Scottish Natural Heritage
Research Report No. 1032

Site Condition Monitoring survey of upland notified features on designated sites – Flow of Dergoals

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RESEARCH REPORT

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Site Condition Monitoring survey of upland notified features on designated sites – Flow of Dergoals

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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 – Flow of Dergoals

Research Report No. 1032
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Keywords

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

Background

This report was prepared by Peak Ecology Ltd. It provides findings of monitoring undertaken at Flow of Dergoals SAC and SSSI in the South Scotland SNH Area. There was Site Condition Monitoring (SCM) of the Blanket Bog and Valley Bog (Upland) Feature and the Depressions on Peat Substrates Feature (central NGR: NX 24576 57921).

Standard guidance and methodology were followed. SNH provided Site Attribute Tables tailored to the Blanket Bog and Depressions features. Desk study included the 2001 report when the blanket bog feature site was found to be in Favourable Condition. Fieldwork took place over two days in August 2012 and August 2013. A total of 29 sample points were assessed on the blanket bog and 8 on the Depressions feature. Positive and negative management activities were also recorded.

Main findings

- Most targets were easily met on the Blanket Bog, except for two targets: three points were marginal for 'cover of at least three indicators should exceed 50%'; and at two points only five instead of six indicator species were recorded. One sample point is in both categories. These four points were atypical of the main bog.
- On the main bog all Blanket Bog targets were easily met; it is in Favourable Condition
- All Depressions sampled or passed on the main bog surface are in Favourable Condition
- There is potential to improve parts of the southern bog by blocking large drains which currently have some water movement; a hydrological survey would be advisable first.
- When the forestry on the west of the northern bog is felled there would be a significant conservation gain if it was not restocked and the bog restored.

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1. INTRODUCTION

This report has been prepared by Peak Ecology Ltd for Scottish Natural Heritage (SNH). It provides findings of monitoring undertaken at Flow of Dergoals SAC and SSSI (central National Grid Reference: NX 24576 57921) in the South Scotland SNH Area This consisted of Site Condition Monitoring (SCM) of the Blanket Bog and Valley Bog (Upland) Feature in both SSSI and SAC and of the Depressions on Peat Substrates Feature in the SAC. The work was undertaken by Carol Crawford.

From henceforth in this report:

- The Blanket and Valley Bog Feature will be referred to as the Bog feature
- The Depressions on Peat Substrate Feature will be referred to as the Depressions feature

Figure 1. Drosera anglica *at Target Note 4.*

The objectives of the monitoring were:

1. An assessment of the condition of the selected notified features, in the field.
2. A report on the overall condition of the selected notified features.
3. A report on which attributes fail, and estimates of how much target variables differ from targets, at which sample locations, for each notified feature.
4. A written general description of the state of all the notified features over the whole site, highlighting any pattern in condition across multiple features.
5. Completed field recording forms, in a standardised format, showing the results for the notified feature and notes on the reliability of observations (e.g. as affected by bad weather or poor visibility).
6. A record of management activities observed which are likely to affect feature condition (from a supplied standardised list).
7. Photographs of sample points and examples of condition.

2. METHODS

2.1 Monitoring guidance

The methods for assessing the condition of the habitats followed those given in the JNCC (2009) Common Standards Monitoring (CSM) Guidance. This contains attribute tables with targets to be assessed for each feature.

Site Attribute Tables (SATs) tailored to the Bog and Depressions features were provided by SNH with the instruction that at least one target per attribute be used; some targets being more applicable than others. Mandatory attributes were indicated in the SATs. The SNH suggestion that the SAT be included in the return for the site, with final two columns completed, was followed.

SNH's detailed SCM method (MacDonald, 2004) was provided after the first draft report was produced in February 2013. It was referred to for the second monitoring visit and final report.

2.2 Desk study

Ordnance Survey (OS) maps, recent aerial photographs, the SATs and the SNH (2001) SCM report for this feature, provided by SNH, were studied before the field survey. The CSM guidance and an earlier aerial photograph on Google Earth were also referred to.

Two recording forms were designed in Excel: one to capture data necessary to assess targets; the second to record notes and photograph details. In the former the targets are in the same order as in the SAT provided for that site and feature.

2.3 Selection of assessment points

For the Bog feature 39 random sample points were provided by SNH. Some of these could be used for the Depressions feature. Opportunistic samples were allowed as necessary. The provided points were uploaded via Anquet software to a Garmin Etrex Vista HCx GPS handset.

For the 2013 visit SNH provided points on the main bog, not visited in 2012, were chosen and additional points on the main bog were selected (away from these and 2012 points) using Anquet and uploaded to the GPS handset.

2.4 Field survey

The bog was visited on 8th August 2012 and 28th August 2013. Field methods followed those in: SNH (2012) Statement of Requirements (SoR) issued June 2012; the SATs later provided by SNH; and the CSM guidance if more detail was required.

