Scottish Natural Heritage
Research Report No. 1202

Merrick Kells SSSI/SAC – Site Condition Monitoring Report 2013

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RESEARCH REPORT

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SCM Reports

This report was commissioned by SNH as part of the Site Condition Monitoring (SCM) programme to assess the condition of special features (habitats, species populations or earth science interests) on protected areas in Scotland (Sites of Special Scientific Interest, Special Areas of Conservation, Special Protection Areas and Ramsar). Site Condition Monitoring is SNH's rolling programme to monitor the condition of special features on protected areas, their management and wider environmental factors which contribute to their condition.

The views expressed in the report are those of the contractor concerned and have been used by SNH staff to inform the condition assessment for the individual special features. Where the report recommends a particular condition for an individual feature, this is taken into account in the assessment process, but may not be the final condition assessment of the feature. Wider factors, which would not necessarily be known to the contractor at the time of the monitoring, are taken into consideration by SNH staff in making final condition assessments.

RESEARCH REPORT

Summary

Merrick Kells SSSI/SAC – Site Condition Monitoring Report 2013

Research Report No. 1202
Project No: 113952
Contractor: Alison Averis
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Background

Sites of Special Scientific Interest (SSSIs) and Special Areas of Conservation (SACs) are designated on the basis of *notified features of interest*. Site Condition Monitoring is a six year rolling programme of assessment, against quality standards, of the state of each notified feature of interest on each designated site. This project is concerned with upland *habitat* features on the Merrick Kells SSSI/SAC (NGR NX 440 850) which is in the Dumfries & Galloway SNH Area (Dumfries & Galloway local authority area.

Main findings

The features assessed were plants in crevices on acid rocks (SAC feature), blanket bog (SSSI feature) and Upland Assemblage (SSSI feature) consisting of montane acid grassland, alpine heath, subalpine dry heath, wet heath and inland rock. In addition, site check was carried out on the following SAC features: montane acid grassland, acidic scree, dry heath, wet heath, blanket bog and depressions on peat substrates. The fieldwork was carried out by Alison Averis between 23rd and 28th August 2013. The results of the survey are summarized as follows:

- **Plants in crevices on acid rocks.** This habitat is widespread and common here and includes cliffs, low crags, outcrops, boulder-fields, rock pavements and summit detritus. It was sampled at 23 points and all but two of these locations all CSM targets were met. The other two samples had browsing of *Vaccinium myrtillus* on the pass/fail threshold (marginal fail).
- **Blanket bog.** Blanket bogs are very common here and include some fine patterned mires especially on the Silver Flowe. They were sampled at 18 points; at all points all CSM targets were met.
- **Montane acid grassland.** *Carex-Racomitrium* heath U10 clothes all the higher hills in the SSSI. Eight of the 12 sample points failed for having grasses and small herbs at too high a cover. Otherwise all targets were met.

- **Alpine heath.** This habitat is rare at this site. One of the five samples passed all CSM targets. The others failed one or more targets, mainly because of too much browsing of *Vaccinium myrtillus* but also (2 samples) too much grass cover.
- **Subalpine dry dwarf shrub heath.** Dry heaths are widespread on steep rocky slopes, though less extensive than wet heaths and Molinia grasslands. Seven of the eight samples passed all CSM targets. The remaining sample failed because of potentially invasive bracken in the general area.
- **Wet heath.** Wet heath is widespread and extensive here, giving the site its 'west Highland' character. Five of the nine samples passed all CSM targets. Two samples failed for having potentially invasive bracken. Two other samples lacked *Erica tetralix*, but this failure is considered to be unmerited owing to what appears to be a natural absence of this species in the naturally drier M15c sub-community.
- **Acidic screes.** Scree is extensive on the steeper slopes. It was sampled at seven points; all samples passed all CSM targets.
- **Depressions on peat substrates (*Rhynchosporion* hollows).** These occur locally and patchily within blanket bog and wet heath. They were sampled at four points; all samples passed all CSM targets.
- Comparison with the previous survey in 2009 suggests that the condition of the heaths and bogs has improved but sheep numbers on the high ground might still be too high to be sustainable by at least some of the montane vegetation.

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Common Standards Monitoring data: presented in a separate spreadsheet file.

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1. INTRODUCTION

This survey was commissioned by Scottish Natural Heritage to assess the condition of the following designated habitats within the Merrick Kells SSSI/SAC, Dumfries & Galloway:

- **Plants in crevices on acid rocks (SAC feature)** (NVC M15, H10, H12, H18, H20, H21, U4, U5, U16)
- **Blanket bog (SSSI feature)** (NVC M17 and M19)
- **Upland assemblage (SSSI feature), comprising the following habitats:**
  - **Montane acid grassland** (NVC U10)
  - **Alpine heath** (NVC H14 and H20)
  - **Dry heath** (NVC H10, H12 and H18)
  - **Wet heath** (NVC M15)
  - **Inland rock** (includes NVC M15, H10, H12, H18, H20, H21, U4, U5, U16)
- **Site check of the following SAC features:**
  - **Montane acid grasslands** (NVC U10)
  - **Acidic scree** (NVC U5e, U10, U13, U21, H20)
  - **Dry heaths** (NVC H10, H12 and H18)
  - **Wet heath** (NVC M15)
  - **Blanket bog** (NVC M17 and M19)
  - **Depressions on peat substrates (Rhynchosporion hollows)** (NVC M1 & M15a)

This site covers a large area of upland ground in western Galloway (SSSI = 8776 ha; SAC = 8698 ha; approximate central grid reference NX 440 850). It consists of two high ridges separated by an area of lower rocky hills and moorland. To the west is a long, north-south ridge rising to 843 m on the Merrick, the highest hill in the Southern Uplands, and also taking in Benyellary (719 m) and Kirriereoch Hill (786 m). To the east this ridge drops to a remote tract of wild land, with Loch Enoch, Loch Arron, Loch Neldricken, Loch Valley, Long Loch of Glenhead and Round Loch of Glenhead in a line of hollows in rocky moorland. This area is bounded on the east by another north-south line of rocky hills: Mullwarchar (692 m), Craignaw (645 m) and Craiglee (531 m). There is another steep drop eastward to the Silver Flowe, an exceptional raised bog with a very wet, patterned surface. Eastwards again the ground rises to the long, smooth ridge of the Rhinns of Kells, which reaches 814 m on Corserine. The Merrick Kells area is unlike anything else in the Southern Uplands. It resembles a small, separate piece of the west Highlands, with spectacular scenery, long views over mosaics of bog and wet heath, and a distinctive rocky, loch-strewn landscape. These hills are formed from a granite intrusion of late Silurian and Devonian age (British Geological Survey 2007). A hard, largely acid rock, it has weathered into cliffs, crags, bouldery slopes, and some impressive rock pavements on Craignaw.

The vegetation is grazed by red deer, sheep and feral goats, and there are cattle on the lower slopes near Glenhead in upper Glen Trool. Most of the site is now in public ownership (Forestry Commission Scotland) and management is for nature conservation and biodiversity, though there are still large numbers of grazing sheep because of pre-existing agricultural tenancies (Chris Miles unpublished note).

This survey is part of the Scotland-wide series of surveys carried out to assess the condition of notified habitats on designated sites at approximately six-yearly intervals. These surveys use the Common Standards Monitoring (CSM) methodology (JNCC 2009). The previous survey was carried out in 2009 (Dayton & Rafferty 2010).

2. METHODS

The fieldwork was carried out between 23rd and 28th August 2013, mostly in hot, dry, sunny weather.

Some of the monitoring point locations were determined in advance of this study on the basis that they had been recorded in the previous survey in 2009. These locations were not known to me until after the contract was agreed, and when some of them were found to be so remote and difficult of access that they were beyond what I could do in the time available it was agreed with SNH that I would do as many as possible of the previously surveyed points and record some additional 'new' ones in these habitats within the parts of the site visited. Additional 'new' points were recorded for habitats not covered in the 2009 survey.

At each point information was recorded using the current Common Standards Monitoring methodology (JNCC 2009). A total of 87 points was visited, using a *Garmin Etrex 10* Global Positioning System (GPS) device with an accuracy of 3 m to navigate to the locations.

The dry heath, wet heath, montane heath, montane acid grassland and inland rock habitats were assessed within the upland assemblage feature. The method for assessing upland assemblage features is specified by Scottish Natural Heritage as follows:

Each of the components should be assessed using the generic attribute and target tables for the relevant feature type, but with sampling and field assessment carried out in a quicker and more qualitative way than if the component features had been individually notified. To do this, field assessments should be done from a number of vantage points on the site, sufficient to give an overview of most of the extent of each of the components. This will probably require visits to about three to four locations per square kilometre on average, but a lower density of locations will often be sufficient on extensive features on large sites. At each vantage point the surveyor should make an assessment using the appropriate attribute and target tables of each of the component features that can be seen. For those targets that require detailed observations at close quarters, the assessment should be based on informal, notional samples of the appropriate size at both the vantage point and while walking from the previous vantage point. The final assessment should be based on the surveyor's best judgement of whether at least 90% of each component is likely to pass all the targets. If it seems likely that this will be true for all the components then the whole assemblage feature should be recorded as passing the condition assessment.

At each location the habitat was assessed using the Common Standards Monitoring (CSM) methodology developed by the UK nature conservation agencies (JNCC 2009) for the purpose of assessing habitats on designated sites. This method involves recording information about the vegetation and habitat at various scales, mostly at the scales of 4 m^2 and the total extent of the habitat in question visible from each recording location. Criteria for assessment include species composition, vegetation structure and the physical habitat including grazing and trampling, tailored to the individual habitats.

Not all of the points sampled in 2009 were revisited. This was partly because this survey was done by one person rather than two, and with fewer days allowed for the work; partly because the current survey included assessments of two extra categories, montane acid grassland and montane heath, which necessitated spending more time reaching and surveying the higher ground; and partly because it was not worth investing so much effort in surveying siliceous screes when all the sample points had passed in the previous survey: it seemed more appropriate to devote survey time to vegetation where the condition would be more likely to respond to a change in management.

In addition, site check assessments were carried out for several habitats at this site. Site check involves making general observations at various scales while walking across the site, looking for such things as indications of changes to features that could impact on their condition between the longer SCM time intervals (changes could be due to land management, other pressures, unconsented activities, damage, etc). It provides a trigger mechanism for raising and prioritising further action to help retain or deliver features into favourable condition, and if possible to give an idea of the extent of the feature seen as a percentage of the overall site. The information obtained can be presented as a written account or (as in this case) in a simple tabular format.

Two photographs were taken of most recording locations: one general photo showing the location in a wider habitat context, and a closer view looking down (at an oblique angle) at the vegetation.

Botanical nomenclature in this report follows Stace (2010) for vascular plants, Atherton *et al.* (2010) for bryophytes and Purvis *et al.* (1992) for lichens.

3. RESULTS

Table 1 gives a brief summary of the results from the condition assessments carried out in this survey. Photographs of the monitoring locations are in Appendix 1. The locations are mapped in Appendix 2. The Common Standards Monitoring data are presented in a separate spreadsheet.

Table 1. Summary of results from habitat condition assessment at Merrick Kells SSSI/SAC in August 2013

	SSSI or SAC feature	No. of samples	No. of samples which passed on all targets	No. of samples which failed on at least one target	% of total extent likely to pass all CSM targets	Favour-able?
Plants in crevices on acid rocks	SAC feature	23	21	2	>90%	Y
Blanket bog	SSSI feature	18	18	0	>90%	Y
Upland assemblage:	SSSI feature					N
Montane acid grassland	Part of SSSI feature	12	4	8	<90%	
Alpine heath	Part of SSSI feature	6	1	5	<90%	
Dry heath	Part of SSSI feature	8	7	1	>90%	
Wet heath	Part of SSSI feature	9	5	4	>90%	
Inland rock	Part of SSSI feature	23	21	2	>90%	
Site check:						
Montane acid grassland	SAC feature	13	4	9	<90%	N/A
Acidic scree	SAC feature	7	7	0	>90%	N/A
Dry heath	SAC feature	8	7	1	>90%	N/A
Wet heath	SAC feature	9	5	4	>90%	N/A
Blanket bog	SAC feature	18	18	0	>90%	N/A
Rhynchosporion hollows	SAC feature	4	4	0	>90%	N/A
Total no. of sample points		87	65	22		

The rest of this section of the report consists of written accounts (including site check tables) of the condition of the assessed habitats.

