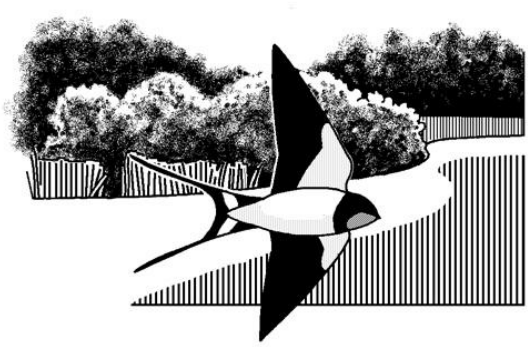

Fieldwork to Support Habitat Restoration Work at Broomscot Common, Garboldisham

Undertaken on behalf of the Little Ouse Headwaters project

by

OHES ENVIRONMENTAL

Incorporating

elp Ecology Land and People

A Division of OHES

With Funding from

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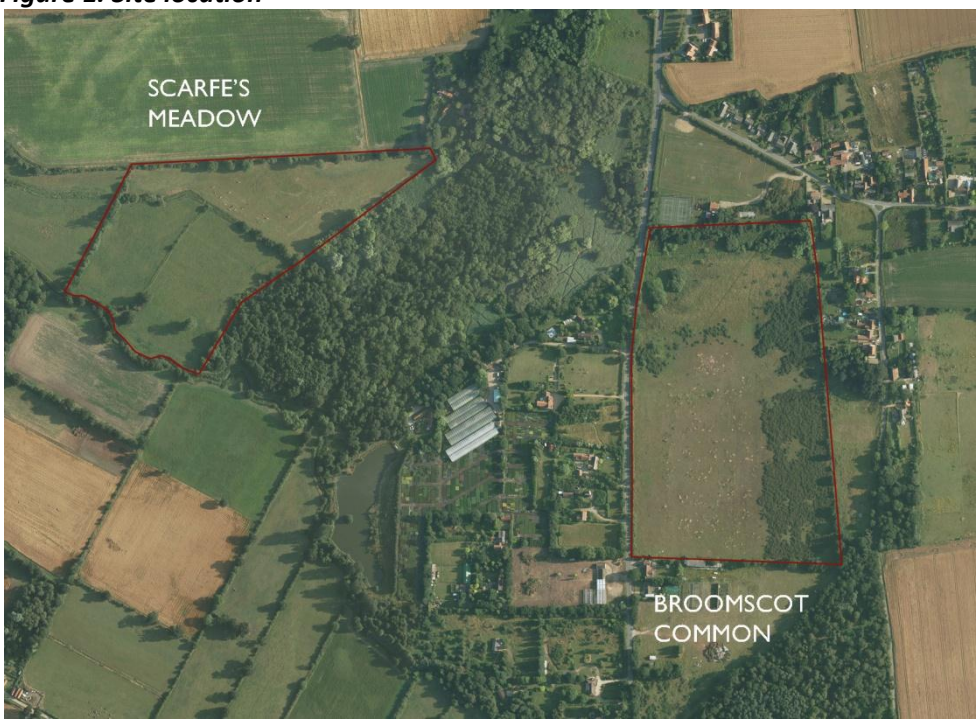
Contents

1. INTRODUCTION

1.1 The Site

Broomscot Common, Garboldisham has been leased by the LOHP from the Garboldisham Parish Charities since late 2010. The Common covers an area of 11.4 hectares, and although not directly adjacent to the Little Ouse, is linked to the river by a small stream that flows from the Common through Garboldisham Old Fen to the LOHP's site at Scarfe Meadows. See Figure 1.

Figure 1. Site location



It is a designated County Wildlife Site, and contains a mix of habitats ranging from wet fen at the north end of the site to very dry, sandy grassland much like that found further west in the Brecks.

The Common has not been grazed or managed in any way for a number of years resulting is loss of quality of some of the habitats, although they still support many species of conservation interest. The LOHP is embarking on a major programme to restore the key habitats, establish a long term management plan and improve public access.

1.2 The Brief

As part of the programme of habitat restoration developed by LOHP, OHES Environmental has been asked to conduct and report on the following field surveys at Broomscot Common:

- National Vegetation Classification survey to provide a baseline for vegetation restoration
- Vegetation Monitoring to establish and record two permanent plots.

2. NATIONAL VEGETATION CLASSIFICATION SURVEY

2.1 Survey objective and method

The fieldwork brief defines the objective of the survey as:

- To provide a baseline survey of the vegetation of Broomscot Common using the National Vegetation Classification.

The National Vegetation Classification (NVC) is the common standard for defining types of vegetation and describing them within a British and European context (JNCC 2011). The classification is widely used by Natural England and has been employed to describe the vegetation of much of the Little Ouse valley and its immediate surroundings, including other LOHP sites.

The survey methodology is described in detail in Rodwell (2006). In summary, the types of vegetation at Broomscot Common are distinguished by the broad class of habitat (e.g. grasslands, fen-meadow and scrub) and by their plant species composition. The main vegetation types are described by selecting a number of representative plots (usually of 2 x 2 metres, depending on the habitat being sampled). Each plot is assessed for the presence and areal cover of all plants (using the Domin cover-abundance scale), including mosses and lichens, and for other attributes such as height of the vegetation and the amount of bare ground or depth of standing water.

The sample plots for each vegetation type are then grouped together in Tables 1-6 and given a constancy score (from I to V) to show the common and typical characters of the vegetation type. Each type of vegetation is then compared with the published NVC accounts (Rodwell 1991-2000). An interpretation of the site's vegetation can then be developed using the published accounts, other fieldwork and also expert knowledge.

2.2 Results

The survey was undertaken in mid-May and the first days of June 2011 at the end of a notable drought period. Broomscot Common is divided into the large plateau covering the central and southern areas and a gentle north-facing slope crossed by a very shallow dry valley. This forms the upper part of the lowest-lying area, which is a peat-bed dissected by the ditch. For reference, the topographical features of the survey area are shown in Figure 2, a detail from the Levels Survey undertaken as part of the Scarfe Meadow fieldwork.

The vegetation on the Common can be divided into dryland and wetland communities by their topographical position and by the changes in floristics that distinguish strongly parched mineral soils on the upper parts of the plateau from the increasingly flushed and peaty soils of the low-lying areas to the north. The main grasslands and wetland habitats were sampled to provide details of their species composition and physiognomy, and the small or species-poor areas were assessed using expert judgement.

The location of vegetation stands and sample plots is shown in Figure 3.

