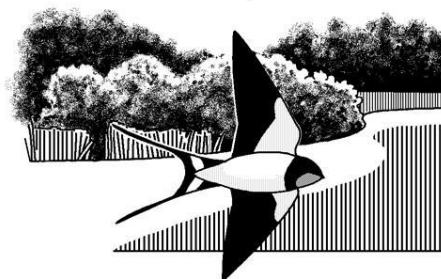




## **Recording of the Monitoring Plots, Broomscot Common, 2020**



**Mike Harding on behalf of  
Little Ouse Headwaters Project**



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## **1. AIMS**

The Little Ouse Headwaters Project set up two monitoring plots at Broomscot (OHES 2011), one on the parched grassland and one in the fen meadow.

In 2020 a full resurvey of the plots was commissioned as part of the ongoing survey and monitoring programme.

This report summarises the resurvey undertaken in May 2020.

## 2. METHODS

The survey methods described by OHES (2011) were used to resurvey the two monitoring plots on Broomscot Common:

**Plot BC01: Fen Meadow** – located just south of the ditch, on the west side of the site adjacent to the fence. Mapped in OHES (2011) as M22 *Juncus subnodulosus-Cirsium palustre* fen meadow, the (a) Typical sub-community (Rodwell 1992).

**Plot BC02: Parched Open Grassland** – located in the middle of the acid grassland sward, mapped in OHES (2011) as U1 *Festuca ovina-Agrostis capillaris-Rumex acetosella* grassland, the (c) *Erodium cicutarium-Teesdalia nudicaulis* sub-community (Rodwell 1992).

OHES (2010) gives the four phases of monitoring common to all of the LOHP site monitoring projects, summarised in Table 1.

**Table 1: The Four Phases of Monitoring (OHES 2010)**

Survey intensity	Fieldwork Element		Function within the Survey
<b>Rapid</b>	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
<b>Full</b>	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.

Item 1, Location of Monitoring Plots, was undertaken in OHES (2011), along with a first recording of the plots (Items 2-4). This report provides the results of a second recording of Items 2-4, nine years after.

Plot and marker details are given in OHES (2011), reproduced in Table 2 and Figure 1. Note that at the time of the 2020 resurvey, only Marker post BC02-02 was still in place. Post BC02-01 was lying on the surface of the heath and was repositioned using GPS co-ordinates and by measuring from post BC02-02. The posts for BC01 were re-positioned using the information in the table to establish BC01-01, and then measuring from this point and using GPS to establish BC02-02. Some slight mis-registration of plots is possible as a consequence but the large size of the plot (10 x 10m) means this can be tolerated. As a precaution, any sub-sample locations within 50cm of the plot boundaries were discarded.

**Table 2: Monitoring Plot Locations at Broomscot Common**

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
		BC01-02	40 m due east, parallel to ditch	00381	80765	
Open Parched 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
		BC02-02	As above, 50 m to approx. east.	00436	80518	

