

Site condition survey of upland and peatland notified features on designated sites: Foinaven SAC/SSSI





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RESEARCH REPORT

Research Report No. 1016

**Site condition survey of upland and
peatland notified features on designated
sites: Foinaven SAC/SSSI**

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RESEARCH REPORT

Summary

Site condition survey of upland and peatland notified features on designated sites: Foinaven SAC/SSSI

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Keywords

Foinaven SAC; Site Condition Monitoring; upland habitats; deer.

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 notified features on designated sites.

This report describes the results of Site Condition Monitoring (SCM) and Site Check surveys carried out in the summer of 2015 on selected notified habitats within Foinaven Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI). SCM surveys were done for six SAC habitat features. Site Check was carried out on five SAC habitat features. The surveys involved visiting 175 pre-selected waypoints and assessing the species composition, structure, grazing, trampling and erosion of the features against standard targets for each habitat.

Main findings

- Wet heath failed to meet targets at ten waypoints and was therefore in unfavourable condition. Target failures were mainly due to trampling, low dwarf-shrub cover and absence of *Erica tetralix*.
- Species-rich *Nardus* grassland failed to meet targets at eight locations and was therefore in unfavourable condition. Target failures were predominantly due to low forb cover and disturbed ground.
- Blanket bog failed to meet targets at eight locations and was therefore in unfavourable condition. The main reason for not meeting targets was disturbed ground.
- The depressions on peat substrates feature failed to meet targets at three locations, and was therefore in unfavourable condition. Again, this was mainly due to disturbed ground.
- Dry heath failed to meet targets at ten waypoints and was therefore in unfavourable condition. Target failures were mainly due to trampling and browsing on *Calluna*.
- Acidic scree passed the assessment with no failure of any of the targets. This feature was in favourable condition.
- Deer trampling was the commonest cause of waypoint failure to meet targets across all habitats.

- Site Checks of five SAC features that are found mainly at higher altitude on the site - Alpine and subalpine heaths, Montane acid grasslands, Plants in crevices on acid rocks, Plants in crevices on base-rich rocks and Tall herb communities - found these habitats to be in mostly good condition.

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1. INTRODUCTION

1.1 Background

Sites of Special Scientific Interest (SSSIs) and Special Areas of Conservation (SACs) 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 on designated sites. Site Check is a less detailed assessment than SCM, focussing mainly on any pressures that may be affected features.

This project is concerned with upland habitat features and this report deals with the site known as Foinaven, (NGR NC 336 495) in the Northern Isles and North Highland SNH area (Highland Council local authority area, Sutherland sub-area).

2. METHODS

2.1 Selection of assessment points

A set of random waypoints generated for the baseline 2004 site condition monitoring assessment (O'Hanrahan, 2005) were derived from a combination of NVC and Upland Survey data; these were also used as the basis for the second monitoring cycle in 2010 (O'Hanrahan, 2011). However, additional waypoints were generated for heath and bog habitat types in order to compensate for points discarded in 2004 due to incorrect habitat, along with the location of opportunistic points for rarer habitats such as tall herb ledges, calcareous rocky slopes and species-rich *Nardus* grassland. This approach was continued in the current survey for those habitats possessing an insufficient number of sampling locations (due to a change in sampling protocols since 2010, a minimum of 28 sampling points per habitat is now required, irrespective of the number of 'failing' points). Due to a misunderstanding over the different boundaries for the SSSI and SAC only 27 points were sampled for the SAC blanket bog and Depressions on peat substrates. This is because the SAC is smaller than the SSSI and one of the points selected was within the SSSI but not the SAC.

2.2 Field methods

The methods for assessing the condition of the habitats followed those given in the documents 'Common Standards Monitoring - guidance for upland habitats' (JNCC, 2009) and Site Condition Monitoring of Upland Sites in Scotland: Method of Field Assessment, by A. MacDonald 5/5/2004.

The methods for assessing the condition of the habitats followed those given in the document 'Common Standards Monitoring guidance for upland habitats' (JNCC, 2009).

The surveyor navigated to each point using a hand-held GPS receiver. At each location the required habitat feature was identified and if not present at the actual reference was searched for within a radius of 20 m or 50 m for fragmentary features.

At each point, all of the targets for the feature were checked and the results recorded in terms of either passing or failing the individual targets, along with the quantitative value of the assessment where appropriate, e.g. percentage of ground disturbed or number of indicator species present.

The scale of assessment varied according to the habitat and attribute to be assessed. For the bog and heath habitats, the assessments were mostly made at an 'immediate' scale of four square metres or at the scale of the entire feature visible from the sample location. For the 'erosion versus redeposition / revegetation' target for blanket bog, the assessment of failure or passing was conducted at the end of the survey based on the aggregate of all of the blanket bog seen from the assessed waypoints.

2.3 Data spreadsheets

The data are presented in Appendix 1 in the form of Microsoft Excel spreadsheets. Each record consists of the waypoint code, date, surveyor, 12-figure grid reference and 'Y's or 'N's for each target (with quantitative details where appropriate) 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 JNCC (2009). Where the grid reference differed from that provided, this is indicated in the spreadsheet by a combination of italic and dark blue font.

The column headings representing the targets are phrased to ensure that a negative answer means failure, whereas a positive one means that the waypoint passes, e.g. the target for blanket bog referring to burning inside sensitive areas – the column heading is phrased 'no burn'g...inside sens've areas?' and a 'Y' result means that, yes, no such areas were seen, while an 'N' result means that no, there was at least some burning observed within a sensitive area of the habitat. Where the target was a quantitative one, e.g., the proportion of the ground intensively disturbed, then the approximate percentage of disturbed ground was noted in brackets (unless there was no significant disturbance).

2.4 'Failure' of waypoints and features

If any target was not met at a waypoint, the feature was considered to have failed at that location (targets which are assessed at a whole-site scale, e.g., blanket bog erosion, are an exception to this rule). The failure of just one waypoint for a feature results in the feature concerned being deemed to have failed for the entire site. The statistical and decision making rationales used to determine the passing or failing 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. The general underlying principle of Common Standards Monitoring is that at least 90% of the extent of the feature on the site should meet the targets for all attributes assessed in order for it to be considered to be in favourable condition.

2.5 Features surveyed on Foinaven

For the SAC the following habitat features were surveyed using full SCM protocols:

- H4010: Northern Atlantic wet heaths with *Erica tetralix* (also called 'Wet heath' in this report)
- H4030: European dry heaths (also called 'Dry heath' in this report)
- H6230: Species-rich *Nardus* grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe) (also called 'Species-rich *Nardus* grassland' in this report)
- H7130: Blanket bogs (also called 'Blanket bog' in this report)
- H7150: Depressions on peat substrates of the *Rhynchosporion* (also called 'Depressions on peat substrates' in this report)
- H8110: Siliceous scree of the montane to snow levels (also called 'Acidic scree' in this report)

Blanket bog was also assessed as an SSSI feature.

