

A303 Amesbury to Berwick Down

Applicant's provision of technical reports supporting the Environmental Information Review

Countess Cutting - Botanical Monitoring Report (2020)

Document reference: Redetermination 2.4

Planning Act 2008

The Infrastructure Planning (Examination Procedure) Rules 2010

February 2022



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1 Introduction

- 1.1.1 Baseline botanical surveys were undertaken in 2017 of areas of land with potential to be directly or indirectly affected by the proposed alignment options for the A303 Stonehenge to Berwick Down road enhancement scheme¹. One of the areas targeted during the survey was a County Wildlife Site (CWS) known as Countess Cutting (hereafter referred to as the Site). The Site was included in the 2017 survey based on its designation as a CWS. The CWS is a south facing cutting on the northern side of the A303 west of Amesbury which was made as part of upgrading of the A303 in the 1960s. It supports a form of secondary calcareous grassland that has developed naturally over time as the bare chalk face of the cutting has weathered.
- 1.1.2 Part of the cutting will be realigned during the construction of the approach to the eastern portal of the tunnel, leading to the loss of 0.74ha of the existing CWS. Post-construction, there will be a longer, deeper cutting and new calcareous grassland will be created on both sides of the new cutting.
- 1.1.3 This report provides the methods and results of the update botanical monitoring survey of the Site undertaken in 2020. The intent of the monitoring was to:
 - update the 2017 baseline survey of the Site; and identify any changes to its vegetative composition that may have occurred since the 2017 survey
 - undertake a condition assessment of the Site (based loosely on the Biodiversity Net Gain condition assessments) to inform the target condition of the grassland to be created as part of the A303 Scheme.

2 Methodology

2.1 National Vegetation Classification

2.1.1 The initial baseline survey was undertaken on the 15th June 2017, with the survey approach following the method outlined in the National Vegetation Classification (NVC) handbook². Five 2m x 2m quadrats locations were sampled along the face of the CWS cutting. The quadrat locations were deliberately selected by the surveyors as being representative of the vegetation present along the face of the cutting. The quadrat locations were recorded using a handheld GPS device. The species within each quadrat were identified to species level and the percentage cover within the quadrat by each species estimated.

¹ Arup Atkins Joint Venture, 2017, A303 Botanical Survey Report 2017, The Hub, Aztec West, 500 Park Avenue, Bristol.

² Rodwell, J.S. (2006) NVC Users' Handbook, JNCC, Peterborough, ISBN 978 1 86107 574 1.

- 2.1.2 The update monitoring survey was undertaken on the 8th August 2020. The 2017 quadrat locations were re-located using a handheld GPS device and the quadrats surveyed using the same method as outlined above.
- 2.1.3 The 2017 quadrat data was assessed using MATCH³ software and the 2020 survey data was assessed using Modular Analysis of Vegetation Information System (MAVIS)⁴ software which is comparable as they both follow the same application of the Czekanowski coefficient⁵. This software compares the quadrat data from a given Site and highlight potential affinities with published NVC communities/sub-communities. Such analysis produces a numerical coefficient of similarity on a scale from 0 to 100 for each dataset. It indicates a 'goodness of fit' with documented NVC communities and as a general rule, the higher the number, the more confidence there normally is with the result. MATCH has the additional advantage of being freely available and thus suitable to compare repeated surveys.
- 2.1.4 Although MATCH and MAVIS are comparable, data for the two years was run through MAVIS to facilitate a full comparison of the quadrats. It should be noted that MATCH uses the Domin scale to estimate abundance / cover, where this is the case, an assumption has been made whereby the medium of the range is used, e.g. 4-10% = 7%.

2.2 Habitat Mapping and Condition Assessment Survey

- 2.2.1 In order to establish a baseline for future monitoring of newly created habitats that will form part of the mitigation for the loss of Countess Cutting CWS, the habitats present were assessed against the monitoring targets that are to be used in the A303 post construction monitoring scheme, and the habitats mapped accordingly. During the survey any notable habitat patches e.g. orchid-rich areas, areas that may be suitable to target for seed bank translocation or areas to avoid for translocating due to the presence of negative indicator species, were target noted to help inform future mitigation works concerning Countess Cutting.
- 2.2.2 The floral species was recorded on an encounter basis, with abundance recorded using the DAFOR⁶ method.
- 2.2.3 The monitoring targets are for all areas to have less than 5% cover of injurious weeds or negative calcareous grassland indicator species (e.g. white clover *Trifolium repens*, creeping buttercup *Ranunculus repens* etc.).
- 2.2.4 The following condition targets for different calcareous grassland habitat sub-types are to be used in monitoring:
 - CG3 open sward described as sparsely vegetated open sward calcareous grassland (wildflowers characteristic of calcareous substrate at least 50% of total cover of vegetation; 10-50% bare ground

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³ Vegetation analysis software developed by scientists from the University of Lancaster for NVC classification.

⁴ Modular Analysis of Vegetation Information System (MAVIS) software developed by the Centre of Ecology and Hydrology.

[[]Accessed October 2020]

⁶ Dominant, Abundant, Frequent, Occasional and Rare

- within the sward; negative indicator species for calcareous grassland less than 5% of total cover.)
- CG3 closed sward defined as closed sward short calcareous grassland (defined as grassland with >30% total cover of wildflowers characteristic of calcareous grassland (including sedges, but not cover of white clover, creeping buttercup and injurious weeds); bare ground <10% of total cover; negative indicators for calcareous grassland <5% of the total cover.)
- CG3 rank sward much lower cover of herbs and high cover of rank grasses, >50% (any combination of *Bromopsis erecta*, *Brachypodium sylvaticum*, *Arrenathrum elatius*, *Dactylis glomerata*)
- Scrub (record types, e.g. bramble *Rubus fruticosus* agg.; hawthorn *Crataegus monogyna*/blackthorn *Prunus spinosa*; mixed scrub/natural regeneration, e.g. ash *Fraxinus excelsior* <5m tall; clematis *Clematis vitalba*) recorded as dense scrub if cover is >33%,
- Record grassland with scattered scrub if 4-33% scrub ('transition zone'),
- Patches of tall ruderal herbs, e.g. nettles *Urtica dioica* separately from calcareous grassland with scatter scrub (i.e. as per Phase 1 habitat survey).

In addition to the above, the habitats present have also been assessed using the Biodiversity Net Gain Metric 2.0 habitat condition assessment table.

2.3 Limitations

- 2.3.1 Due to health and safety issues associated with Covid-19, the survey was undertaken on the 8th of August, which while within the optimal period for general botanical survey, is considered to be at the late end of the survey period for calcareous grassland survey, which is generally considered to be late May to late July. The slightly late date of the survey was exacerbated by the survey coinciding with a period of hot dry weather. These factors, combined with the south-facing nature of the Site and the free-draining characteristics of chalk soil, meant that some of the species recorded had already finished flowering and / or were reduced in size and covered less ground. All orchids within the Site had progressed to seed at the time of the survey and could not be accurately identified to species level. This is not considered to have limited the validity of the survey, as apart from the orchids, it was possible to accurately identify the species present.
- 2.3.2 Inaccuracies with handheld GPS devices (normally accurate to + 5m) mean that while every effort to relocate the original 2017 quadrat location was undertaken, the 2020 quadrat locations could have been as much as 10m out. This is not considered to have limited the validity of the results as the aim of the quadrats was to provide information on the habitat type present, it may however explain some of the variation between the 2017 and 2020 results.

3 Results

3.1 **NVC Survey**

- 3.1.1 For the full 2017 and 2020 quadrat data please see Appendix A
- 3.1.2 The general species list recorded in 2020 from the walkover survey / condition assessment is outlined below using the DAFOR⁶ method.
- 3.1.3 Mouse-eared hawkweed *Pilosella officinalis* was locally dominant forming sprawling patches over open chalk and areas of shorter grass sward. Abundant wild carrot *Daucus carota* and occasional common centaury *Centaurium erythraea*, dwarf thistle *Cirsium acaule*, selfheal *Prunella vulgaris*, red fescue *Festuca rubra*, field maple *Acer campestris*, hawthorn *Crataegus monogyna*, wild parsnip *Passiva sativa*, common knapweed *Centaurea nigra*, yarrow *Achillea millefolium*, dog rose agg *Rosa canina* agg and ash *Fraxinus excelsior*. Rarely occurring were sycamore *Acer pseudoplatanus*, yew *Taxus baccata*, rose species *Rosa* agg. spp. wild privet *Ligustrum vulgare*, beech *Fagus sylvatica* and bramble *Rubus fruticosus* agg.
- 3.1.4 The 2017 quadrat data was assessed as being the best fit to a CG3 Bromopsis erecta grassland (coefficient of similarity 42.8) but no subcommunity could be confirmed when run through MATCH. When the 2017 quadrat data was re-run with MAVIS the data analysis recorded a best goodness of fit to the CG3d (Festuca rubra-Festuca arundinacea) subcommunity coefficient score of 42.30, the relatively low coefficient score and similar scores for the CG3 and CG3b (Centaurea nigra) sub-communities suggests that this sub-community is a poor fit. The sward was sparse, with patches of bare chalk and was typified by prominent Bromopsis erecta, Poterium sanguisorba subsp. sanguisorba, and hawkweed Hieracium sect (not possible to identify to species level at time of survey).
- 3.1.5 The 2020 survey data MAVIS analysis recorded a best goodness of fit to the CG3b sub-community coefficient score of 37.36, the low coefficient score of 37.36 suggests that this sub-community is a poor fit. This is likely due to the low constancy and cover of *Bromus erectus and Festuca rubra*, which may have been attributed to the prolonged period of hot dry weather experienced, leading to the reduced cover of these species in the 2020 survey. The 2017 surveys also recorded low covers of these species, indicating that this habitat is a poor fit with this community.
- 3.1.6 Consideration of the 2017 and 2020 results as outlined above suggests that the Countess Cutting LWS has a weak affinity to the CG3 community with the highest goodness of fit values returned all for CG3 communities as shown in Table 1 below. However, none of the values for any particular sub community reached 50 or higher, it was therefore concluded that this habitat has affinities with the CG3 *Bromus erectus* grassland community, with no confirmed sub-community as per the 2017 survey result (Table 1, Appendix A).

