

National Vegetation Classification of Quarry Hangers SSSI and Quarry Dean Meadows

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Foreword

The work detailed in this report has been commissioned by Natural England to provide detail on the vegetation communities present (type, area, location, species composition) on the land within and surrounding the existing Quarry Hangers SSSI. This information was requested to support re-notification of the SSSI to potentially include additional land as an extension to the existing SSSI.

The findings have been used to assess the habitats and botanical species recorded and determine whether they are eligible for selection. The resulting National Vegetation Classification (NVC) provides support for the designation of Quarry Hangers and Quarry Dean Meadows as an SSSI.

Natural England commission a range of reports from external contractors to provide evidence and advice to assist us in delivering our duties. The views in this report are those of the authors and do not necessarily represent those of Natural England.

Executive summary

Giles Groome, Consultant Ecologist was commissioned by Natural England to undertake National Vegetation Classification (NVC) surveys of eight fields and a former quarry on the North Downs in Surrey to investigate their potential for Site of Special Scientific Interest (SSSI) designation, along with all seven Units of the existing Quarry Hangers SSSI. Five of the non-SSSI fields, plus the former quarry, are referred to collectively as 'Quarry Dean Meadows'. The remaining three, all of which lie contiguous with the existing SSSI, along with the existing SSSI itself, are referred to as 'Quarry Hangers'.

5.27ha of the 'high conservation interest' (Jefferson *et al* 2019) grassland communities MG1d and MG1e were mapped across Quarry Dean Meadows, along with various stands of other neutral grassland (mostly MG1a that could be restored to MG1e), scrub (W21a, W21b, W21c, W24a and W24b) and woodland (W8d). All larger stands of MG1e were quadrat sampled, revealing them to be very species-rich: average 35 species, excluding scrub, per 4m² (n = 15). Several rare/scarce/threatened species were also recorded, including Nationally Rare, Schedule 8 (Wildlife and Countryside Act 1981, as amended) *Rhinanthus angustifolius* (Greater Yellow-rattle), Surrey Rare *Lathyrus sylvestris* (Narrow-leaved Everlasting-pea) and Surrey Scarce *Geranium pratense* (Meadow Crane's-bill).

The three non-SSSI fields within Quarry Hangers support 1.20ha of MG1e, 0.45ha of MG5b and 3.08ha of CG3c. Quadrat sampling again revealed swards to be species-rich: average 27 species, excluding scrub, per 4m² (n = 21). In addition to 'high conservation interest' grassland, two of the fields support marginal scrub (W21c) and woodland (W8d). Nationally Rare, Schedule 8 *Rhinanthus angustifolius* is abundant across one of the fields and locally abundant within another.

Approximately 17.7ha of 'high conservation interest' grassland were mapped across the existing SSSI. Most falls within CG3c, but there are >2.5ha of both MG1e and MG5a, as well as smaller areas of CG3a and CG3b. Collectively, quadrat recording revealed these grasslands to be very species-rich: average 34 species, excluding scrub, per 4m² (n = 46). Much of the remainder of the SSSI supports scrub (mostly W21c) and woodland (W8d and, notably within Unit 6, W12c), although there is c.1.3ha of non-referable 'recently scrub cleared' habitat that is being restored to chalk grassland. In addition to other rare/scarce/threatened species present within the SSSI, a small patch of RDB (Red Data Book) Near Threatened, ERL (English Red List) Vulnerable, Surrey Rare *Onobrychis viciifolia* (Sainfoin) was recorded.

Based on the criteria for selecting grassland SSSIs (Jefferson *et al* 2019), three fields within Quarry Dean Meadows, which collectively support 98% of the MG1e recorded here, automatically qualify for SSSI designation. An adjacent bramble-encroached field (mostly W24b) qualifies on the basis that it lies contiguous with these fields and formerly supported species-rich grassland that could be restored. A further field should be

considered for inclusion on the basis that it too supported species-rich grassland that could be restored; although it does not lie contiguous with any other species-rich grassland. The former quarry does not qualify for SSSI designation.

The three fields bordering the existing Quarry Hangers SSSI automatically qualify for SSSI selection when the combined area of species-rich grassland within them and the existing SSSI is considered together. Indeed, their inclusion would extend the area currently supporting 'high conservation interest' grassland within the SSSI by >25%, to >22ha.

Whilst there is a case for notifying a new Quarry Dean Meadows SSSI and re-notifying a revised Quarry Hangers SSSI, it is recommended that the two sites be considered as a compound North Downs scarp site and notified as the Quarry Dean Meadows and Quarry Hangers SSSI.

Reference:

Jefferson R G, Smith S L N & MacKintosh E J (2019) *Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 3 Lowland Grasslands*. Joint Nature Conservation Committee, Peterborough.

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1 Introduction

1.1 Background

Giles Groome, Consultant Ecologist was commissioned by Natural England to undertake NVC surveys of eight fields and a former quarry on the North Downs in Surrey to investigate their potential for SSSI designation ([Map 1](#)), along with all seven Units of the existing Quarry Hangers SSSI ([Map 2](#)).

The non-SSSI fields are known to have, or have recently had, high floristic interest. Five fall within Quarry Dean Farm and, alongside the former quarry, are collectively referred to as 'Quarry Dean Meadows'. The other three lie contiguous with the existing Quarry Hangers SSSI: 'Quarry Hangers'.

1.2 Study Objectives

- To conduct individual walkover surveys of each field/SSSI Unit, mapping stands of homogenous vegetation using the National Vegetation Classification (Rodwell 1991 et seq).
- To record five representative 2x2m quadrats for each grassland community of 'high conservation interest' (as defined by Jefferson et al 2019) within each field/SSSI Unit.
- To construct constancy tables for each set of recorded quadrats and run the results through published NVC keys, community accounts and floristic tables, and analyse them using MATCH (Malloch 1999).
- To report results by means of NVC maps (including target notes as appropriate), community descriptions and constancy tables.

1.3 Personnel

All surveys, data digitisation, analysis, photographic images and reporting were conducted by Dr Giles Groome CEcol CEnv MCIEEM. A consultant ecologist with 30 years' experience of professional ecological survey, assessment and management.

1.4 Report Presentation

Throughout this report, all species are referred to by their scientific names following the nomenclature of Stace (2019), Hill et al (2008) and Wood & Coppins (2012) (Section 1.4.1). A checklist with both Latin taxon and common English names is given in Appendix I. Appendix II provides a checklist of NVC communities, with nomenclature revised as appropriate (Section 1.4.1).

1.4.1 Changes in Species Nomenclature

Species, and therefore NVC community, nomenclature has changed since the publication of Rodwell (1991 et seq), which followed Tutin et al (1964 et seq), Corley and Hill (1981) and Dahl (1968). Changes relevant to this contract are provided in Table 1.

Table 1 – Changes in species nomenclature

NVC nomenclature	Nomenclature used in this study
<i>Anagallis arvensis</i>	<i>Lysimachia arvensis</i> ssp. <i>arvensis</i>
<i>Avenula pratensis</i>	<i>Helictochloa pratensis</i>
<i>Bromus erectus</i>	<i>Bromopsis erecta</i>
<i>Bromus sterilis</i>	<i>Anisantha sterilis</i>
<i>Festuca arundinacea</i>	<i>Schedonorus arundinaceus</i>
<i>Festuca pratensis</i>	<i>Schedonorus pratensis</i>
<i>Hypochoeris radicata</i>	<i>Hypochoeris radicata</i>
<i>Galium mollugo</i>	<i>Galium album</i>
<i>Hieracium pilosella</i>	<i>Pilosella officinarum</i>
<i>Leontodon autumnalis</i>	<i>Scorzoneroides autumnalis</i>
<i>Leontodon taraxacoides</i>	<i>Leontodon saxatilis</i>
<i>Odontites verna</i>	<i>Odontites vernus</i>
<i>Phleum pratense</i> ssp. <i>bertolonii</i>	<i>Phleum bertolonii</i>
<i>Picris echioides</i>	<i>Helminthotheca echioides</i>
<i>Sanguisorba minor</i>	<i>Poterium sanguisorba</i> ssp. <i>sanguisorba</i>
<i>Senecio erucifolius</i>	<i>Jacobaea erucifolia</i>
<i>Senecio jacobaea</i>	<i>Jacobaea vulgaris</i>
<i>Taraxacum officinale</i> agg.	<i>Taraxacum</i> agg.
<i>Thymus praecox</i>	<i>Thymus drucei</i>
<i>Calliargon cuspidatum</i>	<i>Calliargonella cuspidata</i>
<i>Eurhynchium praelongum</i>	<i>Kindbergia praelonga</i>
<i>Fissidens cristatus</i>	<i>Fissidens dubius</i>

In addition, some species have been split into separate taxa. This includes *Centaurea nigra* (now *Centaurea nigra* and, especially on chalk, *Centaurea debeauxii*), *Brachypodium pinnatum* (now *Brachypodium rupestre* and, rarely, *Brachypodium pinnatum*) and *Arenaria serpyllifolia* (now *Arenaria serpyllifolia*, with two sub-species, and *Arenaria leptoclados*). Despite Rodwell (1992b) separating *Euphrasia nemorosa* and *Euphrasia officinalis* agg., the latter can include the former. Many species referred to as *Rosa canina* agg. by

Rodwell include species that do not belong within this aggregate and should be referred to as *Rosa* spp.

1.5 Electronic Data

The following data have been supplied in electronic format:

- Report (PDF format)
- Quadrat results (MSEXcel workbook)
- Quadrat photographs (JPEG format)
- GIS map data (MapInfo v7.5 format)

2 Methodology

2.1 Fieldwork

2.1.1 Walkover Surveys

Following the guidelines given by Rodwell (2006) for experienced surveyors, each field/Unit was the subject of a walkover survey during which stands of homogenous vegetation were mapped against recent orthorectified aerial photographs printed at a scale of 1:1250 and classified according to the NVC (Rodwell 1991 *et seq*). Where vegetation was plainly heterogeneous and/or did not fit within the framework of existing NVC classifications a transition/mosaic of communities or a non-referable classification was mapped. Minimum mapping threshold was set at 0.01ha.

In addition to NVC mapping, notes on composition, landform, soils, and/or management were recorded during each walkover survey. Target notes were recorded to highlight particularly complex vegetation and the locations of rare/scarce/threatened species.

2.1.2 Quadrat Recording

Only grassland NVC-types of 'high conservation interest' (Jefferson *et al* 2019) were the subject of quadrat recording. The approximate locations were identified during walkover surveys, but quadrats were not recorded until this element of the fieldwork had been completed.

The precise location for each quadrat was selected on the basis of stand homogeneity within the pre-selected broad area identified during the walkover survey, as per Rodwell (2006). Each quadrat was then set out using tapes and metal pegs to create a 2x2m quadrat. Quadrat location was recorded using a hand-held Garmin Etrex GPS (reported by the unit to be accurate to within 3-5m, although undoubtedly not as accurate as this), aspect using a compass, slope a gun clinometer and sward height a drop disk with dowel.

Prior to further recording a photograph of the quadrat was captured, usually from its southern side.

Within each quadrat all vascular plants, bryophytes and lichens were recorded and cover estimated in percentage intervals using the Domin scale (*sensu* Dahl and Hadač 1941). No attempt was made to separate the aggregate taxa *Festuca ovina*, *Festuca rubra*, *Hieracium*, *Rubus fruticosus* or *Taraxacum*. It was not possible to confirm the identity of any *Rosa* species, all of which were found in seedling/sapling or cut/browsed stump regeneration form. All other taxa were identified to species, or where sufficient material was available, sub-species level, with the exception of *Centaurea nigraldebeauxii* (Section 2.3.2).

2.2 Data Input and Analysis

2.2.1 Data Input

Following the completion of fieldwork, the results of quadrat recording were entered into an Excel spreadsheet. Following quality assurance checks this was then broken down to create individual floristic tables (Section 2.2.3).

2.2.2 GIS Mapping

All data mapped in the field were digitised using MapInfo v7.5. NVC communities mapped onto aerial photographs in the field were re-drawn in GIS as polygons at a scale of approximately 1:750. The locations of quadrats and target notes were recorded as point data.

2.2.3 Comparison of Quadrat Data with Rodwell (1992b) and MATCH Analyses

Following fieldwork, the results of quadrat recording were compiled in the form of floristic tables for each surveyed field/Unit (Section 2.2.1). In this form results were taken through the key to mesotrophic or calcareous grasslands given by Rodwell (1992b) and compared to the descriptive accounts therein. In addition, all tables were analysed using the computer program MATCH (Malloch 1999), amending input data as appropriate (Section 2.3.3). All MATCH analyses were tested for “all communities”.

For each field/Unit survey report given in Section 3, a sub-section outlines the results of data comparisons. Whilst these may give the impression that stands were NVC classified post-survey, determination was always made in the field.

2.3 Constraints and Limitations

2.3.1 Impenetrable Vegetation

Survey site 4081 comprises a former quarry and landfill that has barely seen any management in the past decade or more. Several attempts were made to gain access but were thwarted by extremely dense, impenetrable scrub and/or sheer drops (former quarry faces). A small section of woodland above the former quarry was accessible, but for the remainder access was impossible (Section 3.2.2).

Several stands of scrub and woodland in fields/Units elsewhere also supported impenetrable vegetation and/or extremely steep slopes. However, for all these, stand classification could readily be determined from the margins.

2.3.2 Species Recording Limitations

2021 surveys were conducted at the optimal time of year for grassland recording. Nevertheless, strictly vernal or autumnal species will have been missed. In the case of *Centaurea nigra/debeauxii*, flowers had not sufficiently matured by the time of survey to determine taxon and therefore all plants were recorded as *Centaurea nigra* agg. The only *Hieracium* species recorded had had its flowers removed by grazing. This was therefore recorded as *Hieracium* agg.

The only field surveyed in 2022, 'Pilgrims Lane Field', was surveyed during exceptionally hot and dry conditions. Whilst early August would normally be within the optimal time of year for grassland recording, prolonged drought (the most severe for decades) resulted in very challenging survey conditions. For example, the inflorescences of almost all grasses had disintegrated and therefore most species could only be identified with certainty using vegetative material with a hand lens. Moreover, there had been widespread die-back, reducing the cover of almost all taxa and perhaps the total loss of others. However, *Centaurea nigra* agg. flowerheads were present on many plants and it was possible to separate *C. nigra* and *C. debeauxii*. Nevertheless, because both taxa were present in all CG3c quadrats and most plants were non-flowering, cover was again recorded for *Centaurea nigra* agg.

2.3.3 MATCH Limitations

Due to changes in classification and nomenclature, prior to analysing quadrats in MATCH the names of all species were changed to those known to be used by the program. Thus, for example, *Kindbergia praelonga* was changed to *Eurhynchium praelongum* and *Jacobaea vulgaris* to *Senecio jacobaea*. For other taxa the following rules were applied: *Rosa* spp. seedlings/saplings records were input as *Rosa* seed/sp., *Euphrasia nemorosa* as *Euphrasia officinalis* agg., *Pilosella officinarum* as *Pilosella officinarum* agg., *Hieracium* agg. as *Hieracium* sp., and all seedlings/saplings other than *Rosa* spp. as, for example, *Crataegus monogyna* (g), with the exception of *Sorbus aria*. MATCH does not recognise *Sorbus aria* (g) and records were therefore analysed as *Sorbus aria* (s).

Results

3.1 Summary of NVC Mapping

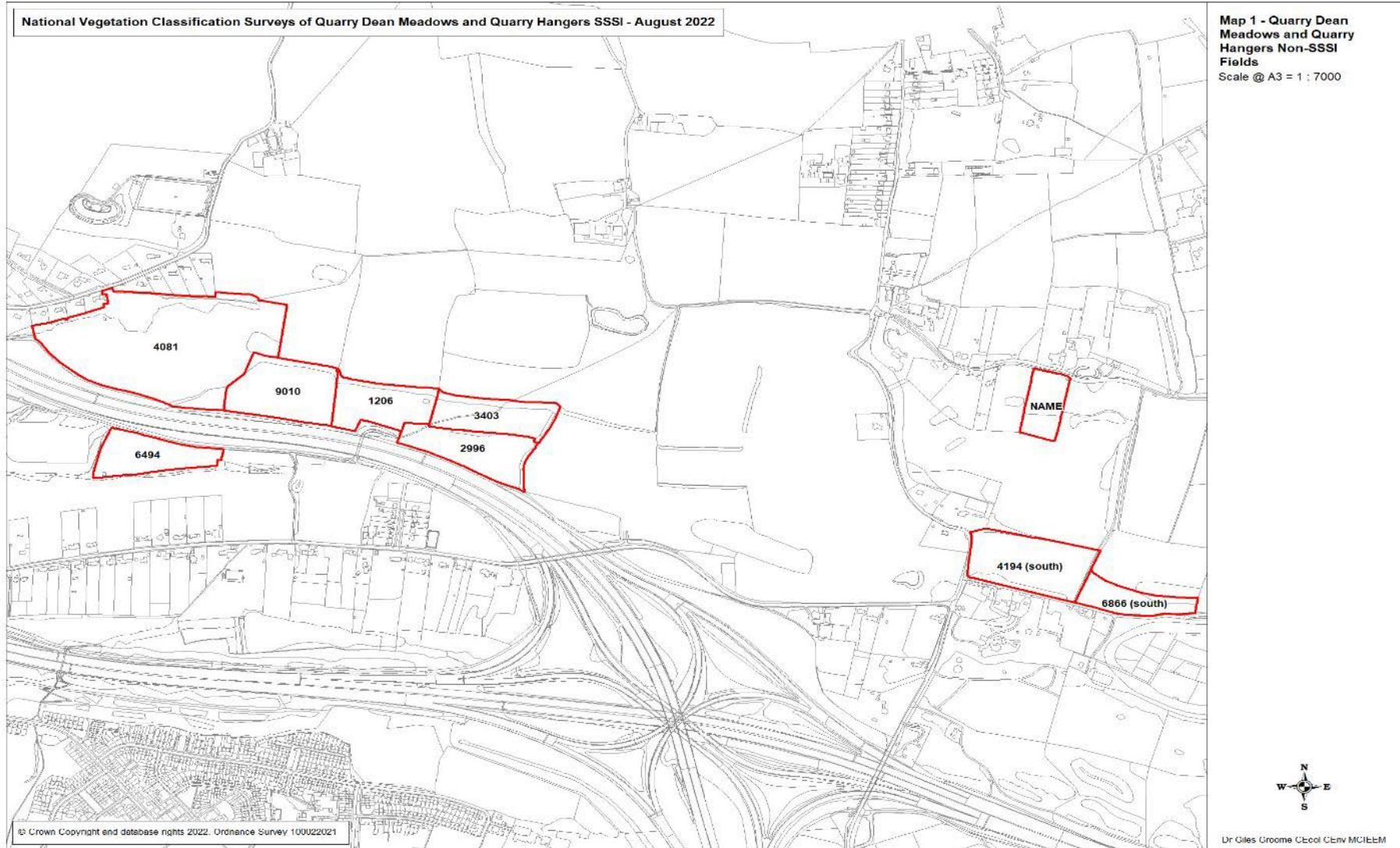
3.1.1 Quarry Dean Meadows and Quarry Hangers Non-SSSI Fields

Nine fields were surveyed during fieldwork (Map 1), although one of these (Field 4081) could barely be accessed and no NVC mapping or quadrat recording was undertaken (Section 3.2.2). A summary is given in Table 2. Some cells have been intentionally left blank because there is no applicable data.

Table 2 – Summary of NVC Mapping: Non-SSSI Fields

Field	Total Area (ha)	CG3c	MG1d	MG1e	MG5b
Quarry Dean Meadows					
6494	1.92		0.11	0.04	
4081	9.99				
9010	2.92			2.41	
1206	2.09			1.59	
3403	2.05			1.08	
2996	2.35			0.04	
Sub-total	21.32	0.00	0.11	5.16	0.00
Quarry Hangers					
4194 (south)	3.17	2.27		0.36	
6866 (south)	1.35	0.05		0.84	
'Pilgrims Lane Field'	1.21	0.76			0.45
Sub-total	5.73	3.08	0.00	1.20	0.45
Total	27.05	3.08	0.11	6.36	0.45

Map 1 – Quarry Dean and Quarry Hangers Non-SSSI Fields



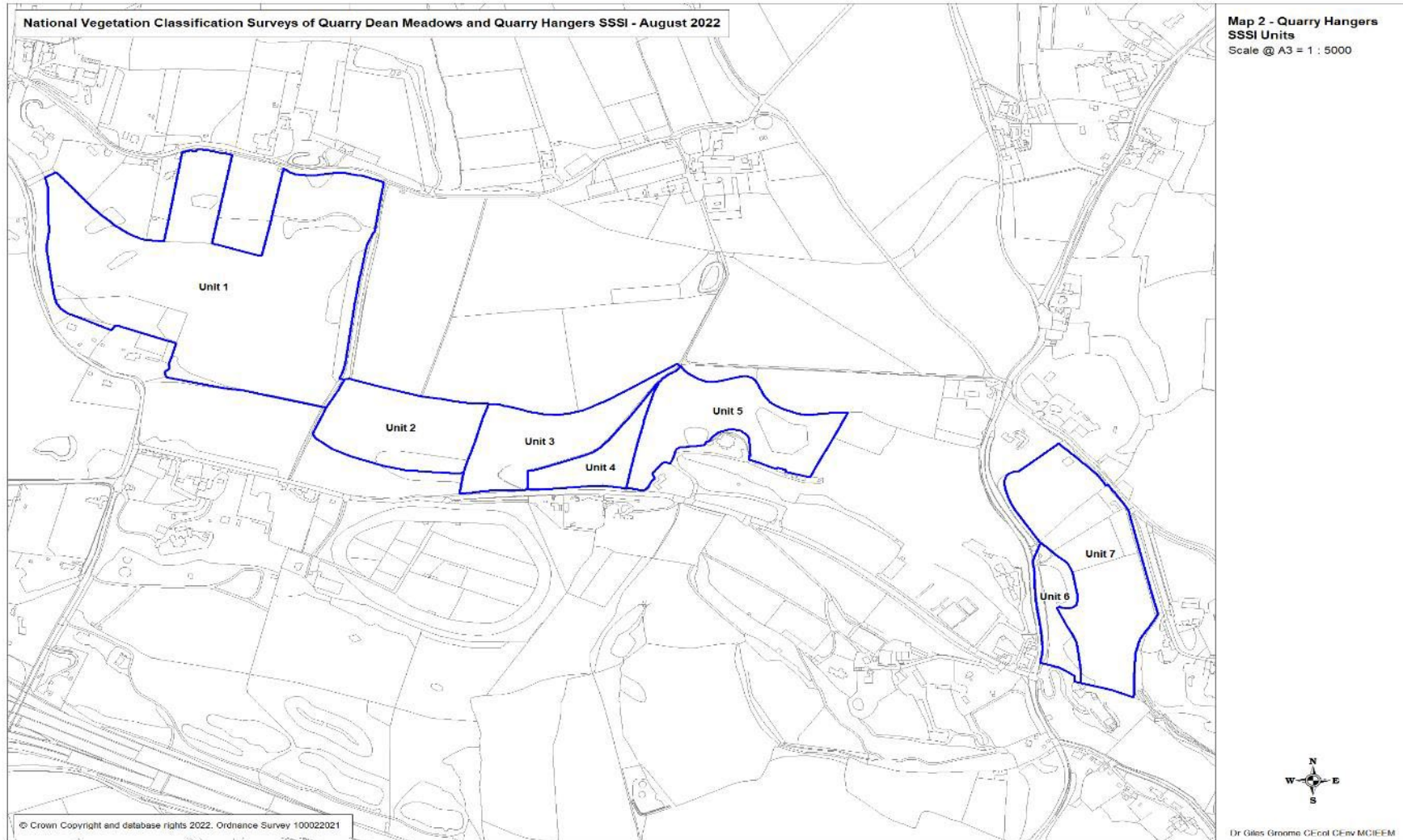
3.1.2 Quarry Hangers SSSI Units

All seven Units of the Quarry Hangers SSSI were surveyed during fieldwork (Map 2). A summary is given in Table 3. Some cells have been intentionally left blank because there is no applicable data.

Table 3 – Summary of NVC Mapping: SSSI Units

SSSI Unit	Total Area (ha)	CG3a	CG3b	CG3c	MG1e	MG5a
1	13.07			8.14	2.48	
2	2.82			2.18	<0.01	
3	2.52			0.40		
4	1.06		0.36			
5	3.48	0.37	0.04			
6	1.03					<0.01
7	4.82			1.06	0.28	2.56
Total	28.80	0.37	0.41	11.78	2.56	2.56

Map 2 – Quarry Hangers SSSI Units



3.2 Quarry Dean and Quarry Hangers Non-SSSI Fields

3.2.1 Quarry Dean Meadows Field 6494

Survey area 1.92ha. Surveyed 23/6/21. Map 3.

Boundaries

With the exception of the eastern boundary, the field is bordered by post and rail fencing, although much (notably to the south) is in disrepair. There is no physical eastern boundary and the limit of survey was set where it is assumed there was once a fence (as suggested both in the field and by OS Mastermap data).

Site Description

Overlying Grey Chalk (British Geological Society 2021) and Upton series grey rendzina soils (Soil Survey of England and Wales 1983), the field is believed to have been formerly managed as a hay meadow. However, following a period of dereliction and a recent change in ownership it is now divided into six temporary horse-grazed paddocks by electric fencing. Two new buildings have been erected (since the date of the aerial photograph used during surveys), including a stable block. A 360 excavator, tractor with bucket and caravan were present toward the eastern end of the field at the time of survey where there was evidence of recent soil disturbance (perhaps levelling?).

At least five horses have been retained in the field for several months and favoured areas, especially those close to the stable block and along fence lines, have been hard grazed and trampled; locally poached.

Mapped NVC Classifications

MG1a (3 mapped stands/polygons, total area 1.05ha)

Swards, which are mostly species-poor, vary from hard-grazed to livestock avoided. All are dominated by *Arrhenatherum elatius* with *Poa trivialis*, *Dactylis glomerata* and locally common *Brachypodium sylvaticum*. *Festuca rubra* appears to be unusually rare. Indicative that swards formerly supported MG1d and/or MG1e, *Origanum vulgare* is common throughout most stands with rather more scattered *Geranium dissectum*, *Potentilla reptans*, *Galium album*, *Odontites vernus* ssp. *serotinus*, *Myosotis arvensis* and *Plantago lanceolata*. *Hypericum hirsutum*, *Convolvulus arvensis*, *Ranunculus repens*, *Prunella vulgaris*, *Clematis vitalba* and *Pastinaca sativa* ssp. *sylvestris* are locally common, but otherwise largely absent. Other species include mostly sparse *Veronica chamaedrys*, *Jacobaea erucifolia*, *Leucanthemum vulgare* and *Jacobaea vulgaris*. A single *Ophrys apifera* was recorded close to mapped MG1e. Ant hills are locally common in the far west of the field.

MG1b (7 mapped stands/polygons, total area 0.20ha)

MG1b is for the most part coarse, species-poor and livestock avoided, although where open to horses, most has been trampled. Swards are dominated by *Arrhenatherum elatius* with *Urtica dioica* ssp. *dioica*, *Galium aparine*, *Ranunculus repens* and *Heracleum sphondylium*. Other species include *Holcus lanatus*, *Odontites vernus* ssp. *serotinus*, *Geranium dissectum*, *Cirsium arvense*, *Glechoma hederacea*, *Trifolium repens* and *Lamium album*.

MG1d (1 mapped stand/polygon, area 0.11ha)

The single stand of mapped MG1d comprises mostly coarse, species-poor *Arrhenatherum elatius* grassland (it had been little grazed at the time of survey) with abundant *Origanum vulgare* and frequent *Pastinaca sativa* ssp. *sylvestris* and *Galega officinalis*. *Leucanthemum vulgare*, *Centaurea nigra* agg. and *Hypericum hirsutum* are occasional. Five *Anacamptis pyramidalis* were also recorded.

MG1e (1 mapped stand/polygon, area 0.04ha)

The single stand of mapped MG1e is the richest grassland within the field and had only been light grazed at the time of survey. Close in composition to MG1d, it is dominated by *Arrhenatherum elatius* with *Festuca rubra*, *Poa trivialis*, *Dactylis glomerata* and occasional *Holcus lanatus*. *Origanum vulgare* is abundant with *Medicago lupulina*, *Prunella vulgaris*, *Leucanthemum vulgare*, *Galium album*, *Plantago lanceolata*, *Centaurea nigra* agg., *Achillea millefolium*, *Ranunculus repens*, *Odontites vernus* ssp. *serotinus*, *Convolvulus arvensis*, *Geranium dissectum*, *Potentilla reptans*, *Vicia sativa* ssp. *segetalis* and locally common *Clematis vitalba*. Other species include *Trifolium repens*, *Rumex crispus*, *Hypericum hirsutum*, *Crepis capillaris*, *Myosotis arvensis*, *Silene dioica*, *Inula conyzae*, *Ranunculus acris*, *Veronica chamaedrys*, *Jacobaea erucifolia*, *Cerastium fontanum* ssp. *vulgare*, *Jacobaea vulgaris*, *Papaver rhoeas* and *Lamium album*. A single *Anacamptis pyramidalis* was also recorded.

OV23d (1 mapped stand/polygon, area 0.24ha)

OV23d swards comprise hard grazed (and trampled) former MG1 grassland (although it will presumably revert back to this once grazing/trampling pressure is reduced) with abundant (often dominant) bare ground. Amongst the most common species are *Ranunculus repens*, *Potentilla reptans*, *Medicago lupulina*, *Arrhenatherum elatius*, *Plantago lanceolata*, *Dactylis glomerata*, *Trifolium repens*, *Heracleum sphondylium* and *Plantago major*. *Lysimachia arvensis* ssp. *arvensis* is locally frequent with a little *Sinapis arvensis* and *Sonchus asper*. *Jacobaea vulgaris* is also present and presumably removed by the grazier.

MG1a/MG6a (1 mapped stand/polygon, 0.19ha)

This classification covers transitional vegetation where swards appear to be reverting from MG1a (formerly MG1d/e) to more open MG6a. To some extent it lies both structurally and compositionally between mapped MG1a and OV23d. Swards are dominated by *Arrhenatherum elatius* and *Dactylis glomerata* with *Poa trivialis* (much of the grassland is shaded), locally abundant *Festuca rubra*, occasional *Holcus lanatus* and a little *Agrostis*

stolonifera and *Lolium perenne*. *Medicago lupulina*, *Convolvulus arvensis*, *Origanum vulgare*, *Geranium dissectum*, *Odontites vernus* ssp. *serotinus* and *Jacobaea erucifolia* are the most common forbs with locally abundant *Calystegia sepium*, *Urtica dioica* ssp. *dioica* and *Achillea millefolium*. *Heracleum sphondylium*, *Agrimonia eupatoria* and *Prunella vulgaris* are occasional; *Centaurea nigra* agg., *Pastinaca sativa* ssp. *sylvestris* and *Leucanthemum vulgare* rare.

MG1a/MG1b/OV23d (1 mapped stand/polygon, area 0.19ha)

This classification covers a complex mosaic of hard grazed, moderately grazed and livestock avoided vegetation in the easternmost paddock. Parts have also been disturbed by what appears to be recent soil scraping/levelling and vehicular ground compaction. Where the grassland remains intact it is species-poor and dominated by *Arrhenatherum elatius* with *Poa trivialis*, *Holcus lanatus* and scattered *Dactylis glomerata*. *Urtica dioica* ssp. *dioica* is frequent and locally abundant (but not constant) with *Ranunculus repens*, *Heracleum sphondylium*, *Odontites vernus* ssp. *serotinus*, *Geranium dissectum* and locally common *Galium aparine* and *Convolvulus arvensis*. Species of barer conditions include *Lolium perenne*, *Trifolium repens*, *Plantago major*, *Polygonum aviculare*, *Cirsium vulgare* and *Capsella bursa-pastoris*.

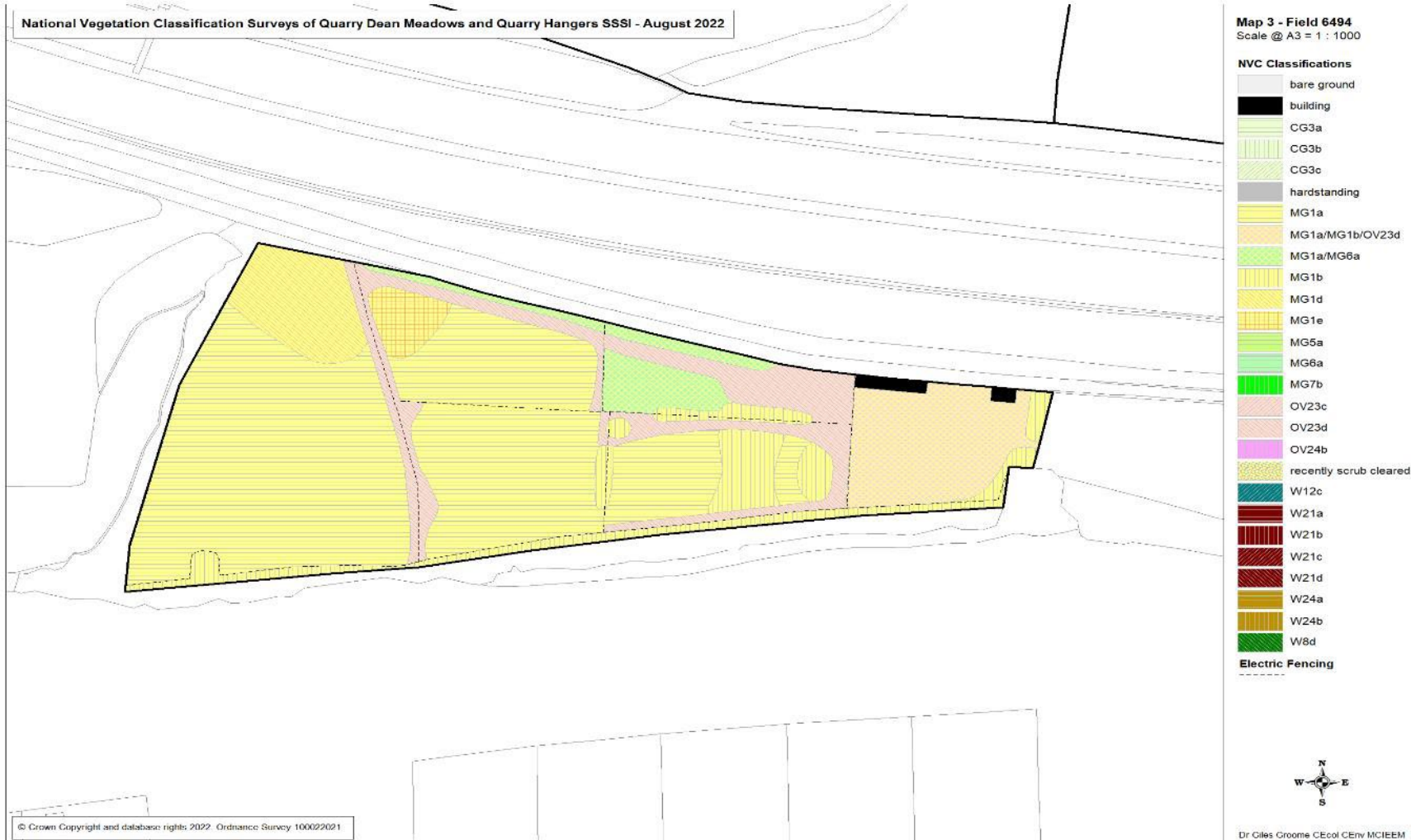
Buildings (2 mapped stands/polygons, total area 0.01ha)

Both mapped buildings are recent structures. One is a stable block. The purpose of the other was not determined.

Quadrats and Confirmation of NVC Classification

Given the small size and relatively poor quality of the remnant stands of MG1d and MG1e, no quadrats were recorded.

Map 3 – Field 6964



3.2.2 Quarry Dean Meadows Field 4081

Survey area 9.99ha. Surveyed 26/6/21. Not mapped.

Boundaries

n/a.

Site Description

Survey site 4081 is owned by Croydon Council and supports a former, part landfilled quarry with a northern strip of W8d woodland above. Having gone largely unmanaged for over a decade or more, dense impenetrable scrub renders all bar this strip of woodland inaccessible.

The W8d woodland that could be accessed during fieldwork is dominated by canopy *Fraxinus excelsior* with locally common *Acer pseudoplatanus*. The understorey comprises mixed *Corylus avellana*, *Acer campestre*, *Crataegus monogyna*, *Taxus baccata*, *Ligustrum vulgare* and *Cornus sanguinea* ssp. *sanguinea*. *Sorbus aria*, *Viburnum lantana*, *Rhamnus cathartica* and *Ulmus glabra* are also present. The field layer is dominated by *Hedera helix* and *Mercurialis perennis* with scattered *Rubus fruticosus*. *Daphne laureola* and *Viola odorata* are rare.

From a single vantage point gained during the attempted survey, it appears that the former quarry is dominated by W21 scrub and W24a underscrub. *Crataegus monogyna* dominated W21a is present above the quarry and W21b on the margins of Field 9010, although given the apparent extent of *Buddleja davidii* and *Clematis vitalba* within the quarry, it may also support W21c. Most W24a appears to be dominated by *Rubus fruticosus* and *Urtica dioica* with encroaching *Buddleja* and *Clematis*. Open areas depicted on aerial imagery appear to include patches of herbaceous vegetation or bracken. There is no evidence of any remnant grassland.

Quadrats and NVC Classification

n/a.

3.2.3 Quarry Dean Meadows Field 9010

Survey area 2.92ha¹. Surveyed 23/6/21. Quadrats recorded 23/6/21. Map 4.

Boundaries

All boundaries follow OS Mastermap lines which, as far as could be confirmed during fieldwork, follow field banks and/or fences.

Site Description

Field 9010 overlies Grey Chalk (British Geological Society 2021) and Upton series grey rendzina soils (Soil Survey of England and Wales 1983) and supports mostly 10-15° south-south-west facing slopes. Bordered by woodland and scrub to the north and west and hedgerows to the south and east, it is believed to have been managed as a hay meadow for many years; albeit without aftermath grazing. However, following a change in ownership, it was horse grazed within two paddocks divided by electric fencing during 2020. The southern half of the field appears to have been much more heavily grazed than the northern half. Animals were removed in March 2021.

Mapped NVC Classifications

MG1a (1 mapped stand/polygon, area 0.07ha)

MG1a is restricted to the north-western margins of the field, where swards are dominated by coarse, relatively species-poor *Arrhenatherum elatius* grassland with *Dactylis glomerata*, *Holcus lanatus* and locally abundant *Brachypodium sylvaticum*. *Origanum vulgare*, *Galega officinalis*, *Galium album* and *Potentilla reptans* are the most abundant forbs. *Clematis vitalba*, seedling/sapling *Acer pseudoplatanus* and a little *Rubus fruticosus* add to the coarse nature of the vegetation.

MG1e (1 mapped stand/polygon, area 2.41ha)

Most of the field supports species-rich, notably calcicolous, MG1e grassland with close affinities to MG1d (see Quadrats and NVC Classification). Swards are dominated by *Arrhenatherum elatius* and *Festuca rubra* with *Dactylis glomerata*, *Poa trivialis* and *Holcus lanatus*. *Brachypodium sylvaticum* is frequent at mostly low cover but can be locally abundant. Other graminoids include locally frequent *Agrostis stolonifera*, scattered *Trisetum flavescens* and a little *Bromus hordeaceus* ssp. *hordeaceus*, *Lolium perenne*, *Schedonorus arundinaceus* and *Schedonorus pratensis*. *Festuca ovina* was recorded from an anthill.

¹ The extreme western end of Field 9010 was mistakenly included within Field 4081 (see Map 1). Due to severe access constraints (Section 3.2.2) it has therefore not been surveyed.