In addition, less formal 'Site Checks' were made of the following features:

- H4060: Alpine and boreal heaths (also known as 'Alpine and subalpine heaths' in this report)
- H6150: Siliceous alpine and boreal grasslands (also known as 'Montane acid grasslands' in this report)
- H6430: Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (also known as 'Tall herb communities' in this report)
- H8210: Calcareous rocky slopes with chasmophytic vegetation (also known as 'Plants in crevices on base-rich rocks' in this report)
- H8220: Siliceous rocky slopes with chasmophytic vegetation (also known as 'Plants in crevices on mainly acid rocks' in this report)

2.6 Dates, surveyors and local conditions

This monitoring survey was carried out by Colin Wells, Ruth Maier, and Tim Rafferty between mid-June and early July. 48 person-days were required to complete the fieldwork required for this report together with the fieldwork for Habitat Impact Assessment on the same site which is reported separately (Wells, 2018).

Overall weather conditions were cool and cloudy with maximum temperatures rarely reaching 13C and more often in the range 6-10⁰C. Mean June temperatures for Northern Scotland in 2015 were around a degree cooler than the long term average, making the region the coolest place in the UK for the month. Hours of sunshine were also lower than usual at around 80% of the long-term average for the region. Precipitation was slightly above average (Met Office, 2015).

Within the Foinaven area this often took the form of persistent cold drizzle shrouding the higher tops and showers affecting the straths, although there were also many clearer days. The unseasonably cool conditions (which continued a trend of cool conditions persisting since early May) had a noticeable impact on the growth of hill grasses, with most observers agreeing that the season was perhaps 3-4 weeks behind normal growth.

2.7 Difficulties/problems with particular attributes or targets

None.

3. RESULTS - GENERAL

175 individual waypoints were visited for the SCM survey. Table 1 summarises the results of the assessment of the features at the waypoints visited.

Map 9 shows the distribution of all waypoints checked during the survey in 2015.

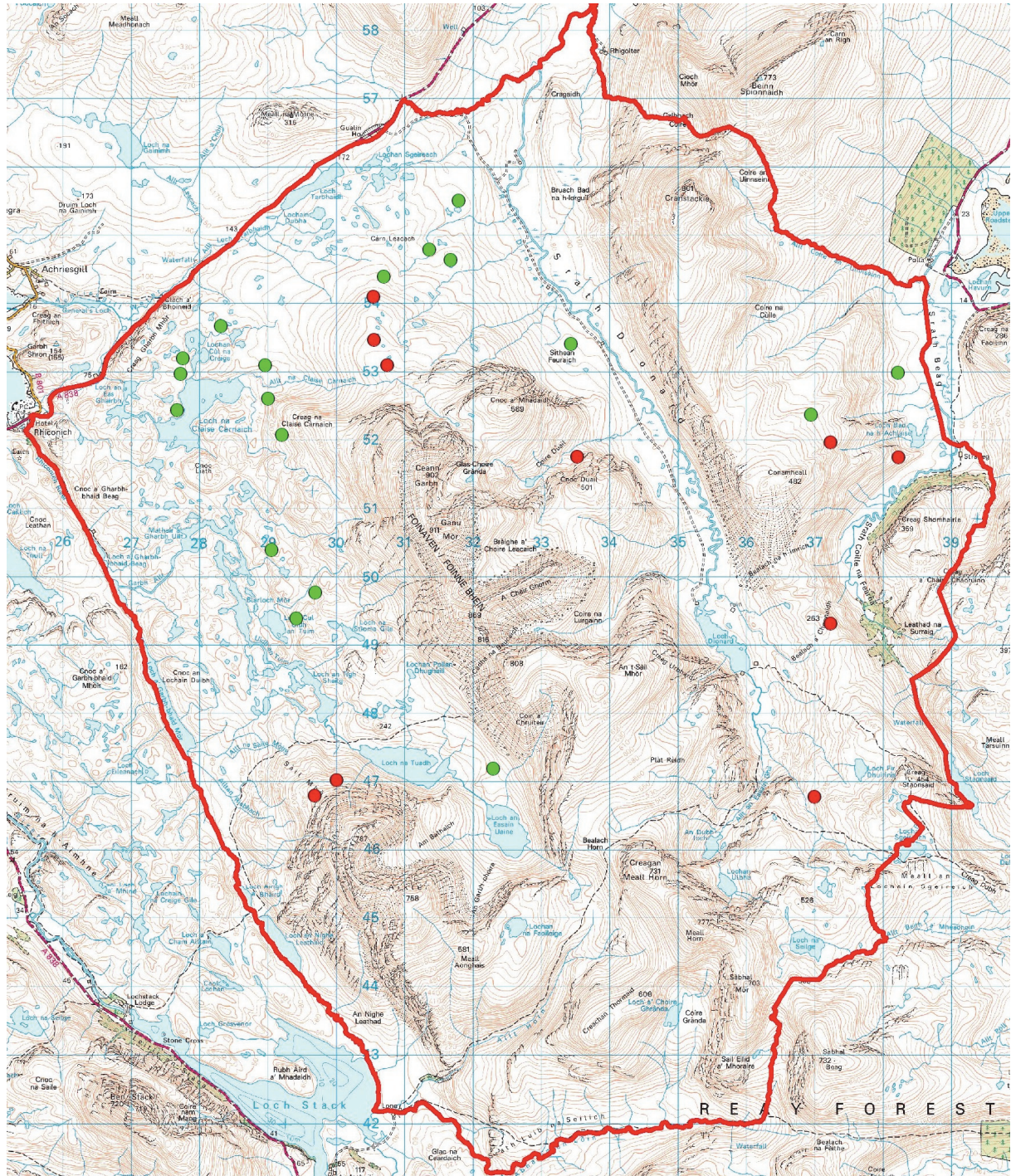
Table 1. Summary table of the results of the field survey

| Feature/habitat | Number of waypoints | | Feature pass/fail | Main reasons for target failure |
|--------------------------------------|---------------------|--------|----------------------|--|
| | passed | failed | | |
| Wet heath | 18 | 10 | fail | disturbed ground; heather browsing; insufficient cover of indicators; graminoid domination; absence of <i>Erica tetralix</i> |
| Species-rich <i>Nardus</i> grassland | 25 | 7 | fail | Grazing, insufficient forb cover; disturbed ground |
| Blanket bog SSSI ¹ | 20 | 8 | fail | disturbed ground |
| Blanket bog SAC ¹ | 19 | 8 | fail | disturbed ground |
| Depressions on peat substrates | 24 | 3 | fail | disturbed ground |
| Acidic scree | 28 | 0 | pass | - |
| Dry heath | 20 | 10 | fail | heather browsing; disturbed ground |

¹ The SSSI is slightly larger than the SAC. One of the blanket bog survey points was within the SSSI but not the SAC.

3.1 Northern Atlantic wet heath with *Erica tetralix* (H4010)

Ten of the 28 points for this feature failed (Map 1) and therefore the feature failed as a whole. Six locations failed due to lack of *Erica tetralix* within 20 m of the plot, three due to trampling disturbance, two due to insufficient dwarf-shrub cover, one because of a preponderance of graminoids in the plot and one due to browsing on dwarf shrubs.



