

FRYENT COUNTRY PARK: HAY MEADOW SURVEY 2017

Introduction

Hay meadows at Fryent Country Park provide approximately 60 hectares of habitat within about thirty hedged fields. This report is a summary of the 2017 hay meadow survey.

Survey information and knowledge informs management decisions, and provides feedback on the effect of an Environmental Stewardship agreement; and actions towards the Lowland Meadows Biodiversity Action Plan. Although this summary is collated after the harvest, initial data from the hay meadow survey is available by early July and is used to help plan the management of the meadows during the late summer and autumn. Weekly conservation projects throughout the year often contribute to the maintenance of the meadows.

Environmental Stewardship: An Environmental Stewardship agreement was awarded by Natural England in February 2008. The meadows in the Fryent Country Park scheme are under two management prescriptions. The majority are managed as 'semi-improved' (HK15) and are managed to include an area in each meadow that is left uncut each year for the benefit of over-wintering invertebrates and other wildlife. These areas cover about a tenth of the field area. These areas are rotated each year to reduce the risk of establishment of thistles, brambles and Sloe scrub.

Other meadows are in a prescription for 'species-rich, semi-natural' (HK7) meadows. These are Lower Hydes East, Honey Slough West, Lyon, Honey Slough East, and Half Yards Meade. These meadows have their whole areas harvested.

For both prescriptions further cutting and harrowing may follow at other times of the year, aimed at reducing accumulated thatch / matt, and increasing species richness.

Up to 2015 there was also a difference in the earliest cutting dates permitted for these two management options (15 July and 1 July). From 2015 this was changed to allow earlier cutting of all meadows which, if implemented, could be conducive to reducing the structural dominance of False Oat-grass. The earliest cutting date (not actually implemented) was agreed as 24 June; and it appears that Natural England have for any future scheme, now standardized the earliest cutting dates to 1 July.

Monitoring team: Barn Hill Conservation Group (BHCG) organised the monitoring of the meadows and data input.

Monitoring: All of the monitored set of hay meadows were surveyed in 2017. In some years a random sub-set has been selected. The monitoring aims to

include the five 'species-rich, semi-natural' fields each year. The numeric results reported here exclude those for Masons Field unless stated otherwise.

Species richness: Species richness is the number of species per unit area. It reflects the combined changes in constituent changes in species frequencies.

Species richness in 2017 averaged at 8.3 species per square metre. This was a reduction on the 8.4 of 2016 and in turn a reduction from recent previous years, having been 10.5 in 2014. Evidence and experience suggests that several factors affect the species richness. Hay harvesting is conducive to higher species richness, possibly to a large extent by reducing the matt of thatch that smothers young, small and low-growing plants; and by aiding competition. Early cutting (but not too early) helps to reduce the structural dominance (and frequency) of False Oat Grass, and that reduction is often conducive to smaller species. A cutting date in early July could be ideal. Aftermath cuts (one or two) are also conducive to higher species richness. And the London Clay soils are highly susceptible to high water tables in the later part of winter and to drought in summer. That, and the causative weather itself, can have a wide range of affects on individual species. For example, in general, dry conditions and summer droughts while reducing the vegetative growth, provides more gaps in the sward for competition by other species. And the annual legumes (for example Common Vetch, Hairy Tare, Smooth Tare and Lesser Yellow Trefoil) are responsive to such conditions. Frequencies of these species can increase rapidly following successive years of such conditions.

For 2017, species richness for individual meadows was in the range of 6.0 at Lyon field to 11.8 at Lower Hydes East.

Information on the constituent species is provided later in this report.

Year	Species Richness	Year	Species Richness
2007	8.2	2013	9.6
2008	7.4	2014	10.5
2009	7.4	2015	8.5
2010	10.7	2016	8.4
2011	10.8	2017	8.3
2012	9.9		

Thatch: An objective of the Environmental Stewardship agreement is to reduce the quantity of thatch (matt / un-decomposed vegetative material at ground level) which is considered to reduce the species richness by physically smothering and otherwise reducing the emergence of some species. The Environmental Stewardship target is that thatch should not exceed 10% of ground cover. Thatch is difficult to measure: the material is visually obscured by the growing sward and canopy above; and at ground level needs to be

distinguished from the current years' growth. Estimates were made in each quadrat.

The average thatch was 23%, similar to the 22% of 2016. Upper Hydes West, Lower Hydes East and Homefield had the lowest percentage of thatch – each at 15%. Richards East had the highest percentage of thatch at 32%.

Year	Thatch	Year	Thatch
2007		2013	60%
2008	77%	2014	28%
2009	62%	2015	76%
2010	40%	2016	22%
2011	48%	2017	23%
2012	36%		

The meadows were cut but not harvested in 2014, the thatch from which probably contributed to the high percentage cover in 2015. Harvesting was undertaken in 2016 (plus aftermath treatments).

