Winsford Allotment

1. Introduction

Natural England (NE) and its predecessors has carried out a series of monitoring programmes on many upland sites in England that contain Priority Habitats, including dry and wet heath, blanket bog and calcareous grassland. These sites have been managed under agri-environment schemes for up to two decades or more, and some were formerly also subject to grazing restrictions under Environmental Cross Compliance (ECC) regulations. Monitoring focussed initially on the condition of heather (*Calluna vulgaris*) in relation to grazing pressure, and latterly also on the overall condition of the vegetation across the range of habitats present on a site.

The aim of this project was to re-survey a selection of these sites using standardised methods, and to provide a series of individual site reports describing their current and changing habitat condition, along with a separate overview of the findings from the complete set of sites. Data from the surveys have also been provided to NE to allow more detailed examination of individual sites to help guide local management inputs.

Each site comprised a whole moorland grazing unit and encompassed a range of vegetation types. A range of variables was recorded at 100 randomly located sample points in each site. Variables to be recorded were agreed with NE prior to the survey, to assess heather grazing and the condition of key habitats. The methodology was based on a modified version of the NE overgrazing surveillance methodology (including laboratory assessment of a heather Grazing Index) and the Common Standards Monitoring (CSM) Guidance for Upland Habitats. Full details of the project objectives and methodology are given in the main overview report. Defra, UK - Science Search

The Winsford Allotment site was surveyed during 8 – 9 April 2014. Results of the survey are presented in a standard format in the following sections. Management information (particularly grazing) is also summarised from reports provided by NE. An assessment is then made of change in vegetation since the previous surveys and this is considered in the context of current and past management practices.

2. Overview

2.1 General description

Winsford Allotment is located on Exmoor and covers 108 ha in South Exmoor SSSI and Exmoor SAC. Although not particularly widespread across the site, heather heath (18% of sample points in 2014; Figure 1) and fragmented heath (16% of sample points) comprise the most frequently occurring target vegetation types concentrated on the western/central plateau area. Heather heath is confined to this central area and is predominantly composed of heather in its mature and degenerate growth stages (52% and 32% respectively of sample points where it is present). Therefore, despite the presence of some heather in the pioneer (10%) and building (6%) phases of growth, large areas of the heathland on the site appeared to lack structural variety which reflects the relatively recent re-establishment of heath since 1993. The periphery of the site is composed of mineral soils and entirely comprises non-target habitats - mainly bent-fescue grassland (14% of sample points), mesotrophic grassland (12%) and bracken (27%). There was a lot of sparse dead heather, especially in the wetter, flatter parts of the site due to heather beetle damage. *Ulex europaeus*, *U. gallii* and *Pteridium aquilinum* are locally dominant around the periphery, and the most commonly dominant graminoids were *Holcus lanatus* (primarily in bracken and mesotrophic grassland vegetation types) and *Molinia caerulea* in heath areas.

There is a small amount of wet heath on shallow peat (5 – 10 cm), characterised by low cover of ericoids and *Sphagnum* but with *Cladonia* locally frequent. Mire vegetation comprised a single area of M25 *Molinia caerulea – Potentilla erecta* mire of approximately 20 m x 30 m in size.

2.2 Site management

Prior to 1993, the site was an overgrazing case, with mean stocking rates of 0.33 LU ha^{-1} in summer and 0.68 LU ha^{-1} in winter. Sheep were present all year and cattle outwintered. In 1993 it entered an Environmentally Sensitive Area (ESA) agreement for Moorland Restoration (Exmoor ESA Tier 2 part 1) which required reduced grazing of sheep only, with summer stocking rate 0.10 LU ha^{-1} and none in winter. Red deer were also present at *c.* 0.02 LU ha^{-1}. In 2010 the site was entered into a Higher Level Stewardship (HLS) agreement, which specified a summer (May – September inclusive) stocking rate of 0.09 LU ha^{-1} minimum and 0.15 LU ha^{-1} maximum[1], comprised of both sheep and cattle. If the maximum permitted cattle stocking rate (0.32 cattle ha^{-1}) was applied, then sheep numbers had to be reduced correspondingly. No grazing was permitted in winter (October – April inclusive).