Swards are for the most part forb-rich, supporting more-or-less constant *Origanum vulgare*, *Potentilla reptans*, *Centaurea nigra* agg., *Leucanthemum vulgare*, *Plantago lanceolata*, *Lotus corniculatus*, *Daucus carota* ssp. *carota*, *Achillea millefolium*, *Medicago lupulina*, *Veronica chamaedrys*, *Prunella vulgaris* (including an unusual pink-flowered form), *Agrimonia eupatoria*, *Jacobaea erucifolia* and *Ranunculus bulbosus*. *Pastinaca sativa* ssp. *sylvestris* is more-or-less constant at low cover, whilst *Galium album*, *Galega officinalis* and *Hypericum maculatum* are locally abundant. Other species include *Leontodon hispidus*, *Hypericum perforatum*, *Clinopodium vulgare*, *Linum catharticum*, *Odontites vernus* ssp. *serotinus*, *Knautia arvensis*, *Hypericum hirsutum*, many 100's of *Anacamptis pyramidalis*, up to 100 *Ophrys apifera* and a handful of *Dactylorhiza fuchsii*. Seedling and sapling woody species, notably *Rosa* ssp., are scattered throughout.

The bryoflora is characteristically poor, supporting only frequent *Brachythecium rutabulum* and, presumably encouraged by last year's grazing, scattered *Barbula unguiculata*.

W21b (2 mapped stands/polygons, total area 0.16ha)

All stands of scrub to the north of the field have been classified as W21b. Commonly inaccessible, they support various mixtures of *Crataegus monogyna*, *Prunus spinosa*, *Clematis vitalba*, *Sambucus nigra*, *Taxus baccata*, *Acer campestre*, *Fraxinus excelsior*, *Acer pseudoplatanus* and *Prunus domestica*. The field layer is mostly species-poor *Glechoma hederacea*, *Mercurialis perennis* and *Urtica dioica* ssp. *dioica*.

Included in the classification are small patches (too small to map separately) of W24a *Rubus-Clematis* underscrub.

W21c (2 mapped stands/polygons, total area 0.01ha)

The eastern boundary hedge is dominated by *Crataegus monogyna* with locally abundant *Prunus spinosa*, *Cornus sanguinea* ssp. *sanguinea* and *Rubus fruticosus*. *Ligustrum vulgare*, *Tamus communis* and *Rhamnus cathartica* are occasional; *Rosa canina* and *Rosa corymbifera* rare. The field layer supports abundant *Brachypodium sylvaticum* with frequent *Glechoma hederacea* and *Galium album*. *Hedera helix* is very local.

W24b (1 mapped stand/polygon)

W24b within Field 9010 is essentially a *Rubus fruticosus* encroached form of MG1a. In addition to the species noted for that community, it supports locally frequent *Calystegia sepium* and *Chaerophyllum temulum* as well as occasional recruitment/regeneration scrub (notably *Prunus spinosa* and *Crataegus monogyna*).

W8d (1 mapped stand/polygon, area 0.17ha)

W8d within Field 9010 is broadly as W21b with the exception that it supports more-or-less continuous former hedgerow trees (almost all *Fraxinus excelsior*).

Quadrats and NVC Classification

Five quadrats were recorded from MG1e grassland. Table 4 highlights the results of the quadrat recordings in field 9010. The results of MATCH analysis are available upon request.

Running the results of quadrat recording through the key to mesotrophic grasslands in Rodwell (1992b) strongly supports the classification of MG1: “grasslands with frequent and often abundant *Arrhenatherum elatius*, *Dactylis glomerata* and *Holcus lanatus*”). However, determining sub-community is less straightforward. Whilst results favour MG1e (“*Centaurea nigra* and *Lotus corniculatus* constant with one or more of *Leucanthemum vulgare*, *Veronica chamaedrys*, *Anthoxanthum odoratum* and *Trisetum flavescens*”), swards are close to MG1d (“*Pastinaca sativa* constant and sometimes abundant with frequent *Festuca ovina*, *Agrostis capillaris*, *Galium verum* and *Senecio jacobaea* [sic]”). Indeed, *Pastinaca sativa* is not listed at all for MG1e in Rodwell's MG1 floristic table; nor are *Origanum vulgare* (the most cover abundant species recorded from quadrats) or *Linum catharticum*. Conversely, *Leucanthemum vulgare* and *Hypericum perforatum* (recorded during the walkover survey but not within a quadrat) are not listed for MG1d.

Considering Rodwell's key, sub-community descriptions and floristic table, along with the results of MATCH analysis, the classification of MG1e, as described above (“species-rich, moderately calcicolous...with close affinities to MG1d”), is the most appropriate.

Table 4 – Quadrat recordings from MG1e grassland in field 9010

Field 9010 MG1e Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Origanum vulgare</i>	7	6	4	5	9	V	(4-9)
<i>Potentilla reptans</i>	5	1	5	6	4	V	(1-6)
<i>Festuca rubra</i> agg.	4	4	5	5	4	V	(4-5)
<i>Leucanthemum vulgare</i>	5	4	5	5	5	V	(4-5)
<i>Arrhenatherum elatius</i>	5	3	3	5	4	V	(3-5)
<i>Centaurea nigra</i> agg.	4	4	5	1	2	V	(1-5)
<i>Achillea millefolium</i>	3	4	3	4	3	V	(3-4)
<i>Plantago lanceolata</i>	2	4	2	4	2	V	(2-4)
<i>Daucus carota</i> ssp. <i>carota</i>	4	2	1	2	4	V	(1-4)
<i>Medicago lupulina</i>	1	3	4	3	2	V	(1-4)
<i>Dactylis glomerata</i>	3	3	3	3	3	V	(3)
<i>Agrimonia eupatoria</i>	2	2	2	2	2	V	(2)

Field 9010 MG1e Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Pastinaca sativa</i> <i>ssp. sylvestris</i>	5	1	1	1	0	IV	(1-5)
<i>Holcus lanatus</i>	0	2	2	4	3	IV	(2-4)
<i>Lotus corniculatus</i>	0	4	3	4	2	IV	(2-4)
<i>Prunella vulgaris</i>	0	2	4	3	2	IV	(2-4)
<i>Poa trivialis</i>	3	2	0	3	3	IV	(2-3)
<i>Veronica</i> <i>chamaedrys</i>	2	2	0	3	3	IV	(2-3)
<i>Brachythecium</i> <i>rutabulum</i>	3	3	0	1	2	IV	(1-3)
<i>Jacobaea erucifolia</i>	1	3	1		2	IV	(1-3)
<i>Ranunculus</i> <i>bulbosus</i>	0	2	3	2	1	IV	(1-3)
<i>Brachypodium</i> <i>sylvaticum</i>	0	2	1	2	2	IV	(1-2)
<i>Rosa spp.</i> <i>(seedling/sapling)</i>	1	1	0	1	1	IV	(1)
<i>Galium album</i>	4	0	2	0	5	III	(2-5)
<i>Jacobaea vulgaris</i>	0	0	2	4	1	III	(1-4)
<i>Agrostis stolonifera</i>	0	3	3	2	0	III	(2-3)
<i>Odontites vernus</i> <i>ssp. serotinus</i>	3	0	3		2	III	(2-3)
<i>Poa pratensis</i>	1	0	3	3	0	III	(1-3)
<i>Vicia sativa ssp.</i> <i>segetalis</i>	1	0	0	2	2	III	(1-2)
<i>Barbula unguiculata</i>	0	0	3	3	0	II	(3)
<i>Anacamptis</i> <i>pyramidalis</i>	0	1	1	0	0	II	(1)
<i>Cirsium arvense</i>	1	0	0	0	1	II	(1)
<i>Ophrys apifera</i>	0	1	1	0	0	II	(1)
<i>Rubus fruticosus</i> <i>agg.</i>	0	0	1	1	0	II	(1)
<i>Galega officinalis</i>	5	0	0	0	0	I	(5)
<i>Lathyrus pratensis</i>	0	0	0	3	0	I	(3)
<i>Leontodon hispidus</i>	0	3	0	0	0	I	(3)

Field 9010 MG1e Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Myosotis arvensis</i>	2	0	0	0	0	I	(2)
<i>Schedonorus arundinaceus</i>	2	0	0	0	0	I	(2)
<i>Trifolium pratense</i>	0	2	0	0	0	I	(2)
<i>Acer campestre</i> (seedling/sapling)	0	0	0	0	1	I	(1)
<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	0	1	0	0	0	I	(1)
<i>Clinopodium vulgare</i>	0	0	0	0	1	I	(1)
<i>Convolvulus arvensis</i>	0	0	1	0	0	I	(1)
<i>Cornus sanguinea</i> (seedling/sapling)	0	1	0	0	0	I	(1)
<i>Crataegus monogyna</i> (seedling/sapling)	0	0	0	0	1	I	(1)
<i>Fraxinus excelsior</i> (seedling/sapling)	1	0	0	0	0	I	(1)
<i>Hypericum maculatum</i>	0	0	0	0	1	I	(1)
<i>Knautia arvensis</i>	0	1	0	0	0	I	(1)
<i>Linum catharticum</i>	0	1	0	0	0	I	(1)
<i>Rhamnus cathartica</i> (seedling/sapling)	0	0	0	0	1	I	(1)
Bare ground	0	4	1	0	1	0	
Species per quadrat	26	31	28	28	31	0	29.8
Species per quadrat excl. scrub	27	32	29	29	32	0	27.6

Map 4 – Field 9010 (Target Notes for Map 4)

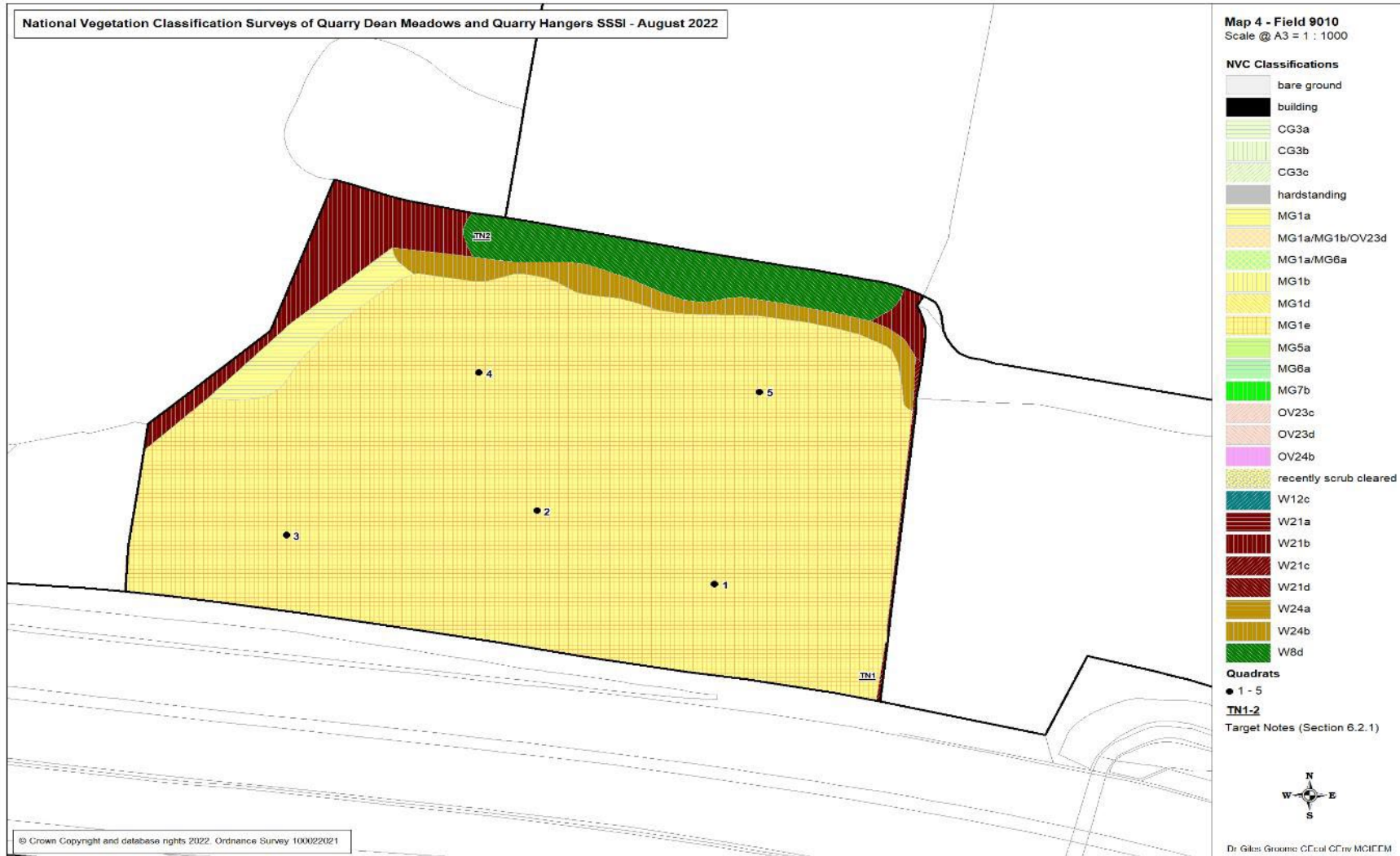


Figure 1 – MG1e (Quadrat 2) within Field 9010



3.2.4 Quarry Dean Meadows Field 1206

Survey area 2.09ha. Surveyed 23/6/21. Quadrats recorded 24/6/21. Map 5.

Boundaries

All northern, western and eastern boundaries follow OS Mastermap lines which, as far as could be confirmed during fieldwork, follow field banks. The western part of the southern boundary also follows an old field bank. To the east there appears to be the remnants of a former bank, but it is far from obvious and it is possible that there is no bank at all and that this was simply where a former fence was once present. All central parts of the southern boundary abut scrub and, given recent management (including cutting and the placing here of various materials such as wooden pallets, a ready-made stable block and bowser), are poorly fixed.

Site Description

Field 1206 overlies Grey Chalk (British Geological Society 2021) and Upton series grey rendzina soils (Soil Survey of England and Wales 1983) and supports mostly 10-15° south-

south-west facing slopes. Bordered by woodland and scrub to the north and hedgerows to the west and east, it is believed to have been managed as a hay meadow for many years; albeit without aftermath grazing. However, following a change in ownership, it was horse grazed within four paddocks divided by electric fencing during 2020. Animals were removed in March 2021. A derelict barn to the north-east of the field appears to be in the process of restoration.

Mapped NVC Classifications

MG1a (1 mapped stand/polygon, area 0.03ha)

Confined to the extreme south-western corner of the field, MG1a supports relatively coarse, species-poor *Arrhenatherum elatius*, *Holcus lanatus*, *Dactylis glomerata* and *Festuca rubra* grassland with frequent *Heracleum sphondylium*.

MG1b (1 mapped stand/polygon, area 0.02ha)

Associated with past disturbance to the south of the former barn and perhaps overlying formerly dumped material, MG1b is dominated by species-poor *Arrhenatherum elatius* grassland with abundant *Urtica dioica* ssp. *dioica* and *Galega officinalis*.

MG1e (1 mapped stand/polygon, area 1.59ha)

Most of the field supports species-rich, notably calcicolous, MG1e grassland with close affinities to MG1d (see Quadrats and NVC Classification). Swards are dominated by *Arrhenatherum elatius* and *Festuca rubra* with *Dactylis glomerata*, *Agrostis stolonifera* and *Holcus lanatus*. *Brachypodium sylvaticum*, *Poa pratensis* and *Trisetum flavescens* are frequent (the latter much more frequent than quadrats suggest). All other graminoids, including *Festuca ovina*, *Carex flacca* and *Avenula pubescens*, are uncommon. In places (notably in the region of quadrat 1), swards can support very low graminoid cover. By contrast, on the margins of scrub and MG1a, cover can be high.

Swards are for the most part very forb-rich, supporting more-or-less constant *Origanum vulgare*, *Centaurea nigra* agg., *Leucanthemum vulgare*, *Potentilla reptans*, *Plantago lanceolata*, *Lotus corniculatus*, *Daucus carota* ssp. *carota*, *Achillea millefolium*, *Medicago lupulina*, *Veronica chamaedrys*, *Pastinaca sativa* ssp. *sylvestris*, *Prunella vulgaris* (again including an unusual pink-flowered form), *Galium album*, *Jacobaea erucifolia*, *Ranunculus bulbosus*, *Odontites vernus* ssp. *serotinus* and *Vicia sativa* ssp. *segetalis*. Scattered associates include *Agrimonia eupatoria*, *Lathyrus pratensis*, *Hypericum perforatum* and *Jacobaea vulgaris*. Other species include *Clinopodium vulgare*, *Poterium sanguisorba* ssp. *sanguisorba*, *Linum catharticum*, *Knautia arvensis*, *Leontodon hispidus*, *Hypericum hirsutum*, 100's of *Anacamptis pyramidalis*, a dozen or more *Ophrys apifera* and a single *Dactylorhiza fuchsii*. Seedling and sapling woody species, notably *Crataegus monogyna* and *Rosa* spp., are scattered.

The bryoflora is characteristically poor, supporting only frequent *Brachythecium rutabulum* and, again presumably encouraged by last year's grazing, scattered *Barbula unguiculata*.

W21b (1 mapped stand/polygon, area 0.17ha)

W21b dominates the scrub and scrub-woodland to the north of the field. Little surveyed, due to the W24a between it and the open field hindering access, it forms a continuation of the W21b of Field 9010, supporting *Sambucus nigra*, *Crataegus monogyna*, *Taxus baccata*, *Cornus sanguinea* ssp. *sanguinea* and the occasional canopy *Fraxinus excelsior* tree. Where access could be gained, the field layer continues to be dominated by *Glechoma hederacea*, *Mercurialis perennis* and *Urtica dioica* ssp. *dioica*.

W21c (3 mapped stands/polygons, total area 0.03ha)

Western and eastern hedges support W21c. The western hedge was included in the survey of Field 9010. The eastern hedge supports a mixture of *Crataegus monogyna*, *Ligustrum vulgare*, *Cornus sanguinea* ssp. *sanguinea*, *Rhamnus cathartica* and climbing *Tamus communis*. *Sorbus aria* and *Rosa corymbifera* are rare. Whilst the field layer is dominated by *Hedera helix*, *Brachypodium sylvaticum* is more-or-less constant within the less densely shaded margins.

W24a (3 mapped stands/polygons, area 0.09ha)

W24a comprises mostly dense *Rubus fruticosus* with *Clematis vitalba* underscrub and scattered juvenile *Fraxinus excelsior*, *Sambucus nigra*, *Rosa canina*, *Rosa corymbifera* and *Crataegus monogyna*. *Urtica dioica* ssp. *dioica* and *Heracleum sphondylium* are occasional.

W24b (1 mapped stand/polygon, area 0.03ha)

This classification was mapped to cover recently scrub-cut stands (presumably formerly W24a) to the north of the derelict barn. In reality, current composition is not accommodated by the NVC, with stands comprising mixtures of regeneration scrub (especially *Rubus fruticosus*) and colonist species, including *Origanum vulgare*, *Urtica dioica* ssp. *dioica*, *Galega officinalis*, *Fumaria officinalis* ssp. *officinalis*, *Lamium purpureum*, *Veronica persica*, *Cirsium vulgare*, *Sonchus asper* and *Chaenorhinum minus*. There is little or no graminoid cover.

W8d (1 mapped stand/polygon, area 0.10ha)

Inaccessible (impenetrable) *Fraxinus excelsior* and *Fraxinus excelsior-Taxus baccata* woodland.

Bare Ground (2 mapped stands/polygons, total area 0.02ha)

Two stands of bare ground were mapped during fieldwork. The southern stand comprises recently levelled ground where an excavator has dug into the hill slope (presumably in preparation for a stable block). Whilst dominated by bare ground it supports frequent recruitment *Knautia arvensis* and, where the vehicular track of target note TN1 (Section 6.2.2 and Map 5) runs through it, locally frequent *Polygonum aviculare*.

The northern stand is associated with recent scrub clearance to the east of the derelict barn.

Building (1 mapped stand/polygon, area 0.01ha)

Derelict corrugated iron barn in process of restoration.

Quadrats and NVC Classification

Five quadrats were recorded from MG1e grassland. Table 5 highlights the results of the quadrat recordings in field 1206. Some cells have been intentionally left blank because there are no species recordings within the quadrats. The results of MATCH analysis are available upon request.

Table 5 – Quadrat recordings on MG1e grassland in field 1206

Field 1206 MG1e Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Origanum vulgare</i>	5	10	5	4	5	V	(4-10)
<i>Centaurea nigra</i> <i>agg.</i>	5	4	4	4	5	V	(4-5)
<i>Leucanthemum</i> <i>vulgare</i>	5	5	5	4	5	V	(4-5)
<i>Achillea</i> <i>millefolium</i>	3	3	4	4	5	V	(3-5)
<i>Festuca rubra</i> <i>agg.</i>	4	3	4	5	4	V	(3-5)
<i>Galium album</i>	4	4	5	4	2	V	(2-5)
<i>Potentilla reptans</i>	4	4	4	5	2	V	(2-5)
<i>Plantago</i> <i>lanceolata</i>	2	1	2	3	5	V	(1-5)
<i>Arrhenatherum</i> <i>elatius</i>	3	4	4	4	4	V	(3-4)
<i>Dactylis</i> <i>glomerata</i>	2	2	2	4	4	V	(2-4)
<i>Medicago lupulina</i>	3	3	2	4	3	V	(2-4)
<i>Pastinaca sativa</i> <i>ssp. sylvestris</i>	1	1	1	4	1	V	(1-4)
<i>Agrostis</i> <i>stolonifera</i>	1	1	3	3	3	V	(1-3)
<i>Holcus lanatus</i>	1	2	2	2	3	V	(1-3)
<i>Ranunculus</i> <i>bulbosus</i>	3	3	2	1	1	V	(1-3)
<i>Jacobaea</i> <i>erucifolia</i>	2	1	2	1	1	V	(1-2)
<i>Lotus corniculatus</i>	5		1	2	2	IV	(1-5)

Field 1206 MG1e Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Brachypodium sylvaticum</i>	2	1	4		2	IV	(1-4)
<i>Daucus carota</i> <i>ssp. carota</i>	4	1		4	2	IV	(1-4)
<i>Veronica chamaedrys</i>	1	4	2	3		IV	(1-4)
<i>Odontites vernus</i> <i>ssp. serotinus</i>	2	1		3	2	IV	(1-3)
<i>Poa trivialis</i>		1	2	3	3	IV	(1-3)
<i>Prunella vulgaris</i>	3	1	2		2	IV	(1-3)
<i>Vicia sativa</i> <i>ssp.</i> <i>segetalis</i>		1	3	3	2	IV	(1-3)
<i>Poa pratensis</i>	1	2		2	1	IV	(1-2)
<i>Lathyrus pratensis</i>	2			2	5	III	(2-5)
<i>Rubus fruticosus</i> <i>agg.</i>		4	1	5		III	(1-5)
<i>Brachythecium rutabulum</i>		3	3		3	III	(3)
<i>Barbula unguiculata</i>			1	3	2	III	(1-3)
<i>Linum catharticum</i>	1	1	3			III	(1-3)
<i>Agrimonia eupatoria</i>	2	1		2		III	(1-2)
<i>Crepis capillaris</i>	1	1	1			III	(1)
<i>Hypericum perforatum</i>	1		1		1	III	(1)
<i>Jacobaea vulgaris</i>	1		1		1	III	(1)
<i>Vicia cracca</i>	1	4				II	(1-4)
<i>Clinopodium vulgare</i>				2	3	II	(2-3)
<i>Poterium sanguisorba</i> <i>ssp.</i> <i>sanguisorba</i>			2		3	II	(2-3)
<i>Leontodon hispidus</i>	2		1			II	(1-2)

Field 1206 MG1e Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Anacamptis pyramidalis</i>	1		1			II	(1)
<i>Crataegus monogyna</i> (seedling/sapling)	1			1		II	(1)
<i>Lysimachia arvensis</i> ssp. <i>arvensis</i>	1		1			II	(1)
<i>Ranunculus repens</i>	1	1				II	(1)
<i>Rosa</i> spp. (seedling/sapling)	1		1			II	(1)
<i>Rumex crispus</i>		1		1		II	(1)
<i>Sonchus asper</i>				1	1	II	(1)
<i>Trifolium pratense</i>	4					I	(4)
<i>Glechoma hederacea</i>		3				I	(3)
<i>Convolvulus arvensis</i>					2	I	(2)
<i>Trisetum flavescens</i>			2			I	(2)
<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>				1		I	(1)
<i>Carex flacca</i>			1			I	(1)
<i>Cirsium arvense</i>					1	I	(1)
<i>Crepis biennis</i>			1			I	(1)
<i>Festuca ovina</i> agg.			1			I	(1)
<i>Heracleum sphondylium</i>				1		I	(1)
<i>Hypericum maculatum</i>					1	I	(1)
<i>Knautia arvensis</i>	1					I	(1)
<i>Lolium perenne</i>				1		I	(1)
<i>Ophrys apifera</i>					1	I	(1)
<i>Potentilla x mixta</i>			1			I	(1)

Field 1206 MG1e Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Prunus spinosa</i> (seedling/sapling)	1					I	(1)
<i>Ranunculus acris</i>			1			I	(1)
<i>Sonchus oleraceus</i>				1		I	(1)
<i>Torilis japonica</i>		1				I	(1)
Bare ground	1		1				
Species per quadrat	39	34	40	35	36		36.8
Species per quadrat excl. scrub	36	33	38	33	36		35.2

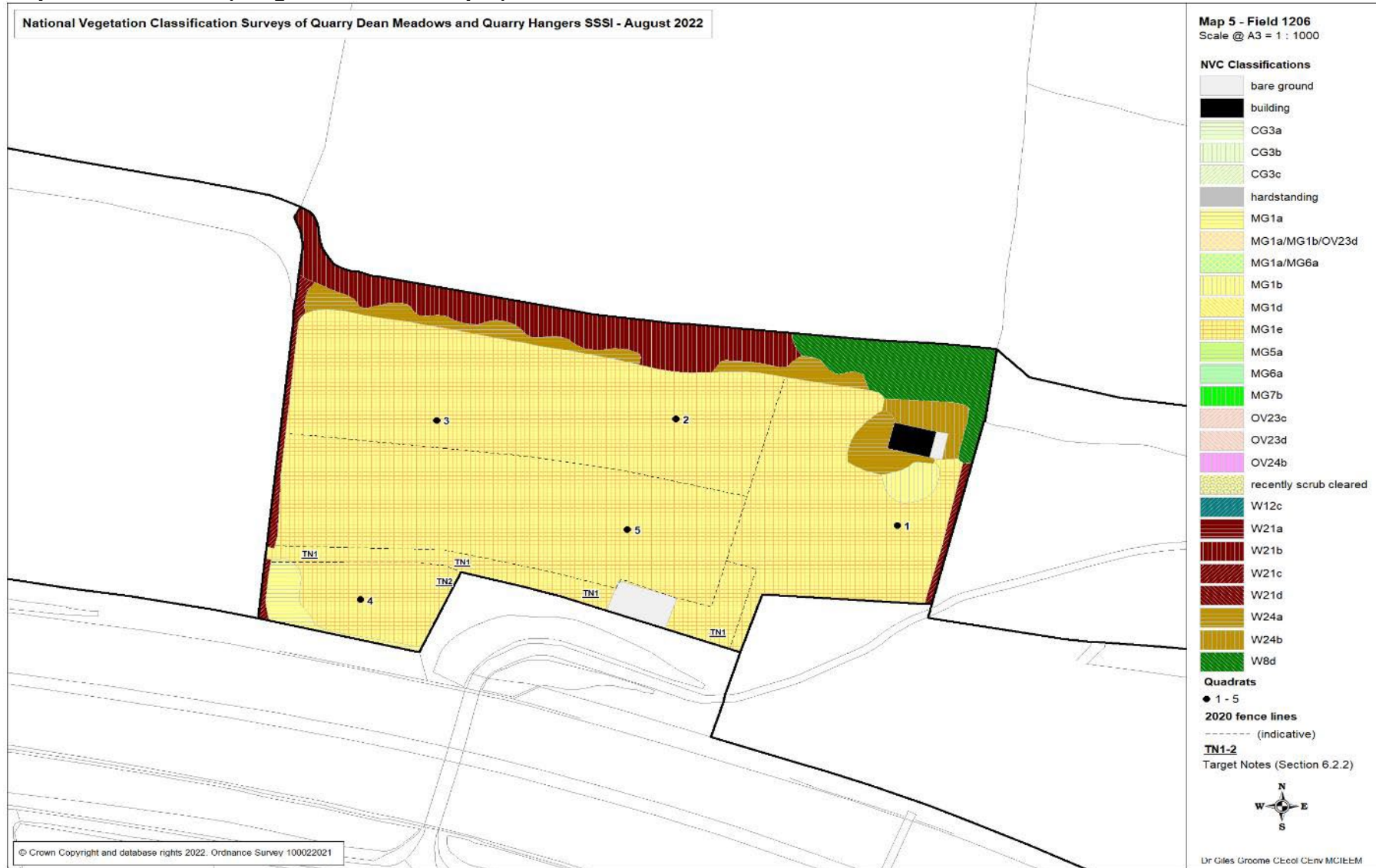
Running the results of quadrat recording through the key to mesotrophic grasslands in Rodwell (1992b) strongly supports the classification of MG1: “grasslands with frequent and often abundant *Arrhenatherum elatius*, *Dactylis glomerata* and *Holcus lanatus*”). However, determining sub-community is less straightforward. Whilst results favour MG1e (“*Centaurea nigra* and *Lotus corniculatus* constant with one or more of *Leucanthemum vulgare*, *Veronica chamaedrys*, *Anthoxanthum odoratum* and *Trisetum flavescens*”), swards are close to MG1d (“*Pastinaca sativa* constant and sometimes abundant with frequent *Festuca ovina*, *Agrostis capillaris*, *Galium verum* and *Senecio jacobaea* [sic]”). Indeed, *Pastinaca sativa* is not listed at all for MG1e in Rodwell’s MG1 floristic table; nor are *Origanum vulgare* (the most cover abundant species recorded from quadrats) or *Linum catharticum*. Conversely, *Leucanthemum vulgare*, *Hypericum perforatum* and *Avenula pubescens* (recorded during the walkover survey but not within a quadrat) are not listed for MG1d.

Considering Rodwell’s key, sub-community descriptions and floristic table, along with the results of MATCH analysis, the classification of MG1e, as described above (“species-rich, moderately calcicolous...with close affinities to MG1d”), is the most appropriate.

Figure 2 – MG1e (Quadrat 3) within Field 1206



Map 5 – Field 1206 (Target Notes for Map 5)



3.2.5 Quarry Dean Meadows Field 3403

Survey area 2.05ha. Surveyed 24/6/21. Quadrats recorded 24/6/21. Map 6.

Boundaries

All boundaries follow OS Mastermap lines which, as far as could be confirmed during fieldwork, follow field banks.

Site Description

Field 3403 overlies Grey Chalk (British Geological Society 2021) and Upton series grey rendzina soils (Soil Survey of England and Wales 1983) and supports mostly 10-15° south and south-south-west facing slopes. Bordered by scrub and woodland to the north, east and south and a hedgerow to the west, it is believed to have been managed as a hay meadow for many years; albeit without aftermath grazing. However, following a change in ownership, it was light or very light horse grazed within two paddocks (one either side of the central footpath) during 2020. Animals were removed in December 2020.

Mapped NVC Classifications

MG1a (3 mapped stands/polygons, total area 0.26ha)

MG1a is restricted to the margins of the field, notably where stands are shaded. Swards are dominated (often overwhelmingly so) by coarse *Arrhenatherum elatius* with *Brachypodium sylvaticum*, *Holcus lanatus* and *Festuca rubra*. Indicative of the field's close association with MG1d, the most common and cover abundant forbs are *Pastinaca sativa* ssp. *sylvestris*, *Galium album* and *Origanum vulgare*. *Clematis vitalba*, *Galega officinalis*, *Ranunculus repens*, *Galium aparine* and *Convolvulus arvensis* are locally common. *Rubus fruticosus* can be very locally frequent on the margins of scrub and some stands will soon cede to W24b without cutting.

MG1e (2 mapped stands/polygons, total area 1.08ha)

Most of the field supports species-rich, notably calcicolous, MG1e grassland with close affinities to MG1d (see Quadrats and NVC Classification). Swards are dominated by *Arrhenatherum elatius*, *Brachypodium sylvaticum* and *Festuca rubra* with *Dactylis glomerata*, *Poa pratensis* and *Holcus lanatus*. *Agrostis stolonifera* and *Poa trivialis* are frequent; *Carex flacca*, *Trisetum flavescens*, *Bromus hordeaceus* ssp. *hordeaceus* and *Avenula pubescens* occasional. A little *Hordeum secalinum* is also present.

Swards are again very forb-rich, supporting more-or-less constant *Origanum vulgare*, *Centaurea nigra* agg., *Leucanthemum vulgare*, *Medicago lupulina*, *Potentilla reptans*, *Lotus corniculatus*, *Plantago lanceolata*, *Agrimonia eupatoria*, *Vicia cracca*, *Poterium sanguisorba* ssp. *sanguisorba*, *Linum catharticum*, *Ranunculus bulbosus*, *Achillea millefolium*, *Pastinaca sativa* ssp. *sylvestris*, *Jacobaea erucifolia*, *Odontites vernus* ssp. *serotinus* and *Hypericum perforatum*. Common associates include *Veronica chamaedrys*, *Prunella vulgaris*, *Lathyrus pratensis*, *Leontodon hispidus*, *Pimpinella saxifraga*,

Clinopodium vulgare and *Jacobaea vulgaris*. *Daucus carota* ssp. *carota*, *Galium album*, *Trifolium pratense*, *Taraxacum* agg. and *Crepis capillaris* are occasional. Other species include *Knautia arvensis*, *Centaurea scabiosa*, *Blackstonia perfoliata*, *Primula veris*, *Arenaria serpyllifolia* ssp. *serpyllifolia*, *Crepis biennis*, *Hypericum hirsutum*, *Eupatorium cannabinum*, *Cirsium acaule*, 100's of *Anacamptis pyramidalis*, a handful of *Dactylorhiza fuchsii* and very locally frequent Nationally Rare, Schedule 8 *Rhinanthus angustifolius* (TN1, Map 6). Seedling and sapling woody species, notably *Crataegus monogyna*, *Cornus sanguinea* ssp. *sanguinea*, *Ligustrum vulgare* and *Rosa* ssp., are scattered throughout.

By contrast to previously described fields, MG1e within Field 3403 supports abundant *Calliergonella cuspidata* and *Pseudoscleropodium purum*, as well as frequent *Brachythecium rutabulum*.

OV23c (1 mapped stand/polygon, area 0.04ha)

The entire width of the trampled footpath that runs through the centre of Field 3403 has been mapped as a OV23c. Besides the bare ground at the centre of the path, vegetation is dominated by trampled *Lolium perenne* and *Plantago major* with abundant *Trifolium repens*. Common associates include *Dactylis glomerata*, *Taraxacum* agg., *Plantago lanceolata*, *Polygonum aviculare*, *Achillea millefolium*, *Lotus corniculatus*, *Trifolium pratense* and, in centre field areas (see TN2, Map 6), Surrey Scarce *Geranium pratense*.

W21b (1 mapped stand/polygon, area 0.10ha)

W21b is confined to the out-grown hedge marking the eastern boundary of Field 3403. It is dominated by *Corylus avellana* and *Acer campestre* with *Crataegus monogyna*, *Clematis vitalba*, *Sambucus nigra* and *Rubus fruticosus*. *Hedera helix* and *Mercurialis perennis* dominate the field layer with *Rubus fruticosus*, *Urtica dioica* ssp. *dioica* and scattered, but very locally abundant, *Brachypodium sylvaticum*.

W21c (3 mapped stands/polygons, total area 0.03ha)

W21c dominates the western hedge (described in Section 3.2.4) and two stretches of the out-grown southern hedgebank. The latter are dominated by mixed *Cornus sanguinea* ssp. *sanguinea*, *Rhamnus cathartica*, *Crataegus monogyna*, *Sambucus nigra*, *Ligustrum vulgare*, *Tamus communis* and juvenile *Fraxinus excelsior* with a species-poor field layer of patchy *Urtica dioica* ssp. *dioica* and *Brachypodium sylvaticum*.

W8d (3 mapped stands/polygons, total area 0.54ha)

Northern stretches of W8d are dominated by canopy *Fraxinus excelsior* with rare *Acer pseudoplatanus* over a mixed understorey of *Crataegus monogyna*, *Corylus avellana*, *Cornus sanguinea* ssp. *sanguinea*, *Taxus baccata*, *Sambucus nigra*, juvenile *Acer pseudoplatanus*, *Ligustrum vulgare* and *Sorbus aria*. Climbers, including *Hedera helix*, *Rubus fruticosus*, *Tamus communis*, *Rosa corymbifera* and *Rosa canina*, are frequent throughout. The field layer is dominated by *Hedera helix* and *Mercurialis perennis* with locally abundant *Glechoma hederacea*, *Rubus fruticosus*, *Urtica dioica* ssp. *dioica* and, notably where the footpath cuts through the centre of the woodland, *Brachypodium sylvaticum*.

Southern stands of mapped W8d are dominated by canopy *Fraxinus excelsior* with occasional *Acer campestre* and rare *Sorbus aria*. *Cornus sanguinea* ssp. *sanguinea* is the most common species of the understorey with *Sambucus nigra*, juvenile *Acer pseudoplatanus*, *Prunus spinosa*, climbing *Clematis vitalba*, *Crataegus monogyna* and a little *Rhamnus cathartica*. The atypical field layer is very poor, commonly supporting little other than leaf litter with patchy *Urtica dioica* ssp. *dioica* and *Brachypodium sylvaticum*.

Quadrats and NVC Classification

Five quadrats were recorded from MG1e grassland. Table 6 highlights the results of the quadrat recordings on field 3403. Some cells have been intentionally left blank because there are no species recordings within the quadrats. The results of MATCH analysis are available upon request.

