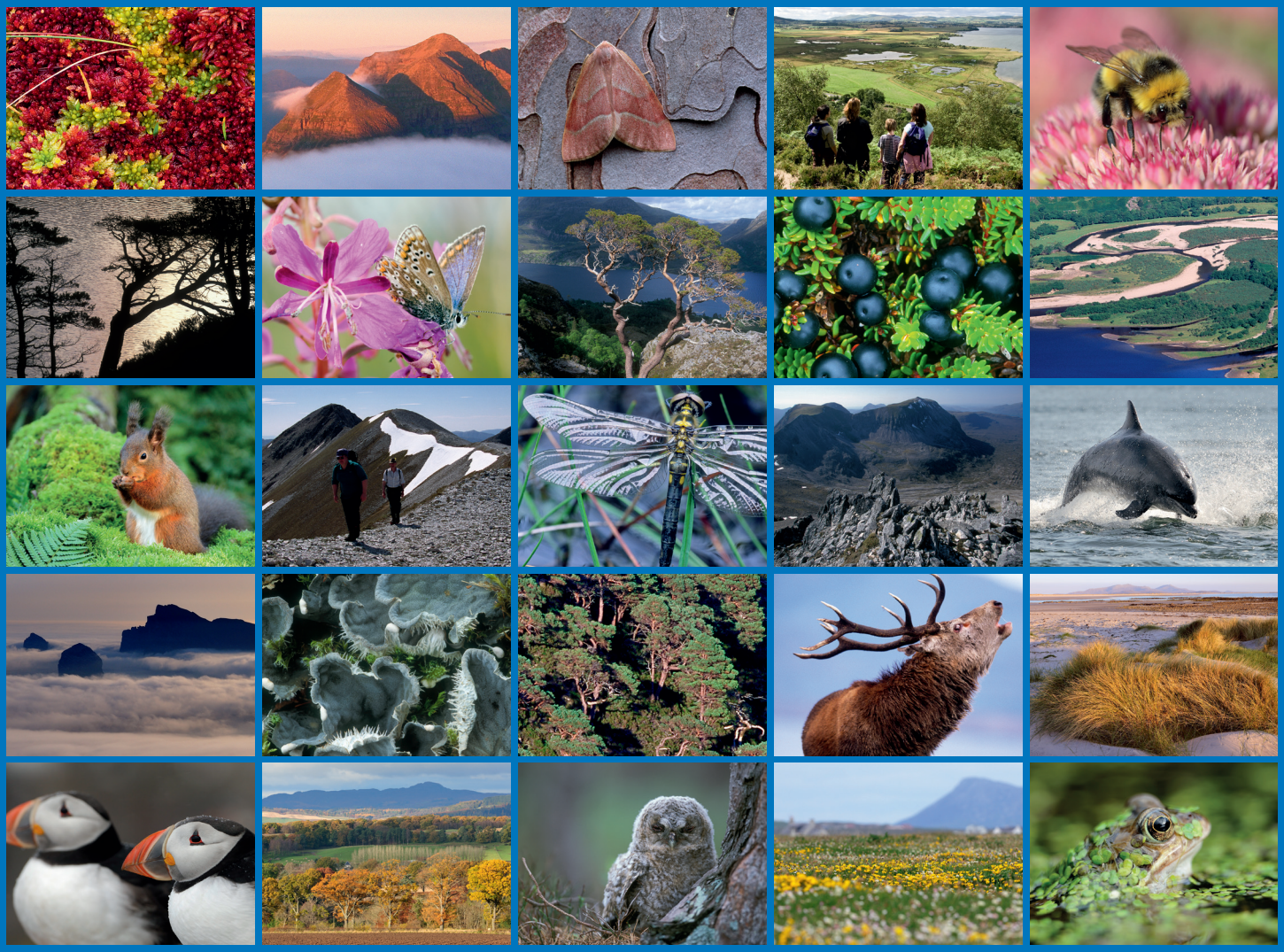
Scottish Natural Heritage
Research Report No. 1033

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



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RESEARCH REPORT

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

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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 – Foula

Research Report No. 1033
Project No: 013952
Contractor: Andy Acton and Anna Griffith
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Keywords

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

Background

Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), 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 is a six year rolling programme of assessment, against quality standards, of the state of notified features of interest on designated sites. This report covers the blanket bog feature of the Foula SSSI, Grid Ref HT960 390, Shetland (SNH Northern Isles and North Highland Area).

Main findings

The blanket bog SSSI notified feature was assessed during September 2012. The feature was assessed at 31 random sample locations and casual observations were made whilst walking between these plots. At each random sample location attributes were assessed against blanket bog targets in the standard guidance for the assessment of upland habitats. The results of the survey were as follows:

- The blanket bog feature failed to meet one or more of the set targets at 26 of the 31 sample locations visited. The failures were due to targets not being met for numbers of indicator species, cover of indicator species, cover of dwarf shrubs, cover of negative indicator species, browsing of dwarf shrub shoots and cover of disturbed bare ground.
- The most significant failures relate to the dominance of dwarf shrubs (14 sample locations) and browsing of dwarf shrubs (17 sample locations). The other target failures only occurred at one to five locations.
- The blanket bog feature therefore fails for the site overall.

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Acknowledgements

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1. BACKGROUND

Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), 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 is a six year rolling programme of assessment, against quality standards, of the state of notified features of interest on designated sites. This report covers the blanket bog feature of the Foula SSSI, Grid Ref HT960 390, Shetland (SNH Northern Isles Area).

2. METHODOLOGY

2.1 Site Condition Monitoring (SCM) (Common Standards Monitoring)

The methods for assessing the condition of the habitats followed those given in the documents listed below:

- Common Standards Monitoring - guidance for upland habitats (JNCC 2009).
- Site Condition Monitoring of Upland Sites in Scotland: Method of Field Assessment (MacDonald, 2004).
- Site Condition Monitoring (SCM) survey of upland and peatland notified features on selected protected areas in Shetland - Contract Statement of Requirements.

The above CSM guidance provides the blanket bog attribute table which includes all targets to be assessed for the feature.

Methods differed to MacDonald (2004) where requested in the contract Statement of Requirements or at the inception meeting. Notably:

- *An assessment of the condition of each selected notified feature, in the field:*
  - *i) For sites over 1000ha, from as many of the 37 sample locations at which the appropriate feature is found to be present, or from known locations and opportunistic samples, using the standard methods provided.*
  - *ii) For sites less than 1000ha, visit as much of the features as practical within a day's fieldwork. Collect data at 5-20 locations.*

- *Stop at 28 sample points for sites falling under i). i.e. continue assessments regardless of the fails at six locations fieldwork cessation threshold given in MacDonald (2004)*.

2.2 Generation of assessment points

Foula SSSI covers 1099ha and the SNH method of assessment is as follows:

> *For sites over 1000ha, from as many of the 37 sample locations at which the appropriate feature is found to be present, or from known locations and opportunistic samples, using the standard methods provided.*

There were no previous sample locations generated by SNH. Therefore, the contractors generated a large number of random 13 figure grid references using Excel 2010. These waypoints were uploaded into GIS. By comparing the locations with a Phase 1 habitat map of the island (Todd *et al.,* 1981) and aerial photos, any falling within obviously incorrect habitat were discarded. For Foula SSSI this gave a potential 48 blanket bog random sample locations. The first 37 were treated as the working list, leaving 11 'spares' should there be too many discards to give 28 sample locations from the first 37. This turned out to be prudent given the borderline locations of some samples.

2.3 Field methods – SCM

The surveyor navigated to each point using a hand-held Garmin GPS eTREX H receiver. Grid references were recorded when the accuracy stated on the GPS unit was between 1-10m.Each location was checked for blanket bog, if not present at the provided grid reference the required habitat was searched for within a 20m radius of that grid reference. The 'new' grid reference was then recorded. Locations falling greater than 20m outside blanket bog habitat were discarded.

At each point, all targets for each feature to be assessed were checked according to the methods listed in section 2.1. For each target a record of whether the feature passed or failed was made and the actual value of the assessment recorded, e.g. the number of indicator species.