Cutting dates: While the events fields received a cut for an event, the hay was not harvested in 2017. Cutting of the hay meadows commenced on 25 July 2017, but appeared to be protracted so some fields could have been cut later. Bugbeards/The Brache and Upper Hydes West were not cut until late September/early November.

Meadow Brown butterfly: The life-cycle of this species is considered to be associated with traditional hay meadow management. Monitoring of populations has continued annually and transect counts are available.

Hay Watch: Hay Watch is organized at the time of the harvest. Thank you to those who participate.

Field Management records: Spreadsheet/s of field management are maintained to bring together farm records and data about the history, geography, administration, technical information and field management.

Meadow management: Cutting commenced later than anticipated; and then the hay contractors withdrew from any harvesting. Cutting was protracted. A second, topping cut was however achieved.

Masons Field: Masons Field on the north-east of the Country Park was the subject of a Heritage Lottery Fund award to restore the field from about 2011. Following the main restoration work, projects have focused on improving the management of the meadow, hedgerows, green lanes and orchard areas. The species richness in 2017 was 9.2 (7.2 in 2015, and 9.5 in 2016). Thatch was 40% in 2017, (92% in 2015 reducing to 23% in 2016). Much of the cut hay was left on some meadows in 2016 – and that may have contributed to the relatively higher thatch in 2017.

A report on the restoration of the meadow at Masons Field was printed in early 2015 – copies are available from Barn Hill Conservation Group.

Soil Association Organic Standard: The certification was retained at the annual inspection. The hay, fruit and the woodland produce are certified as organic.

Species:

Details of the occurrence and frequency of each species are held in a database that includes data on over 200 species recorded in the meadows since 1985. The following tables are a rough and ready way of highlighting the results. The tables cover only those species that have been the more frequent recently. Please consult the database for more details and accuracy. Masons Field was also surveyed but not included in the tables below. Species are listed with frequencies (percentages) based on the proportion of one-metre square quadrats in which the species was recorded. Figures of 0 include some frequencies of less than 0.5%; and thus, a zero does not necessarily indicate absence.

The figures for lowest and highest cover the whole series from 1985 to 2017. The frequencies for the years 2008 and 2017 are a guide to the situation during the Environmental Stewardship agreement.

Yorkshire Fog <i>Holcus lanatus</i>					
Lowest		Highest		2008	2017
1997	83	2002	100	96	93
A medium height grass. Present in almost all quadrats.					

False Oat-grass <i>Arrhenatherum elatius</i>					
Lowest		Highest		2008	2017
1985	37	2006	99	99	89
Structurally the most dominant grass in most of the annually cut meadows, it does better when hay is cut and left rather than being harvested up. Both frequency and abundance increase further if areas are left uncut. It reduces as the number of cuts per year increases. At Fryent Country Park, an aftermath cut can be effective at reducing the frequency and structural dominance – and opening the sward for other species. Earlier hay harvesting is also thought to reduce this species. The frequency increased from the 81% of 2016 which followed a hay harvest, aftermath harvest and harrowing in 2015, which could have been conducive to reducing False Oat-grass in 2016. The meadows received less management in 2016, which could have been conducive to False Oat-grass in 2017.					

Rough Meadow-grass <i>Poa trivialis</i>					
Lowest		Highest		2008	2017
1997	26	2001	95	85	55
This was a large reduction from the 89% of 2016. This species does better in dry years, or following a dry year. It does better in shorter, open swards.					

Meadow Vetchling <i>Lathyrus pratensis</i>					
Lowest		Highest		2008	2017
1985	17	2014	85	58	71
Yellow-flowering. An indicator species of meadows and has increased during recent years.					

Meadow Foxtail <i>Alopecurus pratensis</i>					
Lowest		Highest		2008	2017
1985	27	2013	86	84	74
An early-flowering grass of meadows. Look out for the 'fox-tail' when in flower.					

Meadow Buttercup <i>Ranunculus acris</i>					
Lowest		Highest		2008	2017
1985	29	2013	82	45	53
Appears to be partly affected by cyclic patterns over several years, while other factors probably also affect frequencies.					

Couch <i>Elytrigia repens</i>					
Lowest		Highest		2008	2017
2012	39	1997	89	45	31
Possibly under-recorded when not flowering.					

Bent grasses <i>Agrostis spp.</i>					
Lowest		Highest		2008	2017
1994	10	2003	66	23	43
Late developing so sometimes under-recorded. Most plants in the meadows are Common Bent <i>Agrostis capillaris</i> though other species of <i>Agrostis</i> may also be present.					

Cocksfoot <i>Dactylis glomerata</i>					
Lowest		Highest		2008	2017
1985	9	2017	57	33	57
Cocksfoot has increased during recent years. This was the highest frequency since recording commenced; and a large increase from the 44% of 2016.					