Table 6 – Quadrat recordings on MG1e grassland in field 3403

Field 3403 MG1e Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Origanum vulgare</i>	6	7	7	6	5	V	(5-7)
<i>Calliergonella cuspidata</i>	4	7	7	6	5	V	(4-7)
<i>Leucanthemum vulgare</i>	5	5	5	5	6	V	(5-6)
<i>Medicago lupulina</i>	5	6	4	6	6	V	(4-6)
<i>Brachypodium sylvaticum</i>	2	4	6	5	2	V	(2-6)
<i>Centaurea nigra</i> agg.	5	4	4	4	4	V	(4-5)
<i>Arrhenatherum elatius</i>	3	3	4	4	3	V	(3-4)
<i>Festuca rubra</i> agg.	3	3	4	4	4	V	(3-4)
<i>Lotus corniculatus</i>	4	2	2	2	2	V	(2-4)
<i>Potentilla reptans</i>	4	3	3	2	3	V	(2-4)
<i>Agrimonia eupatoria</i>	2	2	4	4	1	V	(1-4)
<i>Vicia cracca</i>	3	3	4	3	1	V	(1-4)
<i>Linum catharticum</i>	3	3	3	2	2	V	(2-3)
<i>Dactylis glomerata</i>	2	1	3	2	2	V	(1-3)
<i>Plantago lanceolata</i>	3	2	2	2	1	V	(1-3)
<i>Poterium sanguisorba ssp. sanguisorba</i>	3	3	2	1	1	V	(1-3)
<i>Ranunculus bulbosus</i>	2	2	2	2	2	V	(1-2)
<i>Anacamptis pyramidalis</i>	2	1	1	1	1	V	(1-2)

Field 3403 MG1e Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Poa pratensis</i>	1	1	2	1	2	V	(1-2)
<i>Holcus lanatus</i>	1	1	1	1	1	V	(1)
<i>Hypericum perforatum</i>	1	1	1	1	1	V	(1)
<i>Jacobaea erucifolia</i>	1	1	1	1	1	V	(1)
<i>Rubus fruticosus</i> agg.		1	1	5	1	IV	(1-5)
<i>Achillea millefolium</i>	4	3	3	4		IV	(3-4)
<i>Pseudoscleropodium purum</i>	3	3	2		4	IV	(2-4)
<i>Agrostis stolonifera</i>	2	3		3	2	IV	(2-3)
<i>Pastinaca sativa</i> ssp. <i>sylvestris</i>		1	1	1	2	IV	(1-2)
<i>Odontites vernus</i> ssp. <i>serotinus</i>	1	1		1	1	IV	(1)
<i>Brachythecium rutabulum</i>			4	3	2	III	(2-4)
<i>Prunella vulgaris</i>	2	2			4	III	(2-4)
<i>Leontodon hispidus</i>	4	1	1			III	(1-4)
<i>Pimpinella saxifraga</i>	2			3	1	III	(1-3)
<i>Veronica chamaedrys</i>	2	2			2	III	(2)
<i>Lathyrus pratensis</i>		2	2		1	III	(1-2)
<i>Poa trivialis</i>	1	2		1		III	(1-2)
<i>Clinopodium vulgare</i>	1			1	1	III	(1)
<i>Fraxinus excelsior</i> (seedling/sapling)		1	1	1		III	(1)
<i>Jacobaea vulgaris</i>	1		1		1	III	(1)
<i>Trifolium pratense</i>	3				4	II	(3-4)
<i>Clematis vitalba</i> (seedling/sapling)			1		4	II	(1-4)
<i>Carex flacca</i>	3		1			II	(1-3)
<i>Cornus sanguinea</i> (seedling/sapling)			1	1		II	(1)
<i>Crataegus monogyna</i> (seedling/sapling)	1		1			II	(1)
<i>Crepis capillaris</i>		1			1	II	(1)

Field 3403 MG1e Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Daucus carota</i> ssp. <i>carota</i>	1	1				II	(1)
<i>Galium album</i>	1				1	II	(1)
<i>Quercus robur</i> (seedling/sapling)	1		1			II	(1)
<i>Ranunculus repens</i>	1				1	II	(1)
<i>Rosa</i> spp. (seedling/sapling)	1	1				II	(1)
<i>Taraxacum</i> agg.		1		1		II	(1)
<i>Acer campestre</i> (seedling/sapling)			1			I	(1)
<i>Acer pseudoplatanus</i> (seedling/sapling)			1			I	(1)
<i>Avenula pubescens</i>	1					I	(1)
<i>Blackstonia perfoliata</i>					1	I	(1)
<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>					1	I	(1)
<i>Centaurea scabiosa</i>	1					I	(1)
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>		1				I	(1)
<i>Crepis biennis</i>			1			I	(1)
<i>Inula conyzae</i>				1		I	(1)
<i>Knautia arvensis</i>		1				I	(1)
<i>Trisetum flavescens</i>		1				I	(1)
<i>Vicia sativa</i> ssp. <i>segetalis</i>				1		I	(1)
Bare ground		1	1	1			
Species per quadrat	43	41	39	36	41		40.0
Species per quadrat excl. scrub	40	38	31	33	39		36.2

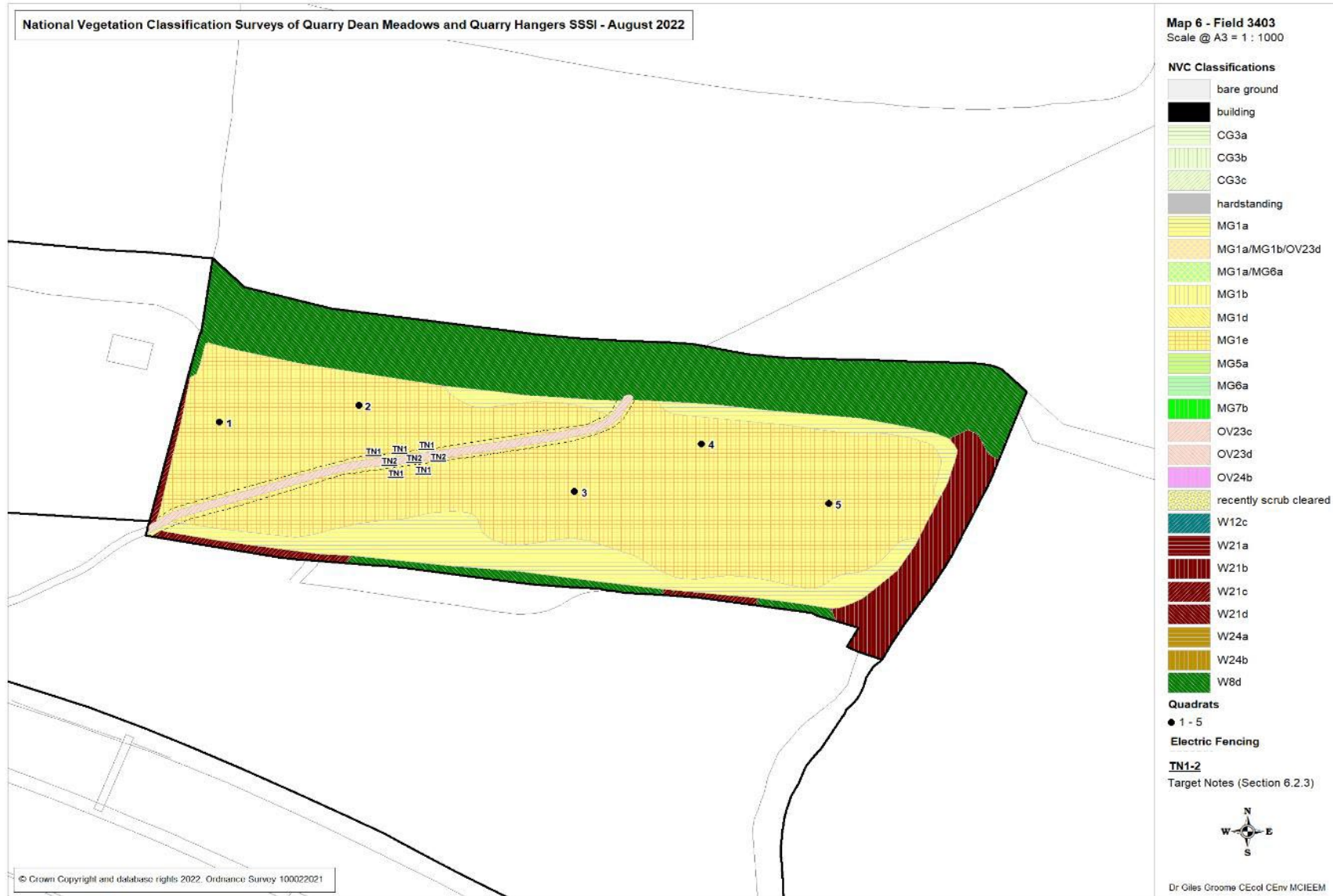
Running the results of quadrat recording through the key to mesotrophic grasslands in Rodwell (1992b) strongly supports the classification of MG1: “grasslands with frequent and often abundant *Arrhenatherum elatius*, *Dactylis glomerata* and *Holcus lanatus*”). However, determining sub-community is perhaps even less straightforward than previously. Whilst results favour MG1e (“*Centaurea nigra* and *Lotus corniculatus* constant with one or more of *Leucanthemum vulgare*, *Veronica chamaedrys*, *Anthoxanthum odoratum* and *Trisetum*

flavescens”), swards are close to MG1d (“*Pastinaca sativa* constant and sometimes abundant with frequent *Festuca ovina*, *Agrostis capillaris*, *Galium verum* and *Senecio jacobaea* [sic]”). Indeed, *Pastinaca sativa* is not listed at all for MG1e in Rodwell’s MG1 floristic table; nor are *Origanum vulgare* (once again the most cover abundant species recorded from quadrats), *Linum catharticum* or *Centaurea scabiosa*. Conversely, *Leucanthemum vulgare*, *Hypericum perforatum*, *Avenula pubescens* and *Primula veris* (recorded during the walkover survey but not within a quadrat) are not listed for MG1d.

Figure 3 – MG1e (Quadrat 1) within Field 3403



Map 6 – Field 3403 (Target Notes for Map 6)



3.2.6 Quarry Dean Meadows Field 2996

Survey area 2.35ha. Surveyed 24/6/21. Map 7.

Boundaries

All boundaries, bar those in the far north-west, follow OS Mastermap lines which, as far as could be confirmed during fieldwork, follow field banks. The north-eastern boundary follows the south-eastern boundary of Field 1206 (Section 3.2.4).

Site Description

Field 2996 overlies Grey Chalk (British Geological Society 2021) and Upton series grey rendzina soils (Soil Survey of England and Wales 1983) and supports mostly <math><10^\circ</math> south facing slopes. Bordered by scrub and woodland to the north, east and south and contiguous with Field 1206 to the west, it is believed to have been managed as a hay meadow for many years; albeit without aftermath grazing. However, following dereliction and a change in ownership, western stands were part scrub-cleared and horse grazed in late 2020. Eastern stands of *Rubus fruticosus* encroached rank grassland have seen no recent management.

Mapped NVC Classifications

MG1b (2 mapped stands/polygons, total area 0.18ha)

MG1b to the west of the OV23c mapped footpath is dominated by rank *Arrhenatherum elatius* grassland that does not appear to have been grazed in 2020; nor cut for several years prior to this. *Cirsium arvense*, *Urtica dioica* ssp. *dioica*, *Heracleum sphondylium* and *Convolvulus arvensis* are abundant.

To the east of the path swards were evidently grazed (and winter-wet soils poached) in late 2020/early 2021, probably following scrub cutting. Stands here are dominated by species-poor *Arrhenatherum elatius* with *Dactylis glomerata*, *Poa trivialis* and *Cirsium arvense*. *Urtica dioica* ssp. *dioica* is frequent (and broadly constant) with rather more local *Galium album*, *Galega officinalis* and *Symphytum x uplandicum*. *Heracleum sphondylium* is scattered with patchy *Origanum vulgare* and occasional *Lathyrus pratensis*.

MG1e (2 mapped stands/polygons, total area 0.18ha)

The two stands of mapped MG1e are relatively very species-poor compared to those in previously described fields. The stand to the north-west lies contiguous with MG1e within Field 1206, but is notably coarser and less species-rich. The other mapped stand has been grazed (and perhaps pre-graze scrub-cut) and supports *Arrhenatherum elatius*, *Dactylis glomerata* and *Poa trivialis* grassland with abundant *Cirsium arvense*, frequent *Leucanthemum vulgare*, locally frequent *Centaurea nigra* agg., occasional *Heracleum sphondylium* and a little *Lotus corniculatus* and *Jacobaea erucifolia*.

OV23c (1 mapped stand/polygon, area 0.02ha)

A continuation of the trampled footpath of Field 3403. In addition to species noted in Section 3.2.5, *Ranunculus repens*, *Artemisia vulgaris* and *Capsella bursa-pastoris* are locally common.

W21a (3 mapped stands/polygons, total area 0.23ha)

W21a is confined to southern and south-eastern stands of boundary scrub. Little surveyed (access is all but impossible in most stands), it is variably dominated by *Prunus spinosa*, *Crataegus monogyna*, *Cornus sanguinea* ssp. *sanguinea* and juvenile *Fraxinus excelsior*. The field layer appears to be mostly very species-poor *Urtica dioica* ssp. *dioica* with locally common *Galium aparine* and *Glechoma hederacea*.

W21b (1 mapped stand/polygon, area 0.04ha)

Situated to the north-east of Field 2996, stands comprise a continuation of the W21b described for Field 3403 (Section 3.2.5).

W21c (3 mapped stands/polygons, one a fragment of the hedge separating Fields 1206 and 3403, total area 0.06ha)

Stands of W21c are described in Section 3.2.5.

W24a (4 mapped stands/polygons, total area 0.22ha)

Confined to the southern and south-eastern stands of boundary underscrub, W24a is dominated by dense *Rubus fruticosus* with scattered *Crataegus monogyna*, *Prunus spinosa* and juvenile *Fraxinus excelsior*. A little *Malus domestica* and *Salix caprea* are also present with climbing *Calystegia silvatica* and the occasional patch of *Epilobium hirsutum*.

One stand (TN12, Map 7), is very different, supporting an abundance of, presumably winter-wet, *Equisetum telmateia*.

W24b (1 mapped stand/polygon, area 1.44ha)

W24b covers most of the former hay meadow. It is dominated by *Rubus fruticosus* encroached rank *Arrhenatherum elatius* grassland (up to 2m in height) with locally abundant (to dominant in north-eastern areas) *Brachypodium sylvaticum*. *Dactylis glomerata* and *Poa trivialis* are abundant in stands to the west of the central fence, which have been part scrub cut and horse grazed, but much less common to the east where there has been no recent management. *Hordeum secalinum* was recorded in small numbers to the west but not seen to the east.

Ranunculus repens is the most common forb to the west of the fence with locally abundant *Origanum vulgare*, *Glechoma hederacea*, *Potentilla reptans* and *Galium album*. *Centaurea nigra* agg., *Stachys sylvatica*, *Rumex sanguineus*, *Agrimonia eupatoria*, *Achillea millefolium*, *Ervum tetraspermum*, *Hypericum perforatum*, *Odontites vernus* ssp. *serotina* and *Symphytum x uplandicum* are occasional. Other species include *Jacobaea erucifolia*, *Ranunculus acris*, *Leucanthemum vulgare*, *Hypericum hirsutum*, *Dactylorhiza fuchsii*,

Pulicaria dysenterica and *Anacamptis pyramidalis*. A very small patch of Surrey Rare *Lathyrus sylvestris* was recorded on the margins of W24a (TN3, Map 7).

East of the fence *Heracleum sphondylium* is the most common forb with locally abundant *Pastinaca sativa* ssp. *sylvestris*, *Galega officinalis* and *Origanum vulgare*. *Cirsium arvense*, *Epilobium hirsutum*, *Galium album* and *Urtica dioica* ssp. *dioica* are locally frequent. A little *Leucanthemum vulgare*, *Centaurea nigra* agg., *Lathyrus pratensis*, *Agrimonia eupatoria*, *Hypericum perforatum* and *Anacamptis pyramidalis* are also present, suggesting stands were formerly MG1e and likely to revert to this given appropriate management. A second patch of Surrey Rare *Lathyrus sylvestris* was recorded on the margins of W24a (TN3, Map 7).

W8d (2 mapped stands/polygons, total area 0.12ha)

Stands of W8d are described in Section 3.2.5.

Quadrats and Confirmation of NVC Classification

Given the small size and poor quality of the remnant stands of MG1e, no quadrats were recorded.

Map 7 – Field 2996 (Target Notes for Map 7)



3.2.7 Quarry Hangers Field 4194 (south)

Survey area 3.17ha. Surveyed 22/6/21. Quadrats recorded 2/7/21. Map 8.

Boundaries

All boundaries follow OS Mastermap lines which, as far as could be confirmed during fieldwork, follow field banks.

Site Description

Field 4194 (south) overlies Grey Chalk (British Geological Society 2021) and Upton series grey rendzina soils (Soil Survey of England and Wales 1983) and supports mostly 10° south-west and south-south-west facing slopes. Bordered by scrub and woodland, it is believed that the field was formerly arable. However, all is now managed as a hay meadow with aftermath sheep grazing.

Mapped NVC Classifications

CG3c (1 mapped stand/polygon, area 2.27ha)

Atypical CG3c dominates Field 4194 (south). Species-rich swards, albeit lacking in several characteristic CG3 species, are dominated by *Bromopsis erecta* and *Festuca rubra* with *Arrhenatherum elatius*, *Dactylis glomerata*, *Carex flacca*, *Briza media*, *Trisetum flavescens*, *Cynosurus cristatus*, *Poa pratensis*, *Holcus lanatus* and *Avenula pubescens*.

Nationally Rare, Schedule 8 *Rhinanthus angustifolius*, *Crepis biennis*, *Leucanthemum vulgare*, *Trifolium pratense*, *Lotus corniculatus* and *Medicago lupulina* are the most common and cover abundant forbs with *Ranunculus acris*, *Plantago lanceolata*, *Veronica chamaedrys*, *Convolvulus arvensis*. *Tragopogon pratensis* ssp. *minor*, *Centaurea nigra* agg., *Ranunculus bulbosus*, *Taraxacum* agg., *Linum catharticum* and *Prunella vulgaris*. Scattered associates include *Primula veris*, *Heracleum sphondylium*, *Agrimonia eupatoria*, *Leontodon hispidus*, *Jacobaea vulgaris*, *Anacamptis pyramidalis* and, not picked up by quadrats, *Potentilla reptans*.

Amongst the bryoflora *Brachythecium rutabulum* is both unusually common and cover abundant with patchy *Calliergonella cuspidata*.

MG1e (1 mapped stand/polygon, area 0.36ha)

MG1e grassland is confined to the southern and western margins of the field. Species-rich swards are dominated by *Arrhenatherum elatius*, *Festuca rubra* and *Dactylis glomerata* with *Poa pratensis*, *Cynosurus cristatus*, *Poa trivialis* (not picked up by quadrats), *Holcus lanatus* and *Trisetum flavescens*. *Brachypodium sylvaticum* and *Hordeum secalinum* are locally abundant; *Lolium perenne* locally frequent. Other species include *Carex flacca*, *Bromus hordeaceus* ssp. *hordeaceus*, *Agrostis stolonifera*, *Bromus commutatus* and, on the margins of CG3c, *Bromopsis erecta*.

Rhinanthus angustifolius, *Crepis biennis* and *Trifolium pratense* are the most common and cover abundant forbs with *Heracleum sphondylium*, *Ranunculus acris* and *Taraxacum* agg. *Plantago lanceolata*, *Primula veris*, *Veronica chamaedrys*, *Centaurea nigra* agg. and *Leucanthemum vulgare* (not always reflected by quadrat recording) are amongst the most common associates with *Lathyrus pratensis*, *Trifolium repens*, *Vicia sativa* ssp. *segetalis*, *Prunella vulgaris* and, on the margins of woodland, *Anthriscus sylvestris*, *Urtica dioica* ssp. *dioica*, *Galium album* and *Galium aparine*. Other species include scattered *Dactylorhiza fuchsii*, *Viola odorata*, *Ranunculus bulbosus*, *Anacamptis pyramidalis*, *Linum catharticum* and *Tragopogon pratensis* ssp. *minor*.

Brachythecium rutabulum is more-or-less constant in the ground layer with patchy *Calliergonella cuspidata*. Woody seedlings/saplings are more-or-less absent; although *Rubus fruticosus* can be very locally common on the margins of woodland (see for example TN1, Section 6.2.5, Map 8).

W21c (2 mapped stands/polygons, total area 0.08ha)

W21c is confined to hedges to the north and east of Field 4194 (south). They are variably dominated by *Crataegus monogyna*, *Prunus spinosa* and *Corylus avellana* with frequent climbing *Clematis vitalba*, *Rubus fruticosus*, *Tamus communis* and *Rosa* spp. (especially *Rosa canina*, plus a little *Rosa corymbifera*). The species-poor field layer supports frequent (and more-or-less constant) *Brachypodium sylvaticum* with *Urtica dioica* ssp. *dioica* and *Galium aparine*, along with locally abundant *Hedera helix* and *Rubus fruticosus*.

W8d (1 mapped stand/polygon, area 0.46ha)

Southern, western and north-western field margins are dominated by *Fraxinus excelsior* woodland with frequent canopy *Acer pseudoplatanus* and *Tilia x europaea*, and occasional *Aesculus hippocastanum*. The understorey is dominated by *Crataegus monogyna* with *Corylus avellana* and sparse *Sambucus nigra*. *Hedera helix* and *Glechoma hederacea* are the most common species of the field layer with locally abundant *Mercurialis perennis*, *Rubus fruticosus*, seedling/sapling *Fraxinus excelsior*, *Poa trivialis*, *Alliaria petiolata*, *Brachypodium sylvaticum*, *Urtica dioica* ssp. *dioica* and, in one patch to the centre-south *Allium ursinum*. *Heracleum sphondylium*, *Stachys sylvatica*, *Arum maculatum*, *Tamus communis* and *Anthriscus sylvestris* are scattered associates. *Epipactis helleborine* is also present.

Quadrats and NVC Classification

CG3c

Five quadrats were recorded from CG3c grassland. Table 7 highlights the results of the quadrat recordings in field 4194. Some cells have been intentionally left blank because there are no species recordings within the quadrats. The results of MATCH analysis are available upon request.

Running the results of quadrat recording through the key to calcareous grasslands in Rodwell (1992b) there is little doubt that swards belong within CG3: Couplet 1 “grasslands with one or more of *Bromus erectus* [sic], *Brachypodium pinnatum* [sic] or *Avenula pubescens* constant at more than 10% cover”; 2 “*Sesleria albicans* [sic] absent”; 3

“*Bromus erectus* [sic] constant with *Brachypodium pinnatum* [sic] very rare”). However, determining sub-community is less straightforward. Whilst *Festuca rubra* is present in the absence of *Festuca ovina*, CG3d can be discounted given that, with one exception, “...*Lotus corniculatus*, *Prunella vulgaris*, *Cirsium acaule*, *Briza media* and *Linum catharticum* [are] frequent” (couplet 4). The problem therefore is separating CG3c from CG3a and, more especially, CG3b. This is a very common issue in Surrey where, for example, CG3c rarely ever supports the reportedly constant *Bellis perennis* (see for example Hedley 1989; Groome 2004, 2017). Running sample results through Rodwell’s key could bring the reader to a default position of CG3a, given that samples do not support (as frequent) five or more “...*Bellis perennis*, *Knautia arvensis*, *Taraxacum officinale* agg. [sic], *Medicago lupulina*, *Trifolium pratense*, *T.repens*, *Viola hirta*, *Vicia cracca*, *Cynosurus cristatus*, *Phleum pratense* ssp. *bertolonii* [sic]” (CG3c); nor is there *Centaurea nigra* “...with two or more of *Hypochoeris radicata* [sic], *Daucus carota*, *Achillea millefolium*, *Galium mollugo* [sic], *Rhinanthus minor*, *Senecio jacobaea* [sic]” (CG3b). There are however, three frequent CG3c species and all six others, excluding *Bellis perennis*, are present within the area mapped; albeit not necessarily within quadrats.

Considering Rodwell’s key, sub-community descriptions and floristic table, along with the results of MATCH analysis, the classification of CG3c, as described above (“atypical”), is the most appropriate.

Table 7 - Quadrat recordings on CG3c grassland in field 4194

Field 4194 (s) CG3c Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Bromopsis erecta</i>	8	8	8	8	7	V	(7-8)
<i>Rhinanthus angustifolius</i>	8	7	7	7	8	V	(7-8)
<i>Brachythecium rutabulum</i>	7	7	7	8	8	V	(7-8)
<i>Festuca rubra</i> agg.	3	5	5	5	7	V	(3-7)
<i>Crepis biennis</i>	4	5	4	4	4	V	(4-5)
<i>Lotus corniculatus</i>	5	5	4	4	4	V	(4-5)
<i>Trifolium pratense</i>	4	5	4	5	4	V	(4-5)
<i>Medicago lupulina</i>	3	3	4	5	4	V	(3-5)
<i>Ranunculus acris</i>	1	2	4	4	5	V	(1-5)
<i>Leucanthemum vulgare</i>	3	3	3	3	3	V	(3)
<i>Carex flacca</i>	3	2	2	3	1	V	(1-3)
<i>Plantago lanceolata</i>	3	2	1	2	1	V	(1-3)
<i>Veronica chamaedrys</i>	1	2	3	2	3	V	(1-3)
<i>Convolvulus arvensis</i>	1	2	1	1	1	V	(1-2)

Field 4194 (s) CG3c Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Arrhenatherum elatius</i>	1	1	1	1	1	V	(1)
<i>Dactylis glomerata</i>	1	1	1	1	1	V	(1)
<i>Tragopogon pratensis</i> ssp. <i>minor</i>	1	1	1	1	1	V	(1)
<i>Centaurea nigra</i> agg.	1	4	1	4		IV	(1-4)
<i>Briza media</i>	3	1	2		3	IV	(1-3)
<i>Linum catharticum</i>	3	3	3	3		IV	(3)
<i>Ranunculus bulbosus</i>		2	1	1	1	IV	(1-2)
<i>Taraxacum</i> agg.	1		1	1	2	IV	(1-2)
<i>Prunella vulgaris</i>	1	1	1		1	IV	(1)
<i>Trisetum flavescens</i>	1	1		1	1	IV	(1)
<i>Avenula pubescens</i>	1		1		1	III	(1)
<i>Calliargonella cuspidata</i>	5		2			II	(2-5)
<i>Primula veris</i>	4				1	II	(1-4)
<i>Agrimonia eupatoria</i>		1	1			II	(1)
<i>Heracleum sphondylium</i>			1		1	II	(1)
<i>Holcus lanatus</i>		1			1	II	(1)
<i>Jacobaea vulgaris</i>	1				1	II	(1)
<i>Leontodon hispidus</i>	1			1		II	(1)
<i>Poa trivialis</i>				1	1	II	(1)
<i>Agrostis stolonifera</i>					1	I	(1)
<i>Anacamptis pyramidalis</i>		1				I	(1)
<i>Crepis capillaris</i>		1				I	(1)
<i>Origanum vulgare</i>			1			I	(1)
<i>Pimpinella saxifraga</i>	1					I	(1)
<i>Poa pratensis</i>				1		I	(1)
<i>Trifolium repens</i>		1				I	(1)
Species per quadrat	29	28	28	25	29		27.8
Species per quadrat excl. scrub	29	28	28	25	29		27.8

Figure 4 – CG3c (Quadrat 3) within Field 4194 (south)



MG1e

Three quadrats were recorded from MG1e grassland. Table 8 highlights the results of the quadrat recordings on field 4194. Some cells have been intentionally left blank because there are no species recordings within the quadrats. The results of MATCH analysis are available upon request.

Running the results of quadrat recording through the key to mesotrophic grasslands in Rodwell (1992b) strongly supports the classification of MG1: “grasslands with frequent and often abundant *Arrhenatherum elatius*, *Dactylis glomerata* and *Holcus lanatus*”). However, determining sub-community is less straightforward given that neither *Centaurea nigra* or *Lotus corniculatus* are constant. Nevertheless, the grassland does not belong within any MG1 sub-community other than MG1e.

MATCH analysis gives the highest co-efficient to MG1e for only one of the three quadrats. Combined, MG1e is 4th on the list of highest co-efficients (52.6). However, higher scoring MG5 communities can be discounted for the reason given above (“frequent and often abundant *Arrhenatherum elatius*, *Dactylis glomerata* and *Holcus lanatus*”).

Table 8 - Quadrat recordings on MG1e grassland in Field 4194

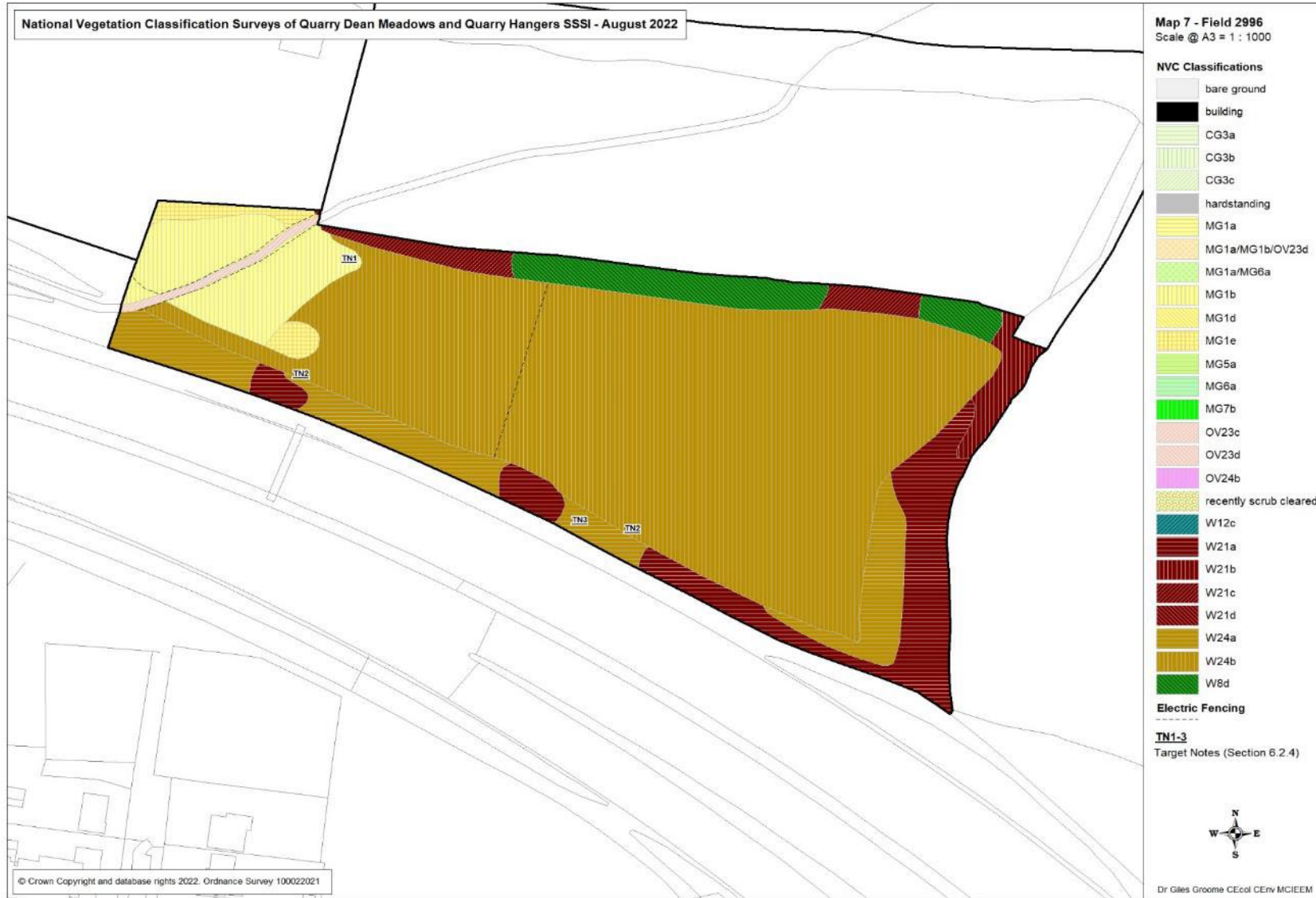
Field 4194 (s) MG1e Quadrats	1	2	3	Constancy	Constancy
<i>Rhinanthus angustifolius</i>	6	7	8	V	(6-8)
<i>Festuca rubra</i> agg.	5	8	7	V	(5-8)
<i>Crepis biennis</i>	6	5	6	V	(5-6)
<i>Trifolium pratense</i>	5	6	5	V	(5-6)
<i>Arrhenatherum elatius</i>	5	4	4	V	(4-5)
<i>Dactylis glomerata</i>	5	2	4	V	(2-5)
<i>Heracleum sphondylium</i>	4	1	1	V	(1-4)
<i>Primula veris</i>	1	1	4	V	(1-4)
<i>Ranunculus acris</i>	4	1	2	V	(1-4)
<i>Taraxacum</i> agg.	4	1	1	V	(1-4)
<i>Brachytecium rutabulum</i>	3	3	3	V	(3)
<i>Plantago lanceolata</i>	1	1	2	V	(1-2)
<i>Trifolium repens</i>		4	4	III	(4)
<i>Centaurea nigra</i> agg.	1		4	III	(1-4)
<i>Holcus lanatus</i>	3	1		III	(1-3)
<i>Poa pratensis</i>	3	1		III	(1-3)
<i>Trisetum flavescens</i>		2	2	III	(2)
<i>Cynosurus cristatus</i>		1	2	III	(1-2)
<i>Calliergonella cuspidata</i>			5	II	(5)
<i>Veronica chamaedrys</i>	4			II	(4)
<i>Leucanthemum vulgare</i>			3	II	(3)
<i>Prunella vulgaris</i>			3	II	(3)

Field 4194 (s) MG1e Quadrats	1	2	3	Constancy	Constancy
<i>Carex flacca</i>			2	II	(2)
<i>Convolvulus arvensis</i>			2	II	(2)
<i>Geranium dissectum</i>	2			II	(2)
<i>Linum catharticum</i>			2	II	(2)
<i>Lotus corniculatus</i>			2	II	(2)
<i>Agrostis stolonifera</i>		1		II	(1)
<i>Anacamptis pyramidalis</i>			1	II	(1)
<i>Anthriscus sylvestris</i>		1		II	(1)
<i>Bromopsis erecta</i>			1	II	(1)
<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>		1		II	(1)
<i>Crepis capillaris</i>	1			II	(1)
<i>Hordeum secalinum</i>	1			II	(1)
<i>Ranunculus bulbosus</i>	1			II	(1)
<i>Tragopogon pratensis</i> ssp. <i>minor</i>			1	II	(1)
Species per quadrat	20	20	26		22.0
Species per quadrat excl. scrub	20	20	26		22.0

Figure 5 – MG1e (Quadrat 3), with CG3c beyond, within Field 4194 (south)



Map 8 – Field 4914 (south) (Target Notes for Map 8)



3.2.8 Quarry Hangers Field 6866 (south)

Survey area 1.35ha. Surveyed 28/6/21. Quadrats recorded 28/6/21. Map 9.

Boundaries

Western and eastern boundaries follow OS Mastermap lines which, as far as could be confirmed during fieldwork, follow field banks. The southern boundary follows a wrought iron fence (also marked by OS material). There is no northern boundary separating the field from Unit 2 of the Quarry Hangers SSSI.

Site Description

Field 6866 (south) overlies Grey Chalk (British Geological Society 2021) and Upton series grey rendzina soils (Soil Survey of England and Wales 1983) and supports mostly 5-15° south-south-west to south-south-east facing slopes. All is sheep grazed in conjunction with Unit 2 of the Quarry Hangers SSSI, although this has not been consistent. There has been a considerable amount of recent scrub clearance.

Mapped NVC Classifications

CG3c (2 mapped stands/polygons, total area 0.05ha)

CG3c is restricted to the northern margins of Field 6866 (south) and was largely ignored during fieldwork given that it was (and remains) unclear where the boundary of the field stops and that of SSSI Unit 2 starts. It had been proposed to record at least one sample quadrat from the central-northern 'island' of CG3c, which supports abundant *Bromopsis erecta* with *Dactylis glomerata* and *Festuca rubra*, and at least some *Cirsium acaule*, *Lotus corniculatus*, *Rhinanthus angustifolius*, *Agrimonia eupatoria* and *Ononis repens*. However, there was insufficient time to complete this and the focus of fieldwork was therefore to sample five quadrats from mapped MG1e and record CG3c quadrats from SSSI Unit 2.

MG1a (2 mapped stands/polygons, total area 0.20ha)

South/south-western stands of MG1a are dominated by coarse *Arrhenatherum elatius* grassland with *Dactylis glomerata*, *Poa trivialis* and locally abundant *Brachypodium sylvaticum*. *Heracleum sphondylium* and *Galium album* are the most common and cover abundant forbs with locally common *Cirsium arvense*, and scattered *Convolvulus arvensis* and *Crepis biennis*. Those to the far east are (presumably following past scrub management) atypical, supporting abundant *Clematis vitalba* and *Galium album* with frequent *Heracleum sphondylium* and patches of *Rubus fruticosus* (to W24b).

MG1e (1 mapped stand/polygon, area 0.84ha)

Most of Field 6866 (south) supports markedly calcicolous, species-rich but atypical MG1e grassland, lacking *Centaurea nigra* agg. Stands are dominated by *Arrhenatherum elatius* and *Festuca rubra* with *Dactylis glomerata*, *Holcus lanatus*, *Agrostis stolonifera*, *Carex flacca* and *Brachypodium sylvaticum*. *Poa pratensis*, *Phleum bertolonii* and *Poa trivialis*

are occasional with sparse *Hordeum secalinum*, *Bromopsis erecta* and, only recorded from an anthill, *Festuca ovina*.

Origanum vulgare, *Galium album* and *Potentilla reptans* are the most common and cover abundant forbs with *Lotus corniculatus*, *Veronica chamaedrys*, *Medicago lupulina*, *Trifolium pratense*, *Convolvulus arvensis*, *Plantago lanceolata*, *Prunella vulgaris*, *Agrimonia eupatoria* and *Odontites vernus* ssp. *serotinus*. Common associates include *Ranunculus bulbosus*, *Jacobaea erucifolia*, Nationally Rare, Schedule 8 *Rhinanthus angustifolius*, *Heracleum spondylium*, *Ranunculus repens*, *Viola hirta*, *Linum catharticum*, *Taraxacum* agg., *Trifolium repens*, *Crepis biennis*, *Tragopogon pratensis* ssp. *minor*, *Cirsium arvense* and *Clinopodium vulgare*. *Ononis repens*, *Achillea millefolium*, *Ranunculus acris* and *Lathyrus pratensis* are locally abundant. *Leontodon hispidus*, *Euphrasia nemorosa*, *Dactylorhiza fuchsii*, *Leucanthemum vulgare* and *Cerastium fontanum* ssp. *vulgare* are occasional. Other species include *Primula veris*. *Knautia arvensis*, *Anacamptis pyramidalis*, *Poterium sanguisorba* ssp. *sanguisorba*, *Silene vulgaris* ssp. *vulgaris*, *Cirsium acaule*, *Pimpinella saxifraga* and the roses *Rosa corymbifera*, *R. rubiginosa* and *R. micrantha*. Other scrub species include very locally frequent *Rubus fruticosus*, occasional *Crataegus monogyna* and a little *Prunus spinosa* and juvenile *Fraxinus excelsior*.

The ground layer supports locally abundant *Pseudoscleropodium purum* with patchy *Brachythecium rutabulum*.

W21c (4 mapped stands/polygons, total area 0.10ha)

W21c on the western field boundary and continuing northward along the western edge of SSSI Unit 2 supports mixed *Crataegus monogyna*, *Clematis vitalba*, *Prunus spinosa*, *Viburnum lantana*, *Hedera helix*, *Tamus communis*, juvenile *Fraxinus excelsior*, *Rubus fruticosus* and a little *Acer campestre*. The field layer is dominated by *Hedera helix* with abundant *Brachypodium sylvaticum* where ever stands are not too heavily shaded, occasional *Rubus fruticosus* and locally frequent *Viola odorata*.

The small W21c 'island' to the east of here is dominated by *Prunus spinosa* over *Brachypodium sylvaticum*.

Stands to the east of the field are dominated by *Crataegus monogyna* with a mostly heavily shaded field layer that includes scattered *Viola hirta*, *Hypericum perforatum*, *Geum urbanum*, *Clematis vitalba*, *Centaureum erythraea*, *Prunella vulgaris*, *Bryonia dioica*, *Rubus fruticosus*, *Veronica chamaedrys*, *Galium album* and *Brachypodium sylvaticum*. *Rhytidadelphus triquetrus* is at least locally common.

W24a (1 mapped stand/polygon, area 0.01ha)

The single stand of mapped W24a is dominated by dense species-poor *Rubus fruticosus*.

W24b (1 mapped stand/polygon, area 0.05ha)

The stand of W24b to the south-east of Field 6866 (south) comprises post-scrub cut regeneration *Rubus fruticosus* with frequent, and locally dominant, *Clematis vitalba*,

Festuca rubra, *Brachypodium sylvaticum* and *Galium album*. Part supports locally abundant regeneration *Ulmus procera*.

W8d (1 mapped stand/polygon, area 0.02ha)

W8d dominates the strip of woodland to the south of the survey site, beyond the southern boundary. What is included within Field 6866 (south) is largely restricted to canopy *Fraxinus excelsior* and *Acer pseudoplatanus* overhang within a narrow strip between relatively recently installed sheep fencing and the wrought iron fence that denotes the southern limit of survey.

Recently Scrub Cleared (2 mapped stands/polygons, total area 0.08ha)

Vegetation included within this classification is not referable to the NVC. It covers stands where, often previously very dense, scrub has been recently cleared (commonly since the date of the aerial imagery used during fieldwork) and where the vegetation comprises regeneration of the scrub that has recently been cut, as well as of previously extant grassland that had been present before the development of scrub, and recruitment of species encroaching (e.g. by tillering) and/or seeding in to the newly exposed, commonly disturbed, open conditions.

Within Field 6866 (south) ‘recently scrub cleared’ stands are variably dominated by *Origanum vulgare*, *Galium album*, *Brachypodium sylvaticum* and *Rubus fruticosus* with *Sonchus asper*, *Atropa belladonna*, *Solanum dulcamara*, *Prunella vulgaris*, *Helminthotheca echioides*, *Reseda lutea*, *Cirsium arvense*, *Sambucus nigra*, *Cirsium vulgare*, *Bryonia dioica*, *Hypericum perforatum* and *Veronica chamaedrys*.