A small number of surveys have taken place over the last 20 or so years, and are summarised in Table 1. Early ESA Monitoring surveys focussed on grazing pressure on dwarf shrub, deriving a heather grazing index (GI) from shoots collected in the field, which was converted to a measure of Biomass Utilisation (BU) using a mathematical function (this conversion was discontinued in later surveys, favouring the more empirical GI measure). The overgrazing Surveillance Survey approach, on which the 2014 methods are based, was developed following the Moorland Appraisal Pilot Project (MAPP) in 2002. This saw a more holistic approach to the assessment of grazing pressure and added the measurement of sward heights, which could be compared to threshold heights for broad habitats, below which a sample area is deemed to be heavily grazed. Surveillance surveys were often carried out on land where overgrazing measures had been implemented, but has subsequently entered an agri-environment agreement. The various types of grazing assessment survey undertaken on Winsford Allotment are set out in Table 1.

Table 1: Past surveys of grazing pressure and impacts on Winsford Allotment, with the type of survey and sampling strategy followed.

Years	Survey type	Main variables	Sampling Strategy	Sample numbers
1993, 1996	ESA monitoring	GI, BU	Quadrats at random points on transects between pairs of random points	100
2003	Surveillance	GI, Sward heights, dwarf shrub variables, sward heights,	Quadrats at random points on transects between pairs of random points	100

2.3 Condition and grazing pressure in 2014

Current grazing levels on heather are moderate, with a mean GI of 23.2% overall (Table 2), but lower on fragmented heath (17.4%) and heather heath (14%). In terms of individual samples, 24% with heather failed to meet the CSM GI target of less than 33%, above which level grazing is likely to be damaging (Figure 2, Table 2, Map 1), and 9% of samples had a GI of 66% or greater. No heavily grazed features were recorded on heather heath and only at low frequency on fragmented

[1] Note that LU equivalents have varied among different schemes

heath (16% overall, Figure 3d; Map 2). The mean graminoid sward height at 9.5% of sample points where graminoids could be measured, or 7% overall, indicated that heavy grazing was likely in these areas (Map 2). Thus the site as a whole would not be classified as overgrazed according to thresholds defined by Natural England. There were also few detached heather stems or other vegetation (Figure 3g) and sheep droppings were relatively infrequent (Figure 3f). No evidence of recent burning was recorded (Figure 3e), but heather beetle damage was recorded at over one third of sample points in heather heath, and at lower frequency in fragmented heath (although there was some uncertainty whether the dead heather was attributable to heather beetle) (Figure 3d).

The dry heath habitat passed most condition assessment thresholds (targets to be passed at 90% of sample points) but failed on the number and cover of indicator species if the measure of dwarf shrub cover is taken as indicator species cover, a reasonable assumption for Winsford Allotment as no *Racomitrium lanuginosum* was recorded. The failure to meet the thresholds for these criteria is probably attributable to historically high levels of grazing.

2.4 Change since previous surveys

Previous surveys of the site used a different sampling regime from that in 2014, with transects in later years targeted in areas of heather Formal analysis of change is not therefore possible, but some general comparisons can be made. Assessments of heather grazing under the ESA scheme showed a significant decrease in biomass utilisation from 74.4% in 1993 to 10.7% in 1996 and a decline from 100% of sample quadrats suppressed to only 12% in 1996. Between 1993 and 2003, the mean GI had declined from 88% to 10%. Assuming that the targeted transects would have been located primarily mainly in heather heath, the 2014 GI (14% in heather heath) is comparable but slightly higher than that in 2003. Mean heather cover overall had increased between 1993 and 2003 from 5% to 29% and from 10% to 43% in quadrats that contained heather. The overall mean heather cover in heather heath and fragmented heath combined in 2014 is 35%, again similar to the 2003 levels (29%), whereas cover in heather heath only is notably higher (60%) than in 2003. Mean dwarf shrub height had increased significantly from 5 cm to 23 cm between 1993 and 2003; this compares with the 2014 mean heather heights of 24 cm in fragmented heath and 48 cm in heather heath. Given the caveats about differences in sampling methods, it appears that the reduced grazing impacts in 2003 have been maintained. It also appears that heather height may have continued to increase since 2003 although its cover overall has probably not changed substantially. There also appears to have been an increase in the area of bracken, which was only 7% in 2003 but 27% in 2014, with a corresponding decrease in bent-fescue grassland and rough acid grassland from 39% in 2003 to 16% in 2014. However, this may reflect differences in sampling with the peripheral slopes less well represented on the transects used in previous surveys (D. Glaves, pers. comm.).

