Ecology Survey

National Vegetation Classification

Glebe Meadow, Tattenhall

July 2022

Project:	Glebe Meadow National Vegetation Classification Survey Report
Version:	Final
Version Date	V1 – 24 July 2022
	V2 – 4 September 2022 (added soil analysis data)
	Final – 26th January 2023 (following client review)
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1 SUMMARY

1.1. A grassland National Vegetation Classification (NVC) Survey, together with soil sampling was undertaken at Glebe Meadow, off Chester Road, Tattenhall, CH3 9AH 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 fair 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].

1.4. This community usually forms on neutral soils, as reflected by the results of the soil analysis, which showed the soil to have a pH of 6.3 – 7.5. The soil nutrient status was high for phosphate and magnesium and moderate to low for potassium.

1.5. 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.

1.6. In terms of retention of the grassland in current form, it is recommended that the annual hay cut 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. Thus allowing access to dog walkers is unlikely to alter the grassland community type over time. It is advised that walkers are reminded to removed dog faeces as this can reduce the quality of hay whilst presenting a risk to humans and livestock in terms of disease.

1.7. 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 re-introduction of grazing, or cessation of the hay cut could alter the NVC community type over time.

1.8. It is recommended any management changes are in line with local conservation objectives and that the site is monitored at minimum 2 and 5 years after implementation of any management changes, to determine how the NVC community, and wildlife value of Glebe meadow is being affected. Should the habitats be adversely affected, it is recommended the management be returned to the current annual hay cut in July, in order to retain the current conservation value of Glebe 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), along with soil sampling was undertaken of the grassland at Glebe Meadow, off Chester Road, Tattenhall, CH3 9AH (National Grid Reference SJ 485 586). The survey and soil samples were taken to provide a baseline survey of the habitat type and quality at Glebe 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 and soil sampling 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. Ten quadrats were assessed to determine vegetation community type, with soil samples taken from four of these quadrats. Dr Rosalind King undertook an NVC survey, whilst the soil sampling was undertaken by Mr Roger Goulding, Green Infrastructure Leader at Cheshire West and Cheshire Council. The soil was sent to NRM laboratories for analysis.

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. Glebe 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. Glebe meadow was initially visually assessed to determine possible differences in community type across the site. Ten 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

3.5. 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

[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)

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 10 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 10 out of 10 quadrats would result in a frequency of V (5), 7 out of 10 would be III (3) or 4 out of 10 quadrats a frequency of II (2)). 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 Glebe 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. Soil samples were taken from four of the ten vegetation quadrats surveyed. The top layer of vegetation (approximately 5 cm) was removed and approximately 200 g of soil taken with a trowel and bagged for later analysis by NRM Laboratories to determine concentrations of three nutrients considered key for healthy agricultural systems. Bioavailable concentrations of phosphate (P), potassium (K) and magnesium (Mg) were determined, along with soil pH. The concentrations of these macronutrients were then graded following the Defra Scale from 0 to 5 according to whether they were at very low to very high concentrations in the soil. This grading system allows for determination of fertiliser application rates to optimise crop growth in an agricultural setting, depending on whether grassland, vegetable or orchard crops are grown. In the context of the report, the soil macronutrient concentrations and Defra score will be monitored over time to inform

[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

management practices with the aim to retain the system in a balance of low to moderate macronutrient concentrations (Defra Scale 0 to 2). Full results are presented in Appendix 4.

3.10. 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

3.11. 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:

- *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

3.12. 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.

3.13. 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.

3.14. 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

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

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.

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

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	10:45 – 13:45	17	100	F2	Dry

4.2. The quadrat locations are shown on the results map below (Figure 4.1) together with the NVC community for each quadrat. Table 4.2 presents further details of quadrat locations, including latitude and longitude, What3Words and OS Grid reference so the same area can be sampled again in future to determine changes in habitat type and soil conditions over time.

4.3.