Figure 2. Broomscot Common topography – detail of Levels Survey area

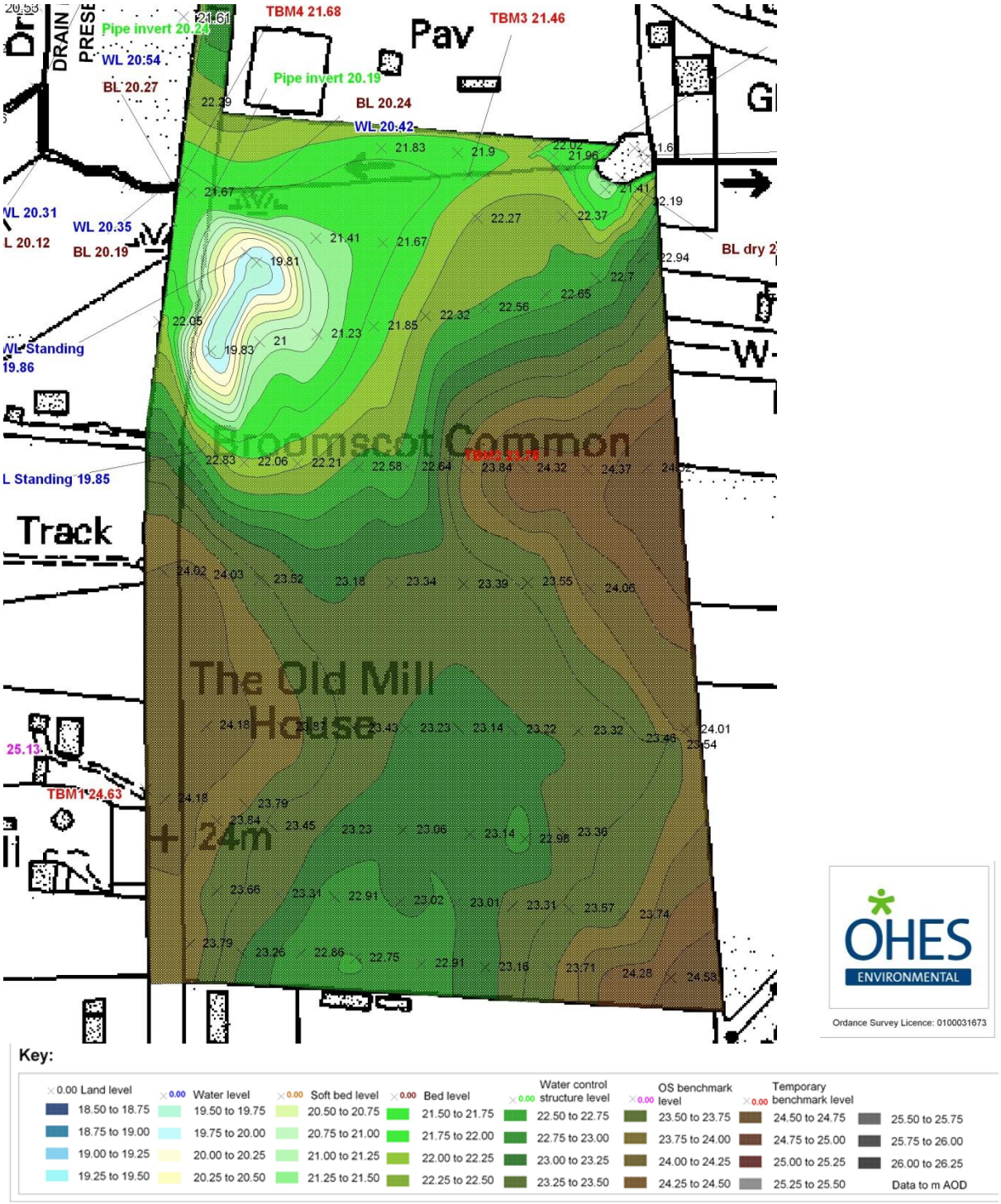
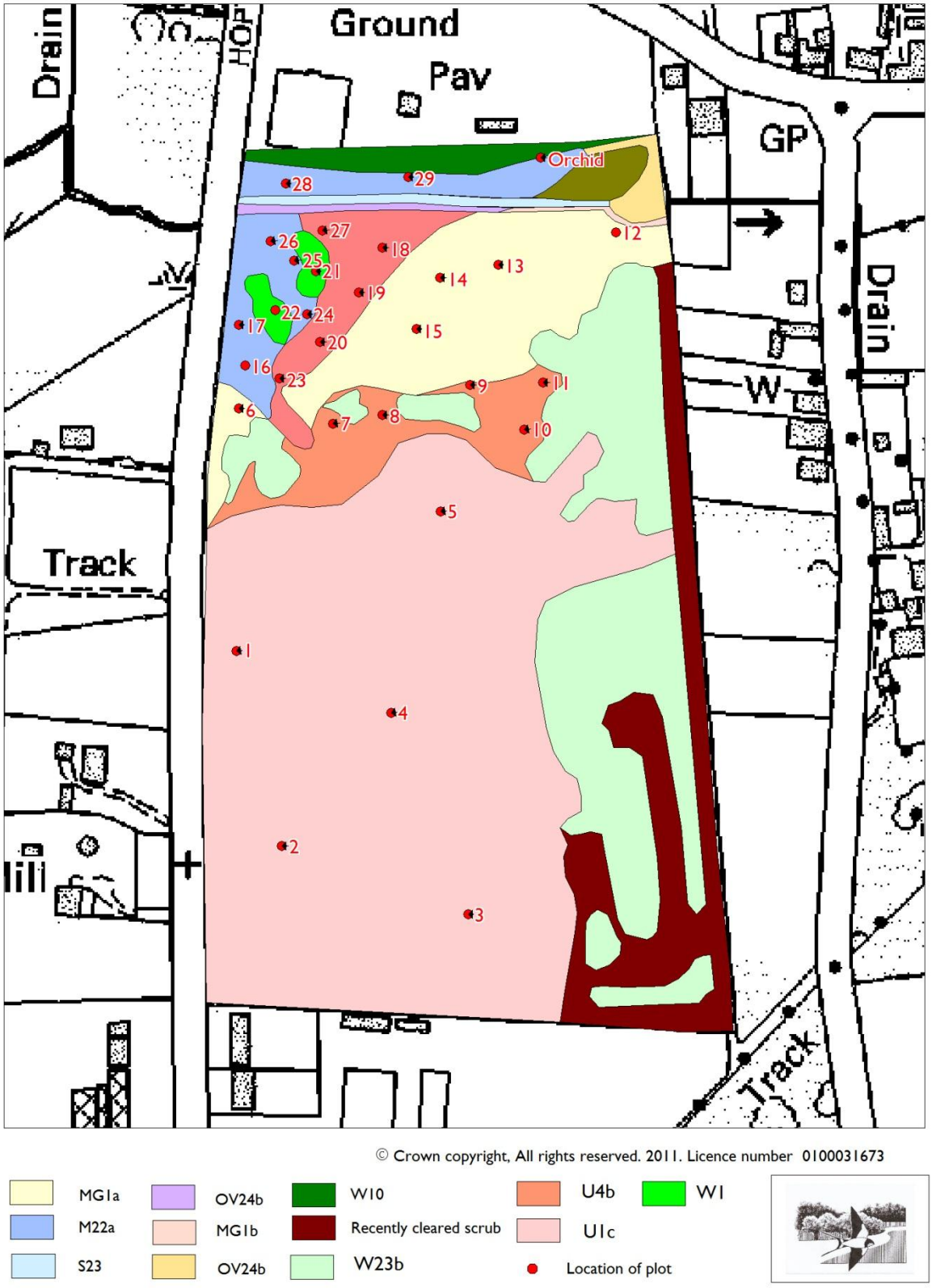


Figure 3. Distribution of vegetation types



Dryland habitats
A large part of the site can be described with reference to a sequence of three NVC grassland communities and a single scrub community.

Habitat-type	Code	Title
Parched open grassland (Table 1)	U1c	*Festuca ovina – Agrostis capillaris – Rumex acetosella* grassland, *Erodium cicutarium – Teesdalia nudicaulis* sub-community
Dry grassland (Table 2)	U4b	*Festuca ovina – Agrostis capillaris – Galium saxatile* grassland, *Holcus lanatus – Trifolium repens* sub-community
Dry tussock grassland (Table 3)	MG1a	*Arrhenatherum elatius* grassland, *Festuca rubra* sub-community
Gorse scrub	W23b	*Ulex europaeus – Rubus fruticosus* scrub, *Rumex acetosella* sub-community

The extensive ***Parched Open Grassland*** covers a large part of the plateau on the Common and represents the kind of grassland that gives this landscape-type its distinctive character. Details of the sample plots are given in Table 1. The dry sandy substrates of the stand are very prone to parching and, coupled with the disturbance and grazing by rabbits, creates a very open sward, with a succession of bare ground patches available for colonisation by annual plants and a suite of distinctive mosses and lichens. Being mildly to moderately acidic, the soil promotes conditions similar to the more extensive heathland areas of East Anglia, such as the Suffolk Sandlings and parts of Breckland.

In more established areas, where grazing has produced a thin sward, the grassland is typically composed of Common Bent-grass, Sheep's Sorrel, and the moss *Hypnum cupressiforme*. Other associates are a type of drought-tolerant dandelion and the occasional tuft of Fine-leaved sheep's fescue. Over much of the sward, however, the vegetation is composed of thin carpets of mosses and lichens, admixed with a distinctive and extensive list of annual plants. These include the Little Mouse-ear, Thyme-leaved sandwort and Parsley-piert. The intense drought leading up to the survey period may have led to an under-representation of records for annuals in the plots.

