THE ENVIRONMENT PARTNERSHIP

Brislington Meadows, Bristol

ECOLOGICAL TECHNICAL APPENDIX D

Grassland Assessment

7507.20.059

March 2022

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THE ENVIRONMENT PARTNERSHIP

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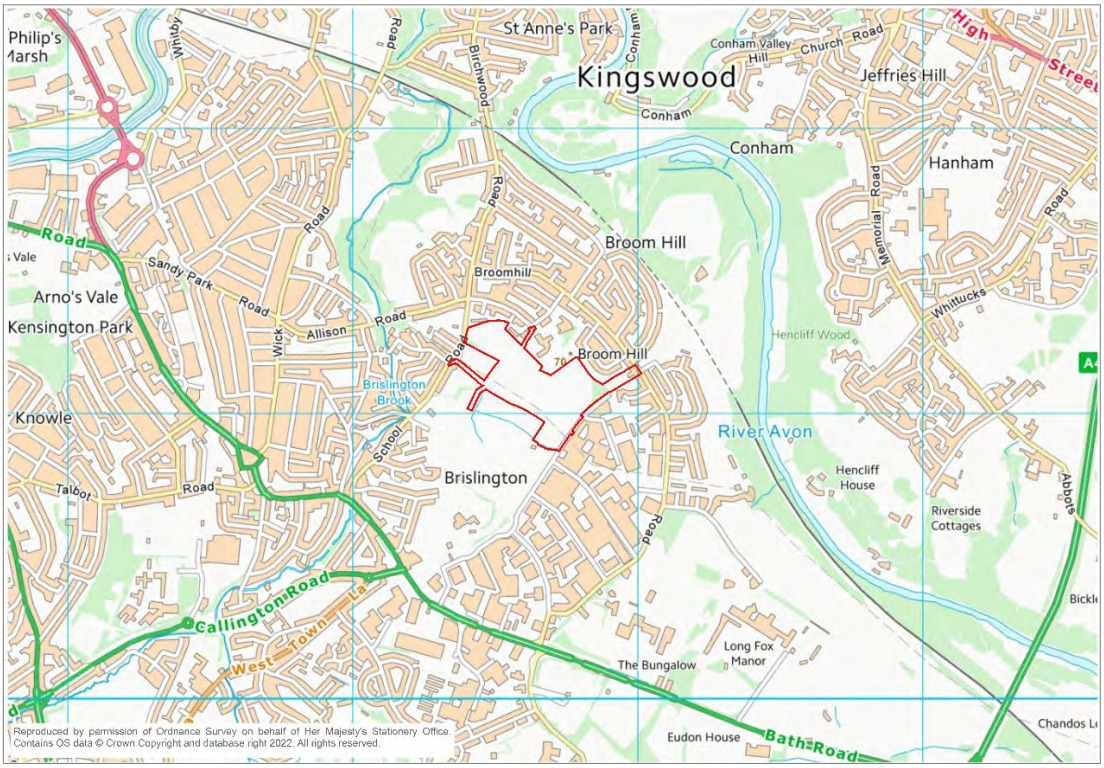
1.0 Introduction

1.1 The Environment Partnership (TEP) was commissioned in August 2020, by Campbell Reith on behalf of Homes England, to complete an Ecological Impact Assessment (EcIA) for the site known as Brislington Meadows (hereafter referred to as 'the site').

1.2 The site is located within Brislington in the southeast of Bristol. The central grid reference for the site is ST 626 711 and the location of the site is shown in Figure 1.

Figure 1: Site Location



1.3 Pre-application consultation (Ref 19/05220/PREAPP) with Bristol City Council in November 2019 identified a requirement to undertake detailed botanical assessment of the grasslands at the site. Further detail regarding the pre-application consultation advice from BCC is presented at Technical Appendix A (TEP Ref 7507.20.039).

1.4 WSP Ltd completed a botanical survey on behalf of Homes England in June 2020 and the findings of this survey are presented at Annex A. The 2020 WSP survey omitted field F6 from its scope. The survey method also deviated from the recommended method for National Vegetation Classification Survey (NVC) of grasslands in that it applied 1m^2 quadrates (1m x 1m) rather than 4m^2 quadrats (2m x 2m). While it was considered this deviation from standard survey guidance is unlikely to have had significant effect upon the conclusions of the 2020 WSP survey, the omission of field F6 required further survey to provide a complete assessment of the grasslands at the site.

1.5 TEP was subsequently instructed by Homes England to undertake a second botanical survey of the grasslands in fields F1 to F6 inclusive.

1.6 The grassland assessment described in this report has been undertaken to determine which grassland communities are currently present on the site and the ecological value of these communities. This includes assessing whether the site supports any grassland habitats of principal importance (HPI), as determined under the requirements of Section 41 of the Natural Environment and Rural Communities Act 2006 (NERC) and identifying location/s of any protected plant species.

2.0 Methods

2.1 Two survey visits were undertaken to the site covering the spring and summer flowering periods. The first visit was undertaken to fields F1 to F5 on 26th May 2021. Field F6 was not accessible on this day. The second visit undertaken to fields F1 to F6 on 15th July 2021. Field F7 does not comprise a grassland type with sufficient diversity to require detailed botanical survey and was therefore excluded from this grassland assessment.

Grassland Walkover Survey

2.2 The grassland walkover survey was undertaken on 26th May 2021 (F1 – F5) and repeated on 15th July 2021 (F1 – F6) by TEP experienced ecologist Val Gateley MCIEEM, who is certified to Level 5 under the Field Identification Skills Certification (FISC) [1].

2.3 Plant species within the grassland fields were identified in accordance with Stace (2019) and recorded as target notes using the DAFOR scale. The application of the DAFOR scale is explained in Technical Appendix B (TEP Ref 7507.20.063).

National Vegetation Classification Survey (NVC)

2.4 During the second site visit the grassland habitat was subject to NVC survey. Areas of grassland habitat were subject to an updated NVC survey. Each area was walked over by experienced botanist Val Gateley (MCIEEM, FISC Level 5) to make a provisional assessment of the boundaries of different vegetation types (as defined by the National Vegetation Classification system (Rodwell, 1991-2000 and 2006)).

2.5 In each provisional zone, vegetation was sampled using quadrats according to standard NVC method (Rodwell, 2006). Each 2m x 2m quadrat was recorded in the field by listing all plants in it with the abundance of each species and the percentage cover of any bare ground or leaf litter using the Domin scale of abundance2. Sufficient quadrats were recorded to include all community types occurring within each surveyed area and to allow a robust statistical analysis of the data.

2.6 Quadrat data was analysed using the computer program TABLEFIT Version 2.0 (Hill, 2016) to establish the “goodness of fit” to the NVC community types. The output results from TABLEFIT analysis of the quadrats have been analysed to assess which vegetation types, as defined by the NVC, are represented across the surveyed areas.

Limitations

2.7 No limitations to the grassland survey were encountered. While F6 was not accessible during the May 2021 visit, it had been subject to previous UKHab survey by two TEP ecologists qualified to FISC 4 in September 2020 and was subject to the NVC survey during the second grassland assessment in July 2021.

[1] A national skills certification scheme operated by Botanical Society of Britain and Ireland. FISC 4 is the competency level recommended for Biodiversity Net Gain (BNG) field assessments, FISC 5 is recommended for National Vegetation Classification (NVC) survey

[2] Detailed in paragraph 4 of Annex 3

3.0 Results

3.1 The distribution of grassland habitat types across the site are identified by the Habitat Survey (Drawing G7507.20.011). NVC quadrat locations are illustrated in Drawing G7507.20.059.

3.2 Species lists, quadrat data and TABLEFIT analysis for each quadrat is presented in Annex 2 of this report. An explanatory note regarding quadrat data and TABLEFIT analysis provided at Annex 3.

Grassland Survey Findings

Overview

3.3 The grassland habitat across fields F1-F5 was found to comprise semi-improved neutral grassland with some areas of relatively species-poor diversity and others with relatively diverse swards. The grassland was generally tussocky and tall, dominated by coarse grasses and had not undergone recent management. There is also an area of rush dominated marshy grassland within field F3, labelled as F3a.

3.4 Within field F6, there is a small area of heavily pony grazed poor semi-improved grassland in the southeast (F6c), but the remainder of F6 (F6a and b) had not been grazed for at least a season and is considered to be a more diverse example of semi-improved grassland. Unlike fields F1-5, the sward was dominated by finer grasses such creeping bent *Agrostis capillaris* and crested dog's-tail *Cynosurus cristatus*.

3.5 Scrub encroachment from the field boundaries (namely blackthorn *Prunus spinosa* and bramble *Rubus fruticosus agg*.) is apparent in all fields, with some islands of scrub also present in fields F6 and F3.

3.6 A description of the vegetation identified within each field and identification of the NVC communities represented is provided within the paragraphs below. In addition, the correspondence of these grasslands to HPI habitat is explored utilising Natural England's Farm Environment Plan (FEP) condition assessment criteria for G06 BAP/S41 lowland meadow and G07 BAP/S41 rush pasture. The dry neutral grassland fields on site were tested against G06 condition assessment criteria and the damper marshy grassland habitat was tested against G07 condition assessment criteria.

3.7 The criteria set out in the FEP condition assessment for G06 BAP/S41 lowland meadow habitat are:

- Cover of undesirable species (creeping thistle, spear thistle, curled dock, broad-leaved dock, common ragwort, common nettle, marsh ragwort, cow parsley and bracken) less than 5%;
- Cover of wildflowers and sedges throughout the sward (excluding the undesirable species listed above and creeping buttercup and white clover) more than 20%;
- Cover of bare ground (including localised areas, for example, rabbit warrens) less than 10%;

- Cover of invasive trees and shrubs less than 5%, and indicators of water logging (such as large sedges, rushes, reeds) less than 30%;
- At least two indicator species are frequent and two occasional.

3.8 The FEP condition assessment criteria for G07 BAP/S41 rush pasture habitat condition assessment are:

- Cover of undesirable species (creeping thistle, spear thistle, curled dock, broad-leaved dock, common ragwort, common nettle, cow parsley, marsh thistle and marsh ragwort) less than 10%;
- Cover of large sedge species less than 30%, and cover of large grasses such as tufted hair-grass and reeds, less than 20%;
- Cover of invasive trees and shrubs less than 5%;
- Cover of non-jointed rushes (soft, hard and compact) less than 50%;
- At least two indicator species are frequent and two occasional.

3.9 The FEP condition assessment is designed to assess/monitor the condition of HPI, but it does also provide a useful tool to help determine if habitats may or may not qualify as HPI alongside findings of NVC survey. It should be noted that FEP condition assessment differs to the habitat condition assessment applied to inform Biodiversity Net Gain (BNG) condition assessment. The Ecological Technical Appendix E (TEP Ref 7507.20.011) details the BNG habitat condition assessment method and results for all habitats across the site.

Field F1

3.10 This semi-improved neutral grassland field lies in the northeast of the site. A total of three quadrats (Q24, Q25 and Q26) sampled the grassland habitat within field F1.

3.11 The species composition is generally similar across the field with three main grasses, Yorkshire fog *Holcus lanatus*, false oat-grass *Arrhenatherum elatius* and meadow foxtail *Alopecurus pratensis* occurring consistently across this area. These tall grasses are dominant within the field but forbs including knapweed *Centaurea nigra*, bird's-foot trefoil *Lotus corniculatus* and meadow vetchling *Lathyrus pratensis* were found to occur occasionally throughout.

3.12 The TABLEFIT analysis identified affinity to two grassland communities. Where false oat-grass was more abundant, good affinity to MG1 (*Arrhenatherum elatius* grassland) was identified. Where meadow foxtail was more abundant, strongest affinity was with MG7d (*Lolium perenne* grassland, *Lolium perenne-Alopecurus pratensis* sub-community) albeit only with a poor goodness of fit identified.

3.13 Both communities are typical of semi-improved neutral grassland. The UKHab classification for these grasslands is g3c5 (*Arrhenatherum* neutral grassland).