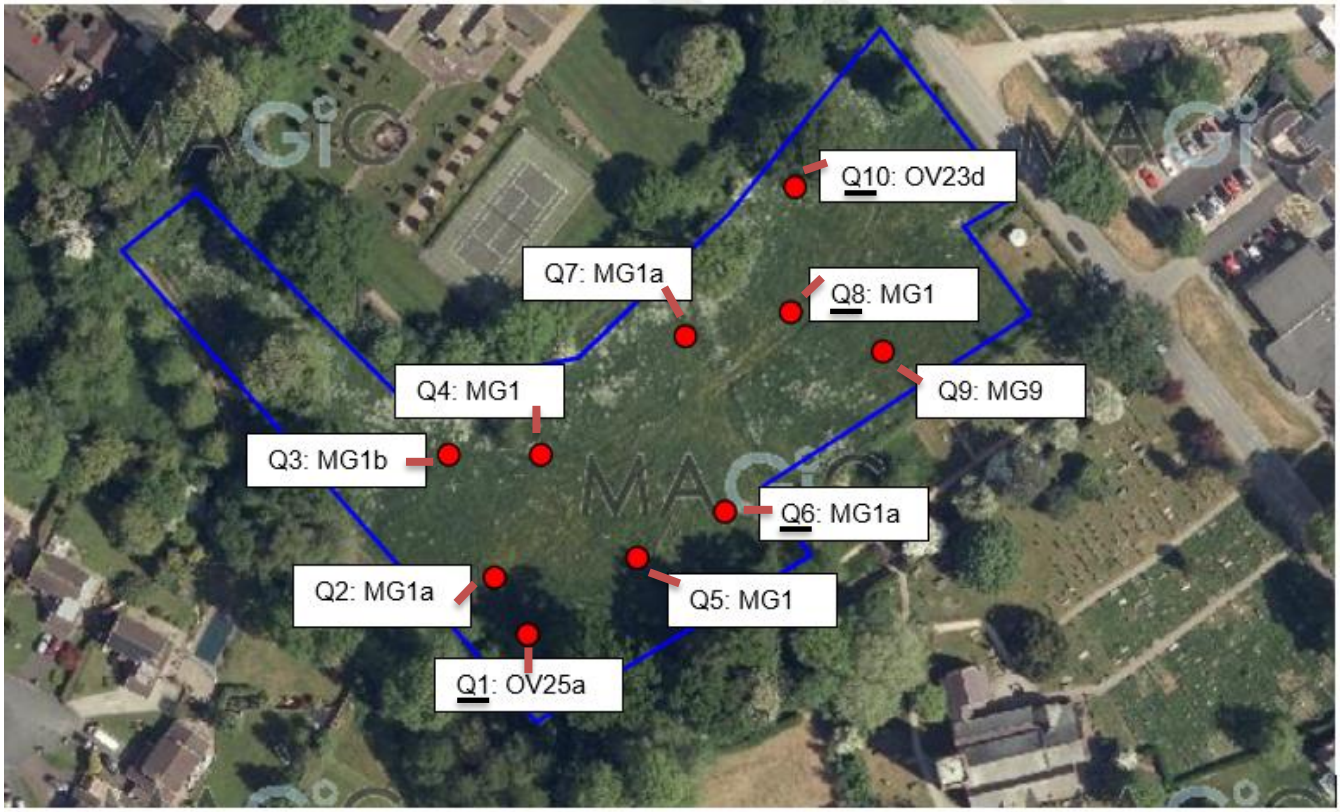

Figure 4.1: Map of Glebe Meadow (blue line indicates approximate boundary), including quadrat locations (red dots) and NVC community type of each quadrat. Underlined Quadrats have had soil sampled. Map from Magic, (c) Crown Copyright and database rights 2022. Ordnance Survey 100022861.

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 numbers in bold and underlined were also sampled for analysis of the soil.

Quadrat	Latitude	Longitude	OS Grid Reference	What3Words Reference	Top NVC Community	Goodness-of-fit (%)
1	53.122490	-2.770320	SJ4854 5863	factoring. poker. heaven	OV25a	46
2	53.122590	-2.770622	SJ4854 5864	slamming. takeovers. stamp	MG1a	72
3	53.122741	-2.770492	SJ4853 5867	curious. scooped. health	MG1b	77
4	53.122702	-2.770265	SJ4855 5867	skipped. necklace. condition	MG1	86
5	53.122618	-2.769854	SJ4857 5864	paler. fleet. latches	MG1	84
6	53.122680	-2.769682	SJ4858 5865	twinkling. diaries. open	MG1a	83
7	53.122968	-2.769804	SJ4858 5869	infants. steeped. lakeside	MG1a	84
8	53.122949	-2.769641	SJ4860 5869	chucked. foods. foreheads	MG1	60
9	53.122964	-2.769347	SJ4861 5869	piglets. festivity. pirate	MG9	48
10	53.123217	-2.769566	SJ4860 5872	downsize. reporting. walls	OV23d	49

4.4. 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.