Photographs were taken at each sample location and throughout the site to illustrate general condition of the blanket bog feature and any particular issues related to condition or management. Each photo was given a unique reference.

2.4 Dates, surveyors and local conditions

The site was surveyed on 14, 15 and 16/09/12 by Andy Acton and Anna Griffith. Weather conditions were variable: 14th – dry, windy; 15th – periods of rain, strong winds prohibiting work on high ground; 16th - dry, bright and windy.

2.5 Constraints

Some of the Foula plots on deep peat are part of the blanket bog complex (e.g. 43, 85, 71, 165) but species such as *Eriophorum vaginatum* was very sparse or absent. These areas are clearly degraded bog (range of *Sphagna* and *Odontoschisma sphagni*) with a vegetation cover now more akin to wet maritime heath (*Scilla verna* and *Plantago maritima* were occasional in these areas). They do not appear to adequately fit into existing NVC communities. Elsewhere the very low cover or absence of key species such as *Eriophorum vaginatum* and *Tricophorum cespitosum* made it difficult to assign to NVC community as part of a rapid assessment such as SCM. Detailed quadrat sampling would be required to either allocate these to existing NVC types with greater confidence or describe new variants. This level of recording was beyond the remit of the contract. Therefore, the NVC column of the spreadsheet in Appendix II has only been completed when assigning plot vegetation to NVC community was straightforward.

In some areas it was debatable whether or not blanket bog vegetation could be restored and therefore whether or not to discard a waypoint. For example plots 71 and 165 fell within an extensive area of deep peat (>1m deep) where the vegetation had affinities to maritime heath and *Nardus* grassland. Here there was still a reasonable cover of component species of mire vegetation and the area of deep peat was extensive and intact. Therefore, the sample locations were assessed.

No difficulties with particular features, attributes or targets were encountered.

3. RESULTS

3.1 SCM of blanket bog

A map showing the Foula SSSI with sample locations visited is provided in Appendix I. Appendix II contains the results of the assessments made at each of the 31 sample locations provided in SNH's standard spreadsheet for upland and peatland features. The list of 48 generated waypoints and their grid references are provided as a separate worksheet in Appendix II. Plot and report figure photos are provided in Appendix III.

For a full list of the abbreviations used in this report see Appendix IV.

The results of the 2012 Site Condition Monitoring visit are summarised in Table 1 below.

Table 1. Summary table of the overall condition assessment for the blanket bog feature at Foula SAC/SSSI.

Feature/ habitat	Number of assessments				Pass/ Fail	Reasons for failure or uncertainty
	passed	failed	discarded	not visited		
Blanket bog	5	26	7	0*	Fail	Number of indicator species<6, cover of indicator species not ≥ 50% consisting of ≥ 3 species, cover of dwarf shrubs> 75%, cover of negative indicator species ≥1%, >33% of dwarf shrub shoots browsed, cover of disturbed bare ground > 10%.

* NB there was no requirement to visit all sample locations due to the size of the site (see section 2.1)

Blanket bog covers a significant proportion of the site and assessments were made from 31 locations spread across the site (see map, Appendix I). The blanket bog feature failed to meet targets at 26 of the 31 sample locations assessed. Therefore, it failed overall for this site. The failed targets are described briefly below.

3.1.1 Number of indicator species

At five locations the number of indicator species was less than six. Due to an error interpreting how the target should be applied, *Sphagna* spp. were scored 1 as an aggregate regardless of how many species were present. Due to this error the result of assessment is as follows: the target was not met for the number of indicator species at a minimum of two locations and a maximum of five locations. At plot 14 the contractor had made a note of *Sphagnum* spp. present and the score of four entered in Appendix II reflects this and therefore the correct assessment is failure. At plot 53 a score of four was recorded; no notes were made on *Sphagnum* spp. present so if two or more species of *Sphagna* were present this plot may have passed for this target. It is likely that two or more species were present as although this was in an area with drains the bog was reasonably damp with typical bog vegetation. Plot 53 did not fail any other targets. At plot 60 a score of five was recorded; no notes were made on *Sphagnum* spp. present so if two or more species of *Sphagna* were present this plot may have passed for this target. It is likely that two or more species were present as the bog was reasonably damp with typical bog vegetation. Plot 60 failed on one other target. Plot 44 scored five for number of target species, this is correct as no *Sphagnum* species were seen. In Plot 93 indicator species scored five. No notes were

made on *Sphagnum* spp. present so if two or more species of *Sphagna* were present this plot may have passed for this target. However, this plot was a grassy form of M19 and the drier conditions are likely to limit the diversity of *Sphagna.* This plot failed one other target. Generally the diversity and cover of *Sphagnum* spp. was low particularly in areas of drier M19 (e.g. on steeper slopes) or where heath vegetation was present over deep peat.

In summary this target definitely failed at two locations (14 and 44) and probably failed at a third (93). At two further locations (53 and 60) the target may have been met. SNH recommended that where there is doubt, give the benefit of that doubt and not record a failure. Thus, for locations 53 and 60 the target has been assessed as met.

3.1.2 Cover of indicator species

At one location the target for at least fifty percent of vegetation cover to consist of at least three indicator species was not met. This plot fell at the edge of an area of blanket bog on steep slopes. The ground was drier and the vegetation composition reflected this. The absence of *Calluna vulgaris* and the scattered presence of *Vaccinium myrtillus* may indicate that dwarf shrubs have been grazed out to some extent in the past.

3.1.3 Cover of dwarf shrubs

The percentage cover of dwarf shrubs failed to meet the target at 14 locations with the cover of *Empetrum nigrum* and/or *Calluna vulgaris* being higher than the 75% threshold for a $4m^2$ plot. The percentage covers ranged from 80% to 95%, representing a factor of 10 - 20% above the target threshold for passing.

The failures for dwarf shrub dominance were scattered across the site. These plots mainly fell within M19 *Calluna vulgaris – Eriophorum vaginatum* blanket mire habitat, a community which often has a high cover of *Calluna* throughout its range in Upland Britain. The prominence of *Empetrum* in some stands may reflect 1) a period of heavy grazing (during which *Calluna* is grazed in preference to the less palatable *Empetrum*), followed by a relaxation of grazing and 2) the maritime conditions (*Empetrum* copes better than *Calluna* when exposed to salt laden air).

3.1.4 Cover of other species (negative indicators)

One plot failed to meet the target requiring less than one percent of the vegetation cover to consist of, collectively *Agrostis capillaris, Holcus lanatus, Phragmites australis, Pteridium aquilinum, Ranunculus repens.* This plot had a high cover of grasses in general and was in an area of heavy sheep grazing.

3.1.5 Browsing

Greater than 33% of the last complete growing season's shoots of dwarf shrub species showed signs of browsing in 17 plots. The percentage of shoots browsed in these failed plots ranged from 40 – >90% with an average of 54%. These plots were scattered across the site. The plots with the higher percentages (>60%) were located on the upper southern slopes of Hamnafield and Da Sneug, and in the areas of bog to the north of this ridge but to the south of Blobers Burn and southwest/west of the road. Sheep were present in these in areas; ponies were also present in the more northern of the two areas.

3.1.6 Cover of disturbed bare ground

Two plots just failed to meet the target for cover of disturbed bare ground in a 4m x 4m plot. The cover was recorded as 10% in both plots and sheep prints were noted. These plots were confined to one area to the west of the school.

3.2 Comparison with previous SCM visit

The previous SCM assessment of the blanket bog feature was carried out in 2001; the blanket bog feature passing the condition assessment. No previous report or data was provided by SNH for comparison or identification of trends. The 2001 visit would not have used the current JNCC guidance and therefore comparison may be difficult.

The Site Management Statement (SNH, 2010) notes that the blanket bog was found to be in favourable condition as the extent and composition of the habitat was intact. In 2012 the target failures suggest the feature is in unfavourable condition. The change in condition assessment is most likely to be due to differences in the method of assessment (2001 pre-dating the JNCC guidance) rather than a decline in condition having occurred.