3.1 Plants in crevices on acid rocks (SAC feature)

There are crags, outcrops, rock pavements and spreads of boulders throughout the site, but especially on the very rocky ridge running from Craig Lee north to Dungeon Hill. Although most of the actual rocks are bare apart from a thin skin of crustose lichens such as *Rhizocarpon geographicum*, and tufts of bryophytes such as *Racomitrium lanuginosum* and *Hypnum jutlandicum*, they are set in a matrix of vegetation and this extends on to ledges and

among boulders. Plant communities recorded in association with rock habitats included *Trichophorum germanicum-Erica tetralix* wet heath M15, *Calluna vulgaris-Erica cinerea* dry heath H10, *Calluna vulgaris-Vaccinium myrtillus* dry heath H12, *Vaccinium myrtillus-Deschampsia flexuosa* dry heath H18, *Vaccinium myrtillus-Racomitrium lanuginosum* heath H20, *Calluna vulgaris-Vaccinium myrtillus-Sphagnum capillifolium* damp heath H21, *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland U4, mossy *Nardus stricta-Galium saxatile* grassland U5e and the *Luzula sylvatica-Vaccinium myrtillus* tall-herb community U16.

Rock habitats were sampled at 23 monitoring points. Two samples had marginal fails because of about 50% (on the threshold) of *Vaccinium myrtillus* shoots browsed. This is considered unmerited in the light of the fact that this species is very commonly browsed to at least this degree, even in rather lightly grazed vegetation. All other samples passed all CSM targets. This fits with the findings of the previous survey, which reported heavy grazing at just one out of 28 rock samples.

This habitat is therefore assessed as being in favourable condition at this site. The greatest threat to the rocks and their vegetation here is accidental fire, though there was no evidence of recent burning at the time of the survey.

One of the rock samples, at NX 44101 85085, near Loch Enoch, is home to a sward of *Luzula-Vaccinium* tall-herb vegetation including a few bushes of the scarce montane willow *Salix lapponum*.

3.2 Blanket bog (SSSI feature)

Blanket bogs are common in the Merrick Kells SSSI on deep spreads of peat. On the lower ground there are *Trichophorum germanicum-Eriophorum vaginatum* bogs M17, and on the wetter peats *Erica tetralix-Sphagnum papillosum* bogs M18. Locally, both of these have well-developed pool systems, especially on the Silver Flowe where there are large areas with almost as much water as vegetation. M17 has a pale ochre-gold sward of *Trichophorum germanicum, Molinia caerulea, Eriophorum vaginatum* and *E. angustifolium,* dotted with *Calluna vulgaris, Erica tetralix* and *Myrica gale.* Under these is a deep, soft, waterlogged layer of *Sphagnum papillosum* and *S. capillifolium* with a little *Hypnum jutlandicum.* M18 is very similar but has a more open sward, which can include much *Empetrum nigrum* as well as the other shrubs. It has a more continuous layer of bryophytes, including the very distinctive *Sphagnum magellanicum* with its fat, wine-red shoots as well as *Aulacomnium palustre.* In both types of bog there is an array of small species such as *Narthecium ossifragum, Potentilla erecta, Drosera rotundifolia, D. anglica, Dactylorhiza maculata, Polygala serpyllifolia* and *Pedicularis sylvatica.*

On drier peats and at higher altitudes there are *Calluna vulgaris-Eriophorum vaginatum* bogs M19. These bogs have a dark, tussocky sward with equal amounts of *Calluna* and *Eriophorum vaginatum*, interleaved with *Vaccinium myrtillus, V. vitis-idaea, Empetrum nigrum* and *Deschampsia flexuosa.* Under the vascular plants is a deep red and gold quilt of *Sphagnum capillifolium* growing with *Hypnum jutlandicum, Pleurozium schreberi, Rhytidiadelphus loreus, Plagiothecium undulatum* and *Hylocomium splendens.*

Blanket bog was sampled at 18 monitoring points including all three types, though most were in M17 as this is the most widespread here. At four of the points the grid reference for the sample had to be changed as the vegetation at the monitoring point was not actually blanket bog, so the nearest stand <20 m from the grid reference was sampled. At a further two points the vegetation proved to be wet heath and there was no blanket bog within 20 m, so the vegetation at these was assessed using the wet heath targets.

All 18 samples passed all of the CSM targets and appear to be in favourable condition. This is a big change from 2009 when 41% of the bog samples failed to pass the targets because of too few indicator species, too much *Molinia*, and local burning. None of my samples had too few indicator species except at the points where the vegetation was clearly wet heath and not blanket bog, and in those cases I selected the nearest example of proper blanket bog or, where there wasn't any within 20 m (and the wet heath did not show clear signs of having been derived from previous blanket bog), assessed the vegetation as wet heath.

The general impression of blanket bogs over the SSSI is that they are in good condition, with interesting pool systems and plenty of structural and floristic diversity. There is some local damage, most notably and also most regrettably, on the Silver Flowe where ATVs have been driven across the bogs.

3.3 Upland assemblage (SSSI feature)

The components of this SSSI feature are described below.

3.3.1 Alpine summit communities (montane acid grassland)

This is mainly *Carex bigelowii-Racomitrium lanuginosum* heath U10 and smaller areas of vegetation transitional between U10 and mossy montane *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland U4e. U10 is the characteristic summit vegetation of the higher hills in Britain and Ireland, where it is more common and extensive than anywhere else in the world (Averis *et al.* 2004). In the Merrick Kells SSSI it occurs on Benyellary, the Merrick, Kirriereoch Hill and Corserine.

On all of these hills there are good examples of U10, with continuous silvery-grey carpets of *Racomitrium lanuginosum* clothing the high plateaux and ridges. These are dotted with montane species such as *Carex bigelowii, Salix herbacea, Diphasiastrum alpinum, Polytrichum alpinum* and *Cetraria islandica* as well as with more widespread upland species such as *Vaccinium myrtillus, V. vitis-idaea, Empetrum nigrum* ssp. *hermaphroditum, Huperzia selago* and *Carex pilulifera.* In most stands there is also a thin sward of *Festuca vivipara* and *Deschampsia flexuosa,* tufts of *Nardus stricta* and trailing shoots of *Potentilla erecta* and *Galium saxatile.* Locally these grasses and herbs thicken up into a more definite mossy grassland and belong to the *Racomitrium lanuginosum* sub-community of the *Festuca-Agrostis-Galium* grassland U4e. In other examples the heaths are dominated by *Carex bigelowii* growing in a dense continuous sward: an unusual type of montane vegetation that seems to be particularly associated with the higher hills in the western Southern Uplands (Averis *et al.* 2004).

Montane acid grassland was sampled at 12 monitoring points, but only four examples passed all the SCM targets. All those that failed had at least 20% cover of grasses and small herbs in the sward.

The presence of grasses and small herbs at a cover of over 20% might not be the result of excessive grazing, trampling and nutrient enrichment from herbivores (especially as other herbivore impacts were generally not found to be excessive here) and might be a reflection of the longer growing season and milder winters when compared with many Highland sites of U10 vegetation. U10 heaths south of the Highlands are generally grassier than those in the Highlands. There is a big difference, though, between the deep carpets of *Racomitrium* over most of the summit of the Merrick, on Little Spear to the north, and on the outlying ridges of Corserine (e.g. photos 5-10 and 19-20), and the thin, patchy, broken wefts of the moss on Benyellary, Kirriereoch Hill and the summit of Corserine (e.g. photos 15-18).

The general impression gained from the survey is that the summit heaths are quite variable over the site. On the Merrick, especially on the gently-sloping plateau to the east of the actual summit, the U10 heaths are in reasonable to good condition despite the presence of sheep. They have a deep, dense, continuous cover of *Racomitrium* and there are good populations of *Salix herbacea* and *Carex bigelowii.* There are also some very good stands on Little Spear, the northern outlier of the Merrick. On Benyellary, Kirriereoch Hill and Corserine there are larger areas of rather grassy, impoverished U10 (and mossy *Festuca-Agrostis-Galium* grassland U4e not counted here as belonging within this assessed montane acid grassland category) with a thinner, more open carpet of *Racomitrium* and more grasses and common herbs, but even in these places there are U10 heaths that appear less damaged and more natural. Condition varies quite widely over small areas, perhaps reflecting long-established patterns of grazing in response to variation in climate and topography as perceived by the sheep themselves.

Between the summit of Corserine and Carlin's Cairn along the narrow ridge to the north there has been considerable damage from a large ATV driven repeatedly along the same route (photograph 149). This is regrettable as not only is it an unsightly scar on the landscape but there is also the potential for continued erosion and loss of the vegetation.

From observations at sample locations and more widely throughout the site it is estimated that well below 90% of the total extent of montane acid grassland at this site would pass all CSM targets.

3.3.2 Alpine heath

Alpine heath is rare in the SSSI, as it is more generally in the Southern Uplands. Most belongs to the *Vaccinium myrtillus-Racomitrium lanuginosum* community H20, with a rich green sward of *V. myrtillus, V. vitis-idaea, Empetrum nigrum* ssp. *hermaphroditum, Salix herbacea, Carex bigelowii, Diphasiastrum alpinum, Deschampsia flexuosa* and *Galium saxatile* growing in a deep, springy carpet of *Racomitrium lanuginosum* interwoven with a few other mosses such as *Polytrichum alpinum, Pleurozium schreberi* and *Hylocomium splendens.* The montane lichen *Cetraria islandica* is common here too. Most examples occur on the upper parts of steep, shaded slopes below the summits of the higher hills. They are important outliers of a community that is almost confined to the Scottish Highlands. On the rocky windswept summit of Craignaw there are small patches of the *Calluna vulgaris-Racomitrium lanuginosum* heath H14, with the heather creeping over the gravelly ground in prostrate carpets through *Racomitrium lanuginosum.* There is a sprinkling of species such as *Carex bigelowii, Vaccinium myrtillus, Empetrum nigrum* ssp. *hermaphroditum* and *Huperzia selago.*

Five of the six samples failed at least one of the SCM targets. In two cases this was because of too high a cover of grasses in the sward: this probably does indicate that grazing is too hard and there is a risk of the heaths being converted to grassland. Four samples failed because more than 33% of the *Vaccinium myrtillus* shoots were browsed. This is not necessarily a negative indication of vegetation condition. *V. myrtillus* is very commonly browsed hard, even in some places where there is little or no stock grazing, as it is eaten by small mammals and birds such as red grouse as well as by sheep, deer and goats. It is a rhizomatous perennial that can survive more grazing than most dwarf shrubs. However, given the high numbers of sheep on these hills, montane heaths are vulnerable if not actually declining, and should still be a cause for concern. Montane heaths are uncommon here, are almost confined to the steepest and most rocky slopes, and could easily be converted to grassier swards if grazed too hard.

From observations at sample locations and more widely throughout the site it is estimated that well below 90% of the total extent of montane heath at this site would pass all CSM targets.

3.3.3 Subalpine dry dwarf shrub heath

Dry heaths occur on the steeper, rockier slopes on well-drained mineral soils. Here they include *Calluna vulgaris-Erica cinerea* heaths H10, *Calluna vulgaris-Vaccinium myrtillus* heaths H12, *Vaccinium myrtillus-Deschampsia flexuosa* heaths H18 and *Calluna vulgaris-Vaccinium myrtillus-Sphagnum capillifolium* damp heaths H21. The monitoring points included all but H21.

All of the eight samples passed all the SCM targets except for one, where there was too high a cover of bracken in the sward. This is an interesting change from 2009, when 50% of the samples failed because of excessive grazing.