The initial reduction of stocking densities under the ESA agreement had clearly been successful in improving the condition and extent of heather. This appears to have been maintained under the current HLS regime. There does not appear to have been a notable increase in cover of heather since 2003, although the increase in height and presence of pioneer growth stage suggests that the current management under HLS continues to be beneficial. Prior to the ESA agreement, there was no dwarf shrub heath on the site, which might explain the lack of structural variety in the heather, but this can be addressed by burning and/or cutting in the future (D. Glaves, pers.comm.). However, restoration to the full complement of dry heath indicator species across the site is likely to take much longer.

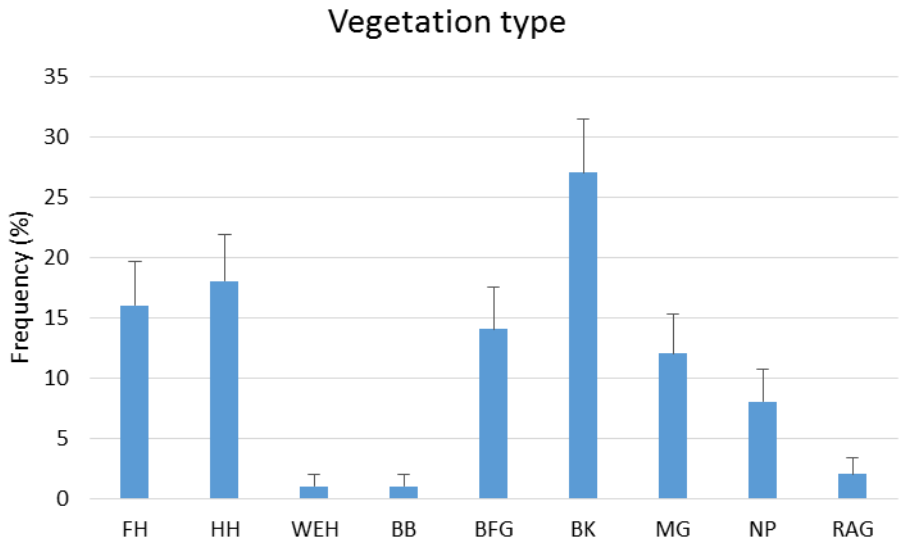

Figure 1. Frequency of vegetation types across the site in 2014. Bars are standard deviations. FH – fragmented heath; HH – heather heath; WEH – wet heath; BB – blanket bog; BFG – bent-fescue grassland; BK – bracken; MG – mesotrophic grassland; NP – non-productive; RAG – rough acid grassland.

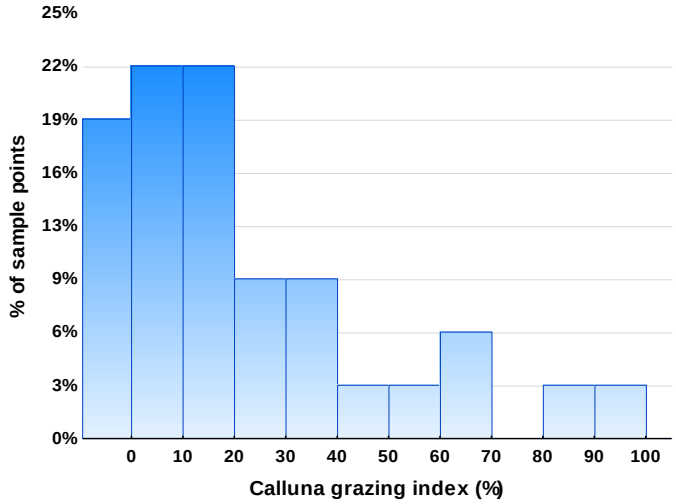

Figure 2. Frequency distribution of heather Grazing Index from sample points containing heather at whole site level in 2014.

Table 2. Heather Grazing Index at site level and by target vegetation type in 2014 (mean ± standard deviation; *n* is number of sample points with heather stems).

