In many ways, it is a poorer version of the sub-central 6+P. It has fewer pools which also have *Sphagnum cuspidatum* but also more algae. *Sphagnum* cover is variable (11-33%). Micro-topography is good, but the inter-pool areas are firm with abundant *Narthecium ossifragum*. *Carex panicea* is frequent. This grades into 6/3 (B) which has no pools and was burnt and this is often in a mosaic with the Marginal complex 3/6. Complex 6/3 +My is found on the eastern side of the site with *Myrica gale* and where there are no pools. At the western side of the high bog *Eriophorum vaginatum* and *Calluna vulgaris* are more prominent in the vegetation and the complex is 9/7/6. Pools are very few or absent, but *Narthecium* is still locally abundant. Where *Narthecium* is absent and Sphagnum cover (mainly *S. capillifolium*) is higher than 25% this becomes 9/7.

Marginal ecotope is slightly drier than sub-marginal ecotope and occurs as a band around the margins of the high bog, except in the south-western side, where the sub-marginal goes to the edge of the high bog. The micro-topography consists of *Calluna vulgaris* hummocks, low *Sphagnum* hummocks, flats and occasionally hollows. The *Sphagnum* cover is even lower here than in the sub-marginal ecotope (<10%) and the vegetation is characterised by a higher cover of *Carex panicea, Narthecium ossifragum, Trichophorum germanicum,* and *Calluna vulgaris*. There are two main community complexes; 3/6 is the most common around the edges where the ground is firm with *Sphagnum* usually <10% and both *Narthecium* and *Carex panicea* are frequent. Pools are absent but there are occasional hollows with *Sphagnum cuspidatum* or algae. Where there is *Trichophorum germanicum* >4%, this is 3/6/2. Complex 7/9 is found on the northern margin which had been burnt. Here there are burnt *Calluna* stumps and a lot of bare peat but both *Calluna* and *Eriophorum*

vaginatum are re-colonising and there are signs of *Sphagnum* recovering. This may have been sub-marginal 9/7 before it was burnt.

Face bank ecotope is characterised by firm ground, tall *Calluna vulgaris*, poor *Sphagnum* cover and a flat micro-topography, but on a fairly steep slope. Much of the face bank has been burnt and there is bare peat up to 50%, but *Calluna* is re-sprouting as well as *Eriophorum spp*. and *Carex panicea*. In places *Myrica gale* is also found on the facebank.

The high bog also features two inactive flushes (**X** and **Y**). **X** is located on the eastern edge of the high bog, and is dominated by *Molinia caerulea* (>90%) with low *Sphagnum* cover and occasional *Narthecium* and *Erica tetralix*. **Y** is a larger flush at the southern side of the high bog. The vegetation is a mosaic of marginal and sub-marginal vegetation with abundant *Molinia* through it. Although it is overall inactive, there are two patches of active regenerating cutover areas with *Sphagnum* dominated hummocks and pools.

Depressions on peat substrates of the Rhynchosporion (7150)

Rhynchosporion vegetation is found mainly on Active Raised Bog. It occurs in the central ecotope usually around the edges of pools and lawns but in the sub-central community complex 10/4. *Rhynchospora alba* and can be up to 25% cover and is found in among *Sphagnum* in hollows. It can also be found in the sub-marginal complex 6/3, but much less abundant, generally <4% cover and less again in marginal 3/6.

Rhynchospora fusca was found at one location E 163038 / N 251722 within an active part of flush **Y**

Detailed vegetation description of the high bog

A detailed description of high bog vegetation recorded during the 2012 survey of Shankill West 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 Shankill West 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 burning) 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	0.11haof the high bog cut away	Inside High Bog: at 1 location on east side	**7120/7110/7150**
J02.07	Drainage	H	-1	4.95km [1]	Inside High Bog	**7110/7120/7150**
J02.07	Drainage	M	-1	n/av	Outside High Bog	**7110/7120/7150**
J01	Fire	M	-1	47.17ha	Inside High Bog	**7110/7120/7150**
B01.02	Artificial planting on open ground (non-native trees)	L	-1	6.2ha	Outside High Bog to the NW	**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. See Table 6.2

n/av: not available

Peat cutting

There is little evidence of recent peat cutting at Shankill West bog. Historically 40% of the original bog area has been cut away since the 1840's (Kelly *et al*. 1994). The 2004 survey reported a 95% reduction in the length of margin activity turf cutting since 1994, with only 4 active turf plots on the eastern side of the bog. In the 2004-2012 reporting period, peat cutting has recently taken place at one location at least along the eastern section of high bog close to drain bG, and has caused modifications on the high bog hydrology. It is considered to have directly caused the decline in the area of high bog by (-) 0.11ha in the 2004-2010 period. As the assessment is based on (2010) aerial photography, there may have been additional peat cutting between 2010-2011, which, therefore, was not included in this assessment. Information from the NPWS indicates that peat cutting did not take place at the site in 2012-2012. Although peat cutting has declined considerably in recent years, this activity takes place directly within flush **X** and functional drains bG and bP and thus a higher impact is expected. Therefore, peat cutting is still considered to have a high importance/impact on high bog habitats.

In addition, old facebanks and high bog and cutover drainage associated with cutting are likely to continue to cause some negative impacts on the high bog habitats.

Drainage

High bog drainage

Table 6.2 shows a slight decrease in the length of reduced functional drains by 0.129km and an increase in the length of non-functional drains by 0.129km. The length of functional drains remains the same at 1.567km. The majority of drains in the high bog remain reduced functional (3.385km), and these include the two drains bE and bG that follow the townland boundary and traverse the central ecotope, as well as a number of parallel drains at the southern edge of the high bog. The functional drains (1.567km) include mainly a number of short parallel drains perpendicular to the eastern edge of the high bog. The functional and reduced functional drains are still impacting on high bog habitats especially on the eastern side, and will continue to do so until they are blocked and become completely in-filled and thus non-functional. High bog drainage is considered to have high importance/impact on high bog habitats. No drain blocking has occurred to date.

Table 6.2 High bog drainage summary

Status	2004 (km) [1]	2012 (km)	Change
NB: functional	1.567	1.567	0.00
NB: reduced functional	3.514	3.385	(-)0.129
NB: non- functional	1.429	1.558	(+)0.129
B: functional	0.00	0.00	0.00
B: reduced functional	0.00	0.00	0.00
B: non- functional	0.00	0.00	0.00

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 Shankill West 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
bA	0.033	NB: reduced functional	NB: non- functional	Yes	
bC	0.096	NB: reduced functional	NB: non- functional	Yes	

Drain Name	Length (km)	2004 status	2012 status	Change	Comment
bD	0.124	NB: non-functional	NB: non- functional	No	
bE	0.307	NB: reduced functional	NB: reduced functional	No	
bE	0.133	NB: functional	NB: functional	No	Southern section of drain wrongly classified as reduced functional in 2004
bF	0.391	NB: reduced functional	NB: reduced functional	No	
bF	0.068	NB: functional	NB: functional	No	Eastern section of drain wrongly classified as reduced functional in 2004
bG	0.369	NB: reduced functional	NB: reduced functional	No	
bG	0.100	NB: functional	NB: functional	No	Eastern section of drain wrongly classified as reduced functional in 2004
bH;H1-6;H9-10	1.120	NB: reduced functional	NB: reduced functional	No	All these drains but bH3 drain were wrongly classified as non-functional in 2004
bH2a; H7-8	0.508	NB: non-functional	NB: non- functional	No	
bJ1	0.208	NB: reduced functional	NB: reduced functional	No	This drain was wrongly classified as functional in 2004
bJ2-9	0.634	NB: functional	NB: functional	No	
bK1	0.078	NB: non-functional	NB: non- functional	No	
bK2;3	0.222	NB: functional	NB: functional	No	
bM	0.038	NB: non-functional	NB: non- functional	No	
bN;O;P	0.410	NB: functional	NB: functional	No	
bR	0.138	NB: non-functional	NB: non- functional	No	
bR	0.158	NB: reduced functional	NB: reduced functional	No	Southern section wrongly classified as non-functional in 2004
bS;T;U; V	0.543	NB: non-functional	NB: non- functional	No	
bW	0.832	NB: reduced functional	NB: reduced functional	No	Double drain

Bog margin drainage

The cutover areas were not surveyed for drains during 2012.