- 3.1.7 The lack of a strong fit is considered likely to be due to the oligotrophic soils, which being comprised of partially weathered chalk bedrock with no development of a defined topsoil layer have prevented the establishment of the main grasses common in the CG3 community (*Bromus erectus* and *Festuca ovina* which can be replaced by *Festuca rubra* in some instances).
- 3.1.8 The main differences between the 2017 and 2020 data relate to the different numbers of grass species recorded in the quadrats as well as in terms of reduced percentage cover in 2020. Bromus erectus had a constancy value of 5 in 2017 but 1 in 2020. The 2017 data shows that this species was present in low ground covers in all but two quadrats where it reached 20% cover. Arrhenatherum elatius had a constancy of 4 in 2017 and 1 in 2020, Festuca rubra had a 2017 constancy value of three but was absent from all quadrats in 2020. All three grass species were recorded in 2020 but outside of the quadrats sampled.
- 3.1.9 The main differences between the herbaceous plants recorded in 2017 and 2020 relate to generally lower species counts from each quadrat, with Achillea millefolium, Anacamptis pyramidalis, Centaurium erythraea, Cirsium acaule, Crataegus monogyna, Dactylorhiza x grandis, Melilotus latissimus, Pilosella officinarum, Prunella vulgaris and the mosses Fissidens dubius and a Wessia species all recorded in 2017 but absent in 2020. Of these species all except Pilosella officinarum were only recorded in low numbers of quadrats and very low percentage covers. The three orchid data identified in 2017: Dactylorhiza fuchsia, Dactylorhiza x grandis and Anacamptis pyramidalis, were assumed to be present in similar numbers in 2020 but were not identified to species level as flower spikes were all reduced to seed heads at the time of survey making ID impossible.
- 3.1.10 The majority of the species recorded in 2017 but absent in the 2020 quadrat data were picked up in 2020 during the course of the wider walkover survey (see paragraph 3.1.3 above) with the exception of *Melilotus latissimus* which was not recorded in 2020.
- 3.1.11 Six species were recorded in the 2020 quadrat data that were not recorded in 2017 quadrats including *Passiva sativa*, *Hypericum perfoliatum*, *Briza media*, *Clinopodium vulgare*, *Hieracium* sp. and *Centaurea nigra*.
- 3.1.12 A number of other species were recorded during the general walkover survey undertaken in 2020 that were not listed in the 2017 report. This is likely due to the 2017 report only detailing the quadrat data as opposed to these species being new additions to the site.
- 3.1.13 CG3 is a characteristic form of unimproved grassland over dry, strongly calcareous soils in the lowlands. It is a qualifying NVC community of the Section 41 important habitat Lowland Calcareous Grassland.

Table 1. MAVIS Result 2017 / 2020

NVC Community	Sub-community	2017 Goodness of Fit (%)	2020 Goodness of Fit (%)
CG3b	Centaurea nigra	38.63	37.36
CG3d	Festuca rubra-Festuca arundinacea	42.30	37.32
CG3	NA	39.54	36.27
CG6	NA	34.09	34.01
CG4	NA	32.58	33.27
CG4b	Centaurea nigra-Leontodon hispidus	-	31.25
CG2d	Dicranum scoparium	-	30.37
CG3c	Knautia arvensis-Bellis perennis	36.07	30.25
CG2a	Cirsium acaule-Asperula cynanchica	32.61	30.14
CG7	NA	-	29.82
CG3a	typical subcommunity	36.16	-
CG5	NA	32.91	-
CG5a	typical subcommunity	32.61	-

3.2 Habitat description and Mapping

- 3.2.1 The Site consists of a southerly facing slope that was found to be broadly homogenous, with a thin sward with herbs dominating. Only a low percentage cover of grasses was noted, with exposed chalk/bare ground that could qualify as CG3 open sward present throughout the majority of the Site (Figure 1). The top and bottom of the slope were found to have much thicker swards (of the same species, with a slightly higher abundance of *Bromus erectus*), with grasses becoming a more dominant component of the sward both in terms of ground cover and sward height. This is likely attributable to a deeper and nutrient-rich topsoil, either where topsoil from above the cutting has moved down slope via soil creep / surface water flows, or where weathered material has accumulated at the bottom of the slope. These areas are described as a CG3 (Rank) under the condition assessment, with a narrow intermediate strip between the two that would classify as CG3 closed sward (Figure 1).
- 3.2.2 Scrub encroachment across the slope was generally limited to the top and bottom sections (Figure 1). Scrub on the main slope itself was sparse and did not exceed 4% in area, with ash, hawthorn, clematis and yew *Taxus baccata* present. These were typically stunted (generally no higher than 1-2m) due to the droughted nature of the slope and were heavily deerbrowsed. The exception to this was the central upper section of the slope, where clematis-dominated scrub approached the 33% threshold to be defined as dense scrub at least in localised patches, with the majority likely to be considered to be grassland with scattered scrub (Figure 1).

- 3.2.3 A few localised patches of chalk dominated areas where the substrate was stonier and less weathered were encountered towards the central western end of the slope (Figure 1).
- 3.2.4 The main flowering period for orchids had passed at the time of survey, with only seed heads remaining. It is assumed that the species present in the 2017 survey are likely to continue to occur in the same proportions with the vast majority of orchids being *Dactylorhiza fuchsii*. The majority of seed heads appeared to correspond with the distribution of the CG3 open sward habitats with a higher abundance observed towards the lower half of the habitat band on the slope

3.3 Condition Assessment

- 3.3.1 The majority of the habitat was found to qualify as sparsely vegetated open sward calcareous grassland supporting 50% cover of defined wildflowers characteristic of calcareous substrate; 10-50% bare ground within the sward; and less than 5% percentage cover of negative indicator species⁷ for calcareous grassland with only *Jacobaea vulgaris* being recorded and at very low ground cover with occasional isolated plants being present. Based on the Grassland Habitat Types Condition Table, this habitat type passes all Condition Assessment Criteria and is therefore assessed as **Good Condition**. It is however noted that the Biodiversity Metric 2.0 is a beta version and that Condition criteria 5, should state that the cover of bar ground should not be greater than 10% (this is being updated with the imminent release of Biodiversity Metric 3.0), as such, the habitat would fail this criteria and be assessed as being of **Moderate Condition**.
- 3.3.2 Smaller areas of closed sward short calcareous grassland (defined as grassland with <30% total cover of wildflowers characteristic of calcareous grassland (including sedges, but not cover of white clover, creeping buttercup and injurious weeds); bare ground <10% of total cover; negative indicators for calcareous grassland <5% of the total cover.) were present. Due to the lower cover of wildflowers (<30%) the habitat was assessed as being of **Moderate Condition**.
- 3.3.3 Limited transition zones of tall calcareous grassland between short calcareous open or closed sward and areas of scrub and/or woodland were also present (Figure 1).
- 3.3.4 Whilst not linked to any of the condition assessment criteria, ash trees on the top of the slope and some of the saplings in the drainage ditch at the base of the slope adjacent to the A303 were showing indications of advanced infections with ash die back *Hymenoscophus franixaesus*.

⁷ As listed within the Grassland Habitat Types Condition Assessment within the Biodiversity Metric 2.0 Technical Supplement.

