

Fairfield Nature Reserve

Monitoring of Meadow, Woodland and Arable Margins

2022

a report for
the Fairfield Association



compiled by

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1 Introduction and Methods

This report was commissioned by the Fairfield Association to continue monitoring the development of:

- the meadow in the Association's Fauna nature reserve;
- Pony Wood, Little Wood and the connecting plantation; and
- the seeded margins of arable fields in the Association's Flora nature reserve.

1.1 The Meadow

Since 2011, an area of grassland in the south-eastern part of the Fairfield Association Fauna Nature Reserve (c 2.4 acres/ 1 ha) has been managed as meadowland; with exclusion of grazing stock during the spring and early summer, removal of ragwort, occasional seeding to encourage a more diverse meadow sward and cutting of the grassland each summer (late July/ early August) with subsequent removal of the hay crop to prevent a build up of nutrients.

The site has been monitored each summer since 2011 to determine whether these management works are being effective in producing a botanically rich meadow and to guide future management of the plot. The monitoring methodology is outlined in the *Fairfield Association meadow survey training notes* (Skelcher 2012), which was based on guidelines for grassland assessment provided for the Defra Higher Lever Stewardship agri-environment scheme (Natural England 2010, 2016). This principally involves recording the presence or absence of a number of key plant species that are indicators of either 'lowland meadow' or 'semi-improved grassland', within ten 2 x 2 m quadrats across the meadow. The ten monitoring points are selected each year to provide broad cover over the full meadow area, while each individual quadrat is selected locally to be representative of the wider meadow vegetation around each point. Areas near to the fence line or merging with the rush-pasture next to Lucy Brook are avoided because these are more likely to support vegetation that is not typical of the majority of the meadow.

According to the methodology criteria, a successfully managed meadow should support at least two 'lowland meadow' indicator species in five or more quadrats (frequent) and at least two species in three or more quadrats (occasional). Note that occurrence in 7 or 8 quadrats is referred to as 'abundant', in 9 or 10 as 'dominant' and in 1 or 2 as 'rare', broadly adapting conventions from the widely used DAFOR methodology for vegetation assessment (though note terms here are used only with respect to distribution and, for example 'dominant' does not necessarily imply high cover in addition to very high frequency, as it would in a standard DAFOR survey). Through good management, a greater diversity and frequency of indicator meadow species should be expected over time; progressing to a herb-rich lowland meadow.

In 2011 and 2012, monitoring took the form of a training event with a number of Fairfield Association members in attendance. Since 2013, monitoring has been undertaken by Graeme Skelcher but has remained open to Fairfield Association members who wished to attend. Only a single survey was carried out in July or early August each year up to 2016, but since 2017 two assessments have been made each year; one within the usual mid-summer period (most often in early July) plus an earlier visit in May. In 2022, these visits were made on 28 May and 2 July.

1.2 Pony Wood and Arable Margins

Following the successful works on the Fauna nature reserve, the Fairfield Association acquired a further 36 acres of land to the south of this site; bought in stages between 2011 and 2013. This land includes a small area of woodland (Pony Wood, Little Wood and a small intervening area that has since been planted with trees and shrubs to connect the two) and fields which have subsequently been managed for arable crops with broad, seeded 'wildlife strips' around their margins. As with the Fauna nature reserve, this land (the Flora nature reserve) has also been entered into higher tier Countryside Stewardship.

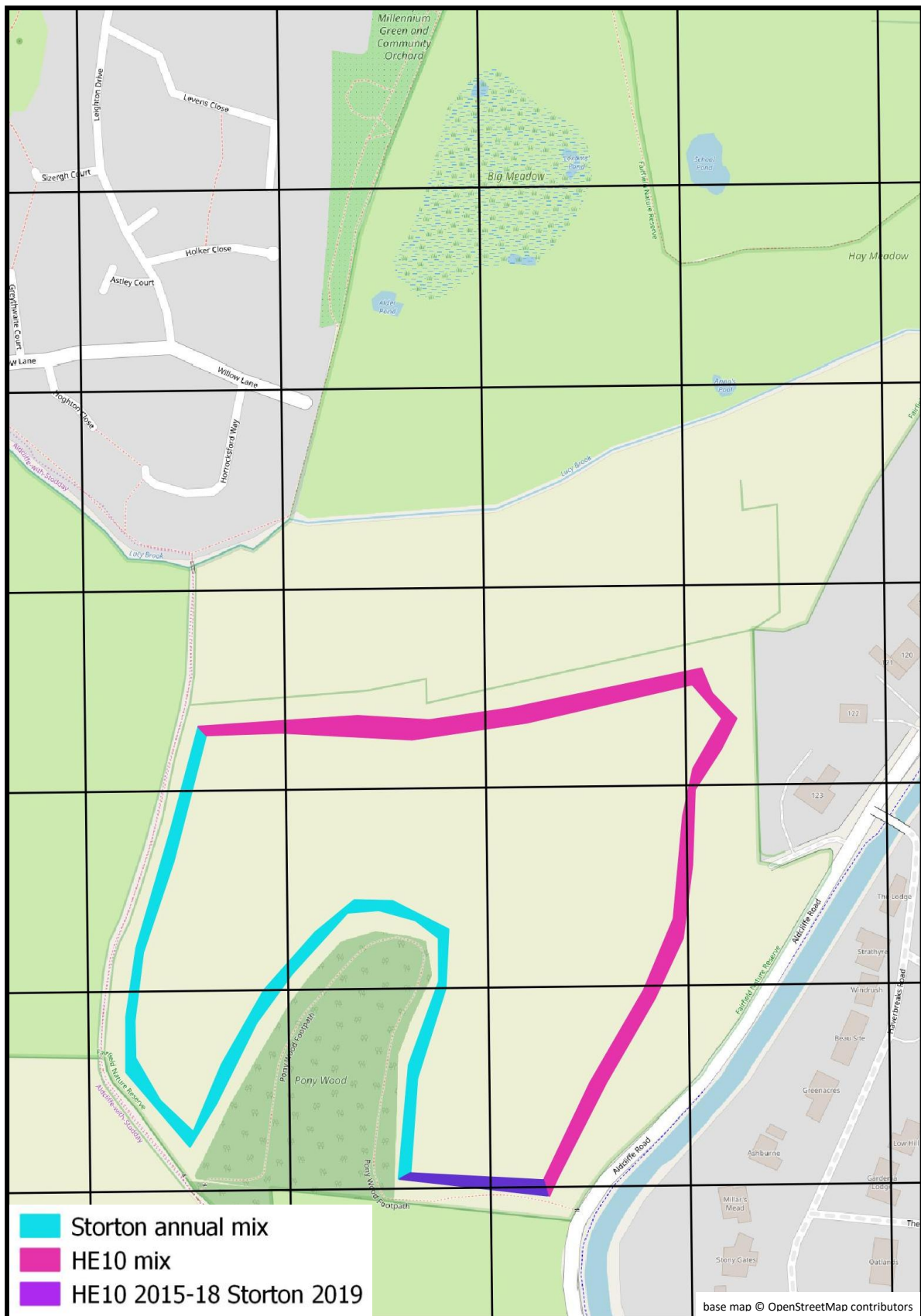
Monitoring of both the woodland and the arable margins commenced in the summer of 2015, following a similar methodology to that used for the meadow. Again, 10 monitoring points were selected to provide broad cover over the full area of each habitat (with, in the case of the arable margins, 10 points each for the two types of seed mix used - see Map 1), with individual points again selected locally to be representative of the wider vegetation around each point. For the arable margins, vegetation was again assessed within 2 x 2 m plots. For the woodland, the field-layer was assessed within 4 x 4 m plots while trees and shrubs were considered within an area of about 50 x 50 m (i.e. up to about 25 m around a standing point). Because of the relatively small size of the wood, it was appropriate for some features to simply be assessed at a 'whole wood' level.