Drains associated with either currently active or no longer active peat cutting are present along the eastern, southern and north-western sections. These drains continue to drain the high bog and impact on high bog habitats. Adjacent agricultural land drainage maintenance is recorded to the south-east of the site (E 163327 / N 251568). Bog margin and adjacent agricultural land drainage is considered to have a medium importance/impact on high bog habitats, particularly those to the southeast of the site where maintenance took place in the reporting period.

Fire history

There is evidence of recent extensive burning on this site and 47.17ha out of 67.34ha. i.e. 70% of the total high bog was burnt at some time between 2011 and 2012. The burning covered most of the bog except for the central ecotope. Burning was last recorded in the 1980's (Douglas and Mooney 1984) which affected 40% of the high bog. No evidence of burning noted from the 2004 survey (Fernandez *et. al.*, 2005). Burning is considered to have had a medium negative importance/impact on high bog habitats.

Invasive species

No invasive plant species were recorded during this survey, neither were any noted from the 2004 survey.

Afforestation and forestry management

There are no plantations on the high bog, but to the north-west of the site (within the cSAC boundary), south-west of Attidavock Lough, there is a conifer plantation (6.2ha). This plantation is on cutover bog and is > 22 years old. There is another smaller plantation (1.7ha), also on cutover bog, north-east of Attidavock Lough that is outside of the SAC. The larger plantation is mostly comprised of Sitka Spruce (*Picea sitchensis*). It is likely to be having at least a low negative impact on the high bog habitats. The smaller plantation located further away is unlikely to have a significant adverse effect on the high bog.

Other impacting activities

No other significant impacting activities were noted or recorded in 2012 that are impacting high bog habitats since the last survey in 2004.

Conservation activities

There is no evidence of physical management actions such as the blocking of drains or the restoration of the turf cutting areas (which would also require the blocking of drains), have been carried out to improve the conservation status of the high bog habitats. Two drains bA and bC have changed status from reduced-functional in 2004 to non-functional in 2012, but this is due to a natural infilling rather than drain blocking.

There is however the potential for restoration of cutover along the NW and NE sides of the high bog. See recommendations section.

Conservation status assessment

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

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

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

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

Active Raised Bog (7110)

Area

Changes within the Active Raised Bog habitats within the reporting period are described below and summarised in Table 8.2.

C1. There is one area of central ecotope on Shankill West located in the centre of the site. It has decreased slightly in area by 3.6%, from 8.32ha in 2004 to 8.02ha in 2012. The perimeter edge of the Central area is more indented now. This is due to more comprehensive surveying and mapping. There is however a noted difference at the south-west corner which is reduced in area since 2004. This is also illustrated by changes in species content in former quadrat **Qc1**, now re-classified as sub-central ecotope (**Qsc1**). It is estimated that approximately 0.3ha of central ecotope declined in quality to sub-central ecotope. A central point that was recorded at this location in 2004 is now classified as sub-marginal vegetation. Although small in area, this would appear to be a real and significant change in area of **C1** due to a drying out process. The actual loss of this central ecotope dot is not calculated as it may have been the case that only one central ecotope dot was present and therefore a polygon should not have been mapped in 2004.

C2 and **C3** as shown on the 2004 ecotope map are no longer present as they are now incorporated into **C1**.

Sc1 sub-central surrounds **C1** and it has also decreased slightly in area 3.73% since 2004. **Sc1** has two narrow lobes stretching towards the SE section of the high bog. This pattern shows that water flows towards the SE where drains bN and bG occur. Thus these drains are likely to have a rather high negative impact on the high bog ARB vegetation. The blocking of these drains is highly recommended. Any maintenance work on adjacent agriculture land drains connected to these two drains, such as the described above and located towards the south-east of the site (E 163327 / N 251568) is also likely to have a negative impact on high bog vegetation.

ARB habitat areas have been lost along the W section of former **Sc1**. Several sub-central ecotope community complex dots (community complex 14) previously recorded along this section of **Sc1** are now mapped as sub-marginal ecotope (community complex 6/3+P). This is likely to be a real change and indicates drying out processes along this section of high bog. One central ecotope (community complex 14) was also recorded in this section (E 162896 / N 251983) in 2004, now in 2012 this area has been mapped as sub-marginal ecotope (complex 6/3+P recorded on this location in 2012), which also confirms that this area has dried out in the reporting period. Approximately 0.5ha of ARB has been lost within **Sc1**. It is now reclassified as sub-marginal. The **Sc1** boundary has

also changed as a result of more comprehensive surveying and mapping in 2012. Therefore, only 0.2ha deemed real loss.

Sc2 and **Sc3** are two small areas of sub-central, located at the north-western edge and south-western edge of the main sub-central ecotope. These 'new' areas have been identified and mapped due to more comprehensive surveying rather than an increase in the area of sub-central ecotope.

Active flush was recorded at three new locations; **V** situated at south-eastern part of **Sc1** and **W** at north side of the central/sub-central boundary. Both have high *Sphagnum* cover (> 90%). Flush V is associated with an infilling drain (bF) and flush **W** is located in flushed area on the north side of the central ecotope. A third newly developed area of active flush is occurring within the inactive flush **Y**, where some cutover sections of **Y** are rewetting and *Sphagnum* regeneration is occurring.

The favourable reference value (FRV) for Area is considered to be the sum of Active Raised Bog (central, sub-central ecotopes, 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 43.00ha (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 (13.31ha) is 69.05% below the FRV. A current Area value more than 15% below FRV falls into the **Unfavourable Bad** assessment category. A long term (1994-2012) trend indicates a reduction in the area of Active Raised Bog at the site by 0.83ha (see table 8.1). A more recent and short term trend analysis (8 years (2004-2012) also indicates a reduction of 0.44ha (3.2%) or a decrease of Active Raised Bog. Therefore, the habitat Area is given a **Decreasing** trend assessment. **The Area of Active Raised Bog at Shankill West 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 6.66ha (half of 13.31ha), the current area of Active Raised Bog. The current value is 8.15ha which is 22.37% above the FRV. Therefore S&Fs are given a **Favourable** assessment. Although the area of active flush has increased from 0ha in 1994 to 0.13ha in 2012, there has been a long term (1994-2012) and short term 8 years; 2004/5-2012 decrease of the area of central ecotope and overall there is a decrease in ARB by 3.2%, and therefore the S&Fs are given a **Declining** trend.

Quadrats analysis (**Qsc1,**) indicates the following:

Qsc1: this quadrat was previously classified as central ecotope (Qc1; complex 15), and is now re-classified as sub-central 6+P. Although both had pools 11-25%, the total *Sphagnum* cover has decreased from 51-75% in 2004 to 34-50% in 2012 and the *Sphagnum* spp. composition has changed also. *Calluna* cover has increased from 11-25% in 2004 to 26-33% in 2012. The quadrat was located near the south-western central-/sub-central boundary where some real change seems to have happened to the vegetation since 2004 and hence a re-classifying of the ecotope from central to sub-central.

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 Shankill Bog** are assessed as **Favourable-Declining** (see table 8.5).

Future Prospects

The ARB habitat Area and S&Fs have continued to decrease in the 2004-2012 reporting period, and there is a small but marked change in the vegetation from central to sub-central at the location of the quadrat (Q**sc1**). The network of functional drains on the eastern side of the high bog appear to be having a continued effect in pulling water towards the eastern edge of the bog and causing subsidence as evidenced by the three lobes of sub-central vegetation extending towards the east and south-western side of the high bog. The reduced functional drains are likely to be having an ongoing negative effect, but this is less visible. The blocking of these drains will be an important part in the restoration of the high bog habitat.

Habitat **Area** is currently 69.05% below FRV (see table 8.4) and a Decreasing trend is expected in the following two reporting periods (12 years). The habitat Area is expected to be more than 15% below FRV. Thus, habitat's **Area Future Prospects** are assessed as **Unfavourable Bad-Decreasing**. Habitat's **S&Fs** are currently 22.37% above FRV (see table 8.4) and although a Declining trend is foreseen, S&Fs are expected to be above FRV in the following two reporting periods. **S&Fs Future Prospects** are assessed as **Favourable-Declining**.