4 Discussion

4.1 **NVC** survey

- 4.1.1 The MAVIS re-run of the 2017 MATCH output concludes the 2017 data set, that this habitat has affinities with the CG3 *Bromopsis erecta* grassland community, with no confirmed sub-community.
- 4.1.2 This result is not surprising given the Cuttings steep slopes relatively recent origin having not allowed sufficient time for the development of a defined topsoil layer through both the weathering of the soil and the addition of humus. The lack of humus, combined with the aspect and angle of slope of the Site means that the conditions are very harsh which prevents it from showing any strong affinity to NVC sub-communities the baseline sampling of which was undertaken on established grasslands of less recent origin than the Countess Cutting.
- 4.1.3 The 2020 MAVIS results suggest that the habitat type has not changed substantially from 2017. The raw data however indicates that the Site has become increasingly encroached by clematis, with abundance / cover of upright brome *Bromopsis erecta* and hawkweed species decreasing between 2017 and 2020.

4.2 Condition Assessment

- 4.2.1 The general description of the CWS remains largely unchanged from the 2017 survey. The minor differences between quadrat data are likely attributable to the 2020 survey having been undertaken at the end of a sustained dry period. Some variation is also possible as a result of possible variation in the quadrat location due to GPS inaccuracies (please see Section 2.4 above), although this is unlikely to significantly skew the results as all quadrats were undertaken within the same habitat.
- 4.2.2 The conversion of the 2017 data which recorded using Domin method to percentage cover (taken as the average percentage cover for each Domin score) could have a minor impact when comparing the results between years but this is considered to have less impact that differences expected between surveyors visual estimates and so is not a significant constraint.

Abbreviations List

BNG - Biodiversity Net Gain

CWS - County Wildlife Site

GI - Ground Investigation

MAVIS - Modular Analysis of Vegetation Information System

NVC - National Vegetation Classification

References

Arup Atkins Joint Venture, 2017, A303 Botanical Survey Report 2017, The Hub, Aztec West, 500 Park Avenue, Bristol.

Crosher, I. et al. 2019. The Biodiversity Metric 2.0: Auditing and accounting for biodiversity value: technical supplement (Beta version, July 2019). Natural England

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

Rodwell, J. S. *et. al.* 1992 British Plant Communities Volume 3 Grasslands and montane Communities. Cambridge University Press, Cambridge ISBN 0521 62719 2

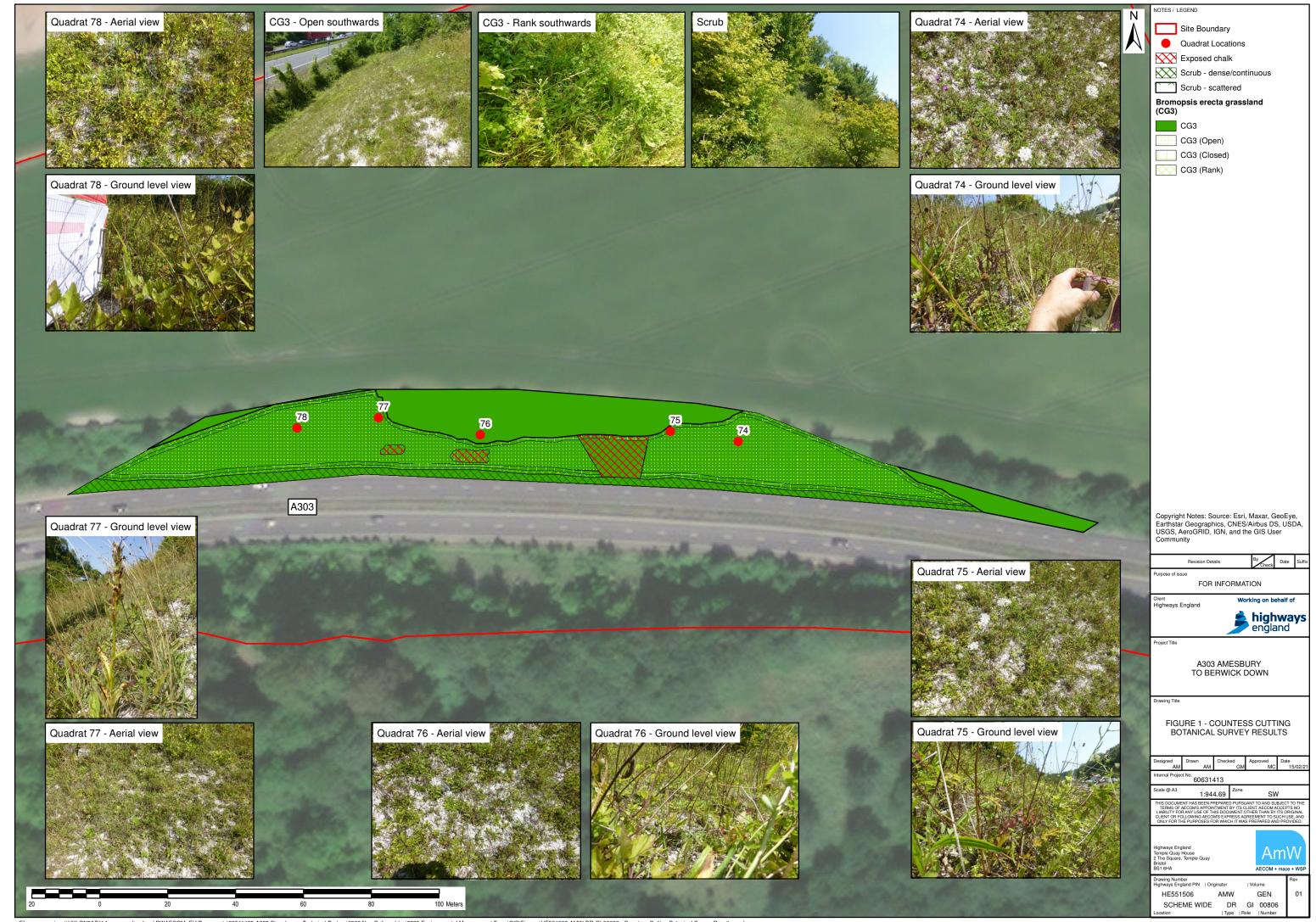
Appendices

Appendix A NVC Quadrat Data

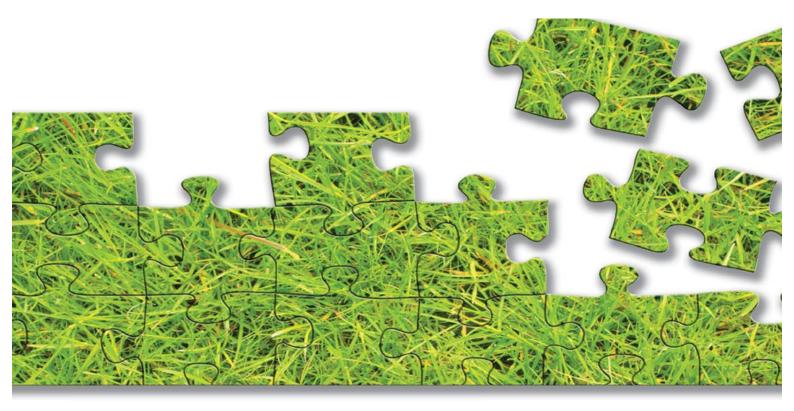
Site Name	Countess Cutting	Countess	Cutting	g Countess Cutting Countess Cutting Cou		Countess Cutting		Countess	s Cutting	Countess Cutting			
Grid reference		SU 14683	3 42134	SU 1466	3 42137	SU 1460	7 42136	SU 14577 42141		SU 14553 42138		Constancy	
Quadrat number			74		75		76		77			2017	2020
Year		2017	2020	2017	2020	2017	2017 2020		2020	2017	2020	2017	2020
Achillea millefolium	Yarrow									1		1	
Anacamptis pyramidalis	Pyramidal orchid	1										1	
Anthyllis vulneraria	Kidney vetch							1			1	1	1
Arrhenatherum elatius	False oat-grass	2		2	1			2		7		4	1
Brachypodium sylvaticum	False-brome	2	1	2	5		2	3		1	1	4	4
Bromopsis erecta	Upright brome	7	1	20		20		7		7		5	1
Centaurium erythraea	Common centaury	1				1						2	
Cirsium acaule	Dwarf thistle	1				7						2	
Clematis vitalba	Traveller's-joy	7	25		15	7	5	1	10	7	5	4	5
Crataegus monogyna	Hawthorn									1		1	
Dactylis glomerata	Cock's-foot	1	1					1		2	1	3	2
Dactylorhiza fuchsii	Common Spotted-orchid	3	1	6	1	1		3		7		5	2
Dactylorhiza x grandis	D. Fuchsii x praetermissa	1										1	
Daucus carota	Carrot	2		2			4	3	15	1	7	4	3
Erigeron acris	Blue fleabane		1			1		3	5		4	2	3
Euphrasia nemorosa	Eyebright					1	1	3	1	3	5	3	3
Festuca rubra	Red fescue			2				2		3		3	
Fissidens adianthoides	Rock Pocket-moss					2						1	
Fraxinus excelsior	Ash			1		1	1	2		1	1	4	2
Galium mollugo	Hedge bedstraw		5	1		7	5	7	5	7	15	4	4
Hieracium Section	Hawkweed	40	5	65	10	65	10	40	5	40	2	5	5
Hippocrepis comosa	Horseshoe vetch					7			1			1	1
Inula conyzae	Ploughman's-spikenard		8			1			3		3	1	2

