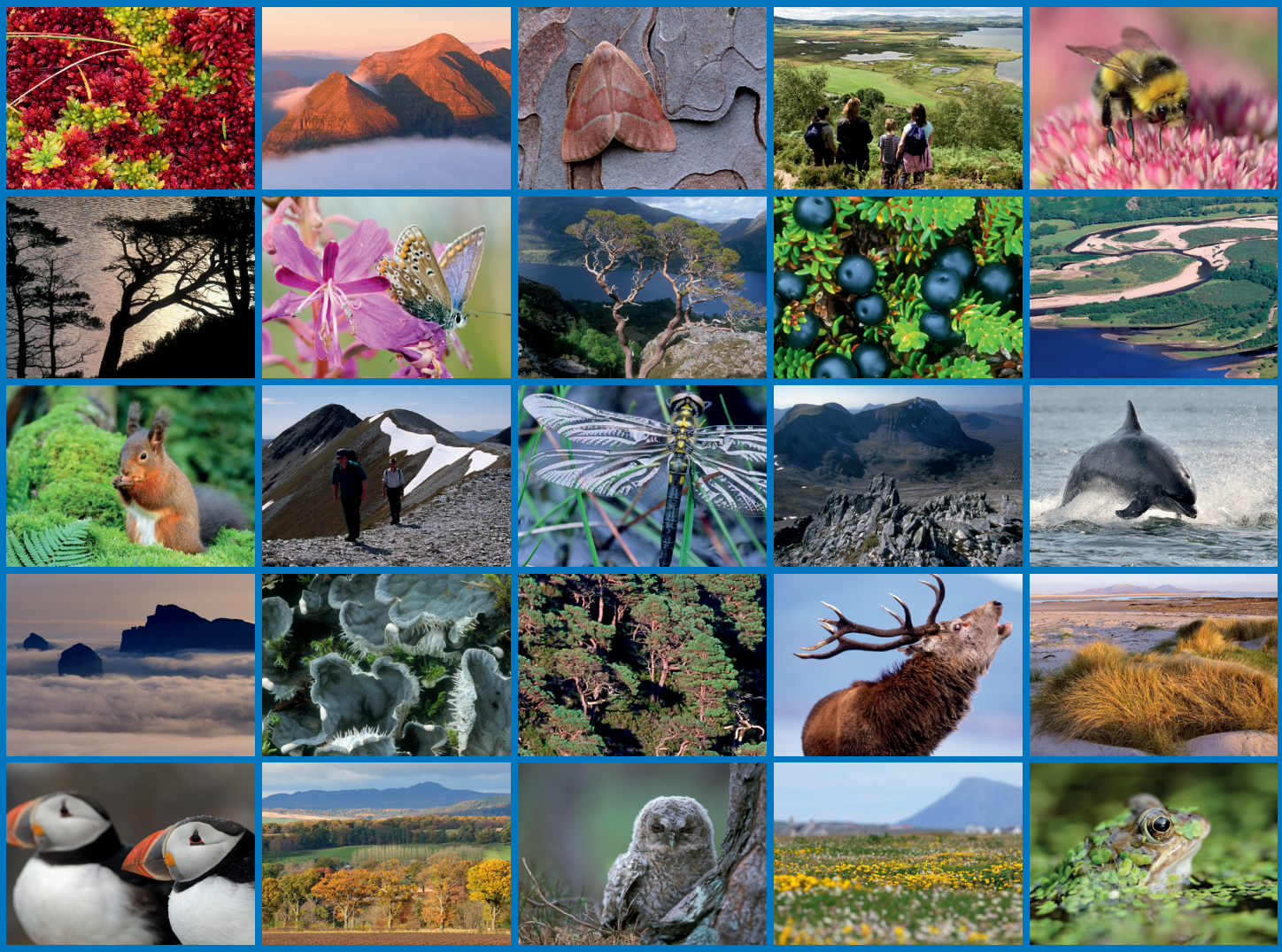
Scottish Natural Heritage
Research Report No. 1027

Site Condition Monitoring survey of upland notified features on designated sites – Caenlochan and Garbh Choire



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RESEARCH REPORT

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Site Condition Monitoring survey of upland notified features on designated sites – Caenlochan and Garbh Choire

For further information on this report please contact:

Brian Eardley
Scottish Natural Heritage
Great Glen House
INVERNESS
IV3 8NW
Telephone: 01463 725304
E-mail: brian.eardley@nature.scot

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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

Site Condition Monitoring survey of upland notified features on designated sites – Caenlochan and Garbh Choire

Research Report No. 1027
Project No: 013952
Contractor: Alistair Headley
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Keywords

Site Condition Monitoring; Protected Area; Upland; Special Area of Conservation; Site of Special Scientific Interest; Condition; Grazing

Background

Caenlochan Special Area of Conservation (SAC) is a large protected area (5,204 ha) of upland habitat on the southern edge of the Cairngorm massif in the Grampian mountains of Scotland between Braemar, Glen Clova and the Spittal of Glenshee. Garbh Choire SSSI is located within the north-western part of the Caenlochan SAC.

There is a rolling programme of monitoring the condition of protected areas in Scotland and this report describes the results of the assessment of the condition of certain upland notified features within the Caenlochan SAC as a whole and ones specifically notified within Garbh Choire SSSI. The features assessed within Caenlochan SAC were: Acidic scree; Alpine flush; Montane acid grasslands; Mountain willow scrub; Plants in crevices on base-rich rocks; Tall herb communities. The features assessed only within the Garbh Choire SSSI part of the Caenlochan SAC were the snowbed and upland assemblage features.