	Overall (*n* = 32)	Fragmented Heath (*n* = 9)	Heather Heath (*n* = 16)
Grazing Index	23.2 ±25.63	17.4 ±22.69	14.0 ±13.69
Samples ≥ 33.3%	24.0%	22.2%	6.3%
Samples ≥ 66.6%	9.4%	11.1%	0.0%

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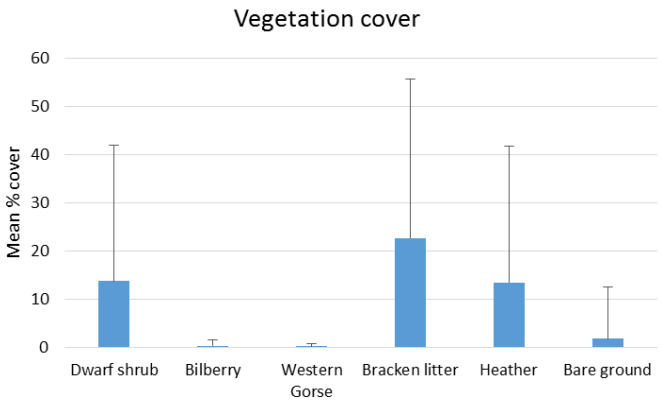

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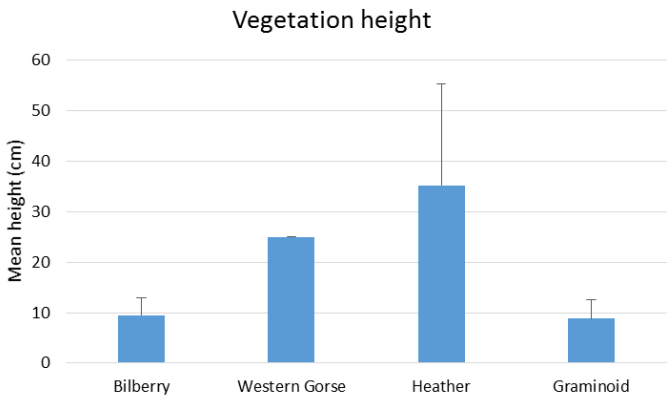

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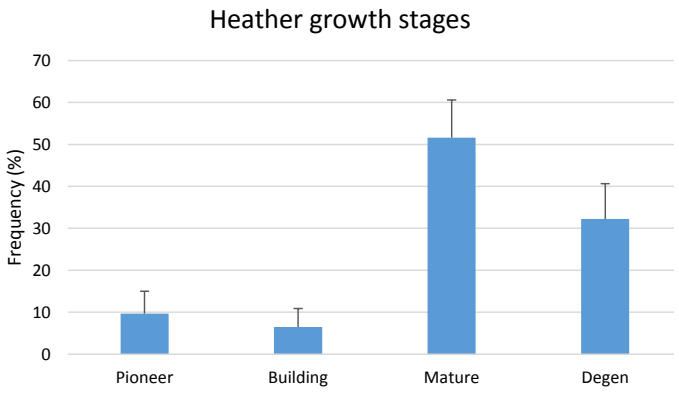

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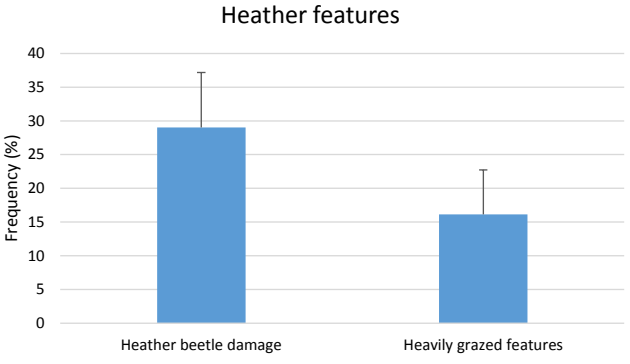

