

Bracken's place in the heathland landscape – the composition, extent and management of bracken dominated vegetation in the New Forest

Introduction

Bracken is a significant component of a number of habitat types for which the New Forest has been designated a Special Area of Conservation (SAC). The New Forest Higher Level Stewardship Agreement includes a number of options for the management and restoration of habitats in which bracken is a significant constituent. In view of this importance, the Forestry Commission initially required:

1. Information about the ecological structure and function of bracken dominated vegetation in the New Forest;
2. Recommendations to help manage these areas in the future and
3. A comprehensive baseline against which to monitor changes in extent and type of bracken dominated vegetation.

This information was to be subsequently used to design a trial of bracken treatments across a number of sites within the New Forest SAC.

Methods

An initial 2011 survey involved field mapping of all patches of bracken dominated vegetation of more than 0.25 hectares in area (bracken stands) on to printed aerial photographs. A revised survey and mapping method was developed for the second phase of the survey in 2012. This involved:

- Quadrat sampling across the New Forest and the development of a classification of New Forest bracken types.
- Air photographic interpretation (API) to develop a map of bracken dominated vegetation within the open New Forest (outside of forestry inclosures).
- Ground-truthing of the digitised air photographs to gather information on the structure and composition of individual bracken stands and the bespoke classification of bracken vegetation types. .

Location of the study site



The New Forest

The most common bracken type was Group 8 – Bracken with Dry Heath and the second most abundant bracken type was Group 5 - Bracken with Bramble, Honeysuckle and Litter. The most uncommon bracken type is the species rich bracken Group 1. Contrary to popular belief, vegetation dominated by bracken can be of high botanical species diversity. A total of 141 species of vascular plants and bryophytes were recorded from bracken dominated vegetation in the New Forest with the maximum number of species recorded from a quadrat of 31. The main factors affecting bracken community species diversity were the extent of litter and thatch (the thick layer of semi-decomposed fronds) which showed a strong negative relationship with the number of associated species.

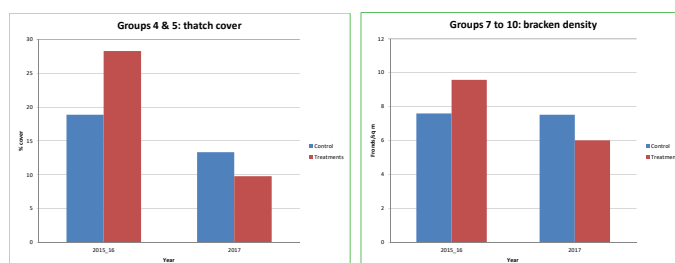
The priority for management was therefore for the most extensive groups with the deepest litter/thatch layers and correspondingly poor associated flora. Two suites of groups were selected for management trials: Groups 4 & 5 which consist of tall dense bracken typically with high cover of bracken thatch and litter and few associated plant species and groups 7-10, bracken growing over heather. Treatments are shown in Table 2. All had non-treatment (control) comparisons.

Table 2. Treatments for bracken control trials

Treatment type	No sites	No sites
	Group 4 & 5	Group 7 to 10
Herbicide + Forage Harvest	2	2
Herbicide + Burn	2	2
Herbicide + Burn + Scarify	2	
Forage Harvest only	2	2
Forage Harvest & Scarify	2	2
Herbicide + Scarify	2	
Herbicide only	2	2

Treatments started in 2016 and monitoring has been carried out over 2015, 2016 and 2017 giving pre- and early post-treatment comparisons. Initial results show promising reductions in mean cover of thatch for groups 4 & 5 and a reduction in mean bracken density in groups 7-10 as shown in Figure 1. All treatments are combined for these data.

Fig. 1. Changes in key measures across the two treatment suites.



Treatments reduce the vigour of bracken fronds before killing them and therefore lower bracken density while thatch could be decreased by mechanical disturbance and as a consequence of reduced bracken abundance. The final survey (in 2019) will enable a more complete analysis of effects of treatments on both structural measures of bracken communities and changes in associated species.

Results

The results of a Two Way Indicator Species Analysis TWINSpan analysis (Table 1) gave rise to 11 groups.

Table 1. Bracken dominated groups from a TWINSpan analysis

Bracken group	Community description	Area (ha)
Group 1	Species rich Bracken	13
Group 2	Wet Grassland	79
Group 3	Wet Grassland with Wood-sage and Violet	140
Group 4	Bracken with Bramble and thatch	48
Group 5	Bracken with Bramble, Honeysuckle and litter	492
Group 6	Bracken with Parched Acid Grassland	227
Group 7	Bracken with mossy Dry Heath	65
Group 8	Bracken with Dry Heath	616
Group 9	Bracken with Humid Heath	245
Group 10	Bracken with Mossy Humid Heath	63
Group 11	Dense Bracken	100