4.5. 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 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, MG1a	69 (Fair)	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.*

4.6. The soil appeared to be a red sandy clay when sampled. The soil results for three macro nutrients considered important in crop yields are presented over the page in Table 4.4.

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

Table 4.4: Potassium (P), Phosphate (K) and Magnesium (Mg) contents of the soil sampled from quadrats 1, 6, 8 and 10. The soil pH, plus index values according to the Defra Index Scale, where 0 is considered to be very low and 5 very high in terms of available concentration of element in the soil. For potassium only, the moderate category of 2 is subdivided into 2- (the lower half of moderate) and 2+ (the upper half of moderate).

Quadrat	pH	Available (mg/L)			Defra index		
		P	K	Mg	P	K	Mg
1	6.3	6.2	60	194	0 Very Low	0 Very Low	4 Very High
6	7.4	28.4	87	153	3 High	1 Low	3 High
8	7.5	32.4	167	305	3 High	2- Low-Moderate	5 Very High
10	6.3	28.4	98	170	3 High	1 Low	3 High

Discussion

4.7. Glebe Meadow is a grassland approximately 1 hectare in size, located in the centre of Tattenhall, Cheshire, west of Chester Road, north of Tattenhall Footpath 6 and east of Millennium Mile footpath. The meadow is surrounded by trees including oak, silver birch and horse chestnut. St Albans church lies to the south, with Tattenhall Park primary school to the east and low density housing to the north and west. The wider area comprises pastoral land, scattered trees and hedgerows. The meadow is well connected to the wider area, ecologically speaking, via hedgerows and trees that line the Millennium Mile footpath. The location of Glebe Meadow in the context of the wider area is shown in Figure 4.2 below.

Figure 4.2: The location of Glebe Meadow (blue line boundary), Tattenhall in relation to the surrounding landscape. Map from Magic, (c) Crown Copyright and database rights 2022. Ordnance Survey 100022861.

4.8. Historically the grassland has been grazed, but this has not happened in recent years. The grassland is now mown annually in July, with the arisings removed for hay. The grassland is currently not freely accessible to the public, although public access is still evident as a desire line though the meadow. The sward height is approximately 1.2m high on average and is dominated by grasses (false oat-grass, cock's-foot and Yorkshire fog) with occasional hogweed, bird's foot trefoil and vetches and rare nettle and knapweed (in accordance with the DAFOR scale). There are occasional willow saplings self-sown, with some mature oak and semi-mature silver birch also scattered within the meadow. Ringlet, small white and gatekeeper butterflies were noted in the meadow, together with other invertebrates and a small mammal (squeaking heard of a likely vole or field mouse). Photographs of the grassland are presented in Figure 4.3 to 4.8 below.

Figure 4.3: Glebe Meadow looking east from Millennium Mile footpath, with two notable mature oaks in the meadow to the left of the photograph.

Figure 4.4: Glebe Meadow looking south east from Millennium Mile footpath.

Figure 4.5: Glebe Meadow information board highlighting the wildlife value of the meadow and ongoing management aspirations.

Figure 4.6: Glebe Meadow flora including false oat-grass and hogweed (left) and bird's-foot trefoil (right).

Figure 4.7: Glebe Meadow flora including knapweed and Yorkshire fog (left) and oxeye daisy, bush vetch and knapweed (right)

Figure 4.8: Glebe Meadow looking west from Chester Road

4.9. The majority of quadrats (7 of the 10) returned a best fit to an MG1 *Arrhenatherum elatius* type grassland and subcommunities thereof. The most common subcommunity MG1a (3 of the 10 quadrats) was the red fescue community, although this grass was not noted much in the sward, possibly due to the dominance of broad-leaved grass species and as it was not yet in flower. The nettle subcommunity (MG1b) occurred in one quadrat, towards the north west of the site, where grass dominance was notably less, with more tall species such as nettle and hogweed present. This community is likely to continue to the north west of the meadow. Overall, the grassland had a fair fit to an MG1 and MG1a mesotrophic grassland (69% and 68% fit respectively). This concurs with the historical management of the site, 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.