Site Name	te Name Countess Cutting		Countess Cutting		Countess Cutting		Countess Cutting		s Cutting	Countess Cutting		Countess Cutting	
Grid reference		SU 14683	8 42134	SU 14663 42137		SU 14607 42136		SU 1457	7 42141	SU 14553 42138		Constancy	
Quadrat number			74		75		76		77		78	2017	2020
Year		2017	2020	2017	2020	2017	2020	2017	2020	2017	2020	2017	2020
Leontodon hispidus	Rough hawkbit	3	5	6	1				1	1		3	3
Leucanthemum vulgare	Oxeye daisy	2	5	2		3	8	7	5	7	15	5	4
Linum catharticum	Fairy flax	3	4		2	3	1	3		3		4	3
Melilotus altissimus	Tall melilot					2						1	
Pilosella officinarum	Mouse-ear-hawkweed	30		6		6						3	
Plantago lanceolata	Ribwort plantain	3	3	6	1	2	5	7	3	7	1	5	5
Sanguisorba minor	Salad burnet	20	15	30	10	6	15	20	20	30	10	5	5
Prunella vulgaris	Selfheal	1								3		2	
Jacobaea vulgaris	Common ragwort		2			1	1		1	1	2	2	4
Taraxacum agg.	Dandelion	6		2	1		1	1	1	2		4	3
Weissia species	A moss			3		3		2		6		4	
Pastinaca sativa	Wild parsnip										1		1
Hypericum perfoliatum	Perfoliate St John's wort										1		1
Briza media	Quaking grass				50								1
	Orchid sp.				1								1
Clinopodium vulgare	Wild basil				1								1
Hieracium sp.	Hawkweed (cordate base)				10		30		5		5		2
Centaurea nigra	Common knapweed								5		5		2
Bare ground		20	45	20	30	20	20	30	20	30	15		
sward height (cm)		NA	30	NA	20	NA	20	NA	15	NA	15		
litter		NA	5	NA	5	NA		NA		NA			

Appendix B Figures



Appendix C 2017 Report



VEGETATION SURVEY & ASSESSMENT

A303 STONEHENGE TO BERWICK DOWN ENHANCEMENTS

BOTANICAL ASSESSMENT

November 2017



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I. INTRODUCTION

1.1 Scope of Work and Objectives

This report brings together the results of a number of different botanical surveys, all of which were undertaken in 2017 to provide a baseline of information about habitats and species within areas of land with potential to be directly or indirectly affected by the proposed alignment options for the A303 Stonehenge to Berwick Down road enhancement scheme.

The work included the following botanical elements:

- Parsonage Down chalk grassland monitoring: establishing a baseline for monitoring the response of unimproved chalk grassland to changes in air quality;
- National Vegetation Classification of vegetation in potentially sensitive areas including the northern and southern River Till valley, Diamond Wood, Countess Cutting Wildlife Site, Countess Swamp Wildlife Site and adjacent parts of the River Avon Special Area of Conservation;
- Arable plant surveys to identify any particularly diverse assemblages of species of farmland; and
- Characterisation of the species and vegetation communities of land where the proposed portals would be located.

1.2 Legislation and Conservation Context

The legislative provisions in Great Britain for the protection of wild plants are contained primarily in the Wildlife and Countryside Act, 1981, Section 13, with protected wild plants listed on Schedule 8. In practice, few British wild plants are directly protected by legislation relevant to the kind of impacts caused by major infrastructure projects.

Valuation of species conservation importance is generally determined against a set of national and regional criteria of rarity and threat (Table I).

Table I: Criteria used to define Plants of National/Regional Conservation Importance

Conservation Category	Status	Definition	Reference
Extent	Nationally Rare (NR) Nationally Scarce (NS) Locally Rare (LR) or Locally Scarce (LS)	A taxon present in I-15 10km Ordnance Survey grid squares in Britain post-1950 A taxon present in I6-100 10km Ordnance Survey grid squares in Britain post-1950 LR – a taxon present in I-3 1km OS squares in South Wiltshire. LS – present in 4-10 squares.	New Atlas of the British and Irish Flora (2002) by C.D Preston, D.A. Pearman and T.D. Dines. Wiltshire Rare Plant Register (2007) by S. Pilkington
Threat (IUCN Red List)	Critically Endangered (CR) Endangered (EN)	A taxon facing an extremely high risk of regional extinction in the wild in the near future. A taxon that is not CR but facing a very high risk of regional extinction in the wild in the immediate future.	The Vascular Plant Red Data List for Great Britain (2005) by JNCC (Eds. C.M Cheffings and L. Farrell). Also: A Vascular Plant Red
	Vulnerable (VU)	A taxon that is not CR or EN, but facing a high risk of regional extinction in the medium-term future.	List for England (2014) by BSBI (Eds. P.A. Stroh et al)
Conservation	NERC Act Section 41	A taxon identified by the Secretary of State as being of principle importance for the purpose of conserving biodiversity in England.	Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006

Vegetation communities of the highest ecological importance are generally recognised and protected through the formal designation of sites including Sites of Special Scientific Interest (SSSIs). Where sites also support habitats listed on Annex I of the EU Habitats Directive many have also been notified as Special Areas of Conservation (SACs).

Outside statutory designated sites, many habitats of high ecological value have been recognised by selection of BAP Priority Habitats under the former UK Biodiversity Action Plan. In England, the UK BAP lists have subsequently been used to draw up statutory lists of habitats that are of principal importance for the conservation of biodiversity in under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

2. METHODOLOGY

2.1 Survey Area

Surveys were undertaken in various places, as indicated in Figure 1.1 and 1.2. All work was undertaken by Sharon Pilkington CEnv MCIEEM, a Wiltshire-based professional botanist, bryologist and vegetation ecologist with more than 15 years' experience of botanical assessment.

2.2 Survey Types and Methods

2.2.1 Chalk Grassland Monitoring

Parsonage Down SSSI is an outlying part of Salisbury Plain SAC. Parsonage Bank is the closest part of the site to the A303 and is, historically, one of the most botanically interesting areas of Parsonage Down. Wild (1988) characterised the grassland on its steep north-facing slope largely as the Succisa pratensis — Leucanthemum vulgare sub-community of CG2 Festuca ovina — Avenula pratensis grassland, a vegetation type largely confined to chalk and other limestones in south- west Britain. Parsonage Bank historically has supported a fluctuating population of Early Gentian Gentianella anglica (thought to be a British endemic) and other Nationally Scarce species including Field Fleawort Tephroseris integrifolius subsp. integrifolius, Burnt Orchid Neotinea ustulata and Dwarf Sedge Carex humilis.

Parsonage Bank would most likely show the earliest signs of vegetation change in response to any potential effects of changes in atmospheric pollution levels from the proposed scheme, either in isolation or in combination with some other environmental change (such as agricultural spray drift, climate change etc.).

Three sets of 100 m long linear transects approximately parallel to the A303 were set up across Parsonage Bank. Transects were positioned using a GPS/GLONASS receiver at the bottom, middle and top of the bank over a linear distance of 75m in approximately the same places as in 2002 (NPA 2003). Figure 2 shows these locations.

Twenty quadrats were randomly placed along each transect, each comprising nested sub-quadrats of 10×10 , 25×25 , 50×50 and 100×100 cm. For each size class of sub-quadrat, presence of all vascular plants and bryophytes was recorded. In addition, for the largest size class (100×100 cm), percentage cover of each species was also estimated. This nested quadrat design allows changes in frequency of occurrence of rare species in different quadrat size classes to be detected between years. The estimates of percentage cover can be used to detect any changes in the more common species.

The transect series was sampled on 5-7 June 2017, an optimal time of year for identification of species of lowland calcareous grassland.

2.2.2 National Vegetation Classification

Baseline classification of vegetation communities in five different locations was undertaken during the optimal survey period for lowland habitats. Habitats in the River Till valley were surveyed on 12 June (north) and 13 June (south). Chalk grassland in Countess Cutting Wildlife Site (WS²) was surveyed on 15 June and part of Countess Swamp WS and the adjacent River Avon were surveyed on 18 August. Characterisation of Diamond Wood (8 June) also followed NVC methodology as a precautionary approach although it was considered likely to be of mainly planted origin.

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¹ Garmin model GPSMAP64S

² In Wiltshire Wildlife Sites are non-statutory sites recognised as being of county importance for wildlife

Standard National Vegetation Classification (NVC) sampling methodology (Rodwell 2006) was employed for all vegetation types likely to fall within the scope of the NVC. None of the wooded habitats was sufficiently large to be sampled by standard means and for these the minimalistic NVC woodland sampling approach set out by Hall, Kirby & Whitbread (2004) was used.