A distinctive strip of transitional ***Dry Grassland*** occurs along the northern margin of the plateau in an at times narrow but frequently clear division between the Parched Open Grassland and the Dry Tussock Grassland below it. Details of the sample plots are given in Table 2. The character species are Common Bent-grass, Field Woodrush and the moss *Scleropodium purum*. These species are frequently abundant; Field Woodrush, in particular, can form large patches that mark the stand even from a distance. Constant associates include both Common and Sheep's sorrel, Lesser Stitchwort and Ragwort. Near the upslope margin of the stand, Harebell and Common Violet are also distinctive features. As a transitional community, the stand retains some characters of the Parched Open Grassland on slight hummocks, with occasional Cladonia lichens and annuals, yet includes a number of mesic species, such as Couchgrass and Marsh Thistle, in hollows and along its downslope margin.

The ***Dry Tussock Grassland*** mantles the central slope separating the plateau to the south from the low-lying wetland. Details of the sample plots are given in Table 3. False Oatgrass tussocks provide the dominant structural element of low tussocks, and these are matted together by other grasses, notably Red fescue and Creeping Bent-grass and less commonly by Couchgrass. Herbs are few, with Lesser Stitchwort, Common Sorrel and Germander Speedwell being the only constants. In isolated patches, the slightly flushed character of the soil is represented by taller tussocks of Hard Rush.

Table 1. Parched Open Grassland (U1c)

Plot No.	1	2	3	4	5		
Agrostis capillaris	7	5	6	2	6	V	(2-7)
Brachythecium albicans	4	3	2	5	2	V	(2-5)
Senecio jacobaea	2	3	3	4	2	V	(2-4)
Rumex acetosella	3	3	3	2	3	V	(2-3)
Aphanes australis	2	3	3	2	3	V	(2-3)
Aira praecox	2	2	3	3	2	V	(2-3)
Cladonia furcata	2	4	3	5	1	V	(1-5)
Ceratodon purpureus	3	3	1	3	4	V	(1-4)
Cerastium semidecandrum	3	4	1	4	4	V	(1-4)
Cladonia fimbriata	2	2	1	2	3	V	(1-3)
Sagina apetala	1	1	2	3	2	V	(1-3)
Taraxacum agg.	2	3	2	1	1	V	(1-3)
Cladonia squamosa	1	1	2	1	3	V	(1-3)
Polytrichum juniperinum		4	5	4	5	IV	(4-5)
Arenaria leptocladus	3	4		2	2	IV	(2-4)
Rhytidiadelphus squarrosus		2	4	3	3	IV	(2-4)
Hypnum cupressiforme	4	4	6	1		IV	(1-6)
Scleropodium purum	2	4	4	1		IV	(1-4)
Xanthoria parietina	2	2		1	2	IV	(1-2)
Festuca rubra	3	3			1	III	(1-3)
Cladonia portentosa			1	1	2	III	(1-2)
Vulpia bromoides	3	2				II	(2-3)
Festuca filiformis		2			2	II	(2)
Geranium molle	2	2				II	(2)
Myosotis ramosissima	1	2				II	(1-2)
Ornithopus perpusillus			2	1		II	(1-2)
Sagina procumbens	1		2			II	(1-2)
Cerastium fontanum	1			1		II	(1)
Cladonia foliacea				1	1	II	(1)
Sonchus arvensis	1	1				II	(1)
Urtica dioica	1				1	II	(1)
Erophila verna	3					I	(3)
Luzula campestris			2			I	(2)
Veronica arvensis	2					I	(2)
Carex muricata lamprocarpa	2					I	(2)
Polytrichum piliferum					2	I	(2)
Cladonia ramulosa					2	I	(2)
Poa pratensis		1				I	(1)
Agrostis vinealis				1		I	(1)
Cetraria aculeata		1				I	(1)
Peltigera canina agg.	1					I	(1)
Stellaria pallida		1				I	(1)
Vicia sativa nigra			1			I	(1)
Trifolium dubium			1			I	(1)
Sward height (cm)	1	1	1	1	1		
Herb cover (%)	50	40	45	20	40		
Bryophyte cover (%)	15	35	50	45	35		
Litter cover (%)	1	2	1	0	1		
Bare ground (%)	40	30	20	40	30		
No. of species	29	29	24	25	24	Av.	26.2

In plots 2, 3 and 4, a few spots of an unidentified white, crustose lichen were recorded from flint surfaces.

Table 2. Dry Grassland (U4b)

Plot No.	7	8	9	10	11		
Agrostis capillaris	9	8	9	7	7	V	(7-9)
Scleropodium purum	5	5	6	7	8	V	(5-8)
Stellaria graminea	3	3	4	4	4	V	(3-4)
Veronica chamaedrys	2	2	3	3	5	V	(2-5)
Rumex acetosa	3	2	4	4	4	V	(2-4)
Senecio jacobaea	2	2	2	3	2	V	(2-3)
Luzula campestris	4	8	2	5	1	V	(1-8)
Festuca rubra	3	2	1	2	5	V	(1-5)
Holcus lanatus	3	2	2	1	4	V	(1-4)
Rumex acetosella	1	3	1	3	1	V	(1-3)
Anthoxanthum odoratum	1	1	1	2		IV	(1-2
Ceratodon purpureus	1	1	1	2		IV	(1-2)
Cirsium palustre	4		1		2	III	(1-4)
Poa pratensis			1	1	2	III	(1-2)
Cerastium fontanum			1	1	1	III	(1)
Viola riviniana	2	3				II	(2-3)
Campanula rotundifolia	1	3				II	(1-3)
Elytrigia repens			3	1		II	(1-3)
Cladonia fimbriata	1			3		II	(1-3)
Veronica arvensis				2	1	II	(1-2)
Carex hirta	2	1				II	(1-2)
Agrostis stolonifera		1	2			II	(1-2)
Sagina apetala	1			1		II	(1)
Phleum bertolonii		1			1	II	(1)
Cladonia foliacea	1			1		II	(1)
Rhytidiadelphus squarrosus				6		I	(6)
Carex muricata lamprocarpa		3				I	(3)
Potentilla reptans					2	I	(2)
Aira praecox		2				I	(2)
Vulpia bromoides				2		I	(2)
Cladonia furcata				2		I	(2)
Achillea millefolium	1					I	(1)
Ranunculus acris	1					I	(1)
Glechoma hederacea	1					I	(1)
Vicia lathyroides	1					I	(1)
Centaurium erythraea	1					I	(1)
Sonchus arvensis				1		I	(1)
Aphanes australis				1		I	(1)
Spergularia rubra				1		I	(1)
Sonchus oleraceus					1	I	(1)
Festuca filiformis				1		I	(1)
Poa annua					1	I	(1)
Cladonia chlorophaea				1		I	(1)
Brachythecium albicans				1		I	(1)
Polytrichum juniperinum				1		I	(1)
Campylopus pyriformis				1		I	(1)
Brachythecium rutabulum				1		I	(1)
Sward height (cm)	1	1	4	1	2		
Herb cover (%)	90	90	90	75	85		
Bryophyte cover (%)	20	20	25	50	60		
Litter cover (%)	45	50	50	10	10		
Bare ground (%)	5	0	1	10	5		
No. of species	24	19	17	31	18	Av.	21.8

Table 3. Dry Tussock Grassland (MG1a)

Plot No.	6	12	13	14	15		
Arrhenatherum elatius	6	8	8	9	9	V	(6-9)
Festuca rubra	6	4	6	7	8	V	(4-8)
Agrostis stolonifera	5	5	5	4	3	V	(3-5)
Holcus lanatus	6	3	2	2	2	V	(2-6)
Rumex acetosa	3	3	3	2	3	V	(2-3)
Stellaria graminea		3	2	2	1	IV	(1-3)
Veronica chamaedrys	3	2	2	1		IV	(1-3)
Elytrigia repens	8	5	4			III	(4-8)
Scleropodium purum	4	5				II	(4-5)
Juncus inflexus			4		4	II	(4)
Carex hirta	4				3	II	(3-4)
Poa pratensis	4		2			II	(2-4)
Brachythecium rutabulum	4		1			II	(1-4)
Ranunculus acris	1	2				II	(1-2)
Cirsium palustre	1		1			II	(1)
Cirsium arvense		1		1		II	(1)
Agrostis capillaris		5				I	(5)
Achillea millefolium	4					I	(4)
Dactylis glomerata	4					I	(4)
Glechoma hederacea	3					I	(3)
Luzula campestris	2					I	(2)
Lathyrus pratensis	2					I	(2)
Anthoxanthum odoratum	1					I	(1)
Vicia cracca	1					I	(1)
Heracleum sphondylium	1					I	(1)
Angelica sylvestris	1					I	(1)
Kindbergia praelonga	1					I	(1)
Cirsium vulgare		1				I	(1)
Ranunculus bulbosus		1				I	(1)
Tragopogon pratensis				1		I	(1)
Sward height (cm)	25	25	35	30	35		
Herb cover (%)	80	90	95	95	95		
Bryophyte cover (%)	5	20	1	0	0		
Litter cover (%)	55	50	70	70	70		
Bare ground (%)	10	0	0	0	0		
No. of species	23	14	12	9	8	Av.	13.2

The upper boundary of this grassland is often clearly marked by the dissolution of the tussock structure and the presence of Field Woodrush denoting the Dry Grassland community. The mapped boundary follows closely the rabbit grazing line around the northern margin of fragmentary stands of Gorse scrub. The lower boundary is similarly sharply defined by the presence of Wild Angelica, and an often distinct change in the character of the ground surface, as this community gives way to the Moist Tussock Grassland. Towards the end of the spring drought, it was possible to pick out the sharp boundary between the Dry and Moist Tussock Grasslands by a change in colour from dull yellow upslope to a muted green.