4.10. Within the grassland, three quadrats returned different community types, however all were very poor fits to the suggested communities (46-49% fit) meaning reliance on these community types being accurate should not be high. It is notable that two of these communities lie near the site entrances to the west and adjacent to a mature oak in the east, where historically the area was more disturbed and likely to have resulted in different ground conditions (compaction / poaching from vehicles / cattle for example by entrances or higher nutrient loading, or lower water availability / higher shading as a result of the mature oak). The soil pH in these areas was 6.3, which is slightly lower than neutral pH 7.5 of the more central samples, but the soil macronutrients were in similar ranges to the rest of field. The communities in these two locations were of the open vegetation type OV25a (nettle – creeping thistle, Yorkshire fog – annual meadow grass tall herb open vegetation sub-community) by the gate in the west and OV23d (Perennial ryegrass – Cock's-foot, false oat-grass – black medic open vegetation sub-community) by the oak in the east. The poor fit could be related to few of the indicative species being noted in these areas, likely as a result of ceasing grazing (and thereby compaction / nutrient loading), with succession to a more typical MG1 grassland occurring gradually.

4.11. The other grassland type noted was an MG9 Yorkshire fog – tufted hair grass mesotrophic grassland community. This was located towards the south east, in an area of grassland with shorter sward height, and with the most species (13 species) recorded here. This may be more indicative of the species richness this grassland could revert to, should grazing be established once again, especially as crested dog's tail and black knapweed was noted in this area, indicative of the MG5 crested dog's-tail – black knapweed Lowland Meadow Priority Habitat grasslands. Although MG9 grasslands can suggest damper soil conditions, there were no species indicative of such in this locality (such as rushes or sedges), and with the poor fit to the community (48%), it is considered unlikely that an MG9 grassland community would establish successfully over the whole site given the current soil conditions.

4.12. In terms of the soil, the laboratory results showed there to be high to very high concentrations of available magnesium in the soil. Phosphates were also generally in the high range, apart from the sample in the far west of the field, which was very low. Potassium was found to be in low-moderate to very low concentrations in the soil. The pH of the soil ranged between 6.3 to 7.5, indicating neutral soil. This nutrient status is expected given previous management of the site and is reflected in the plant community that has formed.

5. EVALUATION

5.1. Glebe Meadow is considered to be an MG1 false oat-grass mesotrophic grassland, with moderate to low nutrient status in the soil. It is not a particularly diverse example of this community, with only 26 species being recorded within the quadrats and an additional 5 grassland herbaceous species recorded outside the quadrats. It may have been more species rich in the past with grazing reducing dominance of broad-leaved grasses such as false oat-grass, cock's-foot and Yorkshire fog in favour of finer leaved grasses such as creeping bent, red fescue and crested dog's-tail. The reduction in grazing (and subsequent nutrient loading from animal manure), together with arisings being removed following a mid-summer hay cut, has now formed a typical MG1 grassland community dominated by tall, broad-leaved grasses and large herbs such as hogweed.

5.2. Cow parsley (*Anthriscus sylvestris*) is another species typical of MG1 grasslands, and although none were recorded during the survey, dead umbellifera's were noted throughout the sward, which may have been cow parsley, although unidentifiable to species due to the time of year of the survey. A survey earlier in the year may produce a better fit to MG1 type grassland, although with the fit being 69% (fair) and with 7 of the 10 quadrats having a fair to very good fit to MG1 grasslands and their subcommunities, there is little doubt the grassland is a typical MG1 community.

5.3. 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.

5.4. The grassland is considered to be no less than Local ecological value due to its central location with in a small village, acting as a stepping stone habitat to smaller areas of similar habitat in the wider environment. It is not currently Priority Habitat, as it is not sufficiently species-rich, but with altered management could be so in the future, potentially, as the species seed bank is present to form 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.

5.5. In terms of nutrient status, the grassland has generally high concentrations of magnesium and phosphates, with lower concentrations of available potassium. These nutrient levels are suitable for maintaining a pasture or hay meadow, but may be on the high side for developing a species rich meadow as high nutrient levels allow faster growing plant species to dominate, supressing sward plant diversity.

5.6. Should the annual cutting for hay cease, the grassland is likely to revert to a scrub habitat with bramble and hawthorn quickly establishing, followed by birch and oak from trees surrounding the meadow. Minor amendments to site use, such as bi-annual 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 soil nutrient levels being generally high for phosphates and magnesium and low to moderate for potassium, and the current plant community being resilient to slight soil nutrient changes.

