Restoration of Norton Heath Common

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1. Introduction

The decline of Norton Heath Common is well documented in Graham Smith's interesting account of his walk from Ongar Railway Station to Fyfield and Norton Heath (Smith 2002) that was a re-creation of a ramble led by Essex Field Club Members in 1913 (Willmott *et al.* 1913). The authors of the 1913 account described the surface of the heath as being disturbed by shallow excavations for gravel and that the resulting swampy heath and shallow pools "*should prove happy hunting grounds for botanists*". The authors go on to list the array of heathland plants that were found and these included Common Milkwort *Polygala vulgaris*, Heath Bedstraw *Galium saxatile*, Heather *Calluna vulgaris* and Lousewort *Pedicularis sylvatica* to name but a few. Sadly as Graham describes in his more recent article, these plants have all gone, and the heath is largely dark and shady woodland that has become established due to the absence of gravel digging and rabbit grazing due to myxomatosis. No Heather is currently found on the heath and only Wood Sage *Teucrium scorodonia* and Yellow Pimpernel *Lysimachia nemorum* remain.

The heath is divided in two by a road running diagonally from the north-west to the south-east corner. The north-east section (grid reference TL 601043) has a dense Bramble understorey and few gravel workings and is to remain an unmanaged non-intervention area as it gets less sunlight than the south-west section (grid reference TL 601042) where the main restoration work is planned by Countrycare. Restoration will include extensive tree felling (up to 30% of the trees on the heath can be felled) and scraping of soil to stimulate germination of heathland plant species.

On 16th February 2007, Andy Vaughan and Jordan Thomas of EFCC felled 15-20 Birch and Oak trees on the sunnier south-west section of the heath in an effort to let more sunlight reach the understorey which is currently very sparse comprising of Brambles *Rubus fruticosus* agg., Honeysuckle *Lonicera periclymenum* and Wood

Sage. Approximately 50 trees were felled in the winter of 2007/08. Twenty permanent quadrats (50 x 50 cm) were also marked out with wooden stakes on both sections of the heath to monitor the response of the ground flora to management in a scientific manner.

2. Survey method

Monitoring of the ground flora took place on 18th May and 20th July 2007 and 18th May and 21st July 2008. On all survey dates a 50 x 50 cm (0.25 m^2) quadrat was placed (always with top left corner of the quadrat touching the stake) at each of the 20 locations on the north-east (control area, non intervention) and south-west (restoration area) sections of the heath. The frame quadrat had 100 divisions so that percentage cover of the vegetation could be more objectively estimated. In each quadrat, the number of squares that each plant species (herbaceous plants, ferns and rushes) was recorded in was noted (e.g. if a species appeared in 100 squares it would be assumed to have 100% cover of the quadrat). Due to the difficulty in identifying grasses before flowering, these were lumped together as grass species. The method allowed objective determination of the abundance of plant species that could be repeated successfully with different recorders.

On the south-west section where restoration is proceeding, the dense leaf litter and fertile topsoil were scraped off around 10 quadrats (approximate size of each scraped area was 2 x 2 m, depth 10 cm) to ascertain if this technique led to enhanced germination of heathland species in comparison to leaving soil unscraped.

In addition to the quadrat surveys other plant species and insects were recorded during the monitoring.

3. Results of the quadrat survey

In the May and July surveys in both years, there were more plant species in the non-managed control on the north-east section of the heath (Fig. 1), largely due to the abundance of Bramble and Honeysuckle. However, in the restoration area of the heath, the number of plant species steadily increased over the course of the survey, species richness being much higher in 2008 (Fig. 1). This suggests that the felling of trees and scraping off of the soil was leading to germination of plant seedlings, particularly in 2008. On the restoration area of the heath, there was a noticeable increase in plant species richness in the scrapes over the course of the surveys, which contrasted with the unscraped quadrats (Fig. 2). The scrapes were at least 10 cm in depth in some places and exposed the underlying gravel, I would suggest that a shallower depth (5 cm) would suffice and be more practical across larger areas of the heath.

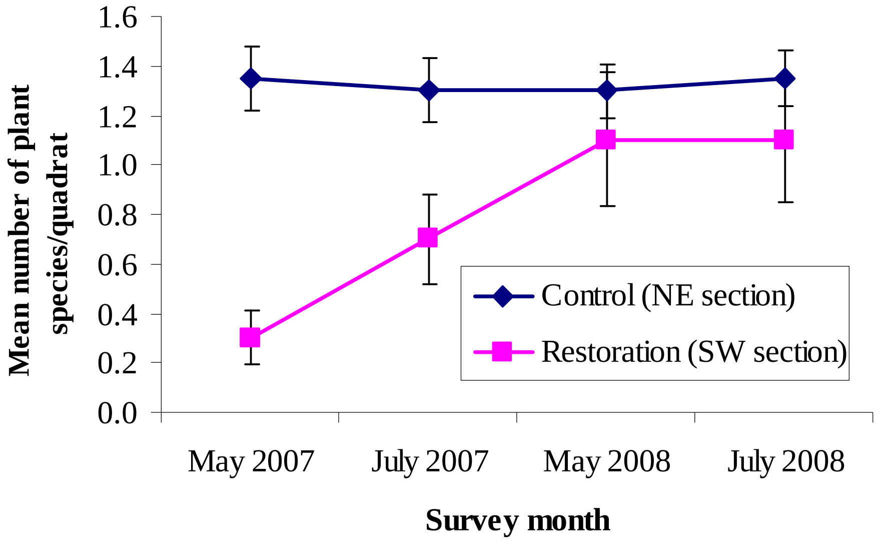

Fig. 1: Number of plant species on both sections of Norton Heath (standard error bars shown)

