

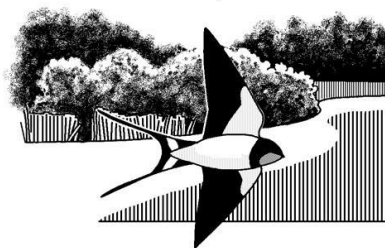


Reeves and Carr Meadows

Walkover Survey and Establishment of Monitoring Plots

2020

Mike Harding on behalf of the Little Ouse Headwaters Project



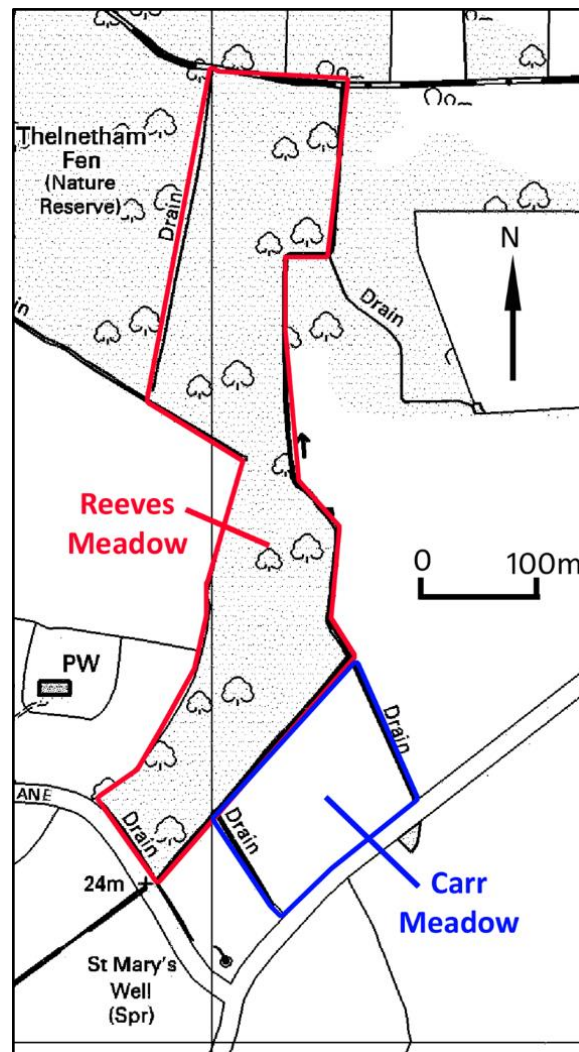
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1. AIMS

The Little Ouse Headwaters project bought Reeves Meadow in 2019 and Carr Meadow in 2017. Previously they were under a variety of agricultural management regimes. Reeves Meadow had gone back to grass in various phases after a period of cultivation, Carr Meadow has been pasture – although agriculturally improved – for some time. The two sites are shown on Figure 1.

Figure 1 : Location of Reeves and Carr Meadows



The main ditch running down the east boundary of Reeves Meadow has been enlarged and deepened (with a substantial spoil bank along the southern meadow boundary) which affects the site hydrology because of the largely permeable soils underlying the site. The ditch and river also affect the water table of the adjacent Hinderclay Fen. Unfortunately, it has not proven possible to address water levels in this ditch so far.

Although currently not all of the purposes for the land can be met, LOHP wish to set a baseline of current condition for both sites.

The aims of this work are therefore:

- To undertake a walkover survey of both sites to evaluate the habitats currently present.
- To install two monitoring plots on Reeves Meadow adopting the methodology laid out by OHES (2010).

2. METHODS

2.1 Walkover Survey

The sites were walked over on 20th May 2020 and 20th June (Reeves Meadow) and 18th June 2020 (Carr Meadow). They were divided into the principle stands of vegetation. An initial sketch map was made.

All of the stands were grassland, ruderal or fen meadow communities. However, with some exceptions, sharply defined boundaries were not evident, with one stand grading into the next. Exceptions were Stand C which was a small, circular stand of *Carex acutiformis* although note that this was overlain on the surrounding (Stand B *Arrhenatherum elatius* community), and the ruderal Stand D, mostly dominated by *Urtica dioica* which was created by regular tilling and sowing as game cover. Stand F an agriculturally sown grassland was reasonably well defined but had a graded boundary with the strip of Stand B.

Within each of the Stands, a species list was recorded. Although Carr Meadow also supported Stands B and F, lists for its areas were made separately. The perimeter Stand B, a rough grassland outside of the fence and therefore not managed, graded into the expanding hedges. Consequently the hedge trees were included in this list as they were clearly coalescing into one. Because of the very dry spring conditions, it is possible that some early annuals were over and missed, especially in Stand A which is on light sandy soil and has a large complement of annuals.

Each species recorded was given a DAFOR rating:

Dominant
Abundant
Frequent
Occasional
Rare

Although the scale mixes abundance and frequency measures, it is widely adopted in such surveys and provides a reasonable impression of the vegetation. Many species frequency/abundance varies across what is a large area of habitat. Where this occurs a prefix of “Locally” (L) is used – Locally Abundant (LA) for instance.

Additional context and information is given in the Stand accounts in Section 3.1.

2.2 Monitoring Plots

2.2.1 The Monitoring Methods

Two monitoring plots were installed on Reeves Meadow. The recommended monitoring methodology described in OHES was followed. OHES (2010) gives the four phases of monitoring common to all of the LOHP site monitoring projects, summarised in Table 1. All

phases were undertaken for this project. OHES (2010) details the monitoring protocols. They were adhered to in all aspects, other than plot marking.

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

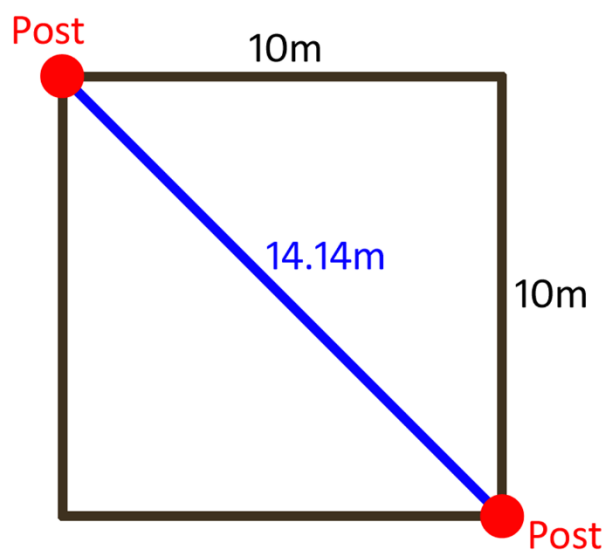
Survey intensity	Fieldwork Element		Function within the Survey
Rapid	1	Locating Monitoring Plots	To establish locations for the Monitoring Plots
	2	Photographic Record	To produce a record surveillance images showing the condition of the developing vegetation
Full	3	Vegetation structural characters	To 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.