6. RECCOMENDATIONS

6.1. In order to retain the grassland as an MG1 community, it is recommended the current management practices continue, with 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. If a public foothpath is opened up through the centre of the grassland, it is recommended that signage is installed to remind users to remove dog waste from the grassland to reduce nutrient loading and also retain the hay as saleable quality. It may be worth including reminders of the hazards associated with dog waste, namely the risk to children of toxocariasis from roundworm egg infection and risk to livestock eating hay potentially infected with parasites harbored by dogs. The parasite eggs can be persistent and live on or in the soil and vegetation a long time after the rain has washed the faeces away, meaning it is not always obvious the area is not safe for children or the hay is not safe for animal consumption.

6.4. Should the aim be to improve the biodiversity value of the meadow, it may be necessary to re-introduce grazing at the site as a means to control the broad-leaved grasses. However, the practicalities of this in the centre of Tattenhall may 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. Agriculturally speaking, if managed as grassland, pasture or hay meadow, the soil results indicate the grassland would require no magnesium or phosphate addition. It would require between 90 to 115 kg/ha of potash (potassium) addition per year in order to provide a suitably abundant and nutrient rich sward for cattle consumption. It is likely the sward would provide suitable nutrients for cattle (magnesium is the key nutrient, and is of high to very high concentrations in the soil), however without further potash addition, the volume of hay produced may decline over time. This is likely to be in line with increased sward species diversity in the meadow as the dominance of fast-growing plant species (that contribute most to hay volume) declines as nutrient levels decline. However, it may take some time to achieve a lower soil nutrient status given the current soil nutrient levels after a few years of the cut and remove management. Soil analysis are recommended to occur no more frequently than 7 years for permanent grassland or 3-4 years for intensively managed grassland. However more frequent soil analysis is recommended should management practices change.

6.6. Any change in management of Glebe Meadows is recommended on a temporary basis, with monitoring at least 2 years and 5 years into the management change to detect NVC community changes and inform updates to any amended management plans. An update analysis of soil to determine nutrient content is recommended in 3 to 5 years. 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. Glebe 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. The soil pH and nutrient concentrations are within expected ranges based on the plant community established.

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 re-introduction of grazing, or cessation of the hay cut could alter the NVC community type over time.

7.3. It is recommended any management changes are in line with local conservation objectives and that the site is monitored at minimum 2 and 5 years after implementation of any management changes, to determine how the NVC community, and wildlife value of Glebe meadow is being affected. Should the habitats be adversely affected, it is recommended the management be returned to the current annual hay cut in July, in order to retain the current conservation value of Glebe Meadow.

Appendix 1 NVC Tables and Tablefit Analysis

Table A1.1: Glebe 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**	**Q6**	**Q7**	**Q8**	**Q9**	**Q10**	**Range**	**Frequency**
Cock's foot	*Dactylis glomerata*	7	9	4	4	4	5	6	5	6	9	4-9	V
Yorkshire Fog	*Holcus lanatus*	2	6		4	4	4	4	5	5	5	2-6	IV
Creeping thistle	*Cirsium arvense*	5	4		4	1	4		4	4		1-5	IV
Meadow buttercup	*Ranunculus acris*	5	2		2	1	2		2	2		1-5	IV
Creeping bent-grass	*Agrostis stolonifera*	7			4	2	7		5	8	4	2-8	IV
False oat-grass	*Arrhenatherum elatius*		4	10	9	9	9	7	5			5-10	IV
Hogweed	*Heracleum sphondylium*	4	4		4	4		7		2	2	2-7	IV
Broadleaved dock	*Rumex obtusifolius*	4	4	4		4	2					2-4	III
Meadow vetchling	*Lathyrus pratensis*	2			5					4	1	1-5	II
Bush vetch	*Vicia sepium*	2				4			5		5	2-5	II
Timothy	*Phleum pratense*	2			5	4						2-5	II
Bird's-foot trefoil	*Lotus corniculatus*				5		4					4-5	I
Perennial ryegrass	*Lolium perenne*		3	2								2-3	I
Hairy tare	*Vicia hirsuta*							2			1	1-2	I
Creeping buttercup	*Ranunculus repens*								6	4		4-6	I
Ragwort	*Senecio jacobaea*							2		2		2	I
Cut-leaved cranesbill	*Geranium dissectum*								2	2		2	I
Meadow foxtail	*Alopecurus pratensis*	1										1	I
Smooth meadowgrass	*Poa pratensis*	4										4	I
White clover	*Trifolium repens*								2			2	I
Red clover	*Trifolium pratense*								2			2	I
Common nettle	*Urtica dioica*			3								3	I
Cleavers	*Galium aparine*					1						1	I
Ribwort plantain	*Plantago lanceolata*									1		1	I
Crested dog's-tail	*Cynosurus cristatus*									1		1	I
Sweet vernal grass	*Anthoxanthum odoratum*									5		5	I