Quadrats and NVC Classification

Five quadrats were recorded from MG1e grassland. Table 9 highlights the results of the quadrat recordings in field 6866. Some cells have been intentionally left blank because there are no species recordings within the quadrats. The results of MATCH analysis are available upon request.

Table 9 - Quadrat recordings on MG1e grassland in field 6866

Field 6866 (S) MG1e Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Festuca rubra</i> agg.	8	6	8	8	8	V	(6-8)
<i>Galium album</i>	4	7	5	2	7	V	(2-7)
<i>Potentilla reptans</i>	5	4	5	4	3	V	(3-5)
<i>Arrhenatherum elatius</i>	1	4	5	5	5	V	(1-5)
<i>Dactylis glomerata</i>	1	2	3	4	5	V	(1-5)
<i>Veronica chamaedrys</i>	4	3	4	3	4	V	(3-4)
<i>Agrostis stolonifera</i>	3	3	3	4	2	V	(2-4)
<i>Medicago lupulina</i>	3	2	2	4	3	V	(2-4)

Field 6866 (S) MG1e Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Plantago lanceolata</i>	4	2	4	4	2	V	(2-4)
<i>Agrimonia eupatoria</i>	4	2	2	2	1	V	(1-4)
<i>Holcus lanatus</i>	2	3	2	3	1	V	(1-3)
<i>Odontites vernus</i> ssp. <i>serotinus</i>	3	1	2	2	1	V	(1-3)
<i>Origanum vulgare</i>	8	6	5	4		IV	(4-8)
<i>Lotus corniculatus</i>	5	7	7	7		IV	(5-7)
<i>Convolvulus arvensis</i>		1	5	1	5	IV	(1-5)
<i>Carex flacca</i>	3	4	3		4	IV	(3-4)
<i>Prunella vulgaris</i>	4	3	3	2		IV	(2-4)
<i>Viola hirta</i>	4	4	2		1	IV	(1-4)
<i>Linum catharticum</i>	3	1	2	1		IV	(1-3)
<i>Cirsium arvense</i>	1	1		1	2	IV	(1-2)
<i>Trifolium pratense</i>	2	1	1	2		IV	(1-2)
<i>Pseudoscleropodium</i> <i>purum</i>	6	5	3			III	(3-6)
<i>Crepis biennis</i>		1	1	5		III	(1-5)
<i>Brachypodium sylvaticum</i>	4	4	1			III	(1-4)
<i>Phleum bertolonii</i>	2	3	1			III	(1-3)
<i>Heracleum sphondylium</i>			1	2	1	III	(1-2)
<i>Ranunculus bulbosus</i>	1		2	1		III	(1-2)
<i>Ranunculus repens</i>	2	2		1		III	(1-2)
<i>Tragopogon pratensis</i> ssp. <i>minor</i>			1	2	1	III	(1-2)
<i>Trifolium repens</i>	2	1	2			III	(1-2)
<i>Clinopodium vulgare</i>	1	1	1			III	(1)
<i>Taraxacum</i> agg.	1	1		1		III	(1)
<i>Bromopsis erecta</i>		2			4	II	(2-4)
<i>Crataegus monogyna</i> (seedling/sapling)	4	1				II	(1-4)
<i>Ranunculus acris</i>	1			4		II	(1-4)
<i>Homalothecium lutescens</i>	3	3				II	(3)
<i>Brachythecium rutabulum</i>			2	2		II	(2)

Field 6866 (S) MG1e Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>	2	1				II	(1-2)
<i>Hordeum secalinum</i>		1			2	II	(1-2)
<i>Poa pratensis</i>			2		1	II	(1-2)
<i>Euphrasia nemorosa</i>	1	1				II	(1)
<i>Fraxinus excelsior</i> (seedling/sapling)	1		1			II	(1)
<i>Jacobaea erucifolia</i>	1		1			II	(1)
<i>Poa trivialis</i>		1	1			II	(1)
<i>Rhinanthus angustifolius</i>				1	1	II	(1)
<i>Rosa</i> spp. (seedling/sapling)	1			1		II	(1)
<i>Achillea millefolium</i>				6		I	(6)
<i>Ononis repens</i>					6	I	(6)
<i>Cirsium acaule</i>		1				I	(1)
<i>Cirsium vulgare</i>	1					I	(1)
<i>Dactylorhiza fuchsii</i>			1			I	(1)
<i>Hypericum perforatum</i>	1					I	(1)
<i>Jacobaea vulgaris</i>		1				I	(1)
<i>Leucanthemum vulgare</i>				1		I	(1)
<i>Pimpinella saxifraga</i>				1		I	(1)
<i>Poterium sanguisorba</i> ssp. <i>sanguisorba</i>		1				I	(1)
<i>Prunus spinosa</i> (seedling/sapling)			1			I	(1)
<i>Rubus fruticosus</i> agg.	1					I	(1)
<i>Veronica arvensis</i>			1			I	(1)
Bare ground			1				
Species per quadrat	39	39	37	32	23		34.0
Species per quadrat excl. scrub	35	37	35	31	23		32.2

Running the results of quadrat recording through the key to mesotrophic grasslands in Rodwell (1992b) strongly supports the classification of MG1: "grasslands with frequent and often abundant *Arrhenatherum elatius*, *Dactylis glomerata* and *Holcus lanatus*"). However,

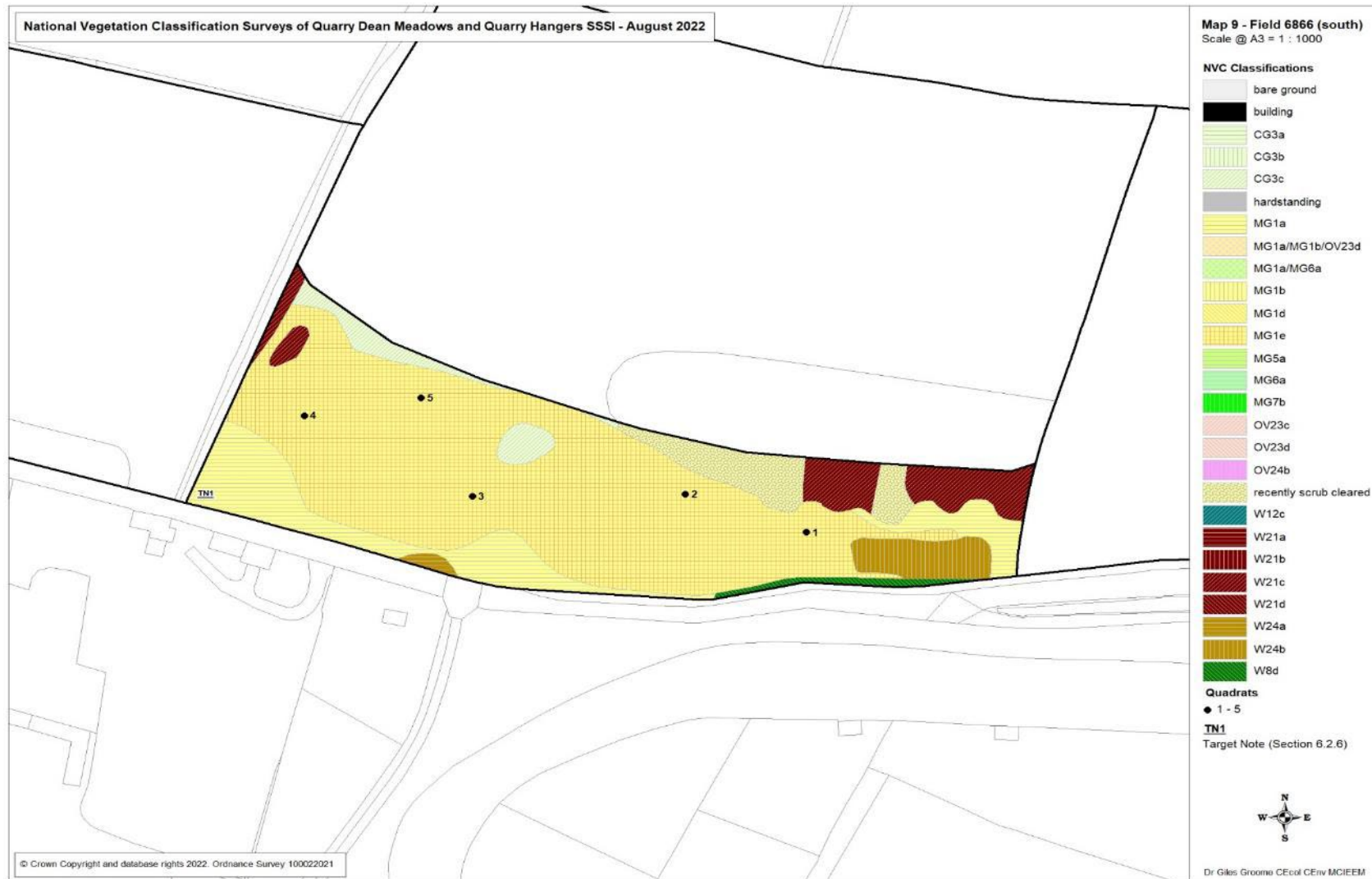
determining sub-community is less straightforward, given the absence of *Centaurea nigra* agg. Nevertheless, results favour MG1e, as swards do not fit elsewhere (MG1a-d).

Considering Rodwell's key, sub-community descriptions and floristic table, along with the results of MATCH analysis, the classification of MG1e, as described above ("markedly calcicolous, species-rich but atypical"), is the most appropriate.

Figure 6 – MG1e (Quadrat 3) within Field 6866 (south)



Map 9 – Field 6866 (south) (Target Note for Map 9)



3.2.9 Quarry Hangers 'Pilgrims Lane Field'

Survey area 1.35ha. Surveyed 9/8/22. Quadrats recorded 9/8/21. Map 10.

Boundaries

All boundaries follow fences (incorporating a managed hedge on the northern boundary) that follow OS Mastermap lines.

Site Description

'Pilgrims Lane Field' overlies Grey Chalk (British Geological Society 2021) and Upton series grey rendzina soils (Soil Survey of England and Wales 1983) and slopes, from a near-hill top summit in the north, up to 20° in a south-south-easterly direction. It was included in the original 1955 notification of the Quarry Hangers SSSI but later removed. The reasons for this are not known, although it may have related to a loss of chalk grassland species in the far north (perhaps following markedly heavy grazing?). All is now sheep grazed. Limited topping of invasive thistle had been undertaken in far northern stands in the days prior to survey.

Mapped NVC Classifications

CG3c (1 mapped stand/polygon, area 0.76ha)

CG3c covers all southern parts of 'Pilgrims Lane Field'. Swards are dominated by *Bromopsis erecta* and *Festuca rubra* with *Agrostis stolonifera*, *Dactylis glomerata*, *Phleum bertolonii*, *Poa pratensis* and *Lolium perenne*. *Arrhenatherum elatius* is scattered in more southern stands which appear to have previously fallen within a separate grazing paddock (still marked by OS Mastermap data). Swards here more closely resemble the CG3c found in adjacent SSSI Unit 1 (Section 3.3.1) than elsewhere, supporting, for example, the only recorded *Briza media*, *Festuca ovina* agg., *Avenula pubescens* and *Helictochloa pratensis* seen during fieldwork. Moving northwards on to gentler slopes, swards become increasingly mesophytic with *Festuca rubra* replacing *Bromopsis* as the dominant graminoid on the margins of MG5b. *Trisetum flavescens*, which is constant in CG3c within SSSI Unit 1, was not recorded anywhere and may have completely gone over during the 2022 drought. *Carex flacca* however, had not gone over, yet was only recorded in 20% of 'Pilgrims Lane Field' CG3c quadrats compared to 100% in Unit 1.

Centaurea nigra agg.², *Lotus corniculatus*, *Trifolium pratense*, *Agrimonia eupatoria*, *Achillea millefolium*, *Plantago lanceolata*, *Pimpinella saxifraga*, *Ranunculus bulbosus*, *Linum catharticum* and *Crepis capillaris* are the most common forbs with scattered but

² Both *Centaurea nigra* and *C. debeauxii* were recorded in all five quadrats. Many plants were intermediate suggesting they are either hybrids or, as Stace (2019) suggests, that the two are not separate species.

patchily common *Cirsium acaule*. *Poterium sanguisorba* ssp. *sanguisorba*, *Medicago lupulina*, *Origanum vulgare*, *Leontodon hispidus* and *Knautia arvensis* are largely restricted to southern parts of mapped CG3c, whilst *Cerastium fontanum* ssp. *vulgare*, *Taraxacum* agg. and *Cirsium vulgare* are largely restricted to the north. Other species recorded from CG3c during fieldwork include *Leucanthemum vulgare*, *Tragopogon pratense* ssp. *minor*, *Prunella vulgaris*, *Jacobaea erucifolia*, *Galium album*, *Odontites vernus* ssp. *serotinus* and *Galium verum*.

Scattered shrubs, mostly *Crataegus monogyna*, are confined to southern stands; mostly within the former southern paddock. No woody seedlings were recorded anywhere.

Drought conditions are likely to have significantly reduced the cover of bryophytes, although the mesophytic moss *Brachythecium rutabulum* was recorded from four of the five quadrats. *Calliergonella cuspidata* was recorded from one.

MG5b (1 mapped stand/polygon, area 0.45ha)

MG5b within 'Pilgrims Lane Field' is atypical of the community nationally; supporting, for example, relatively very low forb cover and little *Galium verum*. In addition, patches of turf in the far north-west support very locally abundant *Bromopsis erecta* (see quadrat 3) and are therefore transitional with a mesophytic form of CG3c³. However, the overwhelming majority of swards are dominated by *Festuca rubra* and *Holcus lanatus* with *Dactylis glomerata*, *Agrostis stolonifera*, *Phleum bertolonii*, *Hordeum secalinum*, *Poa pratensis* and *Lolium perenne*. *Cynosurus cristatus* appears to be infrequent, as is *Agrostis capillaris*. Again *Trisetum flavescens* was not recorded anywhere.

Centaurea nigra agg.⁴, *Lotus corniculatus*, *Achillea millefolium*, *Trifolium pratense*, *Agrimonia eupatoria*, *Plantago lanceolata*, *Pimpinella saxifraga*, *Taraxacum* agg. and *Crepis capillaris* are the most common forbs with *Ranunculus bulbosus*, *Cerastium fontanum* ssp. *vulgare* and *Cirsium vulgare*. However, cover of all forbs is considerably lower than is typical of MG5b. Other species recorded during fieldwork include *Potentilla reptans*, *Medicago lupulina*, *Galium album* and, apparently very sparse, *Galium verum*. *Urtica dioica* ssp. *dioica*, with scattered *Rumex obtusifolius*, is very locally abundant (although very heavily grazed at the time of survey) close to the sheep shelter (target note TN1). The only woody species, a row of *Crataegus monogyna* shrubs, are present on the northern edge of target note 1, south of mapped 'Building'. *Brachythecium rutabulum* was the only ground layer bryophyte recorded; in two of the three quadrats.

³ Adjacent stands within SSSI Unit 1 were mapped as CG3c in 2021 (see Maps 11 and 19) and had the grassland here been surveyed at the same time, a small stretch of MG5b within the norther-western corner of 'Pilgrims Lane Field' may also have been mapped as such.

⁴ Only *Centaurea nigra* was recorded here.

Building (1 mapped stand/polygon, area <0.01ha)

Wooden sheep shelter and adjacent shed.

Hardstanding (1 mapped stand/polygon, area <0.01ha)

Concrete paving in front of shelter.

Quadrats and NVC Classification

CG3c

Five quadrats were recorded from CG3c grassland. Table 10 highlights the results of the quadrat recordings in Pilgrims Lane Field. Some cells have been intentionally left blank because there are no species recordings within the quadrats. The results of MATCH analysis are available upon request.

Running the results of quadrat recording through the key to calcareous grasslands in Rodwell (1992b), there is little doubt that swards belong within CG3; supporting constant *Bromopsis erecta* with a cover >10%. However, determining sub-community is less straightforward. Whilst five or more "...*Bellis perennis*, *Knautia arvensis*, *Taraxacum officinale* agg. [sic], *Medicago lupulina*, *Trifolium pratense*, *T.repens*, *Viola hirta*, *Vicia cracca*, *Cynosurus cristatus*, *Phleum pratense* ssp. *bertolonii* [sic]" (CG3c) are present, only *T.pratense* and *P.bertolonii* are frequent. It would therefore appear appropriate to classify swards as CG3b: "*Centaurea nigra* present with two or more of *Hypochoeris radicata* [sic], *Daucus carota*, *Achillea millefolium*, *Galium mollugo* [sic], *Rhinanthus minor*, *Senecio jacobaea* [sic]". However, descriptions given by Rodwell, along with the results of MATCH analysis, favour CG3c. Notably, Rodwell's (1992b) description lists further preferential mesophytic grasses for CG3c, including *Dactylis glomerata*, *Agrostis stolonifera* and *Lolium perenne*; all of which are constant here. In addition, MATCH analysis gives a higher coefficient to CG3c than CG3b for all quadrats, as well as all quadrats combined.

Considering Rodwell's key, sub-community descriptions and floristic table, along with the results of MATCH analysis, the classification of CG3c is the most appropriate.

Table 10 - Quadrat recordings on CG3c grassland in Pilgrims Lane Field

'Pilgrims Lane Field' CG3c Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Bromopsis erecta</i>	5	8	7	5	5	V	(5-8)
<i>Festuca rubra</i> agg.	7	4	5	8	8	V	(4-8)
<i>Centaurea nigra</i> agg.	4	5	5	5	3	V	(3-5)
<i>Centaurea debeauxii</i>	+	+	+	+	+		
<i>Centaurea nigra</i>	+	+	+	+	+		

'Pilgrims Lane Field' CG3c Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Lotus corniculatus</i>	4	4	4	3	3	V	(3-4)
<i>Achillea millefolium</i>	3	2	3	3	4	V	(2-4)
<i>Agrimonia eupatoria</i>	4	3	4	2	4	V	(2-4)
<i>Agrostis stolonifera</i>	3	3	3	3	3	V	(3)
<i>Trifolium pratense</i>	3	3	3	3	3	V	(3)
<i>Dactylis glomerata</i>	3	2	2	3	3	V	(2-3)
<i>Phleum bertolonii</i>	3	3	2	2	2	V	(2-3)
<i>Crepis capillaris</i>	1	1	2	1	1	V	(1-2)
<i>Lolium perenne</i>	2	1	2	1	2	V	(1-2)
<i>Plantago lanceolata</i>	2	2	2	1	2	V	(1-2)
<i>Poa pratensis</i>	2	2	2	1	1	V	(1-2)
<i>Pimpinella saxifraga</i>		3	2	2	2	IV	(2-3)
<i>Brachythecium rutabulum</i>	1		2	1	1	IV	(1-2)
<i>Linum catharticum</i>	1	1	2	1		IV	(1-2)
<i>Ranunculus bulbosus</i>	2	2	1	1		IV	(1-2)
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>			2	2	3	III	(2-3)
<i>Holcus lanatus</i>	3			2	3	III	(2-3)
<i>Arrhenatherum elatius</i>	3	1	2			III	(1-3)
<i>Convolvulus arvensis</i>	3	1	3			III	(1-3)
<i>Medicago lupulina</i>	2	1		1		III	(1-2)
<i>Poterium sanguisorba</i> ssp. <i>sanguisorba</i>	2	1	1			III	(1-2)
<i>Veronica chamaedrys</i>	2	1			1	III	(1-2)
<i>Cirsium acaule</i>			1	4		II	(1-4)
<i>Galium album</i>	3			1		II	(1-3)
<i>Trifolium repens</i>	1				3	II	(1-3)

'Pilgrims Lane Field' CG3c Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Leucanthemum vulgare</i>		1	2			II	(1-2)
<i>Avenula pubescens</i>	1	1				II	(1)
<i>Festuca ovina</i> agg.	1	1				II	(1)
<i>Helictochloa pratensis</i>	1	1				II	(1)
<i>Jacobaea vulgaris</i>	1	1				II	(1)
<i>Taraxacum</i> agg.				1	1	II	(1)
<i>Tragopogon pratensis</i> ssp. <i>minor</i>		1	1			II	(1)
<i>Carex flacca</i>		3				I	(3)
<i>Hordeum secalinum</i>					2	I	(2)
<i>Knautia arvensis</i>		2				I	(2)
<i>Calliergonella cuspidata</i>			1			I	(1)
<i>Cirsium arvense</i>	1					I	(1)
<i>Cirsium vulgare</i>					1	I	(1)
<i>Jacobaea erucifolia</i>	1					I	(1)
<i>Prunella vulgaris</i>				1		I	(1)
<i>Verbena officinalis</i>		1				I	(1)
Bare ground	1	3	1	1	1		
Dead grass	7	5	5	5	5		
rabbit droppings	1						
sheep dung		1		2	1		
Species per quadrat	32	32	27	26	24		28.2
Species per quadrat excl. scrub	32	32	27	26	24		28.2

Figure 7 – CG3c (Quadrat 2) within ‘Pilgrims Lane Field’



MG5b

Three quadrats were recorded from MG5b grassland. Table 11 highlights the results of the quadrat recordings in Pilgrims Lane Field. Some cells have been intentionally left blank because there are no species recordings within the quadrats. The results of MATCH analysis are available upon request.

Running the results of quadrat recording through the key to mesotrophic grasslands in Rodwell (1992b), there is some equivocation as to whether swards belong within MG5 or MG6: “Generally species-rich swards with an abundance of herbaceous dicotyledons including *Lotus corniculatus* and some of *Leontodon hispidus*, *Ranunculus bulbosus*, *Leucanthemum vulgare*, *Primula veris*, *Rumex acetosa*, *Trifolium pratense*...” (MG5) or “Generally species-poor, grass-dominated swards with constant and usually abundant *Lolium perenne* and few of the above species” (MG6). However, whilst swards are grass-dominated, they are species-rich and include MG5 preferentials that are not associated with MG6, notably *Lotus corniculatus*, *Agrimonia eupatoria* (both of which are constant) and *Ranunculus bulbosus* (which is frequent). MG5 is therefore preferential. Sub-community classification using Rodwell’s key is inconclusive as swards do not support: “frequent and sometimes abundant...” *Galium verum* and *Trisetum flavescens* (MG5b); *Danthonia decumbens*, *Luzula campestris*, *Succisa pratensis* and *Potentilla erecta*

(MG5c); nor frequent *Lathyrus pratensis* (MG5a). However, the walkover survey revealed that *Galium verum* is present in the apparent absence of any listed MG5a or MG5c indicators. Moreover, Rodwell's floristic table includes further MG5b preferentials including *Achillea millefolium* and *Agrostis stolonifera*; both of which are constant here.

MATCH analysis gives similar results to the above. All quadrats, as well as all quadrats combined, have a higher coefficient for MG5 than MG6. However, MG6c is ranked higher than MG5b for all quadrats and all quadrats combined. This however, ignores the fact that MG5b preferentials recorded as constant or frequent are not MG6c associated taxa.

Considering Rodwell's key, sub-community descriptions and floristic table, along with the results of MATCH analysis, the classification, as described above, "atypical MG5b" is the most appropriate.

Table 11 - Quadrat recordings on MG5b grassland in Pilgrims Lane Field

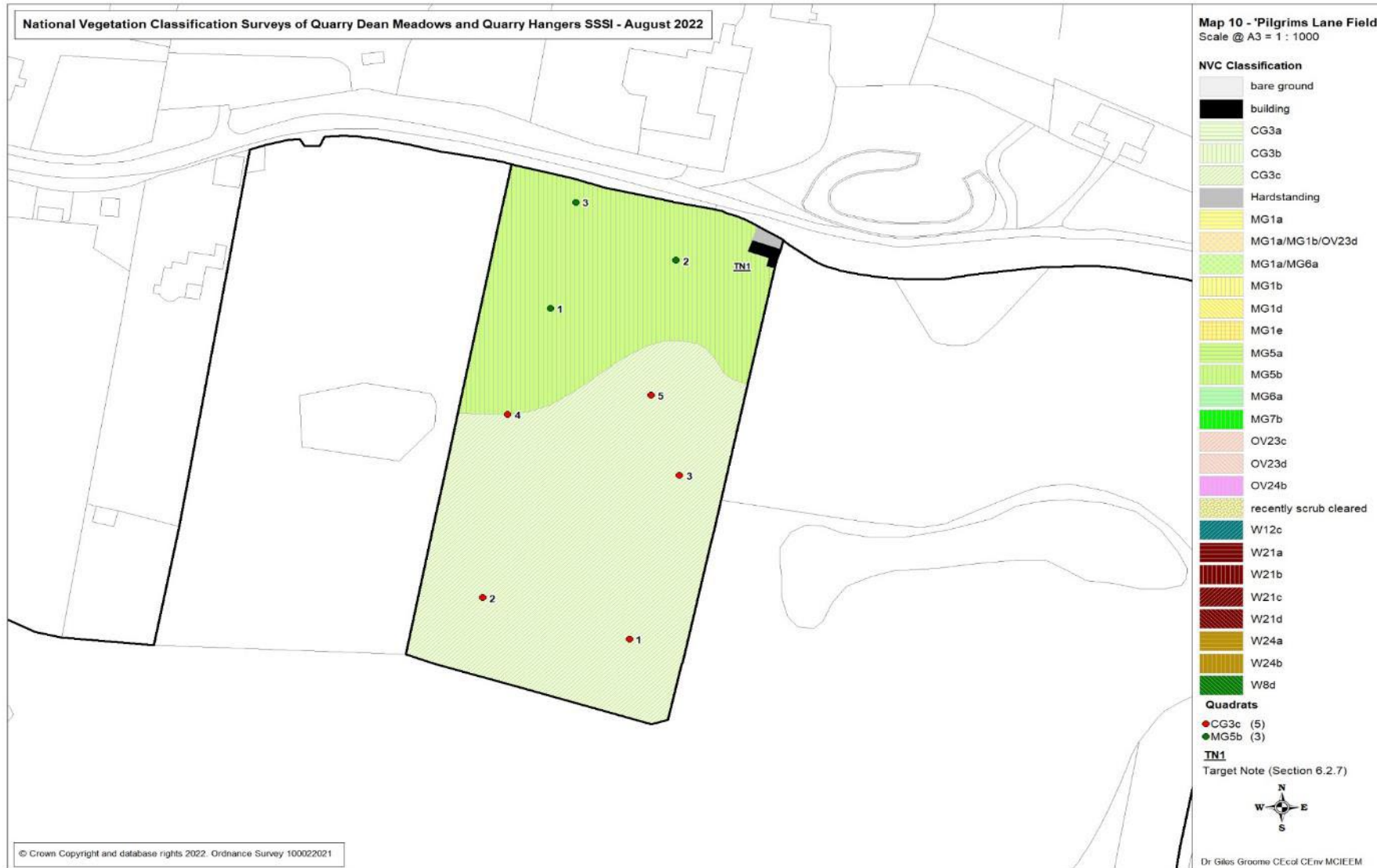
'Pilgrims Lane Field' MG5b Quadrats	1	2	3	Constancy	Constancy
<i>Festuca rubra</i> agg.	8	7	7	V	(7-8)
<i>Holcus lanatus</i>	4	5	2	V	(2-5)
<i>Dactylis glomerata</i>	4	4	4	V	(4)
<i>Achillea millefolium</i>	4	4	3	V	(3-4)
<i>Centaurea nigra</i> agg.	3	2	4	V	(2-4)
<i>Centaurea nigra</i>	+	+	+		
<i>Agrostis stolonifera</i>	3	3	3	V	(3)
<i>Lolium perenne</i>	3	3	3	V	(3)
<i>Trifolium pratense</i>	3	3	3	V	(3)
<i>Agrimonia eupatoria</i>	3	2	3	V	(2-3)
<i>Lotus corniculatus</i>	3	2	3	V	(2-3)
<i>Phleum bertolonii</i>	2	3	3	V	(2-3)
<i>Trifolium repens</i>	2	2	3	V	(2-3)
<i>Pimpinella saxifraga</i>	2	1	3	V	(1-3)
<i>Plantago lanceolata</i>	2	2	1	V	(1-2)
<i>Poa pratensis</i>	2	1	2	V	(1-2)
<i>Crepis capillaris</i>	1	1	1	V	(1)
<i>Taraxacum</i> agg.	1	1	1	V	(1)
<i>Hordeum secalinum</i>	3	3		IV	(3)
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>	3		2	IV	(2-3)
<i>Ranunculus bulbosus</i>	2		1	IV	(1-2)

'Pilgrims Lane Field' MG5b Quadrats	1	2	3	Constancy	Constancy
<i>Brachytecium rutabulum</i>	1		1	IV	(1)
<i>Cirsium vulgare</i>	1		1	IV	(1)
<i>Bromopsis erecta</i>			6	II	(6)
<i>Carex flacca</i>			2	II	(2)
<i>Medicago lupulina</i>	2			II	(2)
<i>Potentilla reptans</i>		2		II	(2)
<i>Agrostis capillaris</i>		1		II	(1)
<i>Cynosurus cristatus</i>			1	II	(1)
Bare ground	1		1		
Dead grass	5	5	5		
sheep dung	2	1	1		
Species per quadrat	23	20	24		22.3
Species per quadrat excl. scrub	23	20	24		22.3

Figure 8 – MG5b (Quadrat 2) within ‘Pilgrims Lane Field’



Map 10 – Pilgrims Lane Field (Target Note for Map 10)



3.3 Quarry Hangers SSSI Unit Survey Reports

3.3.1 SSSI Unit 1

Survey area 13.07ha. Surveyed 22/6/21. Quadrats recorded 9/7/21. Map 11.

Boundaries

All boundaries follow OS Mastermap lines which, as far as could be confirmed during fieldwork, follow field banks and/or fences.

Site Description

Unit 1 of the Quarry Hangers SSSI overlies White Chalk and, in the extreme south, Grey Chalk (British Geological Society 2021). Soils are bulk classified as Upton series grey rendzinas (Soil Survey of England and Wales 1983). The Unit supports variable gentle (<5°) to very steep (>25°) west-south-west to east-south-east facing slopes. Most is sheep, goat and cattle grazed as one extensive grazing compartment. Rabbit grazing is also widespread. Enclosed fields to the north and south-west are sheep grazed, although there has been little consistent recent grazing in the south-westerly enclosure.

Mapped NVC Classifications

CG3c (6 mapped stands/polygons, total area 8.14ha)

Well over half the Unit supports species-rich CG3c grassland. Whilst there can be considerable variation between different areas, swards are universally dominated by *Bromopsis erecta* with a cover that rarely declines below 50% and commonly exceeds 75%. *Carex flacca*, *Festuca rubra*, *Trisetum flavescens*, *Briza media* and *Poa pratensis* are all constant, with *Arrhenatherum elatius*, *Dactylis glomerata*, *Agrostis stolonifera*, *Phleum bertolonii* and *Avenula pubescens* almost so. *Brachypodium sylvaticum*, *Holcus lanatus* and *Luzula campestris* are occasional; although the former can be abundant where scrub has been cleared or there has been little recent grazing; as is the case within the enclosed field to the south-west. *Festuca ovina*, *Koeleria macrantha* and *Helictochloa pratensis* were only recorded from grassland on the steepest slopes. A single patch of *Brachypodium rupestre* (confirmed under the microscope) was recorded near to quadrat 8.

Lotus corniculatus, *Medicago lupulina*, *Agrimonia eupatoria*, *Centaurea nigra* agg., *Origanum vulgare*, *Veronica chamaedrys*, *Linum catharticum* and *Plantago lanceolata* are the most common forbs with *Poterium sanguisorba* ssp. *sanguisorba*, *Thymus drucei*, *Trifolium pratense*, *Cirsium acaule*, *Prunella vulgaris*, *Cerastium fontanum* ssp. *vulgare* and *Trifolium repens*. *Knautia arvensis*, *Pilosella officinarum*, *Leontodon hispidus*, *Leucanthemum vulgare*, *Viola hirta* and *Pimpinella saxifraga* are more-or-less constant on the steepest slopes, but rather scattered elsewhere. Other scattered forbs include *Primula veris*, *Lathyrus pratensis*, *Campanula rotundifolia* (also on the steepest slopes), *Achillea millefolium*, *Crepis biennis*, *Jacobaea erucifolia*, *Leontodon saxatilis*, *Odontites vernus* ssp. *serotinus*, *Jacobaea vulgaris*, *Hypericum perforatum*, *Convolvulus arvensis*, *Crepis capillaris*, *Euphrasia nemorosa*, *Scabiosa columbaria*, *Polygala vulgaris*, *Tragopogon*

pratensis ssp. *minor*, *Anacamptis pyramidalis*, *Blackstonia perfoliata*, *Vicia cracca*, *Thymus pulegioides*, *Dactylorhiza fuchsii* and *Ranunculus acris*.

Juvenile and/or post-cut/browse regeneration scrub is scattered throughout CG3c and can be locally very common. The most frequent woody species are *Crataegus monogyna*, *Fraxinus excelsior* and *Cornus sanguinea* ssp. *sanguinea*.

The ground layer is mostly poor and the majority of bryophytes, other than *Pseudoscleropodium purum* which is patchy throughout, were recorded from quadrats situated on the steepest slopes. Here *Fissidens dubius*, *Eurhynchium striatum* and *Barbula unguiculata* are common with a little *Homalothecium lutescens*.

MG1a (3 mapped stands/polygons, total area 0.11ha)

All three stands of mapped MG1a have developed where there has been past scrub clearance. They comprise coarse or very coarse swards dominated by *Arrhenatherum elatius* and/or *Brachypodium sylvaticum* with abundant *Origanum vulgare* and *Galium album*. *Medicago lupulina* and *Clematis vitalba* are locally abundant; *Potentilla reptans*, *Clinopodium vulgare* and *Cruciata laevipes* locally frequent.

MG1b (7 mapped stands/polygons, total area 0.30ha)

Stands of MG1b within Unit 1 are relatively species-poor and associated with scrub/woodland edges, presumably where livestock congregate, and/or stands recently cleared of scrub. All support abundant *Arrhenatherum elatius* with *Dactylis glomerata* and *Holcus lanatus*. *Brachypodium sylvaticum* is locally abundant/dominant. *Urtica dioica* ssp. *dioica*, *Galium aparine* and *Galium album* are present and usually cover abundant in all stands with locally abundant *Origanum vulgare* and *Clematis vitalba*. *Cirsium arvense*, *Convolvulus arvensis* and *Veronica chamaedrys* are locally frequent; as is, locally marking transitions to W24b, *Rubus fruticosus*.

MG1e (5 mapped stands/polygons, total area 2.48ha)

Most non-CG3c grassland has been mapped as atypical, markedly calcareous MG1e, largely lacking *Centaurea nigra* agg. Species-rich swards are dominated by *Arrhenatherum elatius*, *Festuca rubra*, *Dactylis glomerata*, *Holcus lanatus* and *Agrostis stolonifera* with *Phleum bertolonii*, *Trisetum flavescens* and *Poa pratensis*. *Bromopsis erecta* is present at low frequency and cover across valley stands in the centre-south-east of the Unit. *Hordeum secalinum*, *Poa trivialis* and *Bromus hordeaceus* ssp. *hordeaceus* are all at least locally common in the enclosed fields to the north. Other graminoids include *Lolium perenne*, *Festuca ovina*, *Carex flacca*, *Carex spicata* and *Cynosurus cristatus*.

Amongst the forbs, *Lotus corniculatus*, *Galium album*, *Agrimonia eupatoria*, *Medicago lupulina*, *Veronica chamaedrys*, *Potentilla reptans*, *Trifolium pratense*, *Convolvulus arvensis* and *Trifolium repens* are all more-or-less constant with locally abundant *Origanum vulgare* (throughout mapped valley stands). Scattered associates include *Plantago lanceolata*, *Cirsium arvense*, *Jacobaea vulgaris*, *Ranunculus acris*, *Ranunculus bulbosus*, *Geranium dissectum*, *Crepis biennis*, *Prunella vulgaris*, *Tragopogon pratensis* ssp. *minor*, *Taraxacum* agg., *Cerastium fontanum* ssp. *vulgare*, *Crepis capillaris*, *Heracleum sphondylium* and *Linum catharticum*. Other species include *Leontodon*

hispidus, *Primula veris*, *Jacobaea erucifolia*, *Rumex acetosa*, *Torilis japonica*, *Ononis repens*, *Galium verum*, *Lathyrus pratensis*, *Pimpinella saxifraga*, *Pastinaca sativa* ssp. *sylvestris* and *Cruciata laevipes*. *Centaurea nigra* agg. is mostly very rare. Nationally Rare, Schedule 8 *Rhinanthus angustifolius* is present in the far south-east.

The ground layer is universally poor with only a little *Brachythecium rutabulum* and, where soils had been disturbed by recent grazing, *Barbula unguiculata* recorded from quadrats.

W21b (1 mapped stand/polygon, area 0.03ha)

W21b is restricted to a single stretch of hedgerow in the north-east of the Unit. It is dominated by *Prunus spinosa*, *Crataegus monogyna* and *Rubus fruticosus* with field layer *Glechoma hederacea* and *Mercurialis perennis*.

W21c (5 mapped stands/polygons, total area 1.19ha)

All non-boundary scrub within the Unit 1 falls within W21c. It varies from dense stands of juvenile shrubs to woodland in which originally planted trees (including *Aesculus hippocastanum*, *Acer pseudoplatanus*, *Populus alba*, *Prunus avium*, *Fagus sylvatica*, *Tilia x europaea* and *Pinus* sp.⁵) dominate over small areas. However, most stands are dominated by usually dense *Crataegus monogyna* with very locally abundant *Prunus spinosa*. *Rhamnus cathartica*, *Sambucus nigra* and *Cornus sanguinea* ssp. *sanguinea* are occasional but climbers frequent and locally abundant. They include *Clematis vitalba*, *Rubus fruticosus*, *Tamus communis*, *Bryonia dioica*, and various roses (including *Rosa corymbifera*, *R. canina* and *R. squarrosa*).

The field layer is frequently difficult to access, but common species, at least locally, include *Brachypodium sylvaticum*, *Urtica dioica* ssp. *dioica*, *Rubus fruticosus*, *Galium aparine*, *Poa trivialis* and *Origanum vulgare*.

W24b (2 mapped stands/polygons, total area 0.09ha)

The western stand of mapped W24b covers an area of post-cut regeneration scrub amongst mostly coarse grassland. It is variably dominated by *Brachypodium sylvaticum*, *Arrhenatherum elatius*, *Origanum vulgare*, *Urtica dioica* ssp. *dioica*, *Galium aparine*, *Galium album*, *Clematis vitalba*, *Holcus lanatus* and *Dactylis glomerata*, although very locally stands support species-rich CG3c, with frequent and locally dominant *Rubus fruticosus*. *Crataegus monogyna* is regenerating widely.

The eastern stand covers a very small area of *Rubus fruticosus* encroached grassland on the margins of W8d woodland. *Arrhenatherum elatius* is abundant with *Galium aparine*, *Galium album*, *Origanum vulgare* and frequent <0.5m *Crataegus monogyna*.

⁵ Foliage could not be reached and therefore which species is unknown.

W8d (6 mapped stands/polygons, total area 0.68ha)

With the exception of stands on the margins of Field 4194 (south), where *Fraxinus excelsior* dominates a semi-natural woodland canopy, all W8d within Unit 1 appears to have its origins in late-19th/early-20th Century planting; probably undertaken directly into open grassland at a time when trees were uncommon in the landscape. Trees include *Aesculus hippocastanum*, *Acer pseudoplatanus*, *Fagus sylvatica*, *Pinus* sp., *Picea abies*, *Populus x jackii*, *Sorbus aria*, *Betula pendula* and *Fagus sylvatica* 'purpurea'. *Crataegus monogyna* is present in the understorey of all stands; occasionally in abundance. Other shrub layer species include *Rhamnus cathartica*, *Clematis vitalba*, *Bryonia dioica*, *Cornus sanguinea* ssp. *sanguinea* and *Sambucus nigra*.