In 2015 and 2016, only the mature woodland of Pony Wood (covering c 1 acre/ 0.4 ha) was assessed. Since 2017 additional points were also considered within the adjacent recently planted area (c 0.6 acres/ 0.23 ha) and the small, mature copse (Little Wood - 0.25 acres/ 0.1 ha) which is now connected to Pony Wood by this new plantation.

The monitoring criteria selected for the woodland and arable margins were based on the targets for management provided by Natural England for Higher Level Stewardship management. For the woodland, this includes ensuring frequency of certain tree species (selected for both nature conservation and landscape value), general canopy and shrub cover, and frequency of key woodland herb indicator species. Additional factors have also been included for consideration, which are not requirements for HLS but which are indicative of a healthy woodland. For the arable margins, targets include cover of key wildlife-friendly herb and grass species included in the seed mixes. Additional observed species were noted that were not listed in the seed mixes but which are nevertheless desirable to encourage.

The woodland is monitored in April or early May to coincide with the flowering of most woodland herbs (though assessment in 2019 was made later than usual because the wood was closed due to tree safety concerns during this period), while the arable margins are usually monitored in late July when, again, most of the target herb species are in flower. In 2022, the woodland was assessed on 23 April and the arable margins on 30 July.

Map 1: Location of Seed-mixes applied to Arable Margins



2 Results

2.1 The Meadow

In May 2022 (see Appendix 1a), one species from the 'lowland meadow' indicator list was recorded as 'dominant' (yellow rattle), one species was 'frequent' (black knapweed) and two were 'rare' (ragged robin and eyebright). From the 'semi-improved grassland' indicator list, three species were 'dominant' (meadow buttercup, ribwort plantain and common sorrel), one was 'frequent' (red clover) and one was 'rare' (common cat's-ear).

In July 2022 (see Appendix 1b), one species from the 'lowland meadow' indicator list was recorded as 'dominant' (yellow rattle), two were 'occasional' (black knapweed and common spotted orchid) and three species were 'rare' (ox-eye daisy, greater bird's-foot trefoil and eyebright). From the 'semi-improved grassland' indicator list, four species were 'dominant' (common sorrel, meadow buttercup, ribwort plantain and red clover), and two were 'rare' (common cat's-ear and self-heal).

The mean cover of herbs over the 10 quadrats in July was 75%, with nine quadrats having between 60 and 95% herb cover and the tenth still having 40% cover. Potentially negative meadow features were absent.

The meadow easily satisfies the target criteria for 'semi-improved grassland' (at least four 'lowland meadow' or 'semi-improved grassland' indicator species at least 'occasional'), but falls short of the target criteria for 'lowland meadow' that requires there should be at least two 'lowland meadow' indicator species at least 'frequent' and two at least 'occasional'. However, the total number of six lowland meadow indicators in July was the highest recorded in the 12 years of survey.

2.2 Pony Wood, Little Wood and Plantation

Pony Wood (Appendix 2a) comprised mature trees over a sparse understorey with a mostly grassy field-layer. Of the trees required to be present at regular intervals, mature ash and beech were respectively 'frequent' and 'occasional'. The estimated c 60% canopy cover falls within the Countryside Stewardship target but the 8% shrub-layer remains short of the 20% minimum target (though continues a steady increase in shrub cover since 2015). Regeneration of native tree species was recorded at eight of the ten sample points in 2022.

In the field-layer, bluebell was 'frequent', primrose was 'occasional' and two other indicator species, ramsons and wood anemone, were also present. The target for two indicator woodland herb species being at least 'occasional' has therefore been met for the first time, with primrose joining bluebell in this category.

Undesirable field-species were not excessive (target for no species being more than occasional), with common nettle being recorded at four stops (occasional). Sycamore regeneration was widespread, being recorded at nine of the ten sample points (dominant), though only sparsely scattered.

Little Wood (Appendix 2b) included mature and early-mature ash and oak in its canopy, and also supported a good shrub-layer; though the estimated canopy cover was slightly higher than the Countryside Stewardship target while the shrub cover was below the target. Evidence of tree regeneration was also present. Of the target woodland field species, only bluebell was recorded but these were numerous, while non-target woodland herbs lesser celandine and lords-and-ladies were also present. Common nettle was the only designated undesirable field-species recorded; present at one of the three sample points.

The plantation is continuing to develop towards woodland, with young trees now present rather than just saplings (Appendix 2b). The planted shrubs are forming an increasingly substantial shrub-layer. Oak and birch were frequent components of this developing woodland and regeneration of tree and shrub seedlings was observed. None of the target woodland herbs were present, though the non-target woodland herb lesser celandine was present at all of the three sampled locations. The undesirable field-species common nettle and creeping thistle were both present.