4. MANAGEMENT

The site management statement (SNH, 2010) provides the following information:

In the past much of the land has been used for rough grazing for sheep, cattle and ponies and currently most of the land is managed as pasture for sheep and pony grazing. Some areas along the low lying eastern side of the island have been apportioned and this is mainly to help with stock management rather than for improvement.

The pressures likely to affect condition of the blanket bog are ticked in the standard SNH pressures table provided below. A brief description of observed pressures is also provided.

Table 2. SNH standard list of pressures likely to affect the condition of notified features. Those affecting the condition of the blanket bog feature are ticked.

Pressure	Relevant to feature	Pressure	Relevant to feature
1. Agricultural operations		25. Pollution - sewerage	
2. Burning		26. Presence/changing extent invasive species - NATIVE	
3. Development with planning permission		27. Presence/changing extent invasive species - NON NATIVE	
4. Dumping/spreading/storage of materials		28. Pressure to be identified	
5. Extraction - dredging (capital, maintenance)		29. Proactive on-site management	
6. Extraction - maerl		30. Recreation/disturbance	
7. Extraction - quarrying		31. Statutory undertaker	
8. Extraction - sand & gravel		32. Tourism & recreation	
9. Extraction - water (freshwater catchment; industrial, e.g. power station)		**33. Trampling**	✓
10. Fishing - recreational		34. Waste disposal - quarrying (geological material)	
11. Flood defence/coastal defence works		35. Water Dependant Pressure-abstraction	
12. Forestry operations		36. Water Dependant Pressure-artificial recharge	
13. Game or fisheries management		37. Water Dependant Pressure-diffuse source pollution	
14. Grazing - appropriate level		38. Water Dependant Pressure-flow regulation	
15. Grazing - over	✓	39. Water Dependant Pressure-morphological alteration	
16. Grazing - under		40. Water Dependant Pressure-point source pollution	
17. Inter-specific competition		41. Plant pests and diseases: *Phytophthora ramorum/kernoviae*on Blaeberry of heathland and woodland habitats	
18. Maintenance activities carried out on site by an organisation		42. Plant pests and diseases: *Phytophthora austrocedrae* on Juniper (Juniper dieback)	

19. Mineral extraction		43. Plant pests and diseases: *Dothistroma septosporum* on conifers *(*Dothistroma needle blight, or Red-band needle blight)	
20. Natural event		44. Plant pests and diseases: *Phytophthora ramorum/kernoviae* on Rhododendron, Larch http://tinyurl.com/d6wbe8a, other hosts	
21. No on-site activities related to feature condition noted		45. Plant pests and diseases: Alder dieback (Including *Phytophthora alni* and other causes)	
22. Non intervention		46. Plant pests and diseases: Heather beetle	
23. Pollution - air-based sources (inc. greenhouse gases)		47. Plant pests and diseases: Other/unidentified suspected pest/pathogen	
24. Pollution - land-based sources			

4.1 Grazing, trampling, erosion, drainage and peat cutting

These pressures are discussed on an area by area basis as follows.

4.1.1 Da Fleck to Soberlie

Bog would have formerly blanketed the ground between Da Fleck over Codlafield to Soberlie. Historically there has been loss of/decline in bog habitat (see Figure 1) and the largest remnants are now between Da Fleck and Da Lieug o da Fleck. Contraction of the bog appears to be ongoing with decline to M20 and loss of bog vegetation to U5/U6 (e.g. plots 104, 149, 158, 178). Most of the M6 mires associated with the bog complex here are heavily grazed with abundant uprooted tillers (e.g. plot 149 and Figure 2 below).

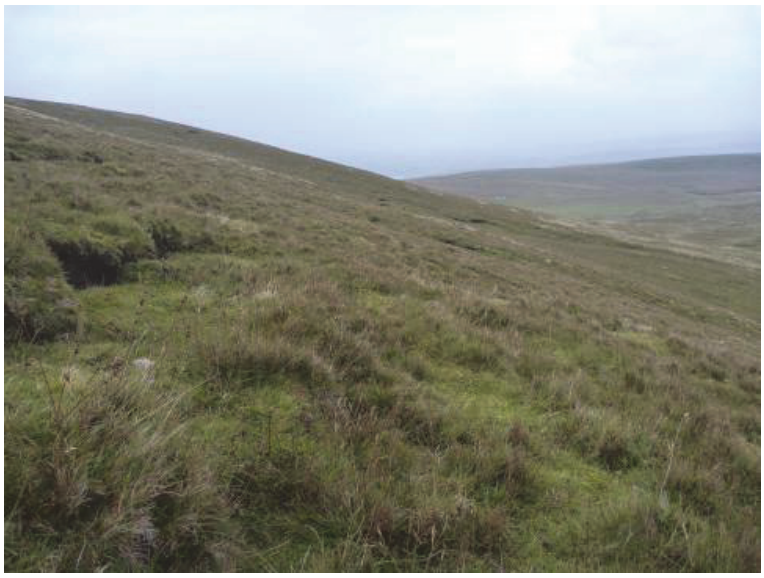


Figure 1. Plot 142 at Soberlie (HT 95153 40758) was visited and discarded as although formerly blanket bog, and with frequent to locally abundant Eriophorum vaginatum it is now dominated by U6 and restoration probably not feasible/realistic. Plots 207 and 216 were also discarded for similar reasons.

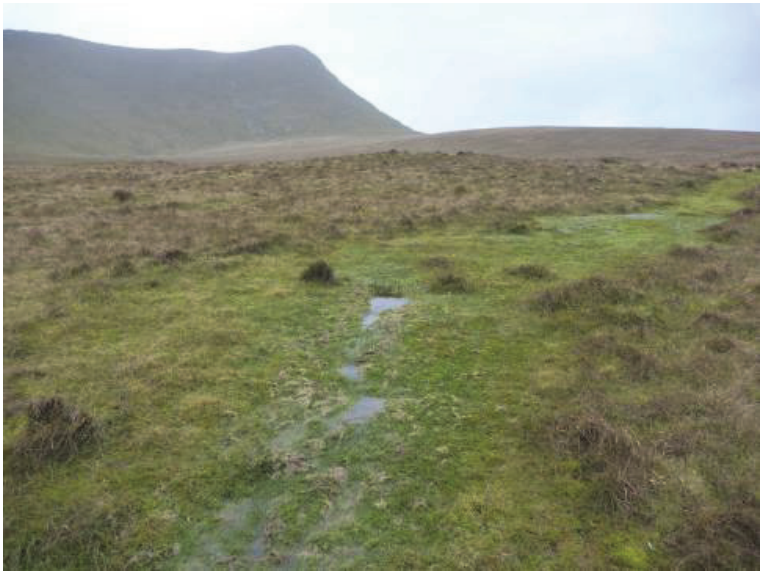


Figure 2. Grazed M6 at HT 95141 40243 with abundant uprooted tillers, frequent Holcus and dung. Some trampling damage but sward still intact with no bare ground. Most of the pools and flushes at Ouvrafandel were similarly grazed.

4.1.2 Ouvrafandal

Sheep appear to shelter at Ouvrafandal and the effects of grazing here are reflected in the high frequency/abundance of grasses amongst the blanket bog vegetation. The areas seen with greatest negative impacts appear to be in the areas with the bog pool systems c. HT 954396 (e.g. plot 5). Here the bog has locally degraded to grassland (e.g. U6) due to heavy

grazing amongst the pools and hag areas. Bird droppings may account for some of the nutrient enrichment in this areas but no obvious evidence was recorded. Despite the obvious effects of grazing/dunging etc. and some disturbance to *Sphagna*, trampling damage is not particularly high and there is more revegetating peat than disturbed bare peat. Signs of heavy grazing in this area include:

- Abundant *Agrostis stolonifera* around edges of bog pools (Figures 3 and 4)
- Locally abundant uprooted tillers (Figure 5).
- locally Frequent to abundant *Holus lanatus* (Figure 6).
- Trampling disturbance to Sphagna (Figure 7)

Figure 3. Bog pools at Ouvrafandal with abundant Agrostis stolonifera in areas heavily used by sheep. Although some trampling along pool edges is present, the trampling impact does not appear not too high. For example the Sphagna at the edges are only subject to moderate disturbance.