Main findings

Acidic scree

- The acidic scree feature was found at 19 out of 31 randomly assigned waypoints.
- Seven of the waypoints failed one or two of the seven targets for this feature.
- The seven waypoints failed due to the browsing of last season's growing shoots on the dwarf-shrubs being more than 50% and/or the cover of vascular plants exceeding 33%.
- The acidic screes are considered to be in unfavourable condition.

Alpine flush

- This feature was assessed at 29 locations, eight of which were from randomly assigned waypoints.
- It failed on only one of the 7 targets at one location because more than 10% of the ground was drained through excessive trampling.
- The alpine flushes are considered to be in favourable condition.

Montane acid grasslands

- The Montane acid grassland failed six of the 29 locations where this feature was assessed.
- The feature failed because the signs of grazing on the leaves of stiff sedge exceeded 10% at five of the locations.
- The feature failed at one location because the cover of undesirable grasses and forbs exceeded 20%.
- The montane acid grasslands are considered to be in unfavourable condition.

Mountain willow scrub

- This feature is very scarce and restricted to ledges and gorges largely inaccessible to large herbivores.
- Montane willows still failed at 13 of the 15 locations where they were assessed.
- Failures were due to the cover of the willow bushes being too low, or not producing seeds or more than 50% of shoots being less than 40 cm long.
- The montane willow scrub features are considered to be in unfavourable condition.

Calcareous rocky outcrops

- This feature is very scarce within the Caenlochan SAC and it was only possible to assess it at six locations.
- The feature failed at two of the six locations due to their being insufficient number of indicator species. These two locations may only marginally qualify for this feature.
- On the whole this feature is in favourable condition.

Tall herb communities

- This feature was assessed at 15 locations which are restricted to inaccessible ledges.
- The feature passed all nine targets at all of the 15 locations where it was assessed.
- The tall herb communities are deemed to be in favourable condition.

Snowbed

- This feature was assessed at seven of the 35 randomly assigned waypoints located within the Garbh Choire SSSI.
- It failed at four of the locations it was assessed and this was due to more than 10% of live leaves of stiff sedge showing signs of being grazed.
- The snowbed communities on this site are considered to be in unfavourable condition.

Upland assemblage

- This feature was assessed in part as part of the wider assessment of the Garbh Choire SSSI for the montane acid grasslands and flushes features. Additional individual opportunistic samples were taken of the Blanket bog and Alpine and subalpine heath component habitats as part of the assessment of the Upland assemblage feature.
- The Upland assemblage feature is in unfavourable condition because more than 10% of the Blanket bog; Alpine and subalpine heath; Spring-head, rill & flush habitats failed on at least one of their relevant targets.

For further information on this project contact:
Brian Eardley, Scottish Natural Heritage, Great Glen House, Inverness, IV3 8NW.
Tel: 01463 725304 or brian.eardley@nature.scot
For further information on the SNH Research & Technical Support Programme contact:
Knowledge & Information Unit, Scottish Natural Heritage, Great Glen House, Inverness, IV3 8NW.
Tel: 01463 725000 or research@nature.scot

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Acknowledgements

I would like to thank all the landowners and keepers for giving permission to gain access to Caenlochan SAC and Garbh Choire SSSI, especially Peter Fraser of the Invercauld Estate and Bill Mearns of the Tulchan Estate. I want to also thank all the members of the survey team (Clare Rickerby, Adrian Davies and Brendan O'Hanrahan) for their efforts in completing the survey and to James Scott and James Irvine of Scottish Natural Heritage in the helpful management of the contract.

Nomenclature

The scientific names of vascular plants follows that of Stace (2010), of mosses and liverworts follows that of Hill *et al.* (2008) and the nomenclature for plant communities are those in Rodwell (1991 and 1992). The equivalent Scottish/vernacular names for the scientific names of the vascular plants, mosses and lichens used in the text are given in Appendix 2.

Note: CDs containing all the original data and photographs referred to in the text have not been reproduced in this copy of the report, but are available on request by contacting Brian Eardley brian.eardley@nature.scot.

1. INTRODUCTION

Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC), and Ramsar sites are designated on the basis of notified features of interest. These features of interest may be particular habitats or vegetation types, particular species, or particular geological or geomorphological features. Site Condition Monitoring (SCM) is a six year rolling programme of assessment, against quality standards, of the state of notified features of interest on designated sites. This project is concerned with upland habitat features and this report deals with the third cycle of SCM for the Caenlochan SAC**,** NGR N0 210770, in the Tayside and Grampian SNH area and straddles several local authority areas. It also includes the assessment of a suite of features within the Garbh Choire SSSI, which is within the north-western part of the Caenlochan SAC.

Caenlochan SAC has been designated for 14 habitats on Annex I of the European Habitats Directive which are of European Importance.

Common Name	**Technical Name**
Acidic scree	Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*)
Alpine flush	Alpine pioneer formations of the *Caricion bicoloris-atrofuscae*
Alpine and subalpine heaths	Alpine and Boreal heaths
Base-rich fens	Alkaline fens
Base-rich scree	Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii*)
Blanket bog	Blanket bogs
Dry heaths	European Dry heaths
Grasslands on soils rich in heavy metals	Calaminarian grasslands of the *Violetalia calaminariae*
Montane acid grasslands	Siliceous alpine and boreal grasslands
Mountain willow scrub	Sub-Arctic *Salix* spp. Scrub
Plants in crevices on acid rocks	Siliceous rocky slopes with chasmophytic vegetation
Plants in crevices on base-rich rocks	Calcareous rocky slopes with chasmophytic vegetation
Species-rich grassland with mat-grass in upland areas	Species-rich *Nardus* grassland, on siliceous substrates in montane areas
Tall herb communities	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

Garbh Choire SSSI has been notified for four habitat features: Alpine flushes: Moss, dwarf-herb, and grass-dominated snow-bed (abbreviated to Snowbed in this report); Spring-head, rill & flush and Upland assemblage.