TABLEFIT RESULT

Sample FulGleMe* 10 Parameters = Nobryo Cover% Sp & c

E2.21 MG 1 69 | 67 74 81 75| Arrhenatherum elatius

E2.21 MG 1a 68 | 81 64 81 66| Arrhenatherum elatius Festuca rubra

E2.21 MG 1c 54 | 60 65 65 61| Arrhenatherum elatius Filip ulmaria

E3.41 MG 9b 48 | 63 57 54 60| Holc lana-Desch cespit Arrhen elatius

E2.21 MG 1b 48 | 68 47 62 52| Arrhenatherum elatius Urtica dioica

The TABLEFIT output shows best fit to an MG1 or MG1a NVC community (fair), further interpretation considers the grassland to fit MG1.

Table A3.2: TABLEFIT outputs detailing highest scoring NVC community for each quadrat within Glebe Meadow

Quadrat	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
No. species	12	8	5	10	11	8	6	11	13	7
NVC community best fit	OV25a	MG1a	MG1b	MG1	MG1	MG1a	MG1a	MG1	MG9	OV23d
% fit to NVC community	46	72	77	86	84	83	84	60	48	49
Goodness of Fit	Very Poor	Good	Good	Very Good	Very Good	Very Good	Very Good	Fair	Very Poor	Very Poor

Appendix 2 – Full Site Species List

These lists include 31 grassland plant, 3 self-sown or mature tree species and 9 animal species

English Common Name	Scientific Name
Bird's-foot trefoil	*Lotus corniculatus*
Bramble	*Rubus fruticosus agg.*
Broadleaved dock	*Rumex obtusifolius*
Bush vetch	*Vicia sepium*
Cleavers	*Galium aparine*
Cock's-foot	*Dactylis glomerata*
Common knapweed	*Centaurea nigra*
Creeping bent	*Agrostis stolonifera*
Creeping buttercup	*Ranunculus repens*
Creeping thistle	*Cirsium arvense*
Crested dog's-tail	*Cynosurus cristatus*
Cut-leaved cranesbill	*Geranium dissectum*
False oat-grass	*Arrhenatherum elatius*
Hairy tare	*Vicia hirsuta*
Hogweed	*Heracleum sphondylium*
Meadow buttercup	*Ranunculus acris*
Meadow foxtail	*Alopecurus pratensis*
Meadowsweet	*Filipendula ulmaria*
Meadow vetchling	*Lathyrus pratensis*
Nettle	*Urtica dioica*
Oak	*Quercus robur*
Oxeye daisy	*Leucanthemum vulgare*
Perennial ryegrass	*Lolium perenne*
Ragwort	*Senecio jacobaea*
Ragged Robin	*Silene flos-cuculi*
Red clover	*Trifolium pratense*
Ribwort plantain	*Plantago lanceolata*
Silver birch	*Betula pendula*
Smooth meadow grass	*Poa pratensis*
Sweet vernal grass	*Anthoxanthum odoratum*
Timothy	*Phleum pratense*
White clover	*Trifolium repens*
Willow sp.	*Salix sp.*
Yorkshire fog	*Holcus lanatus*

Animal Species list

English Common Name	Scientific Name
7-spot ladybird	*Coccinella septempunctata*
Banded snail	*Cepaea nemoralis*
Common green shieldbug	*Palomena prasina*
Gatekeeper	*Pyronia tithonus*
Ringlet	*Aphantopus hyperantus*
Small white	*Pieris rapae*
Spittlebug	*Cercopidae*
Wolf spider	*Lycosidae*
Vole/Mouse	*Avicolinae/Apodemus*