3.14 Assessing field F1 against the FEP condition assessment criteria for G06 BAP/HPI lowland meadow, the cover of undesirable species, wildflowers, bare ground and indicators of water logging throughout the sward was within the thresholds identified. However, the encroaching scrub (blackthorn, bramble and wild cherry *Prunus avium*)

comprises greater than 5%. Thus the FEP HPI condition assessment is failed for this criteria because only three of the required four indicator species were identified within the sward, all of which occur only occasionally.

Field F2

3.15 This semi-improved neutral grassland field lies in the southeast of the site. A total of four quadrats (Q22, Q23, Q27 and Q28) sampled the grassland habitat within field F2.

3.16 The grass species composition is generally similar across the field with four main species, Yorkshire fog, false oat-grass, red fescue *Festuca rubra* and meadow foxtail occurring relatively consistently across this area. Forbs including knapweed, bird's-foot trefoil, pignut *Conopodium majus* and meadow vetchling were found to occur, however the frequency and diversity of forb species was higher in the northwest end of the field with coarse grasses much more dominant in the central and eastern sections of the field. The course grass-dominated central and south eastern sections of the field have therefore been classified as poor semi-improved neutral grassland.

3.17 The TABLEFIT analysis identified poor to very good affinity to MG1 grassland with the MG1a (red fescue *Festuca rubra*) and MG1e (knapweed *Centaurea nigra*) sub-communities also represented. All are typical of semi-improved neutral grassland.

3.18 The UKHab classification for these central and southeastern areas of F2 is g4 (Grassland – modified grassland). The remaining northwestern area of semi-improved grassland is classified as g3c5 (*Arrhenatherum* neutral grassland).

3.19 Assessing field F2 against the FEP condition assessment criteria for G06 BAP/HPI lowland meadow, the cover of undesirable species, wildflowers, bare ground and indicators of water logging throughout the sward was within the thresholds identified. However, the encroaching scrub (blackthorn and bramble) from the boundaries comprises greater than 5%, thus this condition is failed. Four indicator species are identified within the sward. However, the frequency of four is only occasional and therefore the grassland also fails this condition assessment.

Field F3

3.20 This semi-improved neutral grassland field lies in the southeast of the site. A total of six quadrats (Q1, Q4, Q6, Q6, Q7 and Q8) sampled the grassland habitat within field F3.

3.21 The grass species composition is generally similar across the field with three main species, Yorkshire fog, false oat-grass and meadow foxtail occurring consistently across this area. Forbs including knapweed, bird's-foot trefoil, ribwort plantain *Plantago lanceolata* and meadow vetchling were found to occur. Like field F2, the frequency and diversity of forb species was higher in the northwest end of the field. Coarse grasses are much more dominant in the central and eastern sections of the field. The coarse grass dominated central and southeastern sections of the field have therefore been classified as poor semi-improved neutral grassland.

3.22 The TABLEFIT analysis identified poor to very good affinity to MG1 grassland with the MG1a (red fescue *Festuca rubra*) sub-community also represented. Both are typical of semi-improved neutral grassland.

3.23 The UKHab classification for the central and southeastern areas of F3 is g4 (Grassland – modified grassland). The remaining northwestern area of semi-improved grassland is classified as g3c5 (*Arrhenatherum* neutral grassland).

3.24 Assessing field F3 against the FEP condition assessment criteria for G06 BAP/HPI lowland meadow, the cover of undesirable species, wildflowers, bare ground and indicators of water logging throughout the sward was within the thresholds identified. However, the encroaching scrub (dominated by blackthorn and bramble) from the boundaries comprises greater than 5%, and thus this condition is failed. The required number of four indicator species were identified within the sward, but the frequency of these species (two occurring occasionally and two rarely within the sward) falls below the required threshold and the grassland in field F3 therefore fails this condition.

Field F3a

3.25 This is an area of marshy grassland in the southeast of field F3. Two quadrats (Q2, Q3) sampled the habitat within field F3a.

3.26 Sharp-flowered rush *Juncus acutiflorus*, tufted hair-grass *Deschampsia cespitosa* and Yorkshire fog are abundant in the sward. This taller vegetation is dominant within the F3a while forbs including greater bird's-foot trefoil *Lotus pedunculatus* and meadow vetchling were found to occur frequently and occasionally, respectively.

3.27 The TABLEFIT analysis identified poor to very good affinity to MG9 (Yorkshire fog - tufted hair-grass) grassland, with fair goodness of fit to the sharp-flowered rush sub-community of soft/sharp-flowered rush *Juncus effusus/acutiflorus* - marsh bedstraw *Galium palustre* rush pasture M23a, identified in Q2. Both communities are typical of marshy grassland.

3.28 The UKHab classification for field F3a is g3c7 (*Holcus-Juncus* neutral grassland).

3.29 Assessing field F3a against the FEP condition assessment criteria for G07 BAP/HPI rush pasture, the cover of undesirable species, invasive tree and shrub species and cover of non-jointed rushes was within the thresholds identified. However, tufted hair-grass covers greater than the 20% of the sward, so this condition is failed. Only three of the required four indicator species were identified within the sward, with species occurring abundantly, frequently and occasionally, so this condition is also failed.

Field F4

3.30 This semi-improved neutral grassland field lies in the southwest of the site. A total of five quadrats (Q9, Q10, Q11, Q12 and Q) sampled the grassland habitat within field F4.

3.31 The species composition is generally similar across the field with three main grasses, Yorkshire fog, false oat-grass and meadow foxtail occurring consistently across this

area. These tall grasses are dominant within the field but forbs including knapweed, bird's-foot trefoil, bluebell *Hyacinthoides non-scripta* and pignut were found to occur throughout. One small population of lady's bedstraw *Galium verum* was also identified in the north of the field.

3.32 The TABLEFIT analysis identified poor to very good affinity to MG1 grassland with the MG1e (knapweed *Centaurea nigra*) sub-community also represented.

3.33 Both are typical of semi-improved neutral grassland. The UKHab classification for these grasslands is g3c5 (*Arrhenatherum* neutral grassland).

3.34 Assessing field F4 against the FEP condition assessment criteria for G06 BAP/S41 lowland meadow, the cover of undesirable species, wildflowers, bare ground and indicators of water logging throughout the sward was within the thresholds identified for these conditions. However, the encroaching scrub (blackthorn and bramble) from the boundaries comprises greater than 5%, thus this condition is failed. The required minimum of four indicator species were identified, with five species identified within the sward, however the frequency (one occurring frequently, two occasionally and two rarely), falls below the required threshold.

Field F5

3.35 This semi-improved neutral grassland field lies in the north of the site. Three quadrats (Q19, Q20 and Q21) sampled the grassland habitat within field F5.

3.36 The species composition is generally similar across the field with three main grasses, Yorkshire fog, false oat-grass and meadow foxtail occurring consistently across this area with red fescue locally abundant in places. These tall grasses are dominant within the field but forbs including knapweed, bird's-foot trefoil, meadow vetchling and pignut were found to occur occasionally to rarely in the sward.

3.37 The TABLEFIT analysis identified fair affinity to MG1 grassland in quadrats Q19 and 21. Quadrat Q20 identified a fair affinity to MC9 red fescue - Yorkshire fog maritime grassland, this more accurately represents neutral grassland dominated by these grasses that occurs inland with no maritime association and typically grades into younger stands of MG1. These represent vegetation typical of poor semi-improved neutral grassland.

3.38 The UKHab classification for these grasslands is g4 (Grassland – modified grassland).

3.39 Assessing field F4 against the FEP condition assessment criteria for G06 BAP/HPI lowland meadow, the cover of undesirable species, wildflowers, bare ground and indicators of water logging throughout the sward was within the thresholds identified. However, the encroaching scrub (blackthorn and bramble) from the boundaries comprises greater than 5%, thus this condition is failed. The required four indicator species were identified, but the frequency (two occurring occasionally and two rarely) falls below the required threshold. This condition is also failed.

Field F6

3.40 This group of semi-improved neutral grassland paddocks lies in the northwest of the site. Five quadrats (Q14, Q15, Q16, Q17 and Q18) sampled the grassland habitat within field F6. F6a is a small fenced of section of the F6 which houses stabling and the main area of grazing (currently, Shetland ponies), as such this area is heavily grazed and species-poor and was covered by the NVC survey. It is thought that the main field areas of field F6 had not been subject to grazing for at least one growing season at the time of survey (evidence of pony grazing was noted at least into late summer 2020).

3.41 The species composition is generally similar across the field with two main grasses, common bent *Agrostis capillaris* and crested dog's-tail *Cynosurus cristatus* occurring consistently across this area with Yorkshire fog locally abundant in places. These grasses are abundant within the field with forbs including knapweed and bird's-foot trefoil found to occur frequently in the sward. One small population of lady's bedstraw *Galium verum* was also identified in the southwest of F6.

3.42 The TABLEFIT analysis identified affinity to a range of vegetation communities, most notably MG5 (Knapweed *Centaureo* - crested dog's-tail *Cynosuretum cristati*) grassland, MG6a (perennial ryegrass *Lolio* - crested dog's-tail *Cynosuretum cristati*, typical sub-community) grassland and U1f (Sheep's fescue *Festuca ovina* - Common bent *Agrostis capillaris* - Sheep's sorrel *Rumex acetosella*, common cat's-ear *Hypocheris radicata* sub-community) acid grassland.

3.43 It is considered that the grassland most likely represents a mix of MG5 and MG6 with the acidic elements associated with F6b brought about due to the presence of several anthills which have added acidity to the soil. Although MG5 is often associated with species rich unimproved grassland, the species diversity is not sufficient to consider this grassland as species-rich. Overall, the vegetation within F6 is has most affinity to semi-improved neutral grassland.

3.44 The UKHab classification for field F6 is g3c6 (*Lolium-Cynosurus* neutral grassland). The UKHab classification for field F6a is g4 (Grassland – modified grassland).

3.45 Assessing field F6 against the FEP condition assessment criteria for G06 BAP/HPI lowland meadow, the cover of undesirable species, wildflowers, bare ground and indicators of water logging throughout the sward was within the thresholds identified. However, the encroaching scrub (most notably bramble) from the boundaries comprises greater than 5% as such this condition is failed. Three of the required four indicator species were identified with two occurring frequently and one rarely within the sward, therefore this condition is also failed.

Protected flora

3.46 Native bluebell *Hyacinthoides non-scripta* (Schedule 8, WCA 1981) occurs within scattered locations across the site, usually associated with boundary features but bluebell was also noted occasionally with the sward of field F4.

4.0 Conclusions

4.1 Across fields F1-F6 (excluding F3a), the grasslands were found to be semi-improved neutral grassland. Generally, the sward was dense and tussocky with no evidence of recent management through mowing or grazing. The grassland within F6 was not tall and tussocky and was dominated by finer grasses but is still considered to fall within the category of semi-improved neutral grassland based on the findings of the NVC survey.

4.2 The dominant vegetation communities identified on site are MG1, including MG1a and MG1e sub-communities (representing the false oat grass dominated swards) and MG7d (representing the meadow foxtail dominated swards) grasslands, with the majority of fields found to have strongest affinity with these communities, in particular MG1. Only field F6 differed from this showing strongest affinity with MG5 and MG6a.

4.3 Although the vegetation community types identified are relatively consistent across the site (excluding F6 which was notably different from the other swards with much less tall, rank grasses including false oat-grass and meadow foxtail present within the sward), there were differences in the species diversity and frequency of species noted within the different fields, with fields F4 and F6 providing the most diverse mix of species.

4.4 Although some of the thresholds were met following the FEP condition assessment guidelines associated with S41 habitat, the fields did not meet the criteria relating to frequency of indicator species and level of scrub encroachment. Thus, combined with their affinity to semi-improved neutral grassland rather than unimproved grasslands, it is considered that grassland habitat on site does not qualify as HPI lowland meadow habitat of principal importance.

4.5 The small area of MG9 grassland (F3a) provides further ecological value, however this area is also considered not to qualify as HPI rush pasture habitat of principal importance, as it failed the indicator species and tall grasses frequency thresholds.

4.6 Native bluebell (Schedule 8, WCA 1981) occurs within scattered locations across the site, mostly associated with field boundaries and within field F4. A method statement will be required, detailing how bluebell populations on site would be protected or if impacts to some areas are unavoidable, translocated and managed within suitable retained habitat.