2.3 Arable Margins

Four of the target species for the Storton mix margins were present in 2021; two of which being within the desired target cover of 5 - 60% (fodder radish 28% and spring barley 6%, with gold of pleasure and spring wheat both just over 2%) and thus strictly falling short of the Countryside Stewardship target which requires three species to have at least 5% cover. As in 2021, common couch grass was frequent, with an average cover over the whole Storton area of 14%. The clump of purple rampion (Biodiversity 'Priority' species; listed on S41 of the 2006 NERC Act as a 'species of principal importance' for the conservation of biodiversity in England; nationally scarce; and found nowhere in the world outside the British Isles) recorded in the southern margin on the eastern side of Pony Wood in 2019 was not seen during monitoring in 2022.

In the HE10 margins, all of the desired seeded grass species were present in 2022 (crested dog's-tail, timothy, smooth meadow-grass, red fescue and common bent). Their average combined cover was just 19% (see Appendix 3b), however, which falls short of the target of 75% cover after the first year of seeding (although this would be impossible to meet alongside the more important herb cover targets). The bulk of the grassland cover was provided by creeping bent (18%) and Yorkshire-fog (11%) along with the desired timothy (7%) and common bent (6%).

Five Countryside Stewardship required herb species were present within the HE10 margins; three of which exceeded the 5% minimum target threshold required for at least three species (black knapweed 30%, ribwort plantain 11% and yarrow 7%). Ox-eye daisy and red clover also occurred sparsely with below 2% cover each. Other target species, meadow vetchling and common bird's foot trefoil, were not recorded at any of the stops.

Of the listed 'undesirable' species, creeping thistle occurred frequently (6 stops), within HE10 samples, with common nettle (1 stop) and broad-leaved dock (2 stops) both rare, while creeping thistle was frequent (6 stops) within the Storton samples.

3 Discussion

3.1 The Meadow

Table 1 shows the development in the abundance of lowland meadow (G06) and semi-improved grassland (G02) indicator species since 2011. Up to 2020, there had been a slow but steady improvement in most years in the quality and diversity of the meadow recorded each July, but this did not continue in 2021, with the overall results still satisfying the criteria for 'Semi-improved Grassland' but falling further short of the criteria for classification as 'Lowland Meadow'. There was some recovery in 2022, however, with three indicator species at least occasional (though only one of these being at least frequent), plus three additional indicator species also present.

Table 1: Abundance of indicator species (G06 = Lowland meadow; G02 = Semi-improved grassland) at Fairfield Meadow in July/August each year since 2011, together with values of other indicators of meadow quality.

D = Dominant; A = Abundant; F = Frequent; O = Occasional; Rare = Rare

Indicator		'11	12	13	14	15	16	17	18	19	20	21	22
		6/8	5/7	19/7	10/7	15/7	5/7	12/7	5/7	5/7	2/7	17/7	2/7
overall % herb/sedge cover (target > 20%)		15	15	47	56	59	75	55.5	67.5	70	70	74	89
overall % undesirable species (target < 5%)		5	<5	1	<1	<1	1	<1	<1	<1	<1	<1	<1
overall % bare ground (target < 10%)		0	0	0	0	0	0	0	0	<1	0	<1	1
overall % scrub (target < 5%)		0	0	0	0	0	0	0	0	0	0	0	0
overall % large sedges, rushes, reeds (< 30%)		0	0	0	0	0	0	<1	0	0	0	0	<1
Species													
yellow rattle	G06		O	A	A	D	D	D	D	D	D	D	D
black knapweed	G06						R	F	F	F	A	O	O
ox-eye daisy	G06					R	O	O	R	O	O	R	R
orchids	G06					R	R	R	R	R	R		O
greater bird's-foot trefoil	G06							R	R				R
betony	G06									R			
eyebright	G06												R
meadow buttercup	G02	R	A	O	A	D	D	D	D	D	D	D	D
ribwort plantain	G02	R	O	O	O	A	D	D	D	D	D	D	D
common sorrel	G02	O	R	R	R	R	F	A	A	D	D	D	D
red clover	G02	R	O	R	O	O	F	A	F	F	D	F	D
common cat's-ear	G02	R				R	R	O	R	R	R	R	R
yarrow	G02	O	R	R	R	R	R	R	R	R	R	R	
self-heal	G02	R	R		R	R	O	R	R	R	R		R
field wood-rush	G02	R											
germander speedwell	G02	R											

The percentage herb cover has remained very good, being above 50% for the ninth year in succession, while the cover of non-desirable species (mainly ragwort) has remained at no more than 1% over the same period, so no further significant improvement could be expected in these respects.

Of the 'lowland meadow' indicator species, yellow rattle remained constant throughout the sward for the eighth successive year. Black knapweed (which appeared for the first time only in 2016) was recorded only as 'occasional' after being at least 'frequent' from 2017 - 2020. Common spotted orchid was recorded as 'occasional' for the first time, after being absent in 2021 and only 'rare' in the six previous

years, while greater bird's-foot trefoil was recorded for the first time since 2018 and eyebright was recorded for the first time during the 12 years of July surveys.

The diversity of 'semi-natural grassland' indicators in July has remained reasonably constant over the last seven years, with at least frequent occurrence of common sorrel, meadow buttercup, red clover and ribwort plantain.

From 2017 onwards, monitoring of the meadow has also been carried out in May, and Table 2 shows a comparison of results each May from 2017 to 2022, and between May and July 2022. Again the May results had shown a general steady improvement in the overall abundance of indicator species from year to year until a moderate decline in 2021, but results improved again in 2022. Several species tended to be a little less abundant in May compared to the July survey, due to being earlier in their seasonal growth development, but a few spring-flowering species were sometimes seen in May that had not been apparent in the later summer surveys. The May 2022 results included an increase in knapweed cover from 2021 (from 'occasional' to 'frequent') along with only the second ragged robin record (the first being in 2020) and the very first eyebright record.

Table 2: Abundance of indicator species (G06 = Lowland meadow; G02 = Semi-improved grassland) and values of other indicators of meadow quality at Fairfield Meadow in May 2017 to 2022, together with comparison data for July 2022.