The overall habitat's Future Prospects are Unfavourable Bad–Declining (see table 8.5)**.** Blocking of remaining reduced-functional and functional drains, in particular along the southern and eastern edges of the high bog is necessary. Also blocking of drains on agricultural land adjoining the bog is recommended. Although turf cutting has reduced since 1994, and is now only occurring on the eastern edge, however, it should be stopped completely. It is important to monitor the frequency and intensity of fire events to minimise the impact on the area of Active Raised bog.

The overall conservation status of Active Raised Bog at Shankill West 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	8.98	10.20	8.32	8.02	(-)0.30	(-)3.61
Sub-central	5.16	5.73	5.36	5.16	(-)0.20	(-)3.73
Active flush	0.00	0.02	0.07	0.13	(+)0.06	(+)85.71
Total	**14.14**	**15.95**	**13.75**	**13.31**	**(-)0.44**	**(-)3.20**

[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	None	Decreasing	The total central area is smaller than mapped in 2004. This change is likely to be the result of more comprehensive surveying and re-interpretation of vegetation in 2012 which resulted in more accurate mapping. However, habitats losses are likely to have taken place along the W section of **C1**.	
C2	None	No longer present	Now mapped as part of **Sc1**. This is the result of re-interpretation of vegetation rather than an actual change.	
C3	None	No longer present	Now mapped as part of **C1**	
Sc1	Qsc1	Decreasing	Smaller than mapped in 2004. This change is likely to be the result of more comprehensive surveying and re-interpretation of vegetation in 2012 which resulted in more accurate mapping. However, habitats losses are likely to have	Change in quadrat vegetation between 2004 – 2012 resulted in re-classifying the quadrat from Qc1 (Community complex 15) in 2004 to .Q**sc1**(6 +P) in 2012 due to reduction in *Sphagnum* cover and increase in *Calluna*

Area	Quadrats	Trend	Comment	Quadrats analysis
			taken place along the W section of **Sc1**.	
Sc2	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.	
Sc3	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.	
Y	None	Newly developed	Some of the cutover sections of flush Y are re-wetting and Sphagnum regeneration is taking place within them.	
V	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.	
W	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.	

Degraded Raised Bog (7120)

Area

The Degraded Raised Bog FRV for Area is 24.33 ha at Shankill West Bog. This value corresponds with the difference between the current high bog area (67.33ha) and the Active Raised Bog FRV (43.00ha) 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 122.03% bigger than FRV and therefore the habitat Area is given an **Unfavourable Bad** assessment (see table 8.4). Table 8.3 shows a decrease in sub-marginal ecotope by (-) 4.5ha and a more or less corresponding increase (+) 4.94ha in marginal ecotope between 2004 and 2012. Most of the marginal increase seems to be on the northern side and in particular the two lobes that extend north-eastwards from the edge of the bog. This may be due to ongoing drying effects of older drains and turf cutting. Also the recent fire event in 2011/2012 had a severe effect on the vegetation

north of drain bW. A small area of former sub-central at the western corner near the central/sub-central boundary is now classified as sub-marginal and considered to be a real change.

Table 8.3 indicates that there has been an overall increase (+) 0.33ha in the area of Degraded Raised Bog. The increase is the result of expansion of marginal ecotope (22.74ha) and a reduction of 0.42 ha sub-marginal ecotope. As a result the habitat is given an **Increasing** trend.

The Area of Degraded Raised Bog at Shankill 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 13.51ha (25% of 54.02ha, the current area of Degraded Raised Bog). The current marginal and face bank ecotopes area value (25.18ha) is 86.45% 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.

Table 8.3 shows that, the overall area of marginal ecotope expanded by 4.94ha which is a 27.75% increase since 2004. There was no recorded change to the area of face bank during the reporting period. 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). Thus, the DRB's S&Fs at Shankill West are given a **Declinin**g trend.

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 Shankill West Bog are assessed as Unfavourable Bad-Declining (see table 8.5).

Future Prospects

Degraded Raised Bog has increased slightly, and Active Raised Bog has decreased slightly. Marginal ecotope has increased significantly at the expense of the sub-marginal. The network of drains at the east and southern edges of the high bog will continue to draw water off the bog and degrade the habitats as well as those drains across the central part of the bog. The increase in marginal habitat at the northern side of the bog is probably due to ongoing drainage effects and the

recent burn in 2011/2012. The adjacent agricultural land drainages will continue to have an indirect negative effect on the DRB and ARB unless its negative effects are reversed.

Habitat **Area** is currently 122.03% above FRV (see table 8.4) and an Increasing trend is expected in the following two reporting periods (12 years) as result of the negative effects of impacting activities (mainly drainage). 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 86.45% above FRV (see table 8.4). A Declining trend is foreseen in the following two reporting periods, **S&Fs** are expected to remain more than 25% above FRV. Thus, habitat's **S&Fs Future Prospects** are assessed as **Unfavourable Bad-Declining**.

Therefore the Future Prospects for Degraded Raised Bog are considered 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	28.86	34.29	32.22	27.72	(-)4.50	(-)13.97
Marginal[2]	22.93	11.16	17.80	22.74	(+)4.94	(+)27.75
Face bank[2]	n/a	4.24	2.44	2.44	0.00	0.00
Inactive flush	n/a	1.36	1.23	1.12	(-)0.11	(-)8.94
Total	**51.79**	**51.05**	**53.69**	**54.02**	**(+)0.33**	**(+)0.61**

[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 on 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 in 2011-2012 due to peat cutting

Note: Table 8.3 includes 2004 figures and 2004amended 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 2004and 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 Shankill West 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 2012 surveyed has a reported a decrease in the combined extent of ARB and sub-marginal ecotope at Shankill West Bog. As result habitat Area is given a **Decreasing** trend.

The habitat's Area Future Prospects status is equally based on the Active Raised Bog Area Future Prospects status assessment and the Area Future Prospects trend is based on the trend expected for Active Raised Bog and sub-marginal ecotope in the following two reporting periods. Impacting activities such as drainage, both inside and outside the bog, and peat cutting are threatening Active and Degraded Raised Bog. Logically this has to have a long term negative effect on Rhynchosporion depressions and the Future Prospects 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 a **Favourable-Declining** assessment.

The habitat's S&Fs Future Prospects status and trend are equally based on the Active Raised Bog S&Fs Future Prospects status and trend assessments in the following two reporting periods. Therefore, the habitat's S&Fs Future Prospects are given a **Favourable-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 Shankill West Bog 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]	% above target
7110	43.00	13.31	69.05	6.66	8.15	22.37

[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	24.33	54.02	122.03	13.51	25.18	86.45

[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 Annex I 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	Favourable-Declining	Unfavourable Bad-Declining	Unfavourable Bad-Declining
7120	Unfavourable Bad-Increasing	Unfavourable Bad-Declining	Unfavourable Bad-Declining	Unfavourable Bad-Declining
7150	Unfavourable Bad-Decreasing	Favourable-Declining	Unfavourable Bad-Declining	Unfavourable Bad-Declining

Conclusions

Summary of impacting activities

- Peat cutting continued at one location, on the eastern side of Shankill West Bog during the 2004-2012 reporting period. During that time a minimum of 0.11ha of high bog have been lost 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. This figure is only based on the comparison of 2004 aerial photos with the 2010 aerial photo. There is no data for 2010 to 2012. Peat cutting has been discontinued at three other locations which were reported on in 2004.
- There are a total of 6.51km of drains on the high bog of which almost 5km are functional or reduced functional. Most of these are associated with peat cutting at the eastern and southern sides of the bog, plus two drains (bE, bG) along townland boundaries which traverse the central ecotope. There is a double reduced-functional drain (bW) at the north-western side of the site, as well as some non-functional drains near the north-eastern edge of the site.
- Adjacent agricultural land drainage is considered to be having negative impact on the high bog habitats. Four hundred metres of these adjacent agricultural land drains have been maintained (i.e. deepened and widened) in the reporting period.
- A recent fire event in 2011-2012 has burnt 70% of the high bog excluding the central ecotope and some of the sub-central.