Comparison with WSP botanical survey in 2020

4.7 The table below presents a comparison of the WSP 2020 NVC survey findings and the TEP 2021 NVC survey findings for the grasslands.

Table 1: Comparison between findings of 2020 and 2021 grassland surveys

Field ID	WSP 2020		TEP 2021	
	NVC evaluation	Priority habitat?	NVC evaluation	Priority habitat?
F1	MG5 (*Centaureo-Cynosuretum Lathyrus pratensis*) - reasonable	No condition assessment required	MG1 *(Arrhenatherum elatius* grassland) - good MG7d (*Lolium perenne* grassland*, Lolium perenne-Alopecurus pratensis* sub-community) - poor	No
F2	MG1 *(Arrhenatherum elatius* grassland) - reasonable Grading to MG1 Arrhenatheretum elatioris Festuca rubra sub-community	No condition assessment required (insufficient indicator species)	MG1 *(Arrhenatherum elatius* grassland) - poor to very good MG1a (red fescue *Festuca rubra*) and MG1e (knapweed *Centaurea nigra*) sub-communities represented	No
F3	MG1 *(Arrhenatherum elatius* grassland) knapweed *Centaurea nigra* sub-community - reasonable	No condition assessment required (insufficient indicator species)	MG1 *(Arrhenatherum elatius* grassland) - poor to very good MG1a (red fescue *Festuca rubra*) sub-community represented	No
F3a	Species poor M23a community *Juncus effusus/acutiflorus Galium palustre* rush-pasture of a *Juncus acutiflorus* sub-community		MG9 (Yorkshire fog - tufted hair-grass) - poor to very good M23a (*Juncus effusus/acutiflorus* - marsh bedstraw *Galium palustre* rush pasture) - fair (Q2)	No
F4	MG1 *(Arrhenatherum elatius* grassland) knapweed *Centaurea nigra* sub-community - good	No condition assessment required (insufficient indicator species)	MG1 *(Arrhenatherum elatius* grassland) - poor to very good MG1e (knapweed *Centaurea nigra*) sub-community represented	No
F5	MG1 *(Arrhenatherum elatius* grassland) knapweed *Centaurea nigra* sub-community - reasonable	No condition assessment required (insufficient indicator species)	MG1 *(Arrhenatherum elatius* grassland) - fair MC9 (red fescue - Yorkshire fog maritime grassland) - fair (Q20)	No

Field ID	WSP 2020		TEP 2021	
	NVC evaluation	Priority habitat?	NVC evaluation	Priority habitat?
F6	Not surveyed	No condition assessment required	Mixed affinities MG5 (Knapweed *Centaureo* - crested dog's-tail *Cynosuretum* cristati), MG6a (perennial ryegrass *Lolio* - crested dog's-tail *Cynosuretum cristati* typical sub-community), U1f (Sheep's fescue *Festuca ovina* - Common bent *Agrostis capillaris* - Sheep's sorrel *Rumex acetosell*a, common cat's-ear *Hypocheris radicata* sub-community	No

4.8 There is good comparison between the 2020 and 2021 NVC surveys of the grasslands. The only marginal difference between conclusions from the two surveys relates to field F1. The 2020 survey concluded 'reasonable' affinity with MG5 grassland, whereas in comparison the 2021 survey concluded 'good' affinity with MG1 grassland (consistent with the majority of fields) in places as well as affinity with MG7 grassland. Field F1 does appear to exhibit a more patchy sward than most other fields, potentially a consequence of smaller field size resulting in increased edge effects from disturbance and nutrification arising from high levels of dog walking.

4.9 Overall, WSP categorised the field as G02 semi-improved grassland and further concluded field F1 species poor semi-improved grassland'. In this regard, the classification of field F1 is consistent between both the 2020 and 2021 surveys.

5.0 References and Further Reading

Hill, M.O. (2016) TABLEFIT V2.0, for identification of vegetation types. Huntingdon, ITE.

Rodwell, J. S. (1992) British plant communities. Volume 3: Grasslands and montane communities. Cambridge University Press

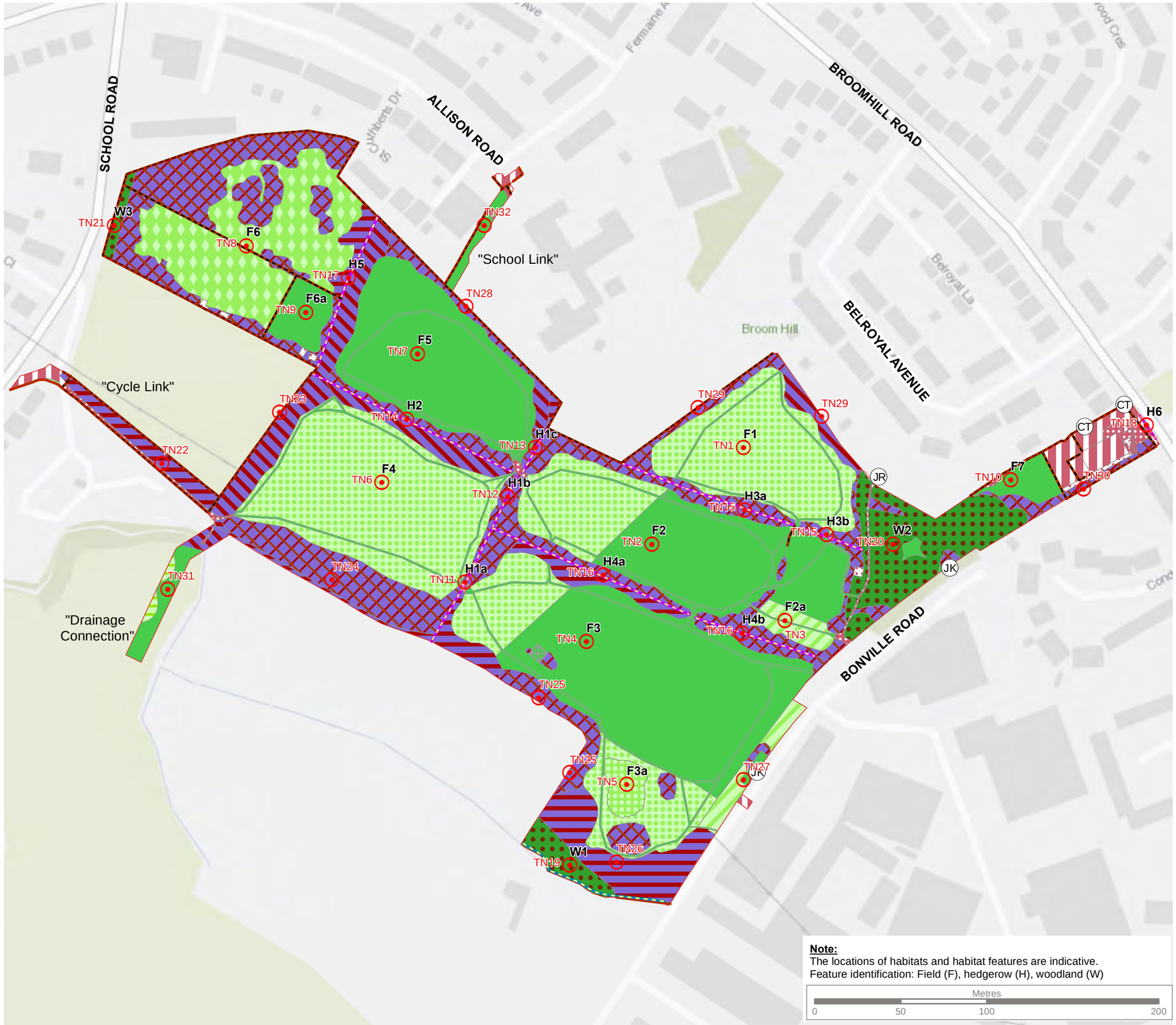
Stace, C.A. (2019) New flora of the British Isles. 4th ed. Cambridge University Press.

Natural England (March 2010), Higher Level Stewardship, Farm Environment Plan (FEP) Manual, Technical guidance on the completion of the FEP and identification, condition assessment and recording of HLS FEP features (Third Edition), Natural England.

Drawings

G7507.20.011 Habitat Survey

G7507.20.059 NVC Quadrat Locations



Note:
The locations of habitats and habitat features are indicative.
Feature identification: Field (F), hedgerow (H), woodland (W)

Metres
0 50 100 200

KEY

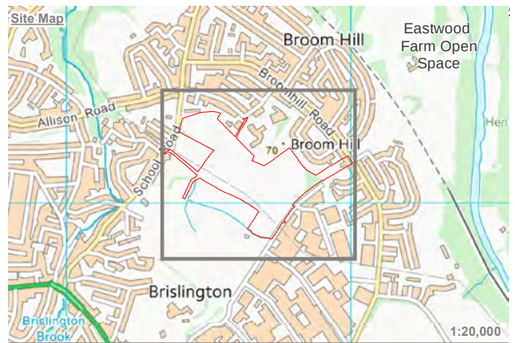
- Site boundary
- Target Note (TN)

Schedule 9 Non-native Invasive Plants

- (CT) Cotoneaster (C. horizontalis)
- (JK) Japanese knotweed (Fallopia japonica)
- (JR) Japanese rose (Rosa rugosa)

Habitat Survey (UKHab)

- h2a - Hedgerow (priority habitat)
- r2b - Other rivers and streams
- u1e(68) - Urban linear feature - wall
- u1e(69) - Urban linear feature - fence
- g3 - neutral grassland
- g3c - Other neutral grassland
- g3c5 - Arrhenatherum neutral
- g3c6 - Lolium-Cynosurus neutral grassland
- g3c8 - Holcus-Juncus neutral grassland
- g4 - Modified grassland
- h3a6 - Other blackthorn scrub
- h3d - Bramble scrub
- h3h - Mixed scrub
- u1b - Developed land, sealed surface
- u1b5 - Buildings
- u1c - Artificial unvegetated unsealed
- w1g - Other woodland, broadleaved



Rev	Description	Drawn	Approved	Date

TEP THE ENVIRONMENT PARTNERSHIP

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Project
Brislington Meadows

Title
Habitats Baseline

Drawing Number
G7507.20.011

Drawn	Checked	Approved	Scale	Date
RR	CB	VG	1:2,250 @ A3	22/02/2022

KEY

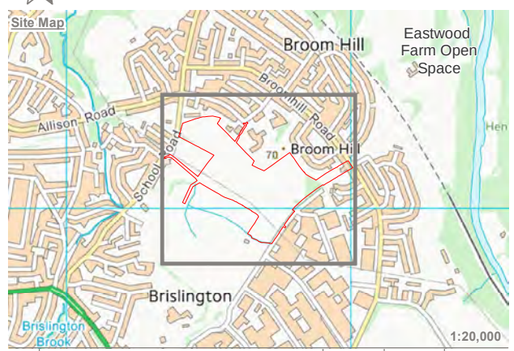
Site boundary

National Vegetation Classification (NVC) Survey

NVC quadrat location

Habitat Survey (UKHab codes):

- h2a(77) - Hedgerow (priority habitat) (neglected)
- r2b - Other rivers and streams
- u1e(68) - Urban linear feature - wall
- u1e(69) - Urban linear feature - fence
- g3 - neutral grassland
- g3c - Other neutral grassland
- g3c5 - Arrhenatherum neutral grassland
- g3c6 - Lolium-Cynosurus neutral grassland
- g3c8 - Holcus-Juncus neutral grassland
- g4 - Modified grassland
- h3a6 - Other blackthorn scrub
- h3d - Bramble scrub
- h3h - Mixed scrub
- u1b - Developed land, sealed surface
- u1b5 - Buildings
- u1c - Artificial unvegetated unsealed surface
- w1g - Other woodland, broadleaved



Rev	Description	Drawn	Approved	Date

Note:
The locations of habitats and habitat features are indicative.