The GPS handset (accurate to 3m in the open) was used to navigate as close as possible to the uploaded sample points and a new ten figure national grid reference (NGR) was taken at the arrival point. A 2m x 2m sample plot was set out from the arrival point. Corners of the plot were marked with pieces of kit.

As prescribed, some targets were assessed in the 4m2 plot, some in the area visible from it and a few both inside the plot and in the surrounding visible area. Active drainage and eroding peat were also looked for between sample points.

All mandatory targets and other targets given for attributes were assessed.

Positive indicator species lists given in the results spreadsheet are not exhaustive. Obvious species were recorded rapidly and once at least six species had been seen recording stopped. Vascular plant names follow Stace (2010) and bryophytes names follow Atherton et al (2010).

Oblique photographs were taken of each plot (and direction noted) and its context in one or more directions. At least one vertical view of the ground layer, at wide angle setting, was also captured.

Target notes cover management activities and other observations of interest and also include photographs.

The three most significant positive management activities and the three most significant negative activities for the blanket bog feature were recorded on the data form.

2.5 Survey limitations

Though the day of the 2012 survey was clear and sunny with good visibility, it was in the middle of a very wet summer making the going on the bog slow, particularly across areas of Molinia mire (M25). Thus there was not enough time to go into every area of bog where sample points were provided. A total of 19 samples were taken.

M25 is not listed among main NVC types for the Blanket and Valley Bog (upland) feature – see 3.1 below. CSM guidance states that where blanket bog communities are being replaced by degraded mire communities such as M25 and where restoration to blanket bog is feasible, then degraded communities should be assessed with the same attributes. However, some M25 at Flow of Dergoals appeared natural (wet and Sphagnum-rich) rather than degraded, e.g. on sloping ground leading down to Dergoals Burn and circling the two main raised mires. Molinia halos are typical of lowland raised mire systems and part of their lagg phases. Given the altitude of this bog (80 – 100 m) it could perhaps be classed as a lowland mire system.

The route used on the 2012 visit (with the greatest concentration of provided sample points) was often round the perimeter of the main bogs therefore much Molinia mire was encountered. As this Molinia ground was often not degraded mire, a decision was taken half way round to stop sampling it. On discussion with the nominated officer after that survey, he advised that the Molinia mire should not have been sampled. Data for the four Bog samples and one Depression sample taken in this habitat could be considered separately - M25 is given below the plot number on data sheets to distinguish them.

The 2013 visit focussed exclusively on the main bog surface as requested.

Targets for the 'Vegetation structure – indicators of browsing' were sometimes difficult to assess, given the time of year (optimum late winter – spring) and therefore these assessments may not be accurate.

3. RESULTS

3.1 Desk study

The extent of the SSSI could be seen on the maps and aerial photographs. No NVC mapping was available. On the aerial photo the main bog can be seen to be in two parts, bisected by the Dergoals Burn and bands of *Molinia* dominated ground.

The Blanket Bog and Valley Bog (upland) Feature is defined in the CSM guidance as comprising the following NVC communities: M1 – M3 bog pool communities and M17 – M21 blanket and raised mire communities. Communities which may indicate degraded blanket bog are also listed.

The feature Depressions on Peat Substrate of the Rynchosporion is included in the CSM guidance for Blanket and Valley Bog (Upland) and its SNH Attribute Table was similar. The SSSI citation describes them as *'distinct hollows with Sphagnum cuspidatum present, though these are quite small and represent a comparatively small proportion of the bog surface'.*

The 2001 SCM report was studied before the visit. In this the condition of the SSSI was assessed as Favourable Maintained. The assessment system was simpler than now.

The 2009 CSM guidance recommends that to report the condition of a feature as favourable, it should be possible to state with a high degree of confidence that each target is met over at least 90% of the feature. MacDonald (2004) explains that if 28 samples are taken, provided no more than five samples fail the targets set, there is sufficient confidence that 90% of the feature is in favourable condition.

3.2 Field survey

3.2.1 Organisation of results

The routes taken, sample points and target note locations are shown in **Figure 2**. This is also provided as shape files in the accompanying data. The data sheets; completed SATs; notes on each sample and target notes, both with lists of photographs are provided in the Excel **Appendix**.

Photographs retain their original numbers and are contained in folders in the accompanying data, each folder labelled by Sample Point or Target Note numbers.

Bog and Depressions sample points are shown with different colours on **Figure 2**. See Excel Appendix Sheets 1 and 3 for data, Sheets 2 and 4 for SATs completed with Target Results and Sheet 5 for each sample's Notes and Target Notes.