Eight of the 14 habitats (Alpine and subalpine heaths; Base-rich fens: Blanket bog; Dry heaths; High-altitude plant communities associated with areas of water seepage (abbreviated to Alpine flush in this report); Montane acid grasslands; Mountain willow scrub; Tall herb communities) within the Caenlochan SAC were assessed to be in 'unfavourable – no change' condition from a SCM assessment carried out in the summer of 2006. The assessment of three of the habitat features within Garbh Choire SSSI found that the Alpine flush was in favourable condition in June 2011, but the Spring-head, rill & flush and Upland Assemblage were found to be in 'unfavourable – no change' condition in 2006 and 2004, respectively.

The Conservation Objectives at the Caenlochan SAC are to maintain the following in the long term for each of the qualifying habitats:

- Extent of the habitat on site;
- Distribution of the habitat within the site;
- The structure and function of the habitat;
- Processes supporting the habitat;
- Distribution of typical species of the habitat;
- Viability of typical species as components of the habitat;
- No significant disturbance of typical species of the habitat.

The repeat assessment used the same methods as those used in the 2006 SCM survey to assess the current (2012) condition of the specified features.

The objectives of the proposed work were therefore to make an assessment of the condition of each selected notified feature and provide a report on the overall condition of each selected notified feature.

For those notified features that are not covered by the above detailed assessment a 'Site Check' was carried out, which involved noting any 'natural' or human processes and activities that appear to have or may potentially affect the condition of these features.

2. METHODS

2.1 Method of assessment

The methods for assessing the condition of the habitats followed those given in the document Common Standards Monitoring (CSM) guidance for upland habitats http://jncc.defra.gov.uk/Default.aspx?page=2237.

2.2 Field procedure

Notified features were normally identified from data provided by previous SNH surveys or contracts, mainly being derived from vegetation maps using standard conversions between vegetation codes and feature types. Once mapped polygons in which features were present had been identified, random sample locations were created and identified by ten-figure grid reference, up to a defined maximum of 37, for each feature type on a site. This project then visited each of these sample locations, finding the ten-figure grid reference. In outline, this consisted of finding the ten-figure grid reference for the waypoint concerned with a hand-held Global Positioning System (GPS) receiver (Garmin etrex and Garmin GPS receivers were used, with accuracies of 5-12 m being normal), then checking to see if the vegetation at the point itself belonged to one of the appropriate vegetation types given for that particular waypoint. The appropriate vegetation types for a feature at a waypoint were derived by referring to the lists of constituent National Vegetation Classification (NVC) communities for the features concerned (JNCC, 2009). If the feature was absent, then the feature was sought within a radius of either 20 m for widespread features (e.g. heaths and grasslands) or 50 m for more restricted features such as Tall herb vegetation, Mountain willow scrub or Plants in crevices on base-rich rocks. The grid reference for this new location was then taken (highlighted in bold in the results spreadsheets).

Some feature types are always very fragmentary and limited in extent and for this reason additional opportunistic samples were searched for where the appropriate habitat was likely to occur or where it was encountered whilst carrying out the Herbivore Impact Assessment. Opportunistic samples were taken of the Plants in crevices on base-rich rocks, Mountain willow scrub and Tall herb communities features. Where Alpine flush and Mountain willow scrub sample plots were being assessed for herbivore impacts a SCM assessment was carried out where the appropriate vegetation type was present and in the case of the Alpine flushes one of the indicator species of alpine flush plant had to be present.

For the upland habitat assemblage each of the component habitats, or vegetation types, identified in the citation for the site are assessed using the generic attribute and target tables for the relevant corresponding feature types in this guidance. However, the assessments are carried out in a quicker and more qualitative way than if the component features had been individually notified. The assessments are carried out at a number of vantage points or locations. The final assessment was 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.

2.3 Data spreadsheets

The list of targets for various attributes, such as vegetation composition, indicators of grazing pressure and of physical disturbance taken from the Common Standards Monitoring table relevant to the particular habitat being assessed (JNCC, 2009) were then checked in order and if the target was met it was recorded as a 'Yes', if not, as a 'No'. The scale of assessment varied according to the habitat and attribute to be assessed. Thus, for Montane acid grasslands, the 'immediate' scale of assessment was four square metres, but for

Mountain willow scrub it was 16 square metres. For certain attributes, e.g. disturbed bare ground, the assessment was made for the entire feature visible from the waypoint location.

Photographs are available, on request from the Project Manager.

The data are presented in an Excel spreadsheet (available on CD), with one worksheet for each feature. Each record consists of the waypoint code, date, surveyor, 12-figure grid reference and 'Yes' or 'No' for each target followed by details of photographs and any appropriate notes. The column headings for the targets are often severely abbreviated to allow an overview in as economical a space as possible – for full details of the target requirements for the different attributes, please refer to the JNCC guidance: http://www.jncc.gov.uk/Default.aspx?page=2237.