Metres
0 50 100 200

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Drawing Number
G7507.20.059

Drawn	Checked	Approved	Scale	Date
RR	CB	VG	1:2,250 @ A3	22/02/2022

Annex 1

WSP (2020) Botanical Technical Note

TECHNICAL NOTE 1

DATE:	02 July 2020	**CONFIDENTIALITY:**	Public
SUBJECT:	Botanical Survey Report		
PROJECT:	Brislington Meadows	**AUTHOR:**	Niall Lusby
CHECKED:	Sam Pegler	**APPROVED:**	Marianne Curtis

INTRODUCTION

WSP UK Ltd. (hereafter referred to as 'WSP') was commissioned on behalf of Homes England to undertake a supplementary botanical survey of the grassland and hedgerow ground flora within Brislington Meadows (hereafter referred to as the "Site"). The Site is situated within the urban area of Brislington in Bristol (Central grid reference ST 626711). The Site is approximately 10 ha and is surrounded by residential properties, community allotments, a retail park and associated amenity habitats

WSP previously undertook a Preliminary Ecological Appraisal (PEA) of the Site in September 2019 (WSP, 2019). The PEA was however undertaken outside of the optimum botanical survey period (May to August). Further botanical assessment was therefore considered appropriate, due to the Site being previously designated as a Site of Importance for Nature Conservation (SINC) by Bristol Council (it should be noted however that the Site is no longer designated as a SINC). The supplementary botanical survey was therefore undertaken to provide further detail on the botanical communities present within the accessible areas of the Site.

The information provided within this document is supplementary to previous survey effort and should therefore be read in conjunction with the PEA of the Site[1].

METHOD

A botanical survey of the grassland and hedgerow ground flora within the Site was undertaken by WSP Ecologists on the 23rd June 2020.

The focus of the grassland survey was the five grassland fields that occupy the bulk of the Sites area. Figure 1 indicates the field numbers used and provides a simple map of the main stands mapped where relevant. In addition to this two sections of hedgerow that may be impacted as part of the Proposed Development within the centre of the site also inspected for woodland groundflora species to supplement the Hedgerow Regulations Survey undertaken by WSP in September 2019 (WSP, 2019).

Each field was surveyed using a diagonal transect, which was walked with all species encountered recorded. This was supplemented with five 1m x 1m quadrats that were sampled in homogenous stands of vegetation typical of the wider field. If a field supported more than one highly distinct stand type, further quadrats were undertaken. Areas of different species composition resulting from pedestrian trampling or other disturbance were excluded from the sampling, along with small areas where stand/community composition differences only concerned a small percentage of the total field area.

[1] WSP. 2019. Brislington Meadows: Preliminary Ecological Appraisal

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For each quadrat sample, species present were identified to species level along with an estimate of its percentage cover. Other species encountered during each transect but not present in the quadrats were recorded as incidental finds.

The results of the quadrat data were then compared to the dichotomous keys for habitats within the relevant volume of British Plant Communities. Grasslands were assessed using the Key to Mesotrophic Grasslands in British Plant Communities Volume 3: Grasslands and Montane Communities[2]. The small area of rush pasture was assessed using the Dendrogram Keys to Mire Communities in British Plant Communities Volume 2: Mires and Heaths[3].

The results are presented below. For each field a brief description is provided, along with notes on the incidental species recorded during the transect and a table providing the species recorded during the quadrat sampling. A short discussion is them undertaken based on the use of the habitat Keys in the respective Volume of British Plant Communities.

The condition of each field condition was assessed against the criteria contained in the Higher Level Stewardship Farm Environment Plan Handbook (FEP) Manual[4].

Hedgerow survey

For each of the two hedgerows of interest for the purpose of this study, the entire length was walked and notes taken on the plant species present so that this information can be used to supplement that recorded by WSP during the earlier Hedgerow Regulations Assessment Survey carried out as part of the PEA in September 2019.

Limitations

The surveys were undertaken within the optimum period for botanical survey, although the survey was slightly late in the woodland botanical survey period which runs April to June.

[2] Rodwell, J. S. (ed.) 1992. British Plant Communities. Volume 3. Grassland and montane communities. Cambridge University Press.
[3] Rodwell, J.S. (ed.) 1991. British Plant Communities. Volume 2. Mires and heaths. Cambridge University Press.
[4] Natural England. 2010. Higher Level Stewardship Farm Environment Plan Handbook (FEP) Manual. ISBN 978-1-84754-211-3

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The above approach for grassland survey is a slight deviation from the standard NVC survey approach[5], with $1m^2$ (1m x 1m) instead of the standard $4m^2$ (2m x 2m) quadrats used and a reduced effort in mapping minor differences in stands. This is considered a suitable approach to rapidly provide a detailed botanical account of the nature of the dominant habitats present on Site however and is not considered to be a limitation.

The hedgerows surveyed are flanked on either side by dense scrub resulting from outgrowth of blackthorn *Prunus spinosa* and bramble *Rubus fruticosus* from the original hedgerow as a consequence of a lack of active management. This restricted the ability of the surveyors to record the groundflora of the original hedgerow to small sections where access was possible to the hedge bank. The groundflora of the scrubby margins was representative of the grassland habitat it has encroached upon and no detailed notes were made on this for that reason as it is comparable with the data collected during the grassland survey.

As information on soil nutrient levels for the survey area was not available, the ability to take each Field through Key 2c of the FEP (which assesses the potential for botanical enhancement) was not possible. This was not considered to be a significant constraint to the assessment.

[5] Rodwell, J.S. (2006) NVC Users' Handbook, JNCC, Peterborough, ISBN 978 1 86107 574 1.

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RESULTS

Grassland survey

Field 1

Description

Field 1 was dominated by a shorter sward of smaller grasses reaching a height of approximately 50cm. In the south-east corner of the field locally dominant tall fescue *Schedonorus arundinacea* formed a small stand and towards the western edge of the field two patches of false oat *Arrhenatherum elatius* dominated grassland also occurred. The shorter grass Yorkshire fog *Holcus lanatus* dominated areas supported a reasonable abundance of flowering plants with bird's-foot trefoil *Lotus corniculatus*, hogweed *Heracleum sphondylium,* creeping thistle *Cirsium arvensis* and wood dock *Rumex sanguinea* all recorded as incidental finds during the transect. Common knapweed *Centaurea nigra* was present across the field in scattered patches where it was locally frequent, but it is not widespread in the sward. Hawthorn *Crataegus monogyna* and pedunculate oak *Quercus robur* saplings and sweet briar *Rosa rubiginosa* occurring as scattered individuals. Photograph 1 at the back of this document shows this field.

FEP Condition Assessment

As the cover of white clover *Trifolium repens* or rye grasses is less than 30% and the sward is moderately species rich (9-15 species per square meter) with a cover of wildflowers and sedges being 10% or more the field was assessed as being Semi-improved grassland **G02.** As less than four semi-improved grassland indicator species from Table 1 of the FEP manual were present however, it is considered as species poor semi-improved grassland. For this habitat type no condition assessment is required.

TECHNICAL NOTE 1

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Table 1 – Field 1 quadrat data

Species	Q1	Q2	Q3	Q4	Q5	Constancy
Anthoxanthum odoratum	40	5	4	5	25	V
Holcus lanatus	50	10	60	50	20	V
Dactylis glomerata	20	10	-	30	10	IV
Alopecurus pratensis	10	80	-	-	10	III
Festuca rubra	-	-	3	40	25	III
Arrhenatherum elatius	-	-	5	-	5	II
Rumex acetosa	-	-	2	1	5	III
Convolvulus arvensis	-	5	5	1	-	III
Lathyrus pratensis	20	5		-	-	II
Plantago lanceolata	-	-	2	-	5	II
Agrostis capillaris	-	-	5	5	-	II
Taraxacum officinalis agg.	2	-	-	-	-	I
Jacobaea vulgaris	-	-	3	-	-	I
Ranunculus acris	-	-	2	-	-	I

Comparison of quadrat data against NVC communities

Having reviewed the quadrat data against the Key to Mesotrophic grasslands In Volume 3 of the JNCC British Plant Communities, the vegetation community in Field 1 is considered to be a reasonable fit with the MG5 *Centaureo-Cynosuretum Lathyrus pratensis* sub-community. This is supported by the incidental records of *Centaurea nigra* and *Lotus corniculatus* are considered for the field as a whole.

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Field 2

Description

The field was mostly dominated by a tall sward of false oat grass, however the western edge of the field supported a shorter sward dominated by Yorkshire fog that extended as a thin strip through the taller false oat dominated sward to the east. Common knapweed was present occasionally in the shorter grassland, becoming locally frequent in patches. Occasional curled dock *Rumex crispus* was also recorded. The far eastern end of the field had evidence of some buildings, with concrete pads present and the vegetation had a range of ruderal species indicating recent disturbance. This area was excluded from the survey on this basis. Photograph 2 at the back of this document shows this field.

Table 2 – Field 2 quadrat data

Species	Q6	Q7	Q8	Q9	Q10	Constancy
Trisetum flavescens	5	5	1	40	60	V
Festuca rubra	5	20	30	10	-	IV
Arrhenatherum elatius	60	-	-	60	40	III
Holcus lanatus	60	50	40	-	-	III
Anthoxanthum odoratum	15	30	40	-	-	III
Alopecurus pratensis	3	-	3	-	-	II
Dactylis glomerata	-	5	-	-	-	I
Agrostis capillaris	5	-	-	-	-	I
Schedonorus arundinacea	-	-	4	-	-	I
Plantago 6anceolate	2	10	3	-	-	III
Rumex acetosa	2	5	2	-	-	III
Lotus corniculatus	-	40	20	-	-	II
Convolvulus arvensis	-	-	-	-	20	I
Centaurea nigra	2	-	-	-	-	I
Taraxacum officinalis agg.	-	-	5	-	-	I

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Comparison of quadrat data against NVC communities

Having reviewed the quadrat data from Field 2 against the Key to Mesotrophic grasslands In Volume 3 of the JNCC British Plant Communities, the quadrat data is a reasonable fit with a MG1 *Arrhenatheretum elatioris Centaurea nigra* sub-community in the more species rich areas, grading towards a MG1 *Arrhenatheretum elatioris Festuca rubra* sub-community in more species poor areas of the field.

FEP Condition Assessment

As the cover of white clover or rye grasses is less than 30% and the sward is moderately species rich (9-15 species per square meter) with a cover of wildflowers and sedges being 10% or more the field was assessed as being Semi-improved grassland **G02**, however as less than four semi-improved grassland indicator species from Table 1 of the FEP manual were present it is considered as species poor semi-improved grassland. For this habitat type no condition assessment is required.

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Field three

Description

The upper part of the field was dominated by tall grasses, with false oat and yellow oat grass being co dominant. Small patches of Yorkshire fog dominated sward were also present but covered very little of the total area. The southern part of the field was notable for a patch of rush dominated ground with noticeable wetter ground conditions. This area of rushes appears immediately below a small ridge/bank and is likely the result of either a small spring or possibly a broken field drain causing localised flushing. The grassland to the south of the rush dominated area grades back into false oat dominated sward, with the transition marked by tufted hair grass *Deschampsia cespitosa* and tall fescue being locally occasional. The rush dominated part of the field was noticeable wetter underfoot, though given the sustained dry period prior to the survey it was only damp as opposed to inundated. Evidence of poaching of the ground by livestock was noted, indicating that this area is normally waterlogged. As the rush dominated area was distinct from the wider community a series of quadrats was taken from this location, which are detailed in Table 4 below. Limited incidental species were recorded other than where the sward was much shorter due to regular use by dogwalkers. Red clover *Trifolium pratense*, white clover and perennial rye grass *Lolium perenne* were all frequent. Photograph 3 at the back of this document shows this field.