2.2.2 Locating Monitoring Plots

The protocol suggests positioning marker posts at distance, and then stringing long tapes of 50m between them, and measuring off from this line. However, experience with re-locating and recording plots established on other sites suggested this line was difficult to keep straight, especially in any wind, and hence there was the likelihood of mis-registering the plots at successive recordings. There seemed to be no benefit to installing the marker posts remotely as each plot required two posts.

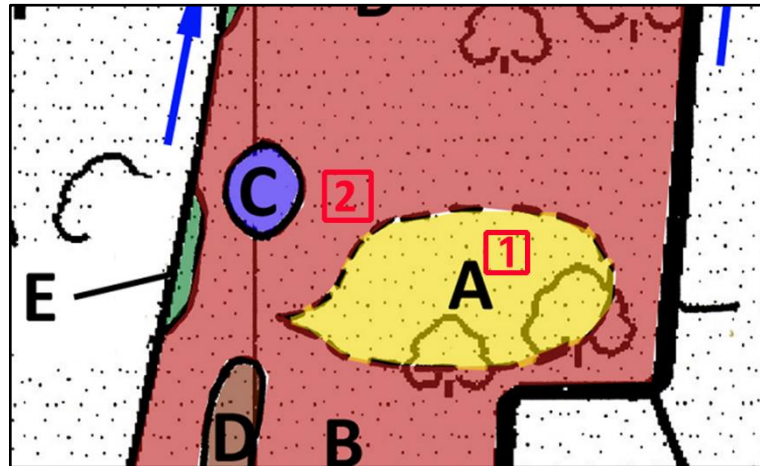
Hence at Reeves Meadow, the two corner points on one diagonal were marked directly with a white-topped post, shown in Figure 2.

Figure 2: The Layout of a 10 x 10m Monitoring Plot



Marking the diagonal points of a 10m square makes re-establishing the original 10x10m square unequivocal, since the remaining 2 corners, if measured as 10m from both diagonal posts, can only be located at one point. The length of the diagonal is 14.14m. The posts were located in the south-east and north-west corners. The plot layout is shown on Figure 2, the approximate location of the plots shown on Figure 3. The location of each post is recorded with a 10-digit GPS reading. All GPS readings in this report refer to OS Square TM.

Figure 3: Location of Monitoring Plots at Reeves Meadow. Base is the Stand Map (Figure 4). See Table 2 for precise location details.



One plot each was located in Stands A and B. Stand A had the greatest species-richness and a distinctive assemblage of annuals and other small herbs rarely found on LOHP reserve holdings. The area of Stand B selected for monitoring was the relatively species-rich fen grassland dominated by *Arrhenatherum elatius* but with a range of fen meadow species including a small population of *Dactylorhiza praetermissa*. With further management its value could be enhanced. The details of the monitoring plots and locations are given in Table 2.

Table 2: Monitoring Plot Locations at Reeves Meadow

VEGETATION TYPE	PLOT CODE	MARKER POSTS	Marker Post Location	EASTING	NORTHING	Plot location
Stand A: Sandy Grassland.	RM01	RM01-01	South-east corner of 10m plot	02076	78710	North part of Stand A. Plot is a few m north of the Old Fen-Hinderclay footpath.
		RM01-02	North-west corner of 10m plot.	02067	78717	
Stand B: MG1 <i>Arrhenatherum elatius</i> coarse grassland	RM02	RM02-01	South-east corner of 10m plot	02029	78719	Northwest of Plot 01. East of Stand C.
		RM02-02	North-west corner of 10m plot.	02020	78729	

