Ecology Survey

National Vegetation Classification

Barn Field (Mill Brook Meadow), Tattenhall

July 2022

Project:	Barn Field (Mill Brook Meadow) National Vegetation Classification Survey Report
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1 SUMMARY

1.1. A grassland National Vegetation Classification (NVC) Survey, together with soil sampling was undertaken at Barn Field (Mill Brook Meadow), off Millennium Mile, Tattenhall, CH3 9RA to provide a baseline survey of the habitat type and quality, and to inform future management plans for the site.

1.2. The NVC Survey was undertaken on the 1st July 2022 by Dr Rosalind King, MCIEEM. Dr King has over 15 years' experience as a Private Consultant and local Authority Ecologist including experience at undertaking vegetation surveys to NVC Standard in woodland, grassland and open mosaic habitats across England.

1.3. The grassland community had a Very Good fit to the Mesotrophic Grassland MG1 following analysis on Tablefit. This grassland is typical of ungrazed meadows managed for hay, where coarse grasses such as false-oat grass, cock's foot and Yorkshire fog dominate over finer grasses such as red fescue and crested dog's tail. The grassland also falls into the unimproved neutral grassland category of the JNCC Phase 1 Habitat Survey system[1], or the g3c5 category Arrhenatherum neutral grassland of the UK Habitat Classification system[2]. This community usually forms on neutral soils and is similar to the grassland formed in the nearby Glebe Meadow.

1.4. This grassland is common across Britain in areas where grazing pressure has reduced, whilst hay cutting continues. It also forms alongside rail and road verges which are mown occasionally and in churchyards and unmanaged agricultural areas. As such it is considered to be of no more than local ecological value.

1.5. In terms of retention of the grassland in current form, it is recommended that the current cutting regime continues, with all arisings removed after a few days of drying in situ. This drying period allows seed drop, enabling maintenance of the sward vegetation diversity. Low levels of localised nutrient enrichment is unlikely to significantly alter the sward vegetation components.

1.6. It is considered minor management changes, such as increasing public access, or slightly amending the hay cut regime, is unlikely to alter the NVC community type or soil nutrient status. More major changes such as introduction of grazing, or cessation of the hay cut could alter the NVC community type over time.

1.7. It is recommended the grassland remain of limited access to the public, in order to protect Mill Brook Wildlife corridor, and the wildlife reliant upon Mill Brook.

1.8. It is recommended any management changes are in line with local conservation objectives and that the site is monitored at minimum 5 and 10 years after implementation of any management changes, to determine how the NVC community, and wildlife value of Barn Field (Mill Brook Meadow) is being affected. Should the habitats be adversely affected, it is recommended the management be returned to the current cutting regime, in order to retain the current conservation value of Barn Field (Mill Brook Meadow).

[1] JNCC, (2010), Handbook for Phase 1 habitat survey – a technique for environmental audit, JNCC, Peterborough, ISBN 0 86139 636 7.

[2] Butcher, B., Carey, P., Edmonds, R., Norton, L. and Treweek, J. (2020) *UK Habitat Classification – Habitat Definitions V1.1 at* http://ukhab.org

2. INTRODUCTION

2.1. A National Vegetation Classification Survey (NVC) was undertaken of the grassland at Barn Field (Mill Brook Meadow), off Millennium Mile, Tattenhall, CH3 9RA (National Grid Reference SJ 481 587). The survey was undertaken to provide a baseline survey of the habitat type and quality at Barn Field (Mill Brook Meadow), with the aim to enable continued monitoring over time and inform any future amendments to the meadow management plan as required in light of any change in management or access rights to the meadow.

2.2. The NVC survey was undertaken on the 1st July 2022. This is an appropriate time of year for undertaking grassland surveys, as the majority of plants are fully flowering by this time. Five quadrats were assessed to determine vegetation community type. Dr Rosalind King undertook an NVC survey.

2.3. This report sets out the survey methods and results, including the determination of NVC community type. The results are a snapshot of current grassland conditions and have not been compared to existing species records for the site or wider area. However, the author is familiar with the area and has used her background knowledge to inform habitat management recommendations in light of likely presence of protected species in the wider area. Final recommendations for future habitat use and management are provided based on these results and surveyor experience.

3. METHODS

3.1. Barn Field (Mill Brook Meadow) was subject to a detailed vegetation surveys adapted from NVC survey methods[3,4,5] and professional judgement and is considered sufficient for use as an evidence base. No other surveys were considered necessary at this stage, although invertebrate surveys may be beneficial in the future.

3.2. The NVC system classifies habitats according to plant species composition within, and frequency of occurrence between, defined survey quadrats (full definition in Appendix 3 – Glossary). The NVC survey for grasslands was undertaken in early July which is a suitable time of year for survey as the grasses and sedges are flowering making identification more reliable. However, earlier flowering species typical of this type of grassland, such as cow parsley, or relic woodland understorey species, may not be identified due to flowering having finished or the sward being tall and densely populated by grasses at this time of year. This limitation is taken into account within the report conclusions and is not considered to adversely impact the survey results or conclusions drawn.

3.3. The survey was undertaken by Dr Rosalind King, MCIEEM. Dr King has over 15 years' experience as a Private Consultant and local Authority Ecologist including experience at undertaking vegetation surveys to NVC Standard in woodland, grassland and open mosaic habitats across England. Dr King studied under Prof J Rodwell (NVC author and editor) and is therefore very familiar with the principals behind NVC survey methods.

3.4. Barn Field (Mill Brook Meadow) was initially visually assessed to determine possible differences in community type across the site. Five quadrats (2 m x 2 m) were sampled randomly across the meadow, with an attempt to capture vegetation in areas of slightly different vegetation dominance or sward height to ensure good coverage of the meadow as a whole and obtain a representative sample of the community type. Percentage cover of each vascular plant species present within each quadrat was recorded to enable statistical analysis using Tablefit[6]. For all sites the percentage cover scores were converted to Domin scores to enable comparison with the published floristic tables (see Table 3.1).