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Table 3 -Field 3 quadrat data

Species	Q11	Q12	Q13	Q14	Q15	Constancy
Arrhenatherum elatius	5	60	60	60	60	V
Trisetum flavescens	10	30	30	30	30	V
Anthoxanthum odoratum	15	-	5	-	-	II
Alopecurus pratensis	-	5	-	-	-	I
Dactylis glomerata	-	-	-	-	2	I
Holcus lanatus	80	-	-	-	-	I
Heracleum sphondylium	5	5	5	-	3	IV
Taraxacum officinalis agg.	2	-	-	-	-	I
Convolvulus arvensis	5	-	-	-	-	I
Plantago lanceolata	-	-	-	-	2	I
Rumex acetosa	-	-	-	-	2	I
Ranunculus acris	1	-	-	-	-	I

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Table 4 - Marshy grassland Quadrat data

Species	Q16	Q17	Q18	Q19	Q20	Constancy
Juncus articulatus	35	40	30	45	45	V
Juncus acutiflorus	35	40	30	45	45	V
Holcus lanatus	18	10	5	5	10	V
Lotus pedunculatus	20	15	30	8	5	V
Rumex acetosa	2	2	5	5	5	V
Anthoxanthum odoratum	5	5	2	-	5	IV
Festuca rubra	-	8	55	10	15	III
Carex hirsuta	2	-	5	5	-	III
Cardamine pratensis	-	1	-	1	1	III
Agrostis capillaris	-	-	2	-	2	II
Alopecurus pratensis	-	-	2	-	-	I
Plantago lanceolata	-	-	2	-	-	I
Dactylis glomerata	-	2	-	5	1	I
Centaurea nigra	-	5	-	-	-	I
Potentilla anserina	-	-	10	-	-	I
Ranunculus repens	-	-	2	-	-	I
Cerastium fontanum	-	-	-	1	-	I
Lathyrus pratensis	-	-	-	1	-	I
Jacobaea vulgaris	-	1	-	-	-	I

Comparison of quadrat data against NVC communities

Having reviewed the quadrat data from the grassland areas of Field 3 against the Key to Mesotrophic grasslands in Volume 3 of the JNCC British Plant Communities, the quadrat data is a reasonable fit with a MG1 *Arrhenatheretum elatioris Centaurea nigra* sub-community due to the presence of *Trisetum flavescens, Anthoxanthum odoratum*. The *Heracleum sphondylium* could be suggestive of a species poor MG2 *Arrhenatheretum elatioris-filipendula ulmaria* taller herb grassland, but in the absence of any of the other characteristic species it is felt that the community is a closer fit to the MG1 community.

Taking the quadrat data from the rush dominated area and taking it through the Dendrogram Keys to Mire Communities in British Plant Communities Volume 2: Mires and Heaths the community is closest in character to a species poor M23a community *Juncus effusus/acutiflorus Galium palustre* rush-pasture of a *Juncus acutiflorus* sub-community due to the absence of *Juncus effusus*. The rushes were not in flower and vegetative ID recorded the presence of *Juncus articulatus* and Juncus *acutiflorus only*. The constant species associated with this communities *Rumex acetosa* and *Lotus pedunculatus* were recorded along with lower instances of other species known to be associated with this community: *Lathyrus pratensis* and *Cardamine pratensis* and *Ranunculus repens*.

FEP Condition Assessment

As the cover of white clover or rye grasses is less than 30% and the sward is moderately species rich (9-15 species per square meter) with a cover of wildflowers and sedges being 10% or more the field was assessed as being Semi-improved grassland **G02**, however as less than four semi-improved grassland indicator species from Table 1 of the FEP manual were present it is considered as species poor semi-improved grassland. For this habitat type no condition assessment is required.

Field 4

Description

Tall grasses are dominant in the field with false and yellow oat grass being frequent, but not reaching dominance, with *Festuca rubra* and some other smaller grasses being a consistent presence in the sward. Pignut *Conopodium majus* was recorded by the presence of seed heads throughout the grassland. Hawthorn saplings were scattered across the field and on the margins of the field where the sward was much shorter due to regular use by dogwalkers. Red clover, white clover and perennial rye were all frequent. Photograph 4 at the back of this document shows this field.

Table 5 - Field 4 quadrat data

Species	Q21	Q22	Q23	Q24	Q25	Constancy
Arrhenatherum elatius	25	40	30	40	40	V
Trisetum flavescens	20	40	30	40	40	V
Holcus lanatus	10	25	10	5	5	V
Festuca rubra	40	25	40	40	35	V
Anthoxanthum odoratum	5	5	10	5	5	V
Dactylis glomerata	5	3	2	-	2	IV
Alopecurus pratensis	-	5	-	-	-	I
Centaurea nigra	25	5	5	5	25	V
Heracleum sphondylium	-	2	-	2	2	III
Plantago lanceolata	15	5	3	-	-	III
Conopodium majus	-	-	1	5	5	III
Rumex acetosa	-	-	1	3	-	II
Ranunculus acris	-	-	-	1	-	I
Lathyrus pratensis	-	-	-	2	-	I

Comparison of quadrat data against NVC communities

Having reviewed the quadrat data from Field 4 against the Key to Mesotrophic grasslands In Volume 3 of the JNCC British Plant Communities, the quadrat data is a good fit with a MG1 *Arrhenatheretum elatioris Centaurea nigra* sub-community.

FEP Condition Assessment

As the cover of white clover or rye grasses is less than 30% and the sward is moderately species rich (9-15 species per square meter) with a cover of wildflowers and sedges being 10% or more the field was assessed as being Semi-improved grassland **G02**, however as less than four semi-improved grassland indicator species from Table 1 of the FEP manual were present it is considered as species poor semi-improved grassland. For this habitat type no condition assessment is required.

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Field 5

Description

The field is dominated by tall grasses with false oat and yellow oat grass being co dominant, with red fescue being present in most of the sward. Field 5 was considered generally less floristically diverse that the other fields in the Site. Photograph 5 at the back of this document shows this field.

Table 6 - Field 5 quadrat data

Species	Q26	Q27	Q28	Q29	Q30	Constancy
Arrhenatherum elatius	40	40	50	20	15	V
Trisetum flavescens	40	40	50	20	15	V
Festuca rubra	5	-	-	50	40	III
Holcus lanatus	1	-	-	5	15	II
Anthoxanthum odoratum	10	-	-	-	10	II
Alopecurus pratensis	5	-	-	-	-	I
Dactylis glomerata	5	-	-	2	-	I
Convolvulus arvensis	10	5	-	-	5	III
Plantago lanceolata	-	-	2	2	4	III
Heracleum sphondylium	-	10	5	-	-	II
Lathyrus pratensis	-	3	-	-	3	II
Centaurea nigra	-	-	-	40	-	I
Rumex acetosa	2	-	-	-	-	I
Jacobaea vulgaris	-	-	-	1	-	I
Ranunculus acris	-	-	-	1	-	I

Comparison of quadrat data against NVC communities

Having reviewed the quadrat data from Field 5 against the Key to Mesotrophic grasslands In Volume 3 of the JNCC British Plant Communities, the quadrat data is a reasonable fit with a MG1 *Arrhenatheretum elatioris Centaurea nigra* sub-community.

FEP Condition Assessment

As the cover of white clover or rye grasses is less than 30% and the sward is moderately species rich (9-15 species per square meter) with a cover of wildflowers and sedges being 10% or more the field was assessed as being Semi-improved grassland **G02**, however as less than four semi-improved grassland indicator species from Table 1 of the FEP manual were present it is considered as species poor semi-improved grassland. For this habitat type no condition assessment is required.

Hedgerow survey

Hedgerow A

The margins of the main body of the hedgerow were inaccessible due to the presence of dense suckering blackthorn and bramble. Access to the old hedgebank and line of mature hawthorns marking the centre of the hedge was possible however at the base of a semi-mature pedunculate oak. The groundflora was dominated by ivy *Hedera helix* with occasional bluebell *Hyacinthoides non-scripta* and small patches of greater stitchwort *Stellaria holostea* and occasional lord's and ladies *Arum maculatum*. Some dog rose *Rosa canina* was also present. Due to the time of year a conclusive identification of the bluebell species was not possible. Based on the size or orientation of the seed pods however is was considered that the species is likely to be the native bluebell *Hyacinthoides non-scripta*; without flowers this identification is tentative, and it was acknowledged that the species could be a hybrid.

Hedgerow B

Similar to hedgerow A access to the original line of the hedge was restricted but where access was possible the ground fora was dominated by ivy with occasional wood avens *Geum urbanum*, sweet briar *Rosa rubiginosa*, white bryony *Bryonia dioica* and cleavers *Galium aparine.*

Incidental records

During the walkover meadow brown *Maniola jurtina*, marbled white *Melanargia galathea* and small skipper *Thymelicus sylvestris* butterflies were abundant. Where one of the footpaths crosses a hedgerow a colony of digger wasps was also recorded, A photograph of the digger wasps is shown in Photograph 6 below. Yellow meadow *Lasius flavus* anthills were present in low frequency in some of the field margins.
A raven *Corvus corax* was also present and calling on the Site from a perch on the pylon in Field three.

A dropping consistent with that of a hedgehog *Erinaceus europaeus* with beetle carapaces being conspicuous was also recorded in Field 4. A photograph of the dropping is shown in Photograph 7 below.

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SUMMARY

Further botanical survey of the Site indicates that Field 1 is a species poor example of a MG5 *Centaureo-Cynosuretum Lathyrus pratensis* sub-community grassland. Field 2 was assessed as being a species poor example of MG1 *Arrhenatheretum elatioris Centaurea nigra* sub-community in the areas of greater species diversity, grading towards a MG1 *Arrhenatheretum elatioris Festuca rubra* sub-community in more species poor areas of the field. Fields 3, 4 and 5 were all assessed as being species poor MG1 *Arrhenatheretum elatioris Centaurea nigra* sub-community grasslands with the exception of a small patch of marsh grassland in Field 3 which was a reasonable fit with a species poor M23a community *Juncus effusus/acutiflorus Galium palustre* rush-pasture of a *Juncus acutiflorus* sub-community due to the absence of *Juncus effusus*.

Assessment of the five fields using approach set out in the FEP Manual determined that all the fields were species poor-semi improved grassland and no condition assessment is required for this habitat type.

The additional hedgerow surveys recorded three Ancient woodland indicator species in hedgerow A but none in Hedgerow B, however as dense flanking scrub prevented access to the majority of the original hedge line including the sections originally assessed by WSP as part of the Hedgerow Regulations Survey it is possible further species were missed.

Date Modified: 30/06/2020 16:46

Drawn By: UKNPL002

Key

Transect route

Hedgerow survey extent

Field 5 - Qudrats 26-30

Hedgerow A

Field 1 - Quadrats 1-5

Field 4 - Quadrats 21-25

Field 2 - Quadrats 6-10

Field 3 - Quadrats 11-15

Hedgerow B

Field 3 Quadrats 16-20

0 10 20 30 40 m

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

wsp

TITLE:

Brislington Meadows botanical survey

FIGURE No:

Figure 1

File: Created using iGIS, WSP's Online Mapping System

TECHNICAL NOTE 1

DATE:	02 July 2020	**CONFIDENTIALITY:**	Public
SUBJECT:	Botanical Survey Report		
PROJECT:	Brislington Meadows	**AUTHOR:**	Niall Lusby
CHECKED:	Sam Pegler	**APPROVED:**	Marianne Curtis

PHOTOGRAPHS

Photograph 1 - Field 1

TECHNICAL NOTE 1

DATE:	02 July 2020	**CONFIDENTIALITY:**	Public
SUBJECT:	Botanical Survey Report		
PROJECT:	Brislington Meadows	**AUTHOR:**	Niall Lusby
CHECKED:	Sam Pegler	**APPROVED:**	Marianne Curtis

Photograph 2 – Field 2

TECHNICAL NOTE 1

DATE:	02 July 2020	**CONFIDENTIALITY:**	Public
SUBJECT:	Botanical Survey Report		
PROJECT:	Brislington Meadows	**AUTHOR:**	Niall Lusby
CHECKED:	Sam Pegler	**APPROVED:**	Marianne Curtis

Photograph 3 - Field 3 showing typical and marshy grassland

TECHNICAL NOTE 1

DATE:	02 July 2020	**CONFIDENTIALITY:**	Public
SUBJECT:	Botanical Survey Report		
PROJECT:	Brislington Meadows	**AUTHOR:**	Niall Lusby
CHECKED:	Sam Pegler	**APPROVED:**	Marianne Curtis

Photograph 4 - Field 4

TECHNICAL NOTE 1

DATE:	02 July 2020	**CONFIDENTIALITY:**	Public
SUBJECT:	Botanical Survey Report		
PROJECT:	Brislington Meadows	**AUTHOR:**	Niall Lusby
CHECKED:	Sam Pegler	**APPROVED:**	Marianne Curtis

Photograph 5 - Field 5

TECHNICAL NOTE 1

DATE:	02 July 2020	**CONFIDENTIALITY:**	Public
SUBJECT:	Botanical Survey Report		
PROJECT:	Brislington Meadows	**AUTHOR:**	Niall Lusby
CHECKED:	Sam Pegler	**APPROVED:**	Marianne Curtis

Photograph 6 - Digger wasps

TECHNICAL NOTE 1

DATE:	02 July 2020	**CONFIDENTIALITY:**	Public
SUBJECT:	Botanical Survey Report		
PROJECT:	Brislington Meadows	**AUTHOR:**	Niall Lusby
CHECKED:	Sam Pegler	**APPROVED:**	Marianne Curtis

Photograph 7 - potential hedgehog dropping

Annex 2

Grassland Survey Data

Brislington Meadows Ecological Technical Appendix D

Annex 2: Grassland Survey Data May and July (combined) 2021

Species lists, quadrat data and TABLEFIT analysis per field parcel is detailed in the below tables.

