

Viking Wind Farm Phase1 Survey 2005 & 2008

A Report for EnviroCentre/SSE

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Highland Ecology**

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3. Introduction

During April and early May 2008 the Nesting and Collafirth quadrants were re-surveyed to Phase1 level by Highland Ecology. This was to ensure compatibility with areas to the west, which were surveyed by HE in September 2005, and particularly to re-evaluate the blanket bog resource in terms of its condition and activity. In a previous survey of Nesting and Collafirth much of the ground had been classed as modified bog, and therefore undervalued, when in fact it is predominantly not modified bog in the strict Phase1 sense but unmodified, although fragmented, blanket bog.

The rate of Phase 1 survey in 2008 and 2005 was approximately 3 sq km per day so the accuracy is therefore much less than that of the detailed wind farm footprint NVC survey carried out later. However, using recent aerial photographs obtained for the project, it is possible that this survey along with the 2005 survey, could form a good basis for a wide scale peatland management plan.

4. Phase1 Habitat Types

2.1 Blanket bog

EC Habitats Directive 7130 Blanket bogs, UKBAP Priority Habitat

Blanket bog is the dominant vegetation type over the whole survey area. It occurs on peat over 50cm in depth and usually at least 2m deep. The vegetation is characterised by a range of species, the most frequent or constant vascular species being *Calluna vulgaris*, *Trichophorum cespitosum*, *Erica tetralix*, *Eriophorum vaginatum* and *Eriophorum angustifolium*. Unlike blanket bog throughout much of the rest of Scotland *Molinia caerulea* is absent. *Sphagnum* moss species, mainly *Sphagnum papillosum* and *Sphagnum capillifolium*, are usually at least patchily prominent in blanket bog and often form extensive continuous carpets in the wettest stands. In some drier blanket bog *Sphagnum* plays a reduced role and *Racomitrium lanuginosum* is very prominent.

Previous and current erosion is an important aspect of the blanket bog resource and special attention was given to the activity, i.e. current active build-up of peat, in different areas. To this end a rating system, devised for the subsequent, detailed wind farm footprint NVC survey, was also employed during the phase 1 survey in 2008. Data from Delting and Kergord (2005) was also interpreted in 2008 to form a similar, comparable assessment of active blanket bog. Blanket bog was graded from 5 (continuous, good condition vegetation with very little erosion) through to 1 (more or less completely eroded except for dry and continually eroding fragments of deep peat). A detailed description of the various criteria used to assign ranking is provided in Appendix 1 and a diagram showing the distribution of the blanket bog activity rankings is provided in Appendix 2.

2.2 Wet and dry dwarf shrub heath

Dwarf shrub heath, along with acid grassland, is a community of the shallower (i.e. less than 50cm deep) peats. It can be found commonly forming mosaics in areas of eroded and fragmented blanket bog as well as within more intact blanket bog where the peat thins over knolls or banks. It can also be found on more extensive slopes of shallower peat.

The characteristics of wet heath are a combination of ericoids, notably *Calluna vulgaris* but also *Empetrum nigrum*, *Erica tetralix* and *Erica cinerea* along with other mire species such as *Trichophorum cespitosum*, *Eriophorum angustifolium* and *Eriophorum vaginatum*. *Sphagnum* can be present but it is usually much more patchy than in blanket bog and can be trampled.

Dry heath can be found on the very steepest slopes and also within stretches of eroding blanket bog where it can resemble alpine heath over broad ridges and summits. It is usually completely dominated by *Calluna vulgaris*, although there can also be a little sparse *Vaccinium myrtillus* or *Erica cinerea*.

Due to a history of heavy grazing the heaths are frequently grassy in nature and occur in intimate mosaics with acid grassland.

2.3 Acid grassland

Acid grassland occurs throughout the survey area and is common in mosaics with dwarf shrub heath. It can be found in areas of eroding blanket bog and also in more uniform extents on steeper slopes with a heavy grazing history. It is also found in enclosed fields around the edges of the survey area.

Various species can predominate. In areas of blanket bog fragmentation the sward is usually a *Juncus squarrosus*-dominated one, although occasionally *Nardus stricta* can be the dominant species. These grasses are joined by a host of other grasses, notably *Festuca vivipara*, *Anthoxanthum odoratum*, *Agrostis canina* and *Deschampsia flexuosa*.

2.4 Other habitats

Other less extensive habitats are common through the survey area:

Acid flushes are frequent, in usually linear stands, through most blanket bog and areas of heath where it occupies soakways and seepage zones. *Juncus spp.* and a variety of mire species occur over a carpet of *Sphagnum fallax* and/or *Sphagnum denticulatum*.

More base-rich flushes have a suite of species unique to them including a diversity of sedges such as *Carex panacea*, *Carex viridula ssp. oedocarpa* and the bryophytes *Scorpidium scorpioides*, *Scorpidium revolvens* and *Campylium stellatum* along with *Pinguicula vulgaris*.

Other fragmentary or rare habitats found on the survey were marshy grassland, oligotrophic standing water and calcareous grassland.

APPENDIX 1

Active vs. Inactive blanket bog assessment criteria

Grading system 1 to 5 as follows (vegetated shallow peat = U6/Cv acid grassland/heath and/or substrate in hag bottoms):

1 More or less totally inactive, poor condition, 80-100% bare peat (or vegetated shallow peat)

- Widespread bare peat, substrate or wet heath/acid grassland on v. shallow soil.
- Very little cover, if any, of *Sphagnum*.
- Current erosion of remaining peat block edges and surfaces
- Maybe occasional fragments of remnant blanket bog but these not of any great size and usually eroding further.

2 Largely inactive, 50%-80 bare peat (or vegetated shallow peat)

- A large part of the area consists of bare peat, substrate or wet heath/grassland derived from former deeper peat.
- >50% bare surface or shallow peat
- Within this there might be some areas of active peat formation, either as existing blocks of uneroded blanket bog or as new active accumulation in the bottom of hags. These are not usually extensive.
- Condition may well be unfavourable (i.e. not recovering, or declining) due to ongoing erosion and/or trampling/grazing effects.

3 Intermediate, widespread larger scale peat erosion, 20-50% bare peat (or vegetated shallow peat)

- Typically a mosaic/patchwork of active and inactive areas, difficult to class as 2 or 4.
- There may be widespread haggling and bare peat or substrate, bare peat often in networks up to several metres wide
- 20-50% Bare peat surfaces or sparse re-vegetation
- There might also be small areas of new build-up of mire species, most importantly *Sphagnum* spp. U6a with *Sphagnum* building up on it. Small patches M17a and M1.
- These areas may be in current unfavourable condition due to trampling or they may be favourable and seen to be recovering.

- If exactly 50%-50% then judge by amount of re-vegetating surfaces vs. bare peat.

4 Areas of broadly intact bog with smaller scale but frequent bare peat erosion, 5-20% bare peat (or vegetated shallow peat)

- A large proportion of ground supports typical mire and peat-forming species, notably *Sphagnum* spp., though it may naturally not be prominent in the drier blanket bog types.
- Hags and bare peat etc. usually present and frequent, covering 5-20% of the ground as very frequent channels within peat but not usually wide or deep, i.e. up 0.5 to 2m
- Blanket bog may be continuing to erode in parts but better re-vegetating bare peat surfaces are more widespread here, along with areas of active building of *Sphagnum* etc. (U6a, M17a, M1) which can occupy hag bottoms, hollows and naturally damned channels in the peat.
- May be recoverable with reduced grazing

5 More or less fully active, good, stable condition blanket bog, <5% bare peat overall

- Widespread deep peat with little haggling and erosion, although there will usually be at least some.
- Continuously vegetated over large extents with typical mire species. In wetter stands there will be extensive unbroken *Sphagnum* carpets.
- Drier stands (e.g. M17b) may quite naturally have much less *Sphagnum* but here there will be extensive cover of *Racomitrium lanuginosum* and *Cladonia* spp. lichens and other typical associates. Where there are pools these will usually be well-vegetated with *Sphagnum cuspidatum* and/or *S. denticulatum* or *S. fallax* and typical vascular associates.

APPENDIX 2 – Blanket Bog Activity



APPENDIX 3 – Phase 1 Target Notes

Nesting

1. 45017 62040 Low lying areas of ground within hag systems, where peat has been eroded away in the past, support co-dominant *Calluna vulgaris* and *Juncus squarrosus* with frequent *Rhytidiadelphus loreus*, *Pleurozium schreberi*, *Hypnum Succisa pratensis* and *Hylocomium splendens*. *Sphagnum capillifolium* and *S. denticulatum* are occasional. Intact M17b blanket bog exists over higher ground. [KP]
2. 45235 61640 Over this higher ground a fine-grained mosaic of blanket bog (M17b), eroding and re-vegetating bare peat (M3) and re-vegetated *Calluna vulgaris*/*Juncus squarrosus* (dry heath/acid grassland) occurs through the different stages of erosion. [KP]
3. 44500 62000 Over the summit of Riven Hill peat has mainly eroded away to the mineral soil which is now mainly vegetated by *Calluna vulgaris* and *Juncus squarrosus* in an acid grassland/dry heath mosaic. Scattered peat hags remain with associated M17b. [KP]
4. 42490 62366 Area of modified bog enclosed within stock fence. Superficially much of this area appears as acid grassland but occurring over deep peat (>0.5m). Elsewhere, and forming a mosaic with acid grassland, are stands of *Eriophorum angustifolium* with *Juncus squarrosus*, *Sphagnum capillifolium*, *Carex panicea*, *Hypnum* sp. and *Racomitrium lanuginosum*. *Trichophorum cespitosum* becomes locally dominant and *Nardus stricta* and *Carex panicea* also become quite frequent in parts along with *Campylopus atrovirens*, *Sphagnum capillifolium* and *Juncus squarrosus*. Vegetation is generally not typical of NVC documentation. [KP]
5. 42697 62032 Bog pool forming behind *Juncus squarrosus* 'banks' within an area of shallower peat which appears to have been eroded away in the past and subsequently become re-vegetated by *Calluna vulgaris*, *Juncus squarrosus*, *Sphagnum capillifolium*, *S. cuspidatum*, *S. denticulatum*, *S. papillosum* and *Eriophorum angustifolium*. Peat throughout this habitat is 20-35cm deep. Photographs 4, 5 & 6. In general, over these low gradient slopes, M17b cut with eroding hags dominate the landscape. In most parts bare peat is becoming colonised *Eriophorum angustifolium*. [KP]
6. 42729 61567 Small pool forming. *Juncus squarrosus* 'banks' are complete with *Sphagnum* spp. starting to build up in-amongst. *Juncus squarrosus* and *Calluna vulgaris* with *Sphagnum* spp. dominate surrounding ground over fairly shallow peat. Photograph 7. [KP]
7. 42726 61188 Bare gravel and peat within eroding hags. Photograph 8 & 9. There is widespread peat erosion over this ridge of higher lying ground which is through to gravelly substrate in parts. Re-vegetation is patchy and often limited to areas where

peat has been completely lost. For the most part where there is bare peat it has become dried out on the surface and very unstable. [KP]