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

Appendix 4 – Soil Analysis Results

ANALYSIS REPORT

Contact : CHESHIRE WEST AND CHESTER COUNCIL
PO BOX 3657
CHESTER
CH1 9PR
Tel. : 07769 910 127

Y337

Please quote the above code for all enquiries

Client : TATTENHALL PARISH COUNCIL
CH3 9QU

Distributor : PO12600043500

Sample Matrix : Agricultural Soil

Laboratory Reference
Card Number 70545/22

Date Received 05-Aug-22
Date Reported 08-Aug-22

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details			Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details	Soil pH	P	K	Mg	P	K	Mg
375477/22	1	**SJ4854 5865** *2.5 hectares* *Grassland into Grassland*	6.3	0	0	4	6.2	60	194
375478/22	2	**SJ4856 5868** *2.5 hectares* *Perm Pasture into Hay*	7.4	3	1	3	28.4	87	153
375479/22	3	**SJ4861 5868** *2.5 hectares* *Perm Pasture into Hay*	7.5	3	2-	5	32.4	167	305
375480/22	4	**SJ4860 5872** *2.5 hectares* *Perm Pasture into Hay*	6.3	3	1	3	28.4	98	170

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
The analytical methods used are as described in DEFRA Reference Book 427
The index values are determined from the AHDB Fertiliser Recommendations RB209 9th Edition.

Released by Katie Dunn On behalf of NRM Date 08/08/22

PAAG

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ANALYSIS REPORT

DATE	8th August 2022	CHESHIRE WEST AND CHESTER COUNCIL
SAMPLES FROM	TATTENHALL PARISH COUNCIL, CH3 9QU	PO BOX 3657 CHESTER CH1 9PR
SAMPLED BY	PO12600043500	
Report reference	70545/22	Tel: 07769 910 127 Fax:

Fertiliser Recommendations

The phosphate and potash recommendations shown below, are those required to replace the offtake and maintain target soil indices. The larger recommended applications for soils below target index will allow the soil to build up to this target index over a number of years. Not applying fertiliser to soils which are above target index will allow the soil to run down over a number of years to the target index.
The recommendation should be increased or decreased where yields are substantially more or less than that specified. The amount to apply can be calculated using the expected yield and values for the offtake of phosphate and potash per tonne of yield given in the RB209 9th edition.
All recommendations are given for the mid-point of each Index.
Where a soil analysis value (as given by the laboratory) is close to the range of an adjacent Index, the recommendation may be reduced or increased slightly taking account of the recommendation given for the adjacent Index. Small adjustments of less than 10 kg/ha are generally not justified.
Efficient use of P and K is most likely to be achieved on soils that are well structured and enable good rooting.
For visual evaluation of soil structure (VESS), a score on 1 or 2 would be considered adequate.
Don't forget to deduct nutrients applied as organic manures.
For Nitrogen recommendations please refer to the RB209 9th edition or seek advice from an FACTS qualified adviser.
Target Indices:
Arable, Forage, Grassland and Potato Crops: P Index 2, K Index 2-
(In rotations where most crops are Autumn-sown, soils are in good condition and P is applied annually, high index 1 can be an adequate target.)
Vegetables and Bulbs: P Index 3, K Index 2+
(If vegetables are only grown occasionally as part of an arable rotation, it would be most economic to target index 2 for arable and forage crops.)
Fruit Vines and Hops: P Index 2, K Index 2, Mg Index 2
(Note: Cider apples respond to K Index 3, Mg Index 3)
A lime recommendation is usually for a 20cm depth of cultivated soil or a 15cm depth of grassland soil. Where soil is acid below 20 cm and soils are ploughed for arable crops, a proportionately larger quantity of lime should be applied. However, if more than 10 t/ha is needed, half should be deeply cultivated into the soil and ploughed down, with the remainder applied to the surface and worked in.
For established grassland or other situations where there is no, or only minimal soil cultivation, no more than 7.5 t/ha of lime should be applied in one application.
In these situations, applications of lime change the pH below the surface very slowly. Consequently, the underlying soil should not be allowed to become too acidic because this will affect the root growth and thus limit nutrient and water uptake, which will adversely affect yield.

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*		*Lime*
SJ4854 5865	**Grassland / Grassland**	*Units/Acre*				*T/Ac*	**0**
375477 /		*Kg/Ha*				*Te/Ha*	**0**

In the first season after Autumn or Spring sowing, deduct the amount of phosphate and potash applied to the seedbed from the recommendations.