Table 3.1: Domin score conversion from percentage vegetation cover, as determined when assessing cover of live, above-ground plant parts by eye vertically. Due to layering effects of vegetation, the total percentage cover can be greater than 100%

Cover (%)	Domin Scale
91-100	10
76-90	9
51-75	8
34-50	7
26-33	6
11-25	5
4-10	4
< 4 many individuals	3
< 4 several individuals	2
< 4 few individuals	1

[3] British Plant Communities Volume 1 - Woodlands and scrub (Rodwell, J. S. (ed.), 1991)
[4] British Plant Communities Volume 3 – Grasslands and montane communities (Rodwell, J. S. (ed.), 1992)
[5] National Vegetation Classification: users' handbook, JNCC (Rodwell, J. S., 2006)

3.5. The methods were adapted from those within the NVC handbook and those used by Rodwell when gathering field samples to differentiate communities. NVC communities can be determined from species lists, however the closer the approach is to the original NVC sampling method, the more robust the analysis of the data and the higher the certainty in the final community assessment. Bryophytes and lichens were not recorded as they are not essential for determining grassland NVC communities. The locations of the quadrats were noted and mapped for future monitoring purposes.

3.6. The vegetation data was run through the programme Tablefit[6] in order to determine NVC community type. For the site as a whole, frequency of each species occurrence over the five quadrats, together with average percentage cover data for the combined quadrats in each area was analysed using Tablefit. The NVC floristic tables present frequency as a Roman numeral value between 1 and 5 (I, II, III, IV and V), with frequency determined by noting how many quadrats a species occurs in over the surveyed area (i.e. present in five out of five quadrats would result in a frequency of V (5), three out of five would be III (3) etc. Tablefit allows for frequency to be determined as a percentage or as a number of occurrences so is less restrictive than the I – V Roman numeral assessment method.

3.7. The programme produces an output of the top five possible NVC communities along with a percentage of the 'goodness-of-fit' (see Glossary) to each of the potential communities (Appendix 3). The 'goodness-of fit' rating is used only as a guide and does not relate to the quality of habitat (e.g., a poor 'goodness-of-fit' rating does not mean the habitat quality is poor but rather the community composition does not match well with published floristic data for the NVC community specified). Instead, the 'goodness-of-fit' rating is a tool to identify potential NVC community type as vegetation communities are on a continuum and are unlikely to match NVC communities exactly. Therefore, the floristic tables from each sample were also compared with published accounts and floristic tables of the relevant NVC community descriptions[7] to enable the most likely NVC community to be identified, although 'exact' matches are still uncommon. Finally, each quadrat was run separately through Tabletfit, using just the percentage cover data to identify areas of slightly different habitat that may affect the 'goodness-of-fit' rating. Using this three-step approach allows greater certainty in the final NVC community determined for Barn Field (Mill Brook Meadow) as a whole, and will allow for more focused analysis of changes in habitat quality over time during ongoing monitoring of the Meadow.

3.8. The quadrat locations were mapped using Magic Maps[8], with location details presented in Table 4.2.

3.9. Weather conditions, general habitat conditions and incidental species records were also noted during the survey as presented in Table 4.1, 4.3 and Appendix 2.

Survey Limitations

3.10. The methods are consistent with national methods and in accordance with best practice. The site was fully accessible. However, the results and conclusions set out in this report should be considered within the context of the survey limitations which are:

[6] TABLEFIT, version 2.0 for identification of vegetation types. Huntingdon: Institute of Terrestrial Ecology (Hill, M. O. and Centre for Ecology and Hydrology, 2015).
[7] British Plant Communities. Volume 3. Grassland and montane communities. Cambridge University Press (Rodwell, J. S. (ed.), 1992)
[8] https://magic.defra.gov.uk/MagicMap.aspx

- *Time of year* – the surveys were undertaken at the optimal time of year for grassland surveys according to NVC methods. Spring, autumn and late flowering species were not visible or flowering at the time of survey and this influences the species recorded and their relative abundance within quadrats. However, relative abundance changes with season and this is accounted for within NVC methods. Missing a few early or late-flowering species from a sample would not have significantly affected the goodness-of-fit as this is calculated on the species present within the community as a whole. It is accepted within NVC survey methods, that not all species need to be present in order to determine community type; and

- *Surveyor skills* – the surveyor is a suitably qualified ecologist with good plant identification skills (estimated FISC level 4 / 5). However, the ecologist is not skilled in bryophyte or fungal identification and these were therefore not recorded to species level, although if present they were noted. However, NVC of the habitats present would not have been limited by this and the Tablefit programme takes into account samples where bryophyte and fungi were not recorded. In addition, the ecologist is not skilled at identifying diverse plants such as dandelion or bramble to species level. For NVC community determination, it is accepted that dandelion and bramble are identified as *Taraxacum officinale agg. and Rubus fruticosus agg.*

Evaluation

3.11. The NVC community was compared with Priority Habitat descriptions[9] to identify any Priority Habitat within the Site. Priority habitats are listed under the Natural Environment and Rural Communities Act (NERC) 2006. The community was also classified in accordance with JNCC Phase I Habitat Classification and the new UK Habitats Classification system.

3.12. The habitat was also evaluated using the CIEEM guidance for Ecological Impact Assessment (EcIA) in the United Kingdom[10]. The level of value of specific ecological receptors is assigned using a geographical frame of reference, i.e. international value being most important then national, regional, county, district, local and lastly, within the immediate Zone of Influence (ZoI) of the sites. These value based terms are defined in the Glossary.