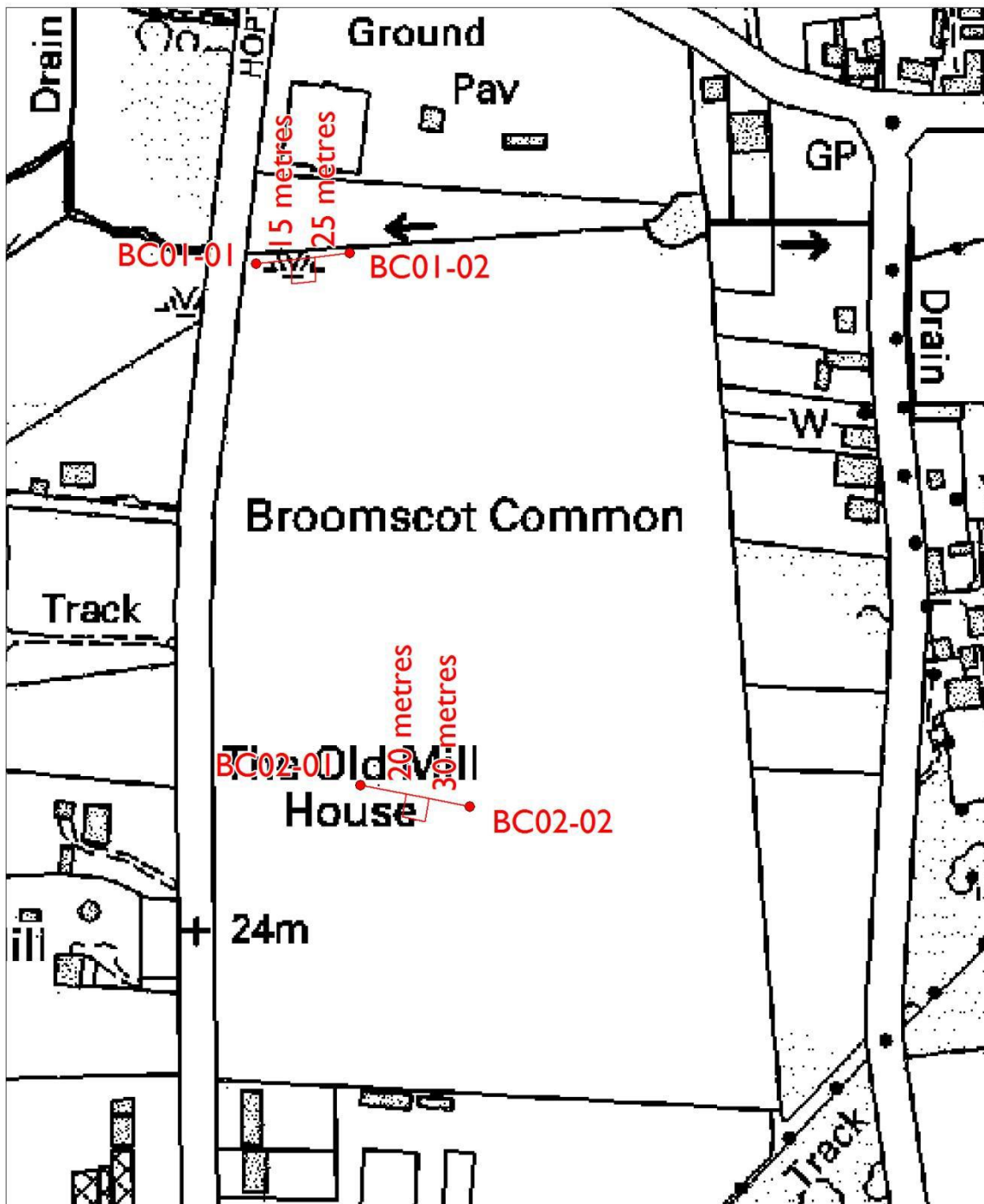
The recommended quadrat size of 1m x 1m was used, with recording of 20 sub-samples in each plot. Neither OHES (2010) nor OHES (2011) specify how sub-samples are to be located within the plot. Hence in 2020, sub-samples were relocated using random number tables and measuring tapes along two of the plot sides.

The weather preceding the survey was extremely dry, with relatively little rain in April and May. Consequently the vegetation was significantly advanced compared to “typical”, although the winter had been quite wet.

The survey work was undertaken on 21<sup>st</sup> and 22<sup>nd</sup> May, about 4 weeks earlier than OHES (2011) reflecting the advanced season. Even so, the parched grassland in particular was strongly droughted and well grazed by rabbits.

As recommended by OHES (2010, 2011), an oblique photograph for each plot was taken, plus a closer direct overhead shot of each quadrant taken. The area used for the quadrant data was not the whole area, but the area projected down from standing height and equivalent to c.1m<sup>2</sup>, as recommended in OHES (2010).