Five quadrats were sampled in most stands of vegetation with distinct floristics and physiognomy although some stands of limited extent were necessarily sampled with fewer quadrats.

MATCH³ software was employed to analyse the quadrat data and to highlight potential affinities with published NVC communities/sub-communities. Such analysis produces a numerical coefficient of similarity on a scale from 0 to 100 for each dataset. It indicates a 'goodness of fit' with documented NVC communities and as a general rule, the higher the number, the more confidence there normally is with the result.

Surveyor experience and detailed descriptions of vegetation communities provided by Rodwell (1991, 1992, 1995 and 2000) were subsequently used to confirm the classification of each stand in NVC terms as appropriate.

2.2.3 Arable Plants

The light soils of south Wiltshire have long been known to be important to communities of declining arable plants (Wilson 1993).

A number of arable fields likely to be impacted by the alignment options were identified from habitat surveys of the area. In addition, as some uncommon arable species are known to persist in short-term pasture laid over former arable land and sometimes in more permanent grassland, pastures that were found to support interesting assemblages of arable species previously (NPA 2003) were also shortlisted for assessment.

Table 2. Scoring categories for arable plant species

Score	Species Status
9	Threatened: Critically Endangered (CR)
8	Threatened: Endangered (EN)
7	Threatened: Vulnerable
6	Near Threatened (NT)
5	Additional Nationally Scarce, in 16-100 10km squares; change index < -1.0
4	Additional Nationally Scarce: in 51-100 10km squares, change index > -1.0
3	Species of local concern: in 101 to 500 10km squares
2	Species of local concern: in 501 to 1000 10km squares
I	Species of local concern: in 1001 to 1500 10km squares, change index < 0.0 i.e. negative

From Byfield & Wilson (2005)

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³ Vegetation analysis software developed by scientists from the University of Lancaster for NVC classification.

Plantlife has developed a methodology for determining sites of importance for arable plant conservation (Byfield & Wilson, 2005). Although it is aimed principally at identifying nationally important sites (Important Arable Plant Areas), the methodology works equally well on a smaller scale. It works on the premise that certain rare and declining plants indicative of arable habitats are assigned a numerical score between I and 9 (Table 2). When assessing the arable plant assemblage of a site (at farm, field or field margin level), the individual scores are summed to give an overall score.

Figures 1.1 and 1.2 show the field margins that were surveyed using this methodology. Others were discounted on the grounds that habitat was found to be unsuitable for arable species. Surveys for arable plants were undertaken during the period 17 - 19 July 2017, the timing of which is optimal for identification of the majority of species in this group.

2.2.4 Portals

Three potential portal impact areas were surveyed on 7 July 2017 by means of a species inventory survey. The purpose of these surveys was to characterise the floristic and structural composition of the vegetation and to identify any habitats or populations of species of particular conservation importance, against the criteria set out in Table I and described in Section 1.2.

2.3 Limitations and Assumptions

All surveys were undertaken at an optimal time of year and in reasonable weather conditions and only a few constraints were encountered.

At Parsonage Down, placement of all transects could not be made entirely within calcareous grassland likely to be classified as CG2 across the part of Parsonage Bank that was monitored previously. Placement of the transects was based on an NVC survey of Parsonage Down from nearly thirty years ago (Wild 2008) and it is highly probable that vegetation communities on Parsonage Bank have changed in floristic composition and/or extent since then.

Although the fieldwork was undertaken at a good time of year for finding *Gentianella anglica* and *Neotinea ustulata*, none were seen within any quadrats on Parsonage Bank. It is possible that cold, dry weather in the preceding months may have delayed or inhibited flowering of these species.

During the arable plant survey, certain fields were in the process of being harvested and so could not be accessed.

At Countess Swamp WS, it was difficult to sample quadrats in some vegetation that had been recently cut. Nearby, tall beds of emergent vegetation below the banks of the River Avon meant that aquatic macrophyte communities in the main flow of the river were only partially visible from the banks and so could only be subjectively described.

3. RESULTS

Botanical nomenclature used in this report follows Stace (2010) for vascular plants and Hill et al (2008) for bryophytes.

3.1 Chalk Grassland Monitoring

The quadrat data are presented in Appendix I.

3.2 Vegetation Classification

Appendix II provides tabulated data collected from all sites where NVC sampling was undertaken.

3.2.1 River Till (north)

Figure 3.1 shows the vegetation communities present in and around the River Till. At this point the winterbourne flowed through cattle-grazed pasture of low botanical interest characterised by MG7b Lolium perenne – Poa trivialis leys (coefficient of similarity 56.0). The sward was of low diversity and characterised by high cover of Perennial Rye-grass Lolium perenne, Yorkshire-fog Holcus lanatus, Cock's-foot Dactylis glomerata and Red Fescue Festuca rubra with few associated forbs.

MG7b is typically highly productive agricultural grassland that has very low botanical or ecological value.

The periodically inundated bed of the Till supported discontinuous beds of wet grassland. These were variably diverse and classified as MG13 Agrostis stolonifera — Alopecurus geniculatus grassland (coefficients of similarity 42.0 and 46.3). The vegetation was typically associated with low silt shelves deposited at the edge of the river, giving way to MG7b on higher ground. Constant and preferential species included Creeping Bent Agrostis stolonifera, Marsh Foxtail Alopecurus geniculatus, Rough Meadow-grass Poa trivialis and locally prominent Water Forget-me-not Myosotis scorpioides, Fool's Water-cress Apium nodiflorum and Brooklime Veronica beccabunga.

Fragmentary stands of MGI3 are frequently associated with sluggish lowland streams and rivers and field ponds where fluctuating water levels keep silty soils moist or waterlogged.

Upstream, vegetation in the channel became complex and could not be referred to any NVC community. It included small patches of Reed Canary-grass *Phalaris arundinacea*, *Apium nodiflorum*, Fat Duckweed *Lemna gibba* and gravelly islands supporting MG7 grassland.

Where deeper water was ponded in the Till at the upper end of the survey area, a poorly developed form of A19 Ranunculus aquatilis community was present (coefficient of similarity 33.4). It was characterised by significant amounts of Common Water-crowfoot Ranunculus aquatilis, Pond Water-crowfoot R. peltatus and Lemna gibba as well as plants more typical of inundation vegetation e.g. Alopecurus geniculatus, Apium nodiflorum and Common Water-cress Nasturtium officinale.

The River Till SSSI forms part of the River Avon SAC and water-crowfoot beds such as those represented by the AI9 community fall within the Annex I habitat 3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation for which the SAC has been designated in part.

3.2.2 River Till (south)

Figure 3.2 shows the vegetation communities associated with this section of the Till. In this part of the valley the river flowed through wet woodland that could not be confidently classified as any NVC type. Its canopy was dominated by sprawling Crack Willow Salix fragilis agg. with local occurrences of White Willow Salix alba over an understorey of Grey Willow Salix cinerea subsp. oleifolia. The field layer was dominated by tall herbs including Common Nettle Urtica dioica and Hemlock Water-dropwort Oenanthe crocata. The woodland also supported diverse communities of common epiphytic and ground-dwelling mosses and liverworts.

Because the riverbed was mostly in deep shade cast by overhanging trees and shrubs, it did not support any well-developed aquatic macrophyte communities and negligible emergent/marginal vegetation.

Grazed pasture east of the river supported typical grassland communities of floodplain pasture. MG9 Holcus lanatus – Deschampsia cespitosa grassland was characterised by mixtures of Agrostis stolonifera, Holcus lanatus, Tufted Hair-grass Deschampsia cespitosa, Poa trivialis, and Hard Rush Juncus inflexus along with a limited array of herbs e.g. Amphibious Bistort Persicaria amphibia, Urtica dioica and Wild Angelica Angelica sylvestris. The analysis of the data confirmed a reasonable goodness of fit to MG9 (similarity coefficient 50.8) but no sub-community could be confirmed.

MG9 grassland is a distinctive kind of vegetation that is highly characteristic of permanently moist, gleyed clay soils, often in floodplains where there is periodic flooding.

On slightly higher ground MG9 was replaced by species-poor MG1b Arrhenatherum elatius grassland, placed with a high level of confidence in the *Urtica dioica* sub-community (coefficient of similarity 57.1). Dominant species of the tall, coarsely-structured sward included False Oat-grass Arrhenatherum elatius, Poa trivialis, Holcus lanatus, Urtica dioica and various large common umbellifers.

MGI is a ubiquitous and low value type of lowland grassland typical of fertile, well-drained neutral soils with light or negligible grazing. The *Urtica* sub-community is particularly common in areas of intensive arable agriculture where there is enrichment from run-off or spray drift of fertilisers.