D = Dominant; A = Abundant; F = Frequent; O = Occasional; Rare = Rare

Indicator		2017	2018	2019	2020	2021	2022	2022
		30 May	28 May	31 May	28 May	28 May	28 May	2 July
overall % herb/sedge cover (target > 20%)		66	58	73.5	68.5	67	74.5	89
overall % undesirable species (target < 5%)		0.5	0.3	0	0.2	0.6	0	<1
overall % bare ground (target < 10%)		0	0	1.3	0.9	1.2	1.6	1
overall % scrub (target < 5%)		0	0	0	0	0.1	0	0
overall % large sedges, rushes, reeds (< 30%)		0	0	0	0	0	0	<1
Species								
yellow rattle	G06	D	D	D	D	D	D	D
black knapweed	G06	R	O	O	F	F	F	O
ox-eye daisy	G06	R		R	R			R
orchids	G06					R		O
greater bird's-foot trefoil	G06				R			R
cowslip	G06	R						
ragged robin	G06				R			
betony	G06							
eyebright	G06						R	R
meadow buttercup	G02	D	D	D	D	D	D	D
ribwort plantain	G02	D	D	D	D	D	D	D
common sorrel	G02	A	A	A	D	D	D	D
red clover	G02	F	F	F	A	F	F	D
common cat's-ear	G02				R		R	R
yarrow	G02	R			R			
self-heal	G02							R
cuckoo flower	G02	R	R		R	R		
field wood-rush	G02	R						
germander speedwell	G02							

3.2 Pony Wood, Little Wood and Plantation

Table 3 shows that the estimated canopy cover of mature trees in Pony Wood has remained broadly constant over the eight-year monitoring period (small fluctuations are likely due to different positions within the wood from which the assessments were made). However, effort made to plant shrubs has had a steady impact in enhancing the understorey with an increase from less than 1% cover in 2015 to over 8% cover in 2022; though this is still well short of the target minimum of 20%.

In the field-layer, bluebell was again 'frequent' (recorded at five stops in 2022), having been 'frequent' or 'abundant' in each year since 2016. Primrose was recorded as 'occasional' for the first time, having been 'rare' in each year since the survey began in 2015. Of the other required indicator species, ramsons remained 'rare', as it has been since 2016, while wood anemone was recorded for only the second time (previously recorded in 2021).

Table 3.1: Woodland indicators at Pony Wood in each year since 2015.

HLS indicates HLS targets need to be met. D = Dominant; A = Abundant; F = Frequent; O = Occasional; Rare = Rare

Indicator		Pony Wood							
		2015	2016	2017	2018	2019	2020	2021	2022
		10 June	6 May	20 April	9 May	31 May	22 April	26 April	23 April
overall % canopy cover (target 25%-70%)	HLS	70	68	60	61	62	63	54	60
cover of shrubs hazel, blackthorn, rowan, hawthorn, holly (target 20% - 75%; 10 - 40% by yr 8 in plantation)	HLS	< 1	1.6	2.8	3.6	4.7	4.7	5.2	8.1
approximate number of age classes (<i>seedling, sapling, young, early-mature, mature, over-mature</i>)		3	4	5	5	5	5	4	5
areas of undisturbed old-growth or scatter of large trees		✓	✓	✓	✓	✓	✓	✓	✓
fallen or standing deadwood		✓	✓	✓	✓	✓	✓	✓	✓
signs of regeneration		none	O	D	O	F	A	F	D
Species - trees									
oak	HLS					O			
ash	HLS	O	O	F	F	A	A	A	F
beech	HLS	O	F	A	F	O	O	F	O
birch	HLS						O		
Species - field-layer									
bluebell	HLS	O	F	F	A	F	A	A	F
dog's mercury	HLS								
primrose	HLS	R	R	R	R	R	R	R	O
ramsons	HLS		R	R	R	R	R	R	R
wood anemone	HLS						R		R
wood-sorrel	HLS								
lesser celandine			A	A	A		A	D	A
lords-and ladies			R				R	R	R
Negative species									
common nettle	HLS	R	R	R	R	R	O	O	O
sycamore seedlings	HLS	D	O	A	R	O	A	A	D

No significant changes have been recorded over the last six years at Little Wood (Table 3.2), which already comprises mature woodland with a reasonable structure and a good ground cover of bluebell. The plantation continues to develop, with some young trees beginning to provide a woodland feel and a substantial shrub layer, but none of the target woodland herbs are yet present in the field-layer which remains a fairly dense grass sward.

Table 3.2: Woodland indicators in Little Wood and Plantation since 2017.

HLS indicates HLS targets need to be met

D = Dominant; A = Abundant; F = Frequent; O = Occasional; Rare = Rare

Indicator		Plantation						Little Wood					
		2017	2018	2019	2020	2021	2022	2017	2018	2019	2020	2021	2022
		20/4	9/5	31/5	22/4	26/4	23/4	20/4	9/5	31/5	22/4	26/4	23/4
overall % canopy cover (target 25%-70%)	HLS	1	0	0	13	10	20	70	45	70	70	80	80
cover of shrubs hazel, blackthorn, rowan, hawthorn, holly (target 20% - 75%; 10 - 40% by yr 8 in plantation)	HLS	20	10	20	40	50	63	25	38	45	40	10	15
approximate number of age classes (<i>seedling, sapling, young, early-mature, mature, over-mature</i>)		2	4	3	3	3	3	4	4	3	4	4	4
areas of undisturbed old-growth or scatter of large trees								✓	✓	✓	✓	✓	✓
fallen or standing deadwood								✓	✓	✓	✓	✓	✓
signs of regeneration				✓		✓	✓	✓	✓		✓	✓	✓
Species - trees													
oak	HLS		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ash	HLS							✓	✓	✓	✓	✓	✓
beech	HLS				✓								
birch	HLS	✓	✓	✓	✓	✓	✓						
Species - field-layer													
bluebell	HLS							✓	✓	✓	✓	✓	✓
dog's mercury	HLS												
primrose	HLS												
ramsons	HLS												
wood anemone	HLS												
wood-sorrel	HLS												
lesser celandine		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
lords-and ladies								✓	✓	✓	✓	✓	✓
Negative species													
common nettle	HLS	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓
spear thistle	HLS					✓							
creeping thistle	HLS					✓	✓						
sycamore seedlings	HLS				✓		✓						

3.3 Arable Margins

Tables 4 and 5 show the development, respectively, of the Storton and HE10 mix arable margins since 2015.