2.4 'Failure' of features

If any target was not met at a waypoint, the feature was considered to have failed at that location. The failure of one or more waypoints, depending on the number of points assessed, for a feature results in the feature concerned being deemed to have failed. The statistical, and decision making, rationales used to determine passing or failure of a feature are described in the SNH paper Site Condition Monitoring of Upland Sites in Scotland: Method of Field Assessment, by A. MacDonald 5/5/2004 (DetFieldMethod.doc). Where the failure is considered to have been 'unmerited', or a 'false alarm', evidence or observations supporting this judgement are discussed in the relevant section for each feature.

2.5 Features surveyed

The condition of the following features was assessed within the whole of the Caenlochan SAC:

- Acidic scree;
- Alpine flush;
- Montane acid grasslands;
- Mountain willow scrub;
- Plants in crevices on base-rich rocks;
- Tall herb communities.

The report also describes the results of a survey of the condition of the following features within only the Garbh Choire SSSI part of the Caenlochan SAC:

- Snowbed;
- Upland assemblage.

2.6 Site Check

For the following features the effects of any 'natural' or 'human' activities were noted on the condition of the habitat concerned:

Alpine and subalpine heaths, base-rich fens, base-rich scree, blanket bog, dry heaths, grasslands on soils rich in heavy metals, plants in crevices on acid rocks and species-rich grassland with mat-grass in upland areas within the Caenlochan SAC and alpine flush and spring-head, rill and flush within the Garbh Choire SSSI. Where Site Check relevant issues are encountered, the GPS grid reference, the feature type, and the issue identified were recorded and one or more photographs were taken to illustrate the record.

2.7 Waypoints surveyed

A total of 168 waypoints were generated for seven of the features. The reference numbers and dates when each of the waypoints were surveyed by particular surveyors are given in Table 1.

2.8 Difficulties with particular attributes or targets

The only problems encountered when assessing particular attributes were for those habitats in inaccessible locations, i.e. Tall herb communities and Mountain willow scrub, where there was a significant threat to the field surveyor.

Table 1. Dates on which individual waypoints were visited.

Date	Surveyor	Waypoints
04/07/2012	A Headley	229, 245, 350, 357, 542, 709, 884, 1028, 1307, 1350, 8016, 8050, 8051, 8052
08/07/2012	A Headley	575
10/07/2012	A Davis	8043, 8044, , 8048
14/07/2012	A Headley	64, 123, 174, 551, 796, 1000, 1109, 1364, 1479, 1789, 1847, 1904, 2090, 2124, 2135, 2513, 2515, 3012, 3155, 8038, 8062, 8063, 8064, 8065, 8066, 8067, 8068, 8069, 8070
15/07/2012	A Headley	46, 119, 353, 1324, 1439, 1730, 1827, 1835, 2242, 2972, 8049
16/07/2012	A Headley	117
	B O'Hanrahan	143, 8036
17/07/2012	A Davis	8045, 8046, 8047
	B O'Hanrahan	56
18/07/2012	A Headley	29, 498, 8005, 8006, 8053, 8054
	C Rickerby	414, 805
19/07/2012	A Headley	59, 153, 8033, 8034, 8035
	B O'Hanrahan	17, 60, 8021, 8022
20/07/2012	A Davis	211, 248, 534
	A Headley	476, 1760, 8017, 8024
	B O'Hanrahan	8024, 8028, 8029, 8030, 8031
25/07/2012	R Lansdown	3764, 4327, 4619, 5003, 5005, 5011, 5016, 5017
26/07/2012	C Rickerby	42, 107, 156, 508
27/07/2012	C Rickerby	118
30/07/2012	C Rickerby	172
31/07/2012	A Headley	89
01/08/2012	A Headley	158
	C Rickerby	8041, 8042
02/08/2012	A Headley	28, 171, 174, 1869, 1922, 2919, 8037
	C Rickerby	267
03/08/2012	A Headley	19, 37, 75, 142, 601, 621, 8071
04/08/2012	A Headley	48, 8015, 94a, 94b, 8059
06/08/2012	A Headley	66, 1202, 8060
07/08/2012	C Rickerby	130, 239, 382, 626, 1112, 166a, 166b, 8058
08/08/2012	C Rickerby	411, 1243, 1608, 3390, 5001, 5002, 5004, 5009, 5010, 5023, 8000, 8001, 8002, 8026, 8027
09/08/2012	A Davis	25, 154, 280, 415, 515, 552, 592, 654, 674, 736, 770, 813
10/08/2012	C Rickerby	468, 596, 731, 1297
23/08/2012	C Rickerby	74, 897, 8055
30/08/2012	B O'Hanrahan	321, 337, 394, 397, 1312, 1466, 8014, 8023, 8025
18/09/2012	A Headley	94, 316, 8018, 8019, 8032, 8061

3. RESULTS

Of the 168 waypoints supplied 165 were visited or attempts were made. An additional eight opportunistic samples were taken for a variety of habitats and 24 Flush and five Mountain willow scrub sample plots assessed for HIA were also assessed using the SCM attributes. Table 2 summaries the results of the assessment of the features at the waypoints and locations visited.

Table 2. Summary of the number of waypoints passed, failed and discarded for each feature.

Feature	Number of waypoints				Reasons for failure
	Assessed	Passed	Failed	Discarded	
Acidic scree	19	12	7	12	More than a third of ground covered by vascular plants and more than 50% of live shoots showing evidence of being browsed.
Alpine flush	27	26	1	3	More than 10% affected by drainage due to trampling impacts.
Plants in crevices on base-rich rocks	6	4	2	2	Fewer than the target of 4 indicator species present on more heathy rock outcrops.
Montane acid grasslands	29	23	6	1	Grazing of live leaves of *Carex bigelowii* >10% and cover of undesirable grasses, *Galium saxatile* and/or *Potentilla erecta* >20%.
Mountain willow scrub	15	2	13	17	Cover of willow bushes below 25%, none producing seed, less than 50% of shoots >40 cm long.
Snowbeds	7	3	4	28	High levels of grazing of live leaves of *Carex bigelowii* .
Tall herb communities	18	18	0	15	
Upland Assemblage	11	9	2	0	Blanket bog, Alpine heath and Spring-heads, rills and flushes over grazed or trampled.