Figure 1: Location of Plots. Reproduced from OHES (2011)



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### 3. RESULTS

#### 3.1 Plot BC01: Fen Meadow

##### 3.1.1 Photographic Record

**BC01: Fen Meadow. View taken from the centre of the southern edge of the plot looking north.**



**BC01: Fen Meadow Quadrants**

South West	South East
	



### 3.1.2 Vegetation Structural Characters

<b>Monitoring Plot</b>		BC01				
<b>Recorder</b>		Mike Harding				
<b>Survey Date</b>		22 May 2020				
<b>Character of the ground surface</b>						
Relatively flat, peaty ground surface, tussocks in places especially towards ditch margin with the change from <i>Juncus subnodulosus</i> dominance to <i>J. inflexus</i> . Ground with thick and variable litter.						
<b>Soil Wetness</b>						
Dry, dusty		Dry, firm		Slightly damp		Moist
				I		III
	<b>Attribute</b>	<b>Quadrant</b>				<b>Average</b>
		<b>SW</b>	<b>SE</b>	<b>NW</b>	<b>NE</b>	
<b>Layer height</b>	Standing water (cm)	0	0	0	0	0
	Plant litter (cm)	7	5	4	15	7.75
	Woody seedlings (cm)	0	0	0	0	0
	Large sedges / rushes (cm)	70	60	80	90	75
	Reed-like grasses (cm)	0	0	0	0	0
	Woody saplings (cm)	0	0	0	0	0
<b>Cover value</b>	Standing water (%)	0	0	0	0	0
	Trampling (%)	0	0	0	0	0
	Dunging (%)	0	0	0	0	0
	Bare ground (%)	0	0	0	0	0
	Plant litter (%)	40	60	50	60	52.5
	Bryophytes (%)	1	1	2	1	1.25
	Woody seedlings (%)	0	0	0	0	0
	Large sedges / rushes (%)	70	80	90	80	80
	Reed-like grasses (%)	0	0	0	0	0
	Woody saplings (%)	0	0	0	0	0



### 3.1.3 Floristic Sampling

<b>Monitoring Plot</b>	BC01
<b>Recorder</b>	Mike Harding
<b>Survey Date</b>	22 May 2020

	Sample Number, 1m <sup>2</sup>																				Frequency 2020	Frequency 2011
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
<i>Arrhenatherum elatius</i>	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	100	100
<i>Juncus subnodulosus</i>	P	P		P	P	P	P	P	P	P	P		P	P	P	P	P		P		85	75
<i>Filipendula ulmaria</i>	P	P	P	P	P	P	P	P	P	P	P	P		P	P	P		P			85	40
<i>Lathyrus pratensis</i>	P	P	P	P	P	P	P	P	P	P	P		P	P	P	P		P			85	20
<i>Poa trivialis</i>	P	P		P	P	P	P	P	P	P	P	P	P		P	P	P		P		85	
<i>Festuca rubra</i>	P		P	P	P	P	P	P	P	P		P	P	P	P	P	P				80	5
<i>Galium uliginosum</i>	P	P		P	P	P	P	P	P		P			P	P	P	P	P	P		80	5
<i>Cirsium palustre</i>	P	P	P		P	P	P		P	P	P		P		P	P	P	P			75	10
<i>Calystegia sepium</i>		P	P	P		P		P	P		P	P	P		P	P		P	P	P	70	100
<i>Angelica sylvestris</i>	P	P	P	P		P		P		P	P		P	P		P	P	P			70	55
<i>Brachythecium rutabulum</i>	P	P	P	P	P		P		P		P	P	P	P					P	P	70	10
<i>Vicia cracca</i>	P	P	P		P			P	P		P	P	P			P	P	P		P	65	45
<i>Equisetum palustre</i>	P		P	P		P	P		P	P		P	P	P			P	P	P		65	10
<i>Cirsium arvense</i>		P			P	P	P	P	P		P		P	P	P		P	P			60	80
<i>Lotus pedunculatus</i>		P			P	P	P	P	P		P		P		P	P	P				60	25
<i>Urtica dioica</i>	P	P	P					P		P			P	P		P		P		P	50	75
<i>Juncus inflexus</i>	P		P						P		P		P	P	P				P	P	45	80
<i>Agrostis stolonifera</i>	P		P	P				P			P			P	P				P	P	45	
<i>Rumex acetosa</i>		P		P				P	P			P		P	P				P		45	
<i>Kindbergia praelonga</i>		P	P			P		P	P			P			P					P	40	
<i>Galium aparine</i>			P	P		P					P			P	P				P		35	45
<i>Rumex conglomeratus</i>	P		P						P					P	P				P	P	35	5