8. 42982 60593 Area of M17a with a fairly continuous carpet of *Sphagna* (*S. papillosum*, *S. palustre*, *S. capillifolium*). There is little damage to the peat surface and associated vegetation through this wetter type of blanket bog. [KP]
9. 42456 60369 Severe localised peat erosion with hags 1.5m+ high. Where the peat has been eroded away to mineral soil/gravel beneath some parts have become vegetated by *Juncus squarrosus* and *Calluna vulgaris*. These hags provide shelter to sheep over an otherwise exposed hilltop. Much of the *Juncus squarrosus* showed evidence of grazing at the time of survey. [KP]
10. 42655 60673 Extensive bare peat/gravel becoming vegetated by grasses and acrocarpous bryophytes up to 3cm tall. [KP]
11. 42376 61211 Localised erosion of peat leaving bare surface >100m² with limited re-vegetation by *Eriophorum angustifolium*. [KP]
12. 43293 62710 Small stream with emergent *Iris pseudacorus* and associated stands of M28 on both banks. [KP]
13. 43533 62440 Small soakways and flushes through surface of the bog support *Carex demissa*, *Potamogeton polygonifolius*, *Scorpidium scorpioides*, *Campylium stellatum*, *Sphagnum denticulatum* and *S. cuspidatum*. Disturbance is minimal and *Sphagnum* carpet (particularly *S. denticulatum*) continuous in parts with sparse *Eriophorum angustifolium* and *Eriophorum vaginatum*. [KP]
14. 43438 61853 Eroding hag system to 1m high. Colonisation of bare peat by *Eriophorum angustifolium* is frequent. Where the peat has been eroded away to a very thin covering or to the mineral soil/gravel beneath *Calluna vulgaris* and *Juncus squarrosus* dominate with frequent *Sphagnum capillifolium*. Erosion more or less equals re-vegetation as a whole. M17a blanket bog occurs as fragments. [KP]
15. 43217 61852 Over this flatter ground the blanket bog surface is structurally varied with small scale erosion. Hags are approximately 0.5m high. Re-vegetation of bare peat is frequent throughout and appears at a greater rate than erosion. This habitat is potentially fragile although in a stable/recovering condition at present. Photograph 1. [KP]
16. 43179 61567 Extensive eroding bare peat with patchy *Eriophorum angustifolium*. Erosion rates appear greater than re-vegetation. [KP]
17. 43739 61364 Gently sloping hillside with a diverse structure of M17b and M3. In parts where there has been more extensive erosion in the past re-vegetation and peat building is obvious with a good cover of *Sphagnum denticulatum* and *S. capillifolium* with frequent *Juncus squarrosus* amongst a variety of species typically associated with M17a. When viewed from the opposite slopes to the west this habitat appeared quite significantly hagged and eroded. [KP]

18. 44119 61477 Pool forming on hilltop with dense *Juncus squarrosus* creating a bank along one side and eroding peat on the other. Photographs 2 & 3. There are several similar small pools over this area. In general this hilltop is a mosaic of acid grassland (U6) and dry heath over ground which appears to have been mainly stripped of peat by extensive past erosion, with some areas of intact M17b blanket bog and eroding bare peat. More areas appear to be re-vegetating than eroding. [KP]
19. 43851 60286 large area of intact M19a blanket bog (*Calluna vulgaris*, *Eriophorum vaginatum*, *Trichophorum cespitosum*, *Hylocomium splendens*, *Sphagnum capillifolium*, *Rhytidiadelphus loreus*) interspersed with smaller stands of the wetter M17a community which has good cover of *Sphagnum denticulatum*. [KP]
20. 42944 61113 Carpet of aquatic *Sphagna* (*Sphagnum denticulatum/cuspidatum*) covers this area with abundant *Eriophorum angustifolium* growing up through it. Drier 'islands' are dominated by a mixture of *Juncus squarrosus* and *Trichophorum cespitosum*. Towards the margins vegetation is more like M17a with frequent *Sphagnum papillosum* and *S. capillifolium*. [KP]
21. 45396 61261 Marginal slopes heavily grazed by sheep with topiarised *Calluna vulgaris* forming a fine-grained mosaic with *Juncus squarrosus* dominated grassland and more typical blanket bog (M17b/M19a). All habitats appear to be over deep peat. [KP]
22. 45145 62025 Re-vegetated area across summit resembles alpine heath (H14) in parts with abundant *Calluna vulgaris* accompanied by frequent *Racomitrium lanuginosum* and *Cladonia portentosa*. *Juncus squarrosus* and *Nardus stricta* are also conspicuous components of this vegetation. Elsewhere there is some exposed rocky substrate and bare peat but in general re-vegetation appears to be occurring at a faster rate than erosion. *Juncus squarrosus/Calluna vulgaris* dominated vegetation is common with scattered *Sphagnum papillosum* over shallow peat. Photographs 10 (N) & 11 (W) from 45068 61904. [KP]
23. 45092 61705 Small area of good condition M17a blanket bog with little/no erosion and a fairly continuous cover of *S. papillosum*, *S. capillifolium*, *S. palustre*, *S. cuspidatum*. [KP]
24. 44785 61498 Degree of haggging varies greatly over this hillside from intact bog to deep hags. Bare ground between hags is generally re-vegetating with *Juncus squarrosus* and *Calluna vulgaris*. [KP]
25. 44335 60960 Scattered small peat mounds. [KP]
26. 44341 60836 Drain cut through M17a/b bog >0.5m. Photograph 12. Similar drains occur down-slope of here and appear, from a distance, deeper. [KP]
27. 44062 59905 Localised deep haggging/severe erosion with some grassy re-vegetation and limited *Eriophorum angustifolium* over bare peat. To the north of here the bog is more-or-less intact. [KP]

28. 44017 59639 Localised severe haggings within wider area of better condition bog. Similar areas of more severe erosion are occasional but localised over the area. Photograph 13. [KP]
29. 41869 60991 Plateau of eroding blanket bog (photograph 14). Much of the bare peat is becoming colonised by sparse *Eriophorum angustifolium*. Hags mainly 0.5-1m high. [KP]
30. 42007 61167 Eroding bare peat (>500m²) with associated haggings (M17b). There is some widely scattered *Eriophorum angustifolium* growing on peat and where the majority has been eroded away to mineral soil there are small patches of *Juncus squarrosus* (U6). [KP]
31. 42243 60224 Wetter area of bog (M17a/b) with pools and a good cover of *Sphagnum papillosum*. Where this flat lying ground meets the adjacent hill slopes there is quite extensive peat haggings/erosion. [KP]
32. 42434 59495 Spring head and flush with abundant *Montia fontana*, *Potamogeton polygonifolius* and *Carex nigra*. Also present are *Juncus bulbosus*, *Myosotis scorpioides*, *Ranunculus flammula*, *Cardamine pratensis*, *Juncus effusus* and *Philonotis fontana*. Towards the slightly drier margins there is frequent *Sphagnum cuspidatum*, *S. denticulatum*, *Carex nigra*, *Eriophorum angustifolium*, *Nardus stricta* and *Juncus bulbosus*. Photograph 15. At the spring head itself *Philonotis fontana* becomes abundant with occasional *Calliergon* sp. & *Cardamine pratensis*. Photograph 16. [KP]
33. 42594 59408 Spring head with abundant *Montia fontana*, *Cardamine pratensis*, *Potamogeton polygonifolius*, *Sphagnum denticulatum*, *Drepanocladus* sp., *Calliergon* sp., *Agrostis stolonifera*, *Ranunculus flammula*, *Carex nigra*, *Aulacomnium palustre* and *Philonotis fontana*. Although largely intact there is some degree of poaching through this habitat. Photograph 17. [KP]
34. 43389 59658 Spring head vegetated by *Sphagnum denticulatum*, *Carex nigra*, *Montia fontana*, *Agrostis stolonifera*, *Juncus effusus* and *Polytrichum commune*. [KP]
35. 42938 58982 Wide-scale peat erosion with fragments of old hags remaining. Bare mineral soil/gravel is becoming re-vegetated in parts, whereas areas of peat are not. Photographs 18 & 19. [KP]
36. 46101 59235 Drain cut through area of mainly intact blanket bog (M17a). Although *Sphagnum papillosum* is fairly constant through this habitat, areas of localised surface drying could be reduced through blocking up drains. Main species present include *Calluna vulgaris*, *Eriophorum vaginatum*, *Eriophorum angustifolium*, *Trichophorum cespitosum*, *Sphagnum palustre*, *Molinia caerulea*, *Sphagnum capillifolium* and *Hylocomium splendens* (local). The drain itself is vegetated by *Potamogeton polygonifolius*, *Eriophorum angustifolium*, *Sphagnum denticulatum* and *Molinia caerulea*. There are localised small stands of acid grassland. [KP]

37. 45449 58829 Spongy *Sphagnum papillosum* through area of active (M17a) blanket bog. Occasional shallow drains through this habitat. In parts there is an increase in *Hylocomium splendens* and *Rhytidiadelphus loreus* over drier tussocks with *Sphagnum capillifolium/papillosum* in hollows and vegetation more closely corresponding to the documented M19 blanket mire. Old drains are vegetated by *Potamogeton polygonifolius*, *Sphagnum denticulatum*, *Eriophorum angustifolium*, *Ranunculus flammula* and *Carex demissa*. [KP]
38. 44733 59021 Severe erosion with extensive (500m²+) bare peat. Areas of hagg and erosion are quite varied over this hilltop with some fairly intact areas ranging through to areas of severe erosion such as this. [KP]
39. 44488 59286 Flush/soakway with *Carex rostrata*, *Carex demissa*, *Potamogeton polygonifolius*, *Scorpidium scorpioides* and *Juncus bulbosus*. [KP]
40. 44778 59977 Localised severe erosion/hagging. [KP]
41. 44479 54780 Steep sides along channel have a good amount of dry heath and patchy acid grassland. Heath most like H10 with some H21 where *Sphagnum* becomes quite prominent on shadier aspects. [TR]
42. 44831 55012 Area of heavily grazed blanket bog. Quite grassy with very short *Calluna vulgaris* and frequent areas of poaching. *Sphagnum* is impoverished, damaged and patchy. The community may be easily recoverable though. [TR]
43. 45056 55149 Acid grassland. Very short and sparse grasses over a carpet of hypnoid mosses. *Juncus squarrosus* is high cover along with *Agrostis capillaris*, *Juncus effusus*, *Bellis perennis*, *Thymus polytrichus*, *Rhytidiadelphus squarrosus*, *Rhytidiadelphus loreus*, *Hylocomium splendens*, *Dicranum scoparium* and *Pleurozium schreberi*. [TR]
44. 45545 55480 Blanket bog which is like M17b but with high *Juncus squarrosus* in places so transitional to M17c. *Calluna vulgaris* is of high cover along with *Eriophorum angustifolium*, *Sphagnum capillifolium* and *Hylocomium splendens*. There are also wet hollows with mainly *Sphagnum cuspidatum* (M1) and patches of U6 *Juncus squarrosus* acid grassland. [TR]
45. 45597 55714 Peat hags here to 1.5m high but there is some regeneration in the hag bottoms with *Eriophorum angustifolium* quite prominent and also the mosses *Sphagnum papillosum* and *Sphagnum cuspidatum* with some standing water in places. [TR]
46. 45113 57149 Large flat plain consisting of largely intact blanket bog, although there are a few areas of hagg within it. *Sphagnum papillosum* and *Sphagnum capillifolium* are very prominent in the vegetation along with *Calluna vulgaris*, *Eriophorum angustifolium*, *Eriophorum vaginatum* and the moss *Aulacomnium palustre*. [TR]