3.1 Alpine flush (Alpine pioneer formations of the *Caricion bicoloris-atrofuscae* - H7240)

This feature is characteristically present on sloping ground where groundwaters issue along spring-lines or hollows and most of these situations have the short-stalked yellow sedge – yellow mountain saxifrage mire (M11) vegetation type where three-flowered rush is usually present. In some of the lower altitude situations three-flowered rush and/or Scottish asphodel can be found in the dioecious sedge – common butterwort mire (M10) and these were also assessed as Alpine flush.

Three (waypoint numbers 476, 8022 and 8024) of the nine waypoints for this feature were discarded because the flush did not have any of the appropriate Arctic-alpine species of wetland plant present. In compensation 18 sample plots assessed as part of the HIA were assessed with regard to the SCM as they had the correct vegetation type and at least one of the Arctic-alpine species listed for Alpine flushes (e.g. *Cochlearia micacea, Juncus*

castaneus, J. triglumis and/or *Tofieldia pusilla*). The addition of these extra 18 samples has therefore provided an adequate sample size to assess the condition of this feature within the Caenlochan SAC. These samples are spread across much of the SAC from the far west of the site in Glen Shee to Corrie Fee in the east (Figure 1).

Only one of the 27 waypoints assessed for the condition of the Alpine flush habitat failed on only one target. This was the proportion of the plot being drained was more than the target maximum of 10%. Approximately 30% of the plot was affected by this drainage, which was due to trampling impacts by red deer. The sample plot is located on Druim Mòr above Creag Caorach (Figure 1). Two other Alpine flushes nearby passed all their relevant targets, but disturbance due to trampling impacts on all types of flush was found to be High in six of the 100 Flush sample plots assessed as part of the HIA within the Caenlochan SAC (Headley 2012a). Although 18 of these are the same plots used in this survey, it does illustrate the low proportion (4 to 6%) of flushes suffering significant trampling impacts.

The increased drainage at the one sample point assessed should not be regarded as symptomatic of a wider problem of trampling impacts across the Alpine flush habitat across the whole of the Caenlochan SAC. The one target which failed on this target could be considered as a sampling fluke, in that from the remainder of the habitat samples and wider habitat observed during the survey, drainage impacts was not an issues. Therefore, we can be 90% confident that this is not an issue for the feature on the site as a whole. On this basis, the feature is deemed to be in Favourable recovered condition.

3.2 Plants in crevices on base-rich rocks (Calcareous rocky slopes with chasmophytic vegetation - H8210)

This feature is very limited in extent, but because of the dangerous nature of the terrain a lot of this feature has not been assessed effectively. It is best represented at the head of Caenlochan Glen, The Dounalt in Glen Doll and some of the cliffs in Corrie Fee. There is no clear vegetation type that typifies this feature as it is often characterised by a chance mixture of calcicolous plants.

The major issue for assessing this feature is safe access to vertiginous slopes and cliff ledges. As a consequence this feature was assessed at only five waypoints, but one waypoint assigned to a different feature was assessed as this feature and two others were picked up opportunistically. Two of the waypoints provided did not have the appropriate habitat and were discarded. Therefore, the Plants in crevices on base-rich rocks feature was assessed at a total of six locations that are scattered across the SAC from Craigie Doubs and below Monega Hill in Caenlochan Glen to one near the Lunkard and one each in Corrie Fee and Corrie Sharroch (Figure 1). The base of most of the cliffs was searched for rare vascular plants and therefore few places were not visited within the SAC, but many of the cliffs could not be accessed with any degree of safety. It is therefore reasonable to conclude that the feature is certainly more extensive on certain of the cliffs.

Two out of the six waypoints assessed for the Plants in crevices on base-rich rocks feature failed on a single target (Table 1). This was the same target, namely that there were too few (less than four) positive indicator species present. The waypoint for the Plants in crevices on base-rich rocks feature in Corrie Sharroch was in rather heathy vegetation and it may not be appropriate to assign any of that slope to the Plants in crevices on base-rich rocks feature in the future. The other sample assessed near The Lunkard only just failed by lacking one of the indicator species and again it was noted that the feature was rather fragmentary.

It is thought that the failure of waypoints 1312 and 8026 on having an insufficient number of indicator species may be considered unmerited for two reasons. Firstly it is usually not possible to search this type of habitat properly for all the species given the vertiginous nature

of the habitat and secondly both of the waypoints that failed could only marginally be considered as belonging to the Plants in crevices on base-rich rocks feature. The low number of samples makes it difficult to make a sound assessment as to the condition of the feature, but given the inaccessibility of this type of habitat that it is likely to be in favourable condition as it should not be adversely affected by any land management practices.

3.3 Montane acid grasslands (Siliceous alpine and boreal grasslands - H6150)

This feature is exceedingly widespread and abundant across the plateau between Glen Doll and Canness Glen and around the north side of Caenlochan Glen and covers much of Glas Maol in the western part of the SAC. The most abundant vegetation type is the mat-grass – stiff sedge grass-heath (U7), but stands of stiff sedge – woolly hair-moss moss-heath (U10) are extensive on Glas Maol.