Map 1. Distribution of wet heath plots. Green dots signify an assessment pass, red dots an assessment failure. The red line shows the boundary of Foinaven SSSI. Foinaven SAC is slightly smaller in Strath Beag in the northeast of the site. © Crown copyright and database rights 2015. All rights reserved. OS Licence Number 100017908.

The number of failing plots is close to the number recorded during the last monitoring assessment in 2010, although ten more samples were assessed during this year's exercise, making the proportion of failed plots lower relative to sample size. Of the nine failed 2010 plots that were reassessed this year, 5 failed again, but four passed. Of the five repeat failing wet heath plots, two nevertheless showed some signs of improvement. Plots 9 and 15 failed on both *Calluna* grazing and disturbance in 2010 but this year only on disturbance. It is possible that the target attribute requiring *Erica tetralix* to be present within 20 m radius of the sampling quadrat may have exaggerated the degree of failure of some M15c plots situated at higher, exposed altitudes on rocky areas with thin peats where *E. tetralix* may be naturally scarce, (namely plots 57, 605, 1101 and 1104). Because this was the sole reason for plot failure in three of these, if they are regarded as unmerited this would bring the total number of wet heath failures down to seven, but would not change the overall assessment of feature failure.

Overall, current herbivore grazing levels do not seem to be an overriding factor leading to the feature's continuing failure. Instead the cause of many failures is more likely to result from a combination of 'legacy' management effects from historically higher levels of grazing and burning, allied with current deer passage, in some areas, which is still sufficient to disrupt the fragile *Racomitrium*-dominated bryophyte mats typical of so much of the M15c which predominates across the site. Nevertheless, even if such failures attributable to putative "legacy" impacts were to be discounted, the feature would still fail on the basis of failures related to current impacts (grazing/trampling). Therefore, there is still a need to adjust management in order for Favourable condition (or Unfavourable recovering condition) to be achieved.

The conclusion overall is that trampling and disturbance problems on wet heath (occasionally with associated browsing issues) persist in some areas (especially south and east of Strath Dionard). However, the graminoid versus dwarf-shrubs imbalances elsewhere primarily responsible for failures are more likely to reflect previous management.

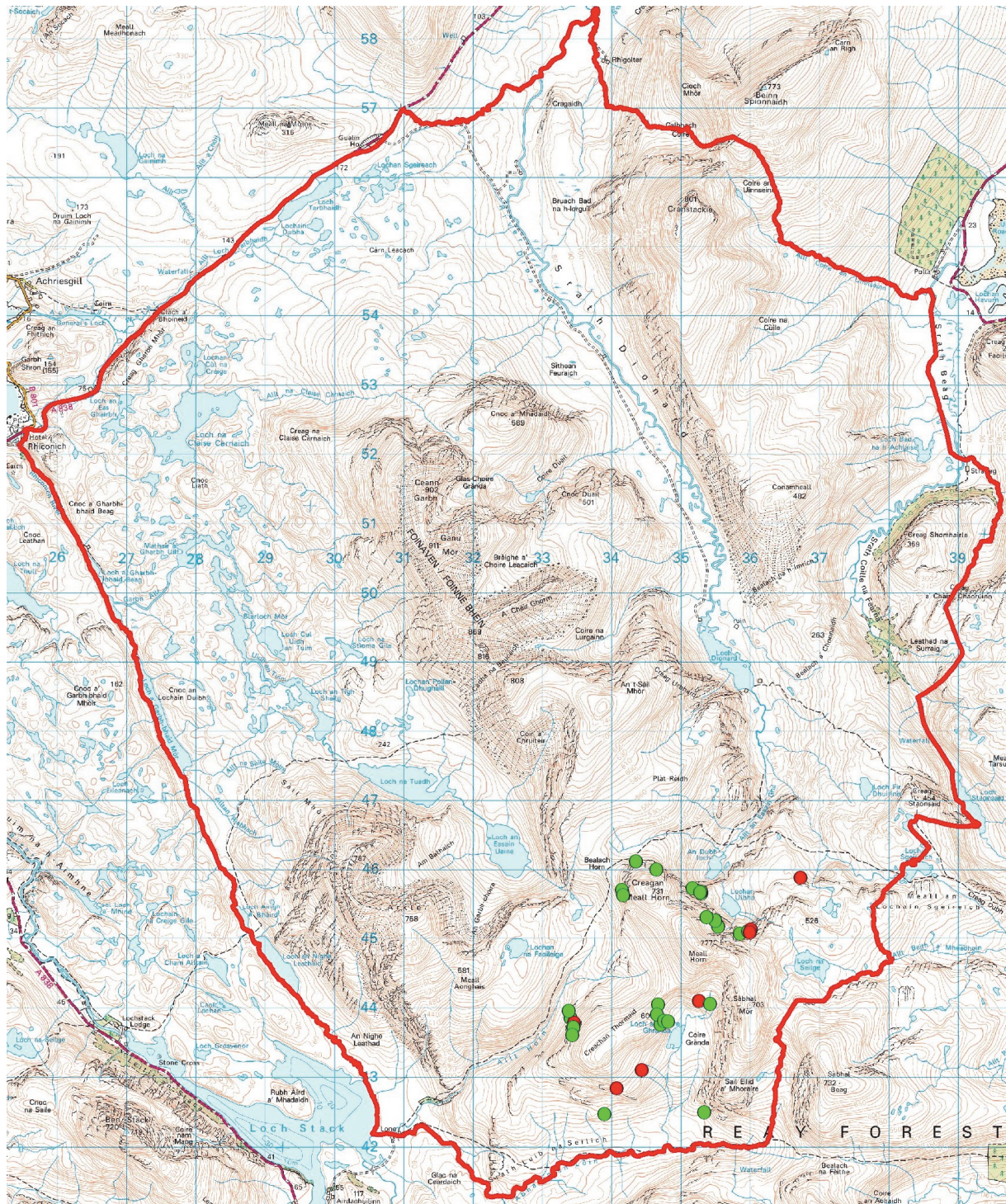
3.2 Species-rich *Nardus* grassland, on siliceous substrates in mountain areas (and submontane areas in continental Europe) (H6230)

Locations for this feature are restricted to the ridges and cliffs situated south and east of Creagan Meall Horn in the south of the SAC.

In total, seven of the 33 locations assessed for this feature failed (Map 2) – just under half the proportional failure rate to that recorded in 2010 when 16 fewer samples were taken. The feature as a whole therefore failed to pass the assessment for favourable condition.

Six plots failed due to insufficient cover of forbs and three due to trampling disturbance.