Hairy Tare <i>Vicia hirsuta</i>					
Lowest		Highest		2008	2017
2001	0	2011	78	8	18
Hairy Tare benefits from hot dry summers, and during the previous year.					

Meadow Brome <i>Bromus commutatus</i>					
Lowest		Highest		2008	2017
2002	8	2011	62	15	49
The name is apt; this grass appears to do best at a single hay meadow cut and harvest per year. An increase from 39% in 2016.					

Perennial Rye-grass <i>Lolium perenne</i>					
Lowest		Highest		2008	2017
2009	12	1987	82	14	24
Widely used agriculturally; and also for sports pitches and lawns. Perennial Rye-grass competes better if cut frequently, and in nutrient-rich soils.					

Smooth Tare <i>Vicia tetrasperma</i>					
Lowest		Highest		2008	2017
2001	0	2010	45	14	15
An annual legume, it benefits from hot and dry summers, and during the previous year.					

Cut-leaved Cranesbill <i>Geranium dissectum</i>					
Lowest		Highest		2008	2017
2001	1	2011	43	6	13
Frequencies are higher following, and during dry summers.					

Creeping Buttercup <i>Ranunculus repens</i>					
Lowest		Highest		2008	2017
2006	5	1989	63	7	23
Some evidence of a medium-term cyclic pattern. Prefers shorter, damper swards.					

Common Vetch <i>Vicia sativa</i>					
Lowest		Highest		2008	2017
2001	1	1997	83	22	6
As for other annual legumes, Common Vetch benefits from hot dry summers and during the preceding year.					

Small-leaved Cat's-tail <i>Phleum bertolonii</i>					
Lowest		Highest		2008	2017
2012	3	2014	17	7	8

Meadow Barley <i>Hordeum secalinum</i>					
Lowest		Highest		2008	2017
1985	2	2017	18	9	18
This was the highest frequency for Meadow Barley since the recording commenced.					

Common Sorrel <i>Rumex acetosa</i>					
Lowest		Highest		2008	2017
2007	1	2012	23	4	12
Common Sorrel can be used as a herb.					

Creeping Thistle <i>Cirsium arvense</i>					
Lowest		Highest		2008	2017
2017	< 1	1992	48	10	< 1
An un-desirable species on account of un-palatability to livestock; the reduction in frequency to approximately 0.3%, the lowest since recording commenced, is an achievement. Creeping Thistle increases in poorly managed meadows, but can be reduced by increasing the cutting frequency. A practice of using the data from the meadow monitoring in early summer to identify meadows with high frequencies of Creeping Thistle, and then arranging for a second cut in the late summer to follow the harvest, applied over a number of years, appears to have been effective.					

Crested Dog's-tail <i>Cynosaurus cristatus</i>					
Lowest		Highest		2008	2017
1990	1	2014	11	4	6
More frequent in meadows in the west of the Park.					

Common Mouse-ear <i>Cerastium fontanum</i>					
Lowest		Highest		2008	2017
2003	0	1991	20	3	1

Dandelion <i>Taraxacum officinale agg.</i>					
Lowest		Highest		2008	2017
1990	0	2013	13	2	7

Red Fescue <i>Festuca rubra</i>					
Lowest		Highest		2008	2017
1985	1	2010	12	8	9
More frequent in meadows in the west of the Park.					

Hogweed <i>Heracleum sphondylium</i>					
Lowest		Highest		2008	2017
1987	1	2017	13	6	13

Red Clover <i>Trifolium pratense</i>					
Lowest		Highest		2008	2017
2009	1	1985	22	1	6

Great Burnet <i>Sanguisorba officinalis</i>					
Lowest		Highest		2008	2017
	2	2010	8	4	5
Particularly in the HK7 meadows. Great Burnet is considered an indicator of MG4 type grasslands of the National Vegetation Classification which includes some flood-plain meadows.					

Meadow Fescue <i>Festuca pratensis</i>					
Lowest		Highest		2008	2017
1990	1	2017	6	4	6
Particularly in Lower Hydes East and Honey Slough East. Meadow Fescue is an indicator species for traditional meadows.					

Lesser Yellow Trefoil <i>Trifolium dubium</i>					
Lowest		Highest		2008	2017
2017	0	1985	54%	0	0.00
This species does better in dry summers and the year following dry summers; and hay harvesting. There were no records in 2017; the lowest since recording commenced. However, the species is known to increase rapidly from low frequencies given conducive growing conditions, probably in part from a buried seed bank. So the absence of vegetative records, does not necessarily mean the loss of this species.					

White Clover <i>Trifolium repens</i>					
Lowest		Highest		2008	2017
2008	0	1987	42	1	1
White Clover is a species of short grassland, while it is less frequent in taller hay meadows. In the meadows typically found on and alongside mown paths.					