In the Storton-mix margins, fodder radish has been the most consistently abundant species. This occurred at or towards the upper limit of the required cover parameters in the first three years of monitoring and exceeding the 60% maximum threshold by an additional 16% in 2018, but returned to around 40 - 50% cover in the following three years and was down to 28% cover in 2022. Other target species have fluctuated in cover over the years, presumably dependent at least in part upon the proportion of seeds in each annual mix. In 2022 spring barley, gold of pleasure and spring wheat were present but, of these, only spring barley exceeded 5% cover and mustard was not recorded for the first time since monitoring began in 2015. Thus, the Countryside Stewardship target of at least three key species occurring with 5 to 60% cover was not achieved in 2022 after three previous successive years in which this target was met. Spring triticale and poacher white millet were not recorded in 2022; the former had been recorded at moderate levels in 2015 but has not been seen since, while the latter was recorded only in 2018.

The presence of purple ramping-fumitory in the Storton margin, recorded in 2019, is significant. This is a nationally scarce species of disturbed ground that can thrive in arable margins, with Lancashire being one of the few strongholds for this species. The plant used to be widespread on abandoned ground in Lancaster in the 1980s and, while it has declined in the district since then, it is still present at a few places locally. The arable margins provide a typical habitat for the species within its established historical range, so its continued presence should be encouraged. While its presence in the last two years has not confirmed, seeds can remain dormant for several years so there is a reasonable chance of the plant returning where conditions are favourable.

In the HE10 margin, all five desirable grass species (common bent, timothy, crested dog's-tail, red fescue and smooth meadow-grass) were present in 2022. Collectively these comprised almost a fifth of the sward, which is a bit below results from the previous five years (20 -33%). Creeping bent and Yorkshire fog typically form the largest grass component.

The total cover of key herb species in the HE10 mix was similar to 2021 at almost 50%. The individual cover of black knapweed, ribwort plantain and yarrow each exceeded 5% cover for the fifth successive year; satisfying the target of minimum 5% cover for at least three key herb species for each year. Ox-eye daisy had also exceeded 5% cover in 2020 as well as in the previous two years, but was only recorded at around 2% cover in 2021 and 2022. Ox-eye daisy frequency was also lower in the meadow survey in these two years, compared to previous years.

Table 4: Arable-margin Storton-mix indicators at the Flora fields in each year since 2015.

HLS indicates HLS targets need to be met

D = Dominant; A = Abundant; F = Frequent; O = Occasional; Rare = Rare

Indicator		2015	2016	2017	2018	2019	2020	2021	2022
		29/7	5/7	28/7	27/7	22/7	22/7	1/8	30/7
Desirable species cover (target 5 - 60% of at least 3 species)									
spring triticale	HLS	19.6	0	0	0	0	0	0	0
poacher white millet	HLS	0	0	0	0.5	0	0	0	0
fodder radish	HLS	58.7	49.5	61.5	76.5	50.5	49.5	41	27.5
spring barley	HLS	1.5	3.2	0	0	0	5.5	3.1	5.6
spring wheat	HLS	6	0	3.5	0.7	0.7	0.8	0.5	2.2
gold of pleasure	HLS	0	0	1	8	23.5	4	9.1	2.5
mustard	HLS	14.3	40.5	18.5	3.1	20.5	19.1	17.6	0
<i>purple ramping-fumitory</i>						2	0		
<i>tansy-leaved Phacelia</i>		2.6	0.9	0.7	0.1	0.2	2.1		0.1
<i>borage</i>		0.5		1	<i>present</i>	0.1	1		
<i>common fumitory</i>						0.1	0		2.6
<i>common couch grass</i>								15.5	14
Cover of bare ground (target 5 - 10%)	HLS	5	5.5	14	13	11	4.7	14.5	9
Undesirable species (target - no species more than 5% cover)	HLS								
common nettle		0.1	0.2	4.1	0.3	0.4	3.4	3.9	
curled dock									
broadleaved dock									
spear thistle		0.1							
creeping thistle,		0.1			0.1	1	4.5	12	5.2
common ragwort							9		

Table 5: Arable-margin HE10-mix indicators at the Flora fields in each year since 2015.

HLS indicates HLS targets need to be met

D = Dominant; A = Abundant; F = Frequent; O = Occasional; Rare = Rare

Indicator		2015	2016	2017	2018	2019	2020	2021	2022
		29/7	5/7	28/7	27/7	22/7	22/7	1/8	30/7
Desirable species cover - grasses									
crested dog's- tail	HLS	1.5	2	2		2	2	2.5	2.5
small leaved timothy	HLS	2	2	3	3	2.5	9.5	4.5	7
smooth meadow-grass	HLS	0.5		0.5	1		0.2	0.5	0.5
red fescue	HLS	4.5	6	12.5	15	1	2	6.5	2.5
common bent	HLS	9.5	3	15	6	15	15.5	10	6
Total cover (target > 75% at end of year 1)		18	13	33	25	20.5	29.2	24	18.5
<i>Yorkshire-fog</i>			39	14	20	25.5	24.5	11	10.5
<i>creeping bent</i>			31.5	30	20	12	8	27.5	17.5
<i>ryegrass</i>			2.1	1.5	3	3	2.7	1.5	1
<i>meadow foxtail</i>			2	5.5	2	1.5	2	1.5	
<i>cock's-foot</i>			1.5			0.5	0.5	1	
<i>sweet vernal grass</i>			1.7	1		0.5	0.5	2	
<i>rough meadow-grass</i>				0.5		12	2.5	0	
<i>marsh foxtail</i>						0.7	0.2	0	
<i>false oat-grass</i>						2.5	3	2	0.5
Desirable species cover - herbs (target 5 - 60% of at least 3 species)									
black knapweed	HLS	4.1	14.5	16	9.2	17	24	27	29.5
yarrow	HLS	0.5	0.6		14	24.4	10.1	5.7	6.6
ox-eye daisy	HLS	12	1.6		5.5	19.5	9.3	2	1.5
ribwort plantain	HLS	7.5	7.7	12.5	6.4	7.5	15.5	9.6	10.6
red clover	HLS	0.1	0.1		0.1		3	3	1.5
meadow vetchling	HLS						0	0	
common bird's-foot trefoil	HLS								
Cover of bare ground (target 5 - 10%)	HLS	0	0	0	2.2	0.8	0	1.8	0.6
Undesirable species (target - no species more 5% cover)	HLS								
common nettle		0.5		0.5	0.1	0.1	1.4	3	0.1
curled dock						0.5	0	0	2
broadleaved dock		0.6		1	0.1	0.8	3.1	0.4	
spear thistle		1.5	1.2		0.2	0.5	1	0	
creeping thistle,		1			0.5	1	1.6	16.5	13.5
common ragwort		0.1						0	

4 Conclusions

The steady increase in diversity and abundance of key species within the meadow over successive years since 2011 stalled in 2021, but largely recovered in 2022. The meadow remains a very good 'semi-improved grassland' but continues to fall just short of meeting the criteria for herb-rich 'lowland meadow'.