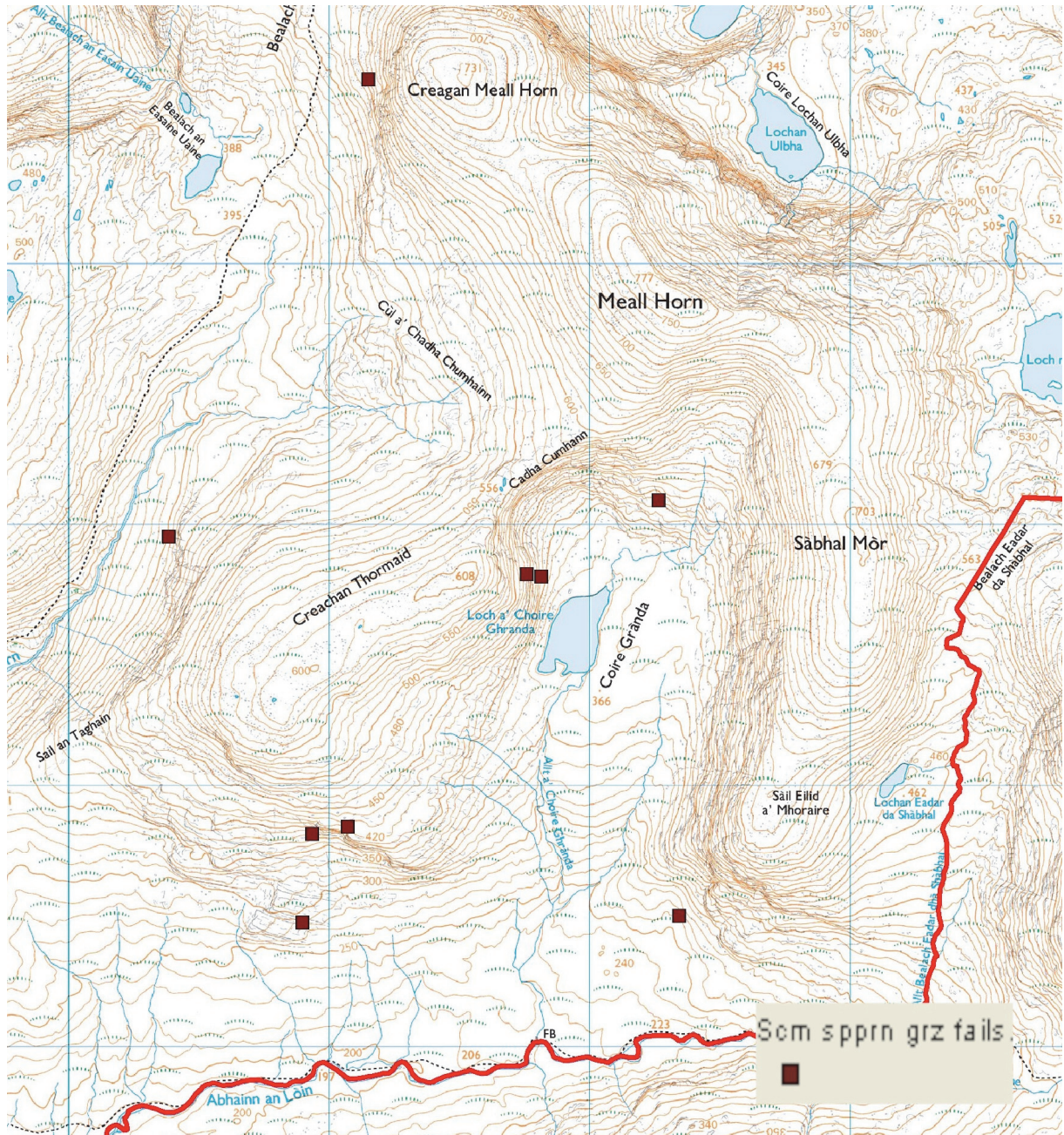
During the last assessment, three samples failed due to 'rank' swards dominated by tall grasses; none failed due to this factor in 2015. (It was previously conjectured that the geographical pattern for the forb cover failures might be geologically determined. However, with a greater number of samples available in 2015, the distribution now appears random, making this theory less likely.)



Map 2. Distribution of species-rich *Nardus* grassland plots. Green dots signify an assessment pass, red dots an assessment failure. © Crown copyright and database rights 2015. All rights reserved. OS Licence Number 100017908.

A notable distributional feature of the results by contrast, is provided by the locations for plots prone to excessive grazing of certain indicator species (namely *Alchemilla alpina*, *Nardus stricta*, or *Thymus polytrichus*) which totalled nine plots (Map 3). Although not a cause of failure in its own right (since this is part of a composite SCM grazing target which is recorded in conjunction with several other measures which contribute to the overall grazing value assigned to the plot) it is noticeable that indicator species grazing is clustered in the southern part of the feature range, especially on the outcrops around Coire Grànda. This

area, which has been noted in previous SCM and HIA surveys as having received higher-than-average herbivore pressures (Morris, 2004, 2005; O’Hanrahan, 2006; Dayton & O’Hanrahan, 2011) now appears to be showing a degree of relaxation in herbivore impacts on the more widespread blanket bog habitat, to judge by the recent HIA carried out in conjunction with this SCM survey (Wells, 2018). However, the current SCM assessment of the species-rich *Nardus* grassland results suggest there are still sufficient numbers of deer (and possibly some sheep) in the area which are selectively seeking out these more palatable plant communities.