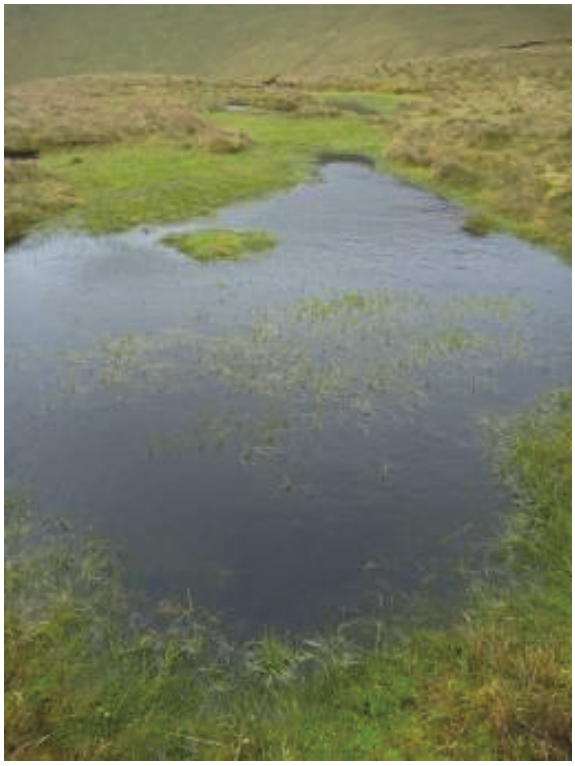


Figure 4. Closer view of bog pools at Ouvrafandal with Agrostis stolonifera

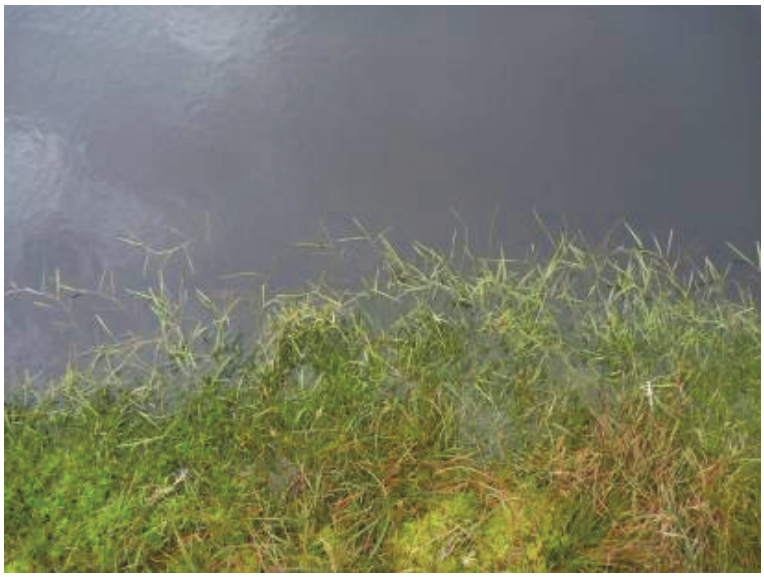


Figure 5. Locally abundant uprooted grass tillers at Ouvrafandal are a good indicator of where there are high levels of grazing pressure.

Figure 6. Locally abundant Holcus (pale Holcus heads visible in photo) at Ouvrafandal due to the effects of grazing/dunging.

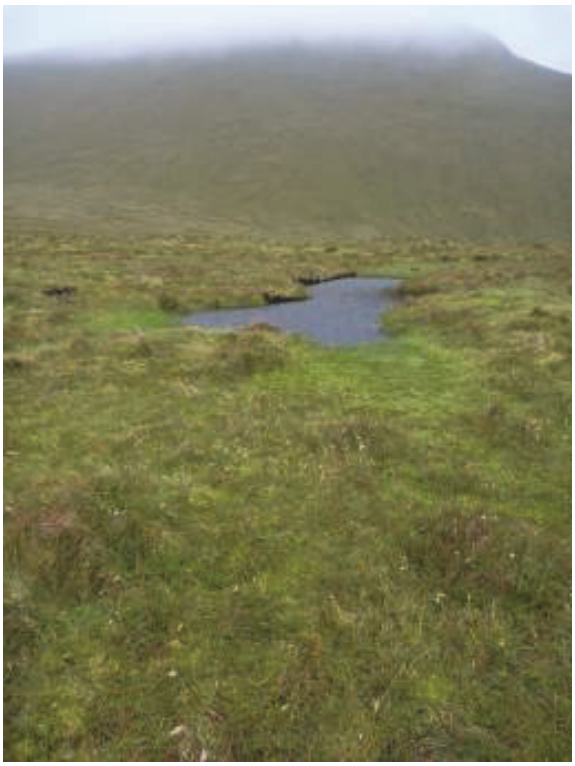
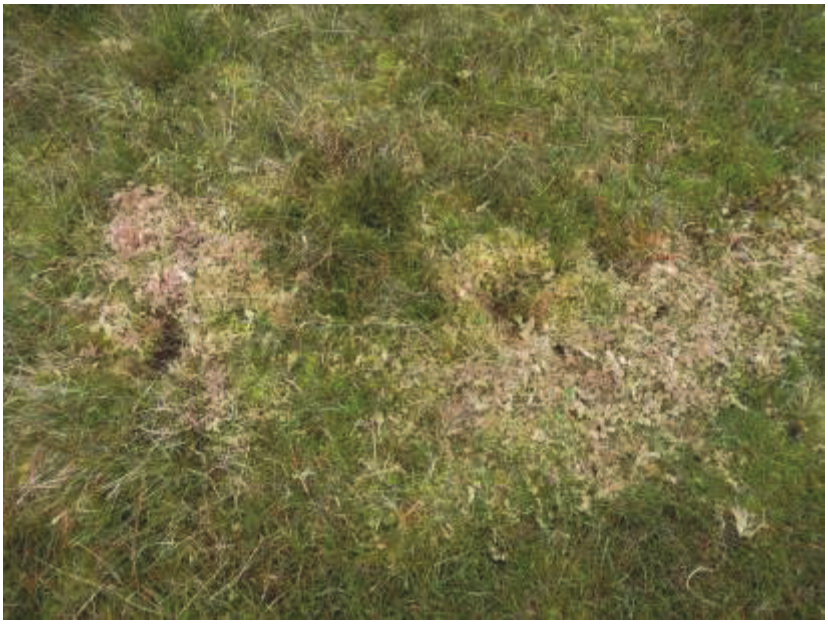


Figure 7. Disturbance of Sphagna at Ouvrafandel appears to be greatest in the area with the pool systems.



4.1.3 Nedderafandal

Drosera rotundifolia was recorded as occasional at Nedderafandal. This bog species was rarely seen during the course of this survey. It was only recorded elsewhere at Da Toon o Ham (plot 197) and at Da Daal (e.g. plot 65). It is likely that this diminutive species is smothered where the ericoid sward is tall, dense and rank. It might occur in other areas of the site or have been overlooked as it is described as common by Gear (2008).

4.1.4 South and South east facing slopes of Hamnafield and Da Sneug

These areas had degraded bog extending from concave slopes and broad ridges onto fairly steep slopes. Three plots were recorded here (161, 172 and 180). The most degraded areas that were formerly bog are now referable to grassland communities (mostly U6 grassland) and although still on peat (e.g. peat > 60cm deep in plot 195), plots in these areas were discarded (plots 30, 44, 195, 213, 200, 217) as restoration is probably not feasible/realistic.

Figure 8. The only significant area of active erosion encountered during the survey was on the south east ridge up to Hamnafield (at HT 96444 38262).