47. 44181 55136 Much of the area to the south of here is less than 50cm depth of peat so not officially blanket bog. But here there are frequent areas of active *Sphagnum* build-up in hollows plus fragments of deeper peat greater than 50cm. [TR]
48. 46178 57477 A3-A4 activity rating and consisting of the communities M17b and M3. [TR]
49. 45953 57701 A2-A1. Hags with remnant peat blocks continuing to erode and break down. Sheep aggravating erosion badly and preventing re-vegetation. [TR]
50. 45350 57658 Some M19 blanket bog here has *Calluna vulgaris* and mosses at about 50%-50%. The mosses are mainly *Hylocomium splendens* and *Rhytidiadelphus loreus*. There is *Empetrum nigrum* through this but it rather sparse. The drop in *Sphagnum* and *Racomitrium lanuginosum* is another difference between this and M17 blanket bog. [TR]
51. 44740 57342 An M10 sedge flush with *Scorpidium scorpioides*, *Carex echinata*, *Bryum pseudotriquetrum*, *Campylium stellatum* and *Carex panicea*. [TR]
52. 44036 58617 Massive wide-scale blanket bog erosion with almost entire bare peat surface, stony substrate or shallow peat acid grassland and heath. [TR]
53. 43806 55942 One of several M10 type flushes on the edge of blanket bog within acid grassland and heath mosaic. Sedges present are *Carex panicea* and *Carex viridula* ssp. *oedocarpa* along with *Juncus bulbosus* and the mosses *Scorpidium scorpioides*, *Bryum pseudotriquetrum* and *Blindia acuta*. [TR]
54. 43905 56298 Flushed ground (similar to M10) has *Thalictrum alpinum*, *Breutelia chrysocoma*, *Carex panicea*, *Carex viridula* ssp. *oedocarpa*, *Campylium stellatum*, *Selaginella selaginoides*, *Ctenidium molluscum* and *Drepanocladus* sp. [TR]
55. 44049 56687 Areas of currently eroding blanket bog with heavy grazing exacerbating erosion [TR]
56. 44202 56775 Currently eroding blanket bog with an activity rating of A3. There is some active peat formation in hag bottoms but also much eroding bare peat. Also areas of U6a where *Juncus squarrosus* is of high cover along with *Calluna vulgaris*, *Cladonia portentosa* and *Sphagnum capillifolium*. [TR]
57. 44006 57401 Area of A2 bare peat along with shallow peat acid grassland and heath consisting of *Calluna vulgaris*, *Juncus squarrosus*, *Empetrum nigrum*, *Sphagnum papillosum*, *Rhytidiadelphus loreus*, *Hylocomium splendens*, *Hypnum jutlandicum*. There are also patches of bare stony substrate and remnant blocks of M17b blanket bog but the shallow peat far outweighs these. Some areas of the grassland are like U5 with *Nardus stricta* taking dominance along with some *Juncus squarrosus*, *Galium saxatile*, *Dicranum scoparium*, *Agrostis capillaris* and *Pleurozium schreberi*. [TR]

58. 43680 56745 Summit area of widespread blanket bog erosion around half bare peat with about 10% remnant blanket bog (M17b) and the rest shallow peat U6 acid grassland and heath. [TR]
59. 43415 56739 Old eroded blanket bog now grassland and heath at around 70%-30%. U6 consists of *Juncus squarrosus*, *Nardus stricta*, *Polytrichum alpestre*, *Rhytidiadelphus squarrosus* and *Rhytidiadelphus loreus*. The heath consists of *Calluna vulgaris*, *Nardus stricta*, *Agrostis capillaris*, *Hypnum jutlandicum*, *Rhytidiadelphus loreus* and *Hylocomium splendens*. [TR]
60. 43685 54980 Eroded blanket bog now mainly heath and grassland with fragments of remaining bog. Heavy grazing and trampling by sheep. [TR]
61. 42988 55041 Blanket bog M17b with frequent erosion channels classed as A4. M17b composed of *Racomitrium lanuginosum*, *Eriophorum angustifolium*, *Calluna vulgaris*, *Eriophorum vaginatum*, *Cladonia portentosa*, *Sphagnum capillifolium*, *Empetrum nigrum*, *Hypnum sp* and *Cladonia uncialis*. Bare peat is frequent but these are not large areas and have some *Eriophorum angustifolium* colonising it. There also some M1 hollows with *Sphagnum cuspidatum* but these are generally trampled and poor. [TR]
62. 42600 55748 Black Loch is drained and not really a proper loch, more like a wet peaty hollow with some standing water with M3 and patches of M17a. [TR]
63. 42764 56174 Loch of the Andris now also drained and not a proper Loch. Still quite wet with patchy hollows of M1 and M17a and some areas of grassland. Photograph 32. [TR]
64. 43080 56263 Area of current bad erosion. Pools are present but will soon be eaten into by erosion of blanket peat and then drain. Need acting on urgently. Photograph 33. [TR]
65. 42065 58593 Steep slopes are a mix of acid grassland and heath at around 70:30% Main species are *Calluna vulgaris*, *Juncus squarrosus*, *Galium saxatile*, *Hylocomium splendens*, *Polytrichum commune*, *Rhytidiadelphus squarrosus* and *Festuca ovina*. [TR]
66. 42622 57451 Area of A3 eroding blanket bog with M17b consisting of *Racomitrium lanuginosum*, *Eriophorum vaginatum*, *Calluna vulgaris*, *Eriophorum angustifolium*, *Cladonia portentosa*, and *Pleurozium schreberi*. At times this is almost like M19 where hypnoids are prominent and *Racomitrium lanuginosum* drops off. There are also areas of M3 bare peat, shallow peat acid grassland and heath. [TR]
67. 42613 57317 2 large pools at edge of erosion area are threatened by being eaten into and draining. Urgent action is required to save these. Photograph 47. [TR]
68. 43563 57757 Very large area of intact M17a blanket mire with much *Sphagnum papillosum* and *Sphagnum capillifolium* cover. [TR]

69. 42631 58827 Variably eroding blanket bog with some big areas of bare peat. Very variable and several activity classes present so not mapped individually. The Loch is currently intact but erosion is getting very close and it is threatened. [TR]

Collafirth

70. 45763 67337 Heavily grazed/topiarised *Calluna vulgaris* towards margins of dry heath habitat. Areas of *Juncus squarrosus* grassland (U6) are also frequent through this area between typical dry heath and blanket bog. [KP]
71. 45715 67430 Good condition BB over slopes which appears most similar to the M19 NVC community, although transitional towards M17a where there is an increase in cover of *Sphagnum papillosum*. In general *Eriophorum vaginatum* tussocks are fairly conspicuous, although scattered, and occur with a mixture of *Sphagnum capillifolium*, *Plagiothecium undulatum*, *Rhytidiadelphus loreus*, *Calluna vulgaris* and *Trichophorum cespitosum*. Where the gradient increases acid grassland (U6) replaces blanket bog. [KP]
72. 44548 67612 Vast area of M17b/M3 with varying degrees of erosion, from more or less intact to localised haggling and associated bare peat. Photographs 20, 21 & 22. [KP]
73. 44014 66632 Low lying area of wetter ground supporting a mixture of abundant *Sphagnum denticulatum* and frequent *Sphagnum cuspidatum*. Higher plants are generally sparser and predominantly a mixture of rushes (*Juncus bulbosus*, *Juncus squarrosus*, *Juncus effusus*). In NVC terms this vegetation most closely relates to M6 (acid flush). Photograph 23. [KP]
74. 44756 66731 Extensive erosion along ridge to East-North-East of here with bare peat and deep haggling. [KP]
75. 45395 66457 Dramatic grazing effect along fence-line shown by photograph 24. [KP]
76. 45396 67790 Area of blanket bog with a good cover of *Sphagnum capillifolium/papillosum/cuspidatum* and frequent *Calluna vulgaris*, *Juncus squarrosus*, *Empetrum nigrum*, *Rhytidiadelphus loreus* and *Aulacomnium palustre*. The peat depth varies around 0.5m. Surrounding bog is varied M17a/c/M19a and generally intact with little/no erosion. [KP]
77. 44814 67691 Area of bare peat which has been eroded away in parts to bare gravel which is becoming vegetated by *Juncus squarrosus*. Haggling and associated erosion are more noticeable over this watershed although there is some re-vegetation in parts. [KP]
78. 41613 66147 Scattered base-rich flushes (M10) over this slope. *Carex demissa*, *Carex panicea*, *Sphagnum denticulatum*, *Pinguicula vulgaris*, *Potamogeton polygonifolius* and *Eriophorum angustifolium* are all frequent. [KP]
79. 41877 66170 Rocky M10 flush with frequent *Carex demissa*, *Juncus bulbosus*, *Drepanocladus* sp., *Scorpidium scorpioides*, *Campylium stellatum*, *Carex panicea* and *Schoenus nigricans*. Also noted through this habitat at low frequency are *Bryum pseudotriquetrum*, *Thalictrum alpinum* and *Pinguicula vulgaris*. Photograph 25. [KP]

80. 42523 66085 Stream cuts through wider area of intact blanket bog where there is little or no erosion to the peat. *Sphagnum papillosum* is frequent (M17a) through wetter areas where the water table is closest to the surface, becoming replaced by *Racomitrium lanuginosum* in slightly drier situations. Vegetation in general is made up of a fairly even mixture of *Calluna vulgaris*, *Eriophorum vaginatum*, *Eriophorum angustifolium* and *Trichophorum cespitosum* with scattered *Cladonia uncialis*, *Pleurozia purpurea* and *Cladonia portentosa*. [KP]
81. 43166 66110 Sequence of species poor bog pools (M1) with abundant aquatic *Sphagnum cuspidatum* and marginal *Sphagnum denticulatum*. [KP]
82. 43743 66915 Localised severe peat erosion/hagging to 1m. Rate of erosion is greater than re-vegetation of bare peat. Sparse *Eriophorum angustifolium* does occur through some areas of eroded peat. [KP]
83. 43660 67015 Peat mound. [KP]
84. 43409 66915 Expanse of eroding bare peat and exposed gravel over hilltop. *Calluna vulgaris* and *Juncus squarrosus* are re-vegetating some areas of shallow peat and mineral soil. [KP]
85. 41578 66321 *Schoenus nigricans* dominated stony flush (M10) with *Carex demissa*, *Narthecium ossifragum*, *Carex panicea*, *Trichophorum cespitosum* and *Scorpidium scorpioides*. [KP]
86. 41563 66842 Acid grassland occurs in a mosaic with blanket bog (as a result of historic grazing pressures). Where blanket bog remains it is rich in graminoids and in particular *Eriophorum vaginatum* with occasional *Juncus squarrosus*, *Eriophorum angustifolium*, *Rhytidiadelphus loreus*, *Hylocomium splendens* and *Calluna vulgaris*. The *Sphagnum* carpet remains more or less intact with frequent *Sphagnum capillifolium*, *S. papillosum* and *S. palustre*. [KP]
87. 43938 67402 Bog pools (M1) with abundant aquatic *Sphagnum denticulatum* and *Sphagnum cuspidatum* interspersed with *Sphagnum* rich *Juncus squarrosus* grassland (U6a). These pools occur within a wider area of intact M17a/b/M19a where *Sphagnum* spp. are abundant through the wetter M17a community. [KP]
88. 44249 67657 Degree of hagging varies greatly over this undulating terrain with some area of bog completely intact and others with frequent peat hags to 1m. [KP]
89. 43343 68028 Flat area of blanket bog with frequent *Sphagnum papillosum*, *S. capillifolium*, *S. cuspidatum* and *S. palustre* through areas of M17a, which become more or less replaced by *Racomitrium lanuginosum* over slightly higher ground. Erosion is minimal with hollows all densely re-vegetated by *Sphagnum* and *Eriophorum angustifolium*. Photographs 26 & 27. [KP]
90. 42971 67999 Despite the steep gradient here, a good proportion of vegetation is over deep (>0.5m) peat and similar to a grassy M19 with frequent *Juncus squarrosus* and *Nardus stricta*. Cover of *Sphagnum* spp. is still significant through this habitat. This

bog habitat occurs in a mosaic with acid grassland and wet heath (particularly over fence to North East). [KP]