Out of the 37 waypoints supplied for this feature 30 were visited and of these only one was discarded because the appropriate vegetation type was not present within 20 metres of the given grid reference (Table 1). The waypoints that were assessed are scattered across virtually all of the Caenlochan SAC, including four within Garbh choire SSSI, five south of Little Glas Maol, two on Glas Maol, one on Tom Buidhe, two around Mayar and the rest right on the plateau from Dun Hillocks around the north side of Canness and Caenlochan Glens to White Brae (Figure 1).

Six of the 29 waypoints assessed failed to reach one of the SCM targets (Table 1). Five of the six waypoints that failed did so because the percentage of *Carex bigelowii* leaves being grazed was greater than the maximum allowable of 10%. The grazing on the leaves of *C. bigelowii* leaves was about 20 to 25%. In the assessment of herbivore impacts across the same site by the same surveyors the grazing of the leaves of the same indicator species was found to be High in 29 out of the 160 sample plots that were assessed (Headley 2012). This is a very similar percentage (18%) to the percentage of waypoints (17%) that failed the same SCM target. Therefore, this level of sampling shows that the sample size used to assess the condition of the Montane acid grassland is adequate to represent the site as a whole and that there is a high degree of consistency in the surveyors carrying out the HIA and SCM in the single survey. One waypoint failed on the combined cover of *Festuca ovina/vivipara, Deschampsia flexuosa, Galium saxatile* and *Potentilla erecta* being more than 10%, i.e. it was about 25 to 30%.

Half of the waypoints that failed the condition assessment were of the *Nardus stricta - Carex bigelowii* grass-heath (U7) and two were intermediate between this community and the *Carex bigelowii – Racomitrium lanuginosum* moss-heath (U10). Four of the waypoints that failed the condition assessment are in the western half of the SAC, but there is no obvious pattern to their distribution (Figure 1). It is fair to say that this feature should be considered to be an unfavourable condition assessment.

3.4 Montane willow scrub (Sub-Arctic Salix spp. scrub - H4080)

The downy willow along with taller forbs, such as water avens and hairless lady's-mantle, typify this habitat which is invariably restricted to inaccessible cliff ledges at this site and most others in Scotland. Occasionally where woolly willow or montane willows other than downy willow were present they were assessed for this feature.

A total of 26 waypoints were provided for the assessment of the condition of this feature, but it was only possible to safely assess the condition of the willow bushes at nine of these locations. Many of these discarded waypoints were on the inaccessible cliffs of The Dounalt or in Corrie Sharroch or Corrie Kilbo (Figure 1). The weather conditions were particularly wet during the summer of 2012 and this made the field assessments on steep slopes and

around cliffs particularly dangerous. One opportunistic sample of Montane willow scrub was assessed as well as five of the sample plots that were assessed as part of the HIA. This gave a total sample size for this feature of 15 (Table 1).

All but two of the 15 sample plots assessed failed one or more targets (Table 1). Two waypoints failed on a single target, whilst five waypoints failed on two targets, three waypoints failed on three targets and one waypoint failed on four targets. The target that most of the 13 waypoints failed on was the lack of sexual reproduction by at least one willow bush. This occurred at nine of the waypoints, whilst at seven of the waypoints the cover of montane willows was below the target of at 25%. At six of the waypoints the length of the long shoots on the willow bushes was less than the target of 40 cm. At four waypoints the number of old and dying bushes were considered to exceed the number of saplings or young bushes. At a single waypoint the cover of the alien *Epilobium brunescens* exceeded 1%.

This high proportion of waypoints failing at least one of the SCM targets is not unusual for Montane willow scrub and this is largely due to the restriction of the feature to inaccessible cliff ledges where the chances for the plants to establish healthy reproducing populations is very limited. Even in Corrie Sharroch where sheep at least and most deer are excluded by a deer fence the planted out willows have still not achieved a high level of cover and only two of the seven waypoints in this area passed all eight of the targets (Figure 1). It is therefore not surprising that this feature has been determined to be unfavourable, as it had done in the summer of 2006.

3.5 Acidic scee (Siliceous scree of the montane to snow levels (H6230)

This feature is widespread, but fragmentary around the SAC and is only particularly extensive on the slopes below Creag Leacach. There are areas where the vegetation type can be classed as the parsley fern - alpine lady's-fern community (U18) or parsley fern – wavy hair-grass community (U21).

All 30 of the waypoints for this feature were visited and one waypoint assigned to the Snowbed/Montane acid grasslands that fell on scree habitat in Garbh Choire was assessed for the Acidic scree feature rather than either the Snowbed or Montane acid grasslands features. Twelve waypoints were discarded as they fell on other habitats or in a few cases were located in inaccessible locations (Table 1). This left a total of 19 waypoints where the condition assessment was carried out with most of them restricted to Winter Corrie, Corrie Fee, Craig Rennet to Craig Maud and the western slopes of Creag Leacach (Figure 1).

Seven of the 19 waypoints failed one or more of the condition assessment targets, five of which failed on one target and two waypoints failed two targets each (Table 1). Six of the waypoints failed the target for the proportion of live dwarf-shrubs shoots or live leaves of forbs being below 50%. Three of the waypoints failed the target on the cover of vascular plants in the scree being above the acceptable maximum of 33%. All of the Siliceous scree waypoints that failed one or more targets are located immediately below the summit of Creag Leacach on its western slopes in the Glen Shee management unit (Figure 1).