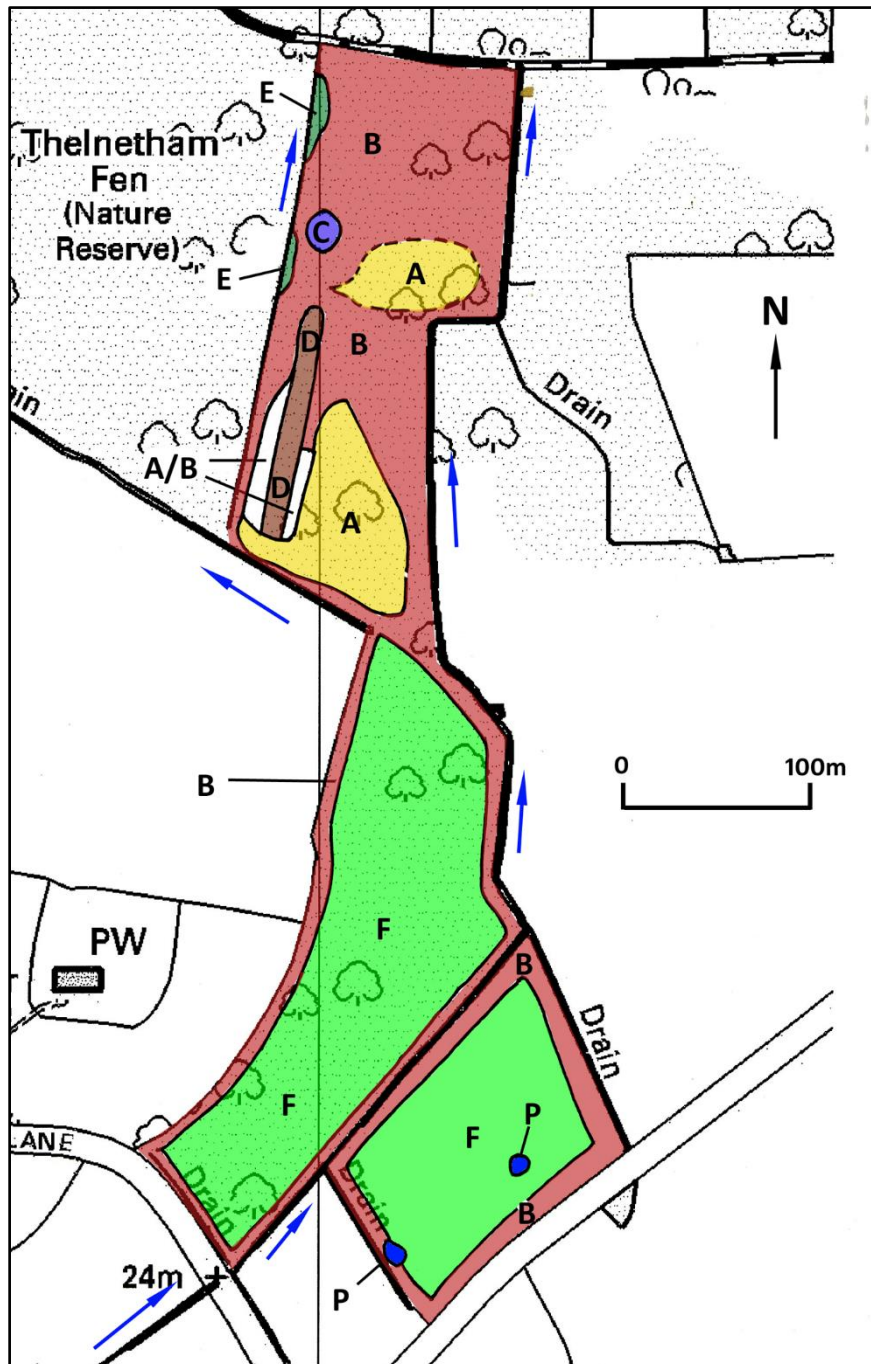
3. RESULTS: WALKOVER SURVEY

3.1 Walkover Survey

3.1.1 Summary of Species Recorded

The map showing the six stands of vegetation is shown in Figure 4. Note that Stand A is split into two stands. Although the two sub-stands have some floristic differences, as described below, they are of very similar vegetation type and have been grouped together. The Plan also shows location of Monitoring Plots.

Figure 4: Map of Vegetation Stands at Reeves Meadow.



Most of the boundaries are characterised by a zone of intergradation between two stands, and should be considered as lines of transition rather than hard boundaries. The two areas marked as intermediate A/B on the map are more extensive and have been marked as such.

The species recorded with their DAFOR rating are summarised in Table 3. The Table groups the species into those that are distinctive of a Stand (tinted) and those that are more generalist or shared between more than one Stand (no tint).

Table 3: Species Lists for Each Stand

Species	Stand								
	Reeves Meadow						Carr Meadow		
	A	B	C	D	E	F	B	F	Ponds
<i>Cerastium fontanum</i>	A		R	F		R		F	
<i>Glechoma hederacea</i>	A	O				R	F	R	
<i>Bromus hordeaceus hordeaceus</i>	A	O				R		O	
<i>Myosotis arvensis</i>	F-LA			O	F				
<i>Linaria vulgaris</i>	F	R							
<i>Plantago lanceolata</i>	F	R		R		R			
<i>Cerastium glomeratum</i>	F								
<i>Veronica chamaedrys</i>	F					R	F-LA	LF	
<i>Festuca ovina</i>	R								
<i>Veronica agrestis</i>	F								
<i>Scorzonerooides autumnalis</i>	F								
<i>Pilosella officinarum</i>	O-LA								
<i>Erophila verna</i>	R								
<i>Sonchus asper</i>	O							O	
<i>Geranium dissectum</i>	F								
<i>Pseudoscleropodium purum</i>	F-LA								
<i>Anthoxanthum odoratum</i>	O								
<i>Veronica arvensis</i>	F								
<i>Hypochaeris radicata</i>	A								
<i>Hypochaeris glabra</i>	F								
<i>Trifolium dubium</i>	F-LA								
<i>Peltigera canina</i>	O								
<i>Centaurium erythraea</i>	R								
<i>Myosotis ramosissima</i>	R								
<i>Luzula campestris</i>	R								
<i>Brachythecium albicans</i>	R								
<i>Tragopogon pratensis</i>	R								
<i>Agrostis capillaris</i>	F	R						F	
<i>Leucanthemum vulgare</i>	R	R					R		
<i>Achillea millefolium</i>	O	O							
<i>Anacamptis pyramidalis</i>	R	O							
<i>Elymus repens</i>	R	R					F	R	
<i>Jacobaea erucifolia</i>	O	R							
<i>Silene latifolia</i>	R	O							
<i>Primula veris</i>	O	LF	R						
<i>Arrhenatherum elatius</i>	F	D	O		F-LA	LA	D	F	
<i>Ranunculus repens</i>		F			R	R	R	R	O
<i>Silene flos-cuculi</i>		R							
<i>Lamium album</i>		O							
<i>Equisetum palustre</i>		O							
<i>Dactylorhiza praetermissa</i>		LF							

Rosa arvensis		R							
Ajuga reptans		R							
Equisetum arvense	O	R-LF							
Conium maculatum		LA					LA		
Chamaenerion angustifolium		R							
Pteridium aquilinum		R							
Anthriscus sylvestris		O-LF		R		R	F		
Carex acutiformis		LO	D		LA				LF
Urtica dioica	R	O-LA		D	LF	R	F-LA	O	
Helminthotheca echioides				F-LA					
Viola arvensis				F-LA					
Cirsium vulgare	R	R		O			R	R	
Plantago major		R		O		R		R	O
Stellaria media				R					
Urtica urens				R					
Senecio vulgaris	R	R		F					
Arctium minus				R					
Chenopodium album				O					
Medicago lupulina				F					
Stellaria pallida				F					
Angelica sylvestris		R			LA				
Phragmites australis		R			LA		R		
Lythrum salicaria					R				
Calystegia sepium					R				
Humulus lupulus					R		O		
Lotus pedunculatus		LF			O				
Hypericum tetrapterum		LO			O				
Cirsium palustre		R			R				
Filipendula ulmaria		R			R				
Bromus racemosus	R	O		R		D	O	O	
Alopecurus pratensis	R	F				A-LD	R	A	
Lolium perenne						LF		R	
Potentilla anserina						R			
Matricaria discoidea						R			
Plantago media						R			
Juncus inflexus								R	R
Juncus articulatus									R
Persicaria amphibia									LA
Mentha aquatica									LF
Phalaris arundinacea									LF
Potentilla reptans								R	O
Carex hirta		R			R				LA
Ranunculus sceleratus									R
Glyceria notata									LA
Cirsium arvense	O	A	F	F-LA	O	R	F	R	
Kindbergia praelonga	F	R	R	R	O	R			
Brachythecium rutabulum	F	R	R	R	F	O			
Galium aparine	R	O	F	F	F	R	F	R	
Agrostis stolonifera	O	O	R	F	F	F-LA	R	F	LF
Rubus fruticosus	O	R	R	O	R		F		
Heracleum sphondylium	R	O	R	R	R	R	R		
Rumex obtusifolius		R		R		R	F	R	
Poa pratensis	O	R		R		F			
Poa trivialis	O	O		F	F	LF	A	A	