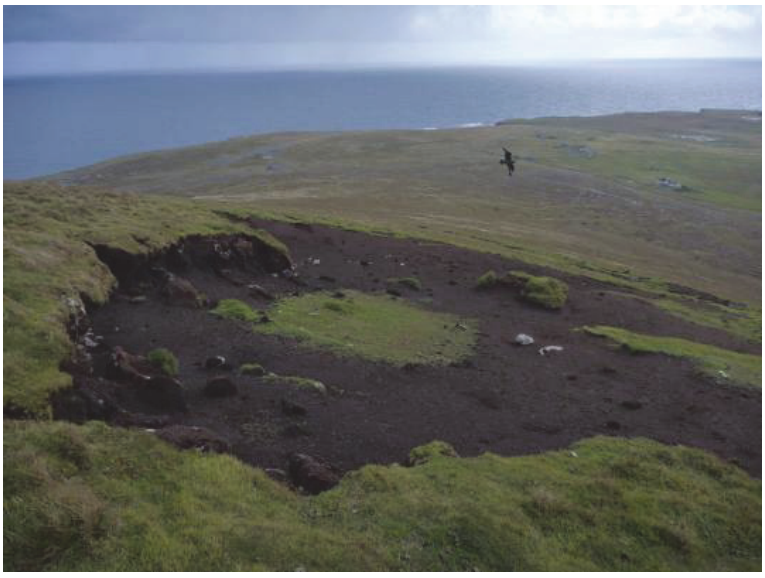
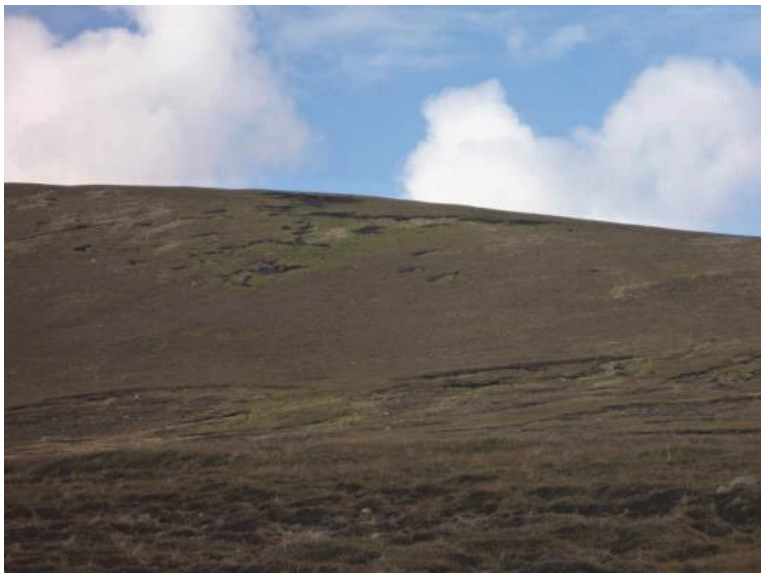


Figure 9. View up to the areas of active erosion on the south ridge of Hamnafield from Da Daal (near plot 65). The scalped areas in the foreground are regenerating well with wet heath.

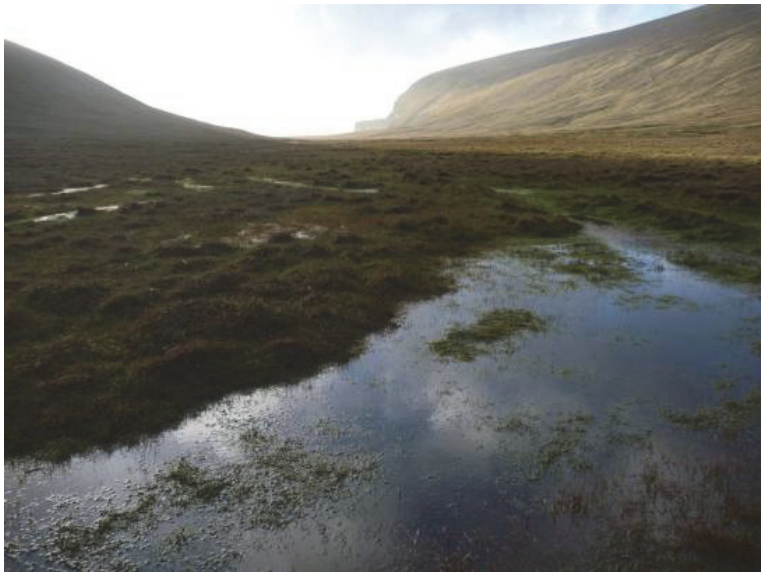


4.1.5 Da Daal

Some of the more intact areas of bog were encountered here. Unfortunately only one plot fell within this area and little time was spent here due to time constraints but some basic observations are below:

- Some areas of bog are active with peat forming *Sphagna* locally abundant (e.g. *Sphagnum papillosum* found at HT 960 379). *Drosera rotundifolia* was also recorded here (plot 65).
- Towards the western areas some scalped areas are recovering well with wet heath (M15).

Figure 11. Da Daal: good, wet area of bog with locally abundant Sphagna.



4.1.6 Da Heights, Da Burns

Two plots in these areas fell on enclosed ground with signs of drainage and/or old peat cutting. At Da Burns (plot 14) the bog vegetation had been modified possibly due to past

peat cutting in the area but the ground was very wet and drains/cut areas had infilled. At Da Heights (plot 53) there was evidence of drains or peat cutting edges, but again the ground was wet and drains had largely infilled. Active drains were observed (see Figure 13) and here the bog vegetation had graded into grassland. These areas represent a very small portion of the site and as drains have largely infilled with *Sphagna* etc. drainage issues should give little cause for concern.

Figure 12. Infilled drain at Da Heights HT 96086 40345 (adjacent to plot 53).

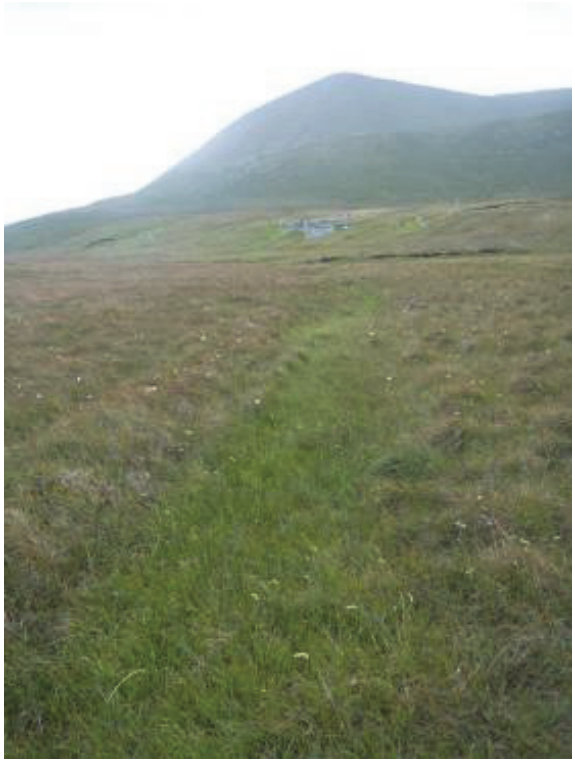
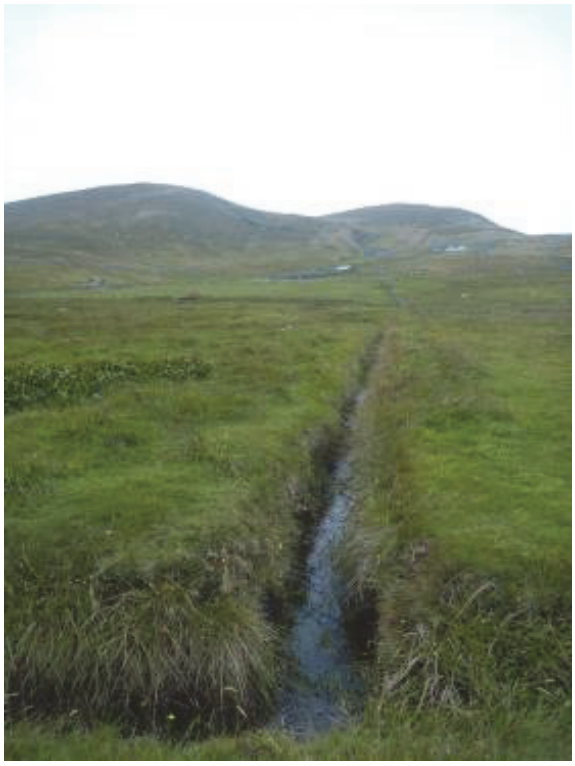


