Site Visit Assessment Form – Pickering's Meadow, Lincolnshire
Update following re-visit in 2022

Yellow dots are quadrat locations visited in 2022.
Red dots are those visited in 2017.
2022 amendments to the form are in red text

Site Name	Grid Ref	County	
Pickerings Meadow	1=TF 041793 2=TF 042792 3=TF 040794 4=TF 040792	Lincolnshire	
River	**Ownership**	**Designation**	**Size (ha)**
Dunholme Beck	In 1984, gift of Miss EH Pickering to Lincolnshire Wildlife Trust (fields 3 and 4). Fields 1 and 2 purchased by LWT in 2008	None	1=2.25 2=1.99 3=1.71 4=0.61
Date 13/07/2017 23/06/2022	**Meeting with** LWT	**Managed by** Lincolnshire Wildlife Trust	

Management and History
Fields 1 and 2 are cut annually for hay and grazed by sheep from mid-August to the end of each year. Fields 3 and 4 are old meadows surrounded by trees and tall hedges. 'Pickering's Meadow' is a Lincolnshire Wildlife Trust Nature Reserve, which was received as a gift from Miss E. H. Pickering in 1984, extended in 2008 by purchasing 2 adjacent fields (1 and 2).
The original meadows were managed by the previous owners by cutting for hay and aftermath grazing with horses. The sward was very short with large clumps of docks, thistles and coarse grasses. In early 1990's horse grazing was replaced with sheep grazing. Since then the meadows have been hay cropped in mid-July and the aftermath grazed. In recent years issues caused by dog-walkers prevent the meadows from being managed consistently. The small meadow at the entrance to the site (field 4) and the bigger meadow to the North in recent years have suffered from the dog walkers, and the previous grazier refused to cut the hay because of faeces. Also refuses to put sheep on it because they were attacked by dogs. The site has great burnet on it, although vegetation is very tall. It is likely to be nutrient rich, in part due to lack of hay cut. It is currently cut and grazed by a new grazier but dogs off leads still cause a problem along the public footpath that crosses through the fields, particularly when livestock are present, also affecting a quality of a hay crop.
Restoration
There are two restoration fields adjacent to Pickering's Meadow. Restored from arable to species-rich meadows by establishing grassy sward by seeding Italian ryegrass *Lolium multiflorum* in the first couple of years and cutting to reduce the nutrient level. This was followed by then sowing a seed mix brush harvested from local sources, cutting and grazing and applying green hay from the nearby SSSI meadows. Field 3 has probably been adversely affected by herbicide application in previous years.

Hydrology	The river is next to field 1, but it is very small and floods only a small area of the field. No floods on field 2
Flooding regime Water management Soil-water levels (indicated by auger hole/any other data)	
Historical information	

Current site interest	Attached excel spreadsheet for botanical data

Field 1 has very sparse and non-grassy vegetation. Red clover *Trifolium pratense* is recorded but may be a hybrid. It is very large and vigorous. Yellow rattle *Rhinanthus minor* has spread along with red clover very widely across the field. It is likely to be supressing the grasses and facilitating the spread of target species. Target species are well spaced apart from each other. It will take some time to get a species-rich and closed meadow sward here. The current community is most similar to dry sub-communities of MG5 and MG4, but it is far from being conclusive. Low fertility and low soil wetness are supported by Ellenberg indicator scores of N=4.8 and F=4.8, respectively.

In 2022, a botanical survey was carried out on five 1 x 1 m quadrats across the field. Species richness in the field hasn't changed much since the previous survey in 2017.

However over the same time period, the plant communities have increased their similarity scores to the reference NVC types by 5%. The Typical MG4 Great Burnet-Meadow foxtail grassland has been forming in the field slowly but steadily. A slight decrease in soil nutrient levels is identified by Ellenberg indicator values (N) (Table 1), which might be supporting changes in community composition.