Anisantha sterilis	O			F		LA	R		
Stellaria graminea	R			R		R			
Dactylis glomerata	F	F		O		F	F	A	
Holcus lanatus	F	F		F	O	LF	A	D-LA	
Jacobaea vulgaris	F	R		F					
Festuca rubra	O	R		R	O	F	F	F	
Vicia sativa	R				F				
Taraxacum officinale agg.	F	R				R			
Vicia cracca	F		F-LA						
Bellis perennis	R					R			
Papaver rhoeas		R							
Sonchus oleraceus								R	
Ervum tetraspermum	R	R							
Anthriscus caucalis	R	R							
Acer campestre							D		
Quercus robur							R		
Fraxinus excelsior							O		
Corylus avellana							F		
Cornus sanguinea							A		
Crataegus monogyna							F		
Prunus spinosa							A		
Ulmus procera							F		
Acer pseudoplatanus							R		
Malus sylvestris							F		
Salix alba							LA		
Sambucus nigra							R		
Clematis vitalba							R		
Rosa arvensis							R		
Stellaria holostea							F		
Chaerophyllum temulum							F		
Dipsacus fullonum							R		
Alliaria petiolata							R		

Note: The distinction between *Bromus hordeaceus hordeaceus* and *Bromus racemosus* can be difficult where there are depauperate specimens of the latter on dry poor soils.

3.1.2 Notable Species

Two species, *Anacamptis pyramidalis* and *Dactylorhiza praetermissa* while not rare are notable. Both are found principally in Stand B the *Arrhenatherum elatius* sub-community, on Reeves Meadow. The *D. praetermissa* is in the damp fenny grassland amongst the developing alder scrub, and is associated with a number of fen meadow species such as *Lotus pedunculatus*. The *A. pyramidalis* is mostly in the thin *Arrhenatherum* between Stands A and B, a transition area, with a few along the northern part of Stand A.

Pyramidal Orchid, margins of Stand A and B, TM 02066 78721



3.1.3 Stand A: Sandy Grassland

This community exists in two discrete patches, both enclaves within the *Arrhenatherum elatius* grassland of Area B in Reeves Meadow; the northern area split by the footpath between Old Fen and Hinderclay Fen, and the southern area. Both are small and their edges grade into the rank grassland. The community occupies the slightly higher ground on sandy soil. It is a short vegetation type, rarely above 20cm in May and often less, low in productivity, with occasional patches of mosses and a significant proportion of bare ground varying between 10-25%.

The main group of distinctive species are tinted grey in Table 3, although other key species are included in the group shared with Community B in white and many species included in the final group, also in white, with no affinity to a particular Stand.

There is no consistent dominant species. The most frequent and perhaps abundant grass is *Bromus hordeaceus hordeaceus*, along with frequent patches of coarser grasses such as *Arrhenatherum*, *Dactylis glomerata*, *Agrostis stolonifera* and *Holcus lanatus* although these are much reduced in stature compared to the coarse grassland. There are also infrequent records for *Anthoxanthum odoratum*, *Poa trivialis*, *Poa pratensis*, *Agrostis capillaris* and *Festuca rubra*, and even in more parched areas *Festuca ovina* characteristic of the developing anthills.

Photo of Stand A, 20/05/20



The open vegetation and the variable management history, including periods of disturbance, means that there is a rich assemblage of open ground plants, annuals and ruderals. Very frequent is *Cerastium fontanum*, which can be locally abundant. Particularly distinctive are rosette species – *Hypochaeris*, *Taraxacum*, *Plantago lanceolata*, *Scorzonerooides autumnalis* and patches of *Pilosella officinarum*. The open ground favours a wide range of ruderals such as *Senecio* spp, *Cirsium arvense*, *Sonchus asper*, and many annuals. *Glechoma hederacea* and *Linaria vulgaris* are both very frequent and altogether the Stand can appear a rather weedy and scrappy vegetation, although it is quite species rich. It does not include indicators of acid grassland.

There are patches of bryophytes in some areas with *Pseudoscleropodium purum* being very obvious in places, but a range of the more catholic grassland mosses – *Brachythecium rutabulum*, *Kindbergia praelonga*, *Rhytidiadelphus squarrosus* being frequent but not extensive.

The southern area is more open with more bare ground and feels as if it has more recent history of disturbance. *Cerastium* species are more frequent and in places abundant, and there is much lower cover of grasses. It feels much less like a grassland. Notably, the lichen *Peltigera canina*, typical of heathlands, was recorded here.

In community terms it does not fit easily into the NVC, being neither an acid grassland nor a mesotrophic grassland but perhaps somewhere between the two, between the *Erodium-Teesdalia* sub-community of U1 *Festuca ovina-Agrostis capillaris-Rumex acetosella* grassland and the MG1 *Arrhenatherum elatius* grassland. The position between these two is probably mediated by management, cutting or grazing favouring the former, and abandonment leading eventually to incorporation into the surrounding MG1 of Stand B.

3.1.4 Stand B: MG1 *Arrhenatherum elatius* coarse grassland

This is the dominant vegetation type in the northern compartment of Reeves Meadow. It is present all around the margin and widens to cover most of the area towards the river. The other communities are patches within Stand B, often with a broad transitional margin. It also occurs as an unmown border around the southern hay meadow of Stand F. On Carr Meadow it forms a n unmanaged border outside of the fence. Lack of management means it is grading into the adjacent hedge with which it has been mapped.