### 3.1.4 Commentary

#### Vegetation structure

This is a relatively flat peat surface adjacent to the ditch, with some topographical variation given by tussocks, especially those of *J. inflexus* nearer to the ditch. The ground is damp to moist, being wetter away from the drainage influence of the ditch. There is a thick litter which is on average around 8cm thick and covers around 53% of the area. Bare ground is rare. The vegetation is dominated by a rush tier 75cm tall, with fen herbs providing much of the remaining structure. There is no scrub, but the plot is backed by dense willow scrub to the south and by the roadside hedge to the west. Bryophytes are very sparse on the ground.

#### Floristics

In 2020, it presents as a reasonably diverse rush fen meadow. Rushes provide the bulk of the cover. The area closest to the drain has the bulk of the *Juncus inflexus* which soon passes to *Juncus subnodulosus*. The latter can be quite dominant, although in every quadrat there is some *Arrhenatherum elatius*, emphasising the unmanaged and rather dry precursor of the vegetation before management was restarted. Other grasses – *Poa trivialis*, *Festuca rubra*, and to a lesser extent *Agrostis stolonifera* are also frequent, but not especially abundant. There is a good range of fen meadow herbs, notably *Filipendula ulmaria*, *Lathyrus pratensis*, *Galium uliginosum*, *Angelica sylvestris*, *Cirsium palustre* and *Equisetum palustre*. With a mean species number of 17.6, this is a reasonably species-rich vegetation.

There are no species of particular conservation concern in the stand, and no wetland bryophytes. It is still a rather dry kind of fen meadow, with rather too frequent ruderals and indicators of under-management – not least, *Arrhenatherum* itself.

Comparison with 2011 data shows the significant improvement of the stand, presumably attributable to cattle grazing and perhaps also mowing. The increasingly occluded adjacent drain, which has not been cleaned out in that time, may have made the ground slightly wetter favouring fen species. Structural characteristics in 2011 showed a taller rush layer, with more litter on the ground and a tall tier (145cm) of reed-like grasses, albeit of low cover (15%), which were not present at all in 2020. Botanically, there are a wide range of new species recruited to the stand, with others increasing substantially. Overall, species richness per sample has doubled. Conversely, non-fen species and ruderals have declined, particularly *Calystegia sepium*, *Urtica dioica*, *Cirsium arvense*, *Galium aparine* and *Sonchus arvensis*. A few tall herb fen species have also reduced, such as *Eupatorium cannabinum*, *Solanum dulcamara* and *Scrophularia auriculata*, all demonstrating the impact of more regular management.

In community terms, this remains M22 *Juncus subnodulosus*-*Cirsium palustre* fen meadow, Typical sub-community.

**Summary of records and events**

The plot is grazed lightly by cattle and sometimes sheep in summer, but this may not be every year and grazing pressure on the plot itself is uncertain as cattle have access to the whole site. The plot is not mown.

**Relation to past and target conditions**

The plot is rather tall and dense and there is too much litter for a full expression of the flora. Ideally the plot should be mown in summer together with the area north of the ditch.