The balance of functional groups in the plant community has been also affected by this decrease in soil nutrients with the proportion of competitive species in the sward declining to a more well-balanced level. However, the proportion of ruderal species, has increased (Table 2).

Yellow rattle, which had a % abundance ranging from 1 to 30% in 2017, had increased to a range of 15 - 80% per 1 m^2 in 2022. The cover of red and white clovers and black medick have gone down from 20 - 80% in 2017 to 1 - 10% in 2022.

Grasses are also very sparse in the field, although perennial rye-grass has increased its cover. The expansion of yellow rattle is likely to help with a decline of this species in the next couple years.

This leaves the meadow in a very good condition to receive propagules of other meadow plants, which will boost species richness and stabilise the plant community as MG4 grassland.

Field 2 looks much more as a meadow than field 1, as the target species distribution across the field is more even. Meadow vetchling *Lathyrus pratensis,* narrow-leaved bird's-foot trefoil *Lotus glaber,* Autumn hawkbit *Leonthodon autumnalis,* rough hawkbit *L. hispidus,* Alsike clover *Trifolium hibridum,* crimson clover *T. incarnatum* and common knapweed *Centaurea nigra* are well spread and established on the field. There are also more grasses on the field. The dominance of perennial rye-grass *Lolium perenne* in the sward can be explained by the specific sowing before restoration.

Field 2 has a "walk-through" plant species list, and no quadrats or more comprehensive walk-through data were collected for fields 3 and 4.

In 2022, a botanical survey was carried out on five 1 x 1 m quadrats across field 2. By 2022, Typical and dry subcommunities of MG4 Great burnet – Meadow foxtail grassland (MG4a and b) are established in the meadow with NVC similarity scores over 60%.
Perennial rye-grass has decreased its cover, while other grasses like red fescue, Yorkshire fog, rough-stalked meadow-grass, smooth brome, crested dog's tail and creeping bent have increased their cover. Ellenberg indicator values confirm that soil in the field is wetter and more fertile than Field 1 (Table 1). The functional diversity of the sward is well balanced on average, across the field.

Field 3. Vegetation on the field is very short with a lot of selfheal *Prunella vulgaris* and hegde bedstraw *Gallium mollugo*. Grasses are mainly crested dog's-tail *Cynosurus cristatus* and red fescue *Festuca rubra*, sparsely distributed along with false oat-grass *Arrhenatherum elatius*. Ribwort plantain *Plantago lanceolata* is one of the most dominant species. Some plant families are missing on the meadow, e.g., Rosaceae, Legumes and Compositae. The vegetation could perhaps be improved by sowing some target herbs. No botanical quadrats were taken here due to lack of time. Soil in this field is similar to field 1 (photo 2 in soil profile section below).

In 2022, a botanical survey was carried out on five 1 x 1 m quadrats across field 3. The species richness in field 3 is similar to fields 1 and 2 (Table 1). Three plant families not found in the field in 2017 (see above), are now well established and are represented by meadowsweet and creeping cinquefoil (Rosaceae), tufted vetch, red and white clovers and bird's-foot-trefoil (Legumes), and dandelion (Compositae).

The forb distribution across the field is still very patchy, but there are good signs of recovery after the accidental herbicide application in 2012. A large and dense population of Adder's-tongue fern is a prominent feature of this field. Ribwort plantain and hedge bedstraw are still dominant in the sward, however red fescue, red clover, smooth brome and yellow oat-grass are increasing their cover.

According to Ellenberg indicator scores, the field is slightly less wet and fertile than Field 2. This condition supports the typical and dry subcommunities of MG4 grassland a with similarity score of just below 60%.

Despite the noticeable progress in meadow recovery, the species richness is below the typical range of 22-25 sp/m^2 observed in MG4a and MG4b subcommuntities of (Rothero et al., 2016). As in Field 1, additional restoration effort at this point would be very helpful.

Field 4 has full species list for plants and animals done before by LWT.