Field F1

Target Note

Alopecurus pratensis	A
Arrhenatherum elatius	A
Holcus lanatus	A
Anthoxanthum odoratum	F
Festuca rubra	F
Plantago lanceolata	F
*Centaurea nigra**	O
Cerastium fontanum	O
Dactylis glomerata	O
Heracleum sphondylium	O
*Lathyrus pratensis**	O
Lolium perenne	O
*Lotus corniculatus**	O
Poa trivialis	O
Trifolium pratense	O
Ranunculus bulbosus	R
Schedonorus arundinaceus	R
Veronica chamaedrys	R
Vicia sativa	R

* Denotes HPI lowland meadow indicator species

3 indicator species identified, all occurring occasionally in the sward

Q24 Species List

Holcus lanatus	8
Dactylis glomerata	6
Alopecurus pratensis	5
Festuca rubra	5
Lathyrus pratensis	5
Agrostis capillaris	4
Anthoxanthum odoratum	3
Ranunculus acris	3
Rumex acetosa	1

Q25 Species List

Holcus lanatus	7
Dactylis glomerata	6
Anthoxanthum odoratum	5
Arrhenatherum elatius	5
Festuca rubra	4
Plantago lanceolata	3
Lotus corniculatus	2
Ranunculus acris	2

Field F1

Q26 Species List

Holcus lanatus	7
Dactylis glomerata	6
Agrostis capillaris	5
Alopecurus pratensis	5
Lathyrus pratensis	5
Anthoxanthum odoratum	4
Cirsium arvense	1
Lotus corniculatus	1

Field F1 - TableFit Analysis

TableFit Results Q24

MG 7d 57 | 70 76 55 61| Lol pere hay-meadow Lol per-Alo pra
MC 9e 56 | 66 82 58 59| Fest rubra-Holcu lanat Anthox odorat
U 4b 56 | 57 88 60 69| Fes ovi-Agr cap-Gal sax Hol lan-Tri rep
MG 7c 55 | 73 85 45 64| Lol pere flood-pasture Lol-Alop-Fes pr
MC 9b 51 | 51 55 72 61| Fest rubra-Holcu lanat Dactyl glomer

Table Fit Results Q25

MG 1a 75 | 81 79 81 72| Arrhenatherum elatius Festuca rubra
MG 1 71 | 69 91 75 87| Arrhenatherum elatius
MG 1e 66 | 62 100 69 95| Arrhenatherum elatius Centaurea nigra
MG 9b 60 | 70 72 59 76| Holc lana-Desch cespit Arrhen elatius
W24b 59 | 41 66 87 81| Rub fr-Hol la underscb Arr ela-Her sph

TableFit Results Q26

MG 7d 52 | 64 65 54 66| Lol pere hay-meadow Lol per-Alo pra
U 4b 51 | 42 72 71 68| Fes ovi-Agr cap-Gal sax Hol lan-Tri rep
MG 7c 46 | 58 73 43 67| Lol pere flood-pasture Lol-Alop-Fes pr
OV23d 43 | 36 51 71 59| Loli-Dactyl weedy grass Arr ela-Med lup
MC 9e 39 | 44 61 53 53| Fest rubra-Holcu lanat Anthox odorat

Field F2

Target Note

Alopecurus pratensis	A
Arrhenatherum elatius	A
Anthoxanthum odoratum	F
Dactylis glomerata	F
Festuca rubra	F
Holcus lanatus	F
Achillea millefolium	O
Anisanthera sterilis	O
*Centaurea nigra**	O
*Conopodium majus**	O
Geranium dissectum	O
Heracleum sphondylium	O
*Lathyrus pratensis**	O
Lolium perenne	O
*Lotus corniculatus**	O
Poa annua	O
Poa trivialis	O
Ranunculus acris	O
Ranunculus bulbosus	O
Ranunculus repens	O
Rumex acetosa	O

* Denotes HPI lowland meadow indicator species

4 indicator species identified, all occurring occasionally in the sward

Field F2		
Trifolium pratense	O	
Epilobium sp.	R	
Geranium molle	R	
Hypochaeris radicata	R	
Rumex crispus	R	
Q22 Species List		
Arrhenatherum elatius	7	
Holcus lanatus	6	
Centaurea nigra	5	
Festuca rubra	5	
Agrostis capillaris	4	
Alopecurus pratensis	4	
Anthoxanthum odoratum	3	
Plantago lanceolata	3	
Dactylis glomerata	2	
Lotus corniculatus	2	
Taraxacum officinale agg.	1	
Q23 Species List		
Holcus lanatus	7	
Festuca rubra	6	
Agrostis capillaris	5	
Alopecurus pratensis	5	
Arrhenatherum elatius	4	
Centaurea nigra	4	
Anthoxanthum odoratum	3	
Lotus corniculatus	3	
Plantago lanceolata	3	
Heracleum sphondylium	2	
Ranunculus repens	2	
Q27 Species List		
Holcus lanatus	8	
Festuca rubra	5	
Agrostis capillaris	4	
Arrhenatherum elatius	4	
Cirsium arvense	4	
Lathyrus pratensis	3	
Dactylis glomerata	2	
Q28 Species List		
Arrhenatherum elatius	8	
Alopecurus pratensis	7	
Vicia sativa	4	
Convolvulus arvensis	3	

Field F2

Field F2 – TableFit Analysis

TableFit Results Q22

MG 1 83 | 86 82 87 81| Arrhenatherum elatius
MG 1a 75 | 96 67 92 67| Arrhenatherum elatius Festuca rubra
MG 1e 75 | 76 100 74 87| Arrhenatherum elatius Centaurea nigra
MG 9b 61 | 83 67 55 70| Holc lana-Desch cespit Arrhen elatius
MG 1d 60 | 61 77 73 62| Arrhenatherum elatius Pastin sativa

TableFit Results Q23

MC 9e 64 | 66 67 81 68| Fest rubra-Holcu lanat Anthox odorat
MG 1e 63 | 73 100 56 74| Arrhenatherum elatius Centaurea nigra
U 4b 59 | 54 68 75 70| Fes ovi-Agr cap-Gal sax Hol lan-Tri rep
MC 9 58 | 65 56 78 62| Fest rubra-Holcu lanat
MC 9c 56 | 54 60 76 66| Fest rubra-Holcu lanat Achill millef

TableFit Results Q27

MG 1a 62 | 88 98 43 60| Arrhenatherum elatius Festuca rubra
W24b 56 | 44 82 79 68| Rub fr-Hol la underscb Arr ela-Her sph
MG 9b 56 | 80 94 34 71| Holc lana-Desch cespit Arrhen elatius
MG 1 53 | 69 100 39 76| Arrhenatherum elatius

TableFit Results Q28

MG 1a 51 | 35 64 77 74| Arrhenatherum elatius Festuca rubra
MG 1 46 | 26 68 71 80| Arrhenatherum elatius
MG 1d 31 | 19 66 56 57| Arrhenatherum elatius Pastin sativa
MG 1c 30 | 21 53 52 62| Arrhenatherum elatius Filip ulmaria

Field F3

Target Note

Alopecurus pratensis	A
Arrhenatherum elatius	F
Heracleum sphondylium	F
Holcus lanatus	F
Plantago lanceolata	F
Poa annua	F
Poa trivialis	F
Agrostis capillaris	O
Anthoxanthum odoratum	O
Convolvulus arvensis	O
*Centaurea nigra**	O
Cerastium fontanum	O
*Lathyrus pratensis**	O
Lolium perenne	O
Ranunculus acris	O
Rumex acetosa	O
Rumex crispus	O
Trifolium pratense	O
Trifolium repens	O
Vicia sativa	O
*Conopodium majus**	R
*Lotus corniculatus**	R
Rumex crispus	R
Schedonorus arundinaceus	R
Silene dioica	R

* Denotes HPI lowland meadow indicator species

4 indicator species identified. 2 occurring occasionally and 2 rarely in the sward

Field F3

Q1 Species List

Arrhenatherum elatius	9
Holcus lanatus	5
Plantago lanceolata	3
Ranunculus acris	3
Rumex acetosa	3
Agrostis stolonifera	2
Dactylis glomerata	2
Heracleum sphondylium	2
Lotus corniculatus	2
Sonchus asper	1

Q4 Species List

Arrhenatherum elatius	8
Heracleum sphondylium	7
Alopecurus pratensis	5
Holcus lanatus	4
Dactylis glomerata	3
Anthoxanthum odoratum	2
Centaurea nigra	2
Plantago lanceolata	2
Rumex acetosa	2
Vicia sepium	2
Juncus inflexus	1
Schedonorus arundinaceus	1

Q5 Species List

Arrhenatherum elatius	8
Alopecurus pratensis	5
Centaurea nigra	4
Dactylis glomerata	4
Festuca rubra	4
Anthoxanthum odoratum	3
Convolvulus arvensis	2
Heracleum sphondylium	2
Lathyrus pratensis	2

Q6 Species List

Arrhenatherum elatius	8
Holcus lanatus	6
Alopecurus pratensis	5
Ranunculus acris	3
Heracleum sphondylium	2
Rumex acetosa	2

Field F3

Q7 Species List

Holcus lanatus	7
Arrhenatherum elatius	6
Agrostis capillaris	5
Dactylis glomerata	4
Festuca rubra	4
Lathyrus pratensis	4
Cirsium arvense	3
Heracleum sphondylium	3
Poa pratensis	3
Achillea millefolium	2
Anthoxanthum odoratum	2
Lolium perenne	2
Ranunculus acris	2

Q8 Species List

Holcus lanatus	7
Alopecurus pratensis	6
Arrhenatherum elatius	6
Agrostis capillaris	5
Centaurea nigra	5
Festuca rubra	5
Anthoxanthum odoratum	4
Dactylis glomerata	4
Lathyrus pratensis	3
Plantago lanceolata	3
Ranunculus repens	3
Heracleum sphondylium	2
Lotus corniculatus	2

Field F3 – TableFit Analysis

TableFit Results Q1

MG 1a 79 | 88 69 83 100| Arrhenatherum elatius Festuca rubra
MG 1 76 | 74 78 82 100| Arrhenatherum elatius
MG 1c 65 | 68 70 68 99| Arrhenatherum elatius Filip ulmaria
MG 9b 58 | 75 62 53 86| Holc lana-Desch cespit Arrhen elatius
MG 1d 55 | 47 66 70 86| Arrhenatherum elatius Pastin sativa

TableFit Results Q4

MG 1 83 | 80 75 91 99| Arrhenatherum elatius
MG 1a 76 | 88 57 90 87| Arrhenatherum elatius Festuca rubra
MG 1c 64 | 68 58 74 79| Arrhenatherum elatius Filip ulmaria
MG 1e 62 | 69 86 55 93| Arrhenatherum elatius Centaurea nigra
MG 9b 57 | 80 58 60 61| Holc lana-Desch cespit Arrhen elatius