91. 42779 68159 Wet heath over shallow peat with abundant *Calluna vulgaris*, *Juncus squarrosus* and *Sphagnum capillifolium*. At lower cover are occasional *Rhytidiadelphus loreus*, *Sphagnum cuspidatum*, *Aulacomnium palustre*, *Eriophorum vaginatum* and *Empetrum nigrum*. This habitat is short-grazed by sheep. [KP]
92. 42007 67044 *Schoenus nigricans* dominated stony flush with abundant *Carex demissa* and occasional *Campylium stellatum*. There are similar flushes scattered over these slopes. [KP]
93. 44505 69106 Sequence of pools (M1) forming hummock/hollow structure in association with M17b & a. Pools are vegetated by *Sphagnum cuspidatum* and *Sphagnum denticulatum* with *Eriophorum angustifolium*. There is also scattered *Potamogeton polygonifolius*. Photographs 28 & 29. [KP]
94. 45267 68714 Sequence of pools/small lochans surrounded by good condition blanket bog (M17a) with a high cover of *Sphagnum papillosum* and minimal erosion. *Eriophorum angustifolium* is colonising bare peat where it exists and a small area of past erosion has become re-vegetated by *Calluna vulgaris* and *Juncus squarrosus*. Photographs 30 & 31. [KP]
95. 43803 63848 Hummock-hollow topography with the topes drying out and hummocks of *Racomitrium lanuginosum*. Also *Cladonia portentosa*, *Eriophorum angustifolium*, *Eriophorum vaginatum*, *Calluna vulgaris* and wetter hollows with very poor vegetation, little *Sphagnum* and trampled by sheep. There are also patches of M17a with more extensive *Sphagnum papillosum*, *Sphagnum capillifolium* and *Pleurozia purpurea*. *Sphagnum magellanicum* is also present. This is A5 but declining and on the verge of being classed as A4. [TR]
96. 44242 64664 *Juncus squarrosus* forming mounds as if it has colonised an old small block of remnant peat within eroded blanket bog. Photograph 34. [TR]
97. 44086 65393 Eroding blanket bog with hags to 1.5m high. The blanket bog is mainly M17b composed of *Racomitrium lanuginosum*, *Calluna vulgaris*, *Hypnum sp*, *Cladonia portentosa*). Very heavily grazed with much bare peat and trampling. Other communities present are U6a *Juncus squarrosus* and *Sphagnum* grassland/mire also with *Sphagnum cuspidatum*, *Scapania gracilis* and *Calluna vulgaris*. Photograph 35. [TR]
98. 44189 65976 Area of flat intact blanket bog is M17a with extensive *Sphagnum papillosum* carpets along with *Sphagnum capillifolium* and *Calluna vulgaris*, *Eriophorum angustifolium* and *Eriophorum vaginatum*. There is an occasional M1 hollow/pool with *Sphagnum cuspidatum* and *Sphagnum denticulatum*. Photograph 36 and 37. [TR]
99. 43321 65184 Looking south – continuous blanket bog classed as A5. M17b has much *Racomitrium lanuginosum* with *Cladonia portentosa*, *Calluna vulgaris*, *Eriophorum angustifolium*, *Eriophorum vaginatum* and some *Trichophorum*

cespitosum. There is also some *Sphagnum capillifolium* and patchy *Erica cinerea* amongst the *Calluna vulgaris*. There is an occasional small patch of M3 bare peat and U6 *Juncus squarrosus* acid grassland with *Nardus stricta* and *Calluna vulgaris*. [TR]

100. 43475 64258 Looking east down onto a patch of A3 eroding blanket bog with intact A5 beyond in the background and A4-5 in the foreground. [TR]
101. 42398 63641 Flat area of blanket bog intact (A5) consisting of mainly M17a and M17b with M1 hollows. There are areas with more erosion (A4) within it and these have bare peat/M3 at around 5-10% coverage. The M17 has *Calluna vulgaris*, *Eriophorum vaginatum*, *Eriophorum angustifolium*, *Sphagnum capillifolium*, *Racomitrium lanuginosum*, *Hypnum jutlandicum*, *Cladonia portentosa* and *Sphagnum papillosum*. The M1 hollows have *Sphagnum cuspidatum* but they are very poor and quite bare being trampled badly by sheep. [TR]
102. 42758 63665 Area of blanket bog classed as A4 and A3. There is very frequent erosion and hags with areas of bare peat up to 1m wide every 5m. The area is also heavily grazed by sheep. [TR]
103. 42849 63440 Very wet area on broad hollow with a gull colony. Consists of much standing shallow water and M1/M17a vegetation. Photograph 38. [TR]
104. 43203 63584 Steeper slope are very much like dry heath but on deep and firm peat. *Calluna vulgaris* is abundant along with *Racomitrium lanuginosum*, *Cladonia portentosa*, *Empetrum nigrum*, *Eriophorum angustifolium*, *Eriophorum vaginatum*, *Hylocomium splendens* and patches of *Sphagnum capillifolium*. [TR]
105. 42184 64289 Large expanse of intact blanket bog with very hags and erosion. Some areas within this have more frequent hags though. The vegetation is mainly M17a and M17b with frequent large cushion and carpets of *Sphagnum capillifolium*, *Racomitrium lanuginosum* and *Cladonia portentosa*. *Sphagnum papillosum* and *Pleurozia purpurea* are more frequent on wetter ground and there are also hollows where *Sphagnum cuspidatum* predominates. Photograph 39 [TR]
106. 42196 63699 5 photos showing effect of grazing levels on blanket bog surface vegetation on either side of a fence. LH side is more heavily trampled than RH side. LH has more bare peat and no *Sphagnum cuspidatum* in hollows whereas RH side has mainly vegetated hollows with much *Sphagnum cuspidatum*. Photograph 40, 41, 42. [TR]
107. 44630 63791 M10 flush with much *Scorpidium scorpioides*, *Carex viridula* ssp. *oedocarpa*, *Juncus bulbosus*, *Blindia acuta*, *Campylium stellatum* and *Ctenidium molluscum*. There are many such flushes along this hillside, some with much *Schoenus nigricans*. [TR]
108. 44890 64889 Large summit area of very eroded blanket bog (A2 and A1). There is widespread bare peat along with shallow peat U6 acid grassland and heath. Main species are *Juncus squarrosus*, *Calluna vulgaris*, *Rhytidiadelphus loreus*, *Hypnum*

sp., *Dicranum scoparium*, and *Barbilophozia sp.* *Juncus squarrosus* colonises old bits of broken off peat and forms tight mono-dominant hummocks. Photograph 43. [TR]

109. 44722 65817 *Juncus squarrosus* appears to be a prime builder of vegetation blocking up eroded peat channels within area of eroding blanket bog (A3) M17 at about 60% U6/M3 around 40%. Photograph 44. [TR]
110. 44882 64109 Big area has much revegetation and active peat build-up in hollows which have much *Sphagnum*. Again *Juncus squarrosus* appears to play an important role in forming a peat surface resistant to erosion. [TR]
111. 45427 65912 Tronister Club – widespread erosion of blanket bog with much bare peat (M3) and U6 acid grassland, bare substrate and heath. There are remnant small isolated blocks of blanket peat (M17). Photograph 45. [TR]
112. 45140 65521 A3 area of remaining blanket bog too shallow and bare peat vegetation is around 50:50 Photograph 46. [TR]
113. 44883 64086 Area in fenced part seems to be recovering – eroded blanket bog with extensive shallow peat but now active build up with much *Sphagnum capillifolium*, *Calluna vulgaris*, *Juncus squarrosus*, *Sphagnum papillosum*, *Cladonia portentosa*, *Empetrum nigrum*. *Juncus squarrosus* being overgrown by *Sphagnum*. There is also an occasional M1 pool with *Sphagnum cuspidatum*. Very little actual bare peat and much U6/M17a/M17b/M1. [TR]

Delting

114. 38819 66577 Wide expanse of blanket bog which varies greatly in condition between more or less intact bog with wet hollows (M17a/b/M1) through to deeply hagged M17b/M3. Past eroded peat tends to be revegetating with wet grassy heath (M15d/U6) vegetation. Bare peat is frequent but not extensive. [KP]
115. 37247 66567 Area of peat cuttings to North-east of here. Over this area blanket bog has been modified by this activity with some areas of bare peat and other parts revegetated by acid grassland. [KP]
116. 37682 65886 Fly tipping of agricultural (manure and straw) and commercial/domestic rubbish (exhausts, oil cans, chairs etc) over this area. [KP]
117. 39119 65433 Continuous intact blanket bog mainly. Flats and depressions have a higher cover of *Sphagnum papillosum* along with *Sphagnum capillifolium*, *Cladonia portentosa*, *Eriophorum angustifolium*, *Eriophorum vaginatum*, *Calluna vulgaris* and *Erica tetralix*. Drier hummocks and better drained peat surfaces have less *Sphagnum*, more *Racomitrium lanuginosum* and *Cladonia portentosa* and also *Calluna vulgaris*, *Empetrum nigrum*, *Eriophorum vaginatum*, *Cladonia arbuscula* and *Cladonia uncialis*. Pools are scarce and have a little *Sphagnum cuspidatum* at edges with little else. Photo 48. [TR]
118. 39119 65414 Pool with standing water which is unvegetated apart from a little *Carex rostrata* and *Sphagnum denticulatum* at the edges [TR]
119. 39767 65666 Mainly shallow peat with grassy wet heath and patches of blanket bog. *Trichophorum cespitosum*, *Racomitrium lanuginosum*, *Calluna vulgaris*, *Cladonia portentosa*, *Cladonia uncialis*, *Nardus stricta*, *Huperzia selago* and *Carex panicea*. Photo 49. [TR]
120. 39608 66836 Around Souther Hill there is eroded blanket bog supporting wet heath and acid grassland. Much of the shallow peat though has very good covers of *Sphagnum papillosum* and *Sphagnum capillifolium* with *Eriophorum angustifolium*, *Eriophorum vaginatum*, *Calluna vulgaris*, *Empetrum nigrum* and *Racomitrium lanuginosum* (U6a->M17a). It has therefore been upgraded in activity ranking from 3 to 4 to reflect this. [TR]
121. 37150 69138 Narrow gorge with steep rocky sides supporting a mosaic of H10a/H10c/U6 with occasional tall herb ledges (U16): *Luzula sylvatica*, *Lonicera periclymenum*, *Solidago virgaurea*, *Thymus polytrichus*, *Jasione montana*, *Erica cinerea*, *Blechnum spicant*, *Hypericum pulchrum*, *Galium verum*, *Prunella vulgaris*, *Succisa pratensis*, *Angelica sylvestris*, *Festuca vivipara*, *Lotus corniculatus*. There are also small fragments of CG10a immediately below ledges. [KP]
122. 37328 68276 Hummock/hollow bog structure over ridge which is in relatively good condition. The drier M17b occurs of the hummocks with M1/M3 hollows. [KP]

123. 37706 68779 Small area adjacent to eroding hagg which is heavily vegetated by *Juncus squarrosus* (U6) with associated shallower substrate. There are similar small areas over this hill. To south-east there are more extensive areas of thin peat vegetated by *Racomitrium lanuginosum*/*Calluna vulgaris* heath (H14a) with occasional *Empetrum nigrum*, *Erica cinerea* and *Cladonia* spp. interspersed with fragments of *Juncus squarrosus* dominated vegetation (U6). [KP]
124. 37755 69351 Localised hagg over ridge of mire. Individual hags are a maximum of 1m high with limited associated peat erosion. [KP]
125. 37816 68446 Area of wetter, lower lying blanket bog with fragments of M17a and frequent M1 pools. Hagg and erosion localised and minimal. [KP]
126. 38025 67101 Areas of H14/U6 over summit with *Racomitrium lanuginosum* and *Calluna vulgaris* co-dominating the short, wind-clipped vegetation with scattered *Nardus Stricta* and locally abundant *Juncus squarrosus*. Over these areas peat depth is less than 0.5m and in parts there is bare, exposed gravelly substrate. Where the peat thickens vegetation is mainly of the M17b blanket bog community with some M19a. [KP]
127. 38654 67069 Eroding hagg system at edge of extensive area of hags to the south and south-east. [KP]
128. 39719 67227 More extensive area of *Juncus squarrosus* dominated vegetation (U6) with a frequently broken peat surface leaving areas of bare gravel. Pockets of deeper peat support M19a/M17b. [KP]
129. 39746 67574 Small areas of *Juncus squarrosus* dominated vegetation with associated thin substrate within wider area of deep peat. There are also localised eroding peat hags over this summit area which are mainly 1m high although increasing to 1.5m occasionally. [KP]
130. 40838 68577 Area of salt-marsh composed mainly of mono-dominant stands of *Plantago maritima* with occasional *Triglochin maritima*, *Glaux maritima* and *Armeria maritima*. There are also smaller fragments of *Glaux maritima*, *Juncus gerardii*, *Armeria maritima*, *Triglochin maritima*, *Plantago maritima* and *Festuca rubra* forming a typically taller sward. [KP]
131. 40947 68433 Stand of *Phragmites australis* at head of salt marsh adjacent to small stream. Associated species include *Juncus gerardii*, *Glaux maritima* and *Triglochin maritima*. [KP]
132. 42126 71663 Occasional scattered small peat hags over Hill of Neegarh which are 1-1.5m high. Photograph 95. [KP]
133. 42468 71337 Eroding peat hagg approximately 1-1.5m high. At base of hagg is exposed gravelly substrate and small fragments of *Juncus squarrosus* dominated vegetation (U6c). There are more hags to immediate west of here. Photograph 94. [KP]