The general impression is that the dry heaths on the Merrick Kells are currently in good condition. There was no evidence of recent burning (though there were signs of an old, now-recovering burnt area on Mullwarchar) and grazing is not at all heavy at present in these communities. *Vaccinium myrtillus* was consistently more browsed than the other dwarf shrubs, but this is normal and not necessarily a cause for concern.

From observations at sample locations and more widely throughout the site it is estimated that at least 90% of the total extent of subalpine dry dwarf shrub heath at this site would pass all CSM targets.

3.3.4 Wet heath

Trichophorum germanicum-Erica tetralix wet heath M15, along with *Molinia caerulea-Potentilla erecta* grassland M25, covers most of the gentle to moderate slopes in the SSSI and gives this area much of its distinctive and interesting West Highland character. M15 has a sward of *Trichophorum germanicum, Molinia caerulea, Erica tetralix* and *Calluna vulgaris,* with sweet-smelling spreads of *Myrica gale* at low altitudes. At moderate to high altitudes and on thinner peat, *Erica cinerea* grows with or instead of *E. tetralix* in the *Cladonia* sub-community M15c. The swards are dotted with smaller species such as *Narthecium ossifragum, Potentilla erecta, Succisa pratensis, Dactylorhiza maculata, Polygala serpyllifolia* and *Carex panicea.*

M15 was sampled at nine monitoring points, of which five passed all the CSM targets and four did not. Two failed because of invasive bracken: this is a potential source of damage at low to moderate altitudes. Two others, however, failed the target for *Erica tetralix* because they lacked this species (though they did have *E. cinerea*). These were in the *Cladonia* sub-community M15c which is a drier form of wet heath in which *E. tetralix* can be absent naturally. *E. tetralix* is not a palatable species and tends to be one of the last dwarf shrubs to be browsed where there is a choice. It is unlikely to have been lost from these stands because of heavy grazing, because *E. cinerea* and *Calluna vulgaris* are still plentiful and the heaths have a diverse array of other species. There is no evidence of drainage on these steep rocky slopes and the absence of *E. tetralix* appears to be the result of natural variation in what is a very variable type of vegetation, rather than of inappropriate management. Therefore the failure of this target in these two samples is considered to be unmerited.

Two of the samples were at points that were assigned to blanket bog in the 2009 survey, but that proved on arrival to be wet heath rather than bog, with no blanket bog vegetation within 20 m of the point. They did not show clear signs of having been derived from previous

blanket bog and were therefore assessed using the wet heath targets rather than the bog targets, and were found to meet all CSM targets.

In the site as a whole the wet heaths appear to be in good condition, though there is local damage from ATV vehicles on the eastern side of the Rhinns of Kells and from cattle trampling on Buchan Hill, Craigminn and Craig Lee in upper Glen Trool. This contrasts with the situation in 2009 when browsing, trampling and damage by burning were reported in ten out of twelve samples. In 2013 there was no sign of recent burning and little damage by browsing and trampling, suggesting an improvement over the last four years.

From observations at sample locations and more widely throughout the site it is estimated that below 90% of the total extent of wet heath at this site would pass all CSM targets, but as discussed above the failures due to a lack of *Erica tetralix* appear unmerited, so if they are not counted it is possible that >90% of the wet heath would pass all CSM targets.

3.3.5 Inland rock

(See Plants in crevices on acidic rock (3.1 above) and Acidic scree (below and 3.6.2 under Site Check).

Screes are common on the steeper slopes, especially on Corserine, and there are also examples on the more level ground of the hill tops and ridges. Much of the habitat on slopes is precariously balanced above big drops and is difficult to access safely. All of the seven samples assessed passed all of the SCM targets. The associated vegetation in the sampled screes included *Vaccinium myrtillus-Racomitrium lanuginosum* heath H20, *Carex bigelowii-Racomitrium lanuginosum* heath U10, mossy *Nardus stricta-Galium saxatile* grassland U5e, *Deschampsia cespitosa-Galium saxatile* grassland U13 and the *Cryptogramma crispa-Deschampsia flexuosa* fern community U21.

From observations at sample locations and more widely throughout the site it is estimated that more than 90% of the total extent of inland rock habitat at this site would pass all CSM targets.

3.4 Site check information

Site Check summaries for the general wider observations of montane acid grasslands, acidic scree, dry heaths, wet heaths, blanket bog and depressions on peat substrates are given below.

3.4.1 Site Check summary for montane acid grasslands

Indicators & pressures, etc	Result	Notes
Positive indicators:		
Little disturbance of habitat, with grazing and trampling low.	Y & N	There are large numbers of sheep (and locally goats and red deer) on the high ground and there is considerable evidence of grazing, trampling and droppings in the moss heaths.
Negative indicators:		
Any sign of burning.	N	None
Presence of disturbed bare ground.	N	Very local
Uprooted grass and sedge tillers.	Y	Present but generally very sparse and in samples never recorded as >10% (of plants)
Key pressures:		
Burning	N	None at these altitudes
Game or fisheries management	N	None
Grazing	Y	Varies from light to very heavy
Pollution	N	No clear evidence of pollution except for animal droppings which are abundant
Recreation/disturbance	N	Negligible away from the obvious footpaths
Trampling	Y	Locally common
Approx. extent of feature seen as % of whole site		Total extent estimated at about 5-10% of the site area.
Any other notes		A reduction of sheep grazing on the high ground would benefit this vegetation.

3.4.2 Site Check summary for acidic scree

Screes are common on the steeper slopes, especially on Corserine, and there are also examples on the more level ground of the hill tops and ridges. Much of the habitat on slopes is precariously balanced above big drops and is difficult to access safely. In this survey and in the 2009 survey all surveyed scree samples passed all CSM targets. The associated vegetation in the sampled screes included *Vaccinium myrtillus-Racomitrium lanuginosum* heath H20, *Carex bigelowii-Racomitrium lanuginosum* heath U10, mossy *Nardus stricta-Galium saxatile* grassland U5e, *Deschampsia cespitosa-Galium saxatile* grassland U13 and the *Cryptogramma crispa-Deschampsia flexuosa* fern community U21.

Indicators & pressures, etc	Result	Notes
Positive indicators:		
Little disturbance of vascular plants, lichens and bryophytes on rock, or rock.	Y	Generally not disturbed.
Rock remains exposed, not shaded or overgrown.	Y	Rocks mostly not overgrown.
Negative indicators:		
>25% cover of bracken.	N	None.
>25% cover of trees & scrub.	N	None.
Disturbance by human or animal paths, scree running or vehicles.	Y	Very local, especially on Corserine.
Key pressures:		
Forestry operations	N	None
Game or fisheries management	N	None
Grazing	Y/N	Generally none but localised nibbling of vegetation along sheep and goat tracks
Natural event	Y	Some active scree, especially on the steep slopes of Corserine.
Native invasive species	N	None.
Recreation/disturbance	N	None.
Trampling	Y	Goat tracks through fine scree on the steep slopes of Corserine.
Other pressures:		
Vehicle tracks	Y	Some seen very locally in flattish scree on the summit ridge of Corserine.
Approx. extent of feature seen as % of whole site		Total extent estimated (roughly) at less than 10% of the site area.
Any other notes		Scree is a naturally unstable habitat, but the current pressure from herbivores does not seem to be increasing the rate of erosion.

3.4.3 Site Check summary for subalpine dry heaths

Indicators & pressures, etc	Result	Notes
Positive indicators:		
All growth phases of heather occurring throughout the feature (excluding sensitive areas).	Y	All phases occur but on a large scale, not in the small patterns produced by regular burning
No burning in sensitive areas.	Y	No deliberate burning
At least 50% of vegetation cover consists of ericoids and woolly fringe-moss).	Y	Dense swards of heather and bell heather or blaeberry
Negative indicators:		
Greyish patches (when viewed at a distance) attributable to heavy browsing or insect herbivory.	Y	Healthy heather – possibly a little heather beetle damage but on a very small scale and not a threat to the heaths as a whole.
Drumstick, topiary, or carpet forms of heather widespread.	N	No
Gullying or erosion following burning.	N	No recent burning
Presence of bracken.	Y/N	Mostly absent but very locally present (and >25% cover at 8001).
Presence of soft rush.	N	Generally absent from these dry heaths
Presence of disturbed bare ground.	N	None
More than 20% of ground cover made up of native trees and scrub.	N	None
Key pressures:		
Burning	N	None recent or deliberate – accidental fires reported in previous SCM report now so well recovered that the sites are hard to see.
Game or fisheries management	N	None
Grazing	Y	Grazing pressure is only light
Plant pests and diseases: *Phytophthora ramorum/kernoviae* on Blaeberry; Heather beetle.	N	See above
Native invasive species	N	None
Non-native invasive species	N	None
Trampling	N	Local trampling on steep slopes in upper Glen Trool where there are large numbers of cattle
Other pressures:		
Vehicle tracks	N	None seen in this habitat
Approx. extent of feature seen as % of whole site		Approximately 10-20% (a very rough estimate).
Any other notes		Although dry heath might once have been more extensive here, the existing swards are in good condition and the habitat as a whole appears to be recovering rather than declining further.

3.4.4 Site Check summary for wet heaths

Indicators & pressures, etc	Result	Notes
Positive indicators:		
All growth phases of heather occurring throughout the feature (excluding sensitive areas).	Y	All phases occur but on a large scale, not in the small patterns produced by regular burning
No burning in sensitive areas.	N	No deliberate burning
Neither dwarf shrubs nor graminoids make up more than 75% of vegetation cover.	Y	Both groups more or less equal or graminoids more extensive (but not exceeding 75%).
Negative indicators:		
Greyish patches (when viewed at a distance) attributable to heavy browsing or insect herbivory.	N	No evidence of heavy browsing
Drumstick, topiary, or carpet forms of heather widespread.	N	None seen
Gullying or erosion following burning.	N	No deliberate burning
Presence of bracken.	Y	20% cover at 36 & 145. Otherwise <10%.
Presence of soft rush.	Y	Present but very sparse indeed, and neither a threat nor an indication of poor habitat quality
Presence of disturbed bare ground.	Y	On slopes in upper Glen Trool where there are large numbers of cattle
More than 20% of ground cover made up of native trees and scrub.	N	Absent from these wet heaths.
Key pressures:		
Burning	N	None recent – older burned areas reported in previous SCM report now well-recovered and barely noticeable
Game or fisheries management	N	None
Grazing	Y	Grazing generally light.
Plant pests and diseases: *Phytophthora ramorum/kernoviae* on Blaeberry; Heather beetle.	N	None seen
Native invasive species	N	None
Non-native invasive species	N	None
Trampling	Y	On slopes in upper Glen Trool where there are large numbers of cattle
Other pressures:		
Vehicle tracks	Y	Local, causing damage where they occur but not a threat on a large scale
Approx. extent of feature seen as % of whole site		The most widespread and extensive plant community on the site, accounting for probably over 60% of the total site area.
Any other notes		Some wet heath is on terrain where one might expect blanket bog, but this looks like the result of burning and grazing in the past, as current management seems appropriate to maintain the habitat in good condition.

3.4.5 Site Check summary for blanket bog

Indicators & pressures, etc	Result	Notes
Positive indicators:		
Little bare peat, trampling, or active erosion.	Y	Bare peat, trampling and active erosion were seen only locally and do not threaten the quality of the bogs over the site as a whole.
High cover and frequency of *Sphagnum* and/or bushy *Cladonia* lichens.	Y/N	*Sphagnum* species are abundant and extensive. Bushy *Cladonia* lichens are very common but mostly at low cover.
Negative indicators:		
Any burning into *Sphagnum* (not surface bleaching) or into peat.	N	None seen.
Extent of eroding peat exceeding that of revegetation and redeposition.	N	Revegetation/redeposition exceed erosion almost everywhere.
Presence of trees and scrub.	N	None.
Presence of disturbed bare ground.	N	Very local.
Key pressures:		
Burning	N	No clear signs of burning in bogs at this site.
Game or fisheries management	N	None.
Grazing	N	Grazing intensity generally low and appropriate to maintenance of bog vegetation in good condition.
Native invasive species	N	None.
Trampling	N	Minimal throughout.
Other pressures:		
Vehicle tracks	Y	Present but very local and not adversely affecting bog habitats except on the wetter parts of the Silver Flowe where there is some local damage.
Approx. extent of feature seen as % of whole site		We do not have a vegetation map of the whole site, but we would give a very rough estimate of bog cover as being at least 20% of the whole site.
Any other notes		There is a low cover of dwarf shrubs in the drier parts of the Silver Flowe, and more locally elsewhere, suggesting that the bogs have been burned and perhaps grazed harder in the past than in recent years, but the tall swards and absence of noticeable browsing damage suggests that the vegetation is recovering.