The potential for Pony Wood to develop into a well-structured woodland, with a good and varied cover of native woodland herbs, is evidenced by the presence of a moderate diversity of woodland herbs, a good cover of bluebell, and scattered natural regeneration of seedlings. In 2022, primrose was recorded as 'occasional' which, alongside the frequent bluebells, meant that the target of at least two listed woodland herbs being at least occasional was met for the first time. Development of a proper shrub layer has also steadily improved over successive years, but still has a way to go before 20% cover is achieved. Some local control of the grass, particularly in areas where the sward is especially dense, may be beneficial in encouraging further woodland herb growth; perhaps an autumn or winter cut (with removal of cuttings) to provide a more open sward in the spring or some creation of bare ground around existing key herb plants to encourage their natural spread through seeding.

The areas of planted trees are beginning to develop into something resembling a woodland, with some of the birch developing into trees rather than large saplings. However, this will take many years to develop a proper woodland structure with typical woodland herbs and ferns in the field layer.

The seeded arable margins have generally shown signs of positive development. The HE10 margins met the HLS targets for cover of key herb species for the fifth successive year. In the Storton margins, only fodder radish and spring barley exceeded 5% cover in 2022, with two other species falling short of this and mustard being unusually absent, which meant that the target for three species exceeding 5% cover was not met after being achieved in the three previous years.

5 References

- Natural England (2010) *Higher Level Stewardship Farm Environment Plan manual (3rd edition)*. Natural England
- Natural England (2016) *Countryside Stewardship baseline evaluation of higher tier agreements (BEHTA) manual part 2: technical user guidance on BEHTA feature identification, condition assessment and data collection in the field (2nd Edition)*. Natural England.
- Skelcher G (2004) *A vegetation survey of Fairfield Urban Nature Reserve*. Unpublished report for the Fairfield Association.
- Skelcher G (2012) *Fairfield Association meadow survey training, 5 July 2012*. Unpublished report for the Fairfield Association.

Appendix 1a: Fairfield Meadow Monitoring Form 28 May 2022

1. Choose sampling points to provide a wide coverage over the whole field and which, at a glance, appear representative of the wider vegetation. Field edges and small stands of atypical vegetation should be avoided.
2. Sample sizes of approximately 2 x 2 m should be used. Where appropriate, the shape of sampled quadrats can be adapted from the standard square to cover a plot of the same total area.
3. Tick presence of indicator species at each sampled stop.
4. Record % cover of listed features at each stop (including combined cover of 'undesirable species': creeping thistle, spear thistle, curled dock, broad-leaved dock, common ragwort, common nettle, marsh ragwort, cow parsley and bracken) and calculate average (mean) cover at all stops in the 'Total' column.
5. Count up the number of stops at which each indicator species is present and record in the 'Total' column:
 D (*dominant*) = occurrence at 9 or 10 stops out of 10,
 A (*abundant*) = occurrence at 7 or 8 stops,
 F (*frequent*) = occurrence at 5 or 6 stops,
 O (*occasional*) = occurrence at 3 or 4 stops and
 R (*rare*) = occurrence at 1 or 2 stops.

Also record species as rare if they were observed on site but not at any of the sampled stops.

6. Note other important habitats present in the field, though these do not need to be monitored.

Site Fairfield Meadow			Sample quadrat										
Date 28 May 2022			1	2	3	4	5	6	7	8	9	10	Total
% herb/sedge cover excluding white clover & creeping buttercup (target > 20%)			95	60	95	40	80	90	65	80	80	60	74.5
% undesirable species (target < 5%)													0
% bare ground (target < 10%)			1	1	1	1	1	1	1	1	3	5	1.6
% scrub (target < 5%)													0
% large sedges, rushes, reeds (< 30%)													0
agrimony	G06												
autumn hawkbit	G06	G02											
betony	G06												
bird's-foot-trefoil	G06												
bitter-vetch	G06												
black knapweed	G06				✓			✓	✓	✓	✓		F
black medick		G02											
bugle	G06												
bulbous buttercup		G02											
burnet saxifrage	G06												
common bistort	G06												
common cat's-ear		G02				✓							R
common meadow-rue	G06												
common sorrel		G02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	D
cowslip	G06												
cuckoo flower		G02											
devil's-bit scabious	G06												
dropwort	G06												
dyer's greenweed	G06												
eyebright	G06									✓			R
field scabious	G06												
field wood-rush		G02											

Site Fairfield Meadow		Sample quadrat										
Date 28 May 2022		1	2	3	4	5	6	7	8	9	10	Total
germander speedwell	G02											
glaucous/common/carnation sedge	G06											
goat's-beard	G06											
great burnet	G06											
greater bird's-foot-trefoil	G06											
lady's bedstraw	G06											
lady's-mantles	G06											
lesser trefoil	G02											
marsh marigold	G06											
marsh valarian	G06											
marsh/fen bedstraw	G06											
meadow buttercup	G02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	D
meadow vetchling	G06											
meadowsweet	G06											
milkworts	G06											
narrow-leaved water-dropwort	G06											
orchids	G06											
ox-eye daisy	G06											
pepper-saxifrage	G06											
pignut	G06											
ragged robin	G06											
red clover	G02	✓		✓		✓			✓		✓	F
ribwort plantain	G02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	D
rough hawkbit	G06											
salad burnet	G06											
saw-wort	G06											
selfheal	G02											
sneezewort	G06											
tormentil	G06											
water avens	G06											
water mint	G06											
wood anemone	G06											
yarrow	G02											
yellow rattle	G06	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	D