The atypical field layer almost always lacks *Hedera helix*, it being 'replaced' by *Brachypodium sylvaticum*, *Arrhenatherum elatius* and/or *Anthriscus sylvestris*. *Urtica dioica* ssp. *dioica*, *Galium aparine*, *Dactylis glomerata*, *Tamus communis* and *Rubus fruticosus* are each locally common. *Origanum vulgare*, *Galium album*, *Stachys sylvatica* and *Geranium robertianum* are very locally frequent.

Recently Scrub Cleared (2 mapped stands/polygons, total area 0.05ha)

Vegetation included within this classification is not referable to the NVC. It covers stands where, often previously very dense, scrub has been recently cleared (commonly since the date of the aerial imagery used during fieldwork) and where the vegetation comprises regeneration of the scrub that has recently been cut, as well as of previously extant grassland that had been present before the development of scrub, and recruitment of species encroaching (e.g. by tillering) and/or seeding in to the newly exposed, commonly disturbed, open conditions.

Within Unit 1 the classification covers two small, very recently scrub cleared stands supporting bare ground with *Brachypodium sylvaticum*, and locally common *Arrhenatherum elatius*, *Dactylis glomerata*, *Galium album* and *Clinopodium vulgare*.

Quadrats and NVC Classification

CG3c

Eight quadrats were recorded from CG3c grassland. Table 12 highlights the results of the quadrat surveys in Unit 1 of Quarry Hangers SSSI. Some cells have been intentionally left blank because there are no species recordings within the quadrats. The results of MATCH analysis are available upon request.

Running the results of quadrat recording through the key to calcareous grasslands in Rodwell (1992b) there is little doubt that swards belong within CG3c. Stands support constant *Bromopsis erecta* with a cover >10% (CG3) and *Knautia arvensis*, *Taraxacum* agg., *Medicago lupulina*, *Trifolium pratense*, *Trifolium repens*, *Viola hirta* and *Phleum bertolonii* are all frequent (CG3c).

Table 12 – Quadrat recordings on CG3c grassland in Unit 1 of Quarry Hangers SSSI

SSSI Unit 1 CG3c Quadrats	1	2	3	4	5	6	7	8	Constancy	Constancy
<i>Bromopsis erecta</i>		2	4	1					II	(1-4)
<i>Lotus corniculatus</i>				1		4	1		II	(1-4)
<i>Medicago lupulina</i>				1		1		1	II	(1)
<i>Agrimonia eupatoria</i>	1			1				1	II	(1)
<i>Trisetum flavescens</i>	1	1		1					II	(1)
<i>Carex flacca</i>		1					1	1	II	(1)
<i>Centaurea nigra</i> agg.		1			1			1	II	(1)
<i>Poa pratensis</i>			2		4				II	(2-4)
<i>Origanum vulgare</i>			4					1	II	(1-4)
<i>Briza media</i>		3					3		II	(3)
<i>Festuca rubra</i> agg.		2	3						II	(2-3)
<i>Plantago lanceolata</i>		2					3		II	(2-3)
<i>Veronica chamaedrys</i>						2	1		II	(1-2)
<i>Linum catharticum</i>		1				1			II	(1)
<i>Poterium sanguisorba</i> <i>ssp. sanguisorba</i>		1						1	II	(1)
<i>Thymus drucei</i>	1				1				II	(1)
<i>Arrhenatherum elatius</i>					1			1	II	(1)
<i>Dactylis glomerata</i>	1					1			II	(1)
<i>Trifolium pratense</i>			1		1				II	(1)
<i>Agrostis stolonifera</i>				1				1	II	(1)
<i>Phleum bertolonii</i>			1		1				II	(1)
<i>Cirsium acaule</i>	1	1							II	(1)
<i>Prunella vulgaris</i>		5							I	(5)
<i>Trifolium repens</i>							3		I	(3)
<i>Avenula pubescens</i>						2			I	(2)
<i>Cerastium fontanum</i> <i>ssp. vulgare</i>						1			I	(1)
<i>Ranunculus bulbosus</i>		1							I	(1)
<i>Leontodon hispidus</i>					1				I	(1)
<i>Pseudoscleropodium</i> <i>purum</i>						1			I	(1)

SSSI Unit 1 CG3c Quadrats	1	2	3	4	5	6	7	8	Constancy	Constancy
<i>Galium album</i>								1	I	(1)
<i>Knautia arvensis</i>						1			I	(1)
<i>Crataegus monogyna</i> (seedling/sapling)						1			I	(1)
<i>Leucanthemum vulgare</i>						1			I	(1)
<i>Viola hirta</i>							1		I	(1)
<i>Pimpinella saxifraga</i>				1					I	(1)
<i>Pilosella officinarum</i>	1								I	(1)
<i>Lathyrus pratensis</i>		1							I	(1)
<i>Primula veris</i>					1				I	(1)
<i>Brachypodium sylvaticum</i>						1			I	(1)
<i>Crepis biennis</i>										
<i>Holcus lanatus</i>	1	1	1		1					
<i>Hypericum perforatum</i>				1						
<i>Jacobaea vulgaris</i>										
<i>Achillea millefolium</i>	36	42	23	37	34	39	38	33		35.3
<i>Convolvulus arvensis</i>	34	41	23	36	33	39	37	32		34.4
<i>Eurhynchium striatum</i>		2	4	1					II	(1-4)
<i>Barbula unguiculata</i>				1		4	1		II	(1-4)
<i>Fissidens dubius</i>				1		1		1	II	(1)
<i>Festuca ovina</i> agg.	1			1				1	II	(1)
<i>Campanula rotundifolia</i>	1	1		1					II	(1)
<i>Crepis capillaris</i>		1					1	1	II	(1)
<i>Fraxinus excelsior</i> (seedling/sapling)		1			1			1	II	(1)
<i>Jacobaea erucifolia</i>			2		4				II	(2-4)
<i>Leontodon saxatilis</i>			4					1	II	(1-4)
<i>Lolium perenne</i>		3					3		II	(3)
<i>Luzula campestris</i>		2	3						II	(2-3)
<i>Odontites vernus</i> ssp. <i>serotinus</i>		2					3		II	(2-3)

SSSI Unit 1 CG3c Quadrats	1	2	3	4	5	6	7	8	Constancy	Constancy
<i>Sonchus asper</i>						2	1		II	(1-2)
<i>Potentilla reptans</i>		1				1			II	(1)
<i>Homalothecium lutescens</i>		1						1	II	(1)
<i>Euphrasia nemorosa</i>	1				1				II	(1)
<i>Blackstonia perfoliata</i>					1			1	II	(1)
<i>Bryum capillare</i>	1					1			II	(1)
<i>Cirsium arvense</i>			1		1				II	(1)
<i>Clinopodium vulgare</i>				1				1	II	(1)
<i>Cornus sanguinea</i> (seedling/sapling)			1		1				II	(1)
<i>Dactylorhiza fuchsii</i>	1	1							II	(1)
<i>Helictochloa pratensis</i>		5							I	(5)
<i>Plantago media</i>							3		I	(3)
<i>Polygala vulgaris</i>						2			I	(2)
<i>Ranunculus acris</i>						1			I	(1)
<i>Taraxacum</i> agg.		1							I	(1)
<i>Thymus pulegioides</i>					1				I	(1)
<i>Tragopogon pratensis</i> ssp. <i>minor</i>						1			I	(1)
<i>Verbena officinalis</i>								1	I	(1)
						1			I	(1)
Bare ground						1			I	(1)
rabbit droppings						1			I	(1)
							1		I	(1)
Species per quadrat				1					I	(1)
Species per quadrat excl. scrub	1								I	(1)

Figure 9 – CG3c (Quadrat 8) within SSSI Unit 1



MG1e

Five quadrats were recorded from MG1e grassland. Table 13 provides a summary of the quadrat recordings in Unit 1 of Quarry Hangers SSSI. Some cells have been intentionally left blank because there are no species recordings within the quadrats. The results of MATCH analysis are available upon request.

Running the results of quadrat recording through the key to mesotrophic grasslands in Rodwell (1992b) strongly supports the classification of MG1: “grasslands with frequent and often abundant *Arrhenatherum elatius*, *Dactylis glomerata* and *Holcus lanatus*”). However, determining sub-community is less straightforward given that *Centaurea nigra* is largely absent. Nevertheless, reading through the key it is evident that the grassland under examination (which supports constant *Lotus corniculatus*) does not belong within any MG1 sub-community other than MG1e.

Considering Rodwell’s key, sub-community descriptions and floristic table, along with the results of MATCH analysis, the classification of MG1e, as described above (“atypical...largely lacking *Centaurea nigra* agg.”), is the most appropriate.

Table 13 - Quadrat recordings on MG1e grassland in Unit 1 of Quarry Hangers SSSI

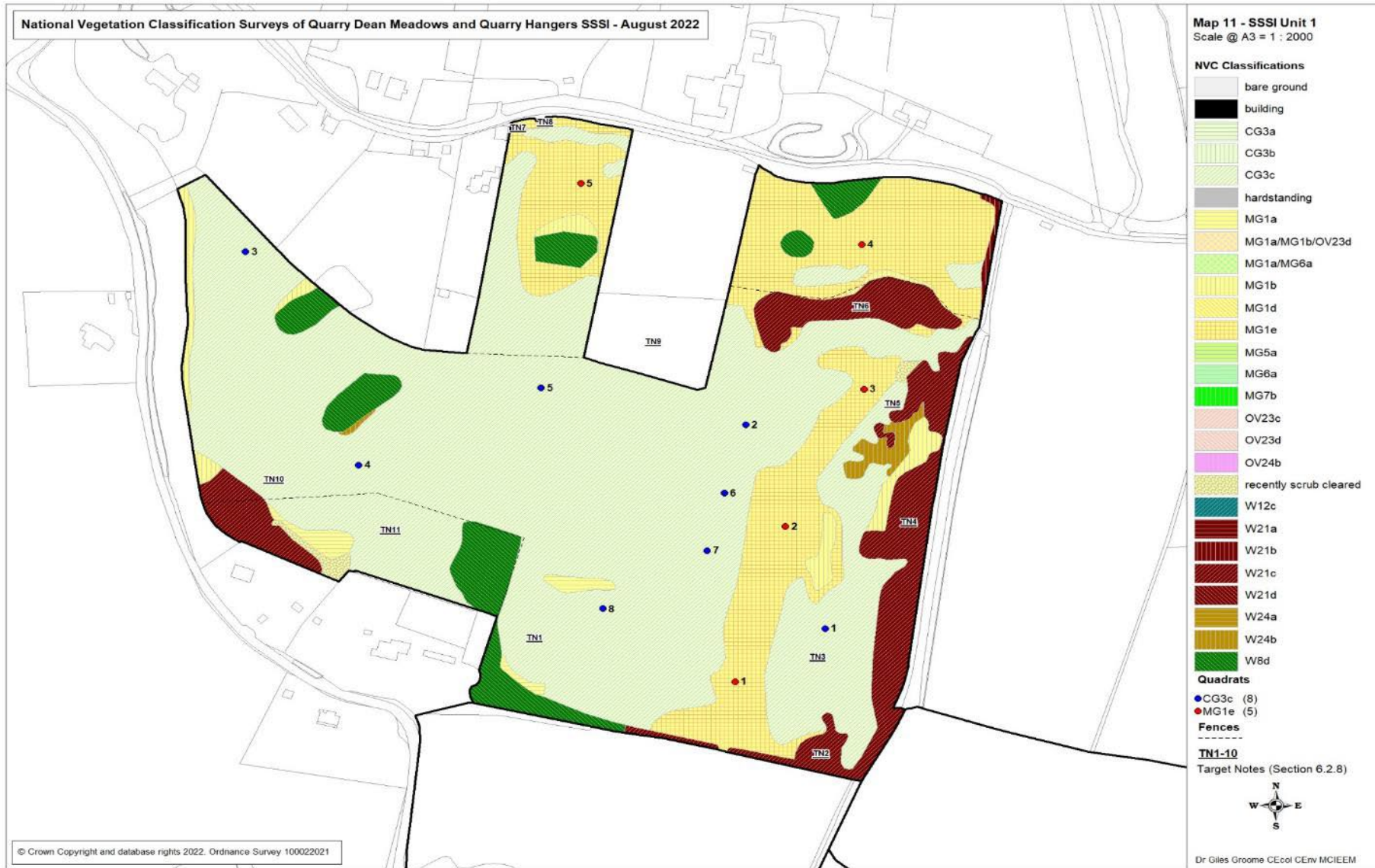
SSSI Unit 1 MG1e Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Festuca rubra</i> agg.	8	8	7	5	7	V	(5-8)
<i>Galium album</i>	7	6	4	7	6	V	(4-7)
<i>Lotus corniculatus</i>	7	7	5	4	2	V	(2-7)
<i>Arrhenatherum elatius</i>	5	5	5	5	6	V	(5-6)
<i>Dactylis glomerata</i>	4	4	2	4	5	V	(2-5)
<i>Veronica chamaedrys</i>	4	5	5	2	2	V	(2-5)
<i>Agrostis stolonifera</i>	4	4	5	1	3	V	(1-5)
<i>Agrimonia eupatoria</i>	4	4	4	4	1	V	(1-4)
<i>Medicago lupulina</i>	4	2	1	3	4	V	(1-4)
<i>Holcus lanatus</i>	2	3	3	2	2	V	(2-3)
<i>Trifolium pratense</i>	5	1		2	5	IV	(2-5)
<i>Trifolium repens</i>	2	4	4		4	IV	(1-5)
<i>Convolvulus arvensis</i>	4	1	1	1		IV	(1-4)
<i>Potentilla reptans</i>	1	4	4		4	IV	(1-4)
<i>Odontites vernus</i> ssp. <i>serotinus</i>	2	3	1	3		IV	(1-3)
<i>Phleum bertolonii</i>		3	2	2	1	IV	(1-3)
<i>Origanum vulgare</i>	5	4	8			III	(4-8)
<i>Poa pratensis</i>		2	3	4		III	(2-4)
<i>Trisetum flavescens</i>			3	4	2	III	(2-4)
<i>Cirsium arvense</i>	2	1			4	III	(1-4)
<i>Plantago lanceolata</i>	2	4	1			III	(1-4)
<i>Hordeum secalinum</i>		2		1	2	III	(1-2)
<i>Ranunculus acris</i>	2	1		2		III	(1-2)
<i>Bromopsis erecta</i>	1	1	1			III	(1)
<i>Jacobaea vulgaris</i>	1	1	1			III	(1)
<i>Lolium perenne</i>		3	1			II	(1-3)
<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>				2	2	II	(2)
<i>Geranium dissectum</i>		1	2			II	(1-2)
<i>Linum catharticum</i>	2	1				II	(1-2)

SSSI Unit 1 MG1e Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>			1		1	II	(1)
<i>Crepis biennis</i>	1	1				II	(1)
<i>Crepis capillaris</i>		1	1			II	(1)
<i>Ranunculus bulbosus</i>	1	1				II	(1)
<i>Taraxacum</i> agg.		1			1	II	(1)
<i>Tragopogon pratensis</i> ssp. <i>minor</i>	1			1		II	(1)
<i>Jacobaea erucifolia</i>	4					I	(4)
<i>Pastinaca sativa</i> ssp. <i>sylvestris</i>					4	I	(4)
<i>Prunella vulgaris</i>		4				I	(4)
<i>Barbula unguiculata</i>				3		I	(3)
<i>Brachythecium</i> <i>rutabulum</i>					3	I	(3)
<i>Lathyrus pratensis</i>			2			I	(2)
<i>Pimpinella saxifraga</i>					2	I	(2)
<i>Poa trivialis</i>					2	I	(2)
<i>Rumex acetosa</i>					2	I	(2)
<i>Achillea millefolium</i>					1	I	(1)
<i>Brachypodium</i> <i>sylvaticum</i>				1		I	(1)
<i>Centaurea nigra</i> agg.			1			I	(1)
<i>Cirsium vulgare</i>			1			I	(1)
<i>Crataegus monogyna</i> (seedling/sapling)			1			I	(1)
<i>Cynosurus cristatus</i>			1			I	(1)
<i>Heracleum</i> <i>sphondylium</i>				1		I	(1)
Bare ground	1	1	1	4	1		
Species per quadrat	26	32	30	23	26		27.4
Species per quadrat excl. scrub	26	32	29	23	26		27.2

Figure 10 – MG1e (Quadrat 3) within SSSI Unit 1



Map 11 – SSSI Unit 1 (Target Notes for Map 11)



3.3.2 SSSI Unit 2

Survey area 2.82ha. Surveyed 28/6/21. Quadrats recorded 28/6/21. Map 12.

Boundaries

With the exception of the southern boundary, all boundaries follow OS Mastermap lines which, as far as could be confirmed during fieldwork, follow field banks. There is nothing to separate the southern boundary of Unit 2 from the northern boundary of Field 6866 (south).

Site Description

Unit 2 of the Quarry Hangers SSSI overlies White Chalk and, in the extreme south, Grey Chalk (British Geological Society 2021). Soils are bulk classified as Upton series grey rendzinas (Soil Survey of England and Wales 1983). The Unit supports mostly 10-20° south-west to south-east facing slopes. All is sheep grazed, although it is reported that this has not been consistent in recent years. Eastern and south-eastern stands have been the subject of much recent scrub clearance.

Mapped NVC Classifications

CG3c (1 mapped stand/polygon, area 2.18ha)

Over 75% of the total area of Unit 2 supports species-rich CG3c grassland. Swards are dominated by *Bromopsis erecta* with *Festuca rubra*, *Carex flacca*, *Brachypodium sylvaticum* and *Dactylis glomerata*. *Briza media*, *Holcus lanatus*, *Phleum bertolonii* and *Agrostis stolonifera* are frequent; *Trisetum flavescens*, *Arrhenatherum elatius*, *Poa pratensis* and *Avenula pubescens* occasional. Other graminoids include *Poa trivialis*, *Bromus hordeaceus* ssp. *hordeaceus*, *Festuca ovina*, *Bromus racemosus* and *Helictochloa pratensis*.

The most frequent and cover abundant forbs are *Poterium sanguisorba* ssp. *sanguisorba*, *Potentilla reptans*, *Lotus corniculatus*, *Medicago lupulina*, *Origanum vulgare* and *Cirsium acaule*. *Viola hirta*, *Plantago lanceolata*, *Linum catharticum*, *Clinopodium vulgare*, *Galium album*, *Cerastium fontanum* ssp. *vulgare* and *Veronica chamaedrys* are also more-or-less constant but at lower cover. Common associates include *Prunella vulgaris*, *Thymus drucei*, *Agrimonia eupatoria*, *Knautia arvensis*, *Ranunculus bulbosus*, *Jacobaea vulgaris*, *Trifolium repens*, *Leontodon hispidus* and *Crepis capillaris*. Other species include *Euphrasia nemorosa*, *Anacamptis pyramidalis*, *Primula veris*, *Achillea millefolium*, *Blackstonia perfoliata*, *Leucanthemum vulgare*, *Centaurea nigra* agg., *Pimpinella saxifraga*, *Ononis repens*, *Arenaria serpyllifolia* ssp. *serpyllifolia*, *Scabiosa columbaria*, *Polygala vulgaris*, *Dactylorhiza fuchsii*, *Galium verum*, *Centaurea scabiosa*, *Plantago media*, *Campanula glomerata* and *Pilosella officinarum*. Nationally Rare, Schedule 8 *Rhinanthus angustifolius* is very locally abundant.

The ground layer supports more-or-less constant *Pseudoscleropodium purum* and *Homalothecium lutescens* with locally common *Calliergonella cuspidata* and *Eurhynchium striatum*.

Scrub, mostly in the form of <0.5m recruitment saplings and cut/browse regeneration, is frequent and locally abundant. *Crataegus monogyna* is the most common woody species with *Rubus fruticosus*, *Clematis vitalba* and *Rosa* species; notably *Rosa micrantha*.

MG1a (1 mapped stand/polygon, area 0.09ha)

MG1a is restricted to grassland within and on the margins of the track and path to the north-east of the Unit. Swards are dominated by *Arrhenatherum elatius* with *Dactylis glomerata*, *Holcus lanatus*, *Poa trivialis* and, along the most trampled path centre *Lolium perenne*. *Anisantha sterilis* is very locally abundant (to dominant) close to the northern access with *Bromus hordeaceus* ssp. *hordeaceus*. Elsewhere *Hordeum secalinum* is very locally common.

Galium album is the most common forb with frequent and locally abundant *Heracleum spondylium* and *Origanum vulgare*. *Potentilla reptans* is also locally abundant. Other species include occasional *Agrimonia eupatoria*, *Odontites vernus* ssp. *serotinus* and *Crepis capillaris*. *Clematis vitalba* and/or *Rubus fruticosus* are very locally common where there has been past scrub cutting.

MG1e (1 mapped stand/polygon, area <0.01ha)

The fragment of mapped MG1e within Unit 2 lies on the extreme southern boundary, contiguous with Field 6866 (south) (Section 3.2.8).

W21c (6 mapped stands/polygons, total area 0.22ha)

W21c is present in the form of out-grown boundary hedges or established scrub within otherwise open grassland. All is dominated by *Crataegus monogyna* and/or *Prunus spinosa*. *Tamus communis*, *Clematis vitalba* and *Hedera helix* are common climbers with *Rosa corymbifera*; especially along the western boundary and within the stand of W21c to the south-east of target note 6. *Sambucus nigra* is scattered, but especially frequent along the northern boundary. Other species include *Taxus baccata*, *Acer campestre*, *Cornus sanguinea* ssp. *sanguinea*, *Rhamnus cathartica* and *Viburnum lantana*. *Fraxinus excelsior*, *Sorbus aria* and *Acer pseudoplatanus* trees occur along the western boundary.

The W21c field layer is, where present, mostly dominated by mixtures of *Hedera helix* and *Brachypodium sylvaticum*.

W24a (1 mapped stand/polygon, area 0.01ha)

The single stand of W24a comprises dense *Rubus fruticosus* that forms part of a larger stand of W24a within SSSI Unit 3.

W24b (5 mapped stands/polygons, total area 0.04ha)

W24b within Unit 2 comprises stands of *Rubus fruticosus* encroached grassland on the margins of scrub. The relict grassland beneath the bramble typically supports impoverished *Brachypodium sylvaticum* and/or *Arrhenatherum elatius* with locally

abundant *Galium album* and/or *Clematis vitalba*. 1-2m *Crataegus monogyna* is locally common.

W12c (1 mapped stand/polygon, area 0.07ha)

The single stand of mapped W12c is composed of a fenced stand of originally planted *Fagus sylvatica*, *Pinus* sp. and *Acer platanoides* over *Taxus baccata* and a heavily shaded, species-poor field layer of sparse *Brachypodium sylvaticum*.

Recently Scrub Cleared (5 mapped stands/polygons, total area 0.21ha)

Vegetation included within this classification is not referable to the NVC. It covers stands where, often previously very dense, scrub has been recently cleared (commonly since the date of the aerial imagery used during fieldwork) and where the vegetation comprises regeneration of the scrub that has recently been cut, as well as of previously extant grassland that had been present before the development of scrub, and recruitment of species encroaching (e.g., by tillering) and/or seeding in to the newly exposed, commonly disturbed, open conditions.

Within SSSI Unit 2 stands are variably dominated by *Brachypodium sylvaticum*, *Arrhenatherum elatius*, *Galium album* and/or *Origanum vulgare* with *Atropa belladonna*, *Holcus lanatus*, *Cirsium arvense*, *Bryonia dioica*, *Clematis vitalba*, *Poa trivialis*, *Solanum dulcamara* and/or *Rubus fruticosus*. One stand supports very locally abundant *Chamaenerion angustifolium*. Stands to the west and north-west of quadrat 5, include relatively species-rich remnant/regeneration CG3c. To the east of it stands include frequent regeneration scrub; especially *Crataegus monogyna*.

Quadrats and NVC Classification

Five quadrats were recorded from CG3c grassland. Table 14 provides the results of the quadrat recordings in Unit 2 of Quarry Hangers SSSI. Some cells have been intentionally left blank because there are no species recordings within the quadrats. The results of MATCH analysis are available upon request.

Running the results of quadrat recording through the key to calcareous grasslands in Rodwell (1992b), there is little doubt that swards belong within CG3c. They support constant *Bromopsis erecta* with a cover >10% (CG3) and *Knautia arvensis*, *Medicago lupulina*, *Trifolium repens*, *Viola hirta* and *Phleum bertolonii* are all frequent (CG3c).

Table 14 - Quadrat recordings on CG3c grassland in Unit 2 of Quarry Hangers SSSI

SSSI Unit 2 CG3c Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Bromopsis erecta</i>	9	8	8	5	7	V	(5-9)
<i>Potentilla reptans</i>	3	6	5	4	4	V	(3-6)
<i>Poterium sanguisorba</i> ssp. <i>sanguisorba</i>	5	5	5	5	5	V	(5)
<i>Carex flacca</i>	5	4	4	4	5	V	(4-5)

SSSI Unit 2 CG3c Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Lotus corniculatus</i>	4	5	5	4	5	V	(4-5)
<i>Origanum vulgare</i>	5	4	4	4	4	V	(4-5)
<i>Medicago lupulina</i>	4	3	4	4	5	V	(3-5)
<i>Pseudoscleropodium purum</i>	4	5	5	4	3	V	(3-5)
<i>Cirsium acaule</i>	1	4	1	5	1	V	(1-5)
<i>Viola hirta</i>	3	3	4	3	4	V	(3-4)
<i>Festuca rubra</i> agg.	2	2	2	3	4	V	(2-4)
<i>Veronica chamaedrys</i>	4	3	3	3	2	V	(2-4)
<i>Crataegus monogyna</i> (seedling/sapling)	1	4	1	1	1	V	(1-4)
<i>Linum catharticum</i>	3	3	3	3	3	V	(3)
<i>Clinopodium vulgare</i>	1	1	3	2	1	V	(1-3)
<i>Galium album</i>	3	2	1	2	2	V	(1-3)
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>	2	1	1	2	1	V	(1-2)
<i>Plantago lanceolata</i>	2	2	2	1	1	V	(1-2)
<i>Hypericum perforatum</i>	1	1	1	1	1	V	(1)
<i>Homalothecium lutescens</i>		2	3	5	5	IV	(2-5)
<i>Prunella vulgaris</i>		4	4	4	2	IV	(2-4)
<i>Brachypodium sylvaticum</i>		4	2	1	1	IV	(1-4)
<i>Crepis capillaris</i>		1	1	1	2	IV	(1-2)
<i>Dactylis glomerata</i>	1	2	1	1		IV	(1-2)
<i>Rosa</i> spp. (seedling/sapling)	1	1	1		1	IV	(1)
<i>Thymus drucei</i>			4	5	4	III	(4-5)
<i>Knautia arvensis</i>	4		4		2	III	(2-4)
<i>Agrimonia eupatoria</i>	4		1		1	III	(1-4)
<i>Clematis vitalba</i> (seedling/sapling)		1	4	1		III	(1-4)
<i>Leontodon hispidus</i>	4	1			2	III	(1-4)
<i>Briza media</i>		1		3	3	III	(1-3)

SSSI Unit 2 CG3c Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Holcus lanatus</i>		1	2	1		III	(1-2)
<i>Ranunculus bulbosus</i>	2	2			1	III	(1-2)
<i>Trifolium repens</i>		1	2		2	III	(1-2)
<i>Jacobaea vulgaris</i>		1	1	1		III	(1)
<i>Phleum bertolonii</i>	1	1			1	III	(1)
<i>Ranunculus repens</i>		2		4		II	(2-4)
<i>Agrostis stolonifera</i>				3	3	II	(3)
<i>Pimpinella saxifraga</i>	2		2			II	(2)
<i>Arenaria serpyllifolia</i> ssp. <i>serpyllifolia</i>			1	2		II	(1-2)
<i>Arrhenatherum elatius</i>		2	1			II	(1-2)
<i>Avenula pubescens</i>	1		2			II	(1-2)
<i>Pilosella officinarum</i>					4	I	(4)
<i>Primula veris</i>			4			I	(4)
<i>Calliergonella cuspidata</i>	3					I	(3)
<i>Euphrasia nemorosa</i>				3		I	(3)
<i>Eurhynchium striatum</i>	3					I	(3)
<i>Trisetum flavescens</i>		3				I	(3)
<i>Centaurea nigra</i> agg.	2					I	(2)
<i>Heracleum sphondylium</i>				2		I	(2)
<i>Leucanthemum vulgare</i>	2					I	(2)
<i>Acer pseudoplatanus</i> (seedling/sapling)		1				I	(1)
<i>Anisantha sterilis</i>		1				I	(1)
<i>Blackstonia perfoliata</i>		1				I	(1)
<i>Brachythecium</i> <i>rutabulum</i>	1					I	(1)
<i>Campanula glomeratum</i>				1		I	(1)
<i>Centaurea scabiosa</i>	1					I	(1)
<i>Centaureum erythraea</i>					1	I	(1)
<i>Cornus sanguinea</i> (seedling/sapling)		1				I	(1)
<i>Festuca ovina</i> agg.				1		I	(1)

SSSI Unit 2 CG3c Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Fragaria vesca</i>					1	I	(1)
<i>Fraxinus excelsior</i> (seedling/sapling)					1	I	(1)
<i>Helictochloa pratensis</i>			1			I	(1)
<i>Odontites vernus</i> ssp. <i>serotinus</i>		1				I	(1)
<i>Poa trivialis</i>				1		I	(1)
<i>Polygala vulgaris</i>					1	I	(1)
<i>Quercus robur</i> (seedling/sapling)					1	I	(1)
<i>Ranunculus acris</i>		1				I	(1)
<i>Rubus fruticosus</i> agg.			1			I	(1)
<i>Scabiosa columbaria</i>					1	I	(1)
<i>Scorzoneroides</i> <i>autumnalis</i>					1	I	(1)
<i>Taraxacum</i> agg.		1				I	(1)
<i>Tragopogon pratensis</i> ssp. <i>minor</i>	1					I	(1)
<i>Trifolium pratense</i>			1			I	(1)
Bare ground	1		1				
Species per quadrat	35	43	40	37	41		39.2
Species per quadrat excl. scrub	33	38	37	35	37		36.0

Figure 11 – CG3c (Quadrat 3) within SSSI Unit 2



Map 12 – SSSI Unit 2 (Target Notes for Map 12)



3.3.3 SSSI Unit 3

Survey area 2.52ha. Surveyed 29/6/21. Quadrats recorded 30/6/21. Map 13.

Boundaries

All boundaries follow OS Mastermap lines which, as far as could be confirmed during fieldwork, follow field banks or footpaths.

Site Description

Unit 3 of the Quarry Hangers SSSI overlies White Chalk to the north and Grey Chalk to the south (British Geological Society 2021). Soils are bulk classified as Upton series grey rendzinas (Soil Survey of England and Wales 1983). Other than where it levels off toward the north, most of the Unit occupies steep and very steep (mostly 15-30°) south-west to south-east facing slopes. All is reported to be sheep grazed, although livestock grazing in recent years must have been very inconsistent and/or at low intensity. Rabbit grazing is widespread in northern areas. There has been considerable recent scrub clearance.

Mapped NVC Classifications

CG3c (3 mapped stands/polygons, total area 0.40ha)

By contrast to Unit 2, CG3c occupies only c.15% of the total area of Unit 3 and, whilst almost all is species-rich, scrub is widespread and some northern stands can be very close to MG1. These aside, the community is dominated by *Bromopsis erecta* with *Brachypodium sylvaticum*, *Carex flacca* and *Dactylis glomerata*. *Festuca rubra*, *Agrostis stolonifera*, *Trisetum flavescens* and *Holcus lanatus* are frequent and each locally abundant. *Festuca ovina*, *Briza media* and *Carex caryophylla* are locally frequent, notably toward the south of the Unit where swards can be close to CG3b, but otherwise largely absent. Other graminoids include mostly sparse or very sparse *Phleum bertolonii*, *Bromus hordeaceus* ssp. *hordeaceus*, *Poa pratensis*, *Cynosurus cristatus* and *Poa trivialis*.

Poterium sanguisorba ssp. *sanguisorba*, *Medicago lupulina*, *Leontodon hispidus*, *Lotus corniculatus*, *Origanum vulgare* and *Fragaria vesca* are the most common and cover abundant forbs with *Prunella vulgaris*, *Veronica chamaedrys*, *Hypericum perforatum*, *Jacobaea vulgaris*, *Viola hirta*, *Galium album*, *Agrimonia eupatoria* and *Clinopodium vulgare*. *Linum catharticum*, *Potentilla reptans*, *Thymus drucei*, *Leucanthemum vulgare*, *Centaurea nigra* agg. and *Ranunculus bulbosus* are frequent and locally very common; *Pilosella officinarum*, *Pimpinella saxifraga*, *Cirsium acaule*, *Primula veris* and *Odontites vernus* ssp. *serotinus* more local still and rarely cover abundant. Other forbs include *Scabiosa columbaria*, *Polygala calcarea*, *Helianthemum nummularium*, *Galium verum*, *Knautia arvensis*, *Hippocrepis comosa*, *Blackstonia perfoliata*, *Polygala vulgaris*, *Plantago media*, *Carlina vulgaris* and *Potentilla sterilis*.

Homalothecium lutescens is common and abundant in the ground layer with *Pseudoscleropodium purum*.

Scrub recruitment and/or post cut/browse regeneration is widespread. *Crataegus monogyna*, *Rubus fruticosus*, *Clematis vitalba* and *Rosa* spp. (notably *Rosa micrantha*) are virtually ubiquitous with *Fraxinus excelsior*, *Cornus sanguinea* ssp. *sanguinea*, *Viburnum lantana* and very locally frequent *Cotoneaster horizontalis*.

MG1a (4 mapped stands/polygons, total area 0.20ha)

MG1a comprises mostly coarse *Arrhenatherum elatius* grassland with locally abundant *Brachypodium sylvaticum* that has developed in areas of post-scrub clearance. *Galium album* and *Origanum vulgare* are abundant in all stands with rather more local *Clematis vitalba*, *Epilobium hirsutum* and *Potentilla reptans*. On occasions swards include species such as *Agrimonia eupatoria*, *Veronica chamaedrys*, *Fragaria vesca*, *Prunella vulgaris*, *Trifolium pratense*, *Hypericum perforatum*, *Lotus corniculatus*, *Clinopodium vulgare* and, in the far east very locally common *Leontodon hispidus*, but in the main they are markedly species-poor.

MG1b (1 mapped stand/polygon, area 0.05ha)

The stand of mapped MG1b is dominated by *Arrhenatherum elatius* with locally abundant *Clematis vitalba*, scattered and locally abundant *Urtica dioica* ssp. *dioica*, *Cirsium arvense* and *Galium aparine*. *Chamaenerion angustifolium*, *Epilobium hirsutum* and *Carduus crispus* are occasional with woodland edge *Mercurialis perennis*, *Geum urbanum* and *Circaea lutetiana*.

OV24b (1 mapped stand/polygon, area 0.01ha)

The single stand of OV24b is dominated by rank species-poor *Cirsium arvense*, *Urtica dioica* ssp. *dioica* and *Galium aparine* with *Arrhenatherum elatius*, *Epilobium hirsutum* and *Rubus fruticosus*.

W21c (5 mapped stands/polygons, total area 0.66ha)

Ranging from relatively recently established to decades-extant, W21c is dominated by *Crataegus monogyna* with locally abundant *Cornus sanguinea* ssp. *sanguinea*, *Rubus fruticosus* and *Clematis vitalba*. *Taxus baccata*, *Sorbus aria*, *Prunus spinosa*, *Rhamnus cathartica*, *Viburnum lantana* and *Ligustrum vulgare* are occasional, notably within the out-grown hedge to the north of the Unit. *Acer pseudoplatanus*, *Prunus avium* and *Fraxinus excelsior* are scattered in the leggy scrub-woodland to the east.

The field layer is usually dominated by *Brachypodium sylvaticum* with *Rubus fruticosus*, locally abundant *Glechoma hederacea*, very locally abundant *Mercurialis perennis* and *Hedera helix*, scattered *Urtica dioica* ssp. *dioica* and very locally frequent *Geranium robertianum*, *Prunella vulgaris* and *Teucrium scorodonia*.

W21d (4 mapped stands/polygons, total area 0.12ha)

W21d comprises mostly dense 1-3m (locally >6m) regeneration scrub of mixed *Cornus sanguinea* ssp. *sanguinea*, *Viburnum lantana*, *Clematis vitalba*, *Ligustrum vulgare*, *Crataegus monogyna*, *Sorbus aria* and *Rhamnus cathartica* with *Rosa canina*. The field layer is difficult to assess given the density of scrub, but appears to comprise mostly

species-poor *Brachypodium sylvaticum* with locally abundant *Mercurialis perennis*. All stands overlie steep or very steep slopes.

W24a (2 mapped stands/polygons, total area 0.04ha)

W24a comprises dense stands of *Rubus fruticosus* underscrub with locally abundant *Clematis vitalba* and occasional shrubs; notably *Sambucus nigra*. The stand spanning the western boundary lies beneath the shade of a mature *Fraxinus excelsior*.

W24b (1 mapped stand/polygon, area 0.01ha)

The stand of W24b situated to the centre-west of the site has developed within an area that appears to have only recently been fenced out from the grazing area. It comprises *Rubus fruticosus* encroached rank grassland with *Urtica dioica* ssp. *dioica* and mixed regeneration scrub (*Sambucus nigra*, *Crataegus monogyna*, *Rosa canina* agg. and *Fraxinus excelsior*).

W8d (1 mapped stand/polygon, area 0.63ha)

W8d is dominated by canopy *Fraxinus excelsior* over understorey *Crataegus monogyna*, *Taxus baccata* (see target note TN1, Section 6.2.9) and *Sambucus nigra* with frequent and locally very abundant climbing *Hedera helix*. *Hedera helix* also dominates the field layer with locally abundant/dominant *Mercurialis perennis* and occasional *Tamus communis*. Other species include *Asplenium scolopendrium*, *Allium ursinum*, *Dryopteris filix-mas* and *Iris foetidissima*.

Recently Scrub Cleared (2 mapped stands/polygons, total area 0.38ha)

Vegetation included within this classification is not referable to the NVC. It covers stands where, often previously very dense, scrub has been recently cleared (commonly since the date of the aerial imagery used during fieldwork) and where the vegetation comprises regeneration of the scrub that has recently been cut, as well as of previously extant grassland that had been present before the development of scrub, and recruitment of species encroaching (e.g. by tillering) and/or seeding in to the newly exposed, commonly disturbed, open conditions.

Within SSSI Unit 3 stands are variably dominated by *Brachypodium sylvaticum*, *Arrhenatherum elatius*, *Clematis vitalba*, *Galium album*, *Origanum vulgare*, regeneration *Cornus sanguinea* ssp. *sanguinea*, *Potentilla reptans*, *Rubus fruticosus*, *Glechoma hederacea*, *Epilobium hirsutum* and *Urtica dioica* ssp. *dioica*. Roses, including *Rosa canina* and *R. micrantha* are frequent, as is regeneration *Crataegus monogyna*. *Cotoneaster horizontalis* is locally common; *Ligustrum vulgare* and *Viburnum lantana* occasional.

Relict CG3c species include *Bromopsis erecta*, *Carex flacca*, *Primula veris*, *Agrimonia eupatoria*, *Lotus corniculatus*, *Leontodon hispidus* *Clinopodium vulgare*, *Leucanthemum vulgare*, *Medicago lupulina*, *Jacobaea erucifolia*, *Veronica chamaedrys*, *Prunella vulgaris* and *Anacamptis pyramidalis*. Other species include *Helminthotheca echioides*, *Atropa belladonna*, *Sonchus asper*, *Odontites vernus* ssp. *serotinus*, *Teucrium scorodonia*,

Solanum dulcamara, *Hypericum hirsutum*, *Centaureum erythraea*, *Inula conyzae* and *Fragaria vesca*.

Quadrats and NVC Classification

Five quadrats were recorded from CG3c grassland. Table 15 highlights the results of the quadrat recordings in Unit 3 of Quarry Hangers SSSI. Some cells have been intentionally left blank because there are no species recordings within the quadrats. The results of MATCH analysis are available upon request.