3.4.6 Site Check summary for Depressions on peat substrates (Rhynchosporion hollows)

Indicators & pressures, etc	Result	Notes
Positive indicators:		
Little bare peat, trampling, or active erosion.	Y	Many bog pool habitats include areas of bare wet peat but there was very little evidence of trampling or active erosion except in upper Glen Trool where there are large numbers of cattle.
High cover and frequency of *Sphagnum* and/or bushy *Cladonia* lichens.	Y/N	High cover and frequency of *Sphagnum* but few lichens.
Negative indicators:		
Any burning into *Sphagnum* (not surface bleaching) or into peat.	N	None seen.
Extent of eroding peat exceeding that of revegetation and redeposition.	N	Revegetation/redeposition exceed erosion almost everywhere.
Presence of trees and scrub.	N	None.
Presence of disturbed bare ground.	N	None seen.
Key pressures:		
Burning	N	None seen.
Game or fisheries management	N	No.
Grazing	Mostly N	Grazing is light apart from in upper Glen Trool where there are large numbers of cattle.
Native invasive species	N	None.
Trampling	N	Minimal throughout.
Other pressures:		
Vehicle tracks	Y	Widespread but very local except on the Silver Flowe where quad bike tracks cut through bog pools. It would be worth monitoring the effects of the quad bike access across the Silver Flowe.
Approx. Extent of feature seen as % of whole site		Less than 1% of the whole site area.
Any other notes		*Rhynchospora alba* occurs sparsely here in *Sphagnum denticulatum* bog pools M1 and *Trichophorum germanicum-Erica tetralix* soligenous mires M15a. It is common in the wetter parts of the Silver Flowe, in M1 bog pools with species such as *Erica tetralix, Narthecium ossifragum, Myrica gale, Calluna vulgaris, Drosera rotundifolia, D. anglica, Menyanthes trifoliata, Sphagnum papillosum, S. magellanicum, S. fallax* and *S. denticulatum.* This Rhynchosporion vegetation was sampled at four monitoring points, all of which passed all SCM targets (as in the previous survey).

4. GENERAL OBSERVATIONS AND COMMENTS

The sampled stands of wet heath, dry heath, blanket bog and *Rhynchosporion* hollows passed almost all CSM targets, were structurally and floristically diverse and lightly browsed. There is potentially invasive bracken in the heaths at low to moderate altitudes, and at two locations (wet heath locations 36 and 145) it was found to exceed 10% cover in the general area in 2013 but not in the previous survey in 2009, so it might be increasing here.

The results suggest that the condition of the heaths and bogs has improved quite a lot since 2009. One reason for this might be that the vegetation has now largely recovered from the recent fires that were reported in the previous survey. Another might be that browsing on *Calluna vulgaris* was more evident in 2009, when the fieldwork was carried out in May and June, than it was in 2013 when the fieldwork was done in August. Another confounding factor is that some of the vegetation assessed as blanket bog in 2009 is actually wet heath. However, I also observed less trampling damage in heaths and bogs in 2013, so some of the improvement is likely to be genuine.

Unsurprisingly, there has been no significant change in the condition of rock and scree habitats in the last four years.

Most of the montane acid grassland samples in *Carex-Racomitrium* heath U10 failed to meet the SCM targets, because the cover of grasses and common herbs was greater than 20%. Unfortunately, the methodology does not distinguish between the very mossy heaths, that appear in good condition despite the presence of grasses, and those with little *Racomitrium* that look as if they are grazed and trampled hard. Although it is true to say that almost all the *Carex-Racomitrium* heath in the study area is on the grassy side, it is not true to say that it is all in equally bad condition. It may, indeed, be natural for these southern and western summit heaths to be grassier than their counterparts in the Highlands.

Most of the montane heaths also failed to meet the SCM targets. Here the reason was hard grazing of *Vaccinium myrtillus.* Although this is a problem that could be more apparent than real, it is likely that these small, outlying stands of vegetation are vulnerable to being damaged by too much grazing and erosion on the steep slopes they occupy.

Upland acid grasslands and montane heaths were not surveyed in 2009, so there are no comparisons to be made.

Most of the SSSI is owned by Forestry Commission Scotland and is managed for biodiversity and nature conservation, although because of the pre-existing agricultural tenancies sheep numbers are probably higher than ideal, especially on the high ground at the western side of the site. At the time of the survey in August there were large numbers of sheep on the summits of the Merrick and Kirriereoch Hill. However, during a vegetation survey of open ground for FCS in September 2009 (Averis & Averis 2009) I recorded enormous numbers of sheep and deer on the summit of Kirriereoch over a week when sheep were being gathered from the whole length of the ridge, and it is likely that there are periods most years when grazing is exceptionally hard on the summits.

The summit and high ridges of Corserine are also grazed hard by sheep, and there are large numbers of feral goats here too.

Some of the summit heath vegetation does appear to be excessively grazed and trampled, especially on Corserine and on parts of Kirriereoch Hill, where it has been reduced to a very thin skin of vegetation over stony ground, but elsewhere on the Corserine ridges and on the Merrick and Benyellary there are some fine stands of *Carex-Racomitrium* heath with a deep carpet of *Racomitrium* that seem to be in good condition despite the presence of grasses. A

reduction in the numbers of sheep using these summits would be beneficial, though a complete absence of grazing might result in a denser sward of grasses and the loss of some of the more exacting montane species such as *Salix herbacea.* In the mild climate of southern Scotland, light to moderate grazing is probably necessary to reduce the competition from more vigorous grasses and ensure the survival of the smaller montane plants.

It is also possible that there is some pollution from atmospheric nitrogen, as there is intensively managed and fertilised farmland to the west and south-west (downwind) of these hills. This could lead to an increase in grasses and herbs at the expense of mosses in the summit heaths, which would not only overshadow the mosses and lichens but could attract more grazing animals and intensify the effects of trampling. However, the patchy distribution of mossy and grassy U10 does not suggest a straightforward relationship with presumably widespread and even deposition of nitrogen over the high ground, so there may be another, or more than one, explanation for the variability of this type of vegetation here.

Over most of the ground grazing does not seem excessive, especially in the vast spreads of *Molinia-Potentilla* grassland M25 on the gentler slopes. However, grazing has probably been harder in the past. *Molinia* grasslands such as these are common throughout the western British uplands, and it is thought that they have become more extensive as a result of repeated winter burning followed by grazing, a process that favours *Molinia* at the expense of dwarf shrubs. When wet heaths and bogs are burned in winter, the damp blanket of the dead *Molinia* leaves protects the living shoot-tips from the fire. They are then poised to shoot up in spring, while the dwarf shrubs have to come back from seed. Over decades this can lead to a progressive loss of shrubs and a concomitant increase in *Molinia* (Averis *et al.* 2004). Once this process has occurred it is not easy to reverse, even with favourable management. *Molinia* grassland is very extensive on the lower slopes, in the central area between Glen Trool and Loch Macaterick, and on the drier parts of the Silver Flowe. It is tall, tussocky and a complete nightmare to walk through, but although this makes monitoring work more difficult, it does mean that ordinary walkers tend to stick to the few existing paths and so reduce the amount of disturbance to the site as a whole.

FCS have introduced cattle to upper Glen Trool, in the hope of reducing the overwhelming dominance of *Molinia* in the vegetation there. At the time of the survey there was little sign that this was happening over more than a small area, though there was much damage by trampling in blanket bogs on the low ground and in the wet heaths on Buchan Hill, where cattle seem to move around the area on the same routes.

There are drains and moor-grips in the wetter glens and, most regrettably, on the Silver Flowe. Many of these are still active and running with water. Blocking these, as time and money allow, would raise the water-table and benefit the bog communities.

On the Silver Flowe and on the ridge running north from the summit of Corserine there is evidence of considerable damage from all-terrain vehicles being driven repeatedly over the same route. It is regrettable that the ATV route across the Silver Flowe crosses some of the wetter parts of the bog with a patterned pool-system. It leads from the ford at NX 477 833, crosses the Brishiel Burn a few hundred metres south of the Long Loch of the Dungeon on a bridge made of railway sleepers, and proceeds up the north-facing corrie of Craignaw to the ridge. At the time of the survey the tracks showed signs of recent use, perhaps for shepherding or deer-stalking.

The ATV used on Corserine appears from the width and depth of the vehicle tracks to be something larger, and with a wider wheelbase, than a quad bike. The tracks here are very visible and potentially damaging, with severe erosion likely on the exposed, windswept col between Corserine and Carlin's Cairn. North of Carlin's Cairn the track continues to the

SSSI boundary, whence it winds away into the distance, but here it crosses more resilient vegetation and is not so obvious.

Dayton & Rafferty (2009) recorded evidence of burning in many parts of the SSSI; some recent fires and some persisting damage from the large and extensive accidental fires that occurred in the very dry spring of 2007. In 2013 there was no evidence of recent burning, though there is a large area of vegetation apparently recovering from a fire on the western slopes of Mullwarchar. This area was not visited during this survey but was viewed from a distance.

5. INCIDENTAL RECORDS MADE DURING THE SURVEY

During the survey I recorded *Salix lapponum* on crags at NX 44101 83500 (one of the sample points) and on the north-facing crags of Castle on Oyne, outwith the SSSI, at NX 425 889.

On 27 August 2013 there was a pair of whooper swans on Loch Neldricken, and a single adult golden eagle flying north over Loch Enoch.

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APPENDIX 1: PHOTOGRAPHS OF HABITAT SAMPLE LOCATIONS

Montane acid grassland

Photograph 1. MAG point 1 at NX 41517 83876. Grassy *Carex-Racomitrium* heath. This failed one SCM target because there is too much grass/tormentil/heath bedstraw in the sward.

Photograph 2. MAG point 1 at NX 41517 83876. Looking E from the pint, showing the carpet of *Carex-Racomitrium* heath clothing the stony plateau of Benyellary. Despite the grassiness at the sample point, this view shows that the community is extensive and not generally in poor condition.

Photograph 3. MAG point 2 at NX 42569 85262. Grassy *Carex-Racomitrium* heath with much *Carex bigelowii.* This point failed the CSM targets because of too much grass/tormentil/heath bedstraw and too much grazing.

Photograph 4. MAG point 2 at NX 42569 85262. Looking NE from the point, showing grazed *Carex-Racomitrium* heath with clonal clumps of *Juncus squarrosus* on the southern slope of the Merrick.

Photograph 5. MAG point 3 at NX 42842 85471. *Carex-Racomitrium* heath on the Merrick. This sample passed all CSM targets.

Photograph 6. MAG point 3 at NX 42842 85471. Looking E towards Corserine, showing the extensive carpet of *Carex-Racomitrium* heath on the summit plateau of the Merrick.

Photograph 7. MAG point 4 at NX 42819 85920. *Carex-Racomitrium* heath on Little Spear. This failed the CSM targets because it has a 15% cover of grass/tormentil/heath bedstraw, but note the dense sward of *Racomitrium lanuginosum* and abundant *Carex bigelowii* and *Salix herbacea.*

Photograph 8. MAG point 4 at NX 42819 85920. Looking SW towards the summit of the Merrick, showing the pure swards of *Carex-Racomitrium* heath on Little Spear. This is not in poor condition despite the slightly higher than ideal cover of grass/tormentil/heath bedstraw.

Photograph 9. MAG point 5 at NX 42683 86300. *Carex-Racomitrium* heath on the col between Little Spear and Kirriereoch Hill. This passed all CSM targets.

Photograph 10. MAG point 5 at NX 42683 86300. Looking N from the point over *Carex-Racomitrium* heath on the stony col between Little Spear and Kirriereoch Hill.