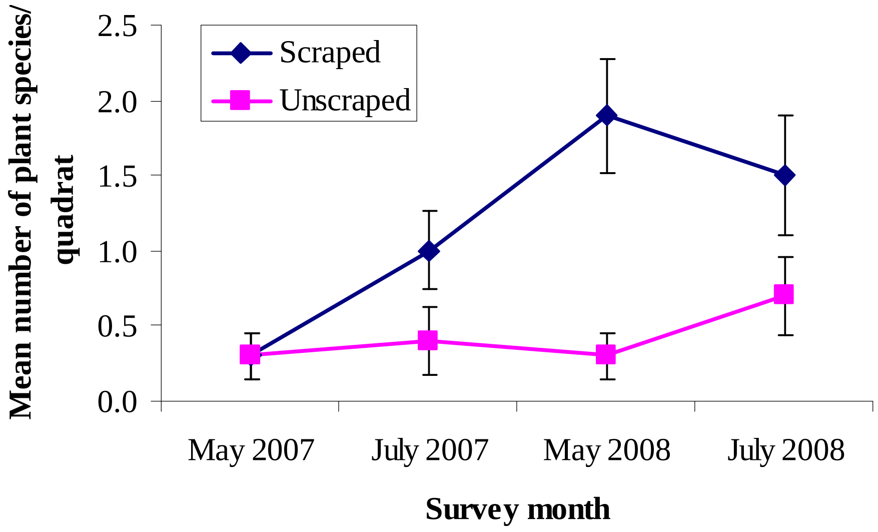

Fig. 2: Plant species richness on the scraped and unscraped areas of the restoration section of the heath (standard error bars shown)

In the scraped quadrats, Gorse *Ulex europaeus* and Sheep's Sorrel *Rumex acetosella*, were first recorded in 2008 (Table 1). These species represent the first signs of heathland plants returning to the common, and show that the management is starting to be successful.

Rosebay Willowherb *Epilobium angustifolium* also appeared in the scrapes, it will be interesting to monitor the spread of this species in the restoration area as it can dominate large areas of heath to the detriment of the more desirable heathland plants. Heather *Calluna vulgaris* has yet to reappear on the heath. In essence, the scrapes provide a perfect starting point for germination and succession of Heather as they are devoid of much vegetation cover (generally less than 10% vegetation cover in 2008 in restoration area; Table 2).

Table 1: Plant species appearing in the three different areas in 2008 that were not recorded in the 2007 surveys (e.g. germinated in the second year after felling)

	Area	
Control	Restoration (scraped)	Restoration (unscraped)
Nettle *Urtica dioica*	Gorse *Ulex europaeus* Rosebay Willowherb *Epilobium angustifolium* Rush *Juncus* spp. Sheep's Sorrel *Rumex acetosella*	Nettle *Urtica dioica*

Sheep's Sorrel (left © Henripekka Kallio) and Gorse (right © Forest & Kim Starr) were recorded in the scrapes in 2008

Table 2: Mean percentage ground cover of vegetation (all plant species combined) in the restoration and control areas (maximum cover in brackets, can total more than 100% due to overlapping layers of vegetation)

	Area	
Survey date	Control	Restoration
May 2007	82 (130)	10 (98)
July 2007	94 (111)	16 (101)
May 2008	92 (106)	8 (40)
July 2008	96 (100)	7 (30)

4. Insect species found on the heath

During monitoring in the May and July surveys, a range of insects were recorded. Generally insect species richness was higher in 2008 (Table 3) suggesting that the opening up of the canopy has benefitted butterflies in particular. There was also a noticeable increase in the number of dragonflies and damselflies recorded on the heath. Species recorded for the first time in 2008 included Small Copper *Lycaena phlaeas* (a localised species in the county), Meadow Brown *Maniola jurtina* and Gatekeeper *Pyronia tithonus* butterflies. Small Copper is a good indicator of acid grassland and heathland habitat. From the Odonata, new species included Common Darter *Sympetrum striolatum* and Southern Hawker *Aeshna cyanea*.

The Large Red Damselfly *Pyrrhosoma nymphula* was recorded around the pond, this species is considered localised in Essex, particularly in areas of intensive agriculture. Orthopteran species richness increased by only one (the Meadow Grasshopper *Chorthippus parallelus* was new), whereas an additional 3 bumblebee species were noted in 2008 (Table 3).

Table 3: Insect species richness on the restored part of the heath in 2007 (1st season after felling started) and 2008 (2nd season after felling)

Insect order	2007	2008
Butterflies (Lepidoptera)	3	11
Dragonflies (Odonata)	3	6
Grasshoppers (Orthoptera)	2	3
Bumblebees (Hymenoptera)	1	4
Total number of species	9	24

 

Small Copper (left) and Meadow Brown (right) colonised Norton Heath Common in 2008 (were not recorded in 2007 surveys) © Olaf Leillinger

5. Management recommendations

In light of the survey results, I would recommend the following management:

- Continuation of tree felling over winter 2008/09, increase number of trees felled so that canopy is opened up further
- Fell trees around the pond to let more light into this habitat which would benefit dragonflies, butterflies and grasshoppers
- Leave some fallen trees as habitat for dead wood invertebrates and fungi
- Continue with scraping of soil so that germination of Heather is encouraged, perhaps a shallower depth of scraping would suffice (e.g. 5 cm) over a large area
- Repeat quadrat monitoring in May and July of 2009 and following years to see how re-establishment of vegetation is going, if no heathland species return, then re-introduction of Heather is a possibility

6. References

Smith, G. (2002) 1913-2001: a lifetime of difference. *Essex Naturalist* (N.S.) **19**: 18-22.

Willmott, E.A. *et al.* (1913) Field meeting at Fyfield and Norton Heath. *Essex Naturalist* **17**: 227.