3.13. Value judgments are based on various characteristics that can be used to identify ecological resources or features likely to be important in terms of biodiversity. These include site designations (e.g. Site of Special Scientific Interest (SSSI), Ancient Woodland, Local Wildlife Site (LWS) or for undesignated features, the size, conservation status (local, national or international), connectivity within the landscape and quality of the ecological resource. Quality can refer to habitats (for instance if they are particularly diverse, or a good example of a specific habitat type), other features (such as wildlife corridors or mosaics of habitats), species populations or assemblages.

3.14. The analysis and evaluation are informed by the NVC community along with surveyor experience and knowledge of the local area and the guidance documents.

[10] Guidelines for Ecological Impact Assessment in the United Kingdom (Institute of Ecology and Environmental Management, 2006)

4. SURVEY RESULTS AND ASSESSMENT

4.1. Weather conditions during the survey are set out in Table 4.1 and were suitable for this type of survey.

Table 4.1: Weather conditions during survey

Date	Time	Temperature (°C)	Cloud cover (%)	Wind (Beaufort Scale)	Conditions
1 July 2022	13:50 – 15:00	17	100	F2	Dry

4.2. The quadrat locations are shown on the map below (Figure 4.1). The latitude and longitude, What3Words and OS Grid references are listed for each quadrat in Table 4.2 so the same area can be sampled again in future to determine changes in habitat type over time if required. The best fitting NVC community, together with the 'goodness of fit' score is also provided for each quadrat in Table 4.2.

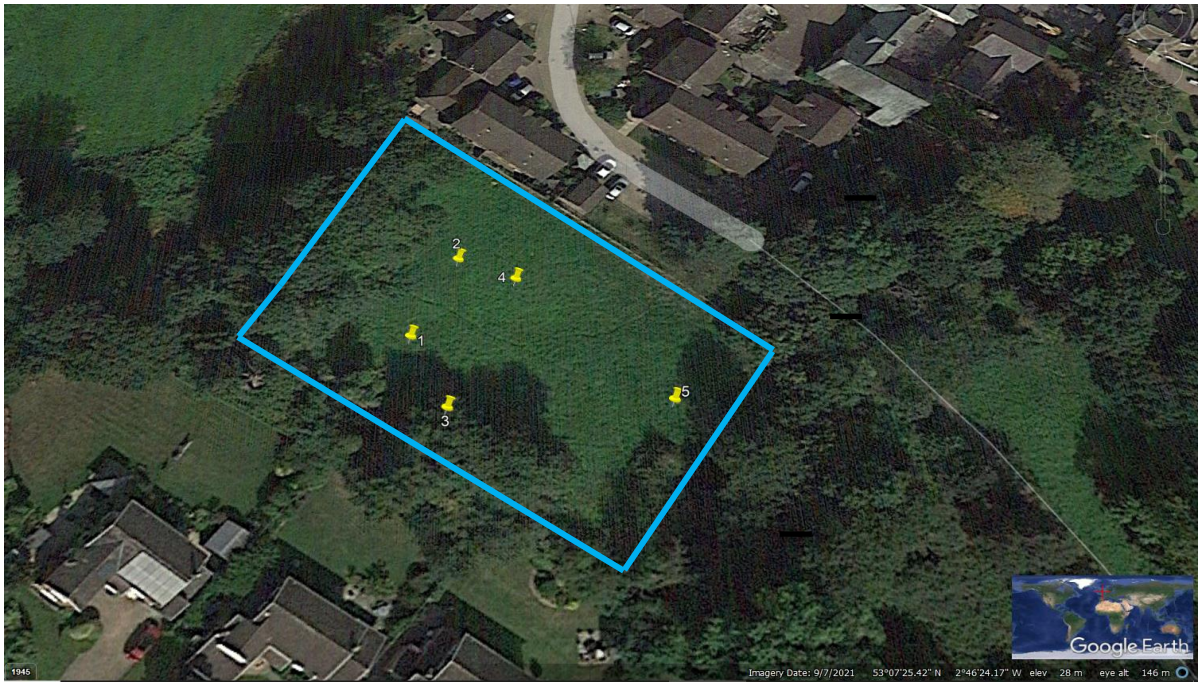

Figure 4.1: Map of Barn Field (Mill Brook Meadow) (blue line indicates approximate survey boundary), including quadrat locations (yellow pins) and number. Map from Google Earth.

4.3. The final NVC community analysis result is presented in Table 4.3, together with a brief description of the habitat and further discussion of the NVC community type and evaluation of Priority Habitat type based on survey outcome. Evaluation of the results is presented in Section 5 and recommendations in Section 6.

Table 4.2: Quadrat locations recorded as OS grid reference, What3Words and Latitude / Longitude, together with top estimated NVC community type and goodness-of-fit for each quadrat determined from Tablefit.

Quadrat	Latitude	Longitude	OS Grid Reference	What3Words reference	Top NVC Community	Goodness-of-fit (%)
1	53.123123	-2.772400	SJ4840 5871	uppermost. focus. unscrew	MG1a	83
2	53.123232	-2.772322	SJ4841 5872	embedded. segmented. galloping	MG1	81
3	53.123029	-2.772147	SJ4842 5870	fonts. stays. states	MG1	81
4	53.123202	-2.772090	SJ4842 5872	washing. defectors. erase	MG1	92
5	53.123037	-2.771916	SJ4844 5870	retailing. pastime. pictured	MG1b	89

4.4. The full NVC table, including Domin and frequency scores, is presented in Appendix 1, together with the results of the Tablefit analysis. A plant species list for the meadow as a whole is in Appendix 2, together with incidental animal records. Scientific plant names are according to Stace[11].

Table 4.3: NVC and Priority Habitat Results.