Where a plantation of poplar trees had been recently felled, an ill-defined form of open vegetation characterised by mixtures of rushes, wet-ground forbs and tall perennial herbs was present. This was classified as OV26 *Epilobium hirsutum* vegetation (coefficient of similarity 53.9). Dominants included *Oenanthe crocata*, *Phalaris arundinacea*, *Angelica sylvestris* and *Urtica dioica*. Great Willowherb *Epilobium hirsutum* was locally prominent. Many of the poplars were beginning to re-grow from the cut stumps.

OV26 is a very common kind of tall herb vegetation that occurs in well-lit situations on moist and fertile soils around ponds and by watercourses, in silting ditches and in transition mires.

The remainder of the survey area to the west of the river was cultivated farmland.

3.2.3 Countess Cutting WS

Countess Cutting (Figure 3.3) lies on the northern side of the A303 and faces south. It supported a form of secondary calcareous grassland that had developed naturally over time as the bare chalk face of the cutting has weathered.

Analysis of quadrats placed the vegetation in CG3 *Bromopsis* erecta grassland (coefficient of similarity 42.8) but no sub-community could be confirmed.

The CG3 was moderately rich in species and also supported swarms of two common orchid species near the bottom of the slope. The sward was sparse, with patches of bare chalk and was typified by prominent Upright Brome Bromopsis erecta, Salad Burnet Poterium sanguisorba subsp. sanguisorba,

hawkweed Hieracium Sect. Hieracium⁴ and locally, Mouse-ear Hawkweed Pilosella officinarum. Scrub, tree saplings and Traveller's-joy Clematis vitalba were beginning to advance across the face of the cutting from both top and the bottom.

CG3 is a characteristic form of unimproved grassland over dry, strongly calcareous soils in the lowlands. It is a qualifying NVC community of the Section 41 important habitat Lowland Calcareous Grassland.

3.2.4 Countess Swamp WS and River Avon SAC

Countess Swamp WS supported a mosaic of tall sedge and herb vegetation typical of lowland riverside habitats (Figure 3.4). It included stands of S28b Phalaris arundinacea tall-herb fen (Epilobium hirsutum – Urtica dioica sub-community) were characterised by mixtures of Phalaris arundinacea, Urtica dioica, Cleavers Galium aparine and Hedge Bindweed Calystegia sepium. Lesser Pond-sedge Carex acutiformis was over-represented in the community, and probably spreading into it due to increased soil waterlogging in the area as a result of blocked drains. Data analysis returned a good coefficient of similarity (49.3) to S28b.

S28 is a frequent vegetation type alongside fluctuating watercourses and standing water, often on alluvial mineral soils which are seasonally wet but not waterlogged. The *Epilobium hirsutum – Urtica dioica* sub-community is the most frequent form of S28 in situations where there is some enrichment from nitrates and phosphates.

Other tall vegetation included communities without NVC classification including *Glyceria maxima* – *Galium aparine* vegetation. This community supported abundant Reed Sweet-grass *Glyceria maxima* alongside several weedy species including *Calystegia sepium* and *Galium aparine*; *Carex acutiformis* was also locally frequent. A small population of Meadow Rue *Thalictrum flavum*, which is a local and declining species in Wiltshire, was present in this community.

Mature willow-dominated woodland could not be assigned with confidence to any NVC type. Its canopy was characterised by tall, sprawling hybrid willows (Salix x rubens), suggesting a history of planting. Below, the poorly-developed understorey and field layer supported a suite of species typical of relatively dry secondary woodlands on fertile soils.

Dense stands of S14 Sparganium erectum swamp (coefficient of similarity 55.0) dominated both river margins north of the A303 road bridge and in places grew several metres out into deeper water. Branched Bur-reed Sparganium erectum was dominant, with few associates: Bittersweet Solanum dulcamara and Myosotis scorpioides were the most frequent. Lemna gibba was also frequent where the stems of Sparganium provided some respite from the water current.

S14 is highly tolerant of moderate currents and is one of the commonest emergent vegetation types along lowland watercourses. It occurs widely in shallow, mesotrophic to eutrophic waters on mineral substrates.

The extensive beds of *Sparganium erectum* obscured much of the deeper water from the riverbank. It was not therefore possible to attempt to classify the aquatic community by sampling. However, visible species included many typical of chalk rivers including abundant Unbranched Bur-reed *Sparganium emersum*, *Elodea canadensis*, one or more water-starworts *Callitriche*, Stream Water-crowfoot *Ranunculus penicillatus* Perfoliate Pondweed *Potamogeton perfoliatus*, Fennel Pondweed *P. pectinatus* and Arrowhead *Sagittaria sagittifolia*.

South of the A303 road bridge, riverbank vegetation in Lords Walk was disturbed and shaded by numerous introduced poplars and other riverside trees and shrubs. Vegetation on the banks and

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⁴ At the time of survey it was not possible to identify this plant to species level.

between paths and woodland/pasture was characterised by patchy *Epilobium hirsutum* over tall weedy mixtures of *Urtica dioica*, *Galium aparine* and Common Comfrey *Symphytum officinale*. Analysis of two sets of quadrats from stands of this vegetation affirmed a reasonable match with undifferentiated OV26 *Epilobium hirsutum* vegetation (coefficients of similarity 53.4 and 59.9).

3.2.5 Diamond Wood

Prior to the survey, it was unclear if Diamond Wood (Figure 3.5) was of semi-natural or planted origins. However, its floristic composition and structure offered strong evidence for the latter and plantings within the wood suggest that it may have been planted as a game covert.

The majority of the woodland appeared to be less than 100 years old, although a few of the trees looked a little older. Its canopy species included Scots Pine *Pinus sylvestris*, Beech *Fagus sylvatica* and Silver Birch *Betula pendula* over an understorey of shrubs often planted in groups. These included native species of local provenance including Buckthorn *Rhamnus cathartica*, Wayfaring-tree *Viburnum opulus* and Hawthorn *Crataegus monogyna*. Plantings also included a variegated-leaved form of Wild Privet *Ligustrum vulgare*. Elder *Sambucus nigra* and Blackthorn *Prunus spinosa* had probably colonised the wood naturally.

The field layer was quite grassy in character and lacked any species indicative of old woodland. Prominent species included *Urtica dioica*, Wood Avens *Geum urbanum*, *Poa trivialis* and False Brome *Brachypodium sylvaticum*. The woodland appeared almost entirely unmanaged and fallen dead wood was common. There were also a few small glades of rough unmanaged neutral grassland not sampled but likely to be referable to a species-poor form of MGI *Arrhenatherum elatius* grassland.

Quadrats were sampled in Diamond Wood as a means of characterising its flora in detail but as expected it could not be classified with any confidence as any NVC woodland type.

A linear earthwork marks the western edge of Diamond Wood. Although outside the wood itself and not part of the formal NVC sampling, this bank was noted to support unimproved calcareous grassland dominated by *Bromopsis erecta* and referable to CG3d, the *Festuca rubra — Schedonorus arundinaceus* sub-community of *Bromopsis erecta* grassland. This sub-community is typical of places where there has been little or no recent grazing.

3.3 Arable Plants

Margins in 27 fields were surveyed; another 4 fields were not surveyed as habitat no longer appeared suitable for arable species or because harvesting operations were underway. Appendix III provides a record of all plants recorded in the course of the fieldwork.

Figure 4 ranks each field according to its arable plant score, with results provided on a field-by-field basis in Tables 3.1 and 3.2.

Field 18 (wheat) had the highest score (25) and supported 7 species of interest in its margins. Its eastern margin was particularly interesting, with a wide weedy margin supporting strong populations of Corn Parsley *Petroselinum segetum* and Venus's-looking-glass *Legousia hybrida*. It was the only field in the survey area to support a population of Narrow-fruited Cornsalad *Valerianella dentata* and one of only 3 to support Prickly Poppy *Papaver argemone*.

An oat crop nearby (Field 26) also had a rich community of arable plants in its weedy margins (scoring 20). Six species of interest were present, with most interest in the corners, where strong populations of Dense-flowered Fumitory Fumaria densiflora, Rough Poppy Papaver hybridum, P. argemone and Petroselinum segetum were found.

Three other fields achieved a score of 10-19. Field 5, another cultivated field, supported the only population of Rye Brome Bromus secalinus⁵ found in the survey area but its margins were not particularly diverse. Field 9 (wheat) at the time of survey, only scored 14 (6 species) but was of particular note for its very large population of Petroselinum segetum (numbering hundreds of plants along the elevated western crop margin). It also supported substantial populations of Round-leaved Fluellen Kickxia spuria, only found in 4 fields and Maple-leaved Goosefoot Chenopodium hybridum.

Sixteen other fields had more limited arable plant interest, with an overall score of 9 or less. These fields almost exclusively supported between 1 and 3 of the species of interest, with *Chenopodium hybridum* and *Petroselinum segetum* being seen most frequently. Field 29, which comprised disturbed ground around the boundaries of a large pig enclosure, was an exception with 6 low-scoring species found, including Dwarf Mallow *Malva neglecta* and Common Broomrape *Orobanche minor*, which were not seen anywhere else.