Lowland Meadow	at least 2 G06 species <i>Frequent</i> and at least 2 G06 species <i>Occasional</i>
Semi-improved Grassland	at least 4 G02 or G06 species <i>Occasional</i>

Appendix 1b: Fairfield Meadow Monitoring Form 2 July 2022

- Choose sampling points to provide a wide coverage over the whole field and which, at a glance, appear representative of the wider vegetation. Field edges and small stands of atypical vegetation should be avoided.
- Sample sizes of approximately 2 x 2 m should be used. Where appropriate, the shape of sampled quadrats can be adapted from the standard square to cover a plot of the same total area.
- Tick presence of indicator species at each sampled stop.
- Record % cover of listed features at each stop (including combined cover of 'undesirable species': creeping thistle, spear thistle, curled dock, broad-leaved dock, common ragwort, common nettle, marsh ragwort, cow parsley and bracken) and calculate average (mean) cover at all stops in the 'Total' column.
- Count up the number of stops at which each indicator species is present and record in the 'Total' column:
 D (*dominant*) = occurrence at 9 or 10 stops out of 10,
 A (*abundant*) = occurrence at 7 or 8 stops,
 F (*frequent*) = occurrence at 5 or 6 stops,
 O (*occasional*) = occurrence at 3 or 4 stops and
 R (*rare*) = occurrence at 1 or 2 stops.
 Also record species as rare if they were observed on site but not at any of the sampled stops.
- Note other important habitats present in the field, though these do not need to be monitored.

Site Fairfield Meadow			Sample quadrat										
Date 2 July 2022			1	2	3	4	5	6	7	8	9	10	Total
% herb/sedge cover excluding white clover & creeping buttercup (target > 20%)			90	90	85	80	95	85	90	95	90	90	89
% undesirable species (target < 5%)			0	0	0	0	0	1	0	1	0	0	<1
% bare ground (target < 10%)			1	1	1	1	1	1	1	1	1	1	1
% scrub (target < 5%)			0	0	0	0	0	0	0	0	0	0	0
% large sedges, rushes, reeds (< 30%)			0	0	0	0	0	1	0	0	0	0	<1
agrimony	G06												
autumn hawkbit	G06	G02											
betony	G06												
bird's-foot-trefoil	G06												
bitter-vetch	G06												
black knapweed	G06			✓			✓				✓		O
black medick		G02											
bugle	G06												
bulbous buttercup		G02											
burnet saxifrage	G06												
common bistort	G06												
common cat's-ear		G02			✓		✓						R
common meadow-rue	G06												
common sorrel		G02	✓	✓	✓	✓	✓	✓	✓	✓	✓		D
cowslip	G06												
cuckoo flower		G02											
devil's-bit scabious	G06												
dropwort	G06												
dyer's greenweed	G06												
eyebright	G06										✓		R
field scabious	G06												
field wood-rush		G02											

Site Fairfield Meadow		Sample quadrat										
Date 2 July 2022		1	2	3	4	5	6	7	8	9	10	Total
germander speedwell	G02											
glaucous/common/carnation sedge	G06											
goat's-beard	G06											
great burnet	G06											
greater bird's-foot-trefoil	G06			●								R
lady's bedstraw	G06											
lady's-mantles	G06											
lesser trefoil	G02											
marsh marigold	G06											
marsh valarian	G06											
marsh/fen bedstraw	G06											
meadow buttercup	G02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	D
meadow vetchling	G06	●										R
meadowsweet	G06											
milkworts	G06											
narrow-leaved water-dropwort	G06											
orchids	G06		✓		✓		✓					O
ox-eye daisy	G06		✓				✓					R
pepper-saxifrage	G06											
pignut	G06											
ragged robin	G06											
red clover	G02	✓	✓	✓	✓	✓	✓	✓	✓		✓	D
ribwort plantain	G02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	D
rough hawkbit	G06											
salad burnet	G06											
saw-wort	G06											
selfheal	G02						✓					R
sneezewort	G06											
tormentil	G06											
water avens	G06											
water mint	G06											
wood anemone	G06											
yarrow	G02											
yellow rattle	G06	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	D

Lowland Meadow	at least 2 G06 species <i>Frequent</i> and at least 2 G06 species <i>Occasional</i>
Semi-improved Grassland	at least 4 G02 or G06 species <i>Occasional</i>

Appendix 1c: Grasses present in Fairfield Meadow, 5 July 2019 (not monitored in 2022)

Site Fairfield Meadow						
Date 5 July 2019	1	2	3	4	5	Total
% herb/sedge cover excluding white clover & creeping buttercup (target > 20%)	80	50	80	40	80	
% undesirable species (target < 5%)	0	<1	0	0	0	
% bare ground (target < 10%)	1	<1	<1	<1	0	
% scrub (target < 5%)	0	0	0	0	0	
% large sedges, rushes, reeds (< 30%)	0	0	0	0	0	
common bent	✓	✓	✓	✓	✓	D
crested dog's-tail	✓	✓	✓	✓	✓	D
meadow foxtail		✓	✓	✓	✓	A
perennial ryegrass	✓	✓	✓		✓	A
red fescue			✓			R
rough meadow-grass		✓				R
smooth meadow-grass				✓		R
sweet vernal-grass	✓	✓	✓	✓	✓	D
Yorkshire-fog	✓	✓	✓	✓	✓	D