Number of quadrats sampled	TABLEFIT NVC community	Goodness of fit (%) and Rating *	Final NVC community, and habitat value (underlined) following evaluation	
10	MG1	>80 (Very Good)	MG1	**Mesotrophic Grassland** *Arrhenatherum elatius* Local value

** The 'Rating' is not an indicator of habitat quality but of how well the community sampled matches the defined NVC community. 'Goodness-of-fit' rating varies depending on sampling methods used and resolution of data obtained (e.g. percentage cover provides a higher data resolution than Domin scores). Computerised analysis of community types should be used in conjunction with published floristic tables and vegetation descriptions when determining community types to provide greater certainty in published NVC community type the sample corresponds best with.*

[11] New Flora of the British Isles 2nd Edition (Stace, C. E., 1997)

Discussion

4.5. Barn Field (Mill Brook Meadow) is a grassland approximately 0.3 hectare in size, located in the centre of Tattenhall, Cheshire, west of the Millennium Mile footpath and north of Mill Brook. The meadow is surrounded by mature trees. Low density housing lies to the to the north and south with open farmland to the west. The wider area comprises pastoral land, scattered trees and hedgerows. The meadow is well connected to the wider area, ecologically speaking, via tree lines and Mill Brook. The location of Barn Field (Mill Brook Meadow) in the context of the wider area is shown in Figure 4.2 below.

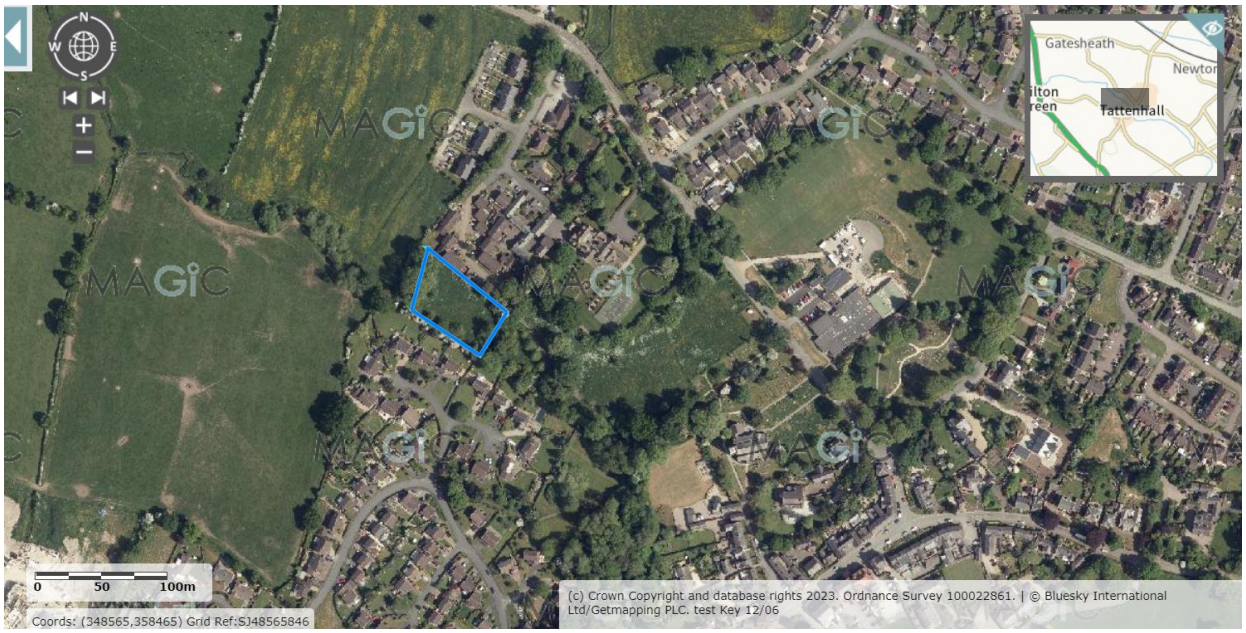

Figure 4.2: The location of Barn Field (Mill Brook Meadow) (approximate blue line boundary), Tattenhall in relation to the surrounding landscape. Map from Magic, (c) Crown Copyright and database rights 2022. Ordnance Survey 100022861. © Bluesky International Ltd/Getmapping PLC. test Key 12/06

4.6. The history of the grassland is unknown, however recently the area started being managed for wildlife, to include managing Barn Field as a wildflower meadow. From the habitat condition, it is likely the meadow is mown once or twice per year, with arisings removed, potentially for hay. The grassland is currently not freely accessible to the public, but can be easily viewed from the adjacent Millennium Mile public footpath, with an information board to encourage public awareness of the wildlife vale of the meadow and wider area.

4.7. The sward height is approximately 1.2m high on average and is dominated by grasses (false oat-grass and cock's-foot) with occasional Yorkshire fog, field bindweed, hogweed, and nettle and rarely creeping buttercup, creeping thistle, common knapweed and smooth meadowgrass (in accordance with the DAFOR scale). Ringlet, small white and gatekeeper butterflies were noted in the meadow, together with other invertebrates. Photographs of the grassland are presented in Figure 4.3 to 4.6 below.