Photograph 11. MAG point 6 at NX 42063 86924. Open sward of *Carex-Racomitrium* heath on Kirriereoch Hill. This passed all CSM targets.

Photograph 12. MAG point 6 at NX 42063 86924. Looking WNW over the smooth grey carpet of *Carex-Racomitrium* heath on Kirriereoch Hill. Most of this is in good condition despite high numbers of sheep and deer.

Photograph 13. MAG point 7 at NX 41986 87022. *Carex-Racomitrium* heath on Kirriereoch Hill: in generally good condition with a continuous mat of *Racomitrium lanuginosum* and much *Carex bigelowii* despite having a 50% cover of grass/tormentil/heath bedstraw.

Photograph 14. MAG point 7 at NX 41986 87022. Looking W over the plateau of Kirriereoch Hill with its sward of grassy *Carex-Racomitrium* heath.

Photograph 15. MAG point 8 at NX 50441 87285. *Carex-Racomitrium* heath on Craigrine, Corserine. This failed the CSM targets because of too much grass/tormentil/heath bedstraw, and is genuinely in poor condition with a very short, open, patchy sward of *Racomitrium* and much bare ground.

Photograph 16. MAG point 8 at NX 50441 87285. Looking S from the conspicuous cairn over the short, sparse, heavily-browsed and trampled sward of *Carex-Racomitrium* heath.

Photograph 17. MAG point 9 at NX 49783 87076. *Carex-Racomitrium* heath at the summit of Corserine. This failed the CSM targets because of too much grass/tormentil/heath bedstraw and is also in poor condition, with a thin, open carpet of grasses and *Vaccinium* and a little *Carex bigelowii* and *Racomitrium lanuginosum.*

Photograph 18. MAG point 9 at NX 49783 87076. Looking E towards the trig point on Corserine over thin, hard-grazed *Carex-Racomitrium* heath on the stony summit plateau.

Photograph 19. MAG point 10 at NX 49688 88348. *Carex-Racomitrium* heath on Carlin's Cairn. Though this failed the CSM targets because of 25% cover of grass/tormentil/heath bedstraw, it is still in reasonably good condition with a continuous sward of *Racomitrium lanuginosum.*

Photograph 20. MAG point 10 at NX 49688 88348. Looking NE to Carlin's Cairn over grassy *Carex-Racomitrium* heath on this stony plateau.

Photograph 21. MAG point 11 at NX 49645 89305. *Carex bigelowii*-dominated *Carex-Racomitrium* heath on the ridge N of Carlin's Cairn. This failed the CSM targets though having too much grass/tormentil/heath bedstraw, but is also in rather poor condition because of the overwhelming dominance of the sedge.

Photograph 22. MAG point 11 at NX 49645 89305. Looking W over *Carex bigelowii* swards dotted with clumps of *Nardus stricta.*

Photograph 23. MAG point 12 at NX 49579 88817. *Carex-Racomitrium* heath in good condition on the northern slopes of Carlin's Cairn. This example passed all the CSM targets.

Photograph 24. MAG point 12 at NX 49579 88817. Looking S towards the summit of Carlin's Cairn showing the dense carpet of *Carex-Racomitrium* heath on the top of this narrow ridge.

Montane heath

Photograph 25. MH point 1 at NX 40674 85548. Montane *Vaccinium-Racomitrium* heath with a very short sward of dwarf shrubs. This failed the CSM targets as it had too high a cover of grasses.

Photograph 26. MH point 1 at NX 40674 85548. Looking N towards Kirriereoch Hill, showing the swards of *Vaccinium-Racomitrium* heath almost concealed by tall tussocks of *Nardus stricta* on the west ridge of the Merrick.

Photograph 27. MH point 2 at NX 41847 85004. Grassy sward of *Vaccinium-Racomitrium* heath. This failed the CSM targets as it had too much grass and too much grazing of *Vaccinium myrtillus.*

Photograph 28. MH point 2 at NX 41847 85004. Looking E along the western ridge of the Merrick towards the summit. Grassy montane *Vaccinium-Racomitrium* heath along the ridge top.

Photograph 29. MH point 3 at NX 41508 83919. *Vaccinium-Racomitrium* heath on steep rocky ground. This sample failed the CSM targets as more than 50% of the *Vaccinium* shoots were browsed, but structurally and floristically it is not in poor condition.

Photograph 30. MH point 3 at NX 41508 83919. On steep rocky ground at the top of the north face of Benyellary. This is looking NNE along the ridge to the Merrick, showing dry heath on the steep slopes giving way to montane heath just below the crest of the ridge.

Photograph 31. MH point 4 at NX 49555 88940. *Vaccinium-Racomitrium* heath on Carlin's Cairn. This sample failed the CSM targets with too much grass and too much grazing, but has a diverse sward with *Salix herbacea* as well as *Vaccinium myrtillus* and *Empetrum nigrum* ssp. *hermaphroditum.*

Photograph 32. MH point 4 at NX 49555 88940. Looking NNW along the steep north-east face of Carlin's Cairn, with *Vaccinium-Racomitrium* heath on the rocky upper slopes.

Photograph 33. MH point 5 at NX 49741 88368. *Vaccinium-Racomitrium* heath E of Carlin's Cairn. This sample failed the CSM targets because of too much grazing on *Vaccinium myrtillus*, but is otherwise in good condition.

Photograph 34. MH point 5 at NX 49741 88368. *Vaccinium-Racomitrium* heath on stony ground around rock outcrops east of the summit of Carlin's Cairn.

Photograph 35. MH point 6 at NX 45906 83659. Prostrate *Calluna-Racomitrium* heath with *Huperzia selago* on Craignaw. This sample passed all the CSM targets.

Photograph 36. MH point 6 at NX 45906 83659. Looking E from the summit of Craignaw, showing prostrate *Calluna-Vaccinium* heath on thin stony soil between large outcrops of granite pavement.

Dry heath

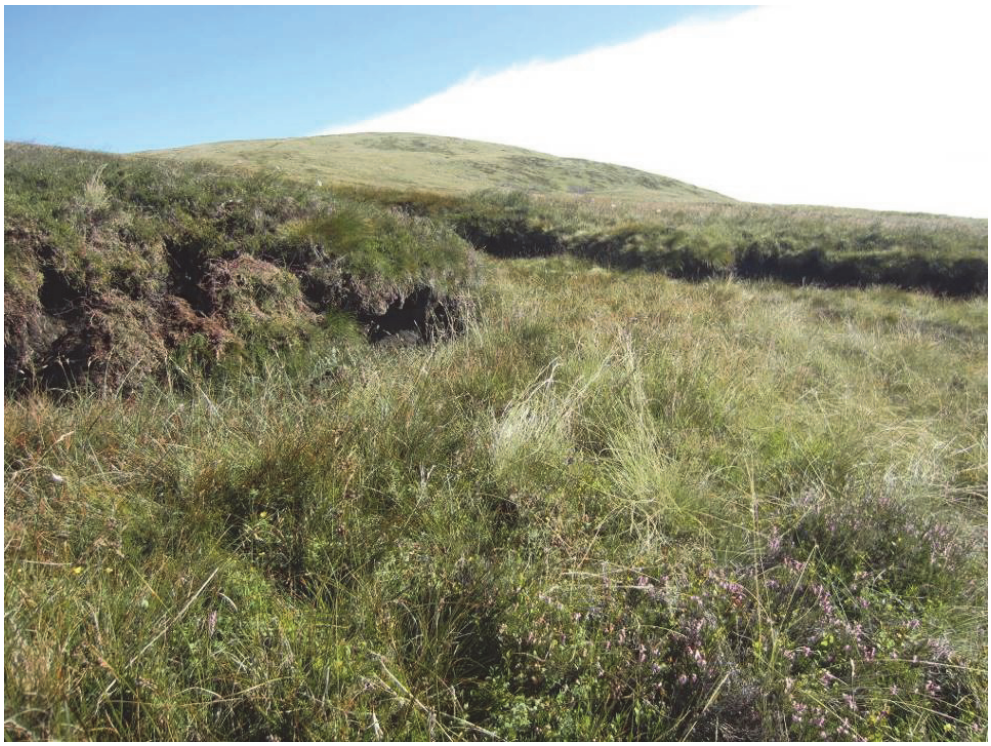
Photograph 37. DH point 8001 at NX 44030 79650. Distant view towards the sample: the dark patch on the left hand side of the steep rocky slope in the middle distance. There was too much rain and too many midges at the actual site for taking a close photograph, but the *Calluna-Erica* heath resembled the stand in the foreground and passed all the CSM targets at the point, though there was potential bracken invasion in similar vegetation nearby.

Photograph 38. DH point 8002 at NX 44479 79690. Tall, lightly-grazed *Calluna-Erica* heath on a steep rocky slope. This sample passed all the CSM targets.

Photograph 39. DH point 8002 at NX 44479 79690. Looking N from the point showing how *Calluna-Erica* heath is confined to the steeper slopes around rock outcrops. Some trampling by cattle around the base of the rock, but not enough to fail the trampling criterion.

Photograph 40. DH point 8003 at NX 40891 83250. *Calluna-Vaccinium* heath on revegetated peat at the edge of eroding blanket bog on Benyellary. This example passed all the CSM targets.

Photograph 41. DH point 8003 at NX 40891 83250. Looking NE across the *Calluna-Vaccinium* heath on revegetated peat to the eroding edge of *Calluna-Eriophorum* blanket bog beyond.



Photograph 42. DH point DH9004 at NX 39873 88230. *Calluna-Erica-Vaccinium* heath in good condition just outside the SSSI N of Kirriereoch Hill. This passed all the CSM targets.

Photograph 43. DH point DH 9004 at NX 39873 88230. The view E up the glen towards Tarfessock, with Kirriereoch Hill on the right.

Photograph 44. DH point DH 9005 at NX 43565 88414. *Calluna-Erica* heath on a steep west-facing slope on Millmore. This example passed all the CSM targets.

Photograph 45. DH point DH 9005 at NX 43565 88414. Looking S from the point, showing *Calluna-Erica* heath on the steep rocky bank to the left and *Trichophorum-Erica* wet heath on the gentle ground to the right.

Photograph 46. DH point DH 9006 at NX 51272 87537. *Vaccinium-Deschampsia* heath in good condition in the eastern corrie of Corserine. This example passed all the CSM targets.

Photograph 47. DH point DH 9006 at NX 51272 87537. Looking E from the point, showing patches of *Vaccinium-Deschampsia* heath in a matrix of acid grassland.

Photograph 48. DH point DH 9007 at NX 42976 86924. *Calluna-Erica-Vaccinium* heath on the eastern side of Kirriereoch Hill. This sample passed all the CSM targets.

Photograph 49. DH point DH 9007 at NX 42976 86924. Looking SW towards the ridge of Kirriereoch Hill, Little Spear and the Merrick showing dry heath on moraines and wet heath on the deeper soils and gentler slopes between. More dry heath on the steep sides of the ridge.

Photograph 50. DH point DH 9008 at NX 43611 84262. *Calluna-Erica-Vaccinium* heath on Craig Neldricken. This point passed all the CSM targets.

Photograph 51. DH point DH 9008 at NX 43611 84262. Looking S from the point showing dry heath on steep rocky slopes and wet heath on gentler slopes.

Wet heath

Photograph 52. WH point 36 at NX 45962 81507. *Trichophorum-Erica* wet heath. In good condition at the actual point, this example failed because of possibly invasive bracken in the surrounding area.

Photograph 53. WH point 36 at NX 45962 81507. Looking N to the rocky slopes of Snibe Hill with mosaics of wet heath and bracken.

Photograph 54. WH point 65 (BB) at NX 43368 89534. *Trichophorum-Erica* wet heath on the west side of Macaterick. Previously assessed as blanket bog in poor condition, it is actually wet heath that passes all the CSM targets.

Photograph 55. WH point 65 (BB) at NX 43368 89534. Looking SSW to Castle on Oyne and Kirriereoch Hill showing extensive wet heath and blanket bog on the smooth lower slopes and floor of this wide glen.