Table 15 - Quadrat recordings on CG3c grassland in Unit 3 of Quarry Hangers SSSI

SSSI Unit 3 CG3c Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Bromopsis erecta</i>	2	8	7	5	1	V	(1-8)
<i>Poterium sanguisorba</i> ssp. <i>sanguisorba</i>	4	5	6	7	4	V	(4-7)
<i>Brachypodium sylvaticum</i>	7	5	4	1	5	V	(1-7)
<i>Fragaria vesca</i>	4	3	4	3	6	V	(3-6)
<i>Homalothecium</i> <i>lutescens</i>	4	6	4	3	5	V	(3-6)
<i>Crataegus monogyna</i> (seedling/sapling)	6	4	4	3	1	V	(1-6)
<i>Rubus fruticosus</i> agg.	6	1	1	4	1	V	(1-6)
<i>Clematis vitalba</i> (seedling/sapling)	4	4	5	4	4	V	(4-5)
<i>Carex flacca</i>	4	4	3	5	4	V	(3-5)
<i>Origanum vulgare</i>	5	3	2	4	4	V	(2-5)
<i>Leontodon hispidus</i>	4	4	5	1	2	V	(1-5)
<i>Lotus corniculatus</i>	1	3	5	5	4	V	(1-5)
<i>Prunella vulgaris</i>	4	4	4	4	4	V	(4)
<i>Veronica chamaedrys</i>	4	2	2	3	2	V	(2-4)
<i>Clinopodium vulgare</i>	4	1	1	1	1	V	(1-4)
<i>Medicago lupulina</i>	3	1	4	4	4	V	(1-4)
<i>Rosa</i> spp. (seedling/sapling)	4	2	2	4	1	V	(1-4)
<i>Hypericum perforatum</i>	2	1	1	3	2	V	(1-3)
<i>Dactylis glomerata</i>	2	2	1	2	2	V	(1-2)
<i>Jacobaea vulgaris</i>	1	1	1	1	1	V	(1)
<i>Viola hirta</i>		3	3	3	4	IV	(3-4)
<i>Agrimonia eupatoria</i>	4		1	1	4	IV	(1-4)

SSSI Unit 3 CG3c Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Fraxinus excelsior</i> (seedling/sapling)	4	4	1	1		IV	(1-4)
<i>Galium album</i>	2		1	2	4	IV	(1-4)
<i>Pseudoscleropodium purum</i>	2	4	1	2		IV	(1-4)
<i>Cornus sanguinea</i> (seedling/sapling)	4	5	4			III	(4-5)
<i>Potentilla reptans</i>			2	3	5	III	(2-5)
<i>Festuca rubra</i> agg.		1		5	4	III	(1-5)
<i>Agrostis stolonifera</i>	2			3	4	III	(2-4)
<i>Centaurea nigra</i> agg.		4	2	1		III	(1-4)
<i>Leucanthemum vulgare</i>	2	4	1			III	(1-4)
<i>Linum catharticum</i>	2			2	3	III	(2-3)
<i>Thymus drucei</i>		3	3	2		III	(2-3)
<i>Holcus lanatus</i>	1			2	3	III	(1-3)
<i>Ranunculus bulbosus</i>	1	2	1			III	(1-2)
<i>Trisetum flavescens</i>		2	2	1		III	(1-2)
<i>Viola riviniana</i>	1	1		1		III	(1)
<i>Festuca ovina</i> agg.			5	4		II	(4-5)
<i>Pilosella officinarum</i>		3	4			II	(3-4)
<i>Odontites vernus</i> ssp. <i>serotinus</i>	3				3	II	(3)
<i>Pimpinella saxifraga</i>		3	1			II	(1-3)
<i>Cirsium acaule</i>		2	1			II	(1-2)
<i>Glechoma hederacea</i>	2				1	II	(1-2)
<i>Trifolium pratense</i>				2	1	II	(1-2)
<i>Viburnum lantana</i> (seedling/sapling)		2	1			II	(1-2)
<i>Brachythecium rutabulum</i>	1			1		II	(1)
<i>Briza media</i>		1		1		II	(1)
<i>Inula conyzae</i>	1	1				II	(1)
<i>Jacobaea erucifolia</i>	1		1			II	(1)
<i>Quercus robur</i> (seedling/sapling)	1	1				II	(1)

SSSI Unit 3 CG3c Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Taraxacum</i> agg.				1	1	II	(1)
<i>Teucrium scorodonia</i>		1	1			II	(1)
<i>Carex caryophylla</i>				4		I	(4)
<i>Cotoneaster horizontalis</i> (seedling/sapling)		4				I	(4)
<i>Anthriscus sylvestris</i>		3				I	(3)
<i>Primula veris</i>				3		I	(3)
<i>Barbula unguiculata</i>				2		I	(2)
<i>Bryum capillare</i>					2	I	(2)
<i>Blackstonia perfoliata</i>	1					I	(1)
<i>Bryonia dioica</i>	1					I	(1)
<i>Centaureum erythraea</i>	1					I	(1)
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>					1	I	(1)
<i>Cirsium arvense</i>	1					I	(1)
<i>Crepis biennis</i>	1					I	(1)
<i>Geranium dissectum</i>					1	I	(1)
<i>Helminthotheca</i> <i>echioides</i>					1	I	(1)
<i>Hypericum hirsutum</i>					1	I	(1)
<i>Leontodon saxatilis</i>					1	I	(1)
<i>Pastinaca sativa</i> ssp. <i>sylvestris</i>				1		I	(1)
<i>Plantago lanceolata</i>					1	I	(1)
<i>Plantago media</i>			1			I	(1)
<i>Poa trivialis</i>					1	I	(1)
<i>Potentilla sterilis</i>	1					I	(1)
<i>Rhamnus cathartica</i> (seedling/sapling)			1			I	(1)
<i>Rumex acetosa</i>					1	I	(1)
<i>Sonchus asper</i>				1		I	(1)
<i>Sorbus aria</i> (seedling/sapling)		1				I	(1)
Bare ground				3	2		

SSSI Unit 3 CG3c Quadrats	1	2	3	4	5	Constancy	Constancy
rabbit droppings				3	2		
Species per quadrat	43	42	41	44	41		42.2
Species per quadrat excl. scrub	36	32	33	39	37		35.4

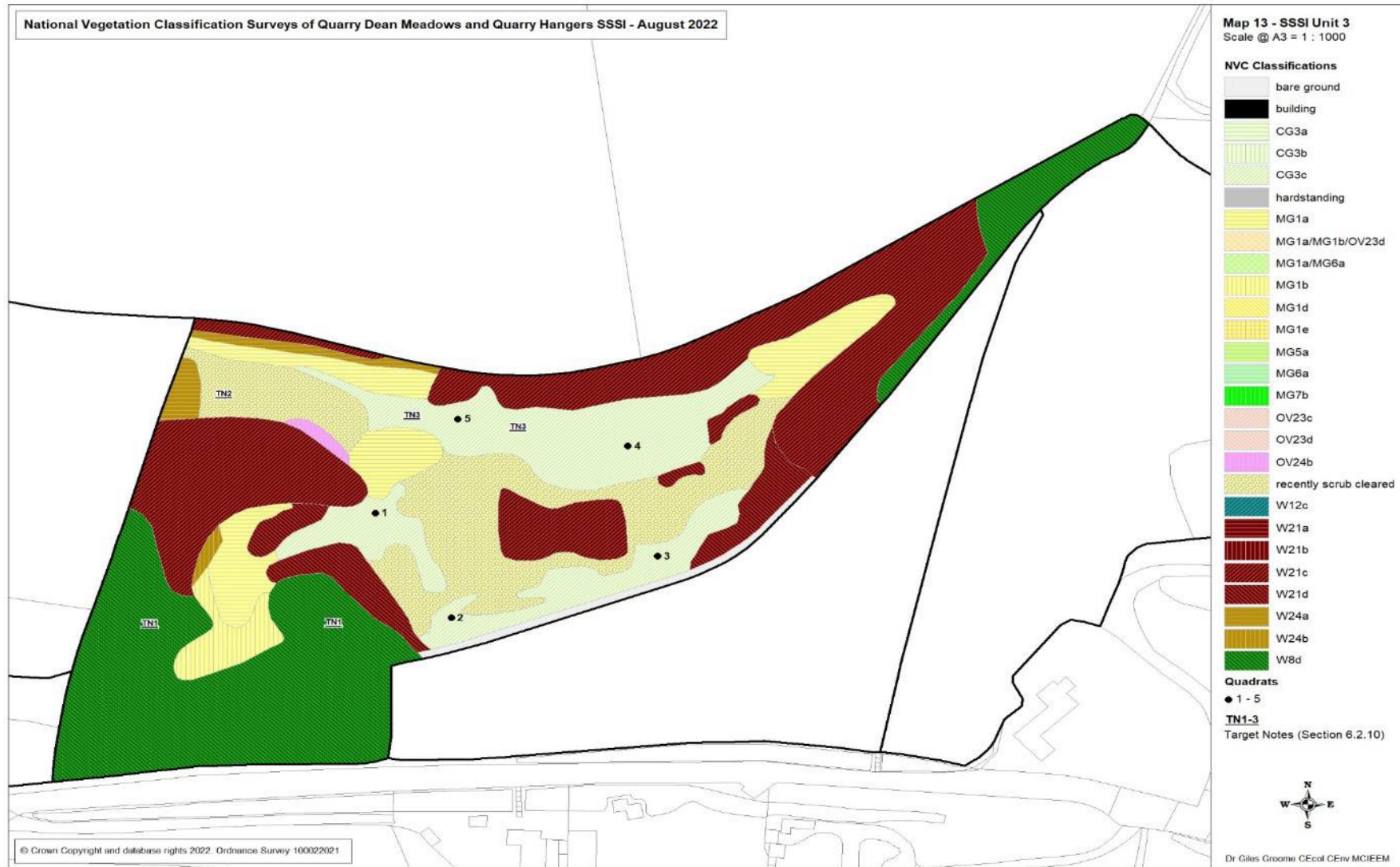
Running the results of quadrat recording through the key to calcareous grasslands in Rodwell (1992b), there is little doubt that swards belong within CG3. However, determining sub-community is less straightforward with swards failing to record five or more “...*Bellis perennis*, *Knautia arvensis*, *Taraxacum officinale* agg. [sic], *Medicago lupulina*, *Trifolium pratense*, *T.repens*, *Viola hirta*, *Vicia cracca*, *Cynosurus cristatus*, *Phleum pratense* ssp. *bertolonii* [sic]” (CG3c), nor supporting *Centaurea nigra* “...with two or more of *Hypochoeris radicata* [sic], *Daucus carota*, *Achillea millefolium*, *Galium mollugo* [sic], *Rhinanthus minor*, *Senecio jacobaea* [sic]” (CG3b). However, two of the listed CG3c species are frequent, two occasional and all others, bar *Bellis perennis* and *Vicia cracca*, present within what was mapped as CG3c during the walkover survey.

Considering Rodwell’s key, sub-community descriptions and floristic table, along with the results of MATCH analysis, the classification of CG3c, particularly given the extent of scrub encroachment and history of inconsistent grazing, is the most appropriate.

Figure 12 – CG3c (Quadrat 2) within SSSI Unit 3



Map 13 – SSSI Unit 3 (Target Notes for Map 13)



3.3.4 SSSI Unit 4

Survey area 1.06ha. Surveyed 29/6/21. Quadrats recorded 30/6/21. Map 14.

Boundaries

All boundaries follow OS Mastermap lines which, as far as could be confirmed during fieldwork, follow field banks or footpaths.

Site Description

Unit 4 of the Quarry Hangers SSSI overlies Grey Chalk (British Geological Society 2021) and Upton series grey rendzina soils (Soil Survey of England and Wales 1983). It supports mostly 10-20° south and south-east facing slopes. Almost all is grazed by sheep and goats. There has been widespread recent scrub clearance.

Mapped NVC Classifications

CG3b (1 mapped stand/polygon, area 0.36ha)

Species-rich stands of CG3b are dominated, although cover is mostly <25%, by *Bromopsis erecta* with *Carex flacca*, *Briza media*, *Dactylis glomerata*, *Trisetum flavescens* and, by contrast to most CG3c across the SSSI, *Festuca ovina*. *Festuca rubra* supports mostly low cover and is far from constant. Other graminoids include frequent and locally abundant *Brachypodium sylvaticum*, and occasional *Poa pratensis* and *Holcus lanatus*. *Avenula pubescens*, *Koeleria macrantha* and *Agrostis stolonifera* are infrequent; *Brachypodium rupestre* (confirmed under the microscope) very rare.

The most frequent and cover abundant forbs are *Leontodon hispidus*, *Poterium sanguisorba* ssp. *sanguisorba*, *Lotus corniculatus*, *Thymus drucei*, *Cirsium acaule* and *Prunella vulgaris*. At lower cover, but nevertheless constant, are *Origanum vulgare*, *Pilosella officinarum*, *Centaurea nigra* agg., *Pilosella officinarum*, *Fragaria vesca*, *Galium album*, *Clinopodium vulgare* and *Viola hirta*. Common associates include *Pimpinella saxifraga*, *Veronica chamaedrys*, *Ranunculus bulbosus*, *Medicago lupulina* and *Hypericum perforatum*. Other forbs include *Euphrasia nemorosa*, *Blackstonia perfoliata*, *Polygala calcarea*, *Centaurea scabiosa*, *Teucrium scorodonia*, *Centaureum erythraea*, *Plantago media*, *Thymus pulegioides*, *Carlina vulgaris*, *Hippocrepis comosa* and *Leontodon saxatilis*. The very small patch of recorded *Onobrychis viciifolia* (target note 2, Section 6.2.10) besides the footpath separating Unit 4 from Unit 5 lies outside the current grazing area.

The ground layer is dominated by *Homalothecium lutescens* with scattered *Pseudoscleropodium purum*, *Eurhynchium striatum* and *Fissidens dubius*.

Juvenile goat-browsed scrub is common across the community. *Crataegus monogyna*, *Cornus sanguinea* ssp. *sanguinea*, *Clematis vitalba*, *Viburnum lantana* and *Fraxinus excelsior* are more-or-less ubiquitous (see floristic table). *Cotoneaster horizontalis* and *C. simonsii* are also present.

W21c (2 mapped stands/polygons, total area 0.16ha)

Stands of mostly leggy W21c scrub and scrub-woodland are dominated by *Crataegus monogyna* with occasional *Acer pseudoplatanus* and *Prunus avium*. The field layer is very poor, comprising mostly scattered *Brachypodium sylvaticum*.

W21d (2 mapped stands/polygons, total area 0.05ha)

W21d within Unit 4 comprises stands of regeneration scrub over *Brachypodium sylvaticum*. They are dominated by mixtures of *Crataegus monogyna*, *Viburnum lantana*, *Cornus sanguinea* ssp. *sanguinea* and the roses *R.micrantha* and *R.rubiginosa*. At the time of survey, all were being browsed to good effect by six goats.

W8d (1 mapped stand/polygon, area 0.26ha)

W8d woodland within Unit 4 is dominated by *Fraxinus excelsior* with, to the south-west, *Aesculus hippocastanum* over shrub layer *Crataegus monogyna*. Beyond the grazing area, stands support field layer *Hedera helix* and/or *Mercurialis perennis*. Within it, most supports *Brachypodium sylvaticum* over *Hedera helix*.

Recently Scrub Cleared (3 mapped stands/polygons, total area 0.23ha)

Vegetation included within this classification is not referable to the NVC. It covers stands where, often previously very dense, scrub has been recently cleared (commonly since the date of the aerial imagery used during fieldwork) and where the vegetation comprises regeneration of the scrub that has recently been cut, as well as of previously extant grassland that had been present before the development of scrub, and recruitment of species encroaching (e.g. by tillering) and/or seeding in to the newly exposed, commonly disturbed, open conditions.

Within SSSI Unit 4 most stands of 'recently cleared scrub' are dominated by redeveloping *Brachypodium sylvaticum* dominated grassland with frequent and locally abundant *Origanum vulgare*, *Galium album*, *Potentilla reptans* and *Fragaria vesca*.

Quadrats and NVC Classification

Five quadrats were recorded from CG3c grassland. Table 16 highlights the results of the quadrat recordings in Unit 4 of Quarry Hangers SSSI. Some cells have been intentionally left blank because there are no species recordings within the quadrats. The results of MATCH analysis are available upon request.

Table 17 - Quadrat recordings on CG3c grassland in Unit 1 of Quarry Hangers SSSI

SSSI Unit 4 CG3b Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Bromopsis erecta</i>	5	5	5	6	7	V	(5-7)
<i>Leontodon hispidus</i>	5	5	6	4	5	V	(4-6)
<i>Poterium sanguisorba</i> ssp. <i>sanguisorba</i>	5	5	5	5	5	V	(5)

SSSI Unit 4 CG3b Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Lotus corniculatus</i>	4	5	5	5	5	V	(4-5)
<i>Prunella vulgaris</i>	3	4	4	5	4	V	(3-5)
<i>Thymus drucei</i>	3	2	4	5	3	V	(2-5)
<i>Cirsium acaule</i>	1	1	4	4	5	V	(1-5)
<i>Carex flacca</i>	4	4	4	4	4	V	(4)
<i>Clematis vitalba</i> (seedling/sapling)	4	4	2	4	4	V	(2-4)
<i>Crataegus monogyna</i> (seedling/sapling)	4	4	2	4	4	V	(2-4)
<i>Trisetum flavescens</i>	2	3	4	3	3	V	(2-4)
<i>Homalothecium</i> <i>lutescens</i>	3	1	3	3	4	V	(1-4)
<i>Origanum vulgare</i>	4	3	4	2	1	V	(1-4)
<i>Rubus fruticosus</i> agg.	4	3	1	2	1	V	(1-4)
<i>Viburnum lantana</i> (seedling/sapling)	1	1	1	4	1	V	(1-4)
<i>Dactylis glomerata</i>	2	2	2	2	3	V	(2-3)
<i>Pilosella officinarum</i>	2	2	3	2	2	V	(2-3)
<i>Viola hirta</i>	2	3	3	3	3	V	(2-3)
<i>Briza media</i>	1	1	3	3	3	V	(1-3)
<i>Centaurea nigra</i>	2	2	1	1	3	V	(1-3)
<i>Fragaria vesca</i>	2	1	1	3	3	V	(1-3)
<i>Clinopodium vulgare</i>	1	2	1	1	1	V	(1-2)
<i>Galium album</i>	2	1	1	1	1	V	(1-2)
<i>Rosa</i> spp. (seedling/sapling)	1	1	1	1	1	V	(1)
<i>Festuca ovina</i> agg.		1	5	6	4	IV	(1-6)
<i>Cornus sanguinea</i> (seedling/sapling)	5	4	1	1		IV	(1-5)
<i>Brachypodium sylvaticum</i>	4	2		1	2	IV	(1-4)
<i>Hypericum perforatum</i>	3	1	1		2	IV	(1-3)
<i>Pimpinella saxifraga</i>	3	3	1		2	IV	(1-3)
<i>Fraxinus excelsior</i> (seedling/sapling)	2	2	2		2	IV	(2)

SSSI Unit 4 CG3b Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Inula conyzae</i>	1	1		1	1	IV	(1)
<i>Medicago lupulina</i>		3	3	3		III	(3)
<i>Festuca rubra</i> agg.		2	1	1		III	(1-2)
<i>Leucanthemum vulgare</i>	2	1	1			III	(1-2)
<i>Pseudoscleropodium purum</i>			2	1	1	III	(1-2)
<i>Ranunculus bulbosus</i>			1	2	2	III	(1-2)
<i>Veronica chamaedrys</i>	2	1		2		III	(1-2)
<i>Barbula unguiculata</i>	1		1		1	III	(1)
<i>Potentilla reptans</i>	4	4				II	(4)
<i>Cotoneaster horizontalis</i> (seedling/sapling)	1	4				II	(1-4)
<i>Knautia arvensis</i>		1			2	II	(1-2)
<i>Linum catharticum</i>			2	1		II	(1-2)
<i>Acer pseudoplatanus</i> (seedling/sapling)	1	1				II	(1)
<i>Centaureum erythraea</i>		1	1			II	(1)
<i>Holcus lanatus</i>	1		1			II	(1)
<i>Jacobaea erucifolia</i>		1		1		II	(1)
<i>Jacobaea vulgaris</i>			1		1	II	(1)
<i>Poa pratensis</i>		1	1			II	(1)
<i>Quercus robur</i> (seedling/sapling)				1	1	II	(1)
<i>Sonchus asper</i>	1	1				II	(1)
<i>Agrostis stolonifera</i>				3		I	(3)
<i>Koeleria macrantha</i>			3			I	(3)
<i>Agrimonia eupatoria</i>	2					I	(2)
<i>Avenula pubescens</i>		2				I	(2)
<i>Thymus pulegioides</i>		2				I	(2)
<i>Achillea millefolium</i>	1					I	(1)
<i>Carlina vulgaris</i>					1	I	(1)
<i>Centaurea scabiosa</i>	1					I	(1)

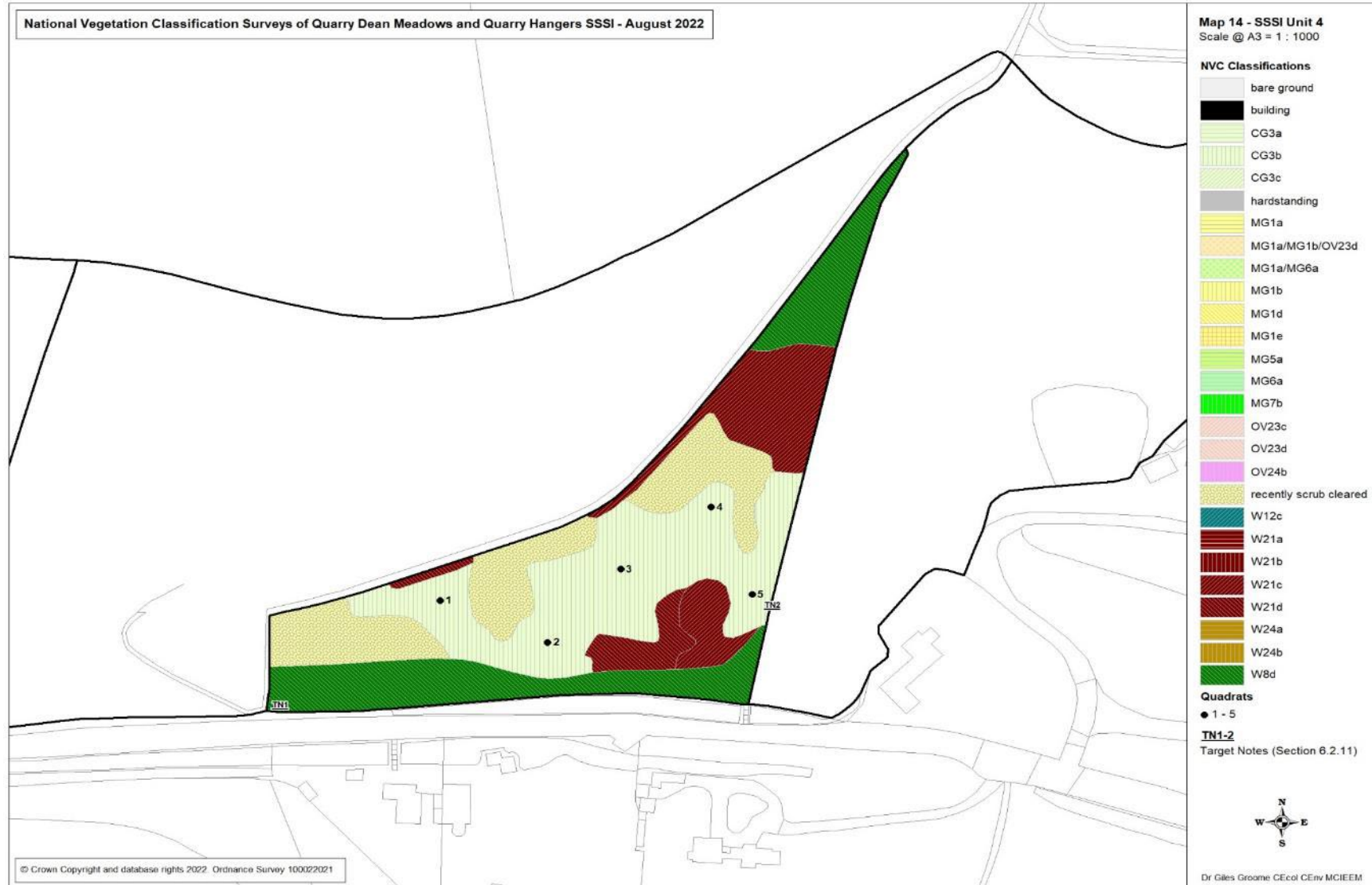
SSSI Unit 4 CG3b Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>			1				(1)
<i>Cirsium vulgare</i>	1						(1)
<i>Cotoneaster simonsii</i> (seedling/sapling)			1				(1)
<i>Eurhynchium striatum</i>					1		(1)
<i>Fissidens dubius</i>		1					(1)
<i>Hippocrepis comosa</i>				1			(1)
<i>Hypericum hirsutum</i>	1						(1)
<i>Leontodon saxatilis</i>				1			(1)
<i>Polygala calcarea</i>				1			(1)
<i>Polygala vulgaris</i>			1				(1)
<i>Scabiosa columbaria</i>		1					(1)
<i>Tamus communis</i>	1						(1)
<i>Taraxacum</i> agg.	1						(1)
<i>Verbena officinalis</i>					1		(1)
goat droppings		2	1	1	1		
Species per quadrat	45	47	44	40	39		43.0
Species per quadrat excl. scrub	37	39	37	34	32		35.8

Running the results of quadrat recording through the key to calcareous grasslands in Rodwell (1992b) there is little doubt that swards belong within CG3b. They support constant *Bromopsis erecta* with a cover >10% (CG3) and “*Centaurea nigra* [is] present with two or more of *Hypochaeris radicata* [sic], *Daucus carota*, *Achillea millefolium*, *Galium mollugo* [sic], *Rhinanthus minor*, *Senecio jacobaea* [sic]” (CG3b).

Figure 13 – CG3b (Quadrat 2) within SSSI Unit 4



Map 14 – SSSI Unit 4 (Target Notes for Map 14)



3.3.5 SSSI Unit 5

Survey area 3.48ha. Surveyed 29/6/21. Quadrats recorded 30/6/21. Map 15.

Boundaries

All boundaries follow OS Mastermap lines which, as far as could be confirmed during fieldwork, follow either field banks or footpaths, with the exception of that to the south, which appears to follow the woodland edge.

Site Description

Unit 4 of the Quarry Hangers SSSI overlies White Chalk to the north and Grey Chalk to the south (British Geological Society 2021). Soils are bulk classified as Upton series grey rendzinas (Soil Survey of England and Wales 1983). Most overlies steep or very steep (locally in excess of 45°) south, south-west and south-east facing slopes. Only north-eastern and central-northern areas are grazed (by sheep and goats within one extensive grazing unit), where there has been considerable recent scrub clearance. A narrow strip of remnant grassland on the eastern side of the footpath that forms the boundary between Units 4 and 5 is ungrazed.

Mapped NVC Classifications

CG3a (2 mapped stands/polygons, total area 0.37ha)

CG3a covers <15% of the total area of Unit 5. It comprises species-rich *Bromopsis erecta* dominated grassland with *Carex flacca*, *Brachypodium sylvaticum*, *Briza media*, *Dactylis glomerata* and *Festuca ovina*. *Carex caryophyllea*, *Trisetum flavescens*, *Agrostis stolonifera*, *Poa pratensis* and *Koeleria macrantha* are locally frequent. All other graminoids are rare.

Poterium sanguisorba ssp. *sanguisorba*, *Leontodon hispidus*, *Pilosella officinarum*, *Thymus drucei*, *Lotus corniculatus*, *Prunella vulgaris* and *Viola hirta* are the most frequent and cover abundant forbs with *Cirsium acaule* and *Fragaria vesca*. *Helianthemum nummularium*, *Origanum vulgare*, *Potentilla reptans* and *Teucrium scorodonia* are locally abundant. *Carlina vulgaris*, *Linum catharticum*, *Pimpinella saxifraga*, *Inula conyzae* and *Knautia arvensis* are more-or-less constant but typically at low cover. Other forbs include scattered *Polygala calcarea*, *Clinopodium vulgare*, *Polygala vulgaris*, *Leontodon saxatilis*, *Centaureum erythraea*, *Campanula glomerata*, *Hippocrepis comosa*, *Campanula rotundifolia*, *Blackstonia perfoliata*, *Linum catharticum* and *Hieracium* agg.

The ground layer supports more-or-less constant *Pseudoscleropodium purum* and *Homalothecium lutescens* with *Eurhynchium striatum* and *Fissidens dubius*.

Despite recent scrub management and on-going grazing, scrub remains common throughout mapped CG3a; although almost all is <1.5m in height and most <0.5m. *Crataegus monogyna* is the most frequent species with *Rubus fruticosus*, *Fraxinus excelsior* (widely seeding in from surrounding W8d woodland), *Viburnum lantana* and *Acer pseudoplatanus* (as *Fraxinus*).

CG3b (1 mapped stand/polygon, area 0.04ha)

Essentially part of the grassland within Unit 4, the strip of mapped CG3b grassland on the western boundary of Unit 5 is ungrazed and supports dense *Bromopsis erecta*. *Hippocrepis comosa* is notably frequent and locally abundant. All recorded *Onobrychis viciifolia* plants (target note 2, Section 6.2.10) were on the western side of the path (Unit 4).

W21b (1 mapped stand/polygon, area 0.04ha)

The stand of mapped W21b is dominated by leggy *Crataegus monogyna* over a field layer dominated by *Mercurialis perennis*.

W21c (4 mapped stands/polygons, total area 0.07ha)

Stands of W21c are largely dominated by *Crataegus monogyna* with locally common *Sambucus nigra* where the community is more open. A mature *Fagus sylvatica* dominates the stand at target note TN3 (Section 6.2.11). Climbing *Clematis vitalba* is locally very common elsewhere. *Brachypodium sylvaticum* is the only consistently frequent species of the mostly species-poor field layer. *Clematis vitalba*, *Galium aparine*, *Rubus fruticosus* and *Urtica dioica* ssp. *dioica* are abundant in the more open stand to the north-west.

W21d (3 mapped stands/polygons, total area 0.05ha)

W21d is confined to the eastern portion of the grazing enclosure where it comprises juvenile stands of mixed *Crataegus monogyna*, *Acer pseudoplatanus*, *Viburnum lantana*, *Rubus fruticosus*, *Tamus communis*, *Cornus sanguinea* ssp. *sanguinea* and *Fraxinus excelsior*. A little remnant CG3 grassland is present in the field layer, at least on grassland/scrub margins.

W8d (2 mapped stands/polygons, total area 2.35ha)

The extensive stands of W8d across Unit 5 are dominated by canopy *Fraxinus excelsior* with occasional/locally frequent *Acer pseudoplatanus*. Almost all has ceded from open grassland since the mid-20th Century. In places a well-defined shrub layer is present with *Crataegus monogyna* and occasional *Taxus baccata*, *Sambucus nigra* and *Cornus sanguinea* ssp. *sanguinea*. Elsewhere the understorey is poorly developed. The field layer comprises mostly species-poor *Mercurialis perennis*, *Hedera helix* and/or *Brachypodium sylvaticum* with some locally extensive areas of bare ground and litter.

Recently Scrub Cleared (2 mapped stands/polygons, total area 0.35ha)

Vegetation included within this classification is not referable to the NVC. It covers stands where, often previously very dense, scrub has been recently cleared (commonly since the date of the aerial imagery used during fieldwork) and where the vegetation comprises regeneration of the scrub that has recently been cut, as well as of previously extant grassland that had been present before the development of scrub, and recruitment of species encroaching (e.g. by tillering) and/or seeding in to the newly exposed, commonly disturbed, open conditions.

Stands within SSSI Unit 5 are typically dominated by *Brachypodium sylvaticum* and *Origanum vulgare* with frequent and/or locally abundant *Glechoma hederacea*, *Arctium lappa*, *Atropa belladonna*, *Fragaria vesca*, *Cynoglossum officinale*, *Helminthotheca echioides*, *Urtica dioica* ssp. *dioica*, *Prunella vulgaris*, *Ranunculus repens* and *Rubus fruticosus*. Other species include occasional and/or very locally frequent *Verbascum thapsus*, *Poa trivialis*, *Mercurialis perennis*, *Galium album*, *Bryonia dioica*, *Dactylis glomerata*, *Teucrium scorodonia*, *Trisetum flavescens*, *Galium aparine*, *Lotus corniculatus*, *Myosotis arvensis*, *Cirsium arvense* and *Geum urbanum*. *Carex flacca*, *Primula veris*, *Viola hirta* and *Leontodon hispidus* are rare, but on-going sheep grazing and goat browsing are improving conditions for such grassland species to become more widely re-established.

Unlike most previous SSSI Units, mapped 'recently scrub cleared' here includes several retained trees (*Fraxinus excelsior*, *Betula pendula*, *Quercus robur*, *Acer pseudoplatanus*) and shrubs (*Crataegus monogyna*, *Corylus avellana*).

Quadrats and NVC Classification

Five quadrats were recorded from CG3c grassland. Table 17 highlights the results of the quadrat recordings on Unit 5 of Quarry Hangers SSSI. The results of MATCH analysis are available upon request.

Table 17 – Quadrat recordings on CG3a grassland of Unit 5 of Quarry Hangers SSSI

SSSI Unit 5 CG3a Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Bromopsis erecta</i>	6	7	8	8	8	V	(6-8)
<i>Poterium sanguisorba</i> ssp. <i>sanguisorba</i>	5	5	7	6	5	V	(5-7)
<i>Pilosella officinarum</i>	4	4	4	4	5	V	(4-5)
<i>Pseudoscleropodium</i> <i>purum</i>	5	5	5	3	3	V	(3-5)
<i>Thymus drucei</i>	4	3	3	4	5	V	(3-5)
<i>Crataegus monogyna</i> (seedling/sapling)	5	4	1	2	4	V	(1-5)
<i>Leontodon hispidus</i>	5	5	1	2	2	V	(1-5)
<i>Carex flacca</i>	4	4	4	4	3	V	(3-4)
<i>Lotus corniculatus</i>	4	3	2	3	2	V	(2-4)
<i>Viola hirta</i>	3	3	4	2	2	V	(2-4)
<i>Brachypodium</i> <i>sylvaticum</i>	4	2	4	4	1	V	(1-4)
<i>Prunella vulgaris</i>	4	4	4	2	1	V	(1-4)
<i>Briza media</i>	3	3	3	2	1	V	(1-3)
<i>Carlina vulgaris</i>	1	1	1	1	1	V	(1)

SSSI Unit 5 CG3a Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Fraxinus excelsior</i> (seedling/sapling)	1	1	1	1	1	V	(1)
<i>Rosa</i> spp. (seedling/sapling)	1	1	1	1	1	V	(1)
<i>Fragaria vesca</i>	3	4	3		4	IV	(3-4)
<i>Cirsium acaule</i>	1	1		1	4	IV	(1-4)
<i>Homalothecium</i> <i>lutescens</i>	1	4		2	3	IV	(1-4)
<i>Rubus fruticosus</i> agg.	4	1	2	1		IV	(1-4)
<i>Dactylis glomerata</i>	3	2	1	2		IV	(1-3)
<i>Eurhynchium striatum</i>	1		1	2	1	IV	(1-2)
<i>Knautia arvensis</i>	1		1	2	2	IV	(1-2)
<i>Linum catharticum</i>	2	1	1		1	IV	(1-2)
<i>Pimpinella saxifraga</i>	2	1	2	1		IV	(1-2)
<i>Inula conyzae</i>	1	1		1	1	IV	(1)
<i>Festuca ovina</i> agg.	4	2			1	III	(1-4)
<i>Origanum vulgare</i>	4	2	1			III	(1-4)
<i>Potentilla reptans</i>	4	4	1			III	(1-4)
<i>Barbula unguiculata</i>		1	1	3		III	(1-3)
<i>Poa pratensis</i>	1	2			1	III	(1-2)
<i>Acer pseudoplatanus</i> (seedling/sapling)	1	1		1		III	(1)
<i>Fissidens dubius</i>	1		1		1	III	(1)
<i>Viburnum lantana</i> (seedling/sapling)	1	1		1		III	(1)
<i>Helianthemum</i> <i>nummularium</i>			5		4	II	(4-5)
<i>Carex caryophyllea</i>	4	3				II	(3-4)
<i>Teucrium scorodonia</i>	2	3				II	(2-3)
<i>Trisetum flavescens</i>	2	3				II	(2-3)
<i>Agrostis stolonifera</i>	2	1				II	(1-2)
<i>Galium album</i>	2	1				II	(1-2)
<i>Campanula glomeratum</i>	1	1				II	(1)
<i>Hieracium</i> agg.				1	1	II	(1)

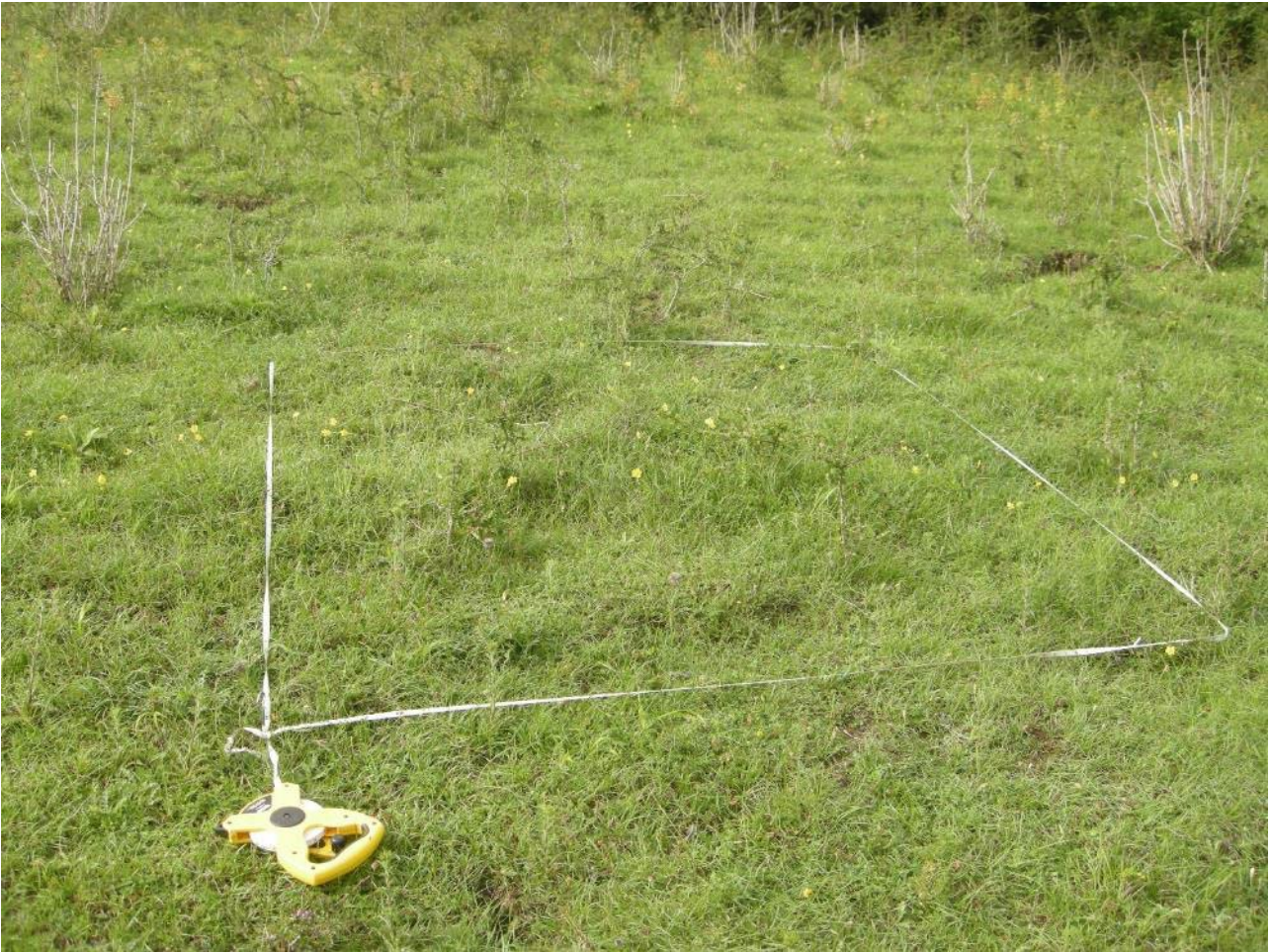
SSSI Unit 5 CG3a Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Polygala calcarea</i>			1		1	II	(1)
<i>Quercus robur</i> (seedling/sapling)		1	1			II	(1)
<i>Taraxacum</i> agg.	1	1				II	(1)
<i>Koeleria macrantha</i>			2			I	(2)
<i>Agrimonia eupatoria</i>	1					I	(1)
<i>Campanula rotundifolia</i>				1		I	(1)
<i>Centaurea nigra</i> agg.			1			I	(1)
<i>Centaureum erythraea</i>		1				I	(1)
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>	1					I	(1)
<i>Clinopodium vulgare</i>	1					I	(1)
<i>Hippocrepis comosa</i>				1		I	(1)
<i>Hypericum perforatum</i>					1	I	(1)
<i>Sonchus asper</i>			1			I	(1)
<i>Veronica chamaedrys</i>	1					I	(1)
Bare ground	1	2	3	4	4		
rabbit droppings			2	1	1		
sheep dung	1	1	1	1			
Species per quadrat	44	40	33	30	30		35.4
Species per quadrat excl. scrub	38	33	28	24	27		30.0

Running the results of quadrat recording through the key to calcareous grasslands in Rodwell (1992b), swards default to CG3a, supporting neither the required number of CG3c indicator species, nor *Centaurea nigra* or sufficient other CG3b preferentials.