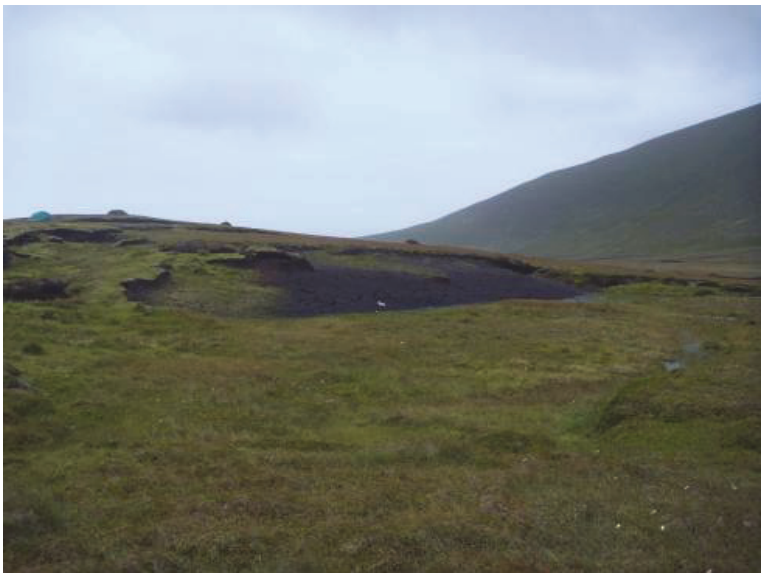
Figure 13. Active drains on northern edge of blanket bog at Da Heights (HT 96053 40360).



4.1.7 Da Lieug to Rossie's Loch, Da Bitten and Da Mill Loch

One of the main peat cutting areas is at Da Lieug. Generally little active erosion was seen as a result of peat cutting activity. Figure 14 shows one area where erosion of peat has started following peat cutting.

Figure 14. Old peat cuttings and subsequent erosion at Da Lieug.



Apart from the areas described in 4.1.2 conspicuous trampling of the bog leading to bare peat or exacerbating erosion was rarely encountered. Some of the most conspicuous areas of trampling were seen in the area from Da Lieug west to Rossie's Loch and south to the edge of the enclosed ground at the northern edge of Da Toon o Ham. Figures 15 and 16 illustrate the most heavily disturbed areas encountered.

Figure 15. Old peat cuttings to the east of the road at Da Lieug creating a funnelling affect concentrating the trampling effects of sheep moving through the area.

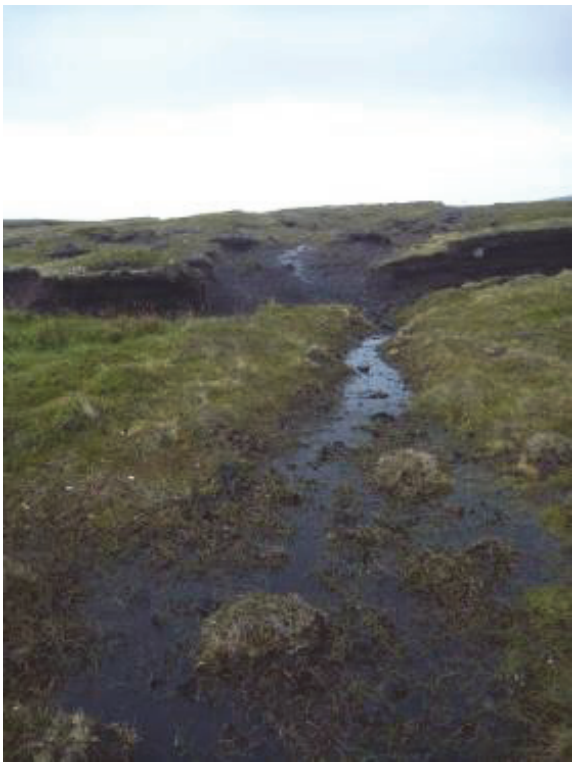
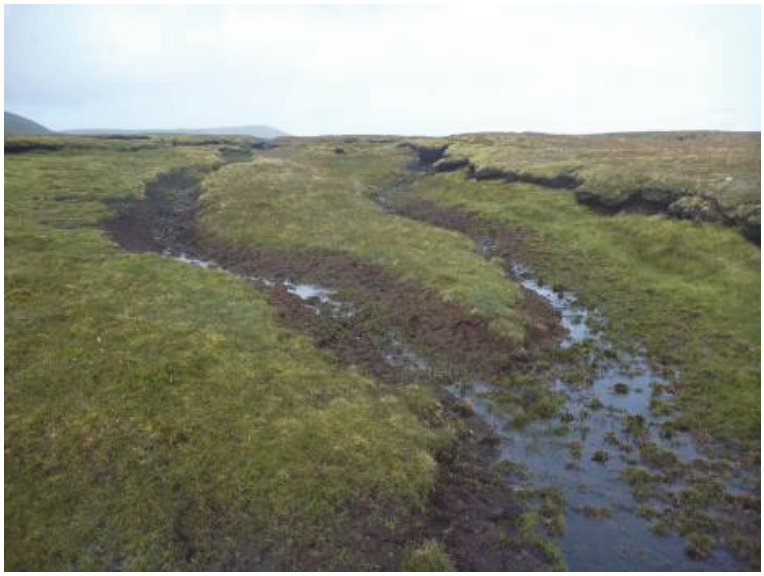


Figure 16. Heavy poaching of bog by sheep to south of Rossie's Loch.



Trampling was also recorded in Plots 80 (Da Bitten) and 39 (northwest of Da Mill Loch) where the disturbance of bare ground target failed (see Appendix III for plot photos).

4.2 Summary

Failures due to high dwarf shrub cover generally represent areas where the sward is (or has been) rank, presumably due to the cessation of cattle grazing on the hill last century. In some areas of the lower lying eastern part of the island where fencing has been there are similar rank swards with a high cover of dwarf shrubs. Where these swards are dense and unbroken the vegetation is species poor (small species like *Drosera* will, for example, be swamped by dense rank swards). These areas may benefit from cattle grazing, although the practicalities of this are probably limited.

However, of greater concern is the condition of the bog between Da Fleck and Da Lieug o da Fleck and deterioration in condition of bog at Ouvrafandel. The bog at Da Daal appears to be much wetter and more robust to change but only one plot fell in this area and more detailed monitoring/investigation might be useful to assess what is happening in this area.