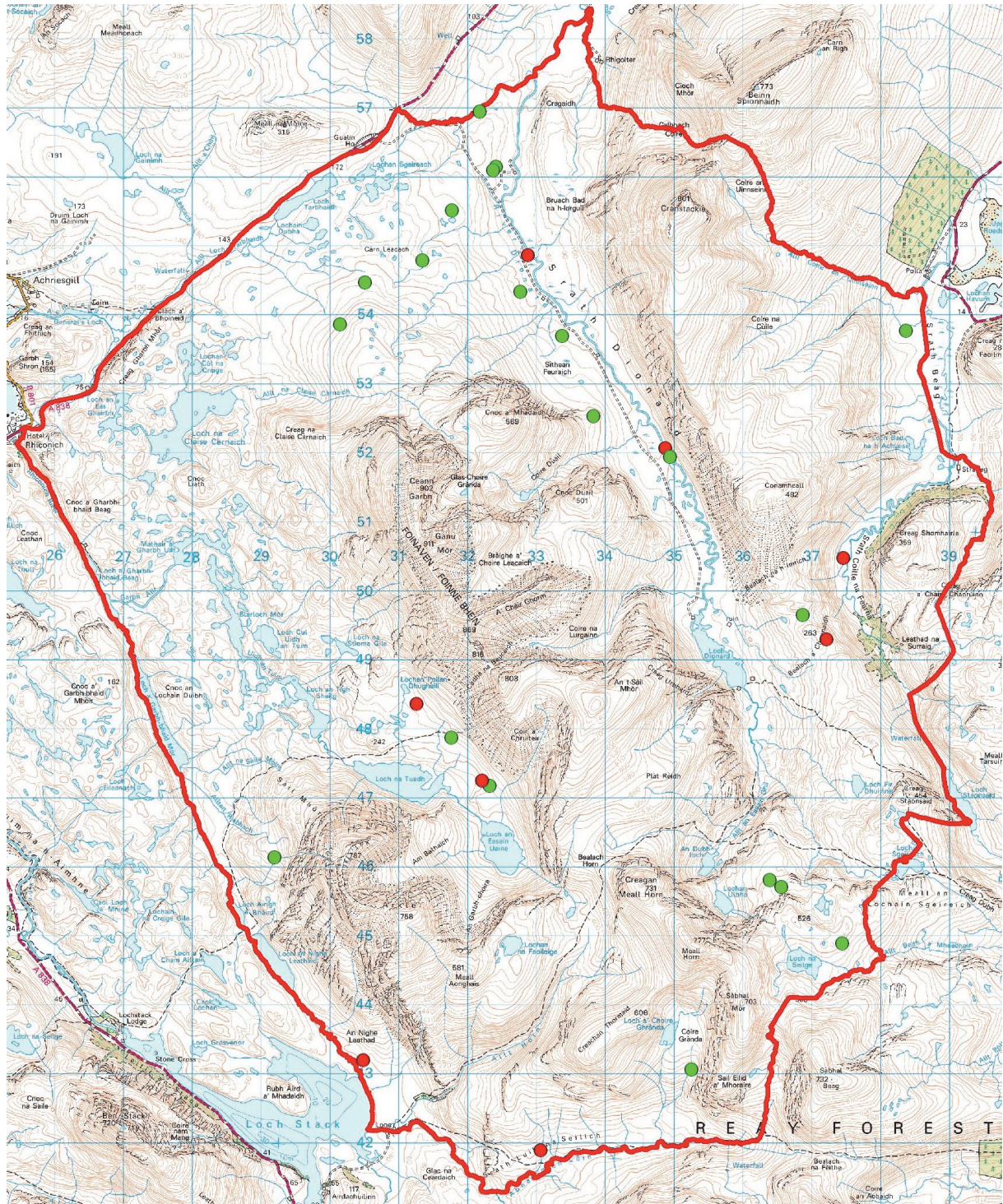


Map 3. Distribution of species-rich *Nardus* grassland plots registering grazing >10% on selected indicator species. © Crown copyright and database rights 2015. All rights reserved. OS Licence Number 100017908.

3.3 Blanket bogs (H7130)

Eight of the 27 SAC (and 28 SSSI) blanket bog sample locations failed the assessment (Map 4), and therefore the feature(s) failed as a whole. Disturbance to bare peat and to *Sphagnum* by trampling was the major reason, with 7 samples failing due to this, while one plot failed due to excessive browsing of *Calluna*.

Failed samples were widely distributed across the site.

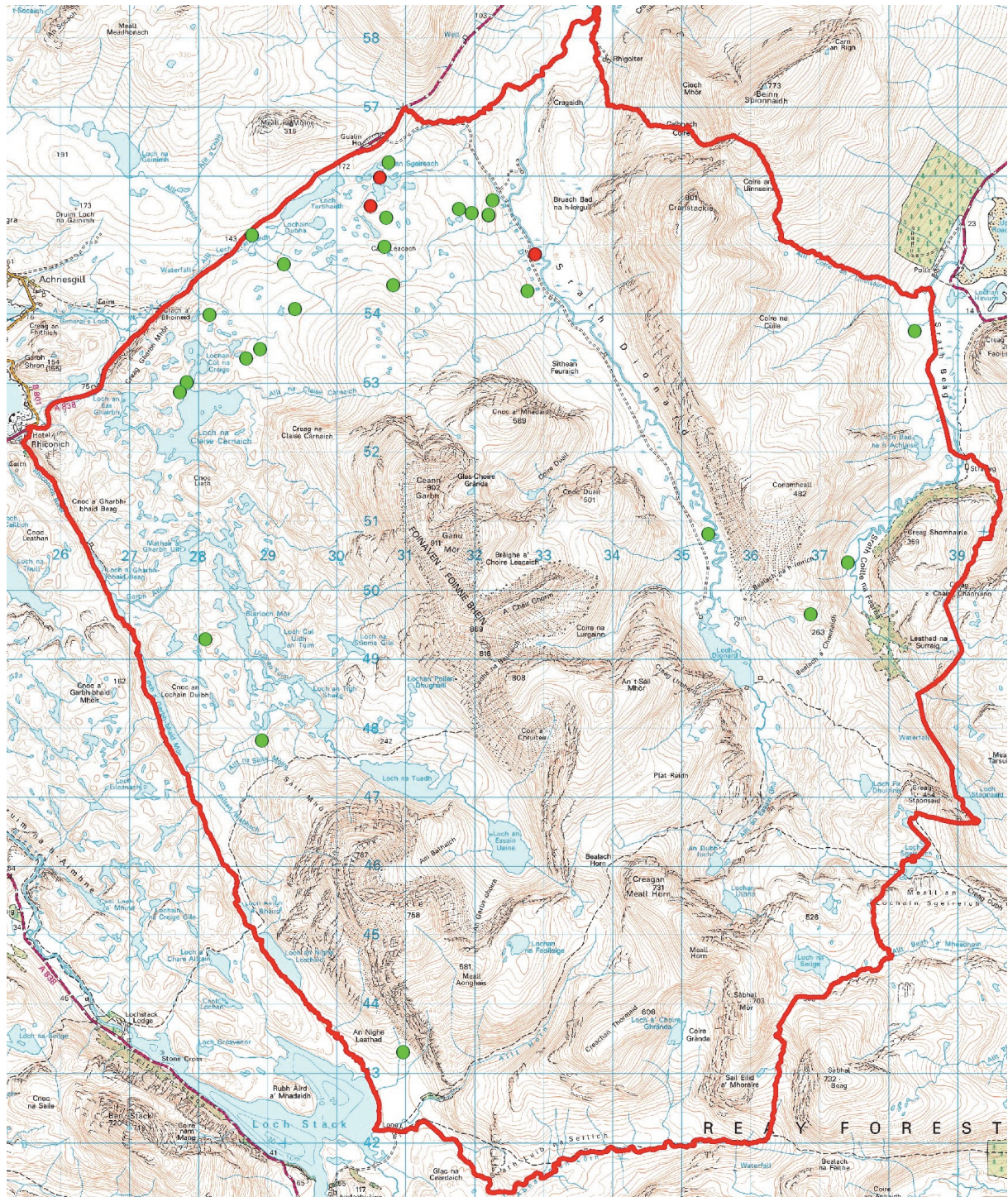


Map 4. Distribution of blanket bog plots. Green dots signify an assessment pass, red dots an assessment failure. © Crown copyright and database rights 2015. All rights reserved. OS Licence Number 100017908.

3.4 Depressions on peat substrates of the *Rhynchosporion* (H7150)

Depressions on peat substrates were mostly found to meet condition targets, with just three samples failing (all due to trampling disturbance) (Map 5). Nevertheless, under the SCM protocols, this total ensures the feature as a whole is classed as having failed to be regarded as being in good condition.