MATCH analysis is less supportive of CG3a, with none of the individual quadrats scoring the highest match co-efficient (although, despite constant *Bromopsis erecta* in the absence of *Brachypodium pinnatum/rupestre*, no CG3 sub-community scores highest). For all quadrats combined, CG3c scores highest (51.1) and CG3a second highest (49.9).

Whilst swards are evidently close to CG3c as suggested by MATCH, it remains the case that they do not support the required number of CG3c preferentials for such a classification (despite these being so common in adjacent SSSI units). CG3a therefore remains the most appropriate classification.

Figure 14 – CG3a (Quadrat 5) within SSSI Unit 5



Map 15 – SSSI Unit 5 (Target Notes for Map 15)



3.3.6 SSSI Unit 6

Survey area 1.03ha. Surveyed on 1/7/21. Map 16.

Boundaries

Western and southern Unit boundaries follow OS Mastermap lines, which mark the eastern side of Whitehill Lane and what is likely to be an old field bank, respectively. Most of the eastern boundary follows a fence line. However, southern parts are undefined and there is no indication of where Unit 6 ends and adjacent Unit 7 begins. The northern unit boundary is entirely undefined.

Site Description

Unit 6 overlies White Chalk to the north and Grey Chalk to the south (British Geological Society 2021). Soils are bulk classified as Upton series grey rendzinas (Soil Survey of England and Wales 1983). Most of the Unit occupies extremely steep (commonly >45°) west and south-west facing slopes. Whilst most supports woodland, a little of the sheep and goat grazed grassland of Unit 7 is present toward the south-east.

Mapped NVC Classifications

MG5a (1 mapped stand/polygon, area <0.01ha)

A slither of the MG5a of Unit 7 (Section 3.3.7) is present in the far south-east.

MG6a (1 mapped stand/polygon, area 0.05ha)

Similar to MG5a, mapped MG6a essentially belongs within the sheep and goat grazed grassland of the southernmost field of Unit 7 (Section 3.3.7).

W24b (1 mapped stand/polygon, area 0.02ha)

Whilst the stand of W24b also forms part of the southernmost field of Unit 7, it does not extend into that Unit. It comprises *Rubus fruticosus* dominated underscrub with *Galium aparine*, along with two *Cornus sanguinea* ssp. *sanguinea* shrubs and one *Buddleja davidii* shrub. A wooden shed lies within the centre of the stand.

W8d (1 mapped stand/polygon, area 0.33ha)

Stands of W8d are dominated by canopy *Fraxinus excelsior* and *Acer pseudoplatanus* over a mixed understorey of *Corylus avellana*, *Crataegus monogyna*, *Taxus baccata* and *Acer campestre* with abundant climbing *Hedera helix* and a little *Sorbus aria* and *Prunus laurocerasus*. The field layer is dominated by *Hedera helix*, *Rubus fruticosus*, *Brachypodium sylvaticum* and *Mercurialis perennis* with patches of *Allium ursinum*.

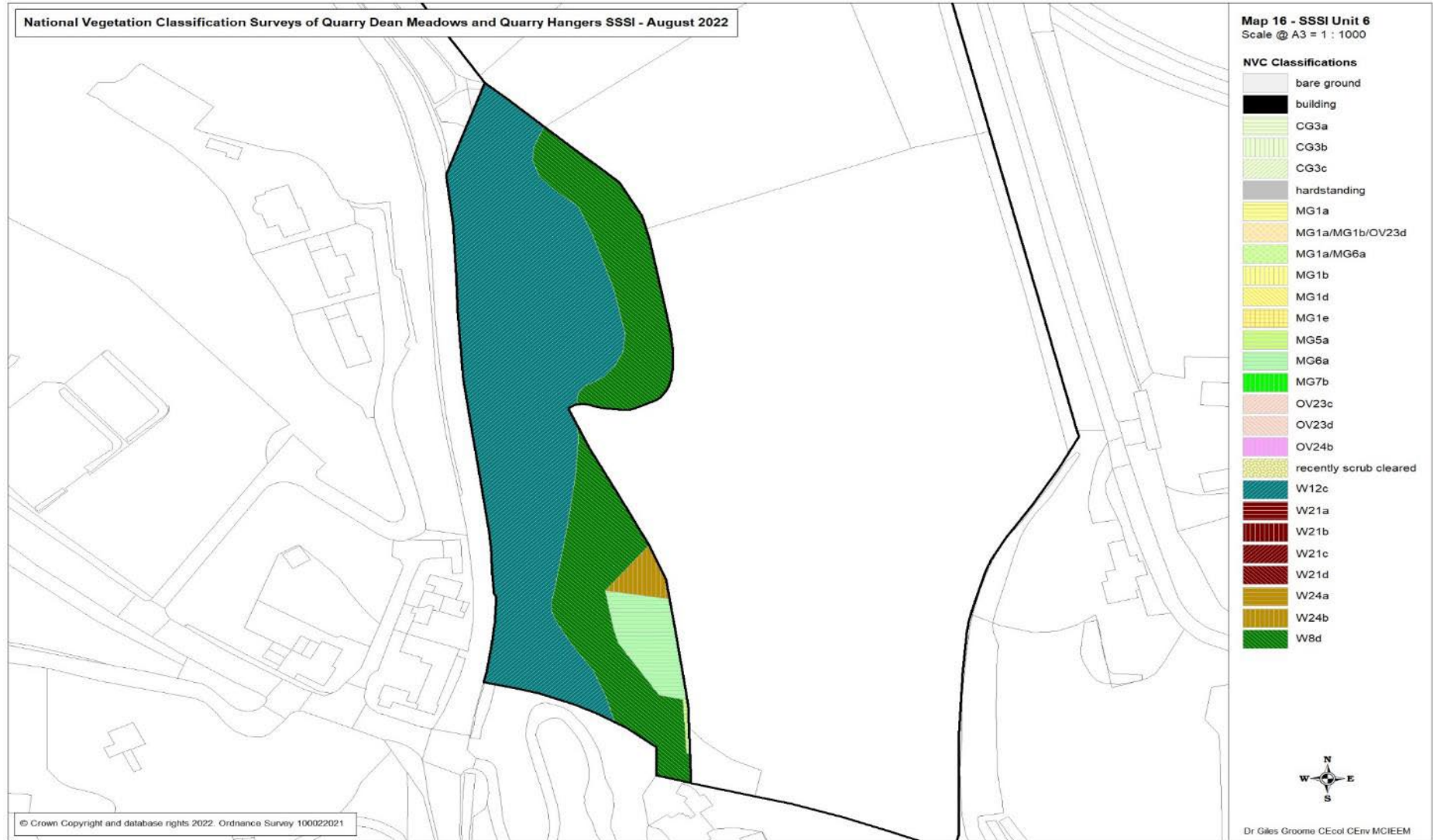
W12c (1 mapped stand/polygon, area 0.63ha)

Most of Unit 6 supports mature *Fagus sylvatica* woodland with understorey *Taxus baccata* and a more-or-less species-free field layer. Most occupies hill slopes that are so steep they cannot be surveyed safely without ropes. Eastern parts, however, are mostly very gently sloping. Despite this there is little change in woodland composition other than the presence of a little sub-canopy *Sorbus aria*, *Acer pseudoplatanus*, *Tilia x europaea* and *Ulmus glabra*, sparse understorey *Prunus laurocerasus*, and small patches of field layer *Hedera helix* with seedling *Fraxinus excelsior*.

Quadrats and NVC Classification

n/a.

Map 16 – SSSI Unit 6



3.3.7 SSSI Unit 7

Survey area 4.82ha. Surveyed 1/7/21. Quadrats recorded 1/7/21 and 2/7/21. Map 17.

Boundaries

With the exception of where it abuts Unit 6 (Section 3.3.6), all boundaries follow OS Mastermap lines, which themselves follow long-established fence lines and/or field banks.

Site Description

Unit 7 of the Quarry Hangers SSSI overlies White Chalk and, in the extreme south, Grey Chalk (British Geological Society 2021). Soils are bulk classified as Upton series grey rendzinas (Soil Survey of England and Wales 1983). Divided into five individual paddocks and, at the time of survey, grazed by horses, ponies, sheep and goats, it occupies mostly 10-15° west and south-west facing slopes.

Mapped NVC Classifications

CG3c (1 mapped stand/polygon, area 1.06ha)

Despite past impoverishment, CG3c within Unit 7 remains species-rich. Swards are dominated by mixtures of *Bromopsis erecta*, *Festuca rubra* and *Brachypodium sylvaticum* with *Carex flacca*, *Agrostis stolonifera*, *Holcus lanatus* and *Poa pratensis*. *Poa trivialis*, *Briza media*, *Lolium perenne* and *Dactylis glomerata* are frequent with scattered *Trisetum flavescens*, *Phleum bertolonii*, *Avenula pubescens*, *Bromus hordeaceus* ssp. *hordeaceus*, *Arrhenatherum elatius* and *Cynosurus cristatus*.

Galium album, *Origanum vulgare*, *Leucanthemum vulgare*, *Lotus corniculatus*, *Medicago lupulina*, *Leontodon hispidus*, *Trifolium pratense*, *Agrimonia eupatoria*, *Veronica chamaedrys* and *Ranunculus bulbosus* are the most common and cover abundant forbs with *Trifolium repens*, *Jacobaea erucifolia*, *Potentilla reptans* and *Poterium sanguisorba* ssp. *sanguisorba*. Frequent associates include *Linum catharticum*, *Ranunculus repens* (mostly in lower lying swards toward the south-west where there is even a little *Ajuga reptans*), *Taraxacum* agg., *Crepis capillaris*, *Viola hirta*, *Primula veris*, *Potentilla sterilis*, *Ranunculus acris* and *Viola riviniana*. Rather more scattered species include *Jacobaea vulgaris*, *Convolvulus arvensis*, *Centaurea nigra* agg., *Vicia sativa* ssp. *segetalis*, *Knautia arvensis*, *Euphrasia nemorosa*, *Pimpinella saxifraga*, *Odontites vernus* ssp. *serotinus*, *Dactylorhiza fuchsii* and *Anacamptis pyramidalis*.

The ground layer supports abundant *Pseudoscleropodium purum* but little else.

Scrub is present throughout mapped CG3c, albeit at low cover and of low stature. *Crataegus monogyna* is the most frequent species with *Rubus fruticosus* and unidentified (non-flowering) *Rosa* spp.

MG1a (2 mapped stands/polygons, total area 0.33ha)

MG1a is largely restricted to lower hill slopes in the northern half of the Unit, to which the ponies and horse present within the Unit at the time of survey had barely accessed. Swards are dominated by coarse *Arrhenatherum elatius*, *Dactylis glomerata* and *Holcus lanatus* with scattered *Poa trivialis*, *Phleum bertolonii*, *Cynosurus cristatus*, *Agrostis stolonifera* and *Bromus hordeaceus* ssp. *hordeaceus*. *Convolvulus arvensis* is the most common forb with scattered *Lathyrus pratensis* and *Ranunculus acris*. All other forbs, bar locally frequent *Glechoma hederacea*, are sparse.

MG1e (2 mapped stands/polygons, total area 0.28ha)

The two stands of MG1e are similar in initial appearance to MG1a but support a much more diverse flora that is more regularly grazed. Species-rich swards are dominated by *Arrhenatherum elatius*, *Festuca rubra* and *Holcus lanatus* with *Dactylis glomerata*, *Agrostis stolonifera*, *Bromus hordeaceus* ssp. *hordeaceus* and low cover *Lolium perenne*. *Cynosurus cristatus*, *Phleum bertolonii*, *Trisetum flavescens* and *Carex flacca* are occasional with locally frequent *Briza media*. *Avenula pubescens* and *Anthoxanthum odoratum* appear to be both rare; as is *Bromopsis erecta* (although see target note TN3, Section 6.2.12).

Potentilla reptans, *Trifolium pratense*, *Lotus corniculatus*, *Agrimonia eupatoria*, *Medicago lupulina*, *Origanum vulgare*, *Leucanthemum vulgare*, *Convolvulus arvensis*, *Prunella vulgaris* and *Trifolium repens* are the most common and cover abundant forbs with *Ranunculus bulbosus*, *Ranunculus acris*, *Cerastium fontanum* ssp. *vulgare* and *Taraxacum* agg. Scattered and/or locally frequent associates include *Leontodon hispidus*, *Veronica chamaedrys*, *Ononis repens* and *Crepis capillaris*. *Brachythecium rutabulum* is scattered throughout the MG1e ground layer.

MG5a (1 mapped stand/polygon, area 2.56ha)

A little over 50% of Unit 7 supports species-rich MG5a, albeit locally transitional with MG5b toward the south and south-west. Swards, some of which (mostly near the stable block) are very hard grazed whilst others barely touched by livestock, are dominated by mixtures of *Festuca rubra* and *Agrostis stolonifera* with *Lolium perenne*, *Cynosurus cristatus* and *Phleum bertolonii*. *Carex flacca* and *Poa trivialis* are frequent toward the south and south-west; whilst *Agrostis capillaris* and *Dactylis glomerata* are preferential toward the north and north-east. Other graminoids include occasional and/or locally frequent *Brachypodium sylvaticum*, *Anthoxanthum odoratum*, *Poa pratensis*, *Trisetum flavescens*, *Hordeum secalinum*, *Avenula pubescens*, *Bromus hordeaceus* ssp. *hordeaceus*, *Briza media* and *Luzula campestris*. *Bromopsis erecta* is present in places close to mapped CG3c; *Arrhenatherum elatius* to MG1a/e.

The non-gramineaceous element of the vegetation is dominated by mixtures of *Lotus corniculatus*, *Trifolium pratense*, *Centaurea nigra* agg., *Trifolium repens*, *Agrimonia eupatoria*, *Potentilla reptans*, *Medicago lupulina*, *Prunella vulgaris*, *Leucanthemum vulgare*, *Plantago lanceolata* and *Ranunculus acris* with *Taraxacum* agg., and *Cerastium fontanum* ssp. *vulgare*. Scattered associates include *Jacobaea erucifolia*, *Veronica chamaedrys*, *Geranium dissectum*, *Rumex acetosa*, *Crepis capillaris*, *Lathyrus pratensis* and *Jacobaea vulgaris*. *Origanum vulgare*, *Galium album*, *Odontites vernus* ssp. *serotinus*,

Convolvulus arvensis, *Stellaria graminea* and *Linum catharticum* are locally common. *Pastinaca sativa* ssp. *sylvestris*, *Viola hirta*, *Knautia arvensis*, *Hypericum hirsutum* and *Primula vulgaris* are rare.

The ground layer supports scattered *Brachythecium rutabulum* with locally common *Pseudoscleropodium purum* and *Calliergonella cuspidata*.

Scrub is largely absent, except for stands to the far south of the Unit where a little *Crataegus monogyna*, *Rosa micrantha* and *Rubus fruticosus* are present.

MG6a (2 mapped stands/polygons, total area 0.27ha)

For the most part MG6a represents impoverished (excessively trampled and/or over-grazed) MG5a. Swards are largely graminoid dominated and lack both the diversity of MG5a and key indicators. *Lolium perenne*, *Holcus lanatus*, *Festuca rubra*, *Poa trivialis*, *Agrostis capillaris* and/or *Agrostis stolonifera* are the typical dominants with locally abundant *Trifolium repens*, *Trifolium pratense* and *Achillea millefolium*. Other scattered, but very locally frequent, forbs include *Rumex acetosa*, *Achillea millefolium*, *Crepis capillaris*, *Leucanthemum vulgare*, *Cerastium fontanum* ssp. *vulgare* and *Convolvulus arvensis*. *Lotus corniculatus* and *Centaurea nigra* agg. are both very rare.

MG7b (3 mapped stands/polygons, total area 0.16ha)

Mapped MG7b is restricted to trampled (both by livestock and/or vehicles), shaded stands on the margins of the Unit. To the south-east stands lie beneath the dense shade of adjacent (especially *Fagus sylvatica*) trees that are presumably favoured by livestock in hot weather. They are dominated by very species-poor *Poa trivialis* and *Lolium perenne*. Stands to the west have formed along what appears to be an irregularly used, but notably compacted, vehicular track. *Lolium perenne* is the dominant species with *Poa trivialis*, locally abundant *Holcus lanatus* and occasional *Dactylis glomerata*. *Trifolium repens* is the only common forb with locally frequent *Plantago major* either side of paddock gates. Despite classification, there is no evidence to suggest that swards have been agriculturally improved.

W8d (1 mapped stand/polygon, area 0.12ha)

W8d to the west of the Unit forms part of the *Fraxinus excelsior* (-*Acer pseudoplatanus*) woodland of Unit 7 (Section 3.3.6). Southern stands similarly form a continuation of this.

W12c (1 mapped stand/polygon, area <0.01ha)

A tiny slither of the mapped W12c of Unit 6 (Section 3.3.6) falls within Unit 7.

Building (1 mapped stand/polygon, area 0.01ha)

Stable block.

Hardstanding (1 mapped stand/polygon, area 0.03ha)

Crushed tarmac and scalpings dressed access track.

Quadrats and NVC Classification

CG3c

Five quadrats were recorded from CG3c grassland. Table 18 highlights the results of the quadrat recordings on Unit 7 of Quarry Hangers SSSI. Some cells have been intentionally left blank because there are no species recordings within the quadrats. The results of MATCH analysis are available upon request.

Table 18 – Quadrat recordings of CG3c grassland on Unit 7 of Quarry Hangers SSSI

SSSI Unit 7 CG3c Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Festuca rubra</i> agg.	5	7	5	5	4	V	(4-7)
<i>Bromopsis erecta</i>	1	5	5	7	7	V	(4-7)
<i>Brachypodium sylvaticum</i>	6	4	5	4	1	V	(1-6)
<i>Galium album</i>	5	5	5	4	4	V	(4-5)
<i>Lotus corniculatus</i>	4	5	4	4	4	V	(4-5)
<i>Carex flacca</i>	5	2	3	4	3	V	(2-5)
<i>Trifolium pratense</i>	4	4	2	5	4	V	(2-5)
<i>Leontodon hispidus</i>	4	1	2	5	5	V	(1-5)
<i>Medicago lupulina</i>	1	4	5	5	5	V	(1-5)
<i>Agrostis stolonifera</i>	4	3	4	3	4	V	(3-4)
<i>Origanum vulgare</i>	4	4	4	4	3	V	(3-4)
<i>Veronica chamaedrys</i>	4	3	4	4	3	V	(3-4)
<i>Holcus lanatus</i>	4	4	3	2	2	V	(2-4)
<i>Leucanthemum vulgare</i>	2	4	4	3	4	V	(2-4)
<i>Ranunculus bulbosus</i>	3	2	3	3	4	V	(2-4)
<i>Agrimonia eupatoria</i>	1	1	2	4	4	V	(1-4)
<i>Plantago lanceolata</i>	4	1	2	1	2	V	(1-4)
<i>Prunella vulgaris</i>	1	2	4	1	4	V	(1-4)
<i>Poa pratensis</i>	2	1	2	2	3	V	(1-3)
<i>Trifolium repens</i>	1	2	2	2	2	V	(1-2)
<i>Crataegus monogyna</i> (seedling/sapling)	1	1	1	1	1	V	(1)
<i>Jacobaea erucifolia</i>	1	1	1	1	1	V	(1)
<i>Potentilla reptans</i>	4	5		4	4	IV	(4-5)
<i>Pseudoscleropodium</i> <i>purum</i>	3		3	3	5	IV	(3-5)

SSSI Unit 7 CG3c Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Poa trivialis</i>	2	4	3		2	IV	(2-4)
<i>Poterium sanguisorba</i> <i>ssp. sanguisorba</i>	2		2	4	2	IV	(2-4)
<i>Calliergonella cuspidata</i>	4	1	3		4	IV	(1-4)
<i>Briza media</i>	1		1	3	3	IV	(1-3)
<i>Taraxacum</i> agg.	2		1	1	1	II	
<i>Ranunculus repens</i>	4	4	2			III	(2-4)
<i>Linum catharticum</i>	1			2	3	III	(1-3)
<i>Lolium perenne</i>	1	2	3			III	(1-3)
<i>Viola riviniana</i>	1	1	2			III	(1-2)
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>		1	1	1		III	(1)
<i>Crepis capillaris</i>		1	1		1	III	(1)
<i>Dactylis glomerata</i>		1	1	1		III	(1)
<i>Potentilla sterilis</i>	1	1		1		III	(1)
<i>Primula veris</i>	1		1	1		III	(1)
<i>Ranunculus acris</i>	1		1	1		III	(1)
<i>Rosa</i> spp. (seedling/sapling)	1	1		1		III	(1)
<i>Rubus fruticosus</i> agg.	1	1	1			III	(1)
<i>Viola hirta</i>	1	1	1			III	(1)
<i>Avenula pubescens</i>				3	2	II	(2-3)
<i>Trisetum flavescens</i>	2				3	II	(2-3)
<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>		1	1			II	(1)
<i>Centaurea nigra</i>			1	1		II	(1)
<i>Convolvulus arvensis</i>				1	1	II	(1)
<i>Jacobaea vulgaris</i>	1			1		II	(1)
<i>Knautia arvensis</i>			1	1		II	(1)
<i>Odontites vernus</i> ssp. <i>serotinus</i>	1		1			II	(1)
<i>Phleum bertolonii</i>			1		1	II	(1)
<i>Vicia sativa</i> ssp. <i>segetalis</i>	1	1				II	(1)

SSSI Unit 7 CG3c Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Ajuga reptans</i>		2				I	(2)
<i>Euphrasia nemorosa</i>				2		I	(2)
<i>Lathyrus pratensis</i>		2				I	(2)
<i>Pimpinella saxifraga</i>				2		I	(2)
<i>Brachythecium rutabulum</i>			1			I	(1)
<i>Cornus sanguinea</i> (seedling/sapling)	1					I	(1)
<i>Cynosurus cristatus</i>			1			I	(1)
<i>Fraxinus excelsior</i> (seedling/sapling)	1					I	(1)
<i>Geranium dissectum</i>		1				I	(1)
<i>Hypericum perforatum</i>		1				I	(1)
<i>Luzula campestris</i>		1				I	(1)
<i>Picris hieracioides</i>	1					I	(1)
<i>Primula vulgaris</i>	1					I	(1)
<i>Pulicaria dysenterica</i>				1		I	(1)
Bare ground				1	1		
sheep dung					1		
Species per quadrat	47	42	45	42	35		42.2
Species per quadrat excl. scrub	42	39	42	40	34		39.4

Running the results of quadrat recording through the key to calcareous grasslands in Rodwell (1992b), there is little doubt that swards belong within CG3c. Stands support constant *Bromopsis erecta* with a cover >10% (CG3) and *Taraxacum* agg., *Medicago lupulina*, *Trifolium pratense*, *Trifolium repens* and *Viola hirta* all at least frequent (CG3c).

Figure 15 – CG3c (Quadrat 4) within SSSI Unit 7



MG5a

Five quadrats were recorded from MG5a grassland. Table 19 highlights the results of the quadrat recordings in Unit 7 of Quarry Hangers SSSI. Some cells have been intentionally left blank because there are no species recordings within the quadrats. The results of MATCH analysis are available upon request.

Table 19 - Quadrat recordings on MG5a grassland in Unit 7 of Quarry Hangers SSSI

SSSI Unit 7 MG5a Quadrats		1	2	3	4	5	Constancy	Constancy
<i>Lotus corniculatus</i>		5	7	6	5	7	V	(5-7)
<i>Agrostis stolonifera</i>		5	6	4	4	7	V	(4-7)
<i>Festuca rubra</i> agg.		7	4	5	5	4	V	(4-7)
<i>Trifolium pratense</i>		4	5	4	5	4	V	(4-5)
<i>Trifolium repens</i>		4	3	5	4	2	V	(2-5)
<i>Lolium perenne</i>		3	4	4	3	3	V	(3-4)
<i>Ranunculus bulbosus</i>		3	4	4	3	2	V	(2-4)

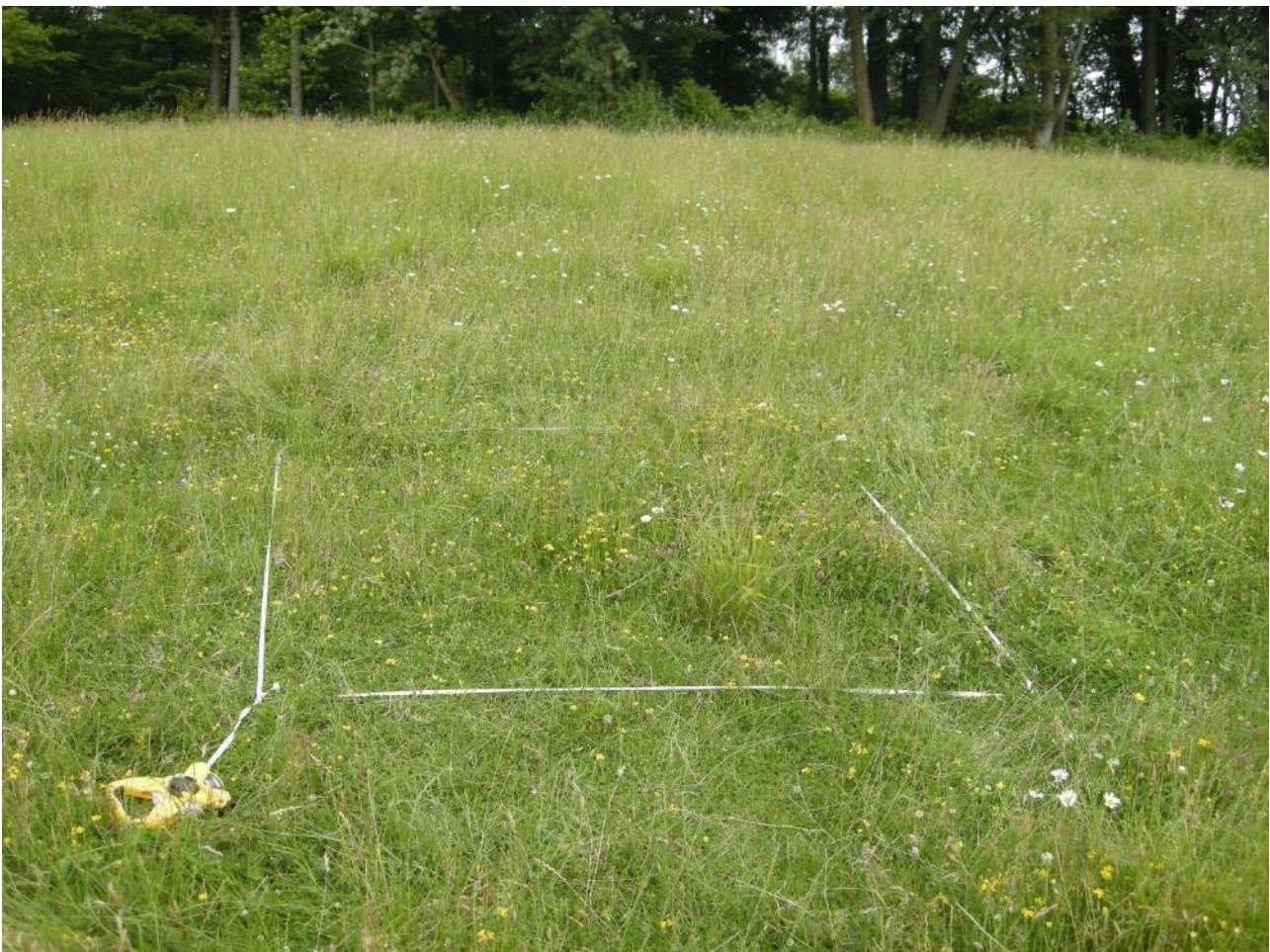
SSSI Unit 7 MG5a Quadrats		1	2	3	4	5	Constancy	Constancy
<i>Agrimonia eupatoria</i>		1	2	2	1	4	V	(1-4)
<i>Centaurea nigra</i> agg.		1	1	1	4	1	V	(1-4)
<i>Leucanthemum vulgare</i>		1	4	2	1	1	V	(1-4)
<i>Taraxacum</i> agg.		2	1	1	2	1	V	(1-2)
<i>Cynosurus cristatus</i>			3	4	4	5	IV	(3-5)
<i>Potentilla reptans</i>		5	4	2		1	IV	(1-5)
<i>Medicago lupulina</i>		4	4	4	2		IV	(2-4)
<i>Plantago lanceolata</i>		4	2	1	2		IV	(1-4)
<i>Prunella vulgaris</i>		2	4	4	1		IV	(1-4)
<i>Calliergonella cuspidata</i>		3	2	2		1	IV	(1-3)
<i>Phleum bertolonii</i>			1	3	3	3	IV	(1-3)
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>			1	1	2	1	IV	(1-2)
<i>Ranunculus acris</i>		2	1	2		2	IV	(1-2)
<i>Galium album</i>		5	2	2			III	(2-5)
<i>Carex flacca</i>		4	3	3			III	(3-4)
<i>Veronica chamaedrys</i>		4	2	3			III	(2-4)
<i>Odontites vernus</i> ssp. <i>serotinus</i>		2	1	1			III	(1-2)
<i>Poa trivialis</i>		1	2	2			III	(1-2)
<i>Rumex acetosa</i>				1	2	2	III	(1-2)
<i>Dactylis glomerata</i>				1	1	1	III	(1)
<i>Geranium dissectum</i>		1	1	1			III	(1)
<i>Agrostis capillaris</i>					7	4	II	(4-7)
<i>Origanum vulgare</i>		5		2			II	(2-5)
<i>Brachypodium</i> <i>sylvaticum</i>		4	1				II	(1-4)
<i>Ranunculus repens</i>		4		1			II	(1-4)
<i>Brachythecium</i> <i>rutabulum</i>			3			3	II	(3)
<i>Poa pratensis</i>			3			2	II	(2-3)
<i>Pseudoscleropodium</i> <i>purum</i>		3	2				II	(2-3)

SSSI Unit 7 MG5a Quadrats		1	2	3	4	5	Constancy	Constancy
<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>		2			1		II	(1-2)
<i>Hypochaeris radicata</i>		1			2		II	(1-2)
<i>Arrhenatherum elatius</i>			1	1			II	(1)
<i>Convolvulus arvensis</i>				1		1	II	(1)
<i>Crepis capillaris</i>		1		1			II	(1)
<i>Jacobaea erucifolia</i>		1	1				II	(1)
<i>Jacobaea vulgaris</i>			1	1			II	(1)
<i>Lathyrus pratensis</i>				1		1	II	(1)
<i>Stellaria graminea</i>				1		1	II	(1)
<i>Pastinaca sativa</i> ssp. <i>sylvestris</i>				4			I	(4)
<i>Anthoxanthum odoratum</i>				3			I	(3)
<i>Trisetum flavescens</i>				3			I	(3)
<i>Achillea millefolium</i>					2		I	(2)
<i>Hordeum secalinum</i>				2			I	(2)
<i>Luzula campestris</i>				2			I	(2)
<i>Bromopsis erecta</i>			1				I	(1)
<i>Cirsium vulgare</i>			1				I	(1)
<i>Crataegus monogyna</i> (seedling/sapling)		1					I	(1)
<i>Hypericum hirsutum</i>		1					I	(1)
<i>Knautia arvensis</i>				1			I	(1)
<i>Leontodon hispidus</i>			1				I	(1)
<i>Linum catharticum</i>		1					I	(1)
<i>Primula vulgaris</i>		1					I	(1)
<i>Pulicaria dysenterica</i>			1				I	(1)
<i>Rosa</i> spp. (seedling/sapling)		1					I	(1)
<i>Rubus fruticosus</i> agg.				1			I	(1)
<i>Veronica serpyllifolia</i> ssp. <i>serpyllifolia</i>				1			I	(1)
<i>Vicia sativa</i> ssp. <i>segetalis</i>		1					I	(1)

SSSI Unit 7 MG5a Quadrats	1	2	3	4	5	Constancy	Constancy
<i>Viola hirta</i>		1				1	(1)
<i>Viola riviniana</i>	1					1	(1)
pony dung				1			
Species per quadrat	38	38	44	23	25		33.6
Species per quadrat excl. scrub	36	38	43	23	25		33.0

Running the results of quadrat recording through the key to mesotrophic grasslands in Rodwell (1992b), there is little doubt that swards belong within MG5a. A conclusion supported by MATCH analysis, which scores MG5a highest for all five samples, as well as for all samples combined (62.4). Nevertheless, as noted above, some swards (notably on the margins of CG3c) can be closer to MG5b.

Figure 16 – MG5a (Quadrat 2) within SSSI Unit 7



MG1e

Three quadrats were recorded from MG1e grassland. Table 20 highlights the results of the quadrat recordings in Unit 7 of Quarry Hangers SSSI. Some cells have been intentionally left blank because there are no species recordings within the quadrats. The results of MATCH analysis are available upon request.

Running the results of quadrat recording through the key to mesotrophic grasslands in Rodwell (1992b) strongly supports the classification of MG1: “grasslands with frequent and often abundant *Arrhenatherum elatius*, *Dactylis glomerata* and *Holcus lanatus*”). However, determining sub-community is less straightforward given that *Centaurea nigra* is infrequent. Nevertheless, reading through the key it is evident that the grassland under examination (which supports constant and abundant *Lotus corniculatus* and *Leucanthemum vulgare*) does not belong within any MG1 sub-community other than MG1e.

MATCH analysis gives the highest co-efficient to MG5a for all three quadrats and for all samples combined. However, this ignores the presumption that the sample must relate to MG1 given the constant presence of *Arrhenatherum elatius* with a cover >10%.

Considering Rodwell’s key, sub-community descriptions and floristic table, along with the results of MATCH analysis (MG1e is the only MG1 community in the top ten of favourable matches), the classification of MG1e is the most appropriate.

Table 20 – Quadrat recordings on MG1e grassland in Unit 7 of Quarry Hangers SSSI

SSSI Unit 7 MG1e Quadrats	1	2	3	Constancy	Constancy
<i>Festuca rubra</i> agg.	8	7	7	V	(7-8)
<i>Arrhenatherum elatius</i>	5	5	7	V	(5-7)
<i>Potentilla reptans</i>	5	5	5	V	(5)
<i>Trifolium pratense</i>	4	5	5	V	(4-5)
<i>Holcus lanatus</i>	4	4	4	V	(4)
<i>Medicago lupulina</i>	4	4	3	V	(3-4)
<i>Lotus corniculatus</i>	2	4	4	V	(2-4)
<i>Prunella vulgaris</i>	2	4	2	V	(2-4)
<i>Agrimonia eupatoria</i>	4	4	1	V	(1-4)
<i>Convolvulus arvensis</i>	1	1	4	V	(1-4)
<i>Leucanthemum vulgare</i>	4	4	1	V	(1-4)
<i>Origanum vulgare</i>	4	4	1	V	(1-4)
<i>Plantago lanceolata</i>	4	2	1	V	(1-4)
<i>Trifolium repens</i>	2	1	4	V	(1-4)
<i>Agrostis stolonifera</i>	3	3	3	V	(3)

SSSI Unit 7 MG1e Quadrats	1	2	3	Constancy	Constancy
<i>Cynosurus cristatus</i>	3	3	3	V	(3)
<i>Ranunculus bulbosus</i>	3	3	2	V	(2-3)
<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	2	1	3	V	(1-3)
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>	3	2	1	V	(1-3)
<i>Dactylis glomerata</i>	2	1	3	V	(1-3)
<i>Ranunculus acris</i>	2	2	2	V	(2)
<i>Brachythecium rutabulum</i>	1	1	2	V	(1-2)
<i>Lolium perenne</i>	1	1	2	V	(1-2)
<i>Taraxacum</i> agg.	1	1	1	V	(1)
<i>Veronica chamaedrys</i>	4	4		III	(4)
<i>Briza media</i>	3	3		III	(3)
<i>Poa pratensis</i>	3	2		III	(2-3)
<i>Crepis capillaris</i>	1	2		III	(1-2)
<i>Phleum bertolonii</i>	1	2		III	(1-2)
<i>Leontodon hispidus</i>	1	1		III	(1)
<i>Picris hieracioides</i>	1	1		III	(1)
<i>Ononis repens</i>			6	II	
<i>Pastinaca sativa</i> ssp. <i>sylvestris</i>		4		II	(4)
<i>Achillea millefolium</i>	3			II	(3)
<i>Carex flacca</i>		2		II	(2)
<i>Centaurea nigra</i> agg.		1		II	(1)
<i>Crataegus monogyna</i> (seedling/sapling)		1		II	(1)
<i>Geranium dissectum</i>		1		II	(1)
<i>Jacobaea erucifolia</i>	1			II	(1)
<i>Jacobaea vulgaris</i>	1			II	(1)
<i>Lathyrus pratensis</i>			1	II	(1)
<i>Odontites vernus</i> ssp. <i>serotinus</i>	1			II	(1)
<i>Primula veris</i>		1		II	(1)

SSSI Unit 7 MG1e Quadrats	1	2	3	Constancy	Constancy
<i>Rumex acetosa</i>			1	II	(1)
<i>Trisetum flavescens</i>		1		II	(1)
Species per quadrat	35	38	27		
Species per quadrat excl. scrub	35	37	27		

Figure 17 – MG1e (Quadrat 2) within SSSI Unit 7



4 Discussion

4.1 SSSI Notifiable Grassland within Quarry Dean Meadows and Quarry Hangers Non-SSSI Fields

Four grassland communities mapped during surveys of non-SSSI fields are of 'high conservation interest' (Jefferson *et al* 2019): MG1d, MG1e, MG5b and CG3c. Excluding the former quarry, one or more of these communities was mapped in every non-SSSI field surveyed. Currently Quarry Dean Meadows supports 5.27ha of MG1d and MG1e, and Quarry Hangers 5.73ha of MG1e, MG5b and CG3c.

Sites supporting >5ha of species-rich (>15 species per 4m²) MG1c-e qualify for notification as SSSI (Jefferson *et al* 2019). Quadrats recorded from MG1e within Quarry Dean Meadows Fields 9010, 1206 and 3403, which account for 98% of the MG1e mapped across Quarry Dean Meadows during surveys, support an average of 35 species, excluding scrub, per 4m² (n = 15). These three fields, which are contiguous, therefore automatically qualify for SSSI designation. Survey evidence suggests that Fields 2996 and 6494 were also once dominated by MG1e and, as noted in Section 3.2.6 in particular, are likely to revert to this given appropriate management.