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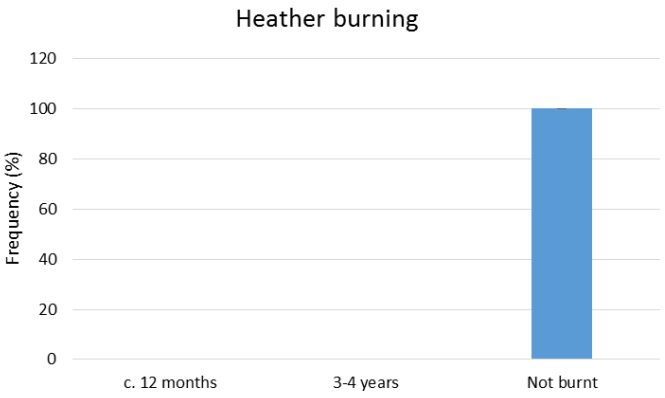

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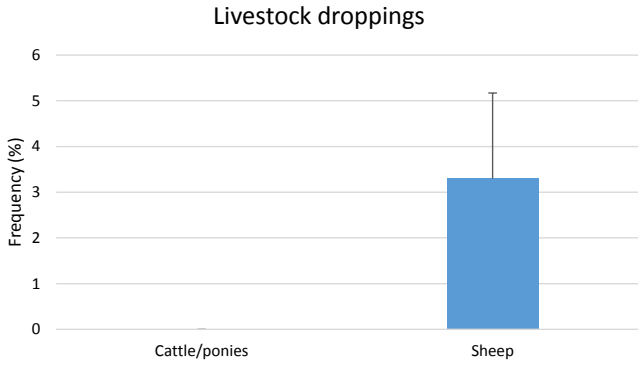

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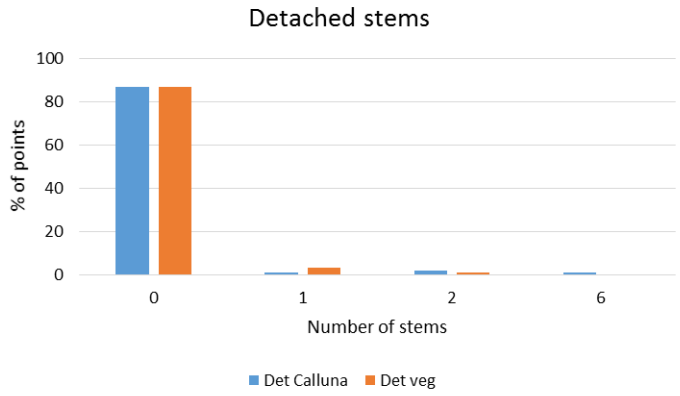

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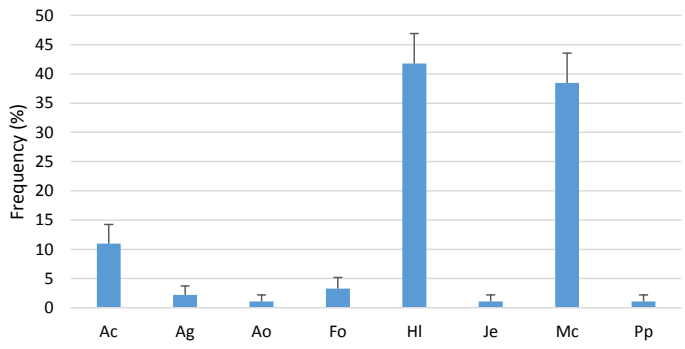


Figure 3. Surveillance variables at whole site level in 2014 (bars are standard deviations).