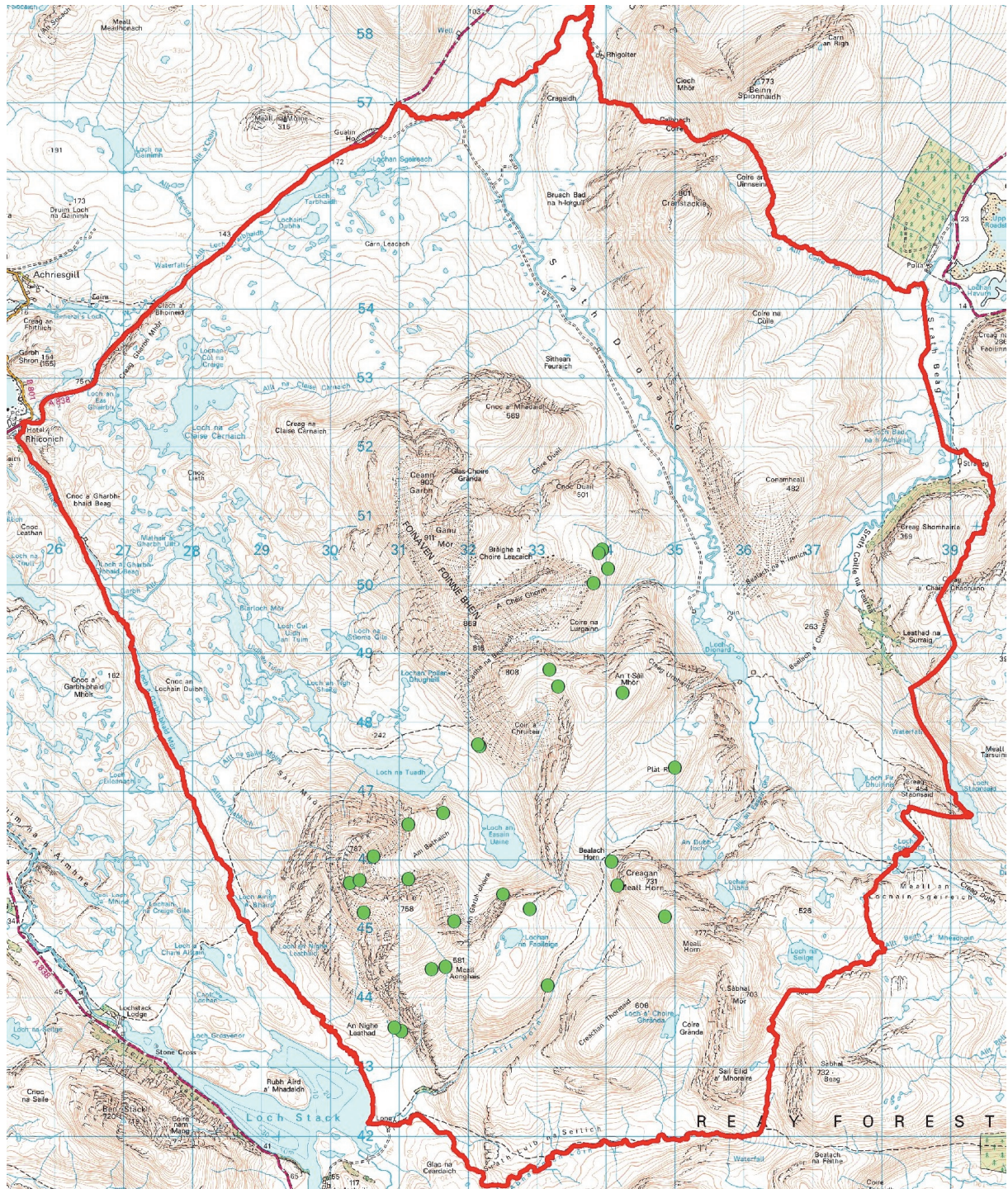
The failing locations were notably clustered towards the northern end of Strath Dionard.



Map 5. Distribution of depressions on peat substrates plots. Green dots signify an assessment pass, red dots an assessment failure. © Crown copyright and database rights 2015. All rights reserved. OS Licence Number 100017908.

3.5 Siliceous scree of the montane to snow levels (H8110)

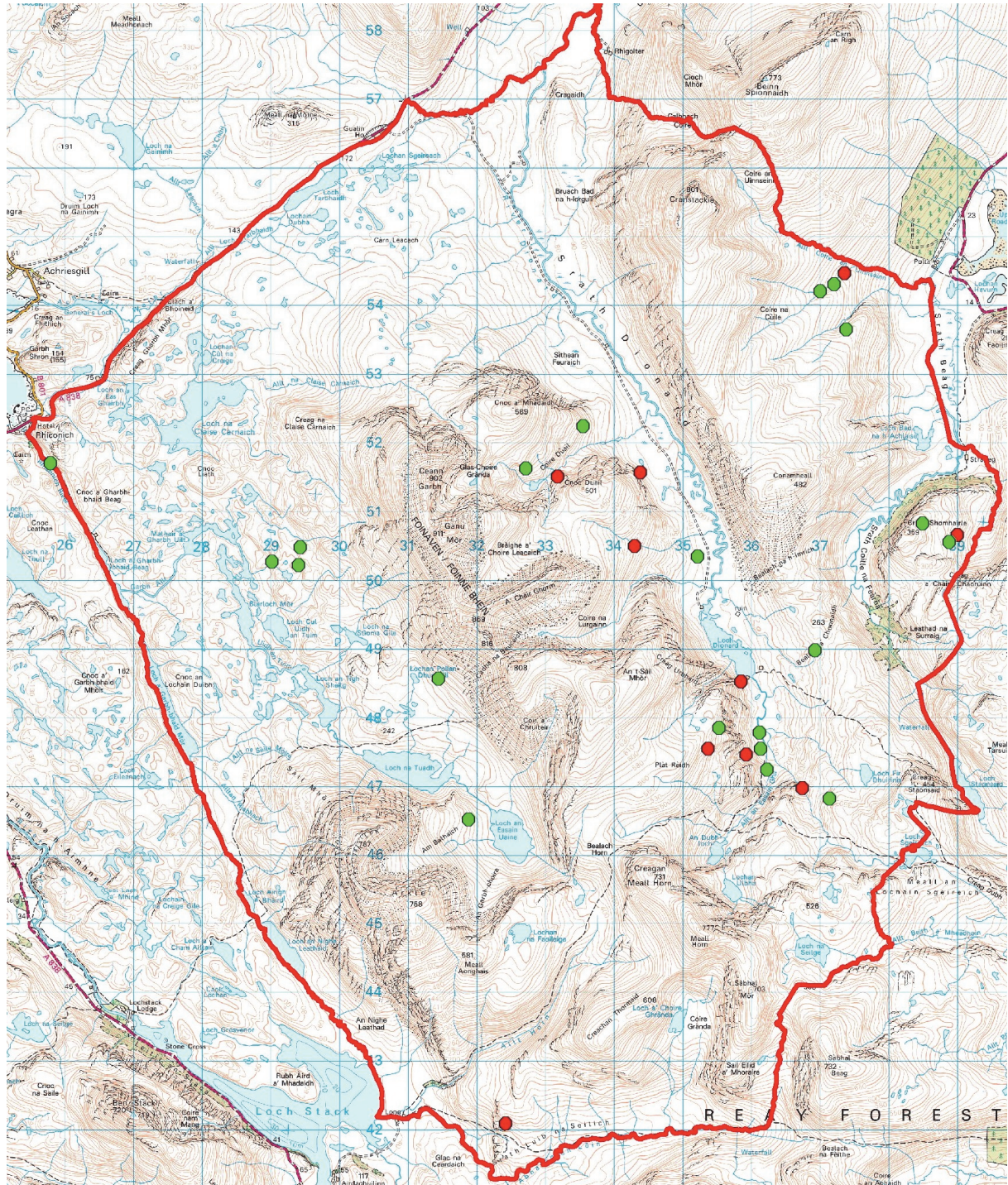
Twenty-eight acidic scree points were assessed. All samples passed all assessment targets (Map 6) and therefore the feature as a whole is classed as having passed the assessment and being in favourable condition.