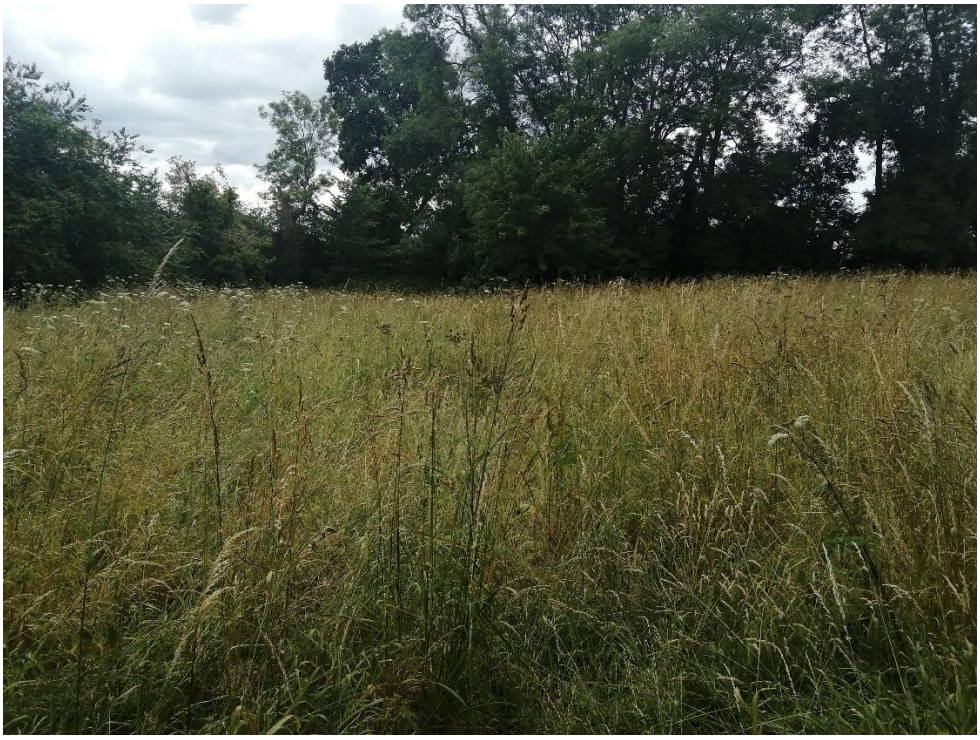

Figure 4.3: Barn Field (Mill Brook Meadow) looking north west towards Mill Brook.

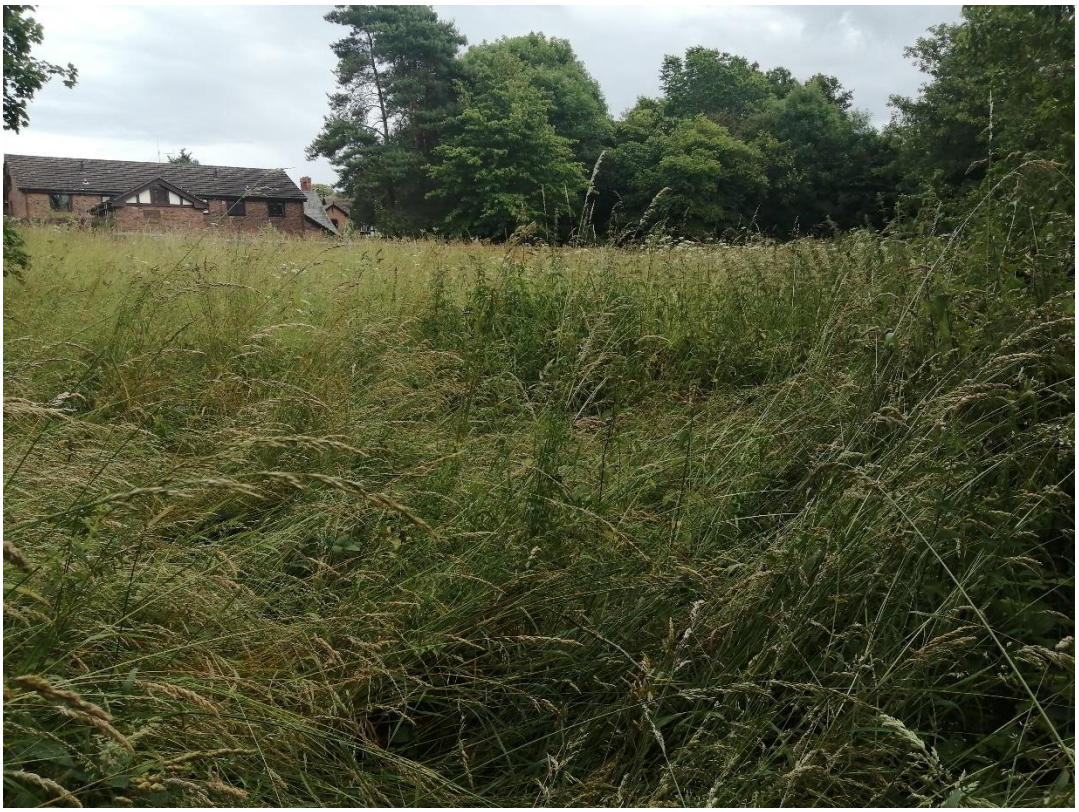

Figure 4.4: Barn Field (Mill Brook Meadow) looking west from near the banks of Mill Brook.