As part of the HIA high levels of browsing of dwarf-shrubs were observed in the Dry heaths and the Alpine and subalpine dwarf-shrub heaths in the same area as the SCM waypoints on the western slopes of Creag Leacach (Headley 2012). It is therefore, apparent that the unfavourable condition of the Siliceous scree feature in this area is a reflection of a general issue of high levels of browsing of dwarf-shrubs in this particular part of the Caenlochan SAC. The Acidic scree feature must therefore be considered to have failed the condition assessment.

3.6 Snowbed

The Snowbed feature is notified for the Garbh Choire SSSI only and therefore the 37 waypoints provided for this habitat are all located within this part of the Caenlochan SAC (Figure 1). It was possible to only find the correct vegetation types in the appropriate topographic setting at seven of the waypoints that were given (Table 1). The majority of the waypoints had been on the wrong habitat, e.g. blanket bog; flush or dwarf-shrub heath. Even if they were placed in areas with one of the correct vegetation types, especially the *Nardus stricta - Carex bigelowii* grass-heath (U7), these locations were not in hollows where there would be persistent snow-lie or they were too low down in the corrie. The other vegetation types present typical of snowbeds are the alpine lady's-mantle – Sibbaldia dwarf-herb community (U14) and more rarely the *Polytrichum sexangulare – Kiaeria starkei* snow-bed (U11).

Four of the seven waypoints failed a single target (Table 1). All four of these waypoints failed the same target and that is the proportion of live leaves of stiff sedge grazed exceeded the threshold of 10%. The proportion of live leaves that were grazed was between 20 and 30%. The waypoints that failed the condition assessment target were scattered throughout Garbh-choire and in some cases were located close to waypoints that had passed all the condition assessment targets (Figure 1).

It is worth noting that two of the Montane acid grasslands SCM waypoints in the same corrie also failed on the same target (Figure 1). A Montane acid grasslands sample square in the same area as one of these Snowbed waypoints that failed the SCM target also had High levels of grazing (Headley 2012). Therefore it appears that the failure of the Snowbed feature is due to high levels of grazing is a genuine and widespread phenomenon which is affecting this and other features within the Garbh Choire SSSI.

3.7 Tall herb communities (Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels - H6430)

This feature is usually found on moist to wet rock ledges and inaccessible slopes where there is a certain amount of base enrichment. The typical vegetation type present is the greater woodrush – water avens tall-herb community (U17), but some of the stands have species more typical of more acidic conditions with foxglove and rosebay willowherb. This feature is scattered around the SAC on the cliffs and steep stream gorges where it is virtually impossible for sheep and red deer to get to.

Out of the 28 waypoints provided for this feature 15 were discarded due to the feature not being present within 50 metres of the given grid reference or it was inaccessible or in eight instances the given grid reference was the same as one other waypoint. Stands of tall herb vegetation were also assessed at four opportunistic sample points scattered around the site as well as at a waypoint (# 316) originally allocated to the Plants in crevices on base-rich rocks feature.

All 18 of the waypoints that were assessed passed all nine CSM targets for the Tall herbs feature (Table 1). In all but one opportunistic sample the waypoints that were assessed were on inaccessible cliff ledges or stream gullies scattered around the Caenlochan SAC. Ten of the waypoints/samples were assessed in Caenlochan and Canness Glens, two in Corrie Sharroch, three in Corrie Fee and three along the base of the cliffs between Craig Rennet and Craig Maud (Figure 1). One of the opportunistic sample plots in Corrie Sharroch was on a moderately steep irrigated slope, but it was in a potentially accessible location. It is likely the appropriate forb dominated vegetation had only recently developed because of the deer fence being erected around Corrie Sharroch.

3.8 Upland assemblage

This feature is notified only for the Garbh Choire SSSI part of the Caenlochan SAC. The constituent habitats of the Upland assemblage were taken to be the Alpine flush; Alpine and subalpine heaths; Blanket bog; Snowbeds; and Spring-head, rill & flush. The Alpine flush and Snowbed features have already been assessed at a number of waypoints within the Garbh Choire SSSI as part of the SCM of the Caenlochan SAC. A single sample of each of the Alpine and subalpine heaths and Blanket bog habitats were taken, whilst nine sample plots assessed for the Flush habitat as part of the HIA were also assessed for their condition using the CSM guidance for Spring-head, rill & flush habitat. These samples are more than adequate to represent the condition of these constituent habitats for the Upland assemblage feature. The Blanket bog, Alpine and subalpine heaths and Spring-head, rill & flush components of the Upland assemblage were viewed but not formally assessed with individual samples whilst traversing between sample points within the SSSI. The samples taken for these three components are typical of the condition of these component habitats within the Garbh Choire SSSI.

The snowbed component was found at seven of the 37 waypoints supplied and of the seven waypoints assessed four failed on the same target. The grazing of stiff sedge leaves was greater than 10% in all these instances.

The single sample of blanket bog habitat failed on five targets and these were the browsing of last growing seasons shoots of dwarf-shrubs being more than 33%; the area of eroding peat exceeding the area of re-deposited/re-vegetated peat; more than 10% of the habitat was being drained due to trampling impacts as seen from the vantage point; and finally more than 10% of the cover of bog-mosses was crushed/broken by trampling impacts.

The Alpine and subalpine heaths was very small in extent and failed a single target and that more than 33% of last growing seasons shoots of dwarf-shrubs were browsed. This sample is considered to be typical of most of the blaeberry – reindeer lichen heath (H19) vegetation present at this site where the browsing of blaeberry is particularly high.