The species especially distinctive of Stand B are tinted blue in Table 3 although on Reeves Meadow it shares important species with Stand A where it grades into sandier less fertile areas, and with Stands C and E where the ground is lower and the soil peatier – here there is transition to fen conditions.

Photo of Stand B, Reeves Meadow, 20/05/20



In the core areas, the sward is dominated by dense stands of *Arrhenatherum elatius* which over large areas have not been cut for some time. There is a deep thatch of old growth. The central area of the north meadow, surrounding Stands A and C, was cut in 2019 but still has very dense *Arrhenatherum*. Also present in the grassy sward are *Dactylis glomerata*, *Alopecurus pratensis*, *Agrostis stolonifera*, *Poa trivialis* and *Holcus lanatus*, and where the dense coarse grass thins or starts to become transitional, less vigorous grasses occur such as *Festuca rubra*, *Bromus hordeaceus hordeaceus* and *Poa pratensis*. In the north-west corner of Reeves Meadow, near to the ditch and Stand E, there is a little *Phragmites australis*.

Over much of the stand grasses occupy at least 80% of the vegetation, but this reduces in transitional areas and a few patches of lower productivity. Even so, broadleaved herbs are still few and mostly characterised by unmanaged and fertile grassland species. Hence *Cirsium arvense* is especially common, abundant in the northern areas, and there is frequent *Heracleum sphondylium*, *Urtica dioica*, *Galium aparine*, *Ranunculus repens*, and locally

Equisetum arvense, and scrub species such as *Alnus glutinosa*, *Salix*, *Rubus fruticosus* and *Rosa arvensis*. This complement of species all reflect high nutrient levels and historic lack of regular management.

Some areas of Reeves Meadow are enriched with additional species. In the damper north-west, *Angelica sylvestris* is frequent and in the central area between Stands B, A and C, *Primula veris* is also frequent. There are a few plants of *Ajuga reptans* here, and a colony of *Dactylorhiza praetermissa*. This area is transitional to a type of damp grassland. Some plants of *Anacamptis pyramidalis* have been recorded in Stand B north of Stand A, suggesting that Stand A may have been more extensive and subsequently overwhelmed by *Arrhenatherum*.

Around the margin of Carr Meadow, the coarse grassland is similar in character but has increasing representation of hedgerow species. Of the herbs, *Chaerophyllum temulum* and *Stellaria holostea* are distinctive, and there are patches of *Leucanthemum vulgare*. The hedgerow and grassland are merging with shrubs such as *Rosa arvensis* and *Rubus fruticosus* invading the grassland as well as sucking species such as *Prunus spinosa* and *Ulmus procera*. The edge along the road is especially species-rich with a diverse structure. The hedges along the NE and SW boundaries are most tall *Salix alba* and are discontinuous.

Photo of Stand B Carr Meadow, looking NE from the gateway, 18 06 20



Otherwise this is a species-poor vegetation type. Bryophytes are infrequent and restricted to more catholic species. There is a strip of Stand B running alongside the ditch in the south field of Reeves Meadow. This is especially rank and has dense patches of *Urtica dioica*, and also frequent *Conium maculatum* which is poisonous to stock. This raised strip of vegetation has developed over enriched ditch spoil. The north-west margin of Carr Meadow carries similar vegetation.

In community terms this is a type of MG1 *Arrhenatherum elatius* coarse grassland. The NVC sub-community varies from the *Urtica dioica-Galium aparine* sub-community in more eutrophic locations, to the *Festuca rubra* sub-community in the grassy and species-poor area, and perhaps the *Filipendula ulmaria* sub-community in the damp areas. MG1 is associated with lack of management.

3.1.5 Stand C: *Carex acutiformis* fen

A small area, less than 10m across, of *Carex acutiformis*-dominated short fen, is found in the northern compartment of Reeves Meadow. It has probably arisen by lack of management of a small peaty hollow, allowing the development of the dense sedge. It is not species-rich, with *Arrhenatherum* the most abundant associate. There are species typical of enriched or disturbed areas – such as *Galium aparine*, *Heracleum sphondylium* and *Cirsium arvense* but other than the last, they are infrequent. A few plants of *Primula veris* occur on the east margin with Stand B. This community does not fit within the NVC being too dry, grassy and ruderalised for S7 *Carex acutiformis* swamp.

Photo of Stand C, 20/05/20



3.1.6 Stand D: OV24 *Urtica dioica-Galium aparine* community,

Stand D forms a long but narrow strip of vegetation on Reeves Meadow. It had been ploughed and used for game cover by previous owners, as evidenced by old maize husks still lying on the ground. It is a ruderal community dominated by *Urtica dioica* in sometimes dense tracts, but also a number of much more open areas with a more diverse flora.

Photo of Stand D, 20/05/20



Characteristic species are tinted in beige in Table 3, and include many arable weeds such as *Viola arvensis*, *Stellaria pallida*, *Urtica urens* and *Chenopodium album*. Ruderals widespread in other stands are especially common here, such as *Cirsium arvense*, *Galium aparine*, *Cirsium vulgare* and *Jacobaea vulgaris*. The grasses *Holcus lanatus*, *Agrostis stolonifera*, *Poa trivialis* and *Dactylis glomerata* are frequent. There are representatives from surrounding grasslands, but there are no species of particular conservation interest.

In community terms, this fits best into the *Arrhenatherum elatius*-*Rubus fruticosus* sub-community of OV24 *Urtica dioica*-*Galium aparine* community, a vegetation typical of disturbed and enriched ground on loamy but well aerated soils (Rodwell 2000).

3.1.7 Stand E: S26 *Phragmites australis*-*Urtica dioica* fen

Along the margin of the western ditch in the north compartment of Reeves Meadow, there is a fragmented stand of *Phragmites australis*-dominated vegetation with *Carex acutiformis* and *Angelica sylvestris*. The distinctive species of the community are tinted yellow in Table 3, plus a block of untinted species which are shared with Stand B the *Arrhenatherum elatius* grassland. There are a few fen associates – *Lythrum salicaria*, *Filipendula ulmaria*, *Cirsium palustre* and *Lotus pedunculatus*, and some damp grassland species such as *Hypericum tetrapterum* and *Carex hirta*. However, *Arrhenatherum elatius* can be abundant and there are numerous indicators of enriched or disturbed conditions such as *Urtica dioica* *Cirsium arvense* and *Galium aparine*. The stand was not mown in 2019.