TableFit Results Q5

MG 1 73 | 74 52 94 90| Arrhenatherum elatius
MG 1a 69 | 81 42 100 83| Arrhenatherum elatius Festuca rubra
MG 1e 67 | 72 72 70 82| Arrhenatherum elatius Centaurea nigra
W24b 52 | 44 38 90 71| Rub fr-Hol la underscb Arr ela-Her sph
MG 1d 47 | 51 47 68 60| Arrhenatherum elatius Pastin sativa

TableFit Results Q6

MG 1 63 | 49 83 78 99| Arrhenatherum elatius
MG 1a 59 | 50 61 79 80| Arrhenatherum elatius Festuca rubra
MG 1c 59 | 53 87 66 88| Arrhenatherum elatius Filip ulmaria
MG 1b 45 | 53 52 56 65| Arrhenatherum elatius Urtica dioica
MG 9b 44 | 44 62 51 81| Holc lana-Desch cespit Arrhen elatius

Field F3

TableFit Results Q7

MG 1 88 | 97 82 100 80| Arrhenatherum elatius
MG 1a 80 |100 73 100 67| Arrhenatherum elatius Festuca rubra
MG 1d 72 | 75 78 86 67| Arrhenatherum elatius Pastin sativa
MG 1e 72 | 76 87 72 79| Arrhenatherum elatius Centaurea nigra
W24b 69 | 65 65 100 71| Rub fr-Hol la underscb Arr ela-Her sph

TableFit Results Q8

MG 1 70 | 80 70 97 58| Arrhenatherum elatius
MG 1e 62 | 73 91 62 60| Arrhenatherum elatius Centaurea nigra
MG 1d 61 | 64 74 83 57| Arrhenatherum elatius Pastin sativa
MG 1a 61 | 88 57 99 45| Arrhenatherum elatius Festuca rubra
MG 1c 57 | 68 58 80 52| Arrhenatherum elatius Filip ulmaria

Field F3a

Target Note

*Juncus acutiflorus**	A
Agrostis stolonifera	F
Cardamine pratensis	F
Deschampsia cespitosa	F
Festuca rubra	F
Holcus lanatus	F
*Lotus pedunculatus**	F
Ranunculus repens	F
Rumex acetosa	F
Anthoxanthum odoratum	O
Geranium dissectum	O
*Lathyrus pratensis**	O
Plantago lanceolata	O
Potentilla anserina	O
Ranunculus acris	O

* Denotes HPI rush pasture indicator species

3 indicator species identified. 1 occurring abundantly, 1 frequently and 1 occasionally in the sward

Q02 Species List

Deschampsia cespitosa	7
Juncus acutiflorus	6
Holcus lanatus	5
Lathyrus pratensis	4
Lotus pedunculatus	4
Agrostis stolonifera	3
Anthoxanthum odoratum	3
Rumex acetosa	3
Ranunculus acris	2

Field F3a

Q03 Species List

Holcus lanatus	7
Lotus pedunculatus	7
Agrostis stolonifera	4
Centaurea nigra	4
Dactylis glomerata	4
Anthoxanthum odoratum	3
Deschampsia cespitosa	3
Festuca rubra	3

Field F3a – TableFit Analysis

TableFit Results Q2

MG 9a 80 | 81 81 98 71| Holc lana-Desch cespit Poa trivialis
MG 9 80 | 83 78 98 71| Holc lana-Desch cespit
M23a 63 | 62 82 85 61| Junc eff/acfl-Gal palu Junc acutifl
MG 9b 41 | 55 50 53 53| Holc lana-Desch cespit Arrhen elatius
M23b 38 | 67 72 21 46| Junc eff/acfl-Gal palu Junc effusus

TableFit Results Q3

MG 9 57 |100 64 48 55| Holc lana-Desch cespit
MG 9a 46 | 91 56 39 48| Holc lana-Desch cespit Poa trivialis
MG 1e 43 | 65 57 46 48| Arrhenatherum elatius Centaurea nigra
MG 9b 42 | 83 51 38 46| Holc lana-Desch cespit Arrhen elatius
MC 9 40 | 79 43 49 41| Fest rubra-Holcu lanat

Field F4

Target Note

Alopecurus pratensis	A
Arrhenatherum elatius	A
Holcus lanatus	A
Anthoxanthum odoratum	F
*Conopodium majus**	F
Dactylis glomerata	F
Festuca rubra	F
Rumex acetosa	F
*Centaurea nigra**	O
Cerastium fontanum	O
Heracleum sphondylium	O
Hyacinthoides non-scripta	O
Lolium perenne	O
*Lotus corniculatus**	O
Plantago lanceolata	O
Ranunculus acris	O
Ranunculus bulbosus	O
Trifolium pratense	O
Veronica chamaedrys	O
Ficaria verna	R
*Galium verum**	R
*Lathyrus pratensis**	R
Ranunculus repens	R
Rumex obtusifolius	R
Taraxacum officinale agg.	R
Trifolium repens	R

* Denotes HPI lowland meadow indicator species

5 indicator species identified. 1 occurring frequently, 2 occasionally and 2 rarely in the sward

Field F4

Q09 Species List

Arrhenatherum elatius	6
Centaurea nigra	6
Holcus lanatus	6
Agrostis capillaris	5
Anthoxanthum odoratum	5
Dactylis glomerata	5
Festuca rubra	5
Alopecurus pratensis	4
Hyacinthoides non-scripta	3
Poa trivialis	3
Ranunculus acris	3
Achillea millefolium	2
Rumex acetosa	2

Q10 Species List

Holcus lanatus	7
Alopecurus pratensis	5
Arrhenatherum elatius	5
Centaurea nigra	5
Tussilago farfara	5
Agrostis capillaris	4
Anthoxanthum odoratum	3
Rumex acetosa	3
Cirsium arvense	2
Conopodium majus	2
Plantago lanceolata	2
Jacobaea vulgaris	1

Q11 Species List

Festuca rubra	6
Holcus lanatus	6
Agrostis capillaris	5
Arrhenatherum elatius	5
Alopecurus pratensis	4
Centaurea nigra	4
Dactylis glomerata	4
Anthoxanthum odoratum	3
Lathyrus pratensis	3
Heracleum sphondylium	2
Rumex acetosa	2
Plantago lanceolata	1

Q12 Species List

Holcus lanatus	8
Arrhenatherum elatius	6
Centaurea nigra	4
Agrostis capillaris	3
Anthoxanthum odoratum	3
Dactylis glomerata	3
Heracleum sphondylium	2
Lotus corniculatus	2
Plantago lanceolata	2
Ranunculus repens	2
Lathyrus pratensis	1
Rumex acetosa	1

Field F4

Q13 Species List

Alopecurus pratensis	7
Arrhenatherum elatius	7
Dactylis glomerata	5
Holcus lanatus	4
Agrostis capillaris	2
Anthoxanthum odoratum	2
Heracleum sphondylium	2
Lathyrus pratensis	2
Poa trivialis	2
Rumex acetosa	2
Ranunculus acris	1

Field F4 – TableFit Analysis

TableFit Results Q9

MG 1e 77 | 73 84 94 78| Arrhenatherum elatius Centaurea nigra
MG 1 75 | 86 69 100 66| Arrhenatherum elatius
MG 1a 63 | 88 53 100 53| Arrhenatherum elatius Festuca rubra
U 4b 62 | 67 70 87 55| Fes ovi-Agr cap-Gal sax Hol lan-Tri rep
MG 9b 60 | 83 60 65 60| Holc lana-Desch cespit Arrhen elatius

TableFit Results Q10

MG 1 57 | 74 65 58 59| Arrhenatherum elatius
MG 1e 49 | 54 66 60 62| Arrhenatherum elatius Centaurea nigra
MG 1c 43 | 57 47 60 50| Arrhenatherum elatius Filip ulmaria
MG 1d 42 | 53 67 50 50| Arrhenatherum elatius Pastin sativa
MG 9b 41 | 60 48 47 54| Holc lana-Desch cespit Arrhen elatius

TableFit Results Q11

MG 1e 80 | 85 100 78 80| Arrhenatherum elatius Centaurea nigra
MG 1 77 | 91 84 76 66| Arrhenatherum elatius
MG 1a 71 |100 71 79 57| Arrhenatherum elatius Festuca rubra
MG 9b 62 | 83 69 60 65| Holc lana-Desch cespit Arrhen elatius
MC 9e 61 | 69 64 79 58| Fest rubra-Holcu lanat Anthox odorat

TableFit Results Q12

MG 1 89 | 91 84 91 94| Arrhenatherum elatius
MG 1e 76 | 85 100 66 95| Arrhenatherum elatius Centaurea nigra
MG 1a 72 | 96 62 88 65| Arrhenatherum elatius Festuca rubra
MG 1c 71 | 80 69 73 82| Arrhenatherum elatius Filip ulmaria
MG 1d 70 | 67 78 79 81| Arrhenatherum elatius Pastin sativa

TableFit Results Q13

MG 1 79 | 74 71 98 84| Arrhenatherum elatius
MG 1a 73 | 85 57 100 73| Arrhenatherum elatius Festuca rubra
MG 1c 73 | 77 76 81 70| Arrhenatherum elatius Filip ulmaria
MG 1e 60 | 65 87 62 70| Arrhenatherum elatius Centaurea nigra
MG 9b 59 | 70 60 63 74| Holc lana-Desch cespit Arrhen elatius

Field F5

Target Note

Alopecurus pratensis	D
Holcus lanatus	A
Anthoxanthum odoratum	F
Festuca rubra	F
Ranunculus bulbosus	F
Rumex acetosa	F
*Centaurea nigra**	O
Cerastium fontanum	O
Cirsium arvense	O
Dactylis glomerata	O
Heracleum sphondylium	O
*Lathyrus pratensis**	O
Lolium perenne	O
Plantago lanceolata	O
Poa annua	O
Poa trivialis	O
Ranunculus acris	O
Trifolium pratense	O
Vicia sativa	O
*Conopodium majus**	R
*Lotus corniculatus**	R
Polygonum aviculare	R

* Denotes HPI lowland meadow indicator species

4 indicator species identified. 2 occurring occasionally and 2 rarely in the sward

Q19 Species List

Arrhenatherum elatius	8
Holcus lanatus	6
Alopecurus pratensis	4
Agrostis capillaris	3
Anthoxanthum odoratum	3
Convolvulus arvensis	2
Heracleum sphondylium	2
Lathyrus pratensis	2
Rumex acetosa	1

Q20 Species List

Festuca rubra	8
Holcus lanatus	6
Agrostis capillaris	4
Alopecurus pratensis	3
Anthoxanthum odoratum	3
Arrhenatherum elatius	3
Dactylis glomerata	3
Lathyrus pratensis	3
Lotus corniculatus	2
Plantago lanceolata	1

Q21 Species List

Arrhenatherum elatius	6
Festuca rubra	6
Holcus lanatus	6
Agrostis capillaris	4
Alopecurus pratensis	4
Anthoxanthum odoratum	4
Dactylis glomerata	3
Lotus corniculatus	2
Cerastium fontanum	1
Rumex acetosa	1

Field F5

Field F5 – TableFit Analysis

TableFit Results Q19

MG 1 62 | 54 62 79 97| Arrhenatherum elatius
MG 1a 59 | 58 46 79 79| Arrhenatherum elatius Festuca rubra
MG 1c 57 | 57 63 66 84| Arrhenatherum elatius Filip ulmaria
MG 1d 50 | 39 59 70 79| Arrhenatherum elatius Pastin sativa
MG 1e 45 | 48 79 45 84| Arrhenatherum elatius Centaurea nigra

TableFit Results Q20

MC 9 65 | 70 66 73 78| Fest rubra-Holcu lanat
MC 9e 64 | 66 74 69 80| Fest rubra-Holcu lanat Anthox odorat
MC 9c 63 | 57 70 77 78| Fest rubra-Holcu lanat Achill millef
MC 8d 57 | 68 45 76 69| Fest rubra-Armer marit Holcus lanatus
U 4b 57 | 57 79 60 84| Fes ovi-Agr cap-Gal sax Hol lan-Tri rep

TableFit Results Q21

MC 9e 66 | 69 77 76 65| Fest rubra-Holcu lanat Anthox odorat
U 4b 65 | 67 92 70 71| Fes ovi-Agr cap-Gal sax Hol lan-Tri rep
MG 1 65 | 63 67 87 70| Arrhenatherum elatius
MG 9b 64 | 80 70 62 68| Holc lana-Desch cespit Arrhen elatius
MG 1a 63 | 70 52 95 63| Arrhenatherum elatius Festuca rubra