Crow Garlic <i>Allium vineale</i>					
Lowest		Highest		2008	2017
	0	2008	3	3	< 1

Marsh Bird's-foot Trefoil <i>Lotus uliginosus</i>					
Lowest		Highest		2008	2017
	0	2017	3	1	3
At Fryent Country Park, Marsh Bird's-foot Trefoil is typically found in the hay meadows and in damp, open habitats. In contrast, Common Bird's-foot Trefoil (<i>Lotus corniculatus</i>) is rarely found in the meadows on the London Clay at Fryent Country Park, but found on the mown grassland of the roadside mounds and in the acid grassland on Barn Hill.					

Creeping Cinquefoil <i>Potentilla reptans</i>					
Lowest		Highest		2008	2017
	0	2014	2	0	<1

Curled Dock <i>Rumex crispus</i>					
Lowest		Highest		2008	2017
2012	1	1998	8	1	2

Tufted Vetch <i>Vicia cracca</i>					
Lowest		Highest		2008	2017
2006	0	2010	7	2	1

Lesser Stitchwort <i>Stellaria graminea</i>					
Lowest		Highest		2008	2017
2017	< 1	1999	8	3	< 1

Cow Parsley <i>Anthriscus sylvestris</i>					
Lowest		Highest		2008	2017
	0	2010	6	0	2
The frequency was 3% in 2015.					

Meadowsweet <i>Filipendula ulmaria</i>					
Lowest		Highest		2008	2017
	0	2009	2	1	2

Pedunculate Oak <i>Quercus robur</i>					
Lowest		Highest		2008	2017
	0	2012	3	0	1

Red-veined Dock <i>Rumex sanguineus</i>					
Lowest		Highest		2008	2017
1986	0	1994	4	2	1

Smooth Meadow-grass <i>Poa pratensis</i>					
Lowest		Highest		2008	2017
2001	0	1998	6	1	< 1

Blackthorn <i>Prunus spinosa</i>					
Lowest		Highest		2008	2017
	0	2012	5	3	1
Considered an un-desirable species in meadows, being woody, thorny and if left un-cut can grow into scrub. Occurs as suckers near to meadow edges; and presumably as seedlings when at a greater distance from the hedgerows.					

Goatsbeard <i>Tragopogon pratensis</i>					
Lowest		Highest		2008	2017
2017	0.01	1998	9	1	0.01

Tufted Hair-grass <i>Deschampsia cespitosa</i>					
Lowest		Highest		2008	2017
1987	3	1991	7	2	1
An indicator of damper conditions.					

Mosses <i>Bryophyta</i>					
Lowest		Highest		2008	2017
	0	2012	4	0	Approx. 1%
Some individual species have been recorded separately. Species recorded included Common Feather-moss (<i>Kindbergia praelonga</i>) and Common / Great Pocket-moss (<i>Fissidens taxifolius</i>). The height of the hay meadow sward is not conducive to a high frequency of mosses.					

Large-leaved Cat's-tail <i>Phleum pratense</i>					
Lowest		Highest		2008	2017
	0	1985	2	1	0

Hoary Ragwort <i>Senecio erucifolius</i>					
Lowest		Highest		2008	2017
	0	2010	1	0	Approx. 0.04%
A ragwort often found in meadows on clay soils. Look for the relatively deeply-cut and straight-edged leaves, and for in-rolled margins on the underside of the leaves. Probably present in all years but may be at too low a frequency to register during the survey. Hoary Ragwort was recorded in 2017 in Masons Field though not within quadrats.					

Common Ragwort <i>Senecio jacobaea</i>					
Lowest		Highest		2008	2017
	0	2000*	1*	0	Approx. 0.04%
This ragwort species is the target for management under the Ragwort Control Act 2003 as it can be poisonous to livestock and is nationally common. In 2017 the estimated frequency was 0.04% (and not found within any quadrats). However, in Masons Field (still in restoration; and not within the long-term set of monitored meadows), the species was more widespread. Plants in Masons Field were pulled before cutting or seed could have been shed. A series of planned repeat cuts could reduce the frequency. A separate report is produced for Common Ragwort: copies are available from Barn Hill Conservation Group. (*Frequencies were higher in some years due to large-scale fly-tipping and ground disturbance in some meadows between 1986-1990).					

Cleavers <i>Galium aparine</i>					
Lowest		Highest		2008	2017
2014	0	1987	5	2	1
More a species of hedgerow edges: in meadows it is more an indicator of poor management of the meadow.					

The following were amongst others also recorded in 2017:

Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>	
Soft Brome	<i>Bromus hordaceus</i>	
Creeping Soft Grass	<i>Holcus mollis</i>	
Yellow Rattle	<i>Rhinanthus minor</i>	