Changes in active peat forming areas

- There has been a decrease of 0.44ha in the area of Active Raised Bog mapped in the reporting period (2004-2012). Peat cutting, high bog drainage and adjacent agriculture land drainage are likely to be the main reason for this decline. All of the central is on one area (**C1**) surrounded by sub-central (**Sc1**). The **Sc1** extends eastwards towards the edge of the bog in three lobes. The network of drains is likely to be pulling water from the central area towards the edge, and at the same time, causing subsidence, and thus extending the sub-central at this location. Two newly mapped small areas of sub-central (**Sc2** and **Sc3**) are likely to be due to more comprehensive surveying and more accurate mapping.

  ARB habitat areas have been lost along the western section of former **Sc1**. Several sub-central ecotope community complex dots (complex 14-) previously recorded along this

section of **Sc1** are now mapped as sub-marginal ecotope (community complex 6/3+P). This is likely to be a real change and indicate drying out processes along this section of high bog. This drying out process has also affected central ecotope (this time part of the large **C1**) along this section of high bog as illustrated by changes in former quadrat **Qc1**, which is now classified as sub-central ecotope (**Qsc1**). It is estimated that approximately 0.3ha of central ecotope declined in quality to sub-central ecotope.

One central ecotope (community complex 14) was also recorded in this section (E 162896 / N 251983), now this area was mapped as sub-marginal ecotope (complex 6/3+P recorded on this location in 2012), which also confirms that this area has dried out in the reporting period. The actual loss of this central ecotope dot is not calculated as it may have been the case that only one central ecotope dot was present and therefore a polygon should not have been mapped in 2004. Approximately 0.5ha of ARB have been lost within **Sc1**. The **Sc1** boundary has also changed as a result of more comprehensive surveying and mapping in 2012. Therefore, only 0.2ha is deemed to be a real loss.

Newly recorded flush areas (**V** and **W**) are the result of more comprehensive surveying and mapping: Former **C2** and flush Z are now considered to be part of **Sc1**.This is the result of re-interpretation of vegetation rather than actual change.

Other changes

The marginal ecotope has expanded along the N section of the high bog. This area was dominated by sub-marginal ecotope, community complex 9/7 in 2004. This complex was described as having and *Sphagnum* cover varying between 20 and 50%. Now marginal ecotope community complex 7/9 (B) which was recently burnt, dominates this section of the high bog. This complex has a very low *Sphagnum* cover (<4%). Thus, it is estimated that marginal ecotope has increased at the expense of sub-marginal ecotope. This increase in marginal ecotope would be the result of further drying out processes on the high bog or the recent fire event. However, some of the changes within the former sub-marginal ecotope along the north section are also likely to be the result of more comprehensive surveying and mapping in 2012. Therefore, only 5ha are considered a real change.

Face bank ecotope extent is slightly smaller as a result of more comprehensive surveying and mapping in 2012, therefore, no changes are shown if you compare 2004 (amended) versus 2012 values.

There was a slight change in flush Y boundary and this included mapping a small area of active flush Y. Re-wetting and regeneration of *Sphagnum* is taking place within some of the cutover sections of flush Y. There is 0.06ha of newly formed active flush.

Quadrats analysis

- Quadrat Q**sc1** previously was previously classified as Qc1. The vegetation indicates a real change at this location on the south-western central/sub-central boundary.

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 Shankill West Bog. The current habitat Area of 13.31ha is below the FRV (43.00ha). The current value is 69.05% below FRV target. This decrease is associated with the ongoing effects of drainage on the bog and peat cutting. Future Prospects are considered **Unfavourable Bad-Declining** as impacting activities (peat cutting, drainage inside and outside of the high bog) continue to threaten the habitat.
- **Degraded Raised Bog has** been given an **Unfavourable Bad-Declining** conservation status at Shankill West Bog. Habitat Area has slightly increased since 2004, due to a decrease in Active Raised Bog. Sub-marginal ecotope has also decreased. These losses are associated with peat cutting, drainage and burning. Habitat's S&Fs have declined for the same reason. Habitat Area is above the FRV. 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 Shankill West Bog. Future Prospects are also considered **Unfavourable Bad-Declining** as a result of threatening impacting activities.

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

Recommendations

- **Cessation of peat cutting.**
- **Restoration works** including blocking of all high bog functional and reduced-functional drains on Shankill West Bog. Of greatest importance is to block the functional drains on the

eastern edge of the bog, but also all the reduced-functional drains, and as well as drains outside the bog on adjacent agricultural land.

- **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 values.
- **Further botanical monitoring surveys** on the high bog 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 14

- **Location**: this is the most frequent community complex across **C1**
- **Ground**: very soft to quaking
- **Physical indicators**: absent
- ***Calluna* height**: 21-30cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: Flat on dome of bog
- **Pools**: Interconnecting pools (26-33% in places)
- ***Sphagnum* cover**: 51-75%
- ***Narthecium* cover**: 26-33%
- **Micro- topography**: High and low hummocks/hollows/flats and pools
- **Tussocks**: absent
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (25-33%), *Erica tetralix* (<4%), *Eriophorum vaginatum* (<4%), *E. angustifolium* (<4%), *Narthecium ossifragum* (26-33%), *Rhynchospora alba* (<4%), *Drosera anglica* (<4%), *Sphagnum cuspidatum* (P; 26-33%), *S. denticulatum* (<4%), *S. capillifolium* (Hummocks (H); 11-25%), *S. austinii* (H; <4%), *S. fuscum* (H; <4%), *S. papillosum* (H & Pools (P); 11-25%), *S. magellanicum* (Lawns (L) & P; 4-10%), *S. austinii (<4%), S. fuscum (<4%), S. subnitens (<4%), Aulacomnium palustre (<4%), Empetrum nigrum (<4%).*
- **Additional comments**: At the north side of the central ecotope (N 252056 /E 163263), the pools are shallower with extensive lawns of *S. Papillosum* and *S. magellanicum.* The hummocks were lower. The C1 on the south side of the central ecotope near the middle is less good with very little *Sphagnum* in the pool areas. Some of it is now re-classified assub-central6+P including the quadrat **Qc1** taken at the same location in 2004 is now called **Qsc1** as it is sub-central

vegetation. This would appear to be a real change, possibly due to drainage effect from the drains to the south.

COMPLEX 10/15 +MY

- **Location**: North and east side of **C1**
- **Ground**: very soft
- **Physical indicators**: absent
- ***Calluna* height**: 21-30cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: Slight depression
- **Pools**: < 10% regular
- ***Sphagnum* cover**: 51-75%
- ***Narthecium* cover**: 11-25%
- **Micro- topography**: Low hummocks/hollows/lawns/flats and pools
- **Tussocks**: absent
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (11-25%), *Erica tetralix* (<4%), *Eriophorum vaginatum* (<4%), *E. angustifolium* (<4%), *Narthecium ossifragum* (11-25%), *Rhynchospora alba* (4-10%), *Drosera anglica* (<4%), *Menyanthes trifoliata* (<4%), *Drosera anglica* (<4%), *Sphagnum cuspidatum* (P; 11-25%), *S. denticulatum* (P; <4%), *S. capillifolium* (Hummocks (H); 11-25%), *S. austinii* (H; <4%), *S. fuscum* (H; <4%), *S. papillosum* (H & Pools (P);26-33%), *S. magellanicum* (Lawns (L) & P; 11-25%), *S. fuscum (H;<4%), Myrica gale (4-10%), Campylopus atrovirens (moss) (<4%), Dicranum scoparium (moss) (<4%), Cladonia uncialis (<4%).*
- **Additional comments**: This complex has a spongy carpet of soft *Sphagnum* spp. It is found around the eastern half of the central ecotope **C1**. *Myrica gale* is scattered throughout <30cm high and 4-10% cover. There are localised patches of *Sphagnum fallax*, *Aulacomnium palustre* and *Vaccinium oxycoccus*. This grades into sub-central 10/4 when it is in isolated patches and Sphagnum cover is less at 34-50%. This complex on the south side of the central ecotope near the middle deteriorates with <4% I in the pools and algae. The inter-pool areas there are variable, some with good *Sphagnum* cover (25-33%), others dominated by *Narthecium* flats.