Map 6. Distribution of acidic scree plots. Green dots signify an assessment pass. © Crown copyright and database rights 2015. All rights reserved. OS Licence Number 100017908.

3.6 European dry heaths (H4030)

Ten of the thirty sample plots failed the assessment (Map 7) and therefore the feature as a whole failed. Disturbance due to trampling and excessive browsing of *Calluna* were the causes, with 6 plots each recording levels which broke failure thresholds. The densest concentration of failing plots lay in the eastern corries of Foinaven where fragile bryophyte-rich stands of H21 oceanic heath are susceptible to deer passage and also on the line of steep cliffs running south from Loch Dionard east of Plat Reidh.



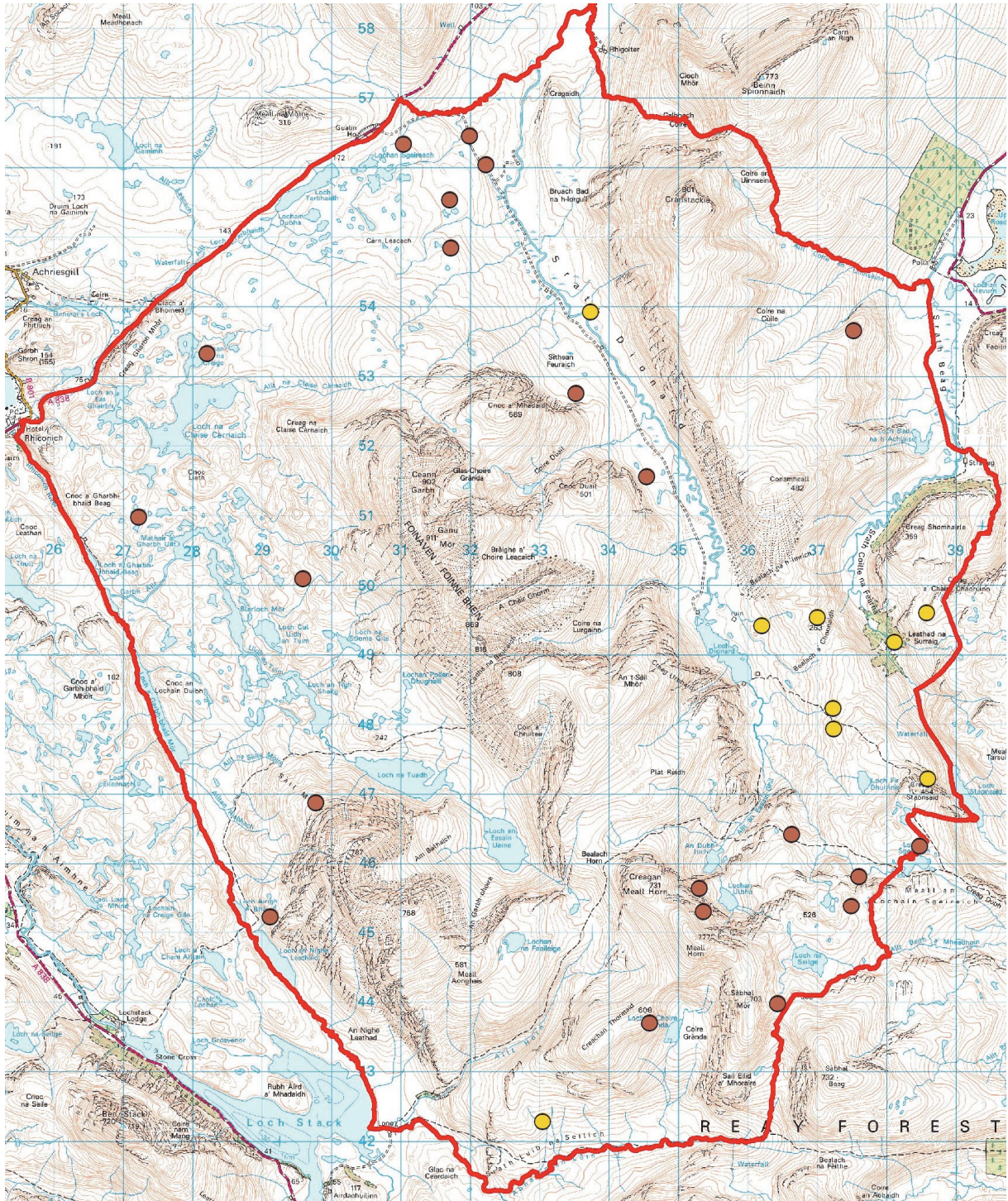
Map 7. Distribution of dry heath plots. Green dots signify an assessment pass, red dots an assessment failure. © Crown copyright and database rights 2015. All rights reserved. OS Licence Number 100017908.

3.7 Site checks

The SAC features Alpine and subalpine heaths, Montane acid grasslands, Plants in crevices on mainly acid rocks, Plants in crevices on base-rich rocks and Tall herb communities were subject to the less formal 'Site Check' assessment, undertaken in conjunction with the main SCM exercise. All were found to be in generally good condition. Representative photographs of some Site Check communities along with other notes and comments on the site are detailed in the Target Notes (Appendix 2).