Photograph 56. WH point 98 at NX 43150 87616. *Trichophorum-Erica* wet heath on the col between Kirriereoch Hill and Rig of Millmore. This example passed all the CSM targets.

Photograph 57. WH point 98 at NX 43150 87616. Looking SW towards Mullwharchar over extensive tracts of wet heath and blanket bog.

Photograph 58. WH point 145 at NX 46135 81565. *Trichophorum-Erica* wet heath. In good condition at the actual point, this example failed because of possibly invasive bracken in the surrounding area.

Photograph 59. WH point 145 at NX 46135 81565. Looking ENE at the craggy slopes of Snibe Hill with mosaics of wet heath, bracken and *Molinia* grassland.

Photograph 60. WH point 164 at NX 45940 82131. *Racomitrium*-rich *Trichophorum-Erica* wet heath on Snibe Hill. This point failed the CSM targets because there was *Erica cinerea* rather than *E. tetralix* in the sward, though this is not unusual in this sub-community and the heath is otherwise in good condition.

Photograph 61. WH point 164 at NX 45940 82131. Mosaics of wet heath, blanket bog and *Molinia* grassland looking WNW over the rocky summit of Snibe Hill.

Photograph 62. WH point 205 at NX 45339 81333. *Racomitrium*-rich *Trichophorum-Erica* wet heath on the Rig of the Jarkness. This point failed the CSM targets because there was *Erica cinerea* rather than *E. tetralix* in the sward, though this is not unusual in this sub-community and the heath is otherwise in good condition.

Photograph 63. WH point 205 at NX 45339 81333. Looking NNW down the slopes of the Rig of the Jarkness with tall, lightly grazed wet heath to Loch Narroch in its boggy hollow.

Photograph 64. WH point 215 at NX 45644 83048. Wet heath on the western slope of Craignaw. This example passed all the CSM targets.

Photograph 65. WH point 215 at NX 45644 83048. Looking E at wet heath on the rocky slopes of Craignaw.

Photograph 66. WH point WH1 at NX 40465 85861. *Trichophorum-Erica* heath in good condition on the north side of the west ridge of the Merrick. This example passed all the CSM targets.

Photograph 67. WH point WH1 at NX 40465 85861. Looking W over the wet heath on gentle slopes to the blanket bogs in the glen beyond.

Blanket bog

Photograph 68. BB point 20 at NX 43229 87986. *Calluna-Eriophorum* bog on Rig of Millmore. This example passed all the CSM targets.

Photograph 69. BB point 20 at NX 43229 87986. Looking N over Millmore and Macaterick showing extensive bogs and wet heaths on gentle slopes and in wide glens.

Photograph 70. BB point 36 at NX 45996 81502. *Trichophorum-Eriophorum* bog in the glen between Craiglee and Snibe Hill. This example passed all the CSM targets.

Photograph 71. BB point 36 at NX 45996 81502. Looking NE at the rocky slopes of Snibe Hill over the swards of blanket bog in the floor of the glen.

Photograph 72. BB point 70 at NX 40836 85950. *Trichophorum-Eriophorum* blanket bog in the glen of the Kirshirroch Burn. This example passed all the CSM targets.

Photograph 73. BB point 70 at NX 40836 85950. Looking E up the glen of the Kirshirroch Burn showing extensive blanket bog on the level floor. Little Spear and the Merrick at the head of the glen.

Photograph 74. BB point 83 at NX 40743 86235. *Calluna-Eriophorum* blanket bog in the lower glen of the Kirshirroch Burn. This example passed all the CSM targets.

Photograph 75. BB point 83 at NX 40743 86235. Looking E up the glen over the spreads of bog on the level peaty floor. Kirriereoch Hill on the left and the Merrick on the right.

Photograph 76. BB point 116 at NX 42734 87420. *Trichophorum-Eriophorum* bog on the eastern slopes of Kirriereoch Hill. This example passed all the CSM targets.

Photograph 77. BB point 116 at NX 42734 87420. Looking E to Mullwharchar across mosaics of blanket bog, wet heath and *Molinia* grassland on gentle slopes.

Photograph 78. BB point 125 at NX 43667 86199. *Calluna-Eriophorum* bog on the Rig of Munshalloch. This example passed all the CSM targets.

Photograph 79. BB point 125 at NX 43667 86199. Looking E to Mullwharchar across extensive blanket bogs.

Photograph 80. BB point 138 at NX 43553 88961. *Trichophorum-Eriophorum* bog north of Millmore. This example passed all the CSM targets.

Photograph 81. BB point 138 at NX 43553 88961. Looking W over extensive blanket bogs to Kirriereoch Hill.

Photograph 82. BB point 140 at NX 43097 89444. *Trichophorum-Eriophorum* blanket bog close to the Tunskeen Lane. This example passed all the CSM targets.

Photograph 83. BB point 140 at NX 43097 89444. Looking SW to Castle on Oyne over extensive blanket bog on level ground and gentle slopes.

Photograph 84. BB point 172 at NX 44003 86050. Wet *Trichophorum-Eriophorum* blanket bog on the Rig of Munshalloch. This example passed all the CSM targets.

Photograph 85. BB point 172 at NX 44003 86050. Looking SW across extensive blanket bogs in this wide, shallow depression. The Merrick and Little Spear on the horizon.

Photograph 86. BB point 247 at NX 43313 87363. *Trichophorum-Eriophorum* blanket bog on the plateau between Kirriereoch Hill and Millmore. This example passed all the CSM targets.

Photograph 87. BB point 247 at NX 43313 87363. Looking ESE across extensive bogs and wet heaths towards Mullwharchar.

Photograph 88. BB point 8004 at NX 45471 81382. *Trichophorum-Eriophorum* bog with pools in the peat-covered flats E of Loch Narroch. This example passed all the CSM targets.

Photograph 89. BB point 8004 at NX 45471 81382. Looking NE over the bogs with their pool systems to the rocky slopes of Craignaw.

Photograph 90. BB point 8005 at NX 45395 81384. Wet *Trichophorum-Eriophorum* blanket bog near the eastern end of Loch Narroch. This example passed all the CSM targets.

Photograph 91. BB point 8005 at NX 45395 81384. Looking W across peaty pools in wet blanket bog with the rocky slopes of the Rig of the Jarkness beyond.

Photograph 92. BB point 8008 at NX 40206 86232. *Trichophorum-Eriophorum* bog and flushed channels with *Juncus acutiflorus* mire in the lower glen of the Kirshirroch Burn. This example passed all the CSM targets.

Photograph 93. BB point 8008 at NX 40206 86232. Looking E up the glen over the bogs in the floor.

Photograph 94. BB point 8012 at NX 43626 88194. *Calluna-Eriophorum* blanket bog on Rig of Millmore. This example passed all the CSM targets.

Photograph 95. BB point 8012 at NX 43626 88194. Looking SW to Kirriereoch Hill, showing mosaics of bog and wet heath on smooth gentle slopes.

Photograph 96. BB point 8017 at NX 43378 83537. Wet *Trichophorum-Eriophorum* bog on the Rig of Loch Enoch. This example passed all the CSM targets.

Photograph 97. BB point 8017 at NX 43378 83537. Looking N to the eastern ridge of the Merrick showing small stand of blanket bog in this wet depression on the top of the Rig of Loch Enoch.

Photograph 98. BB point BB1 at NX 47383 83535. *Trichophorum-Erica* and *Erica-Sphagnum* bog E of Loch Dungeon, on the Silver Flowe. This example passed all the CSM targets.

Photograph 99. BB point BB1 at NX 47383 83535. Looking SW across the almost level surface of the Silver Flowe to the cliffs of Craignaw.

Photograph 100. BB point BB2 at NX 47092 84601. *Trichophorum-Erica* and *Erica-Sphagnum* bog on the Silver Flowe. This example passed all the CSM targets.

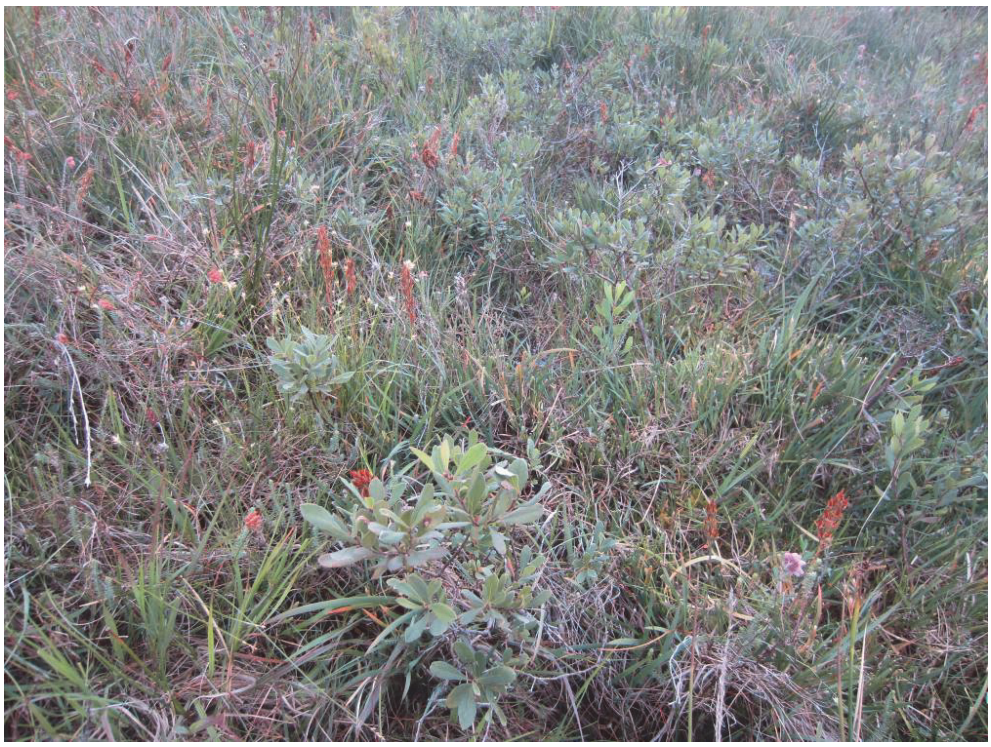
Photograph 101. BB point BB2 at NX 47092 84601. Looking NE towards Corserine over the bog surface.

Photograph 102. BB point BB3 at NX 47696 83235. *Trichophorum-Erica* and *Erica-Sphagnum* bog on the Silver Flowe. This example passed all the CSM targets.

Photograph 103. BB point BB3 at NX 47696 83235. Looking NW over the bog towards Dungeon Hill. Note quad bike tracks through the bog vegetation in the foreground.

***Rhynchosporion* hollows**

Photograph 104. RH point RH1 at NX 43563 79753. *Rhynchospora alba* in *Trichophorum-Erica* flush E of Glenhead. This example passed all the CSM targets.



Photograph 105. RH point RH2 at NX 47443 83195. *Rhynchospora alba* in *Erica-Sphagnum* bog on the Silver Flowe. This example passed all the CSM targets.

Photograph 106. RH point RH2 at NX 47443 83195. Looking NW across the Silver Flowe to Dungeon Hill. Quad bike tracks through wet bog and pool systems on the left of the photograph.

Photograph 107. RH point RH3 at NX 47579 83202. *Rhynchospora alba* in *Erica-Sphagnum* bog on the Silver Flowe. This example passed all the CSM targets.

Photograph 108. RH point RH3 at NX 47579 83202. Looking NE across the Silver Flowe towards Backhill of Bush. Wet blanket bog with pool systems and *Rhynchospora* hollows.

Photograph 109. RH point RH4 at NX 47696 83235. *Rhynchospora alba* in *Erica-Sphagnum* bog on the Silver Flowe. This example passed all the CSM targets.

Photograph 110. RH point RH4 at NX 47696 83235. Looking NW across the Silver Flowe to Dungeon Hill.

Siliceous rock

Photograph 111. SR 6 at NX 42755 86315. Rock pavement on the col between Little Spear and Kirriereoch Hill. Looking N to Kirriereoch Hill. This example passed all the CSM targets.