Sub-Central Ecotope Complexes

COMPLEX 6 +P

- **Location**: found long the west and southwest sections of **Sc1**, as well as **Sc2** and **Sc3**
- **Ground**: soft to quaking
- **Physical indicators**: absent
- ***Calluna* height**: 20-30cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: flat
- **Pools**: interconnecting 11-25% with algae (4-10%)
- ***Sphagnum* cover**: 34-50%
- ***Narthecium* cover**: 34-50%
- **Micro- topography**: High hummocks/low hummocks/pools/flats
- **Tussocks**: *Trichophorum germanicum* <4%
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (26-33%), *Erica tetralix* (<4%), *Eriophorum angustifolium* (<4%), *E. vaginatum* (<4%), *Rhynchospora alba* (<4%), *Carex panicea* (<4%), *Andromeda polifolia* (<1%), *Vaccinium oxycoccus* (<1%), *Aulacomnium palustre*(<1%), *Sphagnum cuspidatum (*P;11-25%), S. *capillifolium* (H; 11-25%), *S. papillosum* (H; 4-10%), *S. magellanicum* (H; 4-10%), *S. austinii* (<4%), *S. fuscum* (<4%), *S. tenellum* (H; <4%), *Campylopus atrovirens (<4%few), Pleurozia purpurea (<4% few), Racomitrium lanuginosum* all (<4% several). *Menyanthes trifoliata*, (<4%), *Drosera anglica* (<4%).
- **Additional comments:** This is generally poor quality sub-central due to the amount of *Narthecium* in the inter-pool areas. This complex grades into sub-marginal 6/3+P (burnt) at the south-western bulge. This was mapped as central in 2004 and included a central (green) dot which is now definitely sub-marginal 6/3+P. **Sc3** is rather wet but *Sphagnum* cover is not particularly high for a sub-central ecotope.

COMPLEX 10/4 +MY (B) BURNT

- **Location**: mostly found along the east of **Sc1** where it was burnt
- **Ground**: soft
- **Physical indicators**: burnt stumps
- ***Calluna* height**: 4-10cm
- ***Cladonia* cover**: 0%
- **Macro-topography**: depression
- **Pools**: absent
- ***Sphagnum* cover**: 50-75%

- ***Narthecium* cover**: <4%
- **Micro- topography**: Low hummocks/hollows
- **Tussocks**: *Trichophorum germanicum* <4%
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (4-10%), *Erica tetralix* (11-25%), *Eriophorum angustifolium* (4-10%), *E. vaginatum* (<4%), *Rhynchospora alba* (11-25%), *Sphagnum papillosum (11-25%), S. magellanicum (11-25%) S. capillifolium* (H; 11-25%), *S. cuspidatum* (<4%), *S. austinii* (H; <4%), *S. fuscum* (H) <4%).
- **Additional comments:** In un-burnt areas this complex is 10/4 +My with *Calluna* height 20-30cm. At extreme south-east of **Sc1** (E 163398 / N 251791) an area previously mapped as **C2** consists of large *S. cuspidatum* pool, it is now considered to be part of sub-central ecotope. Variant 10/9A +My occurs when the *Rhynchospora alba* is replaced by *Eriophorum angustifolium,* along the southeast section of **Sc1.**

Active flushes

FLUSH V

- **Location**: East of site along infilling drain bF
- **Ground**: very soft
- **Physical indicators: absent**
- ***Calluna* height**: 10-20cm
- ***Cladonia* cover**: 4-10%
- **Macro-topography**: depression
- **Pools**: absent
- ***Sphagnum* cover**: >90%
- ***Narthecium* cover**: <4%
- **Micro- topography**: Low hummocks/hollows
- **Tussocks**: absent
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (34-50%), *Erica tetralix* (4-10%), *Empetrum nigrum* (4-10%), *Myrica gale* (<4%), *Menyanthes trifoliata* (<4%), *Aulacomnium palustre*(<4%), *Sphagnum capillifolium* (H; 50-75%), *S. fallax* (H; 4-10%), *S. austinii* (H; <4%), *S. tenellum* (H; <4%), *S. cuspidatum* (Hollows (Hl); 4-10%).

- **Additional comments:** Flush Y is predominantly an inactive flush at the southern side of the site, but it has 2 small patches of active regenerating raised bog within it. See inactive flush Y for description.

FLUSH Z

Grid ref. E 162930 / N 252050 at the north-eastern central/sub-central boundary near drain bG. Very soft area with *Sphagnum cuspidatum* pools 25m long x 1.0m wide. Inter-pool areas with flats of *Rhynchospora alba*, *Narthecium ossifragum* and *Eriophorum angustifolium* in between. It may be associated with old drain work. This flush was reported in 2004 and is now is deemed part of **Sc1.**

Degraded Raised Bog (7120)

Sub-Marginal Ecotope Complexes

COMPLEX 9/7

- **Location**: found to the south-west of **Sc1**
- **Ground**: soft
- **Physical indicators**: absent
- ***Calluna* height**: 10-20-cm
- ***Cladonia* cover**: absent
- **Macro-topography**: flat, slight depression
- **Pools**: absent
- ***Sphagnum* cover**: 26-33%
- ***Narthecium* cover**: 4-10%
- **Micro- topography**: Low hummocks/hollows
- **Tussocks**: *Eriophorum vaginatum* (11-25%)
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (4-10%), *Erica tetralix* (4-10%), *Eriophorum. angustifolium* (<4%), *Narthecium ossifragum* (<4%), *Trichophorum germanicum* (<4%), *Carex panicea* (<4%), *Sphagnum capillifolium* (H; 11-25%), *S. papillosum* (H; <4%), *S. tenellum* (H; <4%), *S. subnitens* (H; <4%)
- **Additional comments:** This area was mapped as sub-central in 2004. It has been burnt and is now reclassified as sub-marginal.

- A variant is 9/7 (B) near the northern side, which has been recently burnt, and bare peat is (4-10%).The *Sphagnum* cover is <10%, but *Eriophorum vaginatum* cover is (11-25%).

COMPLEX 6/3 +P

- **Location**: Described from the north-west side near the sub-central boundary.
- **Ground**: soft to very soft
- **Physical indicators**: absent
- ***Calluna* height**: 20-30cm
- ***Cladonia* cover**: <4%
- **Macro-topography**: Flat, slight depression
- **Pools**: regular and interconnected 4-10%
- ***Sphagnum* cover**: 25-33%
- ***Narthecium* cover**: 25-33% and up to 50% in places
- **Micro- topography**: High hummocks/low hummocks/hollows/pools/flats
- **Tussocks**: absent
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (25-33%), *Erica tetralix* (<4%), *Eriophorum vaginatum* (<4%), *E. angustifolium* (4-10%), *Narthecium ossifragum* (11-25%), *Rhynchospora alba* (<4%), *Sphagnum cuspidatum (*P; <4%), S. *capillifolium* (H; 4-10%), *S. papillosum* (H; 4-10%), *S. tenellum* (<4%), *S. subnitens* (<4%), *S. austinii* (<4%), *Hypnum jutlandicum* (<4%), *Campylopus atrovirens* <4%).
- **Additional comments:** This community complex makes up most of the sub-marginal ecotope on the north, west and southern sides of the site. The description from the north-west area is quite wet with abundant *Narthecium ossifragum* in the inter-pool areas and at the edges of pools. It may have formerly been sub-central or central.
  - A variant of this complex is 6/3 +P (B) where burning has occurred around most of the perimeter of the bog.
  - At the southern side of the site east of drain bE, there is a flat area of sub-marginal 6/3+Pools (B) which was burnt and has abundant *Rhynchospora alba* (25-33%), and *Eriophorum angustifolium* (11-25%). Near the south-west perimeter a Variant 6/3/2+P (B) with occasional pools and has *Trichophorum germanicum* is (4-10%).