Where the stand descends as far as the ditch, it terminates in a narrow, rather weedy strip, where Nettle, Cleavers and Ground Ivy mark a shift to the *Urtica dioica* sub-community of the False Oatgrass grassland (MG1b) on the shallow spoil bank beside the ditch.

Gorse scrub occupies a large part of the eastern side of the plateau, marking the transition on the plateau margin with several small stands and extending northwards towards the ditch. Gorse is the overwhelming dominant in each stand, though small grassy areas persist, and rabbit activity is very evident in the 'sculptured' gorse margins. Floristically, few associate species are present in any quantity and Nettle and Ragwort are most common. Alongside the Parched Open Grassland, Heath Speedwell and Sheep's Sorrel are evident.

The main block of scrub has been cut back from the site margin, and its southern area managed to extend the internal scrub boundary, as shown in Figure 3.

Wetland communities

The wetland can be traced from within the scattered Gorse scrub on the transitional slope, where the remains of the shallow dry valley can be picked out. Here, the establishment of Moist Tussock Grassland is accompanied by occasional wetland herbs before the often abrupt appearance of Water Mint and Brown Sedge marks the start of Fen-Meadow. Surrounding two small Grey Sallow stands, the Fen Meadow extends over the ditch into a strongly flushed swathe of peat where it ends abruptly on the upslope side against the upland edge, marked by a thin line of scrub of Oak and Hawthorn over Yorkshire Fog assigned to *Quercus robur – Pteridium aquilinum – Rubus fruticosus* woodland (W10).

The sequence of wetland communities can be summarised as:

Habitat-type	Code	Title
Moist tussock grassland (Table 4)	MG9b	*Holcus lanatus – Deschampsia cespitosa* grassland, *Arrhenatherum elatius* sub-community
Fen meadow (Table 5)	M22a	*Juncus subnodulosus – Cirsium palustre* fen-meadow, Typical sub-community
Grey Sallow scrub (Table 6)	W1	*Salix cinerea – Galium palustre* woodland
Waterbody vegetation	S23	Other water-margin vegetation [*Berula erecta*]

The boundary between dry and wetland is often abrupt and marked by the appearance of Wild Angelica in the sward. Nonetheless, the ***Moist Tussock Grassland*** continues to be dominated by False Oatgrass, though increasingly Tufted Hairgrass and Hard Rush, sometimes with Soft Rush, contribute to a taller more tussocky sward, akin to fen meadow. Details of the sample plots are given in Table 4. A number of common fen meadow indicators are present, including Marsh Thistle, Silverweed, Tufted Vetch and Marsh Bird's-foot Trefoil. Although there are clearly affinities with fen meadow vegetation, the overwhelming contribution of common grasses including Tufted Hairgrass, and the transitional character of the stand, indicates that it is best regarded as a slope flushed form of mesotrophic grassland, and is assigned to the *Arrhenatherum elatius* sub-community of *Holcus lanatus – Deschampsia cespitosa* grassland. This stand extends around the east side of the scrub from the dry valley, and can be followed as far as the ditch, where it gives way to the vegetation growing on the slightly raised bund, which grades eastwards from the False Oat-grass-Bramble sub-community of Nettle-Cleavers vegetation (OV24b) to the drier Nettle sub-community of False Oatgrass grassland (MG1b).

On the downslope side of the Moist Tussock Grassland, true wetland communities appear, with either fen-meadow or sallow scrub. Details of the sample plots taken in the vegetation-types are

given in Table 5 and 6. The more developed southern areas of the ***Fen Meadow*** community are typically dominated by Brown Sedge on the upslope margins and Blunt-flowered Rush in the central areas. Here, Water Mint and Tufted Forget-Me-Not are patch-forming associates. A partially filled-in ditch running along the central line of slope in this area suggests an attempt has been made to drain what may have been a more significant seepage. Near the stream, the frequency of Meadowsweet and Nettle increases. While the internal variation in species composition is considerable, the stand is collectively assigned to the *Juncus subnodulosus – Cirsium palustre* fen-meadow community (M22a).

The ***Grey Sallow Scrub***, belonging to the *Salix cinerea – Galium palustre* woodland community, consists of two small stands within and bounding the southern Fen Meadow stand. Both areas are created by several mature, open-grown Grey Sallows that now sprawl over patches of former fen meadow. The western, wetter, scrub contains a small suite of distinctive species, including Common Sedge *Carex nigra*, Common Spike-rush *Eleocharis palustris* and Tubular Water-dropwort *Oenanthe fistulosa*.

The ***Waterbody Vegetation*** occurring in the main ditch crossing from east to west through the fen meadow area is dominated by lush and abundant growth of the semi-emergent umbellifer Fool's Watercress *Apium nodiflorum* and Fool's Water Parsley *Berula erecta*. These are species typical of usually fertile calcareous waters and can be particularly freely-growing within slow-flowing waterbodies in south and eastern England. The often fluctuating dominance of either species represents different facies of the S23 'Other water margin vegetation'. Amongst other species, Hairy Willowherb and Narrow-fruited Watercress *Rorippa microphylla* were also recorded here.

On the northern side of the ditch, and extending with the peat along the upland margin, is a second stand of disturbed ***Fen Meadow***, with many of the species found in the ditch, on its margins, and in the southern stand. The peat is far wetter here and there are early indications that wetland mosses may become significant in this stand. There is a suite of fenland species with abundant Hard Rush that extends the stand apparently to the edge of the moist peat, which is roughly marked by the discovery of a single Early Marsh Orchid spike alongside the path into the site from the Playing Field. On its eastern flank, the fen-meadow is replaced by scrub (W21a) and species-poor nettle beds, belonging to the Typical sub-community of Nettle-Cleavers vegetation (OV24a).

Table 4. Moist Tussock Grassland (MG9b)

Plot No.		18	19	20	23	27		
Arrhenatherum elatius		6	5	4	8	7	V	(4-8)
Angelica sylvestris		2	2	6	2	5	V	(2-6)
Galium aparine		2	5	4	3	2	V	(2-5)
Agrostis stolonifera		3	2	2	4	3	V	(2-4)
Urtica dioica		4	3	5	1	1	V	(1-5)
Cirsium arvense		5	2	3	1	3	V	(1-5)
Juncus inflexus		6	7	6	5		IV	(5-7)
Festuca rubra		5		2	5	2	IV	(2-5)
Poa trivialis		3	3	2		3	IV	(2-3)
Cirsium palustre		1	2	2	1		IV	(1-2)
Lathyrus pratensis		1	3		1	1	IV	(1-3)
Potentilla anserina			1	1	2	1	IV	(1-2)
Deschampsia cespitosa		7		4	5		III	(4-7)
Juncus effusus			5	6	3		III	(3-6)
Vicia cracca				2	2	3	III	(2-3)
Lotus pedunculatus				1	2	3	III	(1-3)
Potentilla reptans		1		2		2	III	(1-2)
Rumex acetosa		1			2	2	III	(1-2)
Rumex conglomeratus		1	1	1			III	(1)
Eupatorium cannabinum			1	1		1	III	(1)
Holcus lanatus		4	1				II	(1-4)
Carex hirta				1	3		II	(1-3)
Stellaria graminea			2		1		II	(1-2)
Dactylis glomerata				1		1	II	(1)
Alopecurus pratensis			4				I	(4)
Calystegia sepium						3	I	(3)
Ranunculus ficaria				2			I	(2)
Carex disticha			2				I	(2)
Poa pratensis					2		I	(2)
Ranunculus repens			1				I	(1)
Carex otrubae			1				I	(1)
Glechoma hederacea			1				I	(1)
Epilobium adenocaulon			1				I	(1)
Heracleum sphondylium		1					I	(1)
Convolvulus arvensis		1					I	(1)
Stellaria palustris						1	I	(1)
Lycopus europaeus						1	I	(1)
Valeriana officinalis						1	I	(1)
Brachythecium rutabulum			1				I	(1)
Anthoxanthum odoratum						1	I	(1)
Sward height (cm)		55	75	70	65	50		
Herb cover (%)		95	95	95	95	95		
Bryophyte cover (%)		0	0	0	0	0		
Litter cover (%)		60	65	60	60	65		
Bare ground (%)		10	5	10	10	5		
No. of species		18	23	21	19	21	Av.	20.4