The discontinuous stands of MG1e, MG5b and CG3c within the three non-SSSI fields adjacent to Quarry Hangers SSSI do not qualify for designation in isolation. However, stands of the qualifying grassland types present, which dominate all three fields, are species-rich (average of 27 species, excluding scrub, per 4m², n = 21) and their inclusion in the Quarry Hangers SSSI would increase the area of 'high conservation interest' grassland currently present (Section 4.2) by >25%, to >22ha. Field 4194 (south) is of particular interest in that it is now a managed hay meadow with aftermath grazing; a feature not present elsewhere within the SSSI. In addition, it supports an abundance of Nationally Rare, Schedule 8 *Rhinanthus angustifolius*.

4.1.1 Rare/Scarce/Threatened Species Recorded from Non-SSSI Fields

Table 21 lists the rare/scarce/threatened species recorded from non-SSSI fields during fieldwork. Some cells have been intentionally left blank because these species were not recorded within the non-SSSI fields.

Rare/Scarce/Threatened Species Recorded during Fieldwork from Non-SSSI Fields

'PLF' = 'Pilgrim Lane Field'

RDB = UK Red Data Book species (JNCC 2021).

CR = Critically Endangered (species facing an extremely high threat of extinction in the wild in the near future);

EN = Endangered (species facing a very high threat of extinction in the wild in the near future);

VU = Vulnerable (species facing a high threat of extinction in the wild in the near future);

NT = Near Threatened (species facing a high threat of extinction in the wild in the medium-term future)

Nationally Rare (Cheffings & Farrell 2005, as updated JNCC 2021)

ERL = English Red List (Stroh *et al* 2014, as updated JNCC 2021), classifications as for RDB

Schedule 8 = Species included in Schedule 8 of the Wildlife and Countryside Act 1981 (as updated, JNCC 2021)

VC17 Rare = Surrey Rare (Surrey Botanical Society 2019)

VC17 Scarce = Surrey Scarce (Surrey Botanical Society 2019)

Table 21 - Rare/Scarce/Threatened Species Recorded during Fieldwork from Non-SSSI Fields

Species	Status	9010	1206	3403	2996	4194 (s)	6866 (s)	'PLF'
<i>Briza media</i>	ERL NT					+		+
<i>Cruciata laevipes</i>	ERL NT					+		
<i>Euphrasia nemorosa</i>	ERL NT						+	
<i>Geranium pratense</i>	VC17 Scarce			+				
<i>Knautia arvensis</i>	ERL NT	+	+	+		+	+	+
<i>Lathyrus sylvestris</i>	VC17 Rare				+			
<i>Rhinanthus angustifolius</i>	Nationally Rare, Schedule 8, VC17 Scarce			+		+	+	

4.2 SSSI Notifiable Grassland within the Existing Quarry Hangers SSSI

Five grassland communities mapped during surveys are of ‘high conservation interest’ (Jefferson *et al* 2019): MG1e, MG5a, CG3a, CG3b and CG3c. Excluding Unit 6, which is dominated by internationally important *Fagus-Taxus* woodland, one or more of these communities is present in every Unit; albeit currently at <0.5ha in Units 3, 4 and 5. In addition, there is considerable scope for the restoration of scrub-impoverished grassland with, for example, 1.3ha of ‘recently scrub cleared’ habitat currently present across the SSSI (especially within Units 3, 4 and 5).

All stands of ‘high conservation interest’ grassland, which collectively cover 17.7ha, are species-rich: average 34 species, excluding scrub, per 4m² (n = 46).

4.2.1 Rare/Scarce/Threatened Species Recorded from SSSI Units

Table 22 lists the rare/scarce/threatened species recorded from SSSI Units during fieldwork. Some cells have been intentionally left blank because these species were not recorded within the non-SSSI fields.

Rare/Scarce/Threatened Species Recorded during Fieldwork from SSSI Units

RDB = UK Red Data Book species (JNCC 2021).

CR = Critically Endangered (species facing an extremely high threat of extinction in the wild in the near future);

EN = Endangered (species facing a very high threat of extinction in the wild in the near future);

VU = Vulnerable (species facing a high threat of extinction in the wild in the near future);

NT = Near Threatened (species facing a high threat of extinction in the wild in the medium-term future)

Nationally Rare (Cheffings & Farrell 2005, as updated JNCC 2021)

ERL = English Red List (Stroh *et al* 2014, as updated JNCC 2021), classifications as for RDB

Schedule 8 = Species included in Schedule 8 of the Wildlife and Countryside Act 1981 (as updated, JNCC 2021)

VC17 Rare = Surrey Rare (Surrey Botanical Society 2019)

VC17 Scarce = Surrey Scarce (Surrey Botanical Society 2019)

Table 22 - Rare/Scarce/Threatened Species Recorded during Fieldwork from SSSI Units

Species	Status	1	2	3	4	5	7
<i>Briza media</i>	ERL NT	+	+	+	+	+	+
<i>Campanula rotundifolia</i>	ERL NT	+				+	
<i>Carlina vulgaris</i>	ERL NT			+	+	+	
<i>Cruciata laevipes</i>	ERL NT	+					

Species	Status	1	2	3	4	5	7
<i>Cynoglossum officinale</i>	RDB NT, ERL NT					+	
<i>Euphrasia nemorosa</i>	ERL NT	+	+	+	+		+
<i>Fragaria vesca</i>	ERL NT		+	+	+	+	
<i>Helianthemum nummularium</i>	ERL NT			+		+	
<i>Knautia arvensis</i>	ERL NT	+	+	+	+	+	+
<i>Onobrychis viciifolia</i>	RDB NT, ERL VU, VC17 Rare				+		
<i>Rhinanthus angustifolius</i>	Nationally Rare, Schedule 8, VC17 Scarce	+	+	+	+		

Map 17 – SSSI Unit 7 (Target Notes for Map 17)



5 Recommendations

5.1 Quarry Dean Meadows

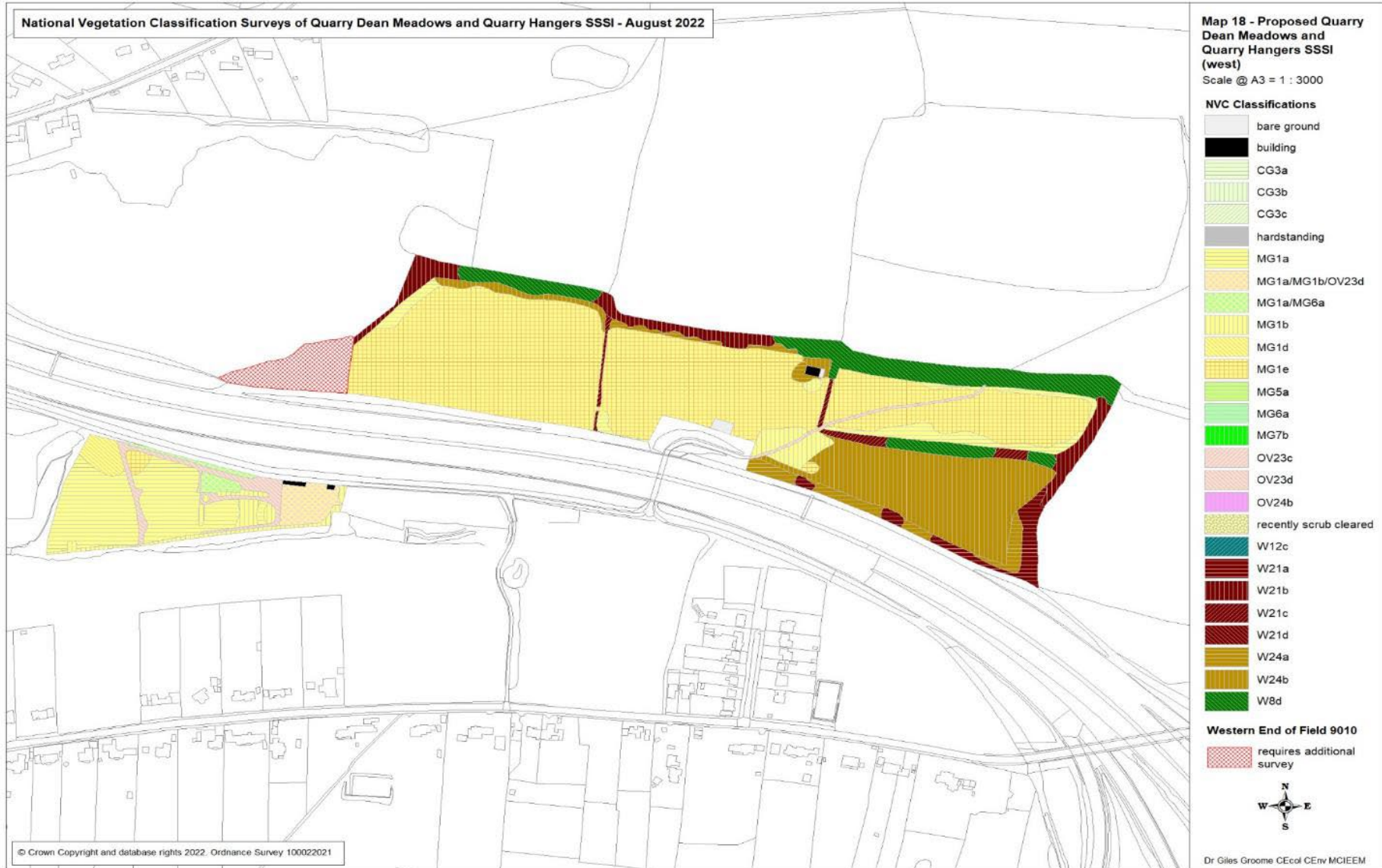
As discussed in Section 4.1, collectively Fields 9010, 1206 and 4303 automatically qualify for selection as an SSSI⁶. Most of Field 2996 is currently underscrub-encroached (W24b) but qualifies for consideration under Section 5.2 of the SSSI selection criteria (Jefferson *et al* 2019): it lies contiguous with Fields 9010, 1206 and 4303; there is evidence that MG1e was formerly dominant; and 'high conservation interest' grassland could be restored with appropriate management. It is therefore recommended that this field (the only one to support Surrey Rare *Lathyrus sylvestris*) be included within a newly notified Quarry Dean Meadows and Quarry Hangers SSSI (Map 18).

The case for including Field 6494 is less straightforward given that it does not lie contiguous with any fields that automatically qualify. However, evidence suggests it too was formerly dominated by MG1e and that this could be restored with appropriate management. It is therefore recommended that this field is also considered for SSSI inclusion (Map 18).

There is currently no case for the selection of Field 4081 (the former quarry) as SSSI.

⁶ The western, scrub-dominated, end of Field 9010 was included within the survey of Field 4081 (the former quarry). However, it could not be accessed at the time this part of the site was surveyed (Section 3.2.2) and therefore requires additional survey.

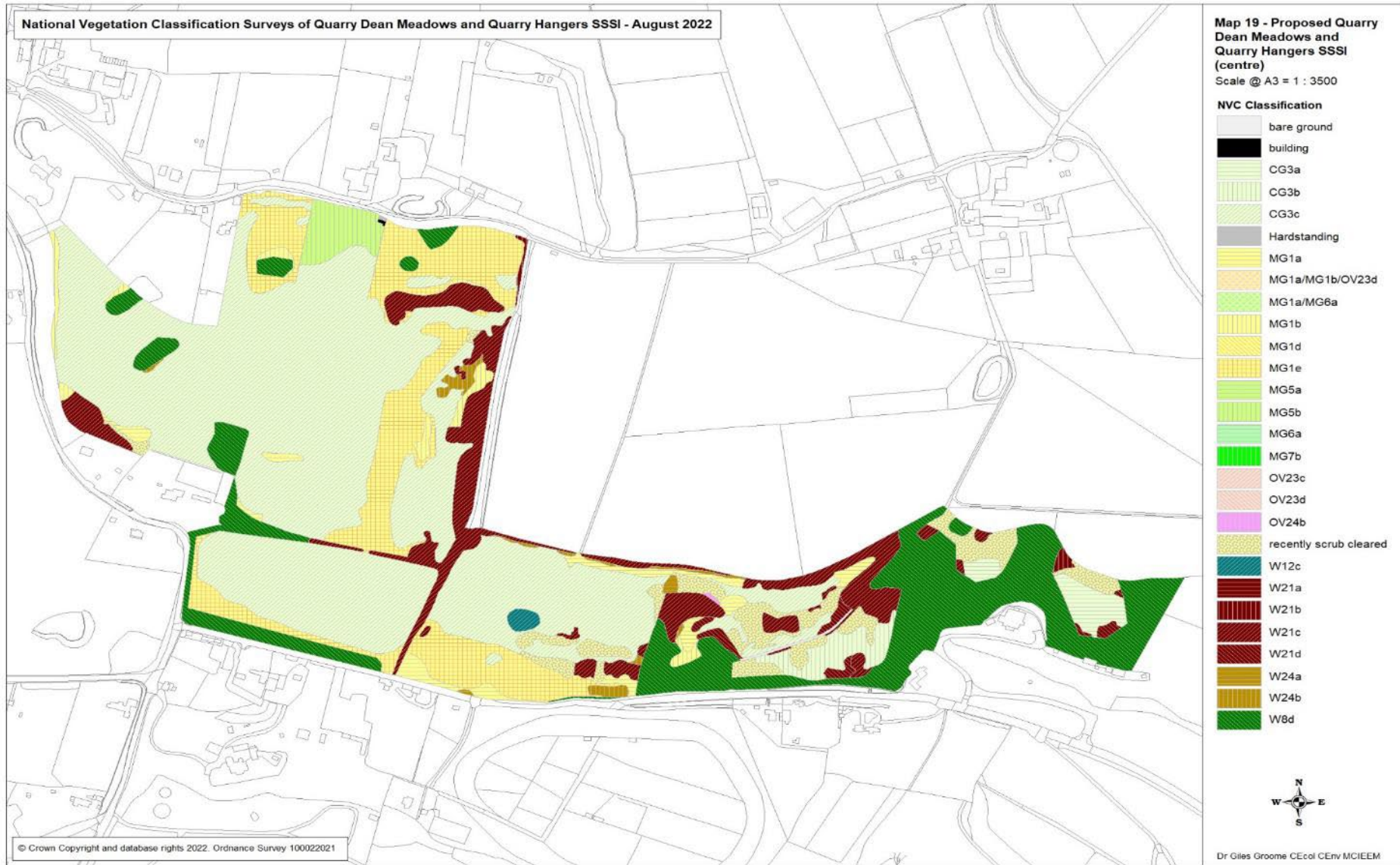
Map 18 – Proposed Quarry Dean Meadows and Quarry Hangers SSSI (west)



5.2 Quarry Hangers

Combining Units 1-5 and 7 of the existing Quarry Hangers SSSI with Fields 4194 (south), 6866 (south) and 'Pilgrims Lane Field', brings the total area of 'high conservation interest' grassland currently present to >22ha. On this basis the three additional fields automatically qualify for SSSI selection and should be included within a newly notified Quarry Dean Meadows and Quarry Hangers SSSI (Maps 19 and 20).

Map 19 – Proposed Quarry Dean Meadows and Quarry Hangers SSSI



Map 20 – Proposed Quarry Dean Meadows and Quarry Hangers SSSI (east)



6 SITE MAPS

6.1 List of Maps

1. Map 1 – Quarry Dean and Quarry Hangers Non-SSSI Fields
2. Map 2 – Quarry Hangers SSSI Units
3. Map 3 – Field 6964
4. Map 4 – Field 9010
5. Map 5 – Field 1206
6. Map 6 – Field 3403
7. Map 7 – Field 2996
8. Map 8 – Field 4914 (south)
9. Map 9 – Field 6866 (south)
10. Map 10 – ‘Pilgrims Lane Field’
11. Map 11 – SSSI Unit 1
12. Map 12 – SSSI Unit 2
13. Map 13 – SSSI Unit 3
14. Map 14 – SSSI Unit 4
15. Map 15 – SSSI Unit 5
16. Map 16 – SSSI Unit 6
17. Map 17 – SSSI Unit 7
18. Map 18 – Proposed Quarry Dean Meadows and Quarry Hangers SSSI (west)
19. Map 19 – Proposed Quarry Dean Meadows and Quarry Hangers SSSI (centre)
20. Map 20 – Proposed Quarry Dean Meadows and Quarry Hangers SSSI (east)

6.2 Target Notes

6.2.1 Target Notes for Map 4

TN1 Fenced corral in the south-eastern corner of Field 9010. MG1e with abundant *Poa trivialis* and scattered disturbance-associated species (*Sinapis arvensis*, *Lysimachia arvensis* ssp. *arvensis*, *Rumex sanguineus*, *Sonchus asper*).

TN2 Two large out-grown *Acer campestre* boundary stubs (badger sett immediately to the east).

6.2.2 Target Notes for Map 5

TN1 Vehicular track (including ruts) between fences. Retained within mapped MG1e (other than where it runs through mapped ‘bare ground’) but with a high cover of bare ground.

TN2 Small stand of MG1e grassland with very abundant *Medicago lupulina* (site of 2020 handling facilities?).

6.2.3 Target Notes for Map 6

TN1 Nationally Rare, Schedule 8 (JNCC 2021) *Rhinanthus angustifolius*.

TN2 VC17 Scarce (Surrey Botanical Society 2019) *Geranium pratense*.

6.2.4 Target Notes for Map 7

TN1 Enclosure/enclosure of heras-style fencing.

TN2 Locations of VC17 Rare (Surrey Botanical Society 2019) *Lathyrus sylvestris*.

TN3 Stand dominated by *Equisetum telmateia*. No NVC equivalent. Retained within mapped W24a.

6.2.5 Target Notes for Map 8

TN1 Marginal MG1e with abundant *Rubus fruticosus* and *Galium album* = W24b (too small to map separately).

TN2 Small stand of *Urtica dioica* ssp. *dioica* with *Galium aparine* and *Rubus fruticosus* on the margins of MG1e/W8d = OV24b (too small to map separately).

TN3 Gated access through W8d woodland supporting open canopy *Urtica dioica* ssp. *dioica*, *Heracleum sphondylium* and *Galium aparine* = OV24a (too small to map separately).

TN4 Vehicular access with limestone scalplings and much adjacent bare ground (presumably used for temporary stock handling facilities) with *Elymus repens*, *Lolium perenne*, *Phleum pratense*, *Arrhenatherum elatius*, *Dactylis glomerata*, *Trifolium pratense*, *Sinapis arvensis* and *Polygonum aviculare*. No NVC equivalent and retained within mapped MG1e.

TN5 Recently resurfaced footpath (track) through mapped W21c = 'bare ground' (too small, narrow, to map separately).

TN6 Where a footpath cuts through the northern field hedge (mapped as CG3c), swards either side of the trampled path are dominated by *Arrhenatherum elatius* with *Urtica dioica* ssp. *dioica* and *Heracleum sphondylium* = MG1b (too small to map separately).

6.2.6 Target Note for Map 9

TN1 Very small stand of remnant hedge supporting juvenile *Fraxinus excelsior* and *Sambucus nigra* = W21c (too small to map separately).

6.2.7 Target Note for Map 10

TN1 MG5b with abundant (but hard grazed) *Urtica dioica* ssp. *dioica* and scattered *Rumex obtusifolius*.

6.2.8 Target Notes for Map 11

TN1 CG3c with frequent (and locally abundant) 1-3m (but up to 6m) *Crataegus monogyna* scrub.

TN2 Mature *Tilia x europaea*, *Aesculus hippocastanum* and *Acer pseudoplatanus* trees (to W8d) within mapped W21c.

TN3 CG3c with abundant, mostly <1m high, *Crataegus monogyna* scrub.

TN4 Mature *Acer pseudoplatanus* and *Pinus* sp. trees (to W8d) within mapped W21c.

TN5 CG3c grassland with high cover of *Arrhenatherum elatius* and patches of *Brachypodium sylvaticum* where past scrub cutting.

TN6 Mature *Pinus* sp., *Populus alba*, *Acer pseudoplatanus*, *Prunus avium*, *Fagus sylvatica* and *Fraxinus excelsior* trees (to W8d) within mapped W21c.

TN7 Fenced pen (not accessed and may not support MG1e – although too small to map separately).

TN8 Trampled grassland in front of access gate supporting abundant *Lolium perenne*, *Plantago major* and *Trifolium repens* = OV23c (too small to map separately).

TN9 Grassland beyond Unit 1 (not surveyed, but appears from casual observation to support species-rich grassland). **UPDATE 2022: this has now been surveyed as ‘Pilgrims Lane Field’ (Section 3.2.9)**

TN10 Heavily rabbit grazed.

TN11 CG3c within enclosed field. Appears to have seen little recent grazing and supports abundant *Arrhenatherum elatius* with frequent <1-3m *Crataegus monogyna* scrub.

6.2.9 Target Notes for Map 12

TN1 Nationally Rare, Schedule 8 (JNCC 2021) *Rhinanthus angustifolius* in abundance.

TN2 CG3c grassland with frequent 1-1.5m *Crataegus monogyna* scrub and patchy *Clematis vitalba-Galium album* where past scrub cleared.

TN3 Small stand of dense *Rubus fruticosus* with 1-2m regeneration *Crataegus monogyna* = W24a (too small to map separately).

TN4 Patches of post-cut regeneration *Clematis vitalba*, *Rubus fruticosus* and *Galium album* = W24b (too small to map separately).

TN5 Species-rich CG3c with frequent and locally abundant 1.5-2m *Crataegus monogyna* with patchy *Rubus fruticosus* and *Clematis vitalba*.

6.2.10 Target Notes for Map 13

TN1 Mapped W8d on very steep slopes with abundant/dominant *Taxus baccata*. Not directly accessed during fieldwork. Further survey may reveal one or both areas are better classified as W13a.

TN2 Stand of regeneration *Rubus fruticosus* within mapped 'recently scrub cleared' = W24b, but boundaries impossible to identify on aerial photograph used during fieldwork.

TN3 Mapped CG3c with abundant (to locally dominant) *Arrhenatherum elatius* (almost transitional CG3c/MG1).

6.2.11 Target Notes for Map 14

TN1 Unit access with wooden fence corral.

TN2 Very small patch of RDB Near Threatened, ERL Vulnerable (JNCC 2021) and VC17 Rare (Surrey Botanical Society 2019) *Onobrychis viciifolia* besides footpath.

6.2.12 Target Notes for Map 15

TN1 Apparent SSSI encroachment viewed from distance.

TN2 RDB and ERL Near Threatened (JNCC 2021) *Cynoglossum officinale*.

TN3 W21c stand dominated by a mature *Fagus sylvatica* tree. W21c classification is based largely on contiguous scrub beyond the Unit boundary.

6.2.13 Target Notes for Map 17

TN1 Recently installed chicken coop and run within mapped MG5a.

TN2 Former location of chicken coop and run supporting much bare ground but encouraging signs of MG5a recovery.

TN3 Small patch of relict CG3c within mapped MG1e (too small to map separately).

TN4 Small relict *Rubus fruticosus*, *Brachypodium sylvaticum* and *Arrhenatherum elatius* glade within W8d (too small to map separately).

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Appendices

Appendix I – Checklist of recorded species

Taxon	Common Name
<i>Acer campestre</i>	Field Maple
<i>Acer platanoides</i>	Norway Maple
<i>Acer pseudoplatanus</i>	Sycamore
<i>Achillea millefolium</i>	Yarrow
<i>Aesculus hippocastanum</i>	Horse-chestnut
<i>Agrimonia eupatoria</i>	Agrimony
<i>Agrostis capillaris</i>	Common Bent
<i>Agrostis stolonifera</i>	Creeping Bent
<i>Ajuga reptans</i>	Bugle
<i>Alliaria petiolata</i>	Garlic Mustard
<i>Allium ursinum</i>	Ramsons
<i>Anacamptis pyramidalis</i>	Pyramidal Orchid
<i>Anisantha sterilis</i>	Barren Brome
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass
<i>Anthriscus sylvestris</i>	Cow Parsley
<i>Arenaria serpyllifolia</i> ssp. <i>serpyllifolia</i>	Fine-leaved Sandwort
<i>Arrhenatherum elatius</i>	False Oat-grass
<i>Arctium lappa</i>	Greater Burdock
<i>Artemisia vulgaris</i>	Mugwort
<i>Arum maculatum</i>	Lord's-and-ladies
<i>Asplenium scolopendrium</i>	Hart's-tongue
<i>Atropa belladonna</i>	Deadly Nightshade
<i>Avenula pubescens</i>	Downy oat-grass
<i>Barbula unguiculata</i>	Bird's-claw Beard-moss
<i>Betula pendula</i>	Silver Birch
<i>Blackstonia perfoliata</i>	Yellow-wort
<i>Brachypodium sylvaticum</i>	False-brome
<i>Brachythecium rutabulum</i>	Rough Feather-moss
<i>Briza media</i>	Quaking-grass

Taxon	Common Name
<i>Bromopsis erecta</i>	Upright Brome
<i>Bromus racemosus</i>	Smooth Brome
<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	Soft-brome
<i>Bryonia dioica</i>	White Bryony
<i>Bryum capillare</i>	Capillary Thread-moss
<i>Buddleja davidii</i>	Butterfly-bush
<i>Calliergonella cuspidata</i>	Pointed Spear-moss
<i>Calystegia sepium</i>	Hedge Bindweed
<i>Calystegia silvatica</i>	Large Bindweed
<i>Campanula glomeratum</i>	Clustered bellflower
<i>Campanula rotundifolia</i>	Harebell
<i>Capsella bursa-pastoris</i>	Shepherd's-purse
<i>Carduus crispus</i>	Wetted Thistle
<i>Carex caryophyllea</i>	Spring Sedge
<i>Carex flacca</i>	Glaucous Sedge
<i>Carex spicata</i>	Spiked Sedge
<i>Carlina vulgaris</i>	Carlina Thistle
<i>Centaurea nigra</i> agg.	Common/Chalk Knapweed
<i>Centaurea scabiosa</i>	Greater Knapweed
<i>Centaureum erythraea</i>	Common Centaury
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>	Common Mouse-ear
<i>Chamaenerion angustifolium</i>	Rosebay Willowherb
<i>Chaenorhinum minus</i>	Small Toadflax
<i>Chaerophyllum temulum</i>	Rough Chervil
<i>Circaea lutetiana</i>	Enchanter's-nightshade
<i>Cirsium acaule</i>	Dwarf Thistle
<i>Cirsium arvense</i>	Creeping Thistle
<i>Cirsium vulgare</i>	Spear Thistle
<i>Clematis vitalba</i>	Traveller-s-joy
<i>Clinopodium vulgare</i>	Wild Basil
<i>Convolvulus arvensis</i>	Field Bindweed
<i>Cornus sanguinea</i> ssp. <i>sanguinea</i>	Dogwood

Taxon	Common Name
<i>Cotoneaster horizontalis</i>	Wall Cotoneaster
<i>Cotoneaster simonsii</i>	Himalayan Cotoneaster
<i>Crataegus monogyna</i>	Hawthorn
<i>Crepis biennis</i>	Rough Hawk's-beard
<i>Crepis capillaris</i>	Smooth Hawk's-beard
<i>Cruciata laevipes</i>	Crosswort
<i>Cynoglossum officinale</i>	Hound's-tongue
<i>Cynosurus cristatus</i>	Crested Dog's-tail
<i>Dactylis glomerata</i>	Cock's-foot
<i>Dactylorhiza fuchsii</i>	Common Spotted-orchid
<i>Daphne laureola</i>	Spurge-laurel
<i>Daucus carota</i> ssp. <i>carota</i>	Wild Carrot
<i>Dryopteris filix-mas</i>	Male-fern
<i>Elymus repens</i>	Common Couch
<i>Epilobium hirsutum</i>	Great Willowherb
<i>Equisetum telmateia</i>	Great Horsetail
<i>Ervum tetraspermum</i>	Smooth Tare
<i>Eupatorium cannabinum</i>	Hemp-agrimony
<i>Euphrasia nemorosa</i>	Common Eyebright
<i>Eurhynchium striatum</i>	Common Striated Feather-moss
<i>Epilobium hirsutum</i>	Great Willowherb
<i>Epipactis helleborine</i>	Broad-leaved Helleborine
<i>Fagus sylvatica</i>	Beech
<i>Fagus sylvatica</i> 'purpurea'	Copper Beech
<i>Festuca ovina</i> agg.	Sheep's Fescue
<i>Festuca rubra</i> agg.	Red Fescue
<i>Fissidens dubius</i>	Slender Pocket-moss
<i>Fragaria vesca</i>	Wild Strawberry
<i>Fraxinus excelsior</i>	Ash
<i>Fumaria officinalis</i> ssp. <i>officinalis</i>	Common Fumitory
<i>Galega officinalis</i>	Goat's-rue
<i>Galium album</i>	Hedge Bedstraw

Taxon	Common Name
<i>Galium aparine</i>	Cleavers
<i>Galium verum</i>	Lady's Bedstraw
<i>Geranium dissectum</i>	Cut-leaved Crane's-bill
<i>Geranium pratense</i>	Meadow Crane's-bill
<i>Geranium robertianum</i>	Herb-Robert
<i>Glechoma hederacea</i>	Ground-ivy
<i>Hedera helix</i>	Common Ivy
<i>Helianthemum nummularium</i>	Common Rock-rose
<i>Helictochloa pratensis</i>	Meadow Oat-grass
<i>Helminthotheca echioides</i>	Bristly Oxtongue
<i>Heracleum sphondylium</i>	Hogweed
<i>Hieracium</i> agg.	Hawkweed
<i>Hippocrepis comosa</i>	Horseshoe Vetch
<i>Holcus lanatus</i>	Yorkshire-fog
<i>Homalothecium lutescens</i>	Yellow Feather-moss
<i>Hordeum secalinum</i>	Meadow Barley
<i>Hypericum hirsutum</i>	Hairy St John's-wort
<i>Hypericum maculatum</i>	Imperforate St John's-wort
<i>Hypericum perforatum</i>	Perforate St John's-wort
<i>Hypochaeris radicata</i>	Cat's-ear
<i>Inula conyzae</i>	Ploughman's-spikenard
<i>Iris foetidissima</i>	Stinking Iris
<i>Jacobaea erucifolia</i>	Hoary ragwort
<i>Jacobaea vulgaris</i>	Common Ragwort
<i>Knautia arvensis</i>	Field Scabious
<i>Koeleria macrantha</i>	Crested Hair-grass
<i>Lamium album</i>	White Dead-nettle
<i>Lamium purpureum</i>	Red Dead-nettle
<i>Lathyrus pratensis</i>	Meadow Vetchling
<i>Lathyrus sylvestris</i>	Narrow-leaved Everlasting-pea
<i>Leontodon hispidus</i>	Rough Hawkbit
<i>Leontodon saxatilis</i>	Lesser Hawkbit

Taxon	Common Name
<i>Leucanthemum vulgare</i>	Oxeye Daisy
<i>Linum catharticum</i>	Fairy Flax
<i>Lolium perenne</i>	Perennial Rye-grass
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil
<i>Luzula campestris</i>	Field Woodrush
<i>Lysimachia arvensis</i> ssp. <i>arvensis</i>	Scarlet Pimpernel
<i>Malus domestica</i>	Apple
<i>Medicago lupulina</i>	Black Medick
<i>Mercurialis perennis</i>	Dog's Mercury
<i>Myosotis arvensis</i>	Field Forget-me-not
<i>Odontites vernus</i> ssp. <i>serotinus</i>	Red Bartsia
<i>Onobrychis viciifolia</i>	Sainfoin
<i>Ononis repens</i>	Common Restharrow
<i>Ophrys apifera</i>	Bee Orchid
<i>Origanum vulgare</i>	Wild Marjoram
<i>Papaver rhoeas</i>	Common Poppy
<i>Pastinaca sativa</i> ssp. <i>sylvestris</i>	Wild Parsnip
<i>Phleum bertolonii</i>	Smaller Cat's-tail
<i>Phleum pratense</i>	Timothy
<i>Picea abies</i>	Norway Spruce
<i>Picris hieracioides</i>	Hawkweed Oxtongue
<i>Pilosella officinarum</i>	Mouse-ear-hawkweed
<i>Pimpinella saxifraga</i>	Burnet-saxifrage
<i>Pinus</i> sp.	unidentified Pine
<i>Plantago lanceolata</i>	Ribwort Plantain
<i>Plantago major</i>	Greater Plantain
<i>Plantago media</i>	Hoary Plantain
<i>Poa pratensis</i>	Smooth Meadow-grass
<i>Poa trivialis</i>	Rough Meadow-grass
<i>Polygala calcarea</i>	Chalk Milkwort
<i>Polygala vulgaris</i>	Common Milkwort
<i>Polygonum aviculare</i>	Knotgrass

Taxon	Common Name
<i>Populus alba</i>	White Poplar
<i>Populus x jackii</i>	Balm-of-Gilead
<i>Potentilla reptans</i>	Creeping Cinquefoil
<i>Potentilla sterilis</i>	Barren Strawberry
<i>Potentilla x mixta</i>	Hybrid Cinquefoil
<i>Poterium sanguisorba</i> ssp. <i>sanguisorba</i>	Salad-burnet
<i>Primula veris</i>	Cowslip
<i>Primula vulgaris</i>	Primrose
<i>Prunella vulgaris</i>	Self-heal
<i>Prunus avium</i>	Wild Cherry
<i>Prunus domestica</i>	Wild Plum
<i>Prunus laurocerasus</i>	Cherry Laurel
<i>Prunus spinosa</i>	Blackthorn
<i>Pseudoscleropodium purum</i>	Neat Feather-moss
<i>Pulicaria dysenterica</i>	Common Fleabane
<i>Quercus robur</i>	Pedunculate Oak
<i>Ranunculus acris</i>	Meadow Buttercup
<i>Ranunculus bulbosus</i>	Bulbous Buttercup
<i>Ranunculus repens</i>	Creeping Buttercup
<i>Reseda lutea</i>	Wild Mignonette
<i>Rhamnus cathartica</i>	Buckthorn
<i>Rhinanthus angustifolius</i>	Greater Yellow-rattle
<i>Rhytidiadelphus triquetrus</i>	Big Shaggy-moss
<i>Rosa</i> spp.	unidentified Roses
<i>Rosa canina</i>	Dog Rose
<i>Rosa corymbifera</i>	Hairy Dog-rose
<i>Rosa micrantha</i>	Small-flowered Sweet-briar
<i>Rosa rubiginosa</i>	Sweet-briar
<i>Rosa squarrosa</i>	Glandular Dog-rose
<i>Rubus fruticosus</i> agg.	Bramble
<i>Rumex acetosa</i>	Common Sorrel
<i>Rumex crispus</i>	Curled Dock

Taxon	Common Name
<i>Rumex sanguineus</i>	Wood Dock
<i>Salix caprea</i>	Goat Willow
<i>Sambucus nigra</i>	Elder
<i>Scabiosa columbaria</i>	Small Scabious
<i>Schedonorus arundinaceus</i>	Tall Fescue
<i>Schedonorus pratensis</i>	Meadow Fescue
<i>Scorzonerooides autumnalis</i>	Autumn Hawkbit
<i>Silene vulgaris</i> ssp. <i>vulgaris</i>	Bladder Campion
<i>Sinapis arvensis</i>	Charlock
<i>Sonchus asper</i>	Prickly Sow-thistle
<i>Sonchus oleraceus</i>	Smooth Sow-thistle
<i>Sorbus aria</i>	Whitebeam
<i>Stachys sylvatica</i>	Hedge Woundwort
<i>Stellaria graminea</i>	Lesser Stitchwort
<i>Symphytum x uplandicum</i>	Russian Comfrey
<i>Tamus communis</i>	Black Bryony
<i>Taraxacum</i> agg.	Dandelion
<i>Taxus baccata</i>	Yew
<i>Teucrium scorodonia</i>	Wood Sage
<i>Thymus drucei</i>	Wild Thyme
<i>Thymus pulegioides</i>	Large Thyme
<i>Tilia x europaea</i>	Lime
<i>Torilis japonica</i>	Upright Hedge-parsley
<i>Tragopogon pratensis</i> ssp. <i>minor</i>	Goat's-beard
<i>Trifolium pratense</i>	Red Clover
<i>Trifolium repens</i>	White Clover
<i>Trisetum flavescens</i>	Yellow Oat-grass
<i>Ulmus glabra</i>	Wych Elm
<i>Ulmus procera</i>	English Elm
<i>Urtica dioica</i> ssp. <i>dioica</i>	Common Nettle
<i>Verbascum thapsus</i>	Great Mullein
<i>Verbena officinalis</i>	Vervain

Taxon	Common Name
<i>Veronica arvensis</i>	Wall Speedwell
<i>Veronica chamaedrys</i>	Germander Speedwell
<i>Veronica persica</i>	Common Field-speedwell
<i>Veronica serpyllifolia</i> ssp. <i>serpyllifolia</i>	Thyme-leaved Speedwell
<i>Viburnum lantana</i>	Wayfaring-tree
<i>Vicia cracca</i>	Tufted Vetch
<i>Vicia sativa</i> ssp. <i>segetalis</i>	Common Vetch
<i>Viola hirta</i>	Hairy Violet
<i>Viola odorata</i>	Sweet Violet
<i>Viola riviniana</i>	Common Dog-violet

Appendix II – Checklist of NVC Community-types

The following list covers all community-types referred to in this report. Nomenclature given by Rodwell 1991 *et seq* has been revised as per Section 1.4.1 as appropriate.

Mesotrophic Grasslands

- MG1a *Arrhenatherum elatius* grassland, *Festuca rubra* sub-community
- MG1b *Arrhenatherum elatius* grassland, *Urtica dioica* sub-community
- MG1d *Arrhenatherum elatius* grassland, *Pastinaca sativa* sub-community
- MG1e *Arrhenatherum elatius* grassland, *Centaurea nigra* agg. sub-community
- MG5a *Cynosurus cristatus*-*Centaurea nigra* agg. grassland, *Lathyrus pratensis* sub-community
- MG5b *Cynosurus cristatus*-*Centaurea nigra* agg. grassland, *Galium verum* sub-community
- MG6a *Lolium perenne*-*Cynosurus cristatus* grassland, typical sub-community
- MG6c *Lolium perenne*-*Cynosurus cristatus* grassland, *Trisetum flavescens* sub-community
- MG7b *Lolium perenne* leys and related grasslands, *Lolium perenne*-*Poa trivialis* leys

Calcareous Grasslands

- CG3a *Bromopsis erecta* grassland, typical sub-community
- CG3b *Bromopsis erecta* grassland, *Centaurea nigra* agg. sub-community
- CG3c *Bromopsis erecta* grassland, *Knautia arvensis*-*Bellis perennis* sub-community
- CG3d *Bromopsis erecta* grassland, *Festuca rubra*-*Schedonorus arundinaceus* sub-community

Open Vegetation Communities

- OV23c *Lolium perenne*-*Dactylis glomerata* community, *Plantago major*-*Trifolium repens* sub-community
- OV23d *Lolium perenne*-*Dactylis glomerata* community, *Arrhenatherum elatius*-*Medicago lupulina* sub-community
- OV24a *Urtica dioica*-*Galium aparine* community, typical sub-community
- OV24b *Urtica dioica*-*Galium aparine* community, *Arrhenatherum elatius*-*Rubus fruticosus* sub-community

Woodland and Scrub Communities

- W8d *Fraxinus excelsior*-*Acer campestre*-*Mercurialis perennis* woodland, *Hedera helix* sub-community
- W12c *Fagus sylvatica*-*Mercurialis perennis* woodland, *Taxus baccata* sub-community
- W13a *Taxus baccata* woodland, *Sorbus aria* sub-community
- W21a *Crataegus monogyna*-*Hedera helix* scrub, *Hedera helix*-*Urtica dioica* sub-community

- W21b *Crataegus monogyna-Hedera helix* scrub, *Mercurialis perennis* sub-community
- W21c *Crataegus monogyna-Hedera helix* scrub, *Brachypodium sylvaticum* sub-community
- W21d *Crataegus monogyna-Hedera helix* scrub, *Hedera helix-Urtica dioica* sub-community
- W24a *Rubus fruticosus-Holcus lanatus* underscrub, *Cirsium arvense-Cirsium vulgare* sub-community
- W24b *Rubus fruticosus-Holcus lanatus* underscrub, *Arrhenatherum elatius-Heracleum sphondylium* sub-community