COMPLEX 6/3 +MY (B) BURNT

- **Location**: Eastern lobe near sub-central boundary.
- **Ground**: Firm to soft

- **Physical indicators**: burnt *Calluna*, bare peat <4%
- ***Calluna* height**: 0-10cm
- ***Cladonia* cover**: 0%
- **Macro-topography**: slight depression
- **Pools**: absent
- ***Sphagnum* cover**: 26-33%
- ***Narthecium* cover**: 11-25%
- **Micro- topography**: Low hummocks/hollows
- **Tussocks**: absent
- **Degradation or regeneration evidence**: burnt
- **Species cover**: *Calluna vulgaris* (4-10%), *Erica tetralix* (<4-10%), *Carex panicea (11-25%), Narthecium ossifragum* (11-25%), *Rhynchospora alba* (<4%), *Myrica gale* (4-10%), *Sphagnum magellanicum (11-25%), S. capillifolium* (H; 4-10%), *S. papillosum* (H; 4-10%), *S. cuspidatum* (<4%),
- **Additional comments:** At the south-eastern side of the site where a lobe of sub-central extends towards the edge of the high bog, *Myrica gale* is locally common probably indicative of some flushing. Where the vegetation has not been burnt, the complex is 6/3 + My.
    - Where the Sphagnum cover increases to >50%, this complex becomes sub-central 10/4+ My (B).

COMPLEX 6/3 (B) BURNT

- **Location**: mostly found along the western and northern sections of high bog
- **Ground**: Firm to soft
- **Physical indicators**: burnt estimated 2 years ago.
- ***Calluna* height**: 0-10cm
- ***Cladonia* cover**: 0%
- **Macro-topography**: Gentle slope towards edge
- **Pools**: absent
- ***Sphagnum* cover**: 11-25%
- ***Narthecium* cover**: 11-25%
- **Micro- topography**: Low hummocks/hollows
- **Tussocks**: *Trichophorum* <4%
- **Degradation or regeneration evidence**: burnt

- **Species cover**: *Calluna vulgaris* (4-10%), *Erica tetralix* (<4-10%), *Eriophorum angustifolium* (<4%), *E. Vaginatum* (<4%), *Carex panicea (11-25%),* , *Narthecium ossifragum* (11-25%), *Rhynchospora alba* (<4%), *Sphagnum capillifolium* (H; 4-10%), *S. papillosum* (H; 4-10%),
- **Additional comments:** 6/3 (B) is frequent in the west, north and north-east sub-marginal ecotope. This community complex can be a mosaic with patches of marginal 3/6. When this community complex is not burnt, the species cover differs; *Carex panicea* (4-10%), *Narthecium ossifragum* (33-50%), *Eriophorum vaginatum* (4-10%), *Calluna vulgaris* (11-25%), and the overall sphagnum cover is still 11-25%, but at the higher end. On the north-western side, the Sphagnum cover is low <10% and there are a few pools (<4%) with *S. cuspidatum,* and also hollows with algae.
  - Variant 6/3/2 where *Trichophorum germanicum* is >4% at the north and west.
  - Variant 6/3+P (B) located further into the high bog from the 6/3 (B) description above. It has pools (4-10%), but Sphagnum cover low in the pools.
  - Variant 6/3 when this complex is not burnt, *Carex panicea* is (<4%), *Eriophorum vaginatum* (4-10%), *Calluna vulgaris* (11-25%) and overall Sphagnum cover is (11-25%).

COMPLEX 9/7/6

- **Location:** South side, near drain network bH
- **Ground**: firm to soft
- **Physical indicators**: absent
- ***Calluna* height**: 10-20cm
- ***Cladonia* cover**: <4% few
- **Macro-topography**: gentle slope to southern edge.
- **Pools**: absent
- ***Sphagnum* cover**: 11-25%
- ***Narthecium* cover**: 4-10%, locally 11-25%
- **Micro- topography**: Low hummocks/hollows
- **Tussocks**: *Trichophorum* (<4%)
- **Degradation or regeneration evidence**: absent
- **Species cover**: *Calluna vulgaris* (11-25%), *Erica tetralix* (<4%), *Eriophorum vaginatum* (11-25%), *E. angustifolium* (4-10%), *Rhynchospora alba* (<4%), *Sphagnum capillifolium (H; 4-10%), S. cuspidatum (Hollows; <4%), S. papillosum (4-10%), S. tenellum* (H; <4%), *S. subnitens* (<4%), *Trichophorum germanicum* (<4%), *Narthecium ossifragum* (4%).

- **Additional comments:** At the south-western side of the high bog, this complex becomes 9/7/6 (B) where burning has occurred.

Marginal Ecotope Complexes

COMPLEX 3/6 (B) BURNT

- **Location**: this is the most widespread marginal ecotope community complex on the site
- **Ground**: firm
- **Physical indicators**: burnt recently, bare peat (<10%)
- ***Calluna* height**: <10cm
- ***Cladonia* cover**: 0%
- **Macro-topography**: steep slope to edge
- **Pools**: absent
- ***Sphagnum* cover**: 4-10%
- ***Narthecium* cover**: 11-25%
- **Micro- topography**: low hummocks/ hollows with water
- **Tussocks**: *Trichophorum germanicum* (<2%)
- **Degradation or regeneration evidence**: burnt
- **Species cover**: *Calluna vulgaris* (<4%), *Erica tetralix* (4-10%), *Eriophorum vaginatum* (<4%), *Narthecium ossifragum* (11-25%), Carex panacea (4-10%), *Rhynchospora alba* (<4%), *Sphagnum capillifolium* (H; <4%), *S. tenellum* (H; <4%), *S. subnitens* (H; <4%), *S. papillosum* (H; <4%), *Campylopus introflexus* (<4%).
- **Additional comments**: Recovering after burning 1-2 years ago. Surface water in hollows.
  - Variant 3/6 +My (B) when *Myrica gale* is present.

COMPLEX 7/9 (B) BURNT

- **Location**: North edge of high bog
- **Ground**: firm
- **Physical indicators**: burnt *Calluna* stumps, bare peat (11-25%)
- ***Calluna* height**: <10cm
- ***Cladonia* cover**: 0%
- **Macro-topography**: gentle slope
- **Pools**: absent
- ***Sphagnum* cover**: <4%

- ***Narthecium* cover**: 0%
- **Micro- topography**: tall peat hummocks (25-40cm)/ hollows
- **Tussocks**: *Eriophorum vaginatum* (11-25%) and up to 33% in places
- **Degradation or regeneration evidence**: burnt
- **Species cover**: *Calluna vulgaris* (11-25%), *Erica tetralix* (4-10%), *Eriophorum vaginatum* (11-25%), *Carex panicea* (<4%), *Sphagnum capillifolium* (H; <4%), *S. subnitens* (H; <4%), *Aulacomnium palustre* (<4%).
- **Additional comments**: This vegetation is regenerating after the burning event with abundant *Eriophorum vaginatum growing* from old tussocks. Although *Sphagnum* cover is still low, it is regenerating and it would appear that this may recover to what might have been similar to the adjacent sub-marginal 9/7 ecotope before burning.
- Variant at the nort*h-eastern l*obe is 7/9(B) +M*y + Mo* where *Myrica gale* is (4-10%) and *Molinia caerulea* (<4%).

Inactive flushes

FLUSH Y AND X

Flush Y is located south of the high bog. It is a mosaic of marginal 3/6 vegetation and Sub-marginal 9/7/6 vegetation with abundant *Molinia* 26-33% and partly cutover areas. Overall it is inactive, but there are two patches of active regenerating cutover areas with *Sphagnum capillifolium (11-25%), S. papillosum* (4-10%) hummocks and *S. cuspidatum* pools (4-10%). They were too small to map separately as active flush areas.

Flush X is located east of the high bog and is traversed by drain bP. Also inactive, it is dominated by *Molinia caerulea* (>90%). *Sphagnum* cover is <10% and includes *S. capillifolium and S. papillosum. Narthecium ossifragum* (<4%) and *Erica tetralix* (<4%).

Face bank Complexes

COMPLEX 1

- **Location**: this community complex is found at the edge of the high bog
- **Ground**: firm
- **Physical indicators**: burnt and bare peat (33-50%)
- ***Calluna* height**: 1-10cm

- ***Cladonia* cover**: 0%
- **Macro-topography**: steep slope
- **Pools**: absent
- ***Sphagnum* cover**: 0%
- ***Narthecium* cover**: 0%
- **Micro- topography:** Fairly flat with *Calluna* stumps
- **Tussocks:** Absent
- **Degradation or regeneration evidence**: burnt
- **Species cover**: *Calluna vulgaris* (26-33%), *Eriophorum angustifolium* (<4-%), *Eriophorum vaginatum* (<4-%), *Carex panicea* (<4%).
- **Additional comments**:
  - Variant Facebank 1 (B) where facebank has been burnt and there is >50% bare peat. *Calluna* (4-10%), *Trichophorum germanicum* (<4%).
  - Variant Facebank 1 +My when not burnt and *Myrica gale* present (<4%). *Calluna vulgaris* 20-30cm high with cover (>90%), *Eriophorum angustifolium* (<4%), *E. Vaginatum* (<4%), and *Sphagnum* cover (<4%).