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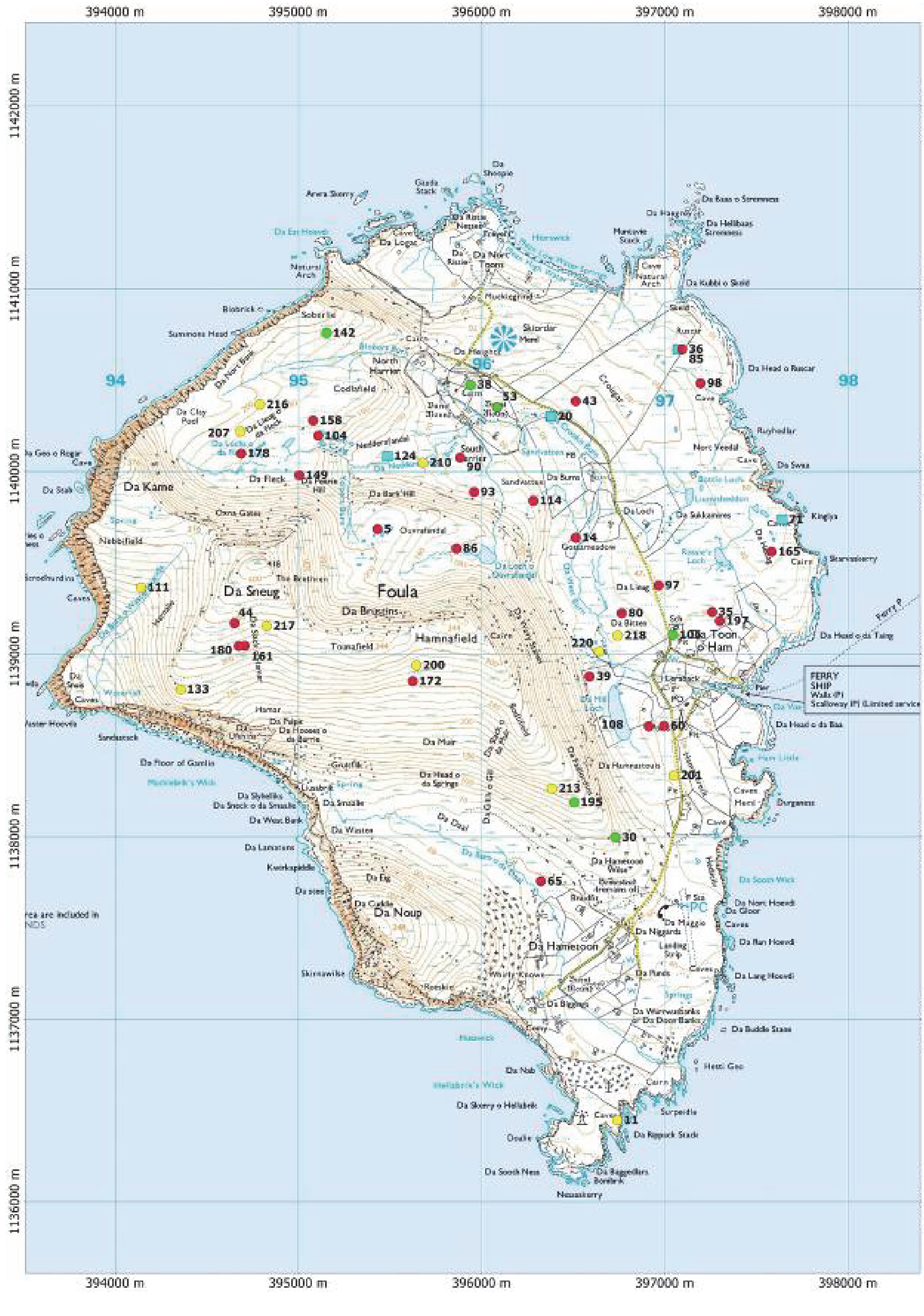
APPENDIX I: MAP OF FOULA SSSI SHOWING SAMPLE LOCATIONS VISITED

Blue = pass, red = fail, green = discard, yellow = not visited.



APPENDIX IV: UCSM ABBREVIATIONS

Species

Aela	Arrhenatherum elatius
Agcap	Agrostis capillaris
Agl	Alnus glutinosa
Agstol/Agsto	Agrostis stolonifera
Agvn/Agvin	Agrostis vinealis
Alcalp	Alchemilla alpina
Alcgla	Alchemilla glabra
Alecnig	Alectoria nigra
Angsyl	Angelica sylvestris
Antdi	Antennaria dioica
Anthvul	Anthyllis vulneraria
Aodo	Anthoxanthum odoratum
Apta	Achillea ptarmica
Arcalp/Arctalp	Arctostaphylos alpinus
Ar-m	Asplenium ruta-muraria
Armar	Armeria maritima
Arserp	Arenaria serpyllifolia
Aspvir	Asplenium viride
Aulpal	Aulacomnium palustre
Au-u	Arctostaphylos uva-ursi
Bchr	Breutelia chrysocoma
Bna	Betula nana
Bpse	Bryum pseudotriquetrum
Bpub	Betula pubescens
Brizmed	Briza media
Ca/Call/Cvul/Cv	Calluna vulgaris
Callcus	Calliergonella cuspidata
Calcor	Calliergon cordifolium
Castella	Campylium stellatum
Cat/Catro	Campylopus atrovirens
Centnig	Centaurea nigra
Chamang	Chamerion angustifolium
Cirarv	Cirsium arvense
Cirpal	Cirsium palustre
Cirvul	Cirsium vulgare
Cirs hete/Cirshet/Cirhet	Cirsium heterophyllum
Clad	Cladonia
Cnig	Centaurea nigra
Coch	Cochlearia sp.
Cochpyr	Cochlearia pyrenaica
Coel vir	Coeloglossum viride
Cosu	Cornus suecica
Cpor	Cladonia portentosa
Cpra	Cardamine pratensis
Crcr	Cryptogramma crispa
Crepal	Crepis paludosa
Csco	Cytisus scoparius
Cshaw	Campylopus shawii

Ctenmol	Ctenidium molluscum
Cx	Carex
Cxbig/Cxbg	Carex bigelowii
Cxbn/Cxbin	Carex binervis
Cxdi	Carex dioica
Cxe/Cxech	Carex echinata
Cxfla	Carex flacca
Cxho	Carex hostiana
Cxla	Carex lasiocarpa
Cxli	Carex limosa
Cxla	Carex lasiocarpa
Cxov	Carex ovalis
Cxpa	Carex panicea
Cxpu	Carex pulicaris
Cxvb	Carex viridula brachyrrhyncha
Cxvo	Carex viridula oedocarpa
Cycris/Ccris/Ccr	Cynosurus cristatus
Cystop	Cystopteris sp.
Dcar	Daucus carota
Dces(p)	Deschampsia cespitosa
Ddil	Dryopteris dilatata
Dfl	Deschampsia flexuosa
Digpur	Digitalis purpurea
Dint	Drosera intermedia
Diph	Diphasiastrum alpinum
Drep sp.	Drepanocladus sp.
Drev	Drepanocladus revolvens
Drot	Drosera rotundifolia
Eang	Eriophorum angustifolium
Eci/Ecin	Erica cinerea
Elmu	Eleocharis multicaulis
Enig/En	Empetrum nigrum
Enigh/Enign	Empetrum nigrum hermaphroditum/Empetrum nigrum nigrum
Epibru(n)	Epilobium brunnescens
Equsyl	Equisetum sylvaticum
Etet	Erica tetralix
Euph sp.	Euphrasia sp.
Evag/Eva/Ev	Eriophorum vaginatum
Filip	Filipendula vulgaris
Fov	Festuca ovina
Fviv	Festuca vivipara
Gang	Genista anglica
Glma	Gloeocapsa magna (an alga, apparently sometimes called ‘mountain dulse’ – Poore & McVean 1957)
Griv/Geriv	Geum rivale
Gsx	Galium saxatile
Gsyl	Geranium sylvaticum
Hampalu	Hammarbya paludosa
Hier	Hieracium sp.
Hlan	Holcus lanatus
Hnum	Helianthemum nummularium
Hsph	Heracleum sphondylium
Hspl	Hylocomium splendens

Jacu	Juncus acutiflorus
Jbu	Juncus bulbosus
Jeff	Juncus effusus
Jsq	Juncus squarrosus
Jtri	Juncus trifidus
Jtrig	Juncus triglumis
Juco	Juniperus communis
Jucoco	Juniperus communis communis
Jucona	Juniperus communis nana
Lcat	Linum catharticum
Lcor	Lotus corniculatus
Lf-c	Lychnis flos-cuculi
Lmaea	Lochmaea suturalis
Loper	Lolium perenne
Loproc	Loiseleuria procumbens
Lsyl/Luzsyl	Luzula sylvatica
Meny	Menyanthes trifoliata
Minsed	Minuartia sedoides
Mper/Merper	Mercurialis perennis
Mol	Molinia caerulea
Noss	Narthecium ossifragum
Ns	Nardus stricta
Orcmasc	Orchis mascula
Oreolim	Oreopteris limbosperma
Oxace	Oxalis acetosella
Oxydig	Oxyria digyna
Palcomm	Palustriella commutata
Paqu/brkn	bracken (Pteridium aquilinum)
Per	Potentilla erecta
Persviv	Persicaria vivipara
Pfon	Philonotis fontana
Plalan	Plantago lanceolata
Plma	Plantago maritima
Pcom(m)/Polycomm	Polytrichum commune
Polyalp	Polytrichum alpinum
Polylon	Polystichum lonchitis
Polypod	Polypodium sp.
Popo	Potamogeton polygonifolius
Poter	Potentilla erecta
Privul	Primula vulgaris
Pruvul	Prunella vulgaris
Raco	Racomitrium lanuginosum
Racr	Ranunculus acris
Ralb/Rha	Rhynchospora alba
Ranrep	Ranunculus repens
Rhmin	Rhinanthus minor
Rhopo	Rhododendron ponticum
Rlor	Rhytidiadelphus loreus
Saca	Silene acaulis
Salrep	Salix repens
Sauc	Sorbus aucuparia
Saussalp	Saussurea alpina
Saust	Sphagnum austinii