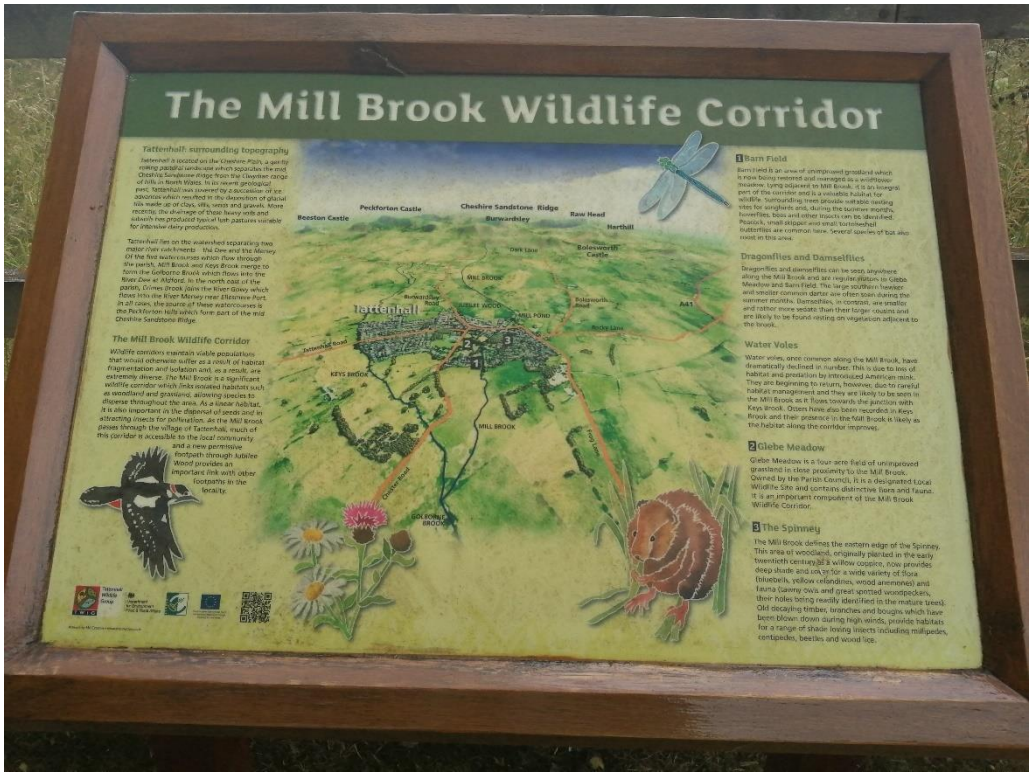

Figure 4.5: Barn Field (Mill Brook Meadow) information board highlighting the wildlife value of the meadow and ongoing management aspirations as part of the wider Mill Brook Wildlife Corridor.

Figure 4.6: Barn Field (Mill Brook Meadow) flora including false oat-grass and hogweed.

4.8. The majority of quadrats (3 of the 5) returned a very good (>80%) fit to an MG1 *Arrhenatherum elatius* type grassland with the remaining two quadrats having a very good fit to subcommunities thereof. The subcommunity MG1a (Q1) was the red fescue community, although this grass was not noted in the sward, but other grasses such as creeping bent and meadow foxtail were present here and in no other quadrat. The nettle subcommunity (MG1b) occurred in one quadrat, towards the entrance to the meadow. Overall, the grassland is considered to be a typical, but species poor, MG1 mesotrophic grassland, with between 7 and 11 species per 2 m x 2 m quadrat. This concurs with the current management of the site as a wildflower meadow, as MG1 grasslands are typical mesotrophic grasslands that are unimproved, with low nutrient input and regular cutting. The nutrient status of the soil is retained at a moderate to low level through removal of arisings (likely as a source of hay) and lack of grazing (manure addition) or fertiliser addition.

5. EVALUATION

5.1. Barn Field (Mill Brook Meadow) is considered to be an MG1 false oat-grass mesotrophic grassland, having a very good fit to this grassland community when analysed by the Tablefit software. It is not a particularly diverse example of this community, with only 21 species being recorded within the quadrats and an additional 1 grassland herbaceous plant recorded outside the quadrats.

5.2. In terms of JNCC Phase I habitat type, the grassland fits in with Unimproved Neutral Grassland, whilst under the new UK Habitats Classification system it is considered to be a g3c5 Arrhenatherum neutral grassland.

5.3. The grassland is considered to be no less than Local ecological value due to its location alongside Mill Brook and near Glebe Meadow (a larger MG1 grassland to the south east). It acts as a stepping stone habitat to other areas of similar habitat in the wider environment along Mill Brook Wildlife corridor. It is not currently Priority Habitat, as it is not sufficiently species-rich, but with altered management could be so in the future, potentially, with appropriate management including seeding with native, locally sourced species that would occur in an MG5-type Lowland Meadow Priority grassland. However, it is still of value to wildlife and as a community asset under the current management regime, despite not being a Priority Habitat.

5.4. Should the annual cutting for hay cease, the grassland is likely to revert to a scrub habitat with bramble and tree saplings quickly establishing. As with the nearby Glebe Meadow, minor amendments to site use, such as slightly increased mowing, or increased recreational use of the site by the public for walking and dog-walking, are unlikely to alter the NVC community type significantly, although a different, less diverse MG community may form alongside the paths should foot traffic increase. With the provision of dog bins in the locality, there is unlikely to be significant nutrient loading to the grassland as a result of increased use by dogwalkers that would alter the whole meadow NVC community to a less diverse type. This is due to the current plant community being resilient to slight soil nutrient changes. However with the proximity to Mill Brook, it is considered presence of dogs may disturb other wildlife that is dependant on Mill Brook, such as water vole.

6. RECCOMENDATIONS

6.1. In order to retain the grassland as an MG1 community, it is recommended the current management practices continue, which is assumed to include an annual cut in July / August. The arisings should be left in situ for a minimum of three days to allow seeds to drop and repopulate the seed bank. The hay should then be removed to reduce risk of nutrient build up and subsequent decline in habitat quality over time.

6.2. Should the meadow be opened to the public to provide an additional recreational resource, it is unlikely that there will be significant impacts on the NVC community, as MG1 grasslands are robust and able to withstand higher levels of nutrient input or trampling as evidenced by their common occurrence alongside roadsides, and formation in churchyards and neglected industrial and agricultural habitats.

6.3. Although the presence of dogs are unlikely to adversely affect the grassland to the extent that the community type would change, dogs and the public may result in increased disturbance to the adjacent Mill Brook, where water vole recolonisation is currently being encouraged. In order to provide a buffer to Mill Brook, to enable species dependant on water courses to re-establish, it is recommended the meadow remains as current, with minimal public access.