In 2022, a botanical survey was carried out on a walk-through basis, and a species list has been produced. Thirty one species were recorded in the field. Large, healthy

| Phosphorus levels	Not known
Soil profiles	

Soil at quadrat 245 (Field 1)

A horizon
0 – 20 cm – arable soil, silty-clay loam

B horizon
20 – 50 cm – clay loam with iron
50 – 70 cm – yellow sand, smell of sulphur

C horizon
70 – 80 cm – sand with gravel

Soil profile from Field 3 (description by the photo).

A horizon
0 - 10 cm top soil, loam

B horizon
10 - 50 cm – clay loam with iron and inclusion of coarse sand.
50 - 55 cm – organic-rich dark-brown layer with a sharp boarder to the next layer of yellow sand with gravel.

C horizon
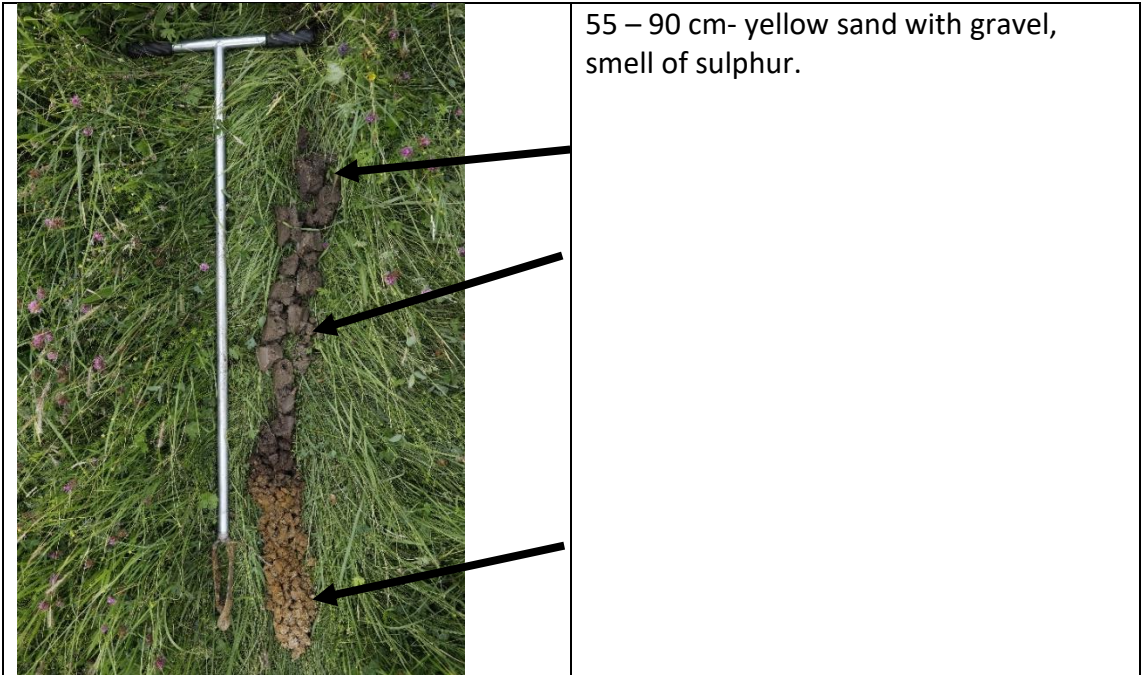
| | 55 – 90 cm- yellow sand with gravel, smell of sulphur. |

Site manager aspirations/objectives

Continue to develop species rich meadows for HLS objectives

Management recommendations

Consistent hay cut and aftermath grazing management on the restoration fields is the best management here. Field 3 would benefit from additional sowing of seeds from plant families which are currently missing in the community (e.g., bird's-foot trefoil *Lotus corniculatus,* meadow vetchling *Lathyrus pratensis,* great burnet *Sanguisorba officinalis,* and common knapweed *Centaurea nigra*. Field 3 is in an excellent condition for the seeds of weak-competitors as Great burnet to germinate and establish in the community, but apparently there are no propagules of those species in the soil. All three fields have excellent perspective of forming species-rich meadow communities.