3. Overgrazing surveillance variables 2014

		Fragmented Heath (*n* = 16)			Heather Heath (*n* = 18)		
Category	**Variable**	**Mean**	**SD**	***n***	**Mean**	**SD**	***n***
Peat	Peat depth (cm)	10	3.2	14	10	3.9	18
Vegetation cover	Dwarf shrub cover (%)	8	19.5	16	60	30.8	18
	Bilberry cover (%)	1	1.7	16	1	2.2	18
	Western Gorse cover (%)	0	1.5	16	0	0.0	18
	Bracken litter cover (%)	0	0.0	16	2	4.8	18
	Calluna cover (%)	6	19.8	16	60	30.9	18
	Bare ground (%)	0	1.3	16	0	0.0	18
Vegetation height	Bilberry height (cm)	9	3.4	6	10	4.0	8
	Western Gorse height (cm)	25	0.0	1	0	0.0	0
	Calluna height (cm)	24	14.8	9	48	16.1	17
	Graminoid height (cm)	8	3.5	10	8	3.2	10
Heather growth stages	Pioneer (% of points)	33	15.7	9	0	0.0	17
	Building (% of points)	22	13.9	9	0	0.0	17
	Mature (% of points)	22	13.9	9	59	11.9	17
	Degenerate (% of points)	22	13.9	9	41	11.9	17
Heather features	Heather beetle damage (% of points)	11	10.5	9	35	11.6	17
	Heavily grazed features (% of points)	11	10.5	9	0	0.0	17
Heather burning	Burnt (*c.* 12 months) (% of points)	0	0.0	9	0	0.0	17
	Burnt (3-4 years) (% of points)	0	0.0	9	0	0.0	17
Droppings	Cattle / ponies (% of points)	0	0.0	16	0	0.0	18
	Sheep (% of points)	13	8.3	16	6	5.4	18
Detached stems	Detached Calluna (no.)	0	0.0	16	0.5	1.5	18
	Detached vegetation (no.)	0	0.0	16	0.0	0.0	18

4. Habitat condition assessment results 2014

4.1 Dry heath

Targets assessed at habitat level in 2 x 2 m quadrat:

Dry heath (*n*=18 heather heath + 12 fragmented heath		
Target	% of points passed	Habitat pass or fail
Presence of moss, liverworts and non-crustose lichens[1]	100	Pass
At least 50% of vegetation cover made up of Table 1 indicator species[2]	47	Fail
At least 25% of dwarf shrub cover should be made up of Group (i) indicator species	96	Pass
Less than 50% of dwarf shrub cover made up of Group (ii) indicator species	96	Pass
At least two indicator species from Group (i)	73	Fail
Cover of weeds < 1%	100	Pass
Cover of soft rush < 10%	97	Pass
Dwarf shrub browsing < 33%	100[3]	Pass
Disturbed bare ground < 10%	100	Pass

[1] assessed in 1 x 1 m quadrat
[2] assessed as total dwarf shrub cover, excluding dead and pioneer heather and recent burns
[3] *n*=22 (8 points with no information)

Targets assessed at feature extent:

Target	**Pass or fail**
Cover of non-native species < 1%	Pass
Cover of bracken < 10%	Pass
Cover of native trees/ shrubs < 20%	Pass
Cover of weeds < 1%	Pass
Cover of soft rush < 10%	Pass
Burning of sensitive areas absent	Pass
Disturbed bare ground < 10%	Pass
Mature heather ≥10% & all growth phases present	Pass

Indicator species frequencies (*n* = 30):

Species	**Frequency (%)**	**SD**
Calluna vulgaris	97	3.3
Erica tetralix	47	9.1
Erica cinerea	7	4.6
Vaccinium myrtillus	50	9.1
Vaccinium oxycoccus	0	0.0
Vaccinium vitis-idaea	0	0.0
Empetrum nigrum	0	0.0
Racomitrium lanuginosum	0	0.0
Ulex gallii	7	4.6
Myrica gale	0	0.0

4.2 Wet heath

This habitat type was recorded in less than 10 sample points so condition cannot be accurately assessed at 2 x 2m quadrat level.

Targets assessed at feature extent:

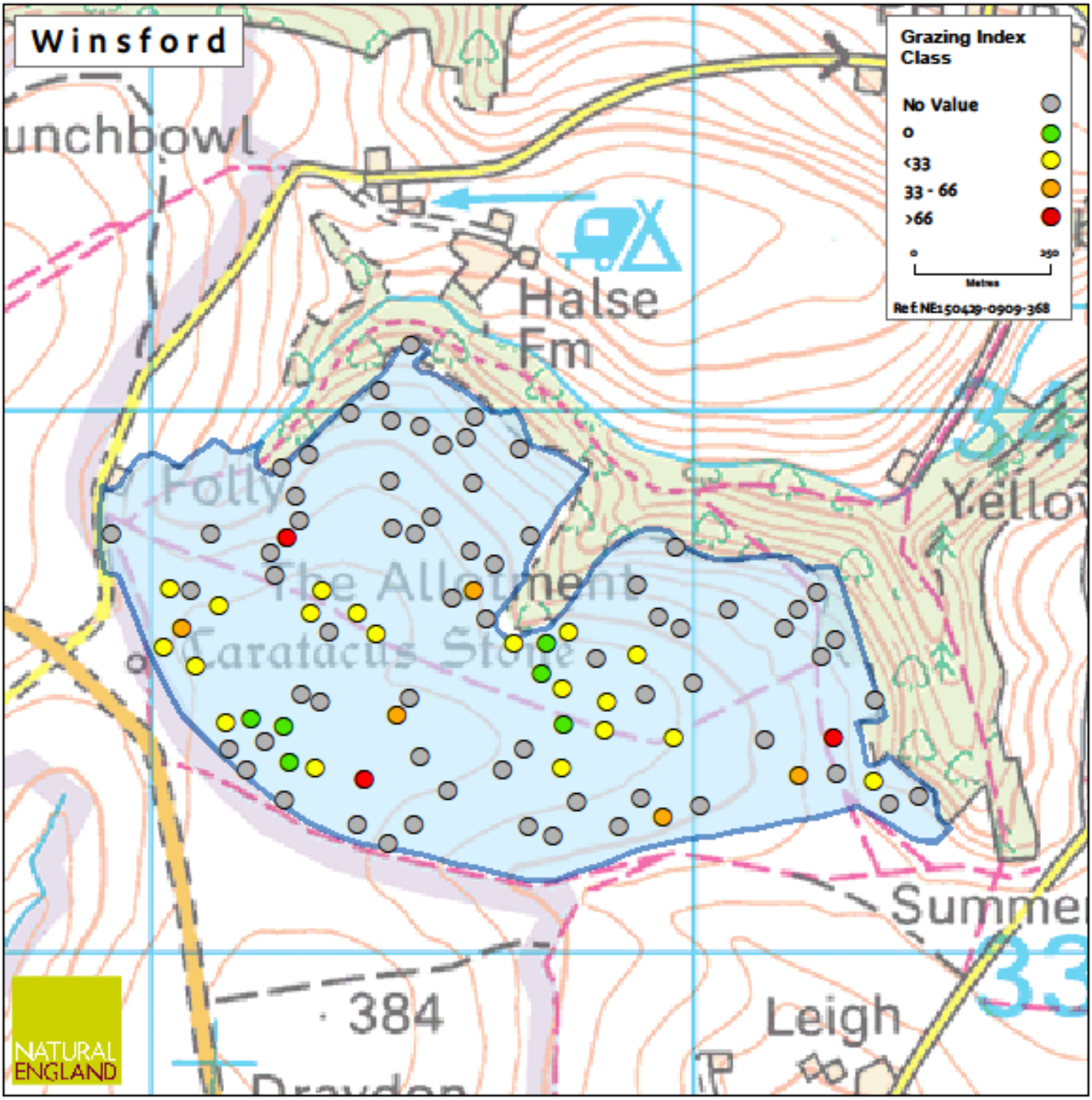
Target	**Pass or fail**
Cover of native trees/ shrubs < 20%	Pass
Cover of bracken < 10%	Pass
Cover of non-native species < 1%	Pass
Cover of negative indicators < 1%	Pass
Cover of soft rush < 10%	Pass
Burning of bryophyte layer absent	Pass
Burning of sensitive areas absent	Pass
Active drainage < 10%	Pass
Disturbed bare ground < 10%	Pass