Depressions on peat substrates of the Rhynchosporion (7150)

The habitat occurs at All Shankill West Bog in both Active and Degraded Raised Bog, but it is only occasionally found on degraded habitat. *Rhynchospora alba* was the main indicator species of this ecotope, Rhynchospora *fusca* was recorded at one location during the 2012 survey at this site.

R. alba is found in most ecotopes in Shankill West Bog; central 14, 10/15, sub-central 6+P, 10/4 +My (B), sub-marginal 6/3+P, 6/3+MY, 6/3 (B), marginal 3/6. It was not found in sub-marginal 9/7, nor in marginal 7/9 nor in facebank 1. The species was most frequent in complexes 10/4 (sub-central) Where it is 11-25%. Most other complexes had a low cover (<4%) of *Rhynchospora alba*.

The species is mostly 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 and marginal ecotope complexes.

Appendix II Photographical records

Photograph Number	Aspect	Type	Feature	Date
0444	NE	Overview	Qsc1	03/10/2012

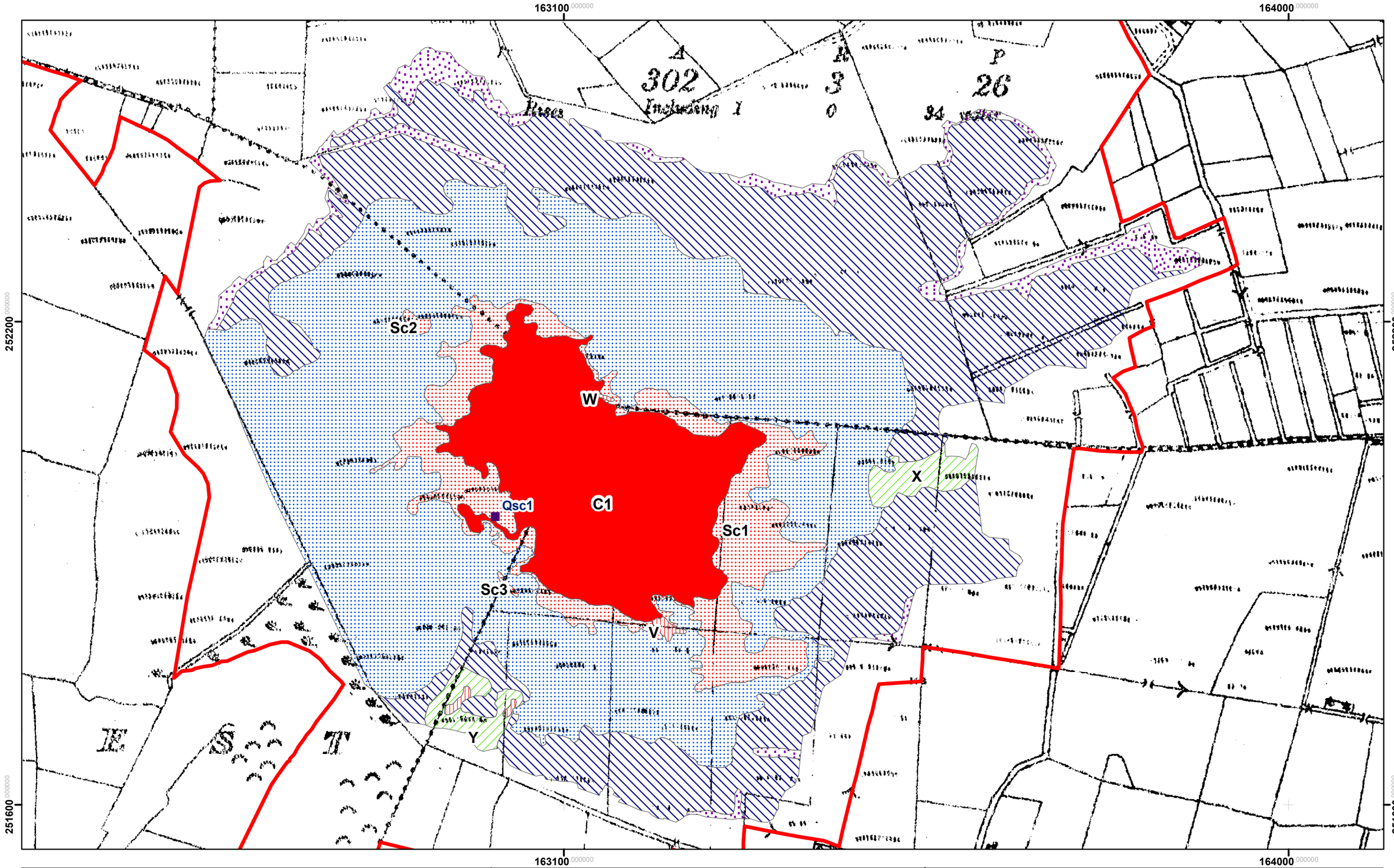
Appendix III Quadrats

Ecotope type	Central	Sub-central
Complex Name	15	6+p
Quadrat Name	Qc1	Q**sc1**
Easting	163009	163015.014
Northing	251953	251957.321
Date	07/10/2004	03/10/2012
Firmness	very soft	Quaking
Burnt	No	No
Algae in hollows %	Absent	Absent
Algae in pools %	4-10	Absent
Bare peat %	Absent	Absent
High hummocks %	na	Absent
Low hummocks %	11-25	34-50
Hollows %	11-25	4-10
Lawns %	Absent	Absent
Pools %	11-25	11-25
Pool type	Regular	Interconnecting
S.austinii hum type	na	Absent
S.austinii hum %	1-3 (many indiv)	Absent
S.austinii height(cm)	na	Absent
S.fuscum hum type	na	Absent
S.fuscum hum %	na	Absent
S.fuscum height(cm)	na	Absent
Leucobryum glaucum	na	Absent
Trichophorum type	Tussocks	Flats
Trichophorum %	na	1-3 (many indiv)
S.magellanicum %	1-3 (many indiv)	Absent
S.cuspidatum %	4-10	11-25
S.papillosum %	11-25	4-10

Ecotope type	Central	Sub-central
Complex Name	15	6+p
S.denticulatum %	na	Absent
S.capillifolium%	26-33	11-25
S.tenellum %	na	1-3 (many indiv)
S.subnitens %	na	Absent
R.fusca %	na	Absent
R.alba %	na	1-3 (many indiv)
N.ossifragum %	11-25	4-10
Sphag pools %	11-25	11-25
Dominant pool Sphag	S.cuspidatum	S.cuspidatum
Sphag lawns %	Absent	Absent
Sphag humm %	11-25	26-33
Sphag holl %	4-10	4-10
Total Sphag %	51-75	34-50
Hummocks indicators	S.austinii	Absent
Cladonia portent %	1-3 (many indiv)	1-3 (many indiv)
Other Cladonia sp	na	
C. panicea %	na	Absent
Calluna cover %	11-25	26-33
Calluna height(cm)	11-20	11-20
Other NotableSpecies		*M.trifoliata*
Other comment		former Qc1;lower Sphagnum cover; *S. magellanicum* absent may be drying out

Note: Data for those 2004 quadrats re-surveyed in 2012 is given to the right of the original 2004 quadrat data in table above.

Appendix IV Survey maps



Raised Bog Monitoring & Assessment Survey 2013

Map 1: Ecotopes Map and Quadrats

Ecology and Environmental Consultants Ireland Ltd.