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*		*Lime*
SJ4856 5868	**P Pasture / Hay**	*Units/Acre*	**0**	**92**		*T/Ac*	**0**
375478 /		*Kg/Ha*	**0**	**115**		*Te/Ha*	**0**

Grass/clover swards are more sensitive to phosphate and potash shortages than pure grass swards. Potash applications may be unnecessary in the upper half of the Index 3. Herbage analysis can also be useful to assess the adequacy of recent phosphate and potash applications and as a basis for adjusting potash use for future cuts. Uncontaminated samples of herbage should be taken just before cutting. Phosphorus deficiency is indicated if the P concentration is below 0.35% and potassium deficiency is indicated if the herbage potassium is below 2.5% (DM basis) or the N:K ratio of the herbage is above 1:1.3.
Sulphur is an essential nutrient in maximising dry matter yield protein levels in both grazed and conserved grass. Sulphur deficiency is increasingly common in grassland, especially at second and later cuts in multi-cut silage systems using high rates of nitrogen, but also sometimes at first cut. Sulphur deficiency is indicated by yellowing of the sward. In contrast to N deficiency where the older leaves are most affected, sulphur deficiency can be identified by yellowing of the youngest leaves. Analysis of uncontaminated herbage sampled just before cutting is a useful indicator of deficiency. The information can be used to assess the need for sulphur for future cuts. The critical level is 0.25% total sulphur or an N:S ratio greater than 13:1.
Some soils are more at risk of sulphur deficiency than others. Apply sulphur to all grass grown on sandy and shallow soils, loamy and coarse silty soils in areas with >200mm rainfall between November and February, or clay, fine silty or peat soils in areas with >400 rainfall between November and February. On soils at risk of sulphur deficiency apply 40kg/ SO3/ha before each cut of silage or 20-30kg SO3/ha when up to 100kg N/ha is applied and an additional 20-30kg SO3/ha for each additional 100kg N/ha applied.
Sodium will not have any effect on grass growth but an adequate amount in the diet is essential for livestock health (0.15% DM basis) and can improve the palatability of grass. Herbage analysis is useful to assess the sodium status of grass and its balance with potassium. Where sodium levels are low (below 0.15%) or the K:Na ratio is higher than 20:1, mineral supplements may be required for some classes of stock or a sodium containing fertiliser may be used. Apply sodium in fertiliser at 140kg/ha Na2O in early spring, either in a single or split application, to improve herbage mineral balances. To improve pasture palatability, apply regular dressings of 10kg/ha Na2O throughout the season.

Fertiliser recommendations are based on **AHDB RB209 (Ninth Edition).** If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest half Ton / Tonne.
NRM is a UKAS accredited laboratory to ISO/IEC 17025

Report continued.....

ANALYSIS REPORT

DATE	8th August 2022	CHESHIRE WEST AND CHESTER COUNCIL
SAMPLES FROM	TATTENHALL PARISH COUNCIL, CH3 9QU	PO BOX 3657 CHESTER CH1 9PR
SAMPLED BY	PO12600043500	
Report reference	70545/22	Tel: 07769 910 127 Fax:

Fertiliser Recommendations

Grass swards must contain a sufficiently high level of magnesium if the risk of hypomagnesaemia (grass staggers) is to be reduced. At soil Mg Index 0, apply 50 to 100 kg MgO/ha every three or four years. However the uptake of herbage magnesium decreases as nitrogen and potash increase: consequently hypomagnesaemia can occur when soil magnesium appear adequate. If there is a risk of hypomagnesaemia, larger amounts may be justified to maintain soil Mg Index 2. Direct treatment of livestock may also be needed to avoid hypomagnesaemia. Where liming is also needed, use of magnesian limestone may be most cost effective Herbage analysis is a useful indicator of the need for additional magnesium and for assessing the risk of hypomagnesaemia. Maintain magnesium concentrations above 0.20% (DM basis) and ensure the K:Mg ratio does not exceed 20:1. The amount of phosphate and potash applied for establishment may be deducted from the first season's grazing or silage/hay requirement.

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*		*Lime*
SJ4861 5868	**P Pasture / Hay**	*Units/Acre*	**0**	**72**		*T/Ac*	**0**
375479 /		*Kg/Ha*	**0**	**90**		*Te/Ha*	**0**

Please see previous sample for crop specific notes.

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*		*Lime*
SJ4860 5872	**P Pasture / Hay**	*Units/Acre*	**0**	**92**		*T/Ac*	**0**
375480 /		*Kg/Ha*	**0**	**115**		*Te/Ha*	**0**

Please see previous sample for crop specific notes.

Fertiliser recommendations are based on **AHDB RB209 (Ninth Edition).** If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest half Ton / Tonne.
NRM is a UKAS accredited laboratory to ISO/IEC 17025