6.4. Should the aim be to improve the biodiversity value of the meadow, it may be necessary to introduce grazing at the site as a means to control the broad-leaved grasses. However, the practicalities of this in this small meadow likely mean this option is not viable. Alternatively, more regular cuts (for example once in early spring and once in late autumn) could improve the floral diversity of the meadow, with arisings being removed. This may need to be in conjunction with plug planting of locally sourced typical hay meadow species that are currently not present or sparsely present in the sward. However, this approach may improve floral diversity, whilst invertebrate diversity may change due to introduction of a grazing regime. Therefore any significant change in management should carefully consider the conservation objectives for the wider area, to ensure they are in alignment with biodiversity aspirations for Cheshire as a whole. Invertebrate surveys may be advisable to inform major management changes.

6.5. Any change in management of Barn Field (Mill Brook Meadow) is recommended on a temporary basis, with monitoring at least 5 years and 10 years into the management change to detect NVC community changes and inform updates to any amended management plans. Monitoring should be done at an appropriate time of year (between May and July). Should the NVC community change to a less desirable one, it is recommended the site management is amended to ensure the change is not permanent. MG1 meadows are resilient in the short term, and can quickly retain their original community once the original management is reinstated after a short period of change.

7. CONCLUSION

7.1. Barn Field (Mill Brook Meadow) is considered to fall into the MG1 false oat-grass NVC habitat type. It is typical of the grassland that establishes in areas which are cut only a few times a year, with the arisings removed for hay. It is also an unimproved neutral grassland and g3c5 Arrhenatherum neutral grassland. It is considered to be of at least Local Ecological Value.

7.2. It is considered minor management changes, such as increasing public access, or slightly amending the hay cut regime, is unlikely to alter the NVC community type or soil nutrient status in the medium term. More major changes such as introduction of grazing, or cessation of the hay cut could alter the NVC community type over time. However increased public access is not recommended to protect wildlife dependant on the adjacent Mill Brook.

7.3. It is recommended any management changes are in line with local conservation objectives and that the site is monitored at minimum 5 and 10 years after implementation of any management changes, to determine how the NVC community, and wildlife value of Barn Field (Mill Brook Meadow) is being affected. Should the habitats be adversely affected, it is recommended the management be returned to the current cutting regime, in order to retain the current conservation value of Barn Field (Mill Brook Meadow).

Appendix 1 NVC Tables and Tablefit Analysis

Table A1.1: Barn Field (Mill Brook Meadow) Quadrat Domin Scores, with Domin ranges and Frequency of occurrence

		Domin Scale for each Quadrat (Q)						
English name	**Scientific Name**	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	**Range**	**Frequency**
Cock's foot	*Dactylis glomerata*	7	7	9	7	2	2-9	V
False oat-grass	*Arrhenatherum elatius*	6	7	5	7	9	5-9	V
Field bindweed	*Convolvulus arvensis*	4	4	4	4	4	4	V
Hogweed	*Heracleum sphondylium*	5		6	5	5	5-6	IV
Common nettle	*Urtica dioica*		4	3	3	4	3-4	IV
Cut-leaved cranesbill	*Geranium dissectum*	1	3	4			1-4	III
Meadow vetchling	*Lathyrus pratensis*	2	4		1		1-4	III
Cleavers	*Galium aparine*			1	1	1	1	III
Yorkshire Fog	*Holcus lanatus*	4		4			4	II
Perennial ryegrass	*Lolium perenne*				1	2	1-2	II
Common vetch	*Vicia sativa*	2					2	I
Meadow foxtail	*Alopecurus pratensis*	1					1	I
Creeping bent-grass	*Agrostis stolonifera*	4					4	I
Smooth meadow grass	*Poa pratensis*		1				1	I
Bramble	*Rubus fruticosus agg.*	4					4	I
Common knapweed	*Centaurea nigra*		4				4	I
Lord's and Ladies	*Arum maculatum*		1				1	I
Ground elder	*Aegopodium podagraria*		4				4	I
Creeping buttercup	*Ranunculus repens*			5			5	I
Creeping thistle	*Cirsium arvense*				4		4	I
Hedge woundwort	*Stachys sylvatica*				1		1	I
TOTAL SPECIES PER QUADRAT		11	10	9	10	7		

EXAMPLE TABLEFIT RESULT (Quadrat 2)

Sample MBRQ2 Parameters = All sp Cover% Sp & c

E2.21 MG 1 81 | 69 73 100 97| Arrhenatherum elatius
E2.21 MG 1a 70 | 70 52 100 79| Arrhenatherum elatius Festuca rubra
E2.21 MG 1b 60 | 71 42 91 70| Arrhenatherum elatius Urtica dioica
E2.21 MG 1c 52 | 53 52 68 74| Arrhenatherum elatius Filip ulmaria
E2.21 MG 1e 48 | 41 61 64 76| Arrhenatherum elatius Centaurea nigra

The TABLEFIT output shows best fit to an MG1 NVC community, overall the Barn Field Grassland is considered to fit MG1.

Table A3.2: TABLEFIT outputs detailing two highest scoring NVC communities for each quadrat within Barn Field (Mill Brook Meadow)

Quadrat	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
No. species	11	10	9	10	7
NVC community best fit	**MG1a**	**MG1**	**MG1**	**MG1**	**MG1b**
% fit to NVC community	83	81	81	92	89
Goodness of Fit	Very Good	Very Good	Very Good	Very Good	Very Good
NVC community second best fit	**MG2**	**MG1a**	**MG1c**	**MG1a**	**MG1**
% fit to NVC community	82	70	76	86	76
Goodness of Fit	Very Good	Good	Good	Very Good	Good

Appendix 2 – Full Site Species List

These lists include 22 grassland plant species and 3 animal species noted during the survey. Mature trees and hedgerow species around the meadow periphery have not been recorded.