Photograph 112. SR 22 at NX 41516 83959. Rock outcrops with *Vaccinium-Racomitrium* heath at the top of the steep north face of Benyellary. This example passed all the CSM targets.

Photograph 113. SR 31 at NX 45948 80785. Granite outcrops and boulders in *Trichophorum-Erica* wet heath on Craiglee. This example passed all the CSM targets.

Photograph 114. SR 40 at NX 51272 87537. Rock outcrop with damp *Calluna-Vaccinium-Sphagnum* heath on the steep eastern slope of Craigrine. This example passed all the CSM targets.

Photograph 115. SR 77 at NX 46290 83698. Shattered rock outcrop in *Trichophorum-Erica* wet heath on the very steep eastern face of Craignaw. This example passed all the CSM targets.

Photograph 116. SR 77 at NX 46290 83698. Looking NE from the point over the Round Loch and Long Loch of the Dungeon with the bogs of the Silver Flowe beyond and Corserine on the skyline.

Photograph 117. SR 91 at NX 45689 83896. Granite outcrop at the northern end of Craignaw, in *Trichophorum-Erica* wet heath. This example passed all the CSM targets.

Photograph 118. SR 105 at NX 45800 80473. Granite outcrops and perched boulders in *Trichophorum-Erica* wet heath on gentle to moderate slope of Craiglee. This example passed all the CSM targets.

Photograph 119. SR 139 at NX 45716 83634. Rock pavement with sparse *Trichophorum germanicum* in cracks on Craignaw. This example passed all the CSM targets.

Photograph 120. SR 144 at NX 50552 87646. Eroding rock outcrop with *Vaccinium-Racomitrium* heath and *Carex-Racomitrium* moss heath on Craigrine, Corserine. This example failed the CSM targets because of too much grazing on *Vaccinium myrtillus.*

Photograph 121. SR 144 at NX 50552 87646. Looking W over eroding rock outcrops on the steep upper slopes of Craigrine.

Photograph 122. SR 164 at NX 45940 82131. Granite outcrop in *Trichophorum-Erica* wet heath and *Molinia* grassland on Snibe Hill. The view out to the west from the point. This point failed the CSM targets because of too much grazing on the dwarf shrubs.

Photograph 123. SR 181 at NX 51222 87462. Conspicuous rock outcrop with *Festuca-Agrostis-Galium* grassland on the eastern slopes of Craigrine. This is the view from slightly upslope and SW of the point. This example passed all the CSM targets.

Photograph 124. SR 215 at NX 45644 83042. Granite outcrop with *Trichophorum-Erica* wet heath and *Festuca-Agrostis-Galium* grassland on the western side of Craignaw. This example passed all the CSM targets.

Photograph 125. SR 8023 at NX 49792 89929. Rock outcrop with montane mossy *Nardus-Galium* grassland on Goat Craigs, Corserine. This example passed all the CSM targets.

Photograph 126. SR 8024 at NX 50399 87413. Eroding rock outcrops with montane mossy *Festuca-Agrostis-Galium* grasslands and *Carex-Racomitrium* heath on Polmaddy Gairy, Corserine.

Photograph 127. SR 8025 from NX 50809 86786. Rock outcrops with *Trichophorum-Erica* wet heath on the north side of North Gairy, Corserine. This example passed all the CSM targets.

Photograph 128. SR 8026 from NX 50809 86786. Rock outcrops with *Trichophorum-Erica* wet heath on the north side of North Gairy, Corserine. This example passed all the CSM targets.

Photograph 129. SR1 at NX 41709 85886. Rock outcrop with *Calluna-Vaccinium* heath and *Vaccinium-Deschampsia* heath low down on the north-facing crags of Black Gairy, the western spur of the Merrick.

Photograph 130. SR2 at NX 43951 88532. Rock outcrop with *Calluna-Erica* heath on Millmore. This example passed all the CSM targets.

Photograph 131. SR3 at NX 49699 87804. Eroding rock outcrop on the southern slope of Carlin's Cairn, Corserine, with montane mossy *Nardus-Galium* grassland U5e. This example passed all the CSM targets.

Photograph 132. SR4 at NX 49556 88941. Rock outcrops with *Vaccinium-Racomitrium* heath on the top of the eastern face of Carlin's Cairn, Corserine. This example passed all the CSM targets.

Photograph 133. SR5 at NX 44000 83500. Granite outcrop with *Calluna-Erica* heath and *Trichophorum-Erica* wet heath on the steep slope between Loch Neldricken and Loch Arron. This example passed all the CSM targets.

Photograph 134. SR A6 at NX 44101 85085. Granite outcrop at the western side of Loch Enoch, with *Luzula-Vaccinium* tall herb vegetation. This example passed all the CSM targets.

Photograph 135. SR A6 at NX 44101 85085. Looking NNW along the rock face from the point showing habitat of *Salix lapponum*: small bushes close to the top of the crag.

Photograph 136. SR A7 at NX 46290 83698. Rock outcrop on the very steep eastern face of Corserine, with *Trichophorum-Erica* wet heath. This example passed all the CSM targets.

Siliceous scree

Photograph 137. SS 22 at NX 41507 83960. Scree with *Vaccinium-Racomitrium* heath at the top of the steep north face of Benyellary. This example passed all the CSM targets.

Photograph 138. SS 22 at NX 41507 83960. Looking N along the ridge towards the Merrick, showing extensive screes on the steep slopes.

Photograph 139. SS 1 at NX 42396 86739. Scree on the south-facing slope of Kirriereoch Hill with *Carex-Racomitrium* moss heath and *Vaccinium-Racomitrium* heath. This example passed all the CSM targets.

Photograph 140. SS 1 at NX 42396 86739. Looking SE towards Little Spear and the Merrick, showing patches of scree in montane heath and grassland on a steep slope.

Photograph 141. SS 2 at NX 49680 88196. Scree in *Carex-Racomitrium* heath on Carlin's Cairn. Corserine. This example passed all the CSM targets.

Photograph 142. SS 2 at NX 49680 88196. Looking NE up the slope (summit out of sight to the left) showing patches of scree and rock detritus surrounded by montane moss heath.

Photograph 143. SS 3 at NX 49621 88621. Scree with *Carex-Racomitrium* heath on Carlin's Cairn, Corserine. This example passed all the CSM targets.

Photograph 144. SS 4 at NX 49741 88368. Block scree to the east of the summit of Carlin's Cairn, with *Cryptogramma-Deschampsia* fern community and *Carex-Racomitrium* heath. This example passed all the CSM targets.

Photograph 145. SS 5 at NX 50177 87121. Fine-grained scree at the top of the northern corrie of Corserine, with *Carex-Racomitrium* heath and *Deschampsia-Galium* grassland. This example passed all the CSM targets.

Photograph 146. SS 5 at NX 50177 87121. Looking NE along the top of the slope, showing scree formation extending back from the break of slope. The slope below is largely scree and it is possible that at least some of the erosion is initiated by goats.

Photograph 147. SS 6 at NX 43182 85169. Scree on Redstone Rig, the eastern spur of the Merrick, with montane mossy *Nardus-Galium* grassland U5e. This example passed all the CSM targets.

Photograph 148. SS 6 at NX 43182 85169. Looking E across the mosaics of scree, rock outcrops, *Carex-Racomitrium* heath and montane mossy *Nardus-Galium* grassland. Corserine on the horizon.

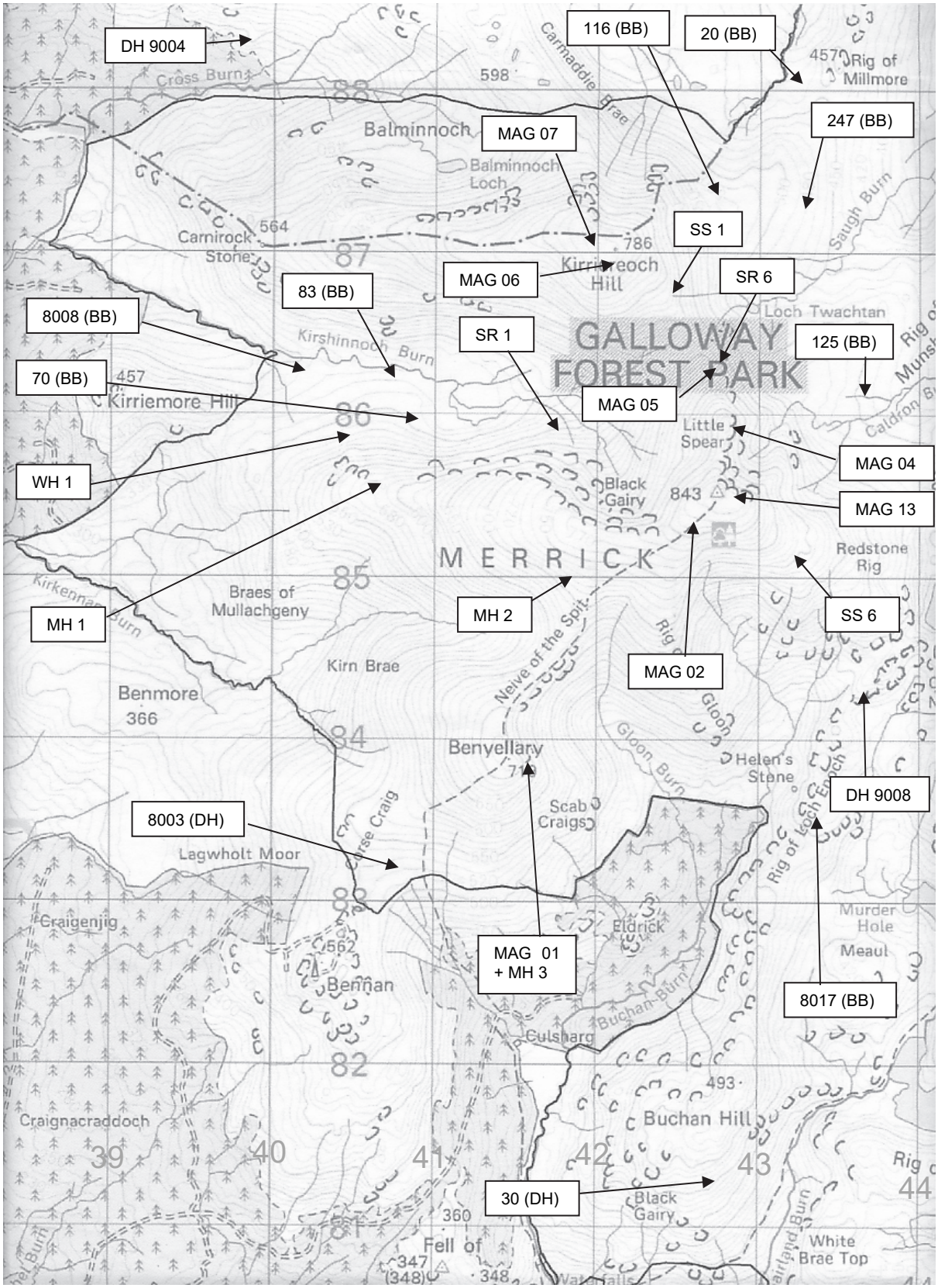
Photograph 149. Vehicle damage high up on the ridge in the east of the site, between Corserine and Carlin's Cairn.