Scap/Sca	Sphagnum capillifolium
Scapgra	Scapania gracilis
Schpal	Scheuchzeria palustris
Sciver	Scilla verna
Scni	Schoenus nigricans
Scosco	Scorpidium scorpioides
Scusp	Sphagnum cuspidatum
Sedros	Sedum rosea
Sde	Sphagnum denticulatum
Selsel	Selaginella selaginoides
Sfa	Sphagnum fallax
Sfu	Sphagnum fuscum
Silaca	Silene acaulis
Sildio	Silene dioica
Siluni	Silene uniflora
Simb	Sphagnum imbricatum
Sjac	Senecio jacobea
Slx/Sx	Salix
Sma	Sphagnum magellanicum
Solvir	Solidago virgaurea
Spap	Sphagnum papillosum
Sphag/Sph	Sphagnum
Spra	Succisa pratensis
Spro/Sibpro	Sibbaldia procumbens
Sxaur	Salix aurita
Sxaz/Sxaiz	Saxifraga aizoides
Sxhirc	Saxifraga hirculus
Sxhyp	Saxifraga hypnoides
Sxlapp	Salix lapponum
Sxopp	Saxifraga oppositifolia
Tfar/Tussfar	Tussilago farfara
Thalp	Thalictrum alpinum
Thypo	Thymus polytrichus
Tofpus	Tofieldia pusilla
Trich/Tces/Tc	Trichophorum cespitosum
Trifrep	Trifolium repens
Troll	Trollius europaeus
Udi(o)	Urtica dioica
Ueu	Ulex europaeus
Utric spp.	Utricularia spp.
Vmy/Vm	Vaccinium myrtillus
Voxy	Vaccinium oxycoccos
Vpal	Viola palustris
Vriv	Viola riviniana
Vuli	Vaccinium uliginosum
Vv-i	Vaccinium vitis-idaea

Abbreviated (or unusual) words

abd/abdt	abundant
abo	above
absc	absence
abt	about

adjct	adjacent
als	also
appd	appeared
aprt	apart
arc-alp	arctic-alpine
aro’	around
assmt	assessment
becs	because
betw	between
b grd	bare ground
binocs	binoculars
blt	burnlet (wee burn)
bott	bottom
bpt/b pt/b peat	bare peat
brow’d/brw’d	browsed
brow’g/brw’g	browsing
bryo	bryophyte
bsd	beside
bur’g	burning
calamgld	calaminarian grassland
Cchn	Caochan (Gaelic name for burn used in Inverness-shire & Eastern Highlands)
cld	could
clo/clo-up	close-up
clrly	clearly
cnocan	wee knoll
coireag	wee corrie
consp/conspic/consp's	conspicuous
cont’s	continuous
cov/covr/cvr	cover
crn	corner
degen	degenerate (Calluna growth form)
deprn	depression
devmt	development
diffic	difficult
distbd/dstbd	disturbed
dmge	damage
dom/dom’d	dominated
Dom	Domin
dp pt/dppt	deep peat
dr	deer
drhth	dry heath
drn	drain
drnge	drainage
d-sh’b/dshs	dwarf shrub(s)
EB	Early Building (Calluna growth form)
ER	en route
ero/ero’d/eron	eroded/erosion
evdc(e)/evident	evidence/evident
expo’d	exposed
ext’e/ext’ve	extensive
extt	extent
f	for

fb	forb
flhd(s)	flowerhead(s)
flr'g/flrg	flowering
flrs	flowers
flu(s)/flu'd	flush(es)/flushed
f-lvd	fine-leaved
for'y	forestry
fq/fqy/fqcy	frequent/frequently/frequency
fr	from
freq/feqy	frequent/frequently
frr	further
gen	general
gld	grassland
glly	generally
gram	graminoid
grd	ground
gref/g ref	grid reference
grp	group
grth	growth
grth-fm/gth fm/gr fm	growth form
grz'd/gzd	grazed
gzg	grazing
hb-rh	herb-rich
hfprts/hfpts	hoofprints
hk/hks	hummock/s
hllw	hollow
hrbv	herbivore
hth	heath
hvy/hvly	heavy/heavily
hwvr	however
impct(s)	impact(s)
impov	impoverished
inacc	inaccessible
incrd/incr'd	increased
indcr/indic	indicator
indrct	indirect
intt/int't	intact
j/jst	just
lcl/locl	local
lf	leaf
leg'ms	legumes
l fen	ladder fen
lge (lgr)	large (larger)
lgy	largely
lich(-rh)	lichen(-rich)
lkg	looking
lly	locally
locn/loc'n	location
lvl(s)	level(s)
lvs	leaves
lwt(s)	liverwort(s)
lyr	layer
mbkn/m'bkn	microbroken (refers to type of erosion)

mdvw/mdview	midview (i.e., between close-up & general view)
mesobkn	mesobroken (intermediate between microbroken & ‘proper’ gullying
mly	mainly
mo'	more
mod’e/mod’y	moderate/moderately
mo'y	mostly
msc	mosaic
nby	nearby
nly	nearly
nrr	narrow
obvs/y	obvious/ly
occ	occasional
o’hang	overhang
opp	opposite
opprtsc/oppsc	opportunistic
‘oscars’	seedlings/saplings that have failed to extend growth above the field layer, almost always due to browsing
pcu/p cu(s)	peat cutting(s)
phs	perhaps
prm	prominent
prob/pby	probably
prsc	presence
pssb(y)	possible(possibly)
pt	point
ptc-ptcs-ptcy	patch-patches-patchy
rec’t	recent
redepn	redeposition
rel	relatively
reveg/rvg(n)/reveg’g	revegetated/revegetation/revegetating
rh	rich
rks	rocks
rky	rocky
rocp	rock outcrop
rvgn/rvgg(reveg’n/reveg’g)	revegetation/revegetating
sca'd	scattered
sdlg(s)	seedling(s)
sev	several
sev'y	severely
sf’ce	surface
shp	sheep
sht/shts	shoot/s
shw	shallow
shwg	showing
sig’t	significant
site agg.	refers to targets where there’s no result for individual waypoints, but rather an overall result for site
slgt	slight
slgy	slightly
slo	slope
smr/smlr	similar
snob’ds	snowbeds
so’	some

sp-pr	species-poor
sp-rh	species-rich
stp/stpr	steep/steeper
suff'y	sufficiently
ssv(e)	sensitive
stp	steep
tds	towards
terr	terrace
tgt/trgt	target
thbs	tall herbs
tho	though
thr	through
tk	tussock
tog	photograph
trk(s)	track(s)
trpd	trampled
trpg	trampling
tssk(y)	tussock(y)
t w	too wet (for taking photographs)
typl	typical
undstbd	undisturbed
uprtd/uprtg	uprooted/uprooting
var'n/var't	variation/variant
v/vy	very
vig's	vigorous
virty	virtually
vis	visible
v'side/vsd	valleyside
w-clp'd/w-clpg	wind-clipped/wind-clipping
wdld	woodland
w/wh	with
wpt	waypoint
wsp/w'spread	widespread
ya	years ago
yr	year

CalRky	calcareous rocky slopes
SilRky	siliceous rocky slopes
SABGld	siliceous alpine and boreal grassland
sprhNs	species-rich Nardus

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