Field 1 is ready to receive more species via green hay and/or seed application. Yellow rattle has created large areas of open ground, allowing weak competitors and great Burnet, devil's-bit scabious, saw-wort and other desirable meadow species to establish in the field. Seeds of great burnet, meadow vetchling and oxeye daisy could be collected from Field 4 and distributed in Fields 1 and 3, which will hugely benefit from the additional seed application.

It is advised to submit the fields that qualify (if not already done so) to the PHI team at Natural England HabitatInventories@naturalengland.org.uk if you want to include the restoration fields for future Stewardship applications. Send this report with the botanical datasheet attached to the above email address. If you have 1quadrat data not included in this report, that could also be used to assess PHI status, it is recommended to apply the PHI criteria to that also, and submit if the fields meet the criteria.

Table 1. Summary of botanical data.

Pickerings Meadow				
	Field 1 2017	Field 1 2022	Field 2 2022	Field 3 2022
Ellenberg F (moisture tolerance)	4.8	4.88	5.32	5.2
Ellenberg N (fertility)	4.8	4.38	4.96	4.8
Ellenberg R (Reaction)	6.54	6.28	6.3	6.44
Species/quadrat (mean and range /1 m x 1 m)	15 (13-18)	15 (9-18)	16.6 (14-19)	17 (13-19)
NVC (top 2 MAVIS subcommunities)	MG5a MG4a	MG4b MG4v2	MG4b MG4a	MG4b MG4a

Table 2. Functional diversity in the meadows.- C- competitive, S – stress-tolerant, R – ruderal species (Grime 1976).

	Field 1		Field 2		Field 3	
	C : R	S : R	C : R	S : R	C : R	S : R
2022	0.92	0.76	1.04	0.83	1.07	0.93
2017	1.22	0.9				

Table 3. Five categories of meadow restoration progress, measured by indicator scales based on species richness, NVC similarity score and ratios of Grime's plant functional types. Adapted from Rothero, Tatarenko & Gowing, 2020.

Field 1	Score of success/progress				
Measure	1 Failure	2	3	4	5 Success
Average scores from five botanical quadrats per field. Calculated in MAVIS					
Species richness (number of species per 1 m^2)	<8	8 to 12	13-15	16-20	>20
NVC similarity score	<50%	50-55%	55-60%	>60%	>60%
C:S ratio	1.65	1.39	1.23	1.1	1.09
S:R ratio	0.67	0.79	0.81	0.89	0.93

Table 4. Five categories of meadow restoration progress, measured by indicator scales based on species richness, NVC similarity score and ratios of Grime's plant functional types. Adapted from Rothero, Tatarenko & Gowing, 2020.

Field 2	Score of success/progress				
Measure	1 Failure	2	3	4	5 Success
Average scores from five botanical quadrats per field. Calculated in MAVIS					
Species richness (number of species per 1 m^2)	<8	8 to 12	13-15	16-20	>20
NVC similarity score	<50%	50-55%	55-60%	>60%	>60%
C:S ratio	1.65	1.39	1.23	1.1	1.09
S:R ratio	0.67	0.79	0.81	0.89	0.93

Table 5. Five categories of meadow restoration progress, measured by indicator scales based on species richness, NVC similarity score and ratios of Grime's plant functional types. Adapted from Rothero, Tatarenko & Gowing, 2020.

Field 3	Score of success/progress				
Measure	1 Failure	2	3	4	5 Success
Average scores from five botanical quadrats per field. Calculated in MAVIS					
Species richness (number of species per 1 m^2)	<8	8 to 12	13-15	16-20	>20
NVC similarity score	<50%	50-55%	55-60%	>60%	>60%
C:S ratio	1.65	1.39	1.23	1.1	1.09
S:R ratio	0.67	0.79	0.81	0.89	0.93