APPENDIX 2: MAPS

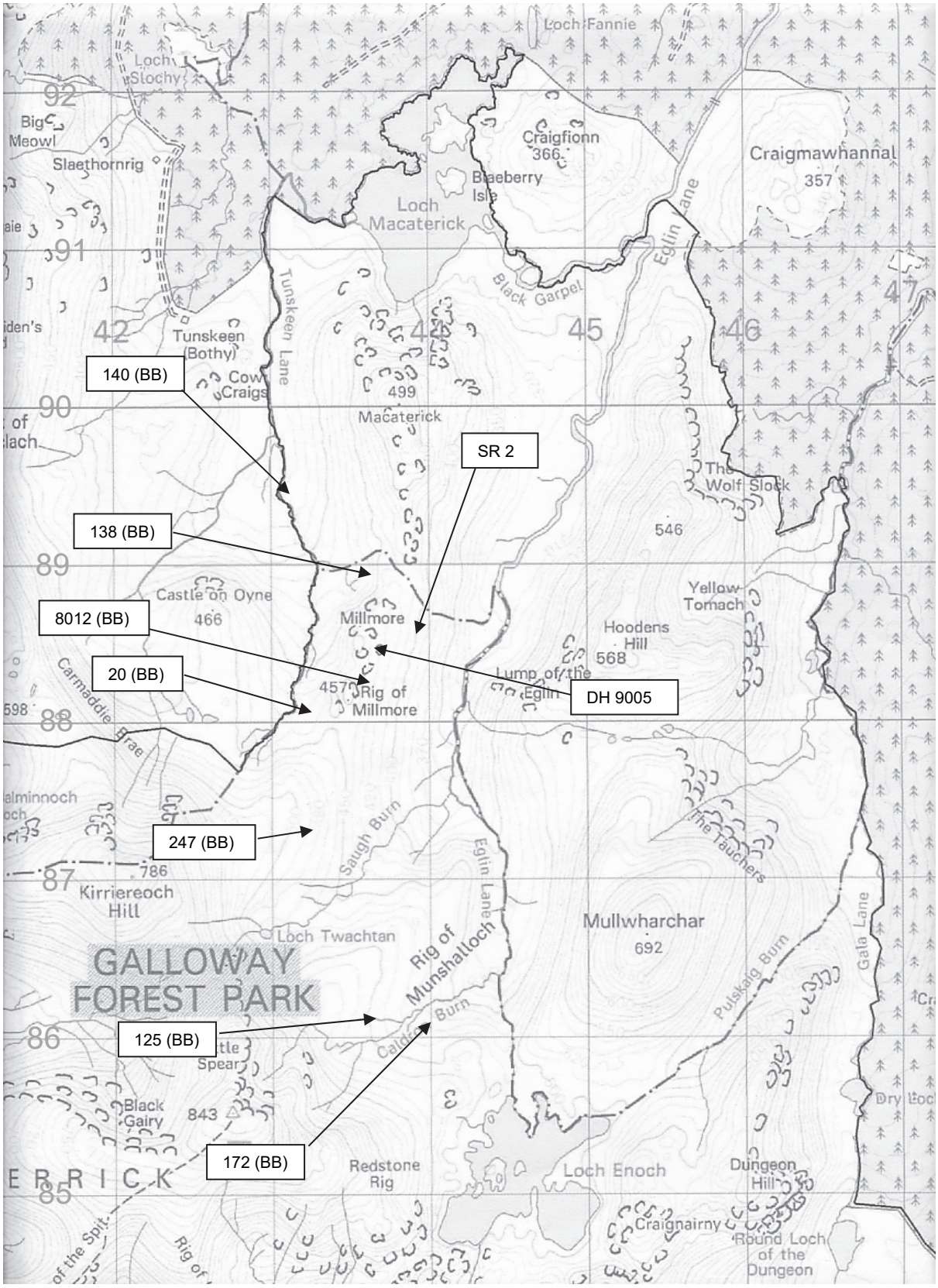
The sample locations in the Merrick Kells SSSI/SAC where habitat condition was assessed using Common Standards Monitoring methods by Alison Averis in August 2013 are shown in the maps in this appendix. The base maps used here are scanned from larger base maps (on A3-size sheets, with the SSSI boundary marked as a solid black line) provided by Scottish Natural Heritage.

Map 1. Sample locations where Common Standards Monitoring was carried out in the NW part of Merrick Kells SSSI/SAC in August 2013

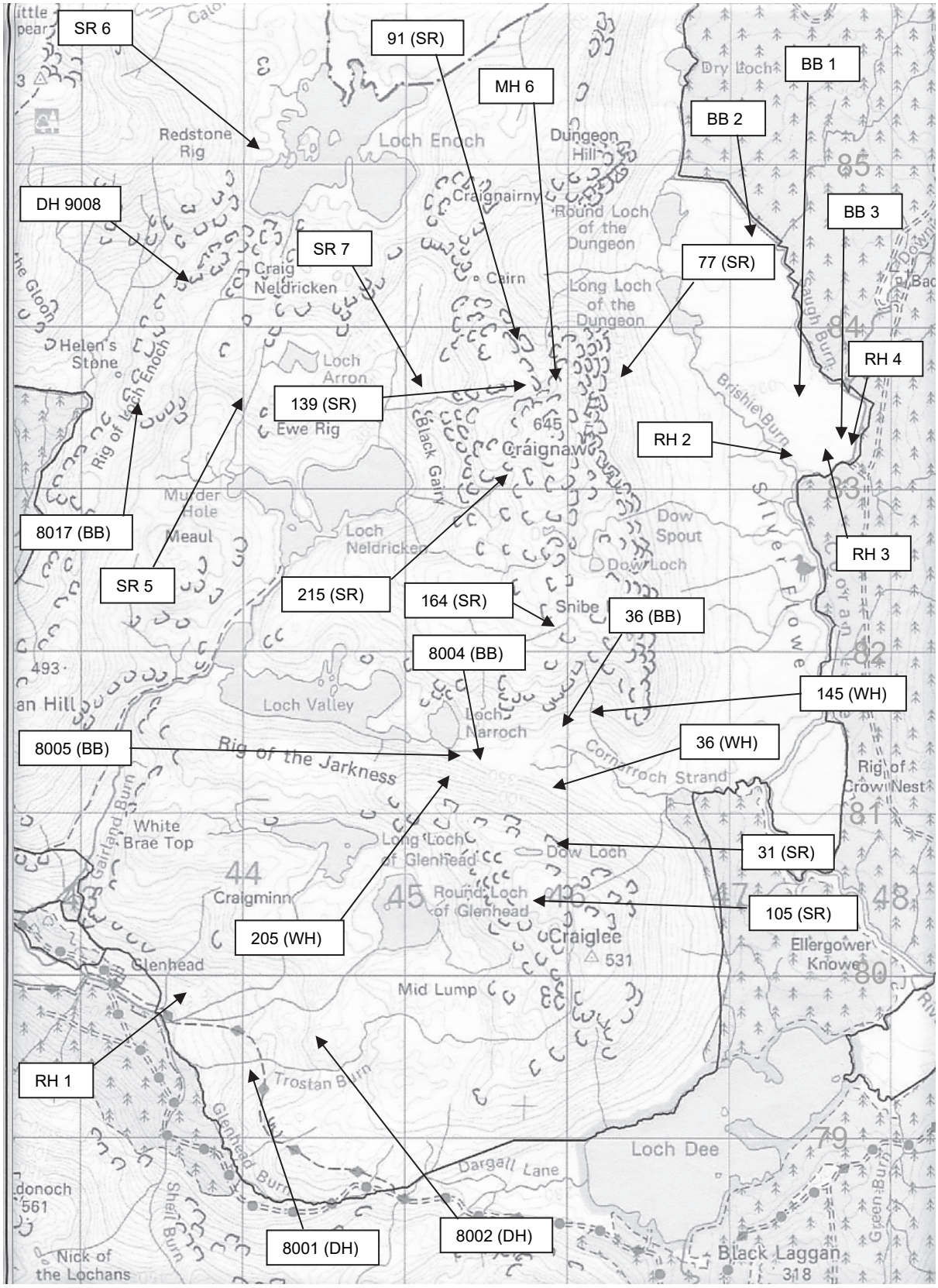
In the labels, numbers before letters (these letter being in brackets) are for locations included in previous SCM survey work here. Labels with letters before numbers are 'new' locations not recorded in previous surveys. Abbreviations for habitat types: BB = blanket bog; DH = dry heath; MAG = montane acid grassland; MH = montane heath; RH = Rhynchosporion; SR = siliceous rock; SS = siliceous scree; WH = wet heath.



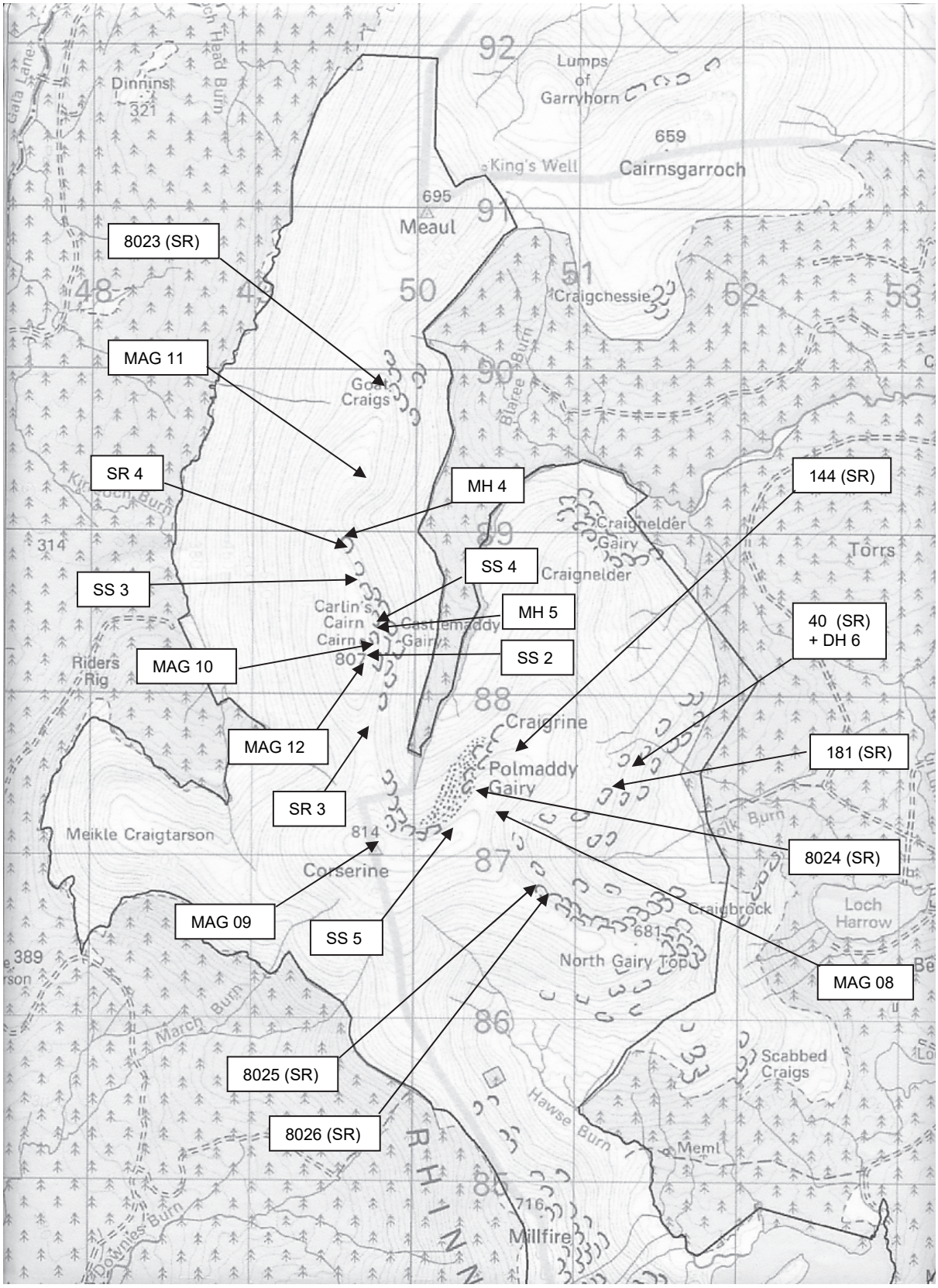
Map 2. Sample locations where Common Standards Monitoring was carried out in the N part of Merrick Kells SSSI/SAC in August 2013



Map 3. Sample locations where Common Standards Monitoring was carried out in the S part of Merrick Kells SSSI/SAC in August 2013



Map 4. Sample locations where Common Standards Monitoring was carried out in the NE part of Merrick Kells SSSI/SAC in August 2013



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