- On (1) and (3) the Data sheets, the first column shows if the target was assessed within a $4m^2$ sample plot and/or the area visible round the plot (denoted $4m^2$ or Ж respectively).
- On (2) and (4) the SATs sheet the Target Results are in the final two (yellow) columns.
- On (5) the Notes are the NGR for each sample plot and a brief description and/or notes for each sample plot and lists of photograph numbers for each. It also explains why points provided by SNH on the routes were not assessed. Bog plots are described first, and then depressions plots.
- Sheet (5) also contains Target Notes (TNs), their NGRs and relevant photos. These notes are below the Depressions Points notes.

3.2.2 Blanket bog feature

Over the two days 29 samples were taken within the bog feature, 14 in 2012 and 15 in 2013. For these samples most targets were easily met but there were some marginal plots or fails in 2012 as given in Table 1. Mandatory targets are given in **bold**. More detail, discussion and judgements made follow the table.

Table 1. Sample plots which failed blanket bog targets (or were marginal)

Attribute	Target	Failed plots	Number of fails
Vegetation composition – cover of indicator species	**50% cover of 3 or more indicators**	**13, 14 and 29 marginal**	
Vegetation composition – frequency of indicator species	**At least 6 indicator species should be present**	**8003 and 29**	**2**

3.2.2.1 Vegetation composition – cover of indicator species

Three samples were marginal: indicator species covering +/- 50% of plot. Two of these samples (13 and 14) were in M25 with high *Molinia* cover and the other (29) on bog grading to wet heath on a knoll near south of site. If they are taken as atypical of the feature, the target is met.

3.2.2.2 Vegetation composition – frequency of indicator species

The atypical 29 again failed the target for this attribute as did 8003 which was also atypical and near the edge of the site – on a ridge near the east edge. Both had only five indicator species. All samples on the main bog passed this target.

3.2.2.3 Vegetation structure – indicators of browsing

As mentioned in 2.5 above this was difficult to assess, however, with the absence of livestock on the bog at the time of survey, generally no grazing was observed and where it was seen the target was met. The main browsers may be roe deer, when moving between the forests on either side. Invertebrates may also be eating some plants, e.g. *Myrica* leaves.

3.2.3 Depressions feature

Eight samples were taken, five in 2012 and three in 2013. Four of the 2012 points were near given SNH points, the fifth (8001) opportunistically sampled en route to bog point 13, was a larger pool system. All 2013 samples were in M2a, one at a given SNH point; two opportunistic. In hindsight point 8001 was different to the typical Depressions feature described in the SSSI citation (see 3.1 above) with more open water which altered the species composition and on lower ground, near a channel, rather than on the bog surface. This led to the plot being marginal for one target: Vegetation Composition – Cover of Indicator Species; the indicators only covering around 50% of the plot and not definitely more than 50%. All other targets were met. Several other depressions were seen on the second visit when focussed on the main bog, all of which would meet all targets, e.g. at TNs 16, 17 and 21 and between points 17 and 8008 and between 27 and 8012.

3.2.4 Other observations

Some grips and old drain lines penetrate the main bogs – showing white on air photograph (*Molinia* and/or *Juncus*), mostly infilled with any water movement was sluggish. The site also contains knolls with heath, bracken or acid grassland, mostly near the boundary e.g. TN5. There is a large *Phragmites* reedbed at TN10 beside open water, near a southern group of knolls and some smaller areas of where it is scattered, e.g. TNs 14 and 17. Several roe deer paths crossed the bog, e.g. TNs 2 and 3 and two roe deer were seen at TN12. Little evidence of vehicle tracking was seen.

4. MANAGEMENT OF BLANKET BOG

4.1 Positive and negative activities

The most positive activities seen were:

1. Low grazing levels (no livestock seen), some swiping
2. Clearfell of some forestry to west
3. Old drains don't appear to be maintained, many infilled

The three most negative activities were:

1. Forestry on rest of west boundary, leading to some conifer regen at west side of bog
2. Some drains do have slow moving water
3. Broadleaved planting at south end of bog – TNs 8 and 9

4.2 Discussion of management

Lack of grazing was not an issue on the main bog areas, because they are so wet, overall the light grazing is positive. A swiped area was seen in the south-east of the bog (TN19) and there graminoid cover exceeded heather cover. Some *Molinia*-dominated areas might be improved by swiping, if machinery can get on.

The main bog areas appear to have little active drainage, most old drainage being redundant. However a little water movement was observed near or between some plots, two of which – 25 and 26 - are close to two large drainage lines which penetrate the southern bog – see air photograph. Water movement was also seen between 27 and 8012 and at TN20. Those are areas where drain blocking could be considered. However it might be advisable to do a more systematic study of the drainage in the bog system before targeting such action.

An obvious issue, though small scale, was two areas of broadleaved planting on bog habitats towards the south of the site – TNs 8 and 9. These trees should be removed. Conifer regeneration seeding in from the forestry, though sparse, would ideally be removed at the same time.