Table 5. Fen Meadow Vegetation (M22a)

Plot No.		17	16	24	25	26	28	29		
Solanum dulcamara		5	1	3	3	1	1	1	V	(1-5)
Cirsium palustre		2	4	2	1	1	1	2	V	(1-4)
Poa trivialis			3	4	3	3	4	5	V	(3-5)
Mentha aquatica		2	3	2	2		3	4	V	(2-4)
Angelica sylvestris			2	1	2	4	2	1	V	(1-4)
Eupatorium cannabinum		1	1	3	2	3	3		V	(1-3)
Juncus subnodulosus		5			10	9	8	4	IV	(4-10)
Juncus inflexus		5	4	4			4	1	IV	(1-5)
Urtica dioica			2	2	2	2	1		IV	(1-2)
Juncus effusus		8	4	6			2		III	(2-8)
Equisetum palustre		2		1			7	8	III	(1-8)
Lathyrus pratensis			1	1	3	2			III	(1-3)
Galium aparine			1	1	1	2			III	(1-2)
Rumex conglomeratus		1		1	1		1		III	(1)
Galium palustre		3	3	2					III	(2-3)
Cirsium arvense				1	2	4			III	(1-4)
Carex disticha			8	8					II	(8)
Arrhenatherum elatius					4	4			II	(4)
Carex otrubae		4						2	II	(2-4)
Epilobium hirsutum							2	3	II	(2-3)
Myosotis laxa caespitosa		3		2					II	(2-3)
Vicia cracca					2	3			II	(2-3)
Valeriana officinalis					2	3			II	(2-3)
Filipendula ulmaria						3		1	II	(1-3)
Rumex acetosa			3	1					II	(1-3)
Lychnis flos-cuculi						1		2	II	(1-2)
Epilobium parviflorum				1				2	II	(1-2)
Carex nigra			1	2					II	(1-2)
Glechoma hederacea					1	2			II	(1-2)
Scrophularia aquatica							1	1	II	(1)
Lotus pedunculatus				1	1				II	(1)
Berula erecta							9		I	(9)
Deschampsia cespitosa			4						I	(4)
Ranunculus ficaria						3			I	(3)
Calliergonella cuspidatum								2	I	(2)
Brachythecium rutabulum								2	I	(2)
Ranunculus repens							2		I	(2)
Salix fragilis sapling							2		I	(2)
Agrostis stolonifera					2				I	(2)
Calystegia sepium						2			I	(2)
Lycopus europaeus			1						I	(1)
Alopecurus pratensis				1					I	(1)
Humulus lupulus				1					I	(1)
Equisetum fluviatile				1					I	(1)
Sward height (cm)		80	75	75	85	85	75	65		
Herb cover (%)		95	95	95	95	95	90	85		
Bryophyte cover (%)		0	0	0	0	0	0	1		
Litter cover (%)		70	70	70	70	70	5	5		
Bare ground (%)		0	0	0	0	0	70	75		
No. of species		12	17	24	17	17	17	16	Av.	17.1

Table 6. Grey Sallow Scrub (W1)

Plot No.		21		22		
Salix cinerea		9		10		
Poa trivialis		10		5		
Ranunculus repens		5		2		
Juncus inflexus		2		4		
Juncus effusus		3		1		
Solanum dulcamara		1		2		
Urtica dioica		2		1		
Myosotis laxa caespitosa		1		2		
Equisetum palustre		1		2		
Epilobium parviflorum		2		1		
Holcus lanatus		1		2		
Carex remota		1		2		
Eupatorium cannabinum		1		1		
Cirsium palustre		1		1		
Mentha aquatica		1		1		
Rumex conglomeratus		1		1		
Deschampsia cespitosa		1		1		
Brachythecium rutabulum		1		1		
Eleocharis palustris				4		
Carex otrubae				3		
Galium palustre				3		
Agrostis stolonifera				2		
Carex nigra				2		
Oenanthe fistulosa				2		
Carex hirta		2				
Stellaria palustris		2				
Arrhenatherum elatius		1				
Angelica sylvestris		1				
Galium aparine		1				
Glechoma hederacea		1				
Lycopus europaeus		1				
Festuca rubra		1				
Salix cinerea seedling		1				
Cardamine flexuosa		1				
Ranunculus flammula				1		
Crataegus monogyna seedling				1		
Sward height (cm)		450		500		
Herb cover (%)		95		25		
Bryophyte cover (%)		0		0		
Litter cover (%)		0		5		
Bare ground (%)		70		90		
No. of species		28		26	Av.	27.0

2.3 Interpretation

Although there is some doubt concerning the geological origins of the sandy plateau[1], this extensive area of the Common supports a type of parched grassland formerly typical of the Little Ouse valley margins, though sadly now uncommon. Its openness and apparently barren aspect is an important element of the landscape character of the area. The presence in this area of a large stand of *Festuca-Agrostis-Rumex* grassland (U1c), particularly as an open, lichen-rich sward, is of great significance to the conservation value of the Common, particularly as the transition downslope to wetland habitats has been preserved. This is a feature of few sites in the area, and can be compared to a small area of Hinderclay Fen and parts of Redgrave and Lopham Fens National Nature Reserve.

The transitional grasslands largely consist of the large area of Dry Tussock Grassland. Although this stand contributes to an understanding of the site's hydrology, and offers cover to fauna, it has little floristic value when ungrazed. Similarly, the Moist Tussock Grassland, although of greater floristic interest, has developed a substantial thatch of plant litter which is likely to be inhibiting seedling germination.

The wetland floor of the Common is of considerable interest as it retains areas of seepage and a diverse fenland flora. Species such as the Hard and Blunt-flowered Rushes indicate that the seepage is somewhat calcareous. In addition to the species mentioned, Common Sedge *Carex nigra* is also present as mature tussocks. The occurrence of this vegetation, as shown in Figure 3, emphasises not only the natural distribution of the wetland communities but also the significance of the earlier attempt to drain the peatland. The wet surface peat on the northern side of the ditch (remarkable given the long intense drought) indicates that the wetland is still influenced by groundwater. Nonetheless, it is noted that the pond at the head of the ditch was dry at the time of survey, and Nettle-Cleavers (OV24a) vegetation is prone to monopolise the flushed, peaty soil in this headwater area.

[1] This was discussed by Tim Holt-Wilson, leading the LOHP Heritage Walk on 12th June 2011.

3. VEGETATION MONITORING

3.1 Methodology

The Little Ouse Headwaters Project recognises the importance of monitoring the development of the vegetation on each of its acquisitions. A Vegetation Monitoring Programme was initially developed to aid the ecological restoration of Bleyswyck's Bank and Parkers Piece on the banks of the Little Ouse at Blo-Norton in Norfolk. The development, methodology and functions of the programme were described in detail in the Monitoring Plan (ELP 2010) for those sites.

The objectives of this initial monitoring survey at Broomscot Common are:

1. To establish permanent monitoring plots in two specified vegetation types on Broomscot Common, using the protocols developed in the Monitoring Plan.