Photo of Stand E, 20/05/20



In NVC type it best fits S26 *Phragmites australis-Urtica dioica* fen, the *Arrhenatherum elatius* sub-community (Rodwell 1995). This is typical of damp soils in disturbed or enriched conditions, typical of ditch-side locations such as at Reeves Meadow.

3.1.8 Stand F: Agricultural Hay Grassland

Stand F occupies all of the southern compartment of Reeves Meadow except the strip of Stand B around the margins. It also forms the core of Carr Meadow within the fence. It is an agricultural grassland. Reeves Meadow has been managed in recent years for the hay crop, while Carr Meadow has been mostly summer-grazed.

Photo of Stand F, 26/05/20, Reeves Meadow



Photo of Stand F, 18/6/20, Carr Meadow



In Reeves Meadow, the tall stands of *Bromus racemosus* is probably the most abundant of the grasses across the stand, with *Alopecurus pratensis* approaching and often dominant. A wide range of grasses can also be locally abundant – *Dactylis glomerata*, *Anisantha sterilis*, *Arrhenatherum elatius*, *Festuca rubra*, *Agrostis stolonifera* – with some such as *Poa pratensis*, *Holcus lanatus*, *Poa trivialis* – and near to the track *Lolium perenne* all being frequent and in

places abundant. This is a very grassy sward with very few broadleaved herbs – a few ruderals including *Anthriscus sylvestris* have invaded from the surrounding Stand B *Arrhenatherum elatius* grassland, but they are not frequent. There are also some species distinctive of poached ground in the gateways but none are of conservation interest.

The area on Carr Meadow is largely similar, perhaps with a greater abundance of *Agrostis capillaris*, *Elymus repens*, *Dactylis glomerata* and *Holcus lanatus*.

In community terms this is probably closest to MG7 *Lolium perenne* agricultural leys but the fit is not especially good with low frequency of *Lolium* on both areas, and a poor fit with the suite of associates (Rodwell 1992).

3.1.9 Ponds

There are two ponds in Carr Meadow (Figure 4). They are quite small. The pond on the south-west boundary is seasonal drying out in most summers. The pond in the middle of the meadow is deeper, thought to be spring fed with a deep and soft base. They both have graded margins.

Photo of Pond in Middle of Carr Meadow, looking NW from TM 022112 78188



Small Pond SW Edge Carr Meadow, Looking NE from TM 02032 78156



Table 3 includes species from the ponds and their damp margins. Those in a mauve tint are especially distinctive of the ponds. They include *Juncus inflexus* and *J. articulatus*. The south-west pond and its margins are distinctive for *Carex hirta* and *Persicaria amphibia*, both also on the dry margins. The middle pond, with permanent water, has beds of semi-floating *Glyceria notata* and some *Phalaris arundinacea* as well as aquatic form of *Persicaria amphibia*. Access to this pond was difficult because of the treacherous margin, but no other aquatics were recorded.

4. RESULTS: MONITORING PLOTS ON REEVES MEADOW



4.1 RM01 Sandy Grassland

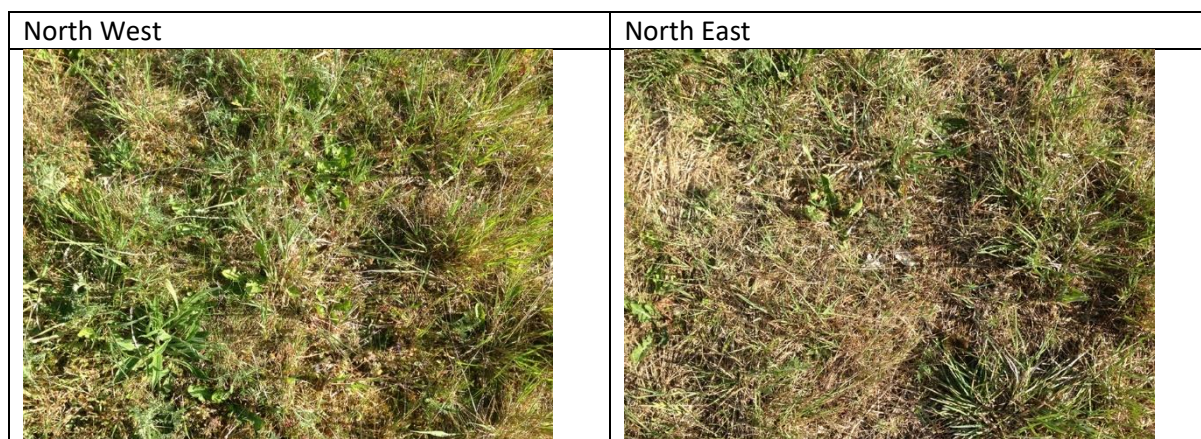
4.1.1 Photographic Record

RM01: Sandy Grassland. View taken from TM 02071 78710, looking north.



RM01: Sandy Grassland Quadrants

South West	South East
	



4.1.2 Vegetation Structural Characters

Monitoring Plot		RM01				
Recorder		Mike Harding				
Survey Date		26 May 2020				
Character of the ground surface						
Flat sandy ground with minimal micro-topographical variation. Some small grass tussocks and a few low, recently developed anthills, and some scrapes from rabbit activity. No scrub trees but some small bramble patches developing.						
Soil Wetness						
Dry, dusty		Dry, firm		Slightly damp		Moist
II		II				
	Attribute	Quadrant				Average
		SW	SE	NW	NE	
Layer height	Standing water (cm)	0	0	0	0	0
	Plant litter (cm)	2	1	1	1	1.25
	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 (%)	0	0	0	0	0
	Dunging (%)	<1	0	<1	0	<0.25
	Bare ground (%)	30	10	20	10	17.5
	Plant litter (%)	50	70	50	70	60
	Bryophytes (%)	1	0	20	10	7.8
	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