Shankill West SAC (000326)
Co. Galway

1:4,500

N

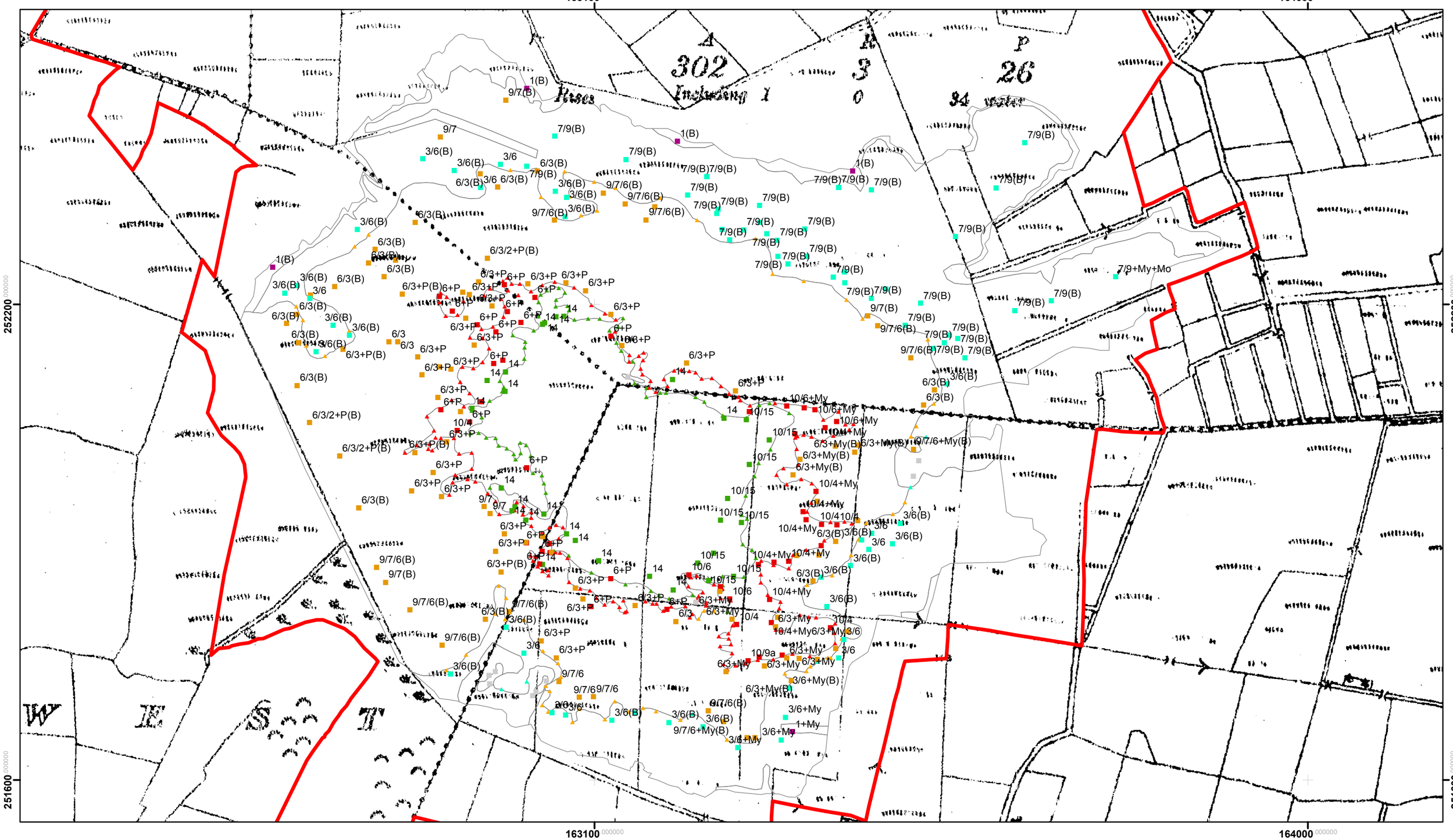
0 55 110 220 330 440 Meters

Legend

Quadrat

Ecotope type

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



Raised Bog Monitoring & Assessment Survey 2013

Map 2: Vegetation community complexes

Ecology and Environmental Consultants Ireland Ltd.

Shankill West SAC (000326)
Co. Galway

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

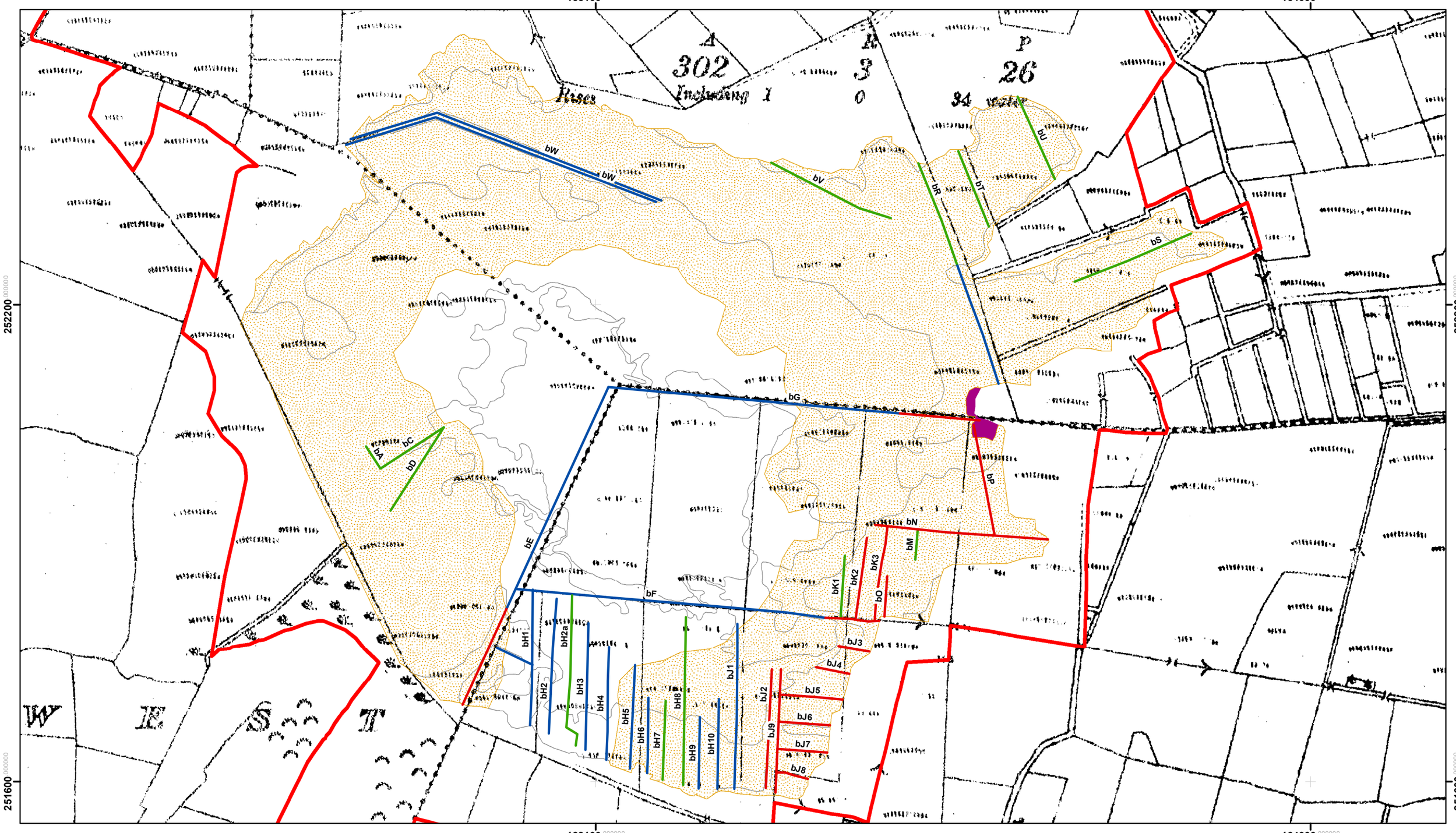
- Flush
- SC/C
- F/C
- SM/C
- M/C
- F/SC
- SM/SC
- M/SC
- FB/SC
- F/SM
- M/SM
- SM/FB
- F/M
- M/FB
- F/FB
- Other
- SAC

163100 000000

164000 000000

252200 000000

251600 000000



Raised Bog Monitoring & Assessment Survey 2013

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

Ecology and Environmental Consultants Ireland Ltd.

Shankill West SAC (000326)
Co. Galway

1:4,500

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