4. GENERAL OBSERVATIONS ON MANAGEMENT

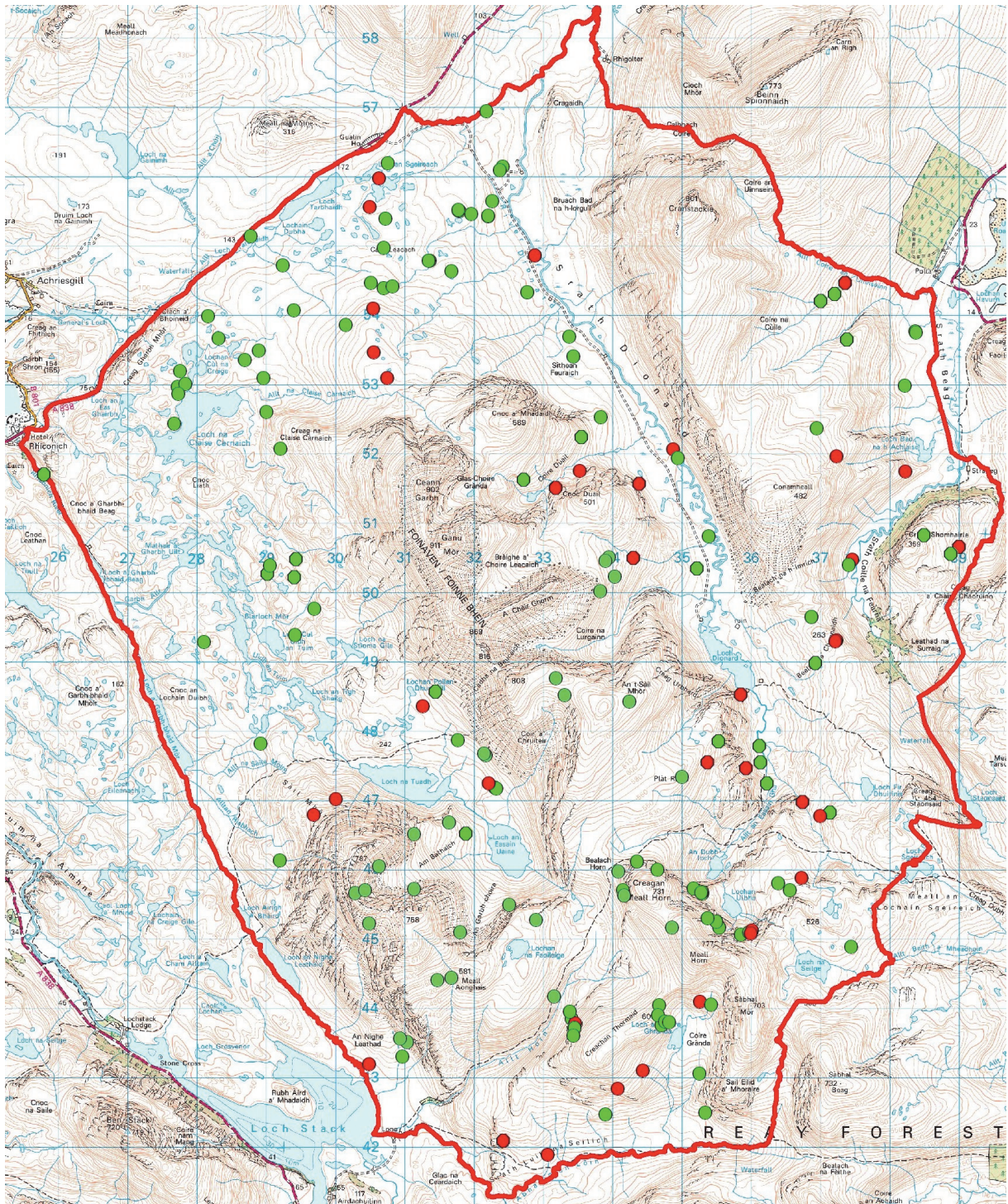
The main negative impact of current management on the site remains locally heavy trampling from deer. This tends to be concentrated in specific places, rather than being widespread, and has significant effects mainly on the more fragile habitats, especially ones with bryophyte-rich carpets on shallow substrates such as M15c wet heath, M21b oceanic heath and blanket bogs (Map 8). As noted in the previous assessment (O'Hanrahan, 2011) sheep numbers remain generally low, although there appeared to have been a slight increase in numbers on the fringes of the site allowing more stragglers than previously to make inroads further into the site than previously noted (such as just to the south-east of Loch Dionard). Nevertheless, they currently remain a minor contributor to overall herbivore impacts.



Map 8. Distribution of herbivore observations within SAC boundaries during survey. Brown dots indicate red deer. Yellow dots indicate sheep. © Crown copyright and database rights 2015. All rights reserved. OS Licence Number 100017908.

If the distribution of plots from all features assessed is viewed synoptically (Map 9), it can be seen that over substantial tracts of the site they remain in good condition. Most notably blanket bogs, depressions on peat substrates and wet and dry heaths and in the north-western part of the site (encompassing most of Rhiconich and the north-western part of Reay), did not register a single failed monitoring plot. Much of the northern part of Strath Dionard is similarly positive and substantial stretches east of Cranstackie and in the south-central area of the site also display uninterrupted sequences of plots registering favourable

condition. Failing plots, although widespread away from the north-west, tend to be clustered in the south and south-east of the site, with notable scatters in the eastern corries of Foinaven and along the Rhiconich/Gualin boundary and around Loch nam Blar-loch.



Map 9. Distribution of all SCM plots. Green dots signify an assessment pass, red dots an assessment failure. © Crown copyright and database rights 2015. All rights reserved. OS Licence Number 100017908.

The marked distribution of favourable plots in the north-west possibly reflects recent significant reductions in herbivore numbers (especially sheep) over the past decade in this part of the site (Dayton & O’Hanrahan, 2011). Elsewhere, clusters of failing plots could be

reflecting traditional through-routes for deer moving between corries or straths where they become concentrated or (in the case of the cluster of Species-rich *Nardus* grassland plot failures in the south east) where preferential grazing areas persist.

There is occasional evidence of continued revegetation of formerly eroded bog from the large high-altitude blanket bog areas (e.g. see Target notes 14-19, Figure 1) although the signs are that it is proceeding quite slowly in such topographical areas. This is offset, to some extent, by observations of increasing trampling damage noted in other areas (e.g. Target notes 21-22).



Figure 1. Area of former probable deer wallows now revegetating east of Loch na Seilge (237410 944836)

Turning to non-herbivore impacts, the healing of former vehicle tracking in Strath Dionard continues, although it was noticeable that some tracks are continuing to resist revegetation stubbornly (Target note 24; Figures 2,3). New vehicle tracks were meanwhile noted in Polla (Target note 25).



Figures 2, 3. Damage to blanket bog and wet heath in Strath Dionard from old vehicle tracks. Revegetation appears to be occurring only very slowly. (234932 951727)

In the extreme east of the site, principally within Polla and Eriboll, blanket bogs which have been subject to historic moorland-gripping appear to be recovering naturally to a certain extent, with evidence for some drains naturally infilling with vegetation (see Target note 10). Balancing this are many still-active drain grips (Target notes 3-9, 11-13; Figure 4) and the blanket bog here, although generally in good condition, would certainly benefit from intervention in the form of ditch-blocking in order to promote faster recovery from drainage and enhancement of the feature.



Figure 4. Active moor grip in blanket bog within SSSI at Strath Beag (238272 953643)

No obvious signs of recent muirburn were encountered on the site during the survey.

No management activities observed were considered to be directly positive.

4.1 Negative management activities

Deer trampling
Deer grazing
Moor grips

4.2 Positive management activities

None.

5. POSSIBLE PROBLEMS DUE TO TIMING OF ASSESSMENT

None.

6. GENERIC PROBLEMS WITH ATTRIBUTES AND TARGETS

A misunderstanding over the different boundary for the SSSI and SAC resulted in some confusion over the number of points ultimately surveyed for blanket bog and Depressions on peat substrates.

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ANNEX 1: RESULTS SPREADSHEETS

This annex can be downloaded from the SNH website as a separate file.

ANNEX 2: TARGET NOTES

This annex can be downloaded from the SNH website as a separate file.

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