4.1.3 Floristic Sampling

Monitoring Plot	RM01
Recorder	Mike Harding
Survey Date	26 May 2020

	Sample Number, 1m ²																				Frequency 2020
	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
<i>Festuca rubra</i>	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	100
<i>Trifolium dubium</i>	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		P	P	95
<i>Myosotis arvensis</i>	P	P	P	P	P	P		P	P	P	P	P	P	P	P	P		P	P	P	90
<i>Cerastium fontanum</i>	P	P	P	P	P	P	P	P	P	P	P	P		P	P	P	P	P		P	90
<i>Hypochaeris radicata</i>	P	P	P	P	P	P	P	P	P	P		P	P	P	P	P	P		P	P	90
<i>Dactylis glomerata</i>	P	P		P		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	90
<i>Pseudoscleropodium purum</i>	P	P	P		P		P	P	P	P	P	P	P	P	P	P		P	P	P	85
<i>Geranium dissectum</i>	P	P	P	P	P	P		P	P	P		P		P	P	P	P	P	P	P	85
<i>Taraxacum officinale agg</i>		P	P	P	P	P	P		P	P	P	P	P	P	P	P	P		P	P	85
<i>Kindbergia praelonga</i>	P			P	P	P	P	P	P	P	P		P	P	P	P	P	P		P	80
<i>Bromus hordeaceus hordeaceus</i>	P	P	P	P	P	P	P		P	P				P	P	P	P		P	P	75
<i>Plantago lanceolata</i>	P	P	P	P	P	P				P		P	P	P	P	P	P	P		P	75
<i>Veronica arvensis</i>	P	P	P	P	P	P		P		P		P			P	P	P		P	P	70
<i>Glechoma hederacea</i>		P	P	P	P	P	P			P	P	P	P		P	P		P	P		70
<i>Scorzoneroides autumnalis</i>		P	P	P		P		P	P	P		P		P		P			P	P	60
<i>Cerastium glomeratum</i>					P	P	P		P	P	P			P				P		P	50
<i>Brachythecium rutabulum</i>	P			P			P			P			P					P			35
<i>Jacobaea vulgaris</i>				P			P			P	P				P			P	P		35
<i>Agrostis capillaris</i>			P			P		P		P				P							30
<i>Veronica chamaedrys</i>						P	P	P					P	P					P		30
<i>Hypochaeris glabra</i>	P			P					P				P						P		25

<i>Elymus repens</i>	P						P				P				P			P			25
<i>Holcus lanatus</i>		P				P	P					P				P					25
<i>Vicia sativa</i>		P	P				P	P								P					25
<i>Jacobaea erucifolia</i>					P				P			P			P				P		25
<i>Poa pratensis</i>					P		P	P	P							P					25
<i>Sonchus asper</i>	P			P		P												P			20
<i>Linaria vulgaris</i>							P	P	P											P	20
<i>Erophila verna</i>		P				P									P						15
<i>Rubus fruticosus</i>										P	P	P									15
<i>Bromus racemosus</i>				P											P						10
<i>Pilosella officinarum</i>								P								P					10
<i>Ranunculus repens</i>															P				P		10
<i>Stellaria graminea</i>															P					P	10
<i>Myosotis ramosissima</i>								P													5
<i>Brachythecium albicans</i>										P											5
<i>Crataegus monogyna seedling</i>															P						5
																					Mean
<i>Total Number Species</i>	17	18	16	20	17	21	20	19	18	22	14	16	15	18	22	17	18	15	16	20	17.95

4.1.4 Commentary

Vegetation structure

There is no standing water on the site, with the plot very dry – either dusty dry or firm dry. The area of bare ground is generally quite high providing plenty of regeneration niches for annuals. There is no significant scrub, other than some low sprawls of bramble, contained by mowing. Plant litter is relatively high, around 60%, although this may be an accumulation of past years' litter through lack of management. There is a ground layer of bryophytes in all areas, but abundance is very patchy. The plot is grazed only by rabbits, as evidenced by their droppings.

Floristics

The plot is typical of the core of the Sandy Grassland as described in the Walkover Survey above.

Constant in the sward are *Arrhenatherum elatius* (indicating the close relationship with much of Stand B), *Festuca rubra*, *Trifolium dubium*, *Myosotis arvensis*, *Cerastium fontanum*, *Hypochaeris radicata*, *Geranium dissectum*, *Taraxacum officinale agg* and *Dactylis glomerata* although the grasses are never abundant in this dry and infertile ground. The assemblage of annuals and drought-resistant rosette species are visually dominant, especially the grass *Bromus hordeaceus hordeaceus*, and there is a surprising amount of bryophyte - *Pseudoscleropodium purum* and *Kindbergia praelonga* – in the sward, although the mosses are always shrivelled and sparse. *Cerastium* species are also particularly distinctive and can form patches.

There is much bare ground accounting for the high proportion of annuals in the sward, and many species characteristic of light sandy soils.

There is no preceding monitoring vegetation with which to compare change.

Summary of records and events

The plot was mown in summer 2020 and the cuttings removed. Prior to this the land was owned privately. Management of the plot is uncertain but has included some arable history, set aside and then no significant management, but periods are not certain.

Relation to past and target conditions

Historic condition of the plot is not known for certain. A management plan for the site has not been compiled as yet. This is one of the more valuable habitat types on the site and certainly maintaining species-richness and open conditions should be core objectives. This would need regular management, either cutting or grazing.

4.2 RM02: MG1 *Arrhenatherum elatius* coarse grassland

4.2.1 Photographic Record

RM02: MG1 *Arrhenatherum elatius* Coarse Grassland View, from TM 02024 78719 North.