134. 42505 71200 Summit ridge is a mixture of *Calluna vulgaris*, *Nardus Stricta*, *Racomitrium lanuginosum* and *Juncus squarrosus* with varying levels of dominance. Substrate is quite stony and vegetation most similar in NVC terms to U6c/H14a. [KP]

135. 42993 72952 Peat cuttings through area of marginal blanket bog adjacent to minor road. Mire is locally modified with associated surface drying as a result. Vegetation superficially resembles dry heath in parts. [KP]

136. 43197 71848 Small area of vegetation over shallow substrate. Vegetation most closely resembles a mosaic of heathy *Juncus squarrosus* grassland (U6c) and *Calluna vulgaris*-*Racomitrium lanuginosum* heath (H14a) and is frequently transitional between the two. Vegetation tends to be made up of a mixture of *Calluna vulgaris*, *Nardus Stricta*, *Racomitrium lanuginosum* and *Juncus squarrosus* with occasional *Carex bigelowii*. Dominance between these species varies. [KP]

137. 43309 72134 Small fragments of *Juncus squarrosus* dominate vegetation (U6c) with shallow substrate here and to the north-east over this ridge. [KP]

138. 43433 71326 Short grazed flush (*Carex flacca*, *Succisa pratensis*, *Plantago maritima*, *Prunella vulgaris*, *Thymus polytrichus*, *Selaginella selaginoides*, *Danthonia decumbens*, *Potentilla erecta*, *Thalictrum alpinum*, *Calluna vulgaris*, *Nardus Stricta*, *Festuca ovina*, *Bellis perennis*, *Rhytidiadelphus squarrosus*, *Pseudoscleropodium purum*). To south-west of here is *Schoenus nigricans* flush with *Carex echinata*, *Eriophorum angustifolium*, *Trichophorum cespitosum*, *Hylocomium splendens*, *Plantago lanceolata*, *Plantago maritima* and *Calliargon cuspidatum*. [KP]

139. 42043 70357 These slopes look like dry heath being *Calluna vulgaris*-dominated but there is plentiful *Erica tetralix* and frequent patches of *Sphagnum capillifolium*, *Sphagnum papillosum* with sparse *Eriophorum angustifolium* and has therefore been classed as M15b. Drier parts have less *Erica tetralix* and *Sphagnum* and there is then an increase in *Erica cinerea* along with *Hypnum* sp., *Hylocomium splendens*, *Potentilla erecta* and *Rhytidiadelphus loreus* – this has been classed as H10a. *Juncus squarrosus* is frequent throughout and *Calluna vulgaris* is grazed to a height of about 15cm. [TR]

140. 40591 69737 Large parts of the broad ridge below the summit of the Hill of Dale have shallow peat and M15c (see quadrat). *Vaccinium vitis-idaea* is also present here and there are areas of *Juncus squarrosus* and *Nardus stricta* acid grassland U6/U5. There are a few intact peat blocks but these are relatively small with most of the deeper peat over the brow of the hill to the south-east. [TR]

141. 40431 69550 A large area of deep waterlogged peat with an abundance of *Sphagnum papillosum* and *Sphagnum capillifolium* (M17a) along with wet hollows having *Sphagnum cuspidatum* and *Sphagnum denticulatum* (M1). Avoid developing here. Also highest part of Hill of Dale has fairly intact blanket mire. [TR]

142. 40569 69974 An area of relatively intact peat to 3m deep as seen at various hagg locations. The blanket bog is in good condition with typical species composition for M17b, M17a, M19a and M1 where they occur. Avoid developing. [TR]
143. 41645 71524 More erosion here with hags to 3m high and a bare peat network to 3m wide. There are some very wet areas though, up to 200m across, with M17a and M1 in depressions and these should be avoided. [TR]
144. 41874 70746 An area of largely shallow peats (M15c/U6 – *Juncus squarrosus*, *Calluna vulgaris*, *Erica cinerea*, *Cladonia portentosa*, *Cladonia uncialis*, *Racomitrium lanuginosum*, *Empetrum nigrum*) with few blocks of deeper peat with some M17a-c and M1. There are also bare stony patches. [TR]
145. 38845 69656 Small hill has eroded blanket mire with hags to 2m and a high cover of *Juncus squarrosus* acid grassland (U6 – *Juncus squarrosus*, *Nardus stricta*, *Polytrichum commune*, *Calluna vulgaris*, *Racomitrium lanuginosum*, patchy *Sphagnum palustre* and *Sphagnum capillifolium*) and scattered deeper peat blocks. [TR]
146. 40062 69042 Here the mire is quite flat and wet with a high cover of *Sphagnum capillifolium* along with *Trichophorum cespitosum*, *Calluna vulgaris*, *Empetrum nigrum*, *Juncus squarrosus*, *Cladonia portentosa*. There are shallow pools with *Sphagnum cuspidatum* and *Sphagnum denticulatum*. There is small amount of shallower peat and bare ground around the summit of Bonnet Knowe. [TR]
147. 39473 68998 This long ridge has blanket mire variably hagged to 3m deep. It has M17b on deep intact peat blocks and a network of M3 bare peat and *Eriophorum angustifolium* to 10m across and there are also wetter areas of mire. There are patches of U6/U5 acid grassland to 50m across which are the preferable areas for development and all deep peat should be avoided. [TR]
148. 39159 68971 Blanket mire here more intact with very few hags. There are areas of wetter peat with carpets of *Sphagnum papillosum* and *Sphagnum capillifolium* in good condition. [TR]
149. 38885 68762 Dynascord Hill has many large areas of bare stony ground and shallow peat with acid grassland (U6) and is suitable for development although the remaining intact peat blocks should be avoided, especially where there is some active formation. [TR]
150. 38472 67995 Summit of Riding Hill has eroded blanket mire consisting of deep blocks of peat amid shallow peats (M15c – *Calluna vulgaris*, *Racomitrium lanuginosum*, *Juncus squarrosus*, *Erica cinerea*, *Empetrum nigrum*, *Cladonia portentosa*, *Hypnum* sp. and bare peat and stony ground. Suitable for turbines but avoid intact peats. [TR]
151. 39381 68177 Button Hills – there is a very large area of intact blanket mire which is generally very wet with abundant *Sphagnum papillosum* in carpets with *Sphagnum capillifolium* and *Cladonia portentosa*, *Calluna vulgaris*, *Empetrum nigrum*,

Eriophorum vaginatum, *Eriophorum angustifolium*, *Trichophorum cespitosum* and *Juncus squarrosus*. [TR]

Kergord

152. 35509 59676 Badly eroded ridge of former blanket peat which has frequently been eroded down to the gravely substrate. [KP]
153. 35597 55048 *Calluna vulgaris* heavily browsed and exhibiting topiary growth form. [KP]
154. 36152 54732 Small area of eroding peat hags (1m high) with some *Eriophorum angustifolium* re-colonising bare peat along with more established *Juncus squarrosus* dominated vegetation (U6c). To north of here M17b/M3 vegetation is typical of much of the survey area with *Racomitrium lanuginosum* dominated vegetation interspersed with peaty hollows and runnels. [KP]
155. 36292 59693 Large area of eroding bare peat. Some parts have re-vegetated with grassland species and *Juncus squarrosus* with *Eriophorum angustifolium* colonising areas with no other vegetation. Photograph 78. Similar, smaller scale areas occur to the east of here, nearer the road. Areas of surrounding M17b are fairly typical of the survey area as a whole with occasional peaty pools/hollows (M1/M3) and some degree of erosion throughout, varying from small scale to deep actively eroding hags where there is exposed gravely substrate. [KP]
156. 36527 56144 This extensive area of blanket bog is partially modified and moderately grazed. Impact on the surface, in the form of bare peat, is frequent from trampling (sheep). There is also a population of mountain hares across this area. Vegetation is mainly of the M17b sub-community with patchy peaty hollows (M3). Photographs 71 & 72. [KP]
157. 36739 55464 *Carex*-rich flush with abundant *Carex panicea* and *Carex viridula* ssp. *oedocarpa*, *Danthonia decumbens*, *Juncus bulbosus*, *Thalictrum alpinum*, *Calluna vulgaris*, *Potentilla erecta*, *Nardus Stricta* and *Carex echinata*. Bryophytes are more or less absent except for some localised *Sphagnum denticulatum*. Flush is approximately 10m wide and linear down hillside. Further up-slope vegetation becomes more *Nardus Stricta* dominated and most similar to U5c in terms of NVC. Photograph 73. [KP]
158. 36842 56375 Soligenous flush (M6bii) with *Trichophorum cespitosum*, *Carex echinata*, *Juncus bulbosus*, *Nardus Stricta*, *Calluna vulgaris*, *Sphagnum denticulatum*, *Potentilla erecta* and *Eriophorum angustifolium*. Similar flushes are frequent over this area. Immediately adjacent mire is quite grassy with frequent *Nardus Stricta* and *Sphagnum palustre* as well as occasional *Sphagnum papillosum*. [KP]
159. 37010 57267 Expanse of blanket bog. Some localised poaching and *Sphagnum* disturbance with increased *Racomitrium lanuginosum*. Areas of M19a/M17b with

smaller fragments of the wetter M17a and peaty M3 hollows. Moderate grazing by sheep over the area has led to some areas of vegetation more closely resembling wet heath although still over deep peat. [KP]

160. 37237 55479 Haggings over North Mid Hill. Vegetation is mainly of the M17b blanket bog community with scattered peaty hollows/haggs (M3). Photographs 74 (to north) & 75 (to south). [KP]
161. 37385 57215 Immediately adjacent to stream are fragments of acid grassland (U4b) which are preferentially grazed. Adjacent areas of dry heath exhibit carpet/topiary growth forms and have an obvious browse line. This dry heath is tussocky *Calluna vulgaris* with grassy pathways between. Photograph 64. [KP]
162. 37438 57223 M30 soakway with *Potamogeton polygonifolius*, *Sphagnum cuspidatum* and *Ranunculus flammula*. This low-lying ground also supports frequent soligenous *Carex* spp. flushes (M6bii) with frequent *Nardus Stricta*, *Sphagnum denticulatum* and *Carex panicea*. *Danthonia decumbens* becomes frequent at flush margins where vegetation is transitional to acid grassland. [KP]
163. 37500 54500 Scattered *Rhynchospora alba* in transitional zone between M17b and M1. [KP]
164. 37698 55573 Large, linear bog-pool (M1) which is mainly deep standing water with abundant aquatic *Sphagnum cuspidatum*. Marginal vegetation includes a mixture of *Sphagnum cuspidatum*, *S. palustre*, *S. denticulatum*, *Drosera rotundifolia*, *Eriophorum angustifolium*, *Empetrum nigrum*, *Pinguicula vulgaris*, *Trichophorum cespitosum* and *Erica tetralix*. Photograph 76. [KP]
165. 37698 53469 Large area of frequent peat haggs (1-2m) and associated erosion which is frequently severe. Photograph 90 taken from 37509 53622 looking east. [KP]
166. 37805 57121 Localised, small-scale peat erosion and haggings with evidence of trampling by sheep. Photograph 65. [KP]
167. 37950 56900 Large stand of emergent *Equisetum fluviatile* at south end of Loch of Lunklet. Photograph 66. [KP]
168. 38153 57025 Partially modified vegetation over hillside. Where the slope is least there are pockets of *Calluna vulgaris*/*Eriophorum vaginatum* blanket bog (M19a) similar to vegetation seen over large expanses of the survey area. Where the gradient increases wet heath (M15) vegetation is quite grassy and often transitional to acid grassland where there is a higher cover of graminoids. Locally there are also stands of flushed *Nardus Stricta* grassland and *Juncus squarrosus* dominated vegetation (U6). There are small eroding peat haggs (mainly in grassier areas) and evidence of a history of high grazing pressure. [KP]