Field F6

Target Note

Agrostis capillaris	A
Cynosurus cristatus	A
Achillea millefolium	F
Anthoxanthum odoratum	F
*Centaurea nigra**	F
Holcus lanatus	F
Hordeum secalinum	F
*Lotus corniculatus**	F
Rumex obtusifolius	F
Trifolium pratense	F
Cerastium fontanum	O
Crepis capillaris	O
Festuca rubra	O
Hypochaeris radicata	O
Jacobaea vulgaris	O
Lolium perenne	O
Malva moschata	O
Plantago major	O
Poa pratensis	O
Prunella vulgaris	O
Ranunculus repens	O
Rumex acetosa	O
Trifolium repens	O
Allium vineale	R
Bromus hordeaceus	R
Cirsium vulgare	R
*Galium verum**	R
Helminthotheca echioides	R
Polytrichum juniperinum	R
Rumex acetosella	R
Trifolium arvense	R

* Denotes HPI lowland meadow indicator species

3 lowland meadow indicator species identified. 2 occurring frequently and 1 rarely in the sward

Field F6		
Q14 Species List		
Agrostis capillaris	7	
Cynosurus cristatus	7	
Dactylis glomerata	5	
Lotus corniculatus	5	
Achillea millefolium	4	
Plantago lanceolata	4	
Centaurea nigra	3	
Crepis capillaris	3	
Hypochaeris radicata	3	
Lolium perenne	3	
Poa pratensis	3	
Rumex acetosa	3	
Trifolium repens	3	
Malva moschata	2	
Taraxacum officinale agg.	2	
Trifolium pratense	2	
Q15 Species List		
Agrostis capillaris	7	
Cynosurus cristatus	7	
Achillea millefolium	5	
Centaurea nigra	5	
Lolium perenne	4	
Bare Ground	3	
Lotus corniculatus	3	
Poa pratensis	3	
Poa trivialis	3	
Anthoxanthum odoratum	2	
Plantago lanceolata	2	
Vulpia bromoides	1	
Q16 Species List		
Holcus lanatus	8	
Cynosurus cristatus	6	
Trifolium pratense	5	
Agrostis capillaris	4	
Achillea millefolium	3	
Jacobaea vulgaris	3	
Lolium perenne	3	
Lotus corniculatus	3	
Dactylis glomerata	2	
Prunella vulgaris	2	
Ranunculus repens	2	
Q17 Species List		
Agrostis capillaris	8	
Achillea millefolium	5	
Holcus lanatus	5	
Lolium perenne	5	
Trifolium pratense	4	
Hypochaeris radicata	3	
Lotus corniculatus	3	
Poa trivialis	3	
Trifolium repens	3	
Crepis capillaris	2	
Malva moschata	2	

Field F6

Polytrichum juniperinum	1
Rumex acetosella	1
Trifolium arvense	1

Q18 Species List

Agrostis capillaris	8
Cynosurus cristatus	5
Achillea millefolium	4
Lotus corniculatus	4
Holcus lanatus	2
Hypochaeris radicata	2
Polytrichum juniperinum	2
Trifolium repens	2
Poa pratensis	1

Field – F6 TableFit Analysis

TableFit Results Q14

MG 5 73 | 80 97 66 96| Cynos cris-Centaur nigr
MG 5a 71 | 77 98 65 95| Cynos cris-Centaur nigr Lath pratensis
MG 5b 63 | 73 94 54 91| Cynos cris-Centaur nigr Galium verum
OV23d 59 | 81 64 85 44| Loli-Dactyl weedy grass Arr ela-Med lup
MG 5c 55 | 52 78 62 80| Cynos cris-Centaur nigr Danth decumbens

TableFit Results Q15

MG 5a 48 | 55 100 41 95| Cynos cris-Centaur nigr Lath pratensis
MG 5 48 | 56 100 40 95| Cynos cris-Centaur nigr
MG 6b 47 | 57 68 45 72| Lolium per-Cynos cris Anthox odorat
U 4b 46 | 55 68 50 59| Fes ovi-Agr cap-Gal sax Hol lan-Tri rep
MG 5b 45 | 52 98 39 93| Cynos cris-Centaur nigr Galium verum

TableFit Results Q16

MG 6a 57 | 77 70 46 76| Lolium per-Cynos cris Typical
MG 5b 48 | 54 100 42 92| Cynos cris-Centaur nigr Galium verum
MG 5a 47 | 55 100 40 96| Cynos cris-Centaur nigr Lath pratensis
MG 5 47 | 54 97 39 96| Cynos cris-Centaur nigr
MG 6 46 | 63 61 41 75| Lolium per-Cynos cris

TableFit Results Q17

U 1f 54 | 83 41 98 48| Fes ovi-Agr cap-Rum acl Hypoch radicata
U 4b 53 | 52 51 69 78| Fes ovi-Agr cap-Gal sax Hol lan-Tri rep
MG 6a 43 | 68 49 43 62| Lolium per-Cynos cris Typical
MG 6b 40 | 49 49 47 75| Lolium per-Cynos cris Anthox odorat
OV23d 40 | 62 50 38 61| Loli-Dactyl weedy grass Arr ela-Med lup

TableFit Results Q18

U 1f 63 | 67 53 98 62| Fes ovi-Agr cap-Rum acl Hypoch radicata
U 4b 51 | 55 84 49 83| Fes ovi-Agr cap-Gal sax Hol lan-Tri rep
MG 6a 42 | 64 71 29 63| Lolium per-Cynos cris Typical
MG 5 42 | 46 100 37 100| Cynos cris-Centaur nigr
MG 6b 41 | 52 76 36 80| Lolium per-Cynos cris Anthox odorat

Annex 3

Quadrat Data and TABLEFIT Explanation

Brislington Meadows Ecological Technical Appendix D

Annex 3: Quadrat Data and TABLEFIT Explanation

1. When recording and analysing vegetation there are two significant properties of the vegetation types that help define the different communities and sub-communities. Firstly there is abundance, this refers to the dominance of any particular plant within a stand, that is to say the proportion of ground that the plant occupies. For the purposes of NVC analysis the cover abundance is recorded using the Domin scale, where Domin is an abbreviation of dominance. The scale runs from 1, where there may be only one or two individuals in any given sample area to 10 where the dominant species may well occupy 100 % of the plot; as, for example, Common Reed in a dense reedbed.

2. The full scale is as follows:

Percentage cover		Domin value
91 -100%		10
76 - 90%		9
51 - 75%		8
34 - 50%		7
26 - 33%		6
11 - 25%		5
4 - 10%		4
< 4%	Many individuals	3
	Several individuals	2
	Few individuals	1

3. These percentage bands give an approximation of the abundance of each species in a quadrat in the field. Whilst it is frequent for the upper limits of each band to exceed 100% when the score for each plant is accumulated, especially in layered vegetation such as woodlands, the total upper percentage cannot be less than 100% unless other features such as bare ground, leaf litter or open water are recorded, a quick calculation in the field prevents species being under-recorded.

4. The second way that plant species can make their presence felt in any NVC community is by frequency, also known as constancy. Common Reed is expected to be dominant in a set of reedbed samples and it is also very likely to be constant; that is occurring in a high percentage of the samples. On the other hand, a species such as Hemp Agrimony often occurs with reeds and can be at very low levels of abundance. It is quite possible for Hemp Agrimony to be present at a Domin level of 2 in eight out of ten reedbed samples. In this case Hemp Agrimony (occurring in 80% of the samples) would also be a constant species, that is to say it is almost as equally

frequent as Common Reed, although nowhere near as abundant. The combinations of abundance and frequency are used to define NVC communities and in this case reedbeds with constant Hemp Agrimony would more likely be S26 type than S4 which is more of a reed monoculture. The definitions of frequency are as follows, depending on what percentage of samples a particular species is recorded in:

Percentage occurrence	Description	Frequency Class
81 -100%	Constant	V
61 - 80%	Constant	IV
41 - 60%	Frequent	III
21 - 40%	Occasional	II
1 -20%	Scarce	I

5. In the NVC floristic tables, published for every vegetation community and sub-community described in the National Vegetation Classification, the frequency is always expressed at a Roman numeral (from I -V) with the range of dominances recorded (Domin 1 -10) expressed in Arabic numerals, say (7 - 9) for a more dominant species and (1 - 2) for a much less dominant species. In recognising many NVC communities the frequency of a species can be just as significant as the dominance.

6. When entering data into TABLEFIT, or other similar programmes such as MATCH, MAVIS or TURBOVEG, it usually only the Domin levels of each species that are known, the frequency can then be worked out once a full dataset has been entered; how this is done varies from programme to programme. It is possible to work out frequency values for each species in advance of allocating NVC types if so desired. In that case the manual dichotomous keys in each of the five volumes of the NVC can be utilised, having first drawn up floristic tables specific to the site to compare with the floristic tables nationally.

7. TABLEFIT version 2.0 is a tried and tested vegetation analysis programme compiled by Dr Mark Hill of the Institute of Terrestrial Ecology in 1996. TABLEFIT has been adopted as standard by TEP ecologists. When NVC samples have been collected, using the approved methodology, the species and Domin data are entered and the programme makes an objective analysis of which vegetation community it most closely matches. However, as the 2000 review of the NVC shows, the classification system is still evolving to some extent and there are some communities that occur in the British Isles that have not yet been classified, this has an effect on the accuracy of some of the output and it is very frequent, for example, for inland grasslands dominated by Red Fescue to be spuriously analysed as Maritime Grasslands even though far from any coastal influence. Therefore, the TABLEFIT output needs to be interpreted carefully, especially when the goodness-of-fit rating descends to Fair or lower (Poor and Very Poor). Whilst the TABLEFIT output is always useful as a guide, the manual keys, the community descriptions and the floristic tables are just as useful and they should all be used together to help an experienced ecologist make the best interpretation.

8. The TABLEFIT goodness-of-fit rating can range from 0 to 100, with increasing closeness of fit with ascending scores, the ratings are as follows:

Goodness-of-fit	Rating
80 - 100	Very good
70 - 79	Good
60 - 69	Fair
50 - 59	Poor
0 - 49	Very poor

9. Even when a very good rating is indicated it is always worth checking through the community descriptions and floristic tables to double check, but these higher ratings are more often than not accurate and provide a very useful tool in helping to identify NVC community types.

10. However there are many instances where the top rating of the five best fits should not simply be accepted, in some cases different communities have very similar scores or the scores are simply too low to give any confidence. There are many factors involved: there may well be zones of transition between communities that have been sampled, or in the case of many sites that we are called on to survey, the vegetation is still simply too young to have developed fully into one of the semi-natural community types that the NVC was designed to define. TABLEFIT analysis can be very useful in recognising different communities in transition and sometimes a transitional type is identified and mapped as such. Many samples of developing vegetation simply cannot be identified to sub-community level and are allocated as undifferentiated communities with no sub-community suffix. The experience of the ecological surveyors is important as they will be able to balance the dominant and frequent species recorded from site and compare various floristic tables and descriptions to arrive at logical conclusions.

11. The TABLEFIT output indicates the NVC community type of the top five matches in the first column, the second column then gives the overall ‘goodness-of-fit’ rating, this is not a percentage but a classification derived from the average of four individual values that are also included in the output table.

12. The first column of these four values relates to the fit of the species composition of each sample with the NVC data nationally, but with increased weighting for the species with higher frequency values (III-V).

13. The second column is the mean constancy of species in the sample, as a proportion of what would be expected for each community. For species-poor sample this column 2 number tends to be low, but column 1 value would be high.

14. In the third column the figures represent dominance satisfaction, that is to say it checks that species that are expected to have a high Domin value in that community

do in fact fulfil that characteristic. This number can be high in samples with a single dominant where that species is present at high Domin levels.

15. For the final column the species are weighted by the 0.75 power of their cover value to give a weighted mean constancy

16. TABLEFIT carries out all these background calculations and leaves us with simply the 'goodness-of-fit' value to help with interpretation of the field data.

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