RM01: MG1 *Arrhenatherum elatius* Coarse Grassland Quadrants

South West	South East
	



4.2.2 Vegetation Structural Characteristics

Monitoring Plot		RM02: MG1 <i>Arrhenatherum elatius</i> Coarse Grassland				
Recorder		Mike Harding				
Survey Date		26 th May 2020				
Character of the ground surface						
Flat peaty sandy soil, little or no microtopographic variation. Some young alder scrub around 10% of plot, mostly along east margin.						
Soil Wetness						
Dry, dusty		Dry, firm	Slightly damp	Moist	Wet	Saturated
		I	II	I		
Attribute		Quadrant				Average
		SW	SE	NW	NE	
Layer height	Standing water (cm)	0	0	0	0	0
	Plant litter (cm)	3	3	5	4	3.75
	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 (%)	0	0	0	0	0
	Dunging (%)	0	0	0	0	0
	Bare ground (%)	25	30	20	15	18
	Plant litter (%)	25	40	70	70	51.25
	Bryophytes (%)	2	2	0	0	1
	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

4.2.3 Floristic Sampling

Monitoring Plot	RM02: MG1 <i>Arrhenatherum elatius</i> Coarse Grassland
Recorder	Mike Harding
Survey Date	26 th May 20120

	Sample Number																				Frequency 2020
	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
<i>Cirsium arvense</i>	P	P	P	P	P		P	P	P	P	P	P	P	P	P	P	P	P	P	P	95
<i>Kindbergia praelonga</i>	P	P		P		P	P	P	P	P	P	P	P	P	P	P		P		P	80
<i>Equisetum arvense</i>	P	P	P	P	P	P		P	P	P	P		P		P	P	P			P	75
<i>Agrostis stolonifera</i>			P	P	P	P	P	P	P	P		P		P	P	P	P		P		70
<i>Vicia cracca</i>	P		P	P	P	P		P	P		P	P		P			P	P		P	65
<i>Equisetum palustre</i>	P	P		P	P		P		P			P	P	P		P	P	P	P		65
<i>Carex hirta</i>	P	P	P						P	P	P	P			P	P	P	P		P	60
<i>Dactylis glomerata</i>		P					P	P	P	P	P	P	P	P	P	P			P		60
<i>Brachytecium rutabulum</i>			P		P	P	P	P	P	P		P		P		P		P	P		60
<i>Holcus lanatus</i>	P		P	P	P		P	P		P			P				P			P	50
<i>Festuca rubra</i>				P		P	P	P			P		P		P		P		P		45
<i>Ranunculus repens</i>			P	P		P		P		P				P				P	P		40
<i>Mentha aquatica</i>					P		P				P			P		P		P	P		35
<i>Lotus pedunculatus</i>						P	P		P				P		P	P				P	35
<i>Poa trivialis</i>							P	P	P			P	P			P			P		35
<i>Myosotis arvensis</i>				P			P		P	P				P						P	30
<i>Hypericum tetrapterum</i>							P						P	P	P	P				P	30
<i>Sonchus asper</i>		P	P								P						P	P			25
<i>Dactylorhiza praetermissa</i>							P		P			P				P					20
<i>Primula veris</i>					P									P						P	15

<i>Taraxacum officinalis</i>								P												P	15
<i>Ajuga reptans</i>															P	P					10
<i>Cerastium fontanum</i>																	P			P	10
<i>Heracleum sphondylium</i>					P																5
<i>Urtica dioica</i>					P																5
<i>Silene flos-cuculi</i>					P																5
<i>Alnus glutinosa seedling</i>								P													5
<i>Linaria vulgaris</i>											P										5
<i>Glechoma hederacea</i>																	P				5
<i>Jacobaea erucifolia</i>																	P				5
																					Mean
Total Number Species	8	8	10	11	13	9	15	14	14	11	11	12	11	13	11	17	10	11	10	13	11.60

4.2.4 Commentary

Vegetation structure

A patchy, discontinuous alder scrub layer is present, especially along the east margin although most of the sample quadrants did not include bushes. Scrub totals around 10% of the plot. There is a layered structure to the grassland. The herbaceous vegetation is principally an *Arrhenatherum* canopy of around 30cm height with other grasses and herbs, but no rush layer or tall reed-like grasses. There is a ground layer of small plants, seedlings and bryophytes but the latter are very sparse. Litter is a relatively extensive, c.50% cover on average, but always with some bare ground. The substrate is flat, with little or no microtopographic variation, the soil a sandy peat which was rather dry at the time of survey.

Floristics

The plot is strongly dominated by *Arrhenatherum elatius*, with *Agrostis stolonifera*, *Dactylis glomerata*, *Holcus lanatus* and *Festuca rubra* together forming a grassy ground. In common with much of the rest of Stand B, *Cirsium arvense* is very frequent along with other indicators of enriched or disturbed ground such as *Equisetum arvense* and *Sonchus asper*. However, there is a clear trend toward damper fen meadow conditions with frequent records for *Carex hirta*, *Mentha aquatica*, *Lotus pedunculatus* and less frequently, *Dactylorhiza praetermissa*. Bryophytes are present and can be frequent but they are of low cover and restricted to the generalists that are characteristic of dryer mesotrophic habitats. There are a few other species of better quality meadows – *Primula veris* and *Ajuga reptans*, for instance. Overall, it is relatively species-poor and there are no wetland bryophytes or rushes.

Summary of records and events

The plot was mown in summer 2020 and the cuttings removed. This was part of a partial mowing of Stand B. Prior to this the land was owned privately. Management of the plot is uncertain but has included some arable history, set aside and then no significant management, but periods are not certain.

Relation to past and target conditions

This is the first year of ownership for LOHP and no formal management plan has been compiled. However, annual mowing and ideally grazing would be needed to recover species richness and maintain the population of southern marsh orchids. In addition, to develop the wetland element of the flora, the water table would need to be raised.

5. REFERENCES

- Dobson, Frank. S. (2005). *Lichens. An Illustrated Guide to the British and Irish Species*. The Richmond Publishing Co. Ltd., Slough.
- OHES (2010) *Fen restoration vegetation monitoring programme for Parker's Piece and Bleyswyck's Bank. Monitoring Plan 2010*. Unpublished report to Little Ouse Headwaters Project.
- Hill M.O., Blackstock T.H., Long D.G. and Rothero G.P. (2008) *A Checklist and Census Catalogue of British and Irish Bryophytes*. British Bryological Society, Middlewich.
- Rodwell, J.S. (ed.) (1991). *British Plant Communities. Volume 2. Mires and Heaths*. Cambridge University Press.
- Rodwell, J. S. (ed.) (1992). *British Plant Communities. Volume 3. Grassland and montane communities*. Cambridge University Press.
- Rodwell, J. S. (ed.) (1995). *British Plant Communities. Volume 4. Aquatic Communities, Swamps and Tall Herb Fens*. Cambridge University Press.
- Rodwell, J. S. (ed.) (2000). *British Plant Communities. Volume 5. Maritime Communities and Vegetation of Open Habitats*. Cambridge University Press.
- Stace C. (2019) *New Flora of the British Isles*. Fourth Edition. C&M Floristics