Appendix 2a: Pony Wood Monitoring Form 2022

Stop number	1	2	3	4	5	6	7	8	9	10	Date: 23 April 2022
1. Area attribute											
no loss of woodland area	✓										
2. Structure and natural processes											
oak											target for HLS - Tree species should be present at irregular spacing
ash		✓	✓	✓	✓	✓	✓				
beech	✓							✓	✓	✓	
birch											
Overall canopy cover %	60	80	60	50	40	70	60	50	70	60	target for HLS between 25% and 70% of the area
Cover of shrubs % hazel, blackthorn, rowan, hawthorn and holly	3	5	3	3	5	5	10	2	25	20	target for HLS hazel, blackthorn, rowan, hawthorn and holly 20% to 75%.
approximate number of age classes	4	4	3	3	3	3	3	3	5	5	desirable features - no target
seedlings	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
sapling	✓	✓							✓	✓	
young trees									✓	✓	
mature trees	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
over- mature trees,	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
veteran/ancient											
areas of relatively undisturbed mature/old growth stands or a scatter of large trees allowed to grow to over-maturity/ death present	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
fallen or standing dead-wood present	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	desirable features - no target
3. Field-layer composition											
bluebells	✓	✓	✓					✓		✓	target for HLS by yr 8 - 2 species should be at least occasional
dog's mercury											
primrose	✓			✓					✓		
ramsons								✓			
wood anemone										*	
wood-sorrel											
Other woodland herbs											
lesser celandine	✓	✓	✓	✓			✓	✓		✓	desirable features - no target
lords-and-ladies		✓							✓		
4. Undesirable field species											
common nettle					✓	✓	✓		✓		target for HLS by yr 8 - no species should be more than occasional
curled dock											
broadleaved dock											
spear thistle											
creeping thistle,											
common ragwort											
sycamore seedling	✓	✓	✓	✓		✓	✓	✓	✓	✓	
5. Regeneration potential											
Signs of seedlings growing through to saplings to young trees	✓	✓		✓	✓	✓		✓	✓	✓	desirable features - no target ash, hawthorn, blackthorn, cherry

Appendix 2b: Little Wood and New Plantation Monitoring Form 2022

Stop number	Plantation			Little Wood			Date: 23 April 2022
1. Area attribute							
no loss of woodland area	✓			✓			
2. Structure and natural processes							
oak	✓			✓			target for HLS - Tree species should be present at irregular spacing
ash				✓			
beech							
birch	✓						
Overall canopy cover %	20			80			target for HLS between 25% and 70% of the area
Cover of shrubs % hazel, blackthorn, rowan, hawthorn & holly	60	90	40	15			target for HLS hazel, blackthorn, rowan, hawthorn & holly 20 - 75%.
approximate number of age classes							desirable features - no target
seedlings		✓	✓	✓			desirable features - no target
sapling	✓	✓	✓	✓			
young trees	✓	✓	✓	✓			
mature trees				✓			
over- mature trees,							
veteran/ancient							
areas of relatively undisturbed mature/old growth stands or a scatter of large trees allowed to grow to over-maturity/death present							
fallen or standing dead-wood present				✓			desirable features - no target
3. Field-layer composition							
bluebells				✓	✓		target for HLS by yr 8 - 2 species should be at least occasional
dog's mercury							
primrose							
ramsons							
wood anemone							
wood-sorrel							
Other woodland herbs							
lesser celandine	✓	✓	✓	✓		✓	desirable features - no target
lords-and-ladies						✓	
4. Undesirable field species							
common nettle	✓		✓	✓			target for HLS by yr 8 - no species should be more than occasional
curled dock							
broadleaved dock							
spear thistle							
creeping thistle,	✓						
common ragwort							
sycamore seedling		✓	✓				
Spanish bluebell							no target
5. Regeneration potential							
Signs of seedlings growing through to saplings to young trees		✓	✓	✓			desirable features - no target blackthorn, holly, field maple, hawthorn

Appendix 3a: Fairfield Arable-margin Monitoring Form 2022 - Storton mix

<i>Stop number</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>Date: 30 July 2022</i>
2. Cover of bare ground											target for HLS - between 5% and 10 % by year 2
bare ground	5	10	5	10	5	5	10	5	20	15	
3. Field-layer composition - Storton mix											target for HLS - between 5% and 60% of at least 3 sown desirable broad-leaf species by year 2
spring triticale (wheat/rye hybrid)											
poacher white millet											
fodder radish	30	25	10	10	50	50	30	25	25	20	
spring barley				20			35	1			
spring wheat				5		1	5		10	1	
gold of pleasure								5	5	15	
mustard											
purple ramping-fumitory											
tansy-leaved Phacelia											
borage						1					
common fumitory			1		10		15				
corn marigold					1		5				
cornflower											
corn camomile											
common couch grass	30	30						25	15	40	
bindweed	✓	✓	✓						✓	✓	
4. Undesirable field species											target for HLS - no species should be more than occasional
common nettle											
curled dock											
broadleaved dock											
spear thistle											
creeping thistle,			5	1	5		20	20		1	
common ragwort											

Appendix 3b: Fairfield Arable-margin Monitoring Form 2021 - HE10 mix

<i>Stop number</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>Date: 30 July 2022</i>
1. Cover of desirable species - HE10 mix											
crested dog's- tail		5						15		5	target for HLS - at least 75% cover of desirable species by year 1
small leaved timothy	15	15		5				35			
smooth meadow-grass	5										
red fescue		5		5	5		5	5			
common bent		5		5	35	10	5				
<i>Yorkshire-fog</i>	5		25	25	5	10	15	5	10	5	Other non-target grass species present
<i>creeping bent</i>	5	15	25	25	15	35	15	30	5	5	
<i>ryegrass</i>					5				5		
<i>meadow foxtail</i>											
<i>cock's-foot</i>											
<i>sweet vernal grass</i>											
<i>rough meadow-grass</i>											
<i>marsh foxtail</i>											
<i>false oat-grass</i>						5					
2. Cover of bare ground											
bare ground					1				5		target for HLS - between 5% and 10 % by year 2
3. Field-layer composition - HE10 mix											
black knapweed		25	20	30	35	45		40	50	50	target for HLS - between 5% and 60% of at least 3 sown desirable broad-leaf species by year 2
yarrow		5	1						40	20	
ox-eye daisy	5			5				5			
ribwort plantain	50	1	5		10	5	15	10	5	5	
red clover								5	5	5	
meadow vetchling											
common bird's-foot											
<i>meadowsweet</i>											
<i>tansy-leaved Phacelia</i>											
<i>cut-leaved crane's-bill</i>											
<i>greater bird's-foot</i>											
<i>greater knapweed</i>											
<i>common fumitory</i>											
<i>borage</i>											
<i>cudweed</i>											
<i>cornflower</i>											
<i>corn marigold</i>											
<i>corncockle</i>											
<i>corn chamomile</i>											
<i>lady's bedstraw</i>		5									
<i>hedge bedstraw</i>		5							5		
4. Undesirable field species											
common nettle			1								target for HLS - no species should be more than occasional
curled dock											
broadleaved dock	10	10									
spear thistle											
creeping thistle,			15			40	60	5	10	5	
common ragwort											