169. 38503 53581 Exposed bedrock over summit interspersed with *Juncus squarrosus* dominated vegetation (U6c). Any turbines proposed over this higher ground should be micro-sited on such vegetation/exposed rock, avoiding deeper peats. [KP]
170. 38583 54757 Large sequence of M1 bog-pools, over hilltop area of blanket bog, with some water movement between pools. Vegetation is mainly a mixture of *Sphagnum cuspidatum*, *S. denticulatum*, *Eriophorum angustifolium* and *E. vaginatum*. Much of the wetter M17a sub-community found over this hilltop is in good condition with semi-continuous *Sphagnum papillosum* and spongy surface. Eroding peat hags are frequent but limited in extent and levels of peat loss. Peat mainly 1-2m deep. [KP]
171. 38589 57502 Carpet of *Sphagnum papillosum* frequently remains intact over this area of watershed blanket bog. There is some tracking and trampling by sheep. Here peat surface has become partially dried vegetation is more similar to M17b sub-community with frequent *Rhytidiadelphus loreus*, *Sphagnum capillifolium* and *Racomitrium lanuginosum*. M19a is generally less frequent here than to the west. [KP]
172. 38620 54667 Sequence of M1 pools over summit/ridge. Pools are mainly intact with no trampled margins and generally surrounded by wetter vegetation (M17a) than to the south of here. M17b and M19a also occur through this polygon on slightly higher, and correspondingly drier ground. Hags are frequent away from the pools with erosion locally down to gravely bedrock in parts. Photograph 85. [KP]
173. 38687 55783 Stream flowing through centre of blanket bog is vegetated by *Carex rostrata* with marginal *Sphagnum denticulatum*. This area of wet valley mire (M17a) has a high cover of *Sphagnum palustre* with locally abundant *Sphagnum papillosum*. *Sphagnum* is completely absent in parts and there is also patchy *Molinia caerulea*. [KP]
174. 38766 57580 Small-scale peat hags with some re-colonising *Eriophorum angustifolium*, although mainly bare eroding peat. Photograph 67. [KP]
175. 38819 61932 Vehicle tracking through peat surface with associated erosion. Locally the mire is drying/modified to *Juncus squarrosus* dominated vegetation (U6) with some areas of bare gravel. [KP]
176. 38639 63634 Badly poached area of blanket bog (M17b, M3, M17a, M1). Photographs 79 & 80. Within peaty hollows (M3) there is some *Menyanthes trifoliata* and *Potamogeton polygonifolius* in addition to the usual frequency of *Eriophorum angustifolium*. Adjacent drier ground is mainly *Juncus squarrosus* dominated modified bog (U6). [KP]
177. 38848 63415 Frequent eroding peat hags (M3) over hillside of modified bog which appears mainly grassy although frequently over deep peat. Areas of eroding peat are greater than those being re-colonised by *Eriophorum angustifolium*. [KP]
178. 38877 56571 Large acid flush (M6bii) which is dominated by *Carex echinata* over *Sphagnum denticulatum*. Associated species include *Sphagnum palustre*, *Viola*

palustris, *Festuca vivipara*, *Potentilla erecta*, *Polytrichum commune*, *Sphagnum cuspidatum*, *Agrostis canina* and locally abundant *Eriophorum angustifolium*. Within this stand there are a few open pools and some localised *Juncus effusus* (M6cii). Area of mire to the east of here has quite extensive haggings with some exposed bedrock in parts. Areas of bog which are not presently eroding tend to be in good condition. [KP]

179. 38888 62960 Expanse of bare rock/gravel over the summit of Sneegie with scattered hags at edge. Gavel is being re-colonised by *Nardus Stricta* and *Deschampsia flexuosa* where there is some soil accumulation. Photograph 81. [KP]
180. 38919 53588 Some of the *Nardus Stricta* dominated vegetation (U5) over these slopes is quite wet and derived from former, modified mire. *Nardus Stricta* dominates with *Festuca vivipara*, *Narthecium ossifragum*, *Potentilla erecta*, *Juncus squarrosus*, *Rhytidiadelphus loreus*, *Hylocomium splendens*, *Thuidium tamariscinum*, *Polygala serpyllifolia*, *Rhytidiadelphus squarrosus*, *Sphagnum palustre*, *Anthoxanthum odoratum*, *Viola palustris* and *Eriophorum angustifolium*. [KP]
181. 38932 57267 Area of eroding bare peat greater than 100m² immediately around Scalla Field trig cairn. No re-colonisation evident. Over this summit there are localised areas of shallower peat with a high cover of *Juncus squarrosus* (U6c). Blanket bog is generally in good condition with a semi-constant *Sphagnum* carpet through areas of wetter, M17a, mire. Some pools are vegetated by *Sphagnum cuspidatum* and *Sphagnum denticulatum* (M1) whilst others have become eroded and mainly bare peat with scattered *Eriophorum angustifolium*. [KP]
182. 38941 57451 Flushed grassy slopes supporting abundant *Nardus Stricta* with *Sphagnum palustre*, *S. capillifolium*, *S. papillosum*, *Juncus squarrosus*, *J. acutiflorus*, *Eriophorum angustifolium*, *Carex panicea*, *C. echinata*, *Thalictrum alpinum*, *Empetrum nigrum* and *Calluna vulgaris*. Vegetation most closely resembles a mosaic or transition between U5c/U6c with a possible transition towards M10 in parts where there is a little *Pinguicula vulgaris*. [KP]
183. 38959 54727 Area of erosion with small associated peat hags (<1m). There is some exposed rock and gravelly substrate as well as fragments of *Juncus squarrosus* dominated vegetation (U6). Most surrounding mire vegetation is mainly good condition M19a/M17b. Photographs 86 – 89. [KP]
184. 38965 57396 Steep craggy slopes/ledges supporting fragments of *Luzula sylvatica* dominated tall-herb vegetation (U16). Associates include *Polypodium vulgare*, *Galium saxatile*, *Rumex acetosa*, *Rhytidiadelphus loreus* and *Polytrichum commune*. Non-documented for this community is frequent *Salix herbacea*. Photograph 68. [KP]
185. 38993 55597 Steep rocky outcrop supporting grassy dry heath (H10c). *Salix herbacea* grows with *Nardus Stricta*, *Carex bigelowii*, *Potentilla erecta*, *Huperzia selago*, *Galium saxatile*, *Racomitrium lanuginosum*, *Vaccinium myrtillus* and *Hymenophyllum wilsonii*. *Salix herbacea* and *Hymenophyllum wilsonii* are both frequent over these rocks. Photograph 77. [KP]

186. 39023 60930 Eroded ridge of M15c vegetation dominated by *Racomitrium lanuginosum*, *Erica cinerea*, *Calluna vulgaris* and *Nardus Stricta* with occasional *Trichophorum cespitosum* and much bare gravel/rock. Locally this vegetation becomes transitional to M10 where there is some soligenous influence. [KP]
187. 39125 54713 Peat hags at break of slope, approximately 1m high with limited re-vegetation by *Eriophorum angustifolium*. [KP]
188. 39215 55587 Stony flush with *Juncus articulatus*, *Carex viridula* ssp. *oedocarpa*, *Triglochin palustre*, *Potamogeton polygonifolius*, *Campylium stellatum*, *Scorpidium scorpioides*, *Juncus bulbosus*, *Narthecium ossifragum*, *Carex panicea*, *Eriophorum angustifolium* and *Carex dioica*. Photographs 91 & 92. [KP]
189. 39268 55296 Area of modified bog with various communities forming a fine-grained mosaic. Small fragments of fairly typical M19a are interspersed with vegetation transitional towards acid grassland. Stony flushes are occasional and similar to photographs 91 & 92. [KP]
190. 39289 63449 Frequent wax cap fungi along slopes of semi-improved acid grassland above ruined buildings. [KP]
191. 39368 57311 Eroding peat hags to 1m. Photographs 69 & 70. [KP]
192. 39467 63201 M10 basic flushes along steeper ground supporting a mixture of *Carex viridula* ssp. *oedocarpa*, *C. panicea*, *C. echinata*, *C. pulicaris*, *Sphagnum denticulatum*, *S. palustre*, *Thalictrum alpinum*, *Galium saxatile*, *Nardus Stricta*, *Potentilla erecta*, *Taraxacum* agg., *Juncus squarrosus*, *Breutelia chrysocoma*, *Plantago lanceolata*, *Cirsium palustre*, *Campylium stellatum*, *Hylocomium splendens*, *Scorpidium revolvens*, *S. scorpioides*, *Rhytidiadelphus loreus*, *Pinguicula vulgaris* and *Prunella vulgaris*. These, often stony, M10 flushes are frequent all along slopes to north-west of here. Surrounding vegetation is mainly *Juncus squarrosus* grassland (U6) which is frequently transitional to *Nardus Stricta* grassland (U5) or less modified blanket bog (M17/M19). [KP]
193. 39535 55267 Small flush with *Schoenus nigricans* and *Carex dioica* at margins. [KP]
194. 39578 56861 Continuous *Sphagnum papillosum/palustre* carpet through area of good condition blanket bog (M17a). [KP]
195. 39638 61108 Start of drain (0.5m deep) which flows north from here through modified mire and acid grassland mosaic. Photograph 83. [KP]
196. 39690 61119 Straight drain cut through mire with drier peat and associated vegetation immediately either side of it. Drain is approximately 1.5m deep and very active at time of survey. If this drain were blocked it would improve overall condition/value of this valley mire. Photograph 82 taken from 39499 61111. [KP]
197. 39758 55242 New drain approximately 0.5m deep. Photograph 93. [KP]

198. 39988 59876 Area of eroding peat hags forming a mosaic of the drier M17b blanket mire and bare peat (M3) over watershed. *Racomitrium lanuginosum* hummocks are conspicuous through this area of mire and expanses of bare peat with scattered *Eriophorum angustifolium* localised. [KP]

199. 40128 60371 Large stand of vegetation which is not typical of documented NVC communities although most similar to M6bii. *Nardus Stricta* is abundant with frequent *Carex panicea*, *Carex echinata*, *Ranunculus flammula* and *Juncus bulbosus*. Occasional through the sward are *Pedicularis sylvatica*, *Potamogeton polygonifolius*, *Juncus effusus*, *Bryum pseudotriquetrum*, *Sphagnum denticulatum*, *Carex nigra*, *Prunella vulgaris*, *Potentilla erecta*, *Cirsium palustre* and *Polytrichum commune*. Small stands of M17a have frequent *Sphagnum palustre* and are often transitional to M19a with conspicuous *Eriophorum vaginatum* tussocks forming. Where there is increased soligenous influence *Potamogeton polygonifolius* becomes more prominent with *Ranunculus flammula*, *Taraxacum* agg., *Sphagnum denticulatum* and *Carex panicea* (M30). [KP]

200. 40314 55646 Steep banks along stream side are mainly short grazed mesotrophic grassland (*Cynosurus cristatus*, *Plantago lanceolata*, *Prunella vulgaris*, *Nardus Stricta*, *Juncus effusus*, *Anthoxanthum odoratum*, *Holcus lanatus*, *Cirsium arvense*, *Mnium hornum*). Wax cap fungi are locally frequent. [KP]

201. 40325 60431 Very wet area of mainly inaccessible mire with frequent dead sheep. Where there is some soligenous influence there are linear stands of *Juncus effusus* (M6) or *Potamogeton polygonifolius* soakways (M30) with *Cardamine pratensis*, *Ranunculus flammula* and *Carex nigra*. In adjacent blanket bog (M17a) there is occasional *Nardus Stricta* through a semi-continuous *Sphagnum* carpet of *Sphagnum papillosum* and *Sphagnum palustre*. [KP]