English Common Name	Scientific Name
Bramble	*Rubus fruticosus agg.*
Cleavers	*Galium aparine*
Cock's-foot	*Dactylis glomerata*
Common knapweed	*Centaurea nigra*
Common vetch	*Vicia sativa*
Creeping bent	*Agrostis stolonifera*
Creeping buttercup	*Ranunculus repens*
Creeping thistle	*Cirsium arvense*
Cut-leaved cranesbill	*Geranium dissectum*
False oat-grass	*Arrhenatherum elatius*
Field Bindweed	*Convolvulus arvensis*
Ground elder	*Aegopodium podagraria*
Hedge woundwort	*Stachys sylvatica*
Hogweed	*Heracleum sphondylium*
Lesser stitchwort	*Stellaria graminea*
Lord's and Ladies	*Arum maculatum*
Meadow foxtail	*Alopecurus pratensis*
Meadow vetchling	*Lathyrus pratensis*
Nettle	*Urtica dioica*
Perennial ryegrass	*Lolium perenne*
Smooth meadow grass	*Poa pratensis*
Yorkshire fog	*Holcus lanatus*

Animal Species list

English Common Name	Scientific Name
Gatekeeper	*Pyronia tithonus*
Ringlet	*Aphantopus hyperantus*
Small white	*Pieris rapae*

Appendix 3 – Glossary and Abbreviations

Term	Definition
Beaufort Scale	A scale of wind speed based on a visual estimation of the wind's effects, ranging from force 0 (less than 1 knot or 1 km/h, 'calm') to force 12 (64 knots or 118 km/h and above, 'hurricane').
County ecological value	A site or priority habitat designated by a county for its ecological value. This includes Local Wildlife Sites and Local Geological Sites for example. These sites are of greater ecological value than sites of district ecological value.
District ecological value	A priority habitat or site designated by a local planning authority for its ecological value and includes area with Tree Preservation Orders (TPOs).
Domin	The Domin system scores vegetation cover on a scale of 1-10 (where 1 = few individuals, 2 = several localised individuals, 3 = individuals scattered throughout sample, 4 = 4 - 10%, 5 = 11 - 25%, 6 = 26 - 33%, 7 = 34 - 50%, 8 = 51 - 75%, 9 = 76 - 90% and 10 = 91 -100% cover) and is used to determine NVC community types.
Goodness-of-fit	A 'goodness-of-fit' rating is used as a guide to determine how well a give sample fits to a defined NVC community type. It is calculated as a percentage with 80-100% meaning there is a very good fit to the identified NVC community type, 70-79% a good fit, 60-69% a fair fit, 50-59% a poor fit and 0-49% a very poor fit.
Local ecological value	A priority habitat under UK Biodiversity Action Plan and Section 41 of Natural Environment and Rural Communities Act 2006 or a habitat of notable biodiversity, size, rarity, quality, species assemblage or value as a wildlife corridor or stepping stone habitat. *Note that some priority habitats of greater ecological status (based on the factors mentioned above) can be valued as of district, county or national importance regardless of their designation or protection.
National ecological value	A Priority Habitat or site designated by a national body e.g. Natural England for its ecological value. This includes Ancient Woodland or National Nature Reserves for example.
National Vegetation Classification	The NVC is a detailed classification system, which assesses the full suite of vascular plant, bryophyte and macro-lichen species and enables the vegetation community to be assessed against the classification. The NVC comprises 286 community types subdivided amongst 12 major types of vegetation which are split over 5 published NVC volumes.
Non-native invasive species	Species listed on Schedule 9 of the Wildlife and Countryside Act 1981.
Phase 2 Survey	More detailed ecological survey of selected single or multi-habitat sites. The National Vegetation Classification (NVC) is the standard method used to carry out Phase 2 Vegetation Survey.
Priority Habitat	These are Habitats of Principal Importance in England and are listed in Section 41 of the Natural Environment and Rural Communities Act 2008. The list includes UK Biodiversity Action Plan habitats.
Quadrat	A rectangle in which plant species, along with their relative abundance or percentage cover are recorded. The dimensions and shape of the quadrat vary depending on habitat type with larger

Term	Definition
	quadrats used for woodland canopy and understorey areas and smaller quadrats used for grassland areas.
Tablefit	A computer programme used to identify vegetation types. A list of species, together with the abundance and frequency of occurrence of the species within the sample if possible, is used by the computer programme to calculate the five most likely NVC communities the sample fits too.
Zone of Influence	Refers to the value of habitat within the immediate area of that habitat or site. This could relate to biodiversity, size, rarity, quality, species assemblage or value as a wildlife corridor or stepping stone habitat.

Abbreviations (including NVC community abbreviations)

Abbreviation	In full
LWS	Local Wildlife Site
JNCC	Joint Nature Conservation Committee
MCIEEM	Full Member of the Chartered Institute of Ecology and Environmental Management
NERC	Natural Environment Research Council
NVC	National Vegetation Classification
MG1	*Arrhenatherum elatius* (False oat-grass) mesotrophic grassland community
MG1a	*Arrhenatherum elatius* (False oat-grass) *Festuca rubra* (red fescue) mesotrophic grassland sub-community
MG1b	*Arrhenatherum elatius* (False oat-grass) *Urtica dioica* (nettle) mesotrophic grassland sub-community
MG9	*Holcus lanatus – Deschampsia caespitosa* (Yorkshire fog – Tufted hair grass) mesotrophic grassland community
OV23d	*Lolium perenne – Dactylis glomerata* (Perrenial ryegrass – Cock's-foot) *Arrhenatherum elatius - Medicago lupulina* (false oat-grass – black medic) open vegetation sub-community
OV25a	*Urtica dioica – Cirsium arvense* (nettle – creeping thistle tall herb) *Holcus lanatus – Poa annua)* Yorkshire fog – annual meadow grass tall herb open vegetation sub-community
OS	Ordnance Survey