2. To undertake the initial monitoring survey, using the 'full' Fieldwork Protocols.

3. To interpret the fieldwork results, and provide guidance on the establishment of initial target conditions.

The reporting follows the prescriptions of the Monitoring Plan (ELP 2010) and broadly follows the format given in the initial Fieldwork Report for Parker's Piece and Bleyswyck's Bank (ELP 2009). This fieldwork report records the 'full' survey protocol, using the four Fieldwork Elements summarised in Table 7.

Table 7. Summary of survey techniques

Survey intensity	Fieldwork Element		Function within the Survey
Rapid	1	Locating Monitoring Plots	To establish locations for the Monitoring Plots
	2	Photographic Record	To produce a record surveillance images showing the condition of the developing fen vegetation
Full	3	Vegetation structural characters	To record features of the vegetation structure against which management requirements can be established.
	4	Floristic sub-sampling	To record the floristic composition of the plot in order to judge to success of the restoration measures against target floristic conditions.

In line with the Monitoring Plan, the vegetation structural characters were sampled from each quarter of the 10 x 10 metre monitoring plot, and twenty 1 x 1 metre sub-samples of the whole plot were taken of the floristic composition.

3.2 Results

The survey was carried out on 28th June 2011 following a period of humid, showery conditions after an intense drought that had characterised the previous months.

3.2.1 Locating the Monitoring Plots

Each plot is located within a stand of vegetation identified and characterised by the vegetation survey described in section 2.

Plot BC01 Fen Meadow
This plot is located in the southern Fen Meadow stand, immediately south of the weedy vegetation associated with ditch spoil. The plot records vegetation at what is recognised as the more fertile part of the stand, where Nettle and Meadowsweet are significant components. It is anticipated that the plot will both record the impact of vegetation management, and also potential changes in hydrology.

Plot BC02 Parched Open Grassland
This plot was selected to represent a typical area of the stand, where no extensive rabbit excavations were present, and the ground surface was extensively grassed over. Also, Nettle and Ragwort were present as minor components of the sward. It is antipated that the plot will provide a record of a typical area of this vegetation.

In establishing the Monitoring Plots, this initial survey of each plot provides a set of vegetation data against which the results of future repeat surveys can be compared. An initial interpretation of the data is given in section 3.3, which can be elaborated and refined in subsequent years.

Plots were established using the method given in the Monitoring Plan. Temporary posts were located in the position of the permanent plot markers. Posts are 3 cm in diameter and 1.2 m long. The tops of all posts are painted white. The fen meadow posts look like the example shown in Photo 1, and one Parched Open grassland post is shown in Photo 2.

Location details of the plot markers are given in Table 8 and shown in Figure 4.

Table 8. Details of permanent monitoring plot locations

VEGETATION TYPE	PLOT CODE	MARKER POSTS	Marker Post Location	EASTING	NORTHING	Plot location (see Figure 4)
Fen Meadow	**BC01**	BC01-01	Alongside boundary fence, c.7 m south of centre of stream ditch	00341	80766	Northwest corner of plot is 15 m east of BC01-01 along the line between marker posts
		BC-01-02	40 m due east, parallel to ditch	00381	80765	
Parched Open Grassland	**BC02**	BC02-01	Free-standing short post, buried to within 15 cm of the ground surface	00388	80528	Northwest corner of plot is 20 m east of BC02-01 along the line between marker posts
		BC-02-02	As above, 50 m to approx. east	00436	80518	

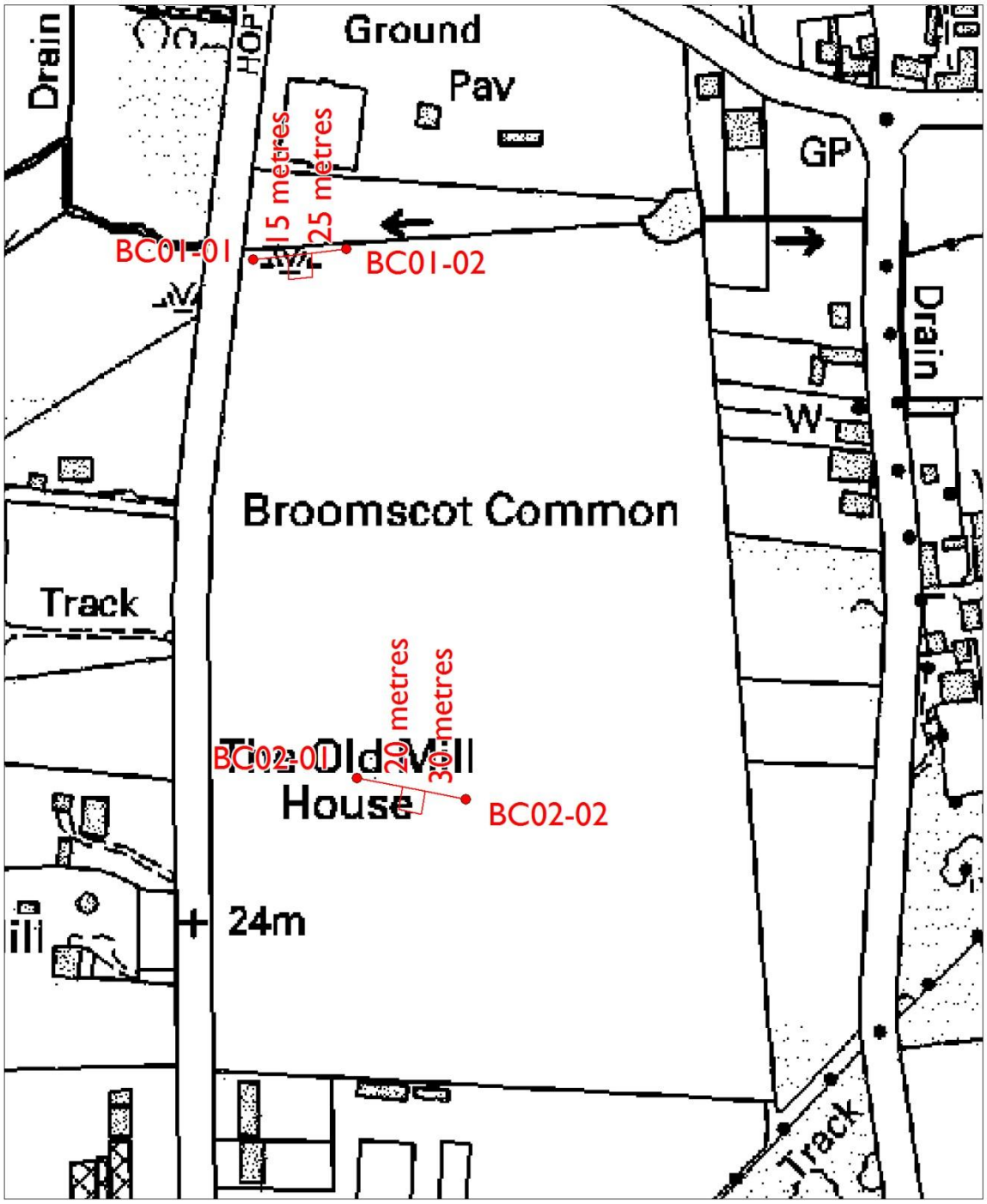
Each plot is 10 m x 10 m in size, and lies between the two permanent marker posts. The precise location of the monitoring plot is re-established by stretching a 50 metre tape between the posts. From known lengths along this baseline, the plot is reconstructed at right angles to it. It should be

noted that the precise locations of some monitoring plots may be affected by the installation of the permanent marker posts following the survey.

Photo 1. Fen Meadow marker post type

Photo 2. Parched Open grassland marker post type

Figure 4. Location of vegetation monitoring plots



3.2.2 Fen meadow Monitoring Plot Report

Plot code	BC01
Treatment type	**Summary of preceding Monitoring Plot Report**
Fen Meadow	This is the initial Monitoring Plot Report

Vegetation structure

● The ground surface is level, with black earthy structureless peat.
● A thick plant litter layer obscures the ground surface; seedlings are absent and bryophytes are very thinly scattered.
● Rush tussocks form the dominant structure, with abundant narrow grass tussocks producing a thin supra-canopy; tall-herbs are ubiquitous, accompanied by sprawling Hedge Bindweed. There is only a thin ground layer.
● Apart from human trampling, the vegetation is undisturbed with no signs of dunging.