### 3.2 BC02: Parched Open Grassland

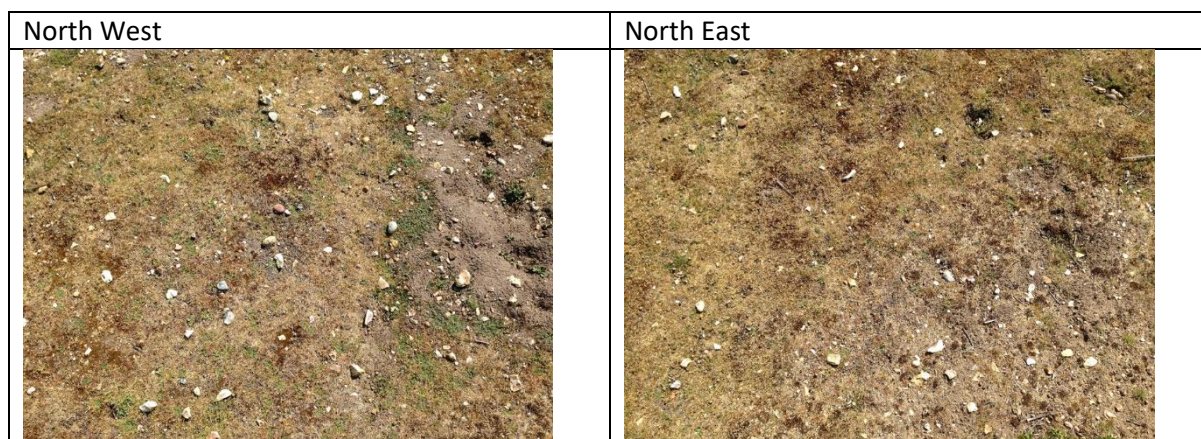
#### 3.2.1 Photographic Record

BC02: Parched Open Grassland View



BC01: Parched Open Grassland Quadrants

South West	South East



### 3.2.2 Vegetation Structural Characteristics

<b>Monitoring Plot</b>		BC02 Parched Open Grassland				
<b>Recorder</b>		Mike Harding				
<b>Survey Date</b>		21 <sup>st</sup> May 2020				
<b>Character of the ground surface</b>						
Uneven, many rabbit holes, scrapes and faeces. Much flint to 5cm on the surface. Soil a grey-brown coarse sandy material, very dry. Vegetation very patched and brown. Bare ground very variable from large patches to more or less none. Some extensive mats of bryophytes but again variable.						
<b>Soil Wetness</b>						
Dry, dusty		Dry, firm		Slightly damp		Moist
Wet		Saturated				
III						
	<b>Attribute</b>	<b>Quadrant</b>				<b>Average</b>
		<b>SW</b>	<b>SE</b>	<b>NW</b>	<b>NE</b>	
<b>Layer height</b>	Standing water (cm)	0	0	0	0	0
	Plant litter (cm)	<1	<1	<1	<1	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
<b>Cover value</b>	Standing water (%)	0	0	0	0	0
	Trampling (%)	?	?	?	?	?
	Dunging (%)	<1	<1	1	1	1
	Bare ground (%)	30	10	25	40	26
	Plant litter (%)	2	<1	<1	<1	1
	Bryophytes (%)	30	35	20	20	26
	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

### 3.2.3 Floristic Sampling

<b>Monitoring Plot</b>	BC02 Parched Open Grassland
<b>Recorder</b>	Mike Harding
<b>Survey Date</b>	21 <sup>st</sup> May 20120