The Alpine flush habitat passed all seven targets, but the Spring-head, rill & flush habitat failed on a single target at three of the nine locations where it was assessed. It failed on the grazing of sedge leaves being much more than the threshold of 25%. The Spring-head, rill & flush habitat is therefore considered to be in unfavourable condition as more than 10% of it fails on at least one of its 12 targets.

The single Acidic scree waypoint passed all the relevant targets. One of the four Montane acid grasslands waypoints (number 119) failed a single target and this was the grazing of the leaves of stiff sedge was higher than 10%.

With the exception of the Alpine flush habitat, in the surveyor's opinion more than 10% of the other component habitats (Blanket bog; Alpine and subalpine heaths; Spring-head, rills & flush; and Snowbed) within the Upland Assemblage for Garbh Choire have or would fail at least one of the relevant CSM targets. For this reason the Upland Assemblage must be considered to fail the condition assessment.

3.9 Features covered by site check

At the same time as this survey were being carried out the Blanket bog, Alpine and subalpine heaths, Dry heaths, Species-rich grassland with mat-grass in upland areas and Alkaline fens features were being assessed with regard to herbivore impacts (HIA) (Headley 2013). As this detailed survey was being carried out, it is possible to give an indication of the influence on the habitats of the factors relevant to CSM.

The majority of the Alkaline fen features seen during the fieldwork would appear to be in a reasonable condition, with few areas showing concerns arising from negative pressures such as grazing/trampling. The Species-rich grassland with mat-grass in upland areas also appears generally to be in reasonable condition, but shows high levels of grazing on some components of the sward, while in other areas grazing levels are lower and the sward is therefore taller. Nevertheless, overall the composition of the vegetation appears to be very good and it does not seem to be especially over-grazed or under-grazed as a whole.

Grazing levels on the Dry heath, Alpine and subalpine heath and Blanket bog features are high, as evidenced by browsing of dwarf-shrubs and, for the Alpine heath, on stiff sedge. Areas of bare peat within the blanket bog are larger than the area of peat re-deposition and re-vegetation, and there are also high levels of trampling of peat.

4. GENERAL OBSERVATIONS ON MANAGEMENT

The main negative impact of current management on the site is the high levels of browsing and grazing in several habitats. This factor has contributed to the direct failure of three of the habitats (Montane acid grasslands, Acidic scree and Snowbed) and indirectly to the failure of the Mountain willow scrub through restricting the willows to small inaccessible cliff ledges. The presence of a stand of the Tall herb communities in the open turf within the deer exclosure around Coire Sharroch suggests that this feature could potentially be more widespread if the grazing by large herbivores were to be severely restricted. Browsing by mountain hare and red deer is also suppressing the remnant stands of Mountain willow scrub.

Excessive trampling impacts on the features assessed are limited to a single Alpine flush waypoint (#267) and the blanket bog habitat as part of the Upland assemblage feature within Garbh Choire SSSI.

No signs of burning were observed during the survey, which is undoubtedly good for the integrity of all the features that are listed for the site.

4.1 Negative management activities

Excessive grazing/browsing by red deer and mountain hare
Trampling by red deer

4.2 Positive management activities

None

5. POSSIBLE PROBLEMS DUE TO TIMING OF ASSESSMENT

No problems were encountered with the assessment of the targets for any of the features and habitats assessed which could be attributed to the timing of the assessment.

Due to the extremely wet conditions of some of the cliff ledges and generally poor weather conditions during the summer of 2012 it was not safe to access many of the cliff ledges and slopes.

6. GENERIC PROBLEMS WITH ATTRIBUTES AND TARGETS

There may well be some problems with the definition of what constitutes Snowbed, especially when there is the *Nardus stricta – Carex bigelowii* grass-heath (U7). The vast majority of the U7 grass-heath within Garbh Choire is not in a suitable topographic location that would constitute an area of snow-lie and the areas do not have any of the relevant Snowbed species.

It is unlikely that grid references on steep slopes, especially for Tall herb, Acidic scree and rocky slope habitats, will be more accurate than to the nearest 10 or 20 metres. This is due to the low visibility of satellites of the hand-held GPS receivers. Therefore re-locating sample locations will depend on having photographs available.

7. REFERENCES

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8. FIGURES

Figure 1. Map showing the waypoints where each feature passed all targets (green symbols) or failed one or more of the relevant targets (red symbols) or were discarded (open symbols) due to no suitable habitat being present or being inaccessible. The symbols for each feature are as follows: circles = Mountain willow scrub; crosses = Spring-head, rill & flush (component of Upland assemblage); diamond = Montane acid grasslands; hexagon = Calcareous rocky outcrops; pentagons = Alpine flush; squares without dot = Snowbed; squares with dot = Blanket bog (component of Upland assemblage); star = Alpine and subalpine heaths (component of Upland assemblage); triangles without dot = Acidic scree; triangles with dot = Tall herb communities.

Figure 1. Results of the condition assessment of selected habitat features within the Caenlochan SAC

Legend

Habitat/Feature

- = Alpine flush
- = Acidic scree
- = Alpine and subalpine heaths
- = Blanket bog
- = Calcareous rocky outcrops
- = Montane acid grasslands
- = Mountain willow scrub
- = Snowbed
- = Spring-head, rill & flush
- = Tall herbs

Condition

- = Passed all targets
- = Failed at least one target
- = Discarded waypoint

- = SAC boundary
- = SSSI boundary
- = management unit boundary

0 0.5 1 2 3 4 Kilometers

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Policy and Advice Directorate, Great Glen House,
Leachkin Road, Inverness IV3 8NW
T: 01463 725000

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