Floristics

• Apart from fen meadow rushes (Hard and Blunt-flowered) there is a large suite of fenland herbs present in low numbers.
• The plot has markedly high numbers of a few 'weedy' species, notably False Oat-grass, Nettle and Creeping Thistle.
• The plot does not contain species associated with inundation, trampling or disturbance.

Summary of records and events

• Not available at time of reporting. Field evidence suggests that the plot vegetation has not been disturbed in recent years. In the past, however, there would have been disturbance associated with slubbing out the main ditch.

Relation to past and target conditions

• This survey initiates the Vegetation Monitoring Programme and provides a baseline for assessing subsequent fen meadow vegetation development.

• Vegetation characters suggest former grazing (or cutting) of what is now relict fen meadow vegetation, likely to be declining in species richness owing to the dense shade cast by larger species. The continued presence of a suite of fen meadow species indicates a high potential for restoration by vegetation management and protection of the hydrology.

Plot code BC01	Photographic Record

Monitoring Plot Field Form – Vegetation structural characters

Monitoring Plot	**BC01**
Recorder	**Jonny Stone OHES**
Survey Date	**28th June 2011**

Character of the ground surface
● The ground surface is level, with black earthy structureless peat.

Soil wetness

Dry, dusty	Dry, firm	Slightly damp	Moist	Wet	Saturated
		I I I I			

	ATTRIBUTE		SAMPLE taken from each quarter of the plot							AVERAGE
			1		2		3		4	
Layer height	Standing water (cm)		0		0		0		0	0
	Plant litter (cm)		8		6		6		9	7.5
	Woody seedlings (cm)		0		0		0		0	0
	Large sedges / rushes (cm)		80		85		90		85	85
	Reed-like grasses (cm)		150		140		145		150	145
	Woody saplings (cm)		0		0		0		0	0
Cover value	Standing water (%)		0		0		0		0	0
	Trampling (%)		0		0		0		0	0
	Dunging (%)		0		0		0		0	0
	Bare ground (%)		0		0		5		0	0
	Plant litter (%)		70		70		65		70	70
	Bryophytes (%)		0		0		0		0	0
	Woody seedlings (%)		0		0		0		0	0
	Large sedges / rushes (%)		60		80		80		70	70
	Reed-like grasses (%)		20		15		15		15	15
	Woody saplings (%)		0		0		0		0	0

Monitoring Plot Field Form – Floristic sub-sampling

Monitoring Plot	**BC01**
Recorder	**Jonny Stone OHES**
Survey Date	**28th June 2011**

This data is collated from the 20 1 x 1 metre sub-samples given in Appendix 1.

Species	**2011**	
	[ex. 20]	
Fen Meadow species		
Calystegia sepium	20	
Juncus inflexus	16	
Juncus subnodulosus	15	
Angelica sylvestris	11	
Vicia cracca	9	
Filipendula ulmaria	8	
Eupatorium cannabinum	5	
Lotus pedunculatus	5	
Lathyrus pratensis	4	
Stellaria palustris	3	
Brachythecium rutabulum	2	
Equisetum palustre	2	
Cirsium palustre	2	
Festuca rubra	1	
Carex disticha	1	
Plagiomnium undulatum	1	
Lychnis flos-cuculi	1	
Mentha aquatica	1	
Valeriana officinalis	1	
Galium uliginosum	1	
Scrophularia aquatica	1	
Solanum dulcamara	1	
Negative indicators		
Arrhenatherum elatius	20	
Cirsium arvense	16	
Urtica dioica	15	
Galium aparine	9	
Sonchus arvensis	3	
Rumex conglomeratus	1	

3.2.3 Parched Open Grassland Monitoring Plot Report

Plot code	BC02
Treatment type	**Summary of preceding Monitoring Plot Report**
Parched Open Grassland	This is the initial Monitoring Plot Report

Vegetation structure

- Loose sand ground surface with frequent scattered flints and occasional quartzite.
- Cratered surface, pock-marked with old and occasionally new rabbit diggings.
- Thin cover of bryophytes and litter over bare ground, which is rarely fully exposed.
- Scattered clusters of rabbit droppings and occasional scratchings.

Floristics

- Ubiquitous Common Bent-grass forms a low sprawl throughout with frequent rosettes of Ragwort and Sheep's Sorrel.
- Patch-forming mosses and sprays of fruticose Cladonia lichens occur throughout.
- Annuals, scattered throughout, are at low density (at the time of survey).
- Occasional clumps of Nettle.

Summary of records and events

• Not available at time of reporting.

Relation to past and target conditions

• This survey initiates the Vegetation Monitoring Programme and provides a baseline for assessing subsequent Parched Open Grassland development.

• Current plot characters illustrate many of the dynamics of the stand, ranging from bare sand through successional routeways taken by annuals, lichens, mosses and perennial species. Large areas of diggings and strong Nettle growth are not present.

• The plot contains all elements of the stand flora likely to be influenced by vegetation management, including negative responders (Ragwort and Nettle), and has the potential to retain local characters of Parched Open Grassland.

Plot code BC02	Photographic Record

Monitoring Plot Field Form – Vegetation structural characters

Monitoring Plot	**BC02**
Recorder	**Jonny Stone OHES**
Survey Date	**28th June 2011**

Character of the ground surface
● Loose sand ground surface with frequent scattered flints and occasional quartzite. ● Cratered surface, pock-marked with old and occasionally new rabbit diggings.

Soil wetness

Dry, dusty	Dry, firm	Slightly damp	Moist	Wet	Saturated
I I I I					

	ATTRIBUTE	SAMPLE								AVERAGE
		1		2		3		4		
Layer height	Standing water (cm)	0		0		0		0		0
	Plant litter (cm)	0		0		0		0		0
	Woody seedlings (cm)	0		0		0		0		0
	Large sedges / rushes (cm)	0		0		0		0		0
	Reed-like grasses (cm)	0		0		0		0		0
	Woody saplings (cm)	0		0		0		0		0
Cover value	Standing water (%)	0		0		0		0		0
	Trampling (%)	5		10		5		5		7.5
	Dunging (%)	1		2		1		1		1
	Bare ground (%)	20		15		5		20		15
	Plant litter (%)	5		10		10		5		7.5
	Bryophytes (%)	30		70		40		65		50
	Woody seedlings (%)	0		0		0		0		0
	Large sedges / rushes (%)	0		0		0		0		0
	Reed-like grasses (%)	0		0		0		0		0
	Woody saplings (%)	0		0		0		0		0

Monitoring Plot Field Form – Floristic sub-sampling

Monitoring Plot	**BC02**
Recorder	**Jonny Stone OHES**
Survey Date	**28th June 2011**

This data is collated from the 20 1 x 1 metre sub-samples given in Appendix 2.

Species	**2011**	
	[ex. 20]	
Perennial species		
Agrostis capillaris	20	
Rumex acetosella	18	
Taraxacum agg.	13	
Poa pratensis	3	
Annual species		
Aira praecox	7	
Vulpia bromoides	6	
Sagina apetala	5	
Conyza canadensis	4	
Arenaria leptoclados	2	
Cerastium semidecandrum	1	
Geranium molle	1	
Mosses		
Brachythecium albicans	18	
Polytrichum juniperinum	8	
Rhytidiadelphus squarrosus	2	
Bryum argenteum	1	
Lichens		
Cladonia furcata	14	
Cladonia squamosa	11	
Cladonia fimbriata	8	
Xanthoria parietina	6	
Cladonia foliacea	3	
Peltigera canina agg.	2	
Cladonia ramulosa	1	
Negative Indicators		
Senecio jacobaea	20	
Urtica dioica	5	

3.3 Interpretation of the vegetation in the Monitoring Plots

Plot BC01 - Fen Meadow

This plot records vegetation at what is recognised as the more fertile part of the southern Fen Meadow stand, where Nettle and Meadowsweet are significant components. More than elsewhere in the stand, the vegetation within and near the plot has the potential to shift with lack of management to a less desirable community, perhaps the *Urtica dioica – Vicia cracca* sub-community of the *Filipendula ulmaria – Anglelica sylvestris* mire (M27b).

Vegetation characters suggest former grazing (or cutting) of what is now relict fen meadow vegetation, likely to be declining in species richness owing to the dense shade cast by larger species. The continued presence of a suite of fen meadow species indicates a high potential for restoration by vegetation management and protection of the hydrology.