	Sample Number																				Frequency 2020	Frequency 2011
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
<i>Vulpia bromoides</i>	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	100	30
<i>Geranium molle</i>	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	100	5
<i>Bryum argenteum</i>	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	100	5
<i>Rumex acetosella</i>	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		P		95	90
<i>Taraxacum officinale agg.</i>	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			P	P	P	95	80
<i>Agrostis capillaris</i>	P	P	P	P	P	P	P		P	P	P		P	P	P	P	P	P	P	P	90	100
<i>Cladonia furcata</i>	P	P	P	P	P	P		P	P	P	P	P	P	P	P			P	P	P	90	70
<i>Erodium cicutarium</i>	P	P	P	P	P	P	P	P	P	P		P		P	P	P	P	P	P	P	90	
<i>Brachythecium albicans</i>	P	P	P	P	P		P	P	P	P	P	P		P	P		P		P	P	80	90
<i>Cerastium semidecandrum</i>	P	P	P			P	P	P	P	P	P	P	P	P				P	P	P	80	5
<i>Aira praecox</i>		P	P			P	P	P	P	P	P	P	P	P	P	P	P			P	75	35
<i>Arenaria leptoclados</i>	P	P	P		P	P	P	P		P		P	P		P	P	P		P	P	75	10
<i>Peltigera canina agg.</i>	P	P		P	P	P			P	P	P	P	P			P	P	P		P	70	10
<i>Rhytidiadelphus squarrosus</i>	P	P		P	P	P			P	P	P			P	P	P	P	P		P	70	10
<i>Sagina apetala</i>		P	P		P	P	P			P		P		P	P	P		P	P		60	25
<i>Hypnum cupressiforme</i>	P		P	P	P	P		P			P	P			P		P		P	P	60	
<i>Ornithopus perpusillus</i>		P	P	P	P		P			P	P		P		P	P		P		P	60	
<i>Cladonia foliacea</i>	P	P	P			P	P	P				P	P			P	P	P			55	15
<i>Veronica arvensis</i>	P	P	P		P		P	P	P		P			P		P				P	55	
<i>Pseudoscleropodium purum</i>			P		P	P		P	P		P		P		P		P		P		50	
<i>Polytrichum juniperinum</i>	P			P	P	P			P	P		P					P	P			45	40
<i>Aphanes arvensis</i>	P	P			P		P			P		P	P			P		P			45	

<i>Campylopus introflexus</i>	P				P		P	P	P				P		P	P		P					<b>45</b>		
<i>Cladonia squamosa</i>	P			P		P			P					P				P			P		<b>35</b>	<b>55</b>	
<i>Syntrichia ruralis ruralis</i>						P	P	P						P		P			P		P		<b>35</b>		
<i>Cladonia fimbriata</i>			P			P		P				P				P				P			<b>30</b>	<b>40</b>	
<i>Xanthoria parietina</i>	P	P			P								P	P				P					<b>30</b>	<b>30</b>	
<i>Cladonia ramulosa</i>					P		P		P					P					P	P			<b>30</b>	<b>5</b>	
<i>Trifolium dubium</i>				P	P				P						P			P			P		<b>30</b>		
<i>Myosotis ramosissima</i>			P					P						P			P	P					<b>25</b>		
<i>Jacobaea vulgaris</i>				P										P			P				P		<b>20</b>	<b>20</b>	
<i>Erigeron canadensis</i>					P					P					P						P		<b>20</b>	<b>20</b>	
<i>Poa pratensis</i>			P				P								P						P		<b>20</b>	<b>15</b>	
<i>Carex muricata pairae</i>	P		P											P							P		<b>20</b>		
<i>Vicia sativa</i>		P													P					P			<b>15</b>		
<i>Urtica dioica</i>								P											P				<b>10</b>	<b>5</b>	
<i>Festuca ovina</i>							P									P							<b>10</b>		
<i>Erophila verna</i>								P													P		<b>10</b>		
<i>Hypochaeris radicata</i>										P												P	<b>10</b>		
																								<b>Mean</b>	
<b>Total Number Species</b>	<b>22</b>	<b>21</b>	<b>22</b>	<b>17</b>	<b>24</b>	<b>21</b>	<b>21</b>	<b>21</b>	<b>20</b>	<b>20</b>	<b>17</b>	<b>19</b>	<b>22</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>20</b>	<b>19</b>	<b>18</b>	<b>23</b>			<b>20.4</b>	<b>8.95</b>	



### 3.2.4 Commentary

#### Vegetation structure

The plot is on a relatively flat sandy substrate with some microtopographic variation due to rabbit scraping and burrowing. It was extremely dry at the time of survey with the surface dusty and friable. Flints were common on the surface. The vegetation structure was minimal, due to drought, infertile soils and continuous rabbit grazing. Vegetation height barely rose above 2cm, except for some small grass tussocks and the occasional taller nettle. The amount of bare ground was high, c.26% on average, and there is very little litter as the sward is mostly composed of small annuals which are tightly grazed. There is no scrub tier, and the vegetation is too short and nibbled to show layering.