Five of the fields supported only common arable plants and were considered to be of negligible interest.

⁵ Numerous new populations of this species have been reported throughout the UK since 2000 and a review of its conservation status is required.

Table 3.1 Field Scores

		Field Reference																
Species	Common name	Score	- 1	2	3	4	5	6	7	8	9	10	П	12	13	14	15	16
Alopecurus myosuroides	Black-grass	2	ı															
Bromus secalinus	Rye Brome	7					- 1											
Chaenorhinum minus	Small Toadflax	I		1			1	I		I						1		
Chenopodium hybridum	Maple-leaved Goosefoot	3		I			I				I				I		I	
Euphorbia exigua	Dwarf Spurge	6						I								I		
Fumaria densiflora	Dense-flowered Fumitory	3									I							
Kickxia spuria	Round-leaved Fluellen	3							I	I	I		I					
Lamium amplexicaule	Henbit Dead-nettle	I									I							
Legousia hybrida	Venus's-looking-glass	3																
Malva neglecta	Dwarf Mallow	2																
Mercurialis annua	Annual Mercury	2															1	
Orobanche minor	Common Broomrape	2																
Papaver argemone	Prickly Poppy	7																
Papaver hybridum	Rough Poppy	3		I							I							
Petroselinum segetum	Corn Parsley	3										I	I					
Sherardia arvensis	Field Madder	I									1		1			1		
Valerianella dentata	Narrow-fruited Cornsalad	8																
Veronica polita	Grey Field-speedwell	2																
	Field assemblag	ge score	2	7	0	NS	П	7	3	4	14	3	7	0	3	8	5	NS

NS= Not surveyed

Table 3.2 Field Scores

			Field	l Refer	ence												
Species	Common name	Score	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Alopecurus myosuroides	Black-grass	2		ı									I			ı	
Bromus secalinus	Rye Brome	7															
Chaenorhinum minus	Small Toadflax	I													I	1	
Chenopodium hybridum	Maple-leaved Goosefoot	3				I				I		I				I	
Euphorbia exigua	Dwarf Spurge	6															
Fumaria densiflora	Dense-flowered Fumitory	3										1				I	
Kickxia spuria	Round-leaved Fluellen	3															
Lamium amplexicaule	Henbit Dead-nettle	1		I											I	I	
Legousia hybrida	Venus's-looking-glass	3		I													
Malva neglecta	Dwarf Mallow	2													1		
Mercurialis annua	Annual Mercury	2															
Orobanche minor	Common Broomrape	2													I		
Papaver argemone	Prickly Poppy	7		I							I	I					
Papaver hybridum	Rough Poppy	3										I					
Petroselinum segetum	Corn Parsley	3		I				I				ı					
Sherardia arvensis	Field Madder	1		ı								1			1		
Valerianella dentata	Narrow-fruited Cornsalad	8		I													
Veronica polita	Grey Field-speedwell	2													I		
Fi	eld assemblage score		0	25	NS	3	0	3	0	3	7	20	2	0	9	10	NS

3.4 Portals

Data collected during the portal surveys are tabulated in Appendix IV, whilst Figures 5.1 and 5.2 indicate areas of botanical interest as described below.

3.4.1 Western Portal Option INA

This portal area fell completely within arable land which at the time of survey was under cultivation of wheat and oilseed rape. Both crops appeared to be intensively managed and there were very few non-crop plants within the crops. An uncultivated margin between the fields supported a mixed community of arable plants, including some of interest (see Field 30, Section 3.3 and Figure 4).

All other species recorded in this area were considered to be common and widespread species.

A population of Red Duckweed *Lemna turionifera* covered the surface of a water-filled trough at Ordnance Survey grid reference SU1124 4104, just outside the portal area. This species was first recorded in Britain in 2008 and Rumsey & Lansdown (2012) consider it to be either previously overlooked as a more common species or a natural colonist. It has no formal conservation status as yet but its current distribution in Britain matches that of recognised Nationally Scarce species. In South Wiltshire it has so far been reported in 3 Ikm OS grid squares so can be regarded as Locally Rare (Pilkington (2007).

3.4.2 Western Portal Option IND

Although smaller than Option INA, this area included arable land, with a herb-rich sown uncultivated margin, a permanent grassy bank and National Trust land under reversion from farmland to calcareous grassland.

Some botanical interest was found in the crop margins, which supported a diverse community of arable plants. This field was not covered by the arable plant survey but had it been, it would have achieved a score of 11, based on the presence of 5 indicator species (Field Madder Sherardia arvensis, Henbit Dead-nettle Lamium amplexicaule, Papaver hybridum, Dwarf Spurge Euphorbia exigua and Small Toadflax Chaenorhinum minus).

The reversion grassland was not without botanical interest although it supported no populations of species of conservation interest. It would probably not be classifiable in NVC terms as it was intermediate between neutral and calcareous grassland. It comprised a cattle-grazed dense sward averaging 80cm high, with abundant Holcus lanatus, Arrhenatherum elatius, Bromopsis erecta, Crested Dog's-tail Cynosurus cristatus, Dactylis glomerata and Festuca rubra. Prominent forbs included Sainfoin Onobrychis viciifolia, Red Clover Trifolium pratense, Ribwort Plantain Plantago lanceolata and Meadow Buttercup Ranunculus acris.

3.4.3 Eastern Portal (Bowtie Field)

Habitats within this portal area included cultivated land (barley), rough neutral grassland and scrub margins and a small planted copse.

The barley field supported a diverse community of arable weeds along its southern edge. In one place (SU1412 4207) the margin was 3-4 m wide and the crop weak. Strong populations of *Fumaria densiflora*, *Chaenorhinum minus*, *Legousia hybrida* and *Euphorbia exigua* were present there. If the field had been included in the arable plant assessment it would have achieved a score of 17, which would have been the third highest of all fields. Widespread species elsewhere in the crop included Perennial Sow-thistle *Sonchus arvensis*, Field Bindweed *Convolvulus arvensis*, Charlock *Sinapis arvensis* and Scarlet Pimpernel *Anagallis arvensis*.

No populations of any notable species were found elsewhere in the survey area and other habitats were of low botanical interest. The rough grassland and scrub was unmanaged and supported abundant Arrhenatherum elatius, Hogweed Heracleum sphondylium, Urtica dioica and Clematis vitalba in a matrix of scattered calcicolous scrub (Crataegus monogyna, Ligustrum vulgare, Rhamnus cathartica, Spindle Euonymus europaeus etc.).

The copse was fenced off and included a single planted mature Beech Fagus sylvatica tree over many recently planted and mostly dead Beech saplings. The understorey was lacking and the field layer comprised ruderal mixtures of Urtica dioica, Galium aparine, Convolvulus arvensis, Heracleum sphondylium and Black Horehound Ballota nigra.

4. **CONCLUSIONS**

4.1 Vegetation Communities

Following analysis and interpretation of the NVC data for each site, each vegetation community has been accorded a relative intrinsic botanical value taking into account a number of criteria, including:

- Its perceived nature conservation importance e.g. uncommon or rare NVC communities, NERC Act Section 41 habitats;
- Its goodness of fit with published NVC communities;
- The presence of plants of recognised conservation importance or other plant species of restricted ecological amplitude; and
- Its botanical diversity.

Table 4.1 River Till (north)

Vegetation Community	Botanical Value	Rationale
A19 community	High	Water-crowfoot vegetation qualifying as Annex I habitat 3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation
Dense Apium	Negligible	Not referable to any NVC type
nodiflorum		Very low diversity
Indeterminate	Low	Not referable to any NVC type
inundation vegetation		Very low diversity
MG13 grassland	Low	Common wet grassland type
		Moderately diverse
MG7b grassland	Low	Ubiquitous type of agricultural grassland
		Low diversity
		Supports a small population of locally uncommon/declining herb (Petroselinum segetum) on its northern boundary bank

Table 4.2 River Till (south)

Vegetation Community	Botanical Value	Rationale
Cultivated land	Negligible	Intensively managed crop
		Margins support common arable plants
MG1b grassland	Negligible	Ubiquitous kind of rough neutral grassland
		Low diversity
MG9 grassland	Low	Frequent kind of floodplain grassland
		Moderate diversity but grasses over-represented
Mixed Salix	Low-	Wet woodland of any kind is rare in Wiltshire
woodland	Moderate	Moderate diversity
		Not referable to any NVC type
OV26	Low	Very common kind of wet-ground vegetation
community		Of relatively recent origin
		Moderate diversity

Table 4.3 Countess Cutting WS

Vegetation Community	Botanical Value	Rationale
CG3 grassland	High	 Qualifying NVC type in Section 41 important habitat Lowland Calcareous Grassland Secondary origins – atypical example of CG3 Moderate - high diversity