202. 40398 57109 Shallow drain cut through bog is vegetated by *Sphagnum denticulatum*. Immediately adjacent vegetation is more grassy (*Nardus Stricta*) with frequent *Juncus squarrosus*. Small fragments of U6 and U5 grassland occur throughout this polygon where the blanket mire is modified, increasing in frequency closer to semi-improved fields to the south. Elsewhere there is good *Sphagnum*/*Eriophorum vaginatum*/*Calluna vulgaris* cover. [KP]

203. 40670 56475 Deep drain at base of slope with increase in cover of U6 down-slope. There are further drains over the slopes to the south of here. [KP]

204. 40765 60051 Large expanse of bare eroding peat over hill summit and ridge which to some extent is associated with overhead cables and poles. Photograph 84. [KP]

205. 40893 60842 Frequent hags over this area and abundant sheep dung. Some re-colonisation by *Eriophorum angustifolium* (M3) and *Juncus squarrosus* grassland (U6). [KP]

206. 41041 57053 Localised severe peat erosion in parts along this ridge becoming less severe to the south. Photograph 19a. [KP]

207. 41225 56973 Vegetation over these steeper east-facing slopes is heavily dominated by *Calluna vulgaris* and most closely resembles H10a dry heath although locally transitional to H10c where there is an increase in graminoids. Occasionally *Eriophorum angustifolium* and *E. vaginatum* or *Juncus effusus* and *Juncus squarrosus* are present at low cover. *Calluna vulgaris* is heavily browsed by sheep with carpet/topiarised growth forms evident and frequent dung conspicuous. [KP]
208. 41344 60901 Area of modified bog with former peat cuttings and high grazing impacts adjacent to main road. Conspicuous sheep dung throughout. [KP]
209. 41345 56015 There is some tracking and trampling across this bog but *Sphagnum* carpet largely intact. A shallow drain bisects the bog here. [KP]
210. 41531 56043 Pool/soakway vegetated by *Potamogeton polygonifolius*/*Ranunculus flammula*/*Callitriche* agg./*Sphagnum denticulatum*, *Glyceria fluitans*, *Myosotis scorpioides*, *Juncus bulbosus*, *Polytrichum commune*, *Eriophorum angustifolium*, *Sphagnum palustre* and *Caltha palustris*. Here the vegetation most closely resembles an M30 soakway in NVC terms. Further into the bog the vegetation becomes more like a soligenous M1 bog-pool. Along the main Burn of Pettawater in this area are quite extensive stands of *Iris pseudacorus* with occasional *Angelica sylvestris*. [KP]
211. 41676 57140 Valley mire with hummock/hollow structure. M17b typically dominates the slightly higher and drier peats with the hollows mainly trampled bare peat (M3) with some standing water. Re-colonisation by *Eriophorum angustifolium* is frequent and, where peat is drier, *Carex panicea* indicating a history of high grazing pressures. There is also some localised disturbance to *Racomitrium lanuginosum* hummocks and occasional intact M1 pools. [KP]
212. 41908 55204 Peat cuttings approximately 1m deep and related drying to adjacent peat surface. *Calluna vulgaris* is frequently topiarised by heavy grazing pressures in areas adjacent to the road such as this. [KP]
213. 42390 56766 Frequent areas of trampling by sheep leaving small fragments of bare peat (M3). *Juncus squarrosus* dominated vegetation (U6) tends to occur in hollows adjacent to small runnels/burns. [KP]
214. 36974 57359 Steep sides of Lunklet Burn are fenced off, bryophyte-rich heath (H21a) is prominent here consisting of a high cover of *Calluna vulgaris* with *Erica cinerea*, *Erica tetralix*, *Empetrum nigrum*, *Potentilla erecta*, *Blechnum spicant*, *Carex binervis*, *Succisa pratensis*, *Salix aurita*, *Luzula sylvatica*, *Lonicera periclymenum*, *Hypnum jutlandicum*, *Dicranum scoparium*, *Sphagnum subnitens*, *Sphagnum papillosum*, *Thuidium tamariscinum*, *Rhytidiadelphus loreus*. There are also acid flushes along the banks consisting of *Juncus effusus*, *Juncus articulatus*, *Cirsium palustre*, *Ranunculus flammula*, *Holcus lanatus*, *Sphagnum palustre*, *Polytrichum commune* (M6c). [TR]
215. 37082 57611 Dry heath on steeper slopes with drier shallower peat and a dominant *Calluna vulgaris* cover. It is heavily grazed by sheep here into tight bushes and an

occasional small patch of acid grassland or sheep scar. There is sparse *Danthonia decumbens* with *Deschampsia flexuosa* and *Festuca vivipara*, *Potentilla erecta*, *Juncus squarrosus*, *Rhytidiadelphus squarrosus*, *Hypnum jutlandicum*, *Thuidium tamariscinum* and *Rhytidiadelphus loreus*. [TR]

216. 38620 58284 Here below Gruti Hill there are deep hags to 3m high. The dried out peat surfaces have an abundance of *Calluna vulgaris* and *Racomitrium lanuginosum* with sparser *Empetrum nigrum*, *Eriophorum angustifolium*, *Eriophorum vaginatum* and *Rhytidiadelphus loreus* and *Cladonia portentosa* (M17b). Bare peat generally only has sparse *Eriophorum angustifolium* (typical M3) with some U6 (*Juncus squarrosus*, *Empetrum nigrum*, *Sphagnum palustre*, *Lophocolea bidentata*) in bottoms of hags. No M1 hollows seen. Photograph 63. [TR]
217. 37195 57815 Eroding blanket mire here. On drier surfaces there is abundant *Calluna vulgaris* with *Empetrum nigrum*, *Juncus squarrosus* and much *Racomitrium lanuginosum* with *Rhytidiadelphus loreus*, *Cladonia portentosa*, *Cladonia uncialis* (M17b). In wetter depressions there is some *Sphagnum cuspidatum* and *Sphagnum denticulatum* (M1). On shallower peats the vegetation verges towards wet heath with patchy *Sphagnum capillifolium* and *Scapania gracilis*. [TR]
218. 37451 57921 Along the sides of the burn is variable with some dry heath which has been mapped as H10a although lacking in *Erica cinerea* generally (*Calluna vulgaris*, *Empetrum nigrum*, *Galium saxatile*, *Blechnum spicant*, *Thuidium tamariscinum*, *Rhytidiadelphus loreus*, *Hylocomium splendens*, *Diplophyllum albicans*) and U6 acid grassland (*Juncus squarrosus*, *Potentilla erecta*, *Luzula multiflora*, *Agrostis canina*, *Galium saxatile*, *Rhytidiadelphus squarrosus*, *Dicranum scoparium*). U4b in more mesotrophic nutrient-enriched patches. [TR]
219. 37644 57935 Lower flat mire is intact with many wet depressions having abundant *Sphagnum cuspidatum*, *Sphagnum papillosum* and very little bare peat except at trampled edges of wet hollows. [TR]
220. 38399 58120 A fairly intact area of blanket mire within overall eroding mire. Here *Sphagnum papillosum* is of high cover with *Calluna vulgaris*, *Empetrum nigrum*, *Eriophorum vaginatum* and *Sphagnum capillifolium* all very visually prominent. There is an occasional pool with *Sphagnum cuspidatum* (M1) and occasional hags (M17b/M3) with some *Juncus squarrosus* acid grassland forming on the shallow peats. [TR]
221. 38677 58248 Where the blanket peat has eroded down to expose the stony substrate there are visible calcareous influences in the presence of bryophytes not otherwise seen in this acid terrain. Prominent are *Scorpidium scorpioides* with *Scorpidium revolvens*, *Blindia acuta*, *Scapania undulata*, *Campylium stellatum*, *Dicranella palustris*, and the sedges *Carex pulicaris*, *Carex viridula* ssp. *oedocarpa* and *Carex panicea*. Such areas have with affinities with M10/M11 mountain flushes and are frequent on the west side of the hill forming a valuable and probably increasing element in the general diversity. [TR]

222. 38996 58108 Blanket mire here is relatively intact with few hags. It is mainly M19a with wetter patches having M17a marked out by increased *Sphagnum* cover. [TR]
223. 39251 58391 There are some linear down-slope hags here but not extensive. Again, where eroded to the substrate basic influences are visible in the presence of *Scorpidium revolvens*. [TR]
224. 39000 59060 M10 type flushes with many sedges – *Carex panicea*, *Carex viridula* ssp. *oedocarpa*, *Carex pulicaris*, *Ranunculus flammula* and the moss *Campyllum stellatum*. [TR]
225. 39174 59241 Some very wet areas on the flatter ground here are not as hagged and consist of areas of wet hollows (M1) with abundant *Sphagnum cuspidatum*, *Sphagnum denticulatum* and *Potamogeton polygonifolius*. These often occur within extensive carpets of *Sphagnum papillosum* with *Calluna vulgaris* and *Eriophorum vaginatum* growing amidst. [TR]
226. 37299 59149 Wet area now very eroded with much wet bare peat (M3) and drier hummocks of *Calluna vulgaris*, *Erica cinerea*, *Racomitrium lanuginosum* (M17b). [TR]
227. 37358 58869 Area of low-lying flat bog a high cover of *Sphagnum papillosum* and *Sphagnum capillifolium*. There is also some *Rhynchospora alba*, which is generally scarce in the area, and *Eriophorum vaginatum*, *Erica tetralix*, *Calluna vulgaris*, *Trichophorum cespitosum*, *Narthecium ossifragum*, *Eriophorum angustifolium*, *Cladonia portentosa*, *Cladonia uncialis* (M17a). [TR]
228. 37122 58590 East-facing dry heath (H21a) has a high cover of *Calluna vulgaris* with some *Carex binervis*, *Juncus squarrosus*, *Potentilla erecta*, sparse *Nardus stricta* and a luxuriance of the bryophytes *Sphagnum capillifolium*, *Sphagnum papillosum*, *Dicranum scoparium*, *Hylocomium splendens* and *Rhytidiadelphus loreus*. (16) [TR]
229. 37380 59747 Wet flat area with some erosion and bare peat but also intact blocks of peat varying from wet (*Sphagnum papillosum* and *Sphagnum capillifolium* abundant, M17a) to drier (*Racomitrium lanuginosum* abundant, M17b). Also prominent here are *Calluna vulgaris*, *Trichophorum cespitosum*, *Eriophorum vaginatum*, *Erica tetralix*, *Cladonia portentosa*, *Aulacomnium palustre* and hollows of *Sphagnum cuspidatum* (M1) where not so trampled and bare. [TR]
230. 37980 59742 Bratta Field summit area is generally well eroded to a stony substrate with some plates of remnant blanket peat to 30m across. The remaining mire is mainly M19a (*Calluna vulgaris*, *Eriophorum vaginatum*, *Empetrum nigrum*, *Vaccinium myrtillus* and hypnoid mosses) but there are drier peat surfaces with abundant *Racomitrium lanuginosum* (M17b) and some large areas where the peat remains intact and waterlogged to about 200m across (*Sphagnum papillosum*, *Sphagnum capillifolium*, *Juncus squarrosus*, *Eriophorum vaginatum*, *Eriophorum angustifolium*). Avoid developing on wetter areas and any intact peat blocks. Photograph 62. [TR]