#### Floristics

In 2020, the sward is strongly dominated by annual herbs, in terms of assemblage of species, frequency of occurrence for individual species, and the total cover. Most noticeable are *Erodium cicutarium* (not recorded in 2011), *Vulpia bromoides*, *Geranium mole*, *Cerastium semidecandrum*, *Aira praecox*, *Arenaria leptoclados* and *Sagina apetala*, with many others within the sward. There are many fewer perennials, the most notable being the constant *Rumex acetosella* and *Agrostis capillaris*. The grass *Festuca ovina* is perhaps surprisingly rather uncommon.

Mosses are significant with *Bryum argenteum* constant (although never abundant) and the acid moss *Brachythecium albicans* also very frequent. *Pseudoscleropodium purum* and *Hypnum cupressiforme* can be locally quite extensive forming patches where not scraped away by rabbits, as can rather depauperate and sickly looking *Rhytidiadelphus squarrosus*. Then there are a range of acid grassland mosses at lower frequency. Lichens too are distinctive of the sward. *Cladonia furcata* is constant and occasionally forms small patches, with *C. foliacea* and *Peltigera canina* frequent. This is supplemented by some less frequent *Cladonia* species, but the extensive growth associated with "lichen heath" is not characteristic.

The negative indicators *Jacobaea vulgaris* and *Urtica dioica* are rare in the sward. *Urtica* has always had a very clumped distribution on the heath with dense stands of rather short and depauperate nettle associated with rabbit burrows, with relatively little in the monitoring plot. Ragwort seems to be very reduced across the heath.

There has been significant change since 2011, with the plot improving in quality. The annual herbs have increased enormously with species such as *Erodium cicutarium*, *Geranium mole*, *Vulpia bromoides*, *Cerastium semidecandrum*, *Arenaria leptoclados* increasing from rare to constant or very frequent. Mosses too have increased substantially across the sward, *Cladonia* lichens showing a more variable response.

In terms of habitat structure, the plot has shown an increase in bare ground (from 15% to 26%), a decrease in cover of plant litter (from 7.5% to 1%) and a halving of the cover of bryophytes. Sheep grazing is unlikely to account for this, as it has been consistent across the years and relatively modest. The changes may reflect an increase in rabbit numbers. Despite declines in recent years in the region, there were abundant signs of

their activity such as scrapes, burrows and pellets. Their activity, in combination with dry conditions in this and the previous summer, may have caused the changes in structural characteristics.

Overall, the sward is much richer with many new species recruited since 2011, with number of species per quadrat more than doubling. Negative indicators have not increased. Condition has improved significantly.

In community terms, it remains U1c *Festuca ovina* – *Agrostis capillaris* – *Rumex acetosella* grassland, *Erodium cicutarium* – *Teesdalia nudicaulis* sub-community, but is a much better fit than the rather depauperate example recorded in 2011.

#### **Summary of records and events**

The plot is grazed constantly by rabbits. Sheep also graze the plot but irregularly and in any case there is little growth for them. The plot is not mown but the ragwort has been treated in some years when very dense.

#### **Relation to past and target conditions**

The site has improved and meets the objectives for the acid grassland.

## 4. CONCLUSIONS AND RECCOMENDATIONS

Both the fen meadow and the parched grassland plots have increased in species richness and conservation value since they were last recorded in 2011.

Clearly the management has been beneficial.

There is no need to make any significant changes to management of the acid grassland, based on these findings.

Although the fen plots have improved, the condition of the plot would benefit from additional summer mowing with subsequent aftermath grazing by cattle.

The plots should be re-recorded in 2025. A five-year resurvey is ideal.

## 5. REFERENCES

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