Table 4.4 Countess Swamp WS and River Avon SAC

Vegetation Community	Botanical Value	Rationale
Glyceria – Galium swamp	Low	 Not referable to any NVC type Degraded by invasion of Carex acutiformis Supports population of locally uncommon plant (Thalictrum flavum)
Mixed Salix woodland	Low	 Possibly of planted origin Moderate diversity Not referable to any NVC type
OV26 community	Negligible	Very common kind of wet-ground vegetation Low diversity
Populus x canadensis plantation	Negligible	 Planted, mature non-native trees OV26 vegetation/scrub below
S14 swamp	Low	Common riparian vegetation community
S28b tall-herb fen	Low	 Common wetland vegetation type Epilobium – Urtica sub-community indicates enrichment Degraded by invasion of Carex acutiformis
Submerged aquatic vegetation	High	 Well-developed submerged vegetation community High diversity, includes species indicative of high-quality chalk river Vegetation likely to fall within Annex I habitat 3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation Established population of Schedule 9 invasive plant (Elodea canadensis) present

Table 4.5 Diamond Wood

Vegetation Community	Botanical Value	Rationale
CG3d grassland	High	 Not sampled but distinctive kind of vegetation qualifying as Section 41 important habitat Lowland Calcareous Grassland Unmanaged Moderate diversity
Broad-leaved plantation woodland	Low	 Secondary planted woodland Not referable to any NVC type Rare example of wooded habitat in intensively arable area

4.2 Arable Plant Communities

The light chalky soils of farmland across the survey area and further afield (for example east towards Andover and south towards Salisbury) have long been known to support diverse communities of uncommon and declining arable plant species. Some of the interest of the A303 road corridor was characterised during the previous road enhancement ecological assessment (NPA 2003). The findings of the current survey indicate that much of the farmland in the survey area is intensively managed, with high levels of fertiliser input and /or herbicide application likely to be the main reason for poorly developed communities of arable plants in many of the fields.

A few arable landholdings retain some fields with high arable plant diversity. Although no populations of any particularly rare species were seen in the course of the assessment, it is clear that these fields retain a valuable seed bank of a number of declining species that are nowadays rarely encountered in Wiltshire's arable habitats.

Table 5 provides a broad evaluation of the arable plant communities using individual field scores. These valuations are relative to arable communities in the Stonehenge A303 area / south Wiltshire chalk farmland.

Table 5. Valuation of Arable Plant Communities

•	Value	Field Reference	No. of
Score			fields
20+	High	18, 26	2
10-19	Moderate	5, 9, 30	3
1-9	Low	1, 2, 6-8, 20, 11, 13-15, 20, 22, 24, 25, 27, 29	16
0	Negligible	3, 12, 17, 21, 23, 28	6

4.3 Portals

Where portals would include land take of cultivated ground (farmland), communities of declining arable plants were relatively diverse, but otherwise these areas should be considered to be of low botanical interest.

Vegetation communities within these areas are generally of low intrinsic value, although the reversion grassland at Normanton Down should be regarded as being of low to moderate value having developed some of the floristic character of lowland calcareous grassland.

5. **RECOMMENDATIONS**

This section is concerned with recommending some generic mitigation proposals that could be used to offset as yet unknown impacts on ecological receptors of significant botanical value as a result of the proposed road enhancements.

5.1 Calcareous Grassland Enhancement and Creation

Loss of, or damage to, calcareous grassland such as at Countess Cutting WS and the earthwork alongside Diamond Wood could be mitigated by creation of new calcareous grassland alongside the new road alignment. The development of chalk grassland on the steep road bank at Countess Cutting has taken place naturally over many years and there are local seed sources in the area e.g. at Parsonage Down, Yarnbury Castle and nearby on Salisbury Plain. It is therefore recommended that similar chalk grassland is allowed to develop naturally i.e. without any deliberate seeding or planting on any freshly exposed chalk cuttings or embankments associated with the new road alignment.

If Countess Cutting is unaffected by the road enhancements then it is recommended that its condition is improved by implementation of scrub and tree clearance. At present the bank is unmanaged and tree saplings and native scrub are beginning to encroach on its open chalk grassland.

5.2 Improving Farmland for Arable Plants

To mitigate loss of any arable land supporting diverse communities of declining arable plants, it is recommended that local farmers should be encouraged to take up any relevant agri-environment options promoting such communities in working farmland.

The A303 corridor lies within an area identified by Natural England as being a high priority for arable plants. Although closed to new applicants, Entry-level Stewardship Options promoting arable plant diversity on cultivated land include EF10 Unharvested cereal headlands for birds and rare arable plants and EF11 Uncropped Cultivated Margins for Rare Arable Plants.

5.3 Wetland Habitat Restoration

Although Countess Swamp WS has been identified as an area of high conservation value, its botanical interest appears to be in decline because of the advance of tall rhizomatous sedges (mainly *Carex acutiformis*) across open riverside habitats. The spread of such tall pond-sedges is normally an indicator of increased soil waterlogging.

It is therefore recommended that waterlogging in Countess Swamp is addressed by restoring regular clearance management of drains in the site to allow water to drain into the River Avon.

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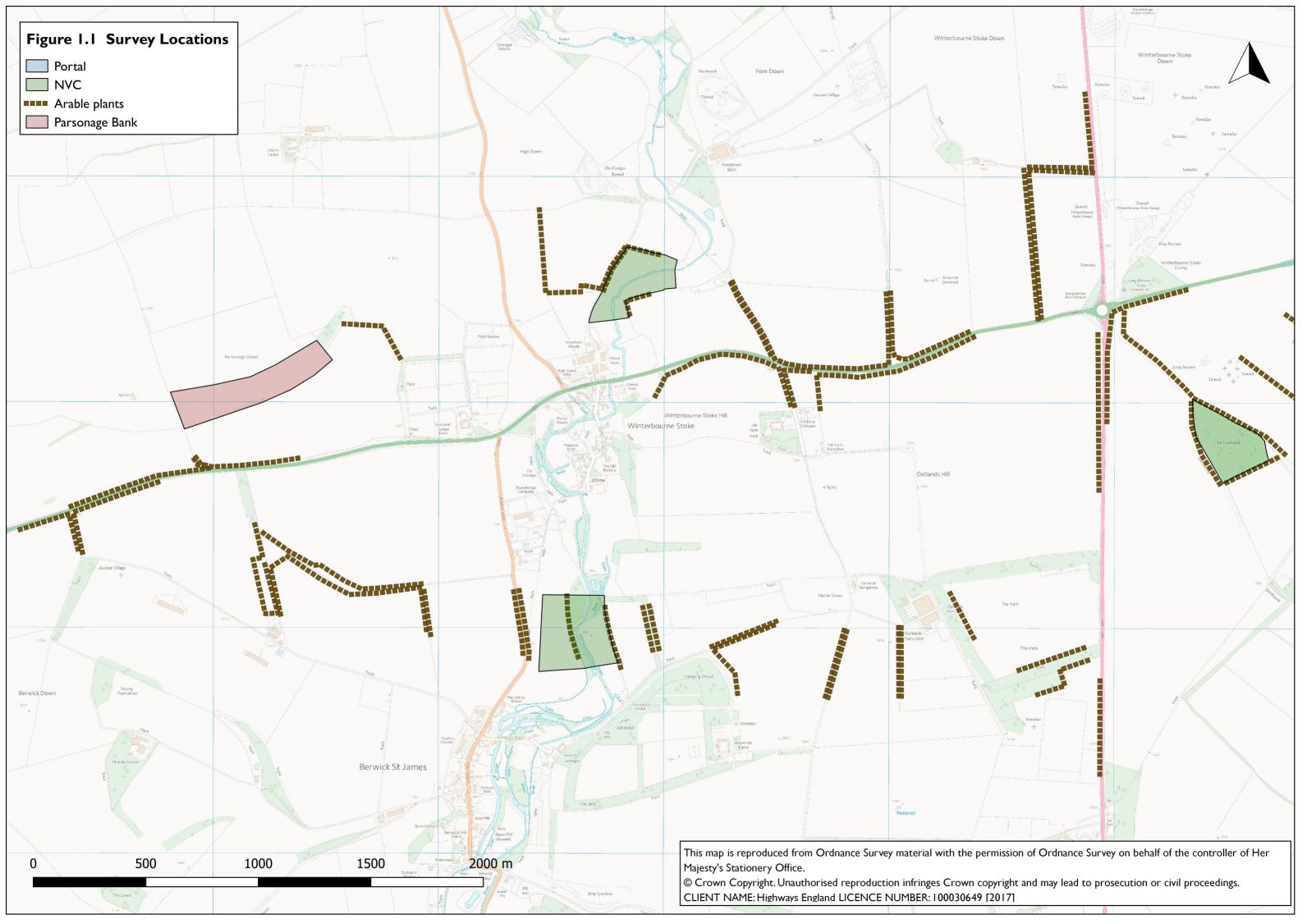
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