It is anticipated that the plot will both record the impact of vegetation management, and also potential changes in hydrology. The structure of the plot, and potentially its species compliment, may change markedly in response of cutting management but more slowly following grazing or changes to the hydrological regime.

Recorded species from the plot have been separated into two groups, Fen meadow and Negative indicators.

Plot BC02 – Parched Open Grassland

This plot was selected to represent a typical area of the stand, where no extensive rabbit excavations were present, and the ground surface was extensively grassed over. Also, Nettle and Ragwort are present as minor components of the sward. Current plot characters illustrate many of the dynamics of the stand, ranging from bare sand through successional routeways taken by annuals, lichens, mosses and perennial species. Large areas of diggings and strong Nettle growth are not present.

The plot contains all elements of the stand flora likely to be influenced by vegetation management, including negative responders (Ragwort and Nettle), and has the potential to retain local characters of Parched Open Grassland.

However, if grazing were to cease, the vegetation is likely to drift towards dryland forms of Nettle- and Ragwort-dominated vegetation.

Recorded species from the plot have been separated into five groups, including one for Negative indicators.

4. RECOMMENDATIONS

Vegetation Management

1. Management of the parched and dry grasslands has relied on rabbit grazing in recent years. It should be emphasised that the condition of these kinds of grassland is dependent upon a combination of droughting and grazing. The grazing favours many of the high light-demanding mosses, lichens and annual plants that give the grasslands their character. It is strongly recommended that grazing is viewed as a priority for the preservation of the character of this vegetation.

2. Nettle and Ragwort are significant features of the current Parched Open Grassland sward. Nonetheless, each species employs a particular strategy to overwhelm the surrounding vegetation, and their spread may severely impact on the condition of the sward. It is recommended that measures are taken to reduce the incidence of both species both through intervention and routine management.

3. The species of annuals and bryophytes of the Festuca-Agrostis-Rumex (U1c) and Festuca-Agrostis-Galium (U4b) grasslands were unsatisfactorily assessed due to the state of advanced droughting this year. It is recommended that further plant recording is undertaken in these areas earlier in the season, to confirm records and develop a more complete understanding of the grasslands' character.

4. Management of the wetland area should consider both the hydrological situation as well as cutting or grazing. It is recommended that, in addition to making provision for grazing or periodic cutting of the fen meadow, consideration is also given to making an assessment of how best to protect and restore the hydrological influences affecting the wetland.

Vegetation Monitoring

5. It is recommended that, in line with the Parker's Piece and Bleyswyck Bank Fieldwork Report 2009, the Vegetation Monitoring Programme is adopted at Broomscot Common by those responsible for ensuring appropriate management of the Common and its vegetation.

6. It is recommended to the managers of the Common vegetation that a vegetation compartment map is drawn up incorporating the results of the vegetation survey shown in Figure 5, and that target vegetation states for each compartment are drawn up using the Floristic Sub-sampling lists, against which surveys of the Monitoring Plots can be compared to assess the success of management.

7. It is recommended that the Monitoring Plots are re-surveyed within the next two years by the 'full' survey protocols, and the results are used to directly inform and review vegetation management.

Protected Species (general recommendations)

8. Nesting birds should be given consideration during vegetation clearance. Under the Wildlife and Countryside Act 1981 (as amended) it is an offence to disturb a bird whilst building or

using a nest. Therefore the bird breeding season of March to August should be avoided. If work is required within this period a breeding bird survey should be completed by an ecologist to identify any active nests and ensure they are protected until the young have fledged.

9. All native British species of reptiles are listed in Schedule 5 of the Wildlife and Countryside Act, 1981, and as such are protected from deliberate killing or injury. Therefore, given that this habitat is considered suitable for reptiles (in particular grass snakes, slow worms and common lizard) any works that would risk the disturbance/harm to these species or loss of habitat should be preceded by a reptile survey and suitable mitigation plans.

10. Great crested newts are listed in both Annex 4 of the EC Habitats and Species Directive and in Schedule 5 of the Wildlife and Countryside Act, 1981. It is therefore an offence to kill, injure or disturb a great crested newt; or to damage, destroy or obstruct access to its habitat. Therefore, should any works be proposed to the pond in the north of Broomscot Common (or land within 250m of the pond) an assessment of the pond for great crested newt suitability and presence may be required. A presence survey must be completed between April and May. If great crested newts are found to be present then a European Protected Species (EPS) development licence, issued by Natural England (NE), may be required prior to any works taking place which would disturb newts or their habitat.

11. If any mature trees are proposed for felling then these will need to be assessed for bat roost potential by a licensed bat worker prior to any works. Bats are protected species and they and their habitats are protected from harm, damage and disturbance by Schedule 5 of the Wildlife and Countryside Act, 1981.

12. If any protected species are seen on site during works, all work should cease immediately and an appropriately qualified ecologist should be consulted.

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Appendix 1. Field record for Fen Meadow permanent plot (BC01)

P = present in sub-sample

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
Calystegia sepium	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	20
Arrhenatherum elatius	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	20
Juncus inflexus	P	P	P	P					P	P	P	P	P	P	P	P	P	P	P	P	16
Cirsium arvense	P	P	P	P	P	P					P	P	P	P	P	P	P	P	P	P	16
Juncus subnodulosus			P	P	P	P	P	P	P	P	P	P	P	P	P		P	P			15
Urtica dioica	P	P	P	P		P					P	P	P	P	P	P	P	P	P	P	15
Angelica sylvestris	P	P	P								P	P	P	P	P	P		P	P		11
Galium aparine												P	P	P	P	P	P	P	P	P	9
Vicia cracca		P	P	P	P	P						P		P	P		P				9
Filipendula ulmaria			P		P	P	P		P		P	P		P							8
Lotus pedunculatus				P		P	P	P		P											5
Eupatorium cannabinum			P		P	P				P	P										5
Lathyrus pratensis							P	P	P	P											4
Stellaria palustris								P	P	P											3
Sonchus arvensis											P		P	P							3
Equisetum palustre							P	P													2
Brachythecium rutabulum	P	P																			2
Cirsium palustre		P				P															2
Festuca rubra						P															1
Carex disticha					P																1
Plagiomnium undulatum							P														1
Lychnis flos-cuculi						P															1
Galium uliginosum					P																1
Rumex conglomeratus				P																	1
Mentha aquatica							P														1
Valeriana officinalis								P													1
Scrophularia aquatica							P														1
Solanum dulcamara										P											1
Total no. of species	**7**	**9**	**10**	**9**	**9**	**12**	**10**	**8**	**7**	**9**	**10**	**10**	**9**	**11**	**9**	**7**	**8**	**8**	**7**	**6**	

Appendix 2. Field record for Parched Open Grassland permanent plot (BC02)

P = present in sub-sample

Species	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**Total**
Senecio jacobaea	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	20
Agrostis capillaris	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	20
Rumex acetosella	P	P	P	P		P	P	P	P	P	P	P	P	P	P	P	P		P	P	18
Brachythecium albicans	P	P	P	P		P	P	P	P	P	P	P	P	P	P	P	P	P		P	18
Cladonia furcata	P	P					P	P	P	P	P	P	P	P	P	P			P	P	14
Taraxacum agg.		P	P	P	P	P	P							P	P	P	P	P	P	P	13
Cladonia squamosa		P	P					P	P	P	P	P	P	P	P	P					11
Polytrichum juniperinum								P	P	P	P	P	P	P	P						8
Cladonia fimbriata		P							P	P	P	P	P	P	P						8
Aira praecox	P	P					P	P		P	P		P								7
Vulpia bromoides	P	P		P													P		P	P	6
Xanthoria parietina			P	P		P											P		P	P	6
Sagina apetala		P	P	P														P	P		5
Urtica dioica				P	P											P		P	P		5
Conyza canadensis			P	P		P												P			4
Cladonia foliacea										P	P		P								3
Poa pratensis					P	P														P	3
Arenaria leptoclados					P	P															2
Peltigera canina agg.							P										P				2
Rhytidiadelphus squarrosus						P	P														2
Cladonia ramulosa													P								1
Cerastium semidecandrum							P														1
Geranium molle					P																1
Bryum argenteum					P																1

Total no. of species	**7**	**11**	**9**	**10**	**8**	**10**	**10**	**8**	**8**	**10**	**10**	**8**	**11**	**9**	**9**	**8**	**8**	**7**	**9**	**9**