Part of the western forestry had been felled since the aerial photo was taken. The northern part of the west forest includes 25-35% of the dome of the northern bog – see aerial photograph. When that forestry is felled, there would be significant conservation gains were it not restocked and the bog reinstated.

5. CONCLUSION

If *Molinia* areas and areas transitional to heath (points 13, 14, 29 and 8003) are excluded from Bog samples because they are atypical, the main bog feature is considered to be in favourable condition. Most targets were easily met at all points.

If the atypical point 8001 is excluded the Depressions feature can be considered to be in Favourable Condition. All targets were easily met at the other Depressions samples and other examples of the feature seen.

It might advisable to have a survey carried out to map the lowland raised bog for which a different set of attributes would apply.

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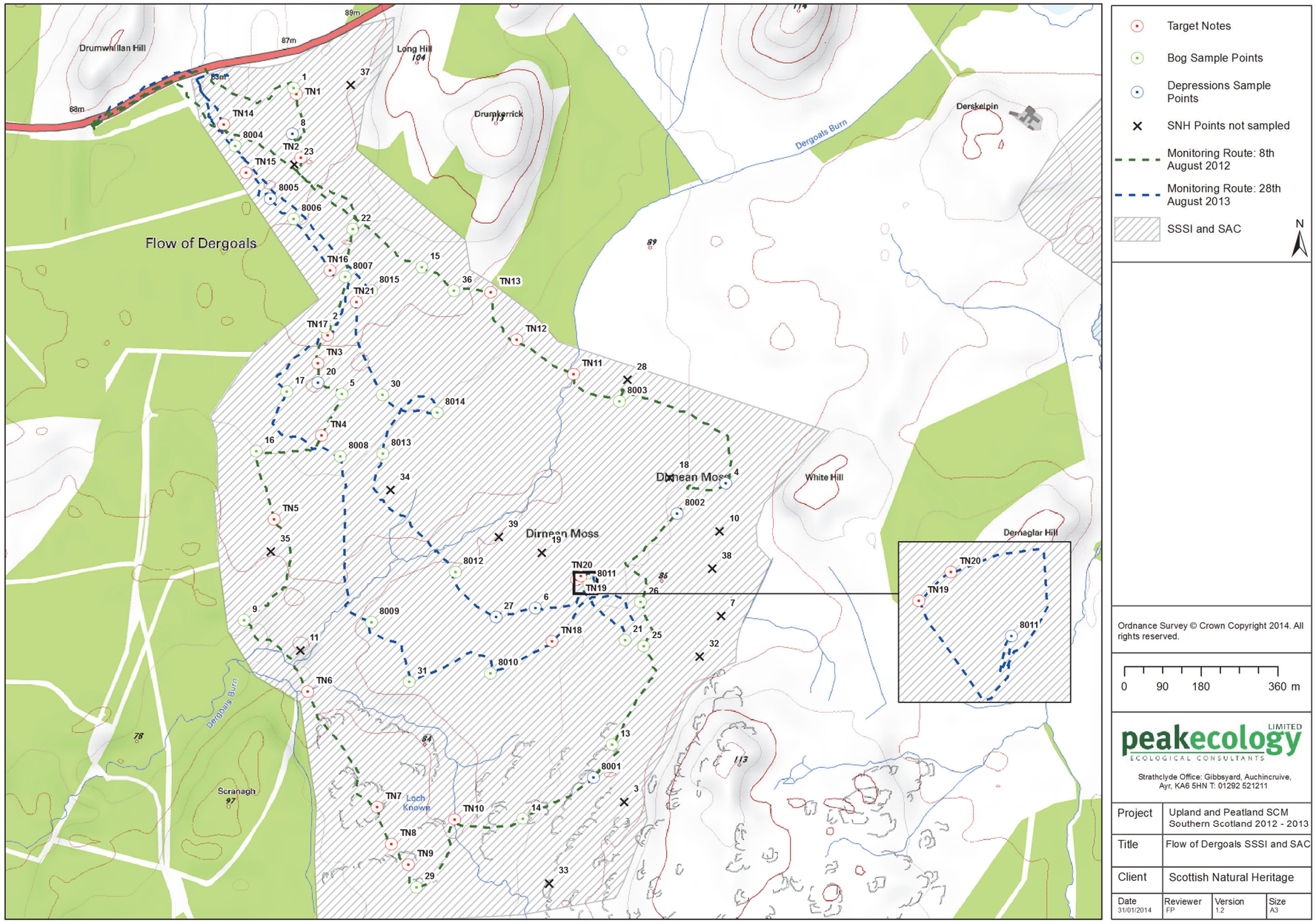

Figure 2. Routes Taken, Sample Points and Target Note locations

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