4.3 Mires

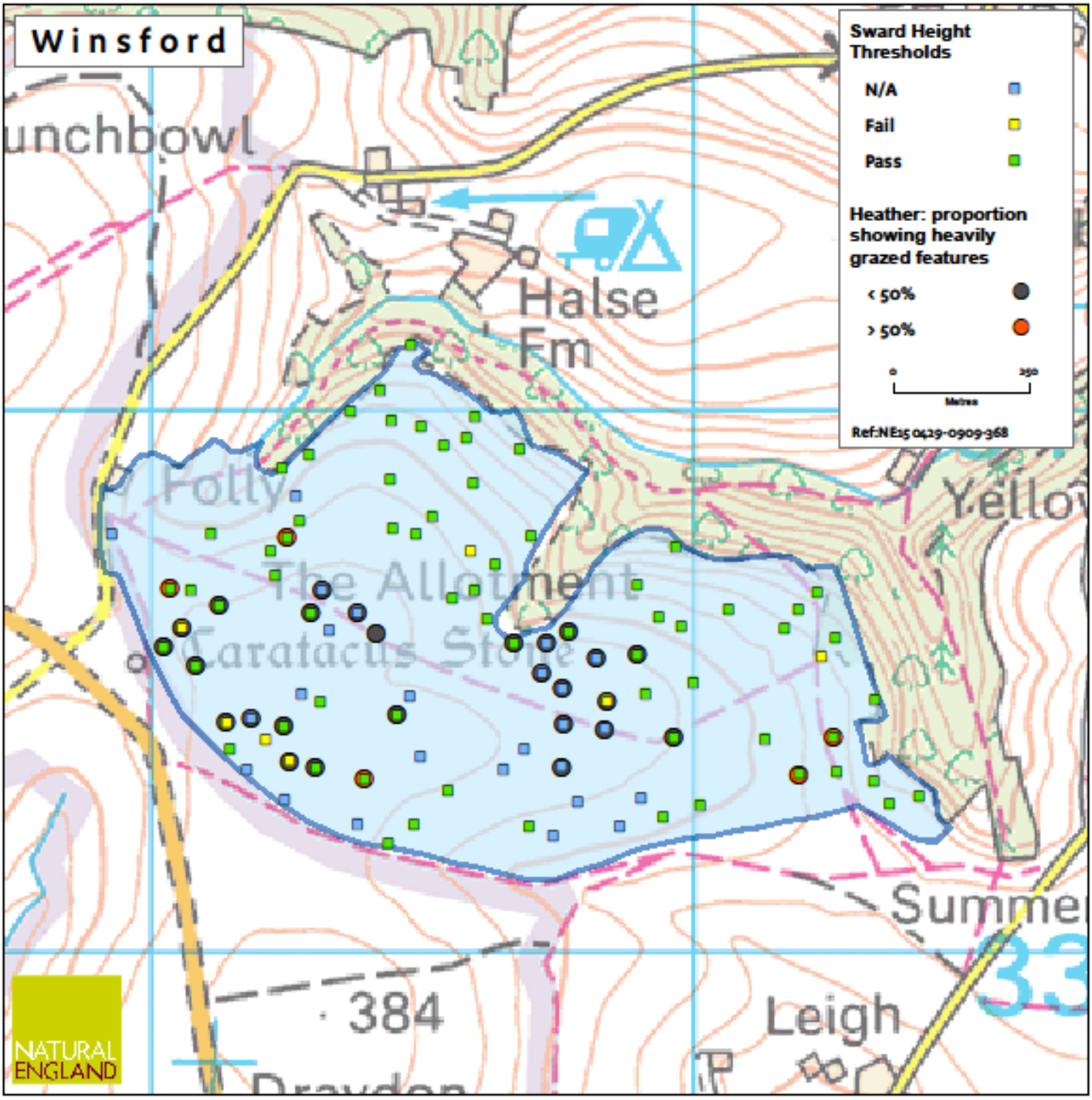
This habitat type was recorded in less than 10 sample points so condition cannot be accurately assessed at 2 x 2m quadrat level.

Targets assessed at feature extent:

Target	**Pass or fail**
Cover of non-native species < 1%	Pass
Cover of native trees/ shrubs < 10%	Pass
Cover of negative indicators < 1%	Pass
Burning of bryophyte layer absent	Pass
Burning of sensitive areas absent	Pass
Extent of eroding peat	Pass
Disturbed bare ground < 10%	Pass



Map 1: Distribution of random sampling points on Winsford Allotment in 2014, showing those where heather was present, along with heather grazing index (GI) class, derived from collected heather shoots.



Map 2: Distribution of sample points on Winsford Allotment in 2014 showing those which fall above (pass) or below (fail) habitat-related height thresholds indicative of heavy grazing, and with more or less than 50% of heather cover showing suppressed growth features.

Further information

Natural England evidence can be downloaded from our **Access to Evidence Catalogue**. For more information about Natural England and our work see **Gov.UK**. For any queries contact the Natural England Enquiry Service on 0300 060 3900 or e-mail **enquiries@naturalengland.org.uk** .

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