231. 39048 60124 Summit of Marro Field is mainly shallow peat with stony substrate and acid grassland (U6 - *Juncus squarrosus*, *Nardus stricta*, *Racomitrium lanuginosum*). On remaining intact peat blocks there is M17b. [TR]
232. 38841 60727 A large area where peat is generally shallow or bare stony substrate with only small blocks of deeper peat (M19a, M17b) to 1m deep. The grassy tundra-like vegetation is dominated by either *Nardus stricta* or *Juncus squarrosus* with *Racomitrium lanuginosum* generally abundant and variable amounts of *Calluna vulgaris*, *Erica cinerea* *Carex panicea* (U5/U6/M15c). Photograph 61. [TR]
233. 37791 60994 Snelda Hill summit quite stony or shallow peat – generally resembling an acid grassland dominated by *Juncus squarrosus* and *Nardus stricta* with some heath species, *Calluna vulgaris*, *Empetrum nigrum* and *Cladonia portentosa*, *Eriophorum angustifolium* and here more like M15c-M17b with only a little deeper peat. [TR]
234. 41867 57742 Patta Dale has deep peat with variable blanket mire. Here there is a central band of M19a (*Eriophorum vaginatum*, *Empetrum nigrum*, *Calluna vulgaris*, *Eriophorum angustifolium*, hypnoid mosses) and is generally greener looking from a distance. Mostly the lower ground is more like M17b (*Racomitrium lanuginosum*, *Trichophorum cespitosum*, *Erica tetralix*, *Sphagnum capillifolium*, *Cladonia portentosa*) with some wetter areas of M17a/M1. The central narrow channel has M23b rush-pasture (*Juncus effusus*, *Viola palustris*, *Ranunculus repens*, *Cardamine pratensis*) and areas of *Potamogeton polygonifolius* over *Sphagnum denticulatum* and *Calliergonella cuspidata*. Photographs 59 & 60. [TR]
235. 41637 58358 The mire here is much more eroded with much heavily trampled bare peat. Gullies up to 4m deep and generally a lot poorer than the blanket mire to the south of here. Photograph 58. [TR]
236. 40900 58830 To the north of here are areas of bare peat to 20m across and there is haggings to 2m deep. There are however also some more intact areas of blanket peat (M19a) though the area too and these should be avoided if possible. Photograph 57. [TR]
237. 40041 59188 Flat valley bottom blanket mire is mainly intact with few haggings. Mainly M17b consisting of *Calluna vulgaris*, *Trichophorum cespitosum*, *Eriophorum vaginatum*, *Eriophorum angustifolium*, *Erica tetralix*, *Racomitrium lanuginosum*, *Sphagnum capillifolium*, *Cladonia portentosa* and *Rhytidiadelphus loreus*. Steeper banks, e.g. alongside channels have U6 *Juncus squarrosus*-dominated acid grassland. There is an occasional acid flush with *Juncus effusus* over *Sphagnum palustre*, *Polytrichum commune* and *Sphagnum fallax* (M6ci). [TR]
238. 36143 60426 Hill of Voxter is mainly eroding and drying blanket mire, hence much M17b – *Calluna vulgaris*, *Erica cinerea*, *Racomitrium lanuginosum*, *Cladonia portentosa*, *Cladonia uncialis*, *Eriophorum vaginatum*, *Eriophorum angustifolium* and spares *Hypnum* sp. There are frequent patches of *Juncus squarrosus* acid grassland within this (U6) where the peat is eroded and there may also be bare substrate associated with these areas, no basic influences noted here. Photograph 56. [TR]

239. 38156 62303 Blanket mire here is eroded with hags through much of the area and there is wet and dry heath over shallow peats on knolls (H10a/M15c – *Racomitrium lanuginosum*, *Erica cinerea*, *Calluna vulgaris*, sparse *Trichophorum cespitosum*, *Cladonia portentosa*, patchy *Sphagnum capillifolium*). Flushed zones on substrate within the mire have some indicators of base enrichment in the bryophytes *Scorpidium revolvens*, *Scorpidium scorpioides* which occur with *Sphagnum denticulatum*, *Potamogeton polygonifolius* and *Trichophorum cespitosum* (M11/M1). [TR]
240. 38692 62978 Eroded blanket mire with large patches of bare stony ground which has high covers of *Juncus squarrosus* and *Nardus stricta* acid grassland and would be a suitable target area for turbines (U6). The remaining blanket mire has many bare eroding peat faces (M3) but there are some remaining active wet depressions which have *Sphagnum cuspidatum*, *Sphagnum denticulatum* and *Eriophorum angustifolium* (M1) and these should be avoided. [TR]
241. 37953 63745 Mainly *Juncus squarrosus* and/or *Nardus stricta* acid grassland on these slopes (U6/U5) but there are also some basic (M10a) flushes marked out by the sedges *Carex viridula* ssp. *oedocarpa*, *Carex panicea*, *Carex dioica*, *Carex echinata* with *Juncus bulbosus*, *Thalictrum alpinum*, *Drosera rotundifolia*, *Potamogeton polygonifolius* and the bryophytes *Ctenidium molluscum*, *Scorpidium revolvens*, *Campylium stellatum* and *Breutelia chrysocoma*. [TR]
242. 36884 63856 Grobs Ness headland is almost entirely semi-improved acid grassland varying from smooth U4b grassland to less enriched U5d *Nardus stricta* grassland. [TR]
243. 37104 63359 Here the acid grassland here is dominated by *Festuca vivipara*, *Anthoxanthum odoratum*, *Nardus stricta* and *Deschampsia flexuosa* with well-browsed *Calluna vulgaris* and some enrichment in the form of *Carex flacca*, *Viola palustris*, *Succisa pratensis*, *Pedicularis sylvatica*, *Erica cinerea*, *Narthecium ossifragum*, *Potentilla erecta*, *Sphagnum denticulatum*, *Thuidium tamariscinum*, *Rhytidiadelphus loreus*, *Hylocomium splendens* and *Sphagnum capillifolium*. More generally on the slopes above there is also an occasional patch of grassy dry heath (H10c). [TR]
244. 27170 62145 Enclosed fields are variably improved. In leys *Lolium perenne* is mono-dominant with some *Trifolium repens* and sparse *Holcus lanatus*, *Ranunculus repens* and *Rumex acetosa*. Where less improved there is usually more *Holcus lanatus* and a diversity of species which moves towards MG6b/U4b. [TR]
245. 37204 61105 The Hoddins blanket mire has a fence-line here. To the south-west it is less grazed and *Trichophorum cespitosum* and *Cladonia portentosa* are visibly much more prominent. On the other side *Calluna vulgaris* is increased amongst shorter vegetation which has a high cover of *Juncus squarrosus*. There are also occasional pools with *Sphagnum cuspidatum* and *Sphagnum denticulatum* (M1). Haggings is rather infrequent here and low. Much of the blanket mire has M17b with *Racomitrium*

lanuginosum abundant and *Empetrum nigrum*, *Erica cinerea*, *Rhytidiadelphus loreus*, *Hylocomium splendens* and patches of *Sphagnum capillifolium*. [TR]

246. 35460 61973 Cole Ness has a very bland acid grassland vegetation dominated by *Juncus squarrosus* and *Nardus stricta* with *Racomitrium lanuginosum*, *Diplophyllum albicans*, *Polytrichum commune*, *Dicranum scoparium* and *Carex panicea* (U6/U5). [TR]
247. 35492 61192 Here the peat is generally shallow with short-grazed wet heath consisting of *Calluna vulgaris*, *Erica cinerea*, *Carex panicea*, *Trichophorum cespitosum*, *Erica tetralix*, *Racomitrium lanuginosum*, *Sphagnum capillifolium*, *Cladonia portentosa*, *Cladonia uncialis*, *Hylocomium splendens* (M15c). Where there is no peat the vegetation resembles a tundra-like grassland dominated by *Juncus squarrosus* and *Nardus stricta* (U6). Photograph 55. [TR]
248. 35427 58385 Wet heath consisting of *Calluna vulgaris*, *Erica cinerea*, *Erica tetralix*, *Racomitrium lanuginosum*, *Juncus squarrosus*, *Cladonia portentosa* with stony basic flushes (M10a) which have *Pinguicula vulgaris*, *Scorpidium scorpioides*, *Carex viridula* ssp. *oedocarpa*, *Campyllum stellatum*, *Juncus bulbosus*, *Carex panicea*, *Carex pulicaris*, *Sphagnum denticulatum* and *Philonotis fontana*. [TR]
249. 35274 58489 An enriched *Nardus stricta* grassland (CG10a) with *Carex flacca*, *Succisa pratensis*, *Narthecium ossifragum*, *Plantago lanceolata*, *Linum catharticum*, *Thalictrum alpinum*, *Polygala serpyllifolia*, *Festuca vivipara*, *Calluna vulgaris*, *Anthoxanthum odoratum*, *Potentilla erecta*, *Pedicularis sylvatica*, *Hylocomium splendens* and *Dicranum scoparium*. There are also basic M10a flushes in the area. [TR]
250. 35767 53792 Whitelaw Hill has mainly intact blanket mire (M17b and M19a) with some erosion, not severe, to 50cm. The mire is dominated by a mixture of *Calluna vulgaris*, *Erica tetralix*, *Trichophorum cespitosum*, *Eriophorum vaginatum*, *Eriophorum angustifolium*, *Narthecium ossifragum*, with *Racomitrium lanuginosum*, *Cladonia portentosa*, *Cladonia uncialis*, *Sphagnum capillifolium* and *Hypnum* sp. generally constant. [TR]
251. 35873 52336 Flat summit area of Dudd Hill has areas of active waterlogged blanket mire with an abundance of *Sphagnum papillosum*, *Sphagnum capillifolium*, low *Calluna vulgaris* and *Trichophorum cespitosum*, *Eriophorum vaginatum* (M17a) grading into hummocks and some pools (M1 - *Sphagnum cuspidatum*, *Eriophorum angustifolium*) as well as some hags (M17b/M3). [TR]
252. 35842 52528 Dudd Hill still M17b but here more eroded than the surrounding blanket mire with hags to 2m high throughout with much bare peat in a M3 network to 8m wide in parts. Photograph 54. [TR]
253. 36682 53040 Hags frequent (M17b/M3) but there are also large patches of intact blanket mire (M1a/M17b) in good condition and supporting indicative good amounts of *Sphagnum papillosum*, *Sphagnum capillifolium* and *Cladonia portentosa*. (41) [TR]

254. 36629 52069 Flat area of blanket mire is very hagged to 1.5m with drying peat blocks (M17b) and a network of bare peat (M3). Some hagg bottoms are waterlogged and active with a good build-up of *Sphagnum cuspidatum* grading into carpets of *Sphagnum papillosum* and *Sphagnum capillifolium* (M1/M17a) and these should be completely avoided. Photographs 52 & 53. [TR]
255. 37045 51487 Summit of Smirlee Hill has much eroded blanket mire with hags to 2m high. There is much bare peat with only *Eriophorum angustifolium* (M3) and there are large areas of bare stony substrate and *Juncus squarrosus* grassland over shallow peat. The area is suitable for turbines but intact areas of peat and their edges should be avoided. Photograph 50. [TR]
256. 37191 51876 Large pools and areas of waterlogged *Sphagnum cuspidatum*, *Sphagnum capillifolium*, *Sphagnum papillosum* with *Juncus squarrosus*, *Eriophorum vaginatum* and *Eriophorum angustifolium*. [TR]
257. 37277 52461 South Mid Field summit has a mixture of intact and eroding mire with a network of bare peat and *Eriophorum angustifolium* (M3) to 5m wide in places. There are also occasional patches of bare soil and shallow peat with U6 but the mire is generally not as eroded as that at Smirlee Hill. [TR]
258. 37652 52763 Intact, good condition typical M17b consisting of a high cover of *Racomitrium lanuginosum* and *Cladonia portentosa* with *Calluna vulgaris*, *Trichophorum cespitosum*, *Eriophorum vaginatum*, *Empetrum nigrum*, *Eriophorum angustifolium*, *Sphagnum capillifolium*, *Pleurozia purpurea*, and only occasional hags. Photograph 51. [TR]
259. 38132 52429 A large flat area of intact blanket mire with good cover of *Sphagnum papillosum*, *Sphagnum capillifolium* and *Sphagnum cuspidatum* hollows with *Sphagnum denticulatum* and *Rhynchospora alba*. Also present are *Trichophorum cespitosum*, *Eriophorum vaginatum*, *Calluna vulgaris*, *Eriophorum angustifolium* and also areas with a high cover of *Juncus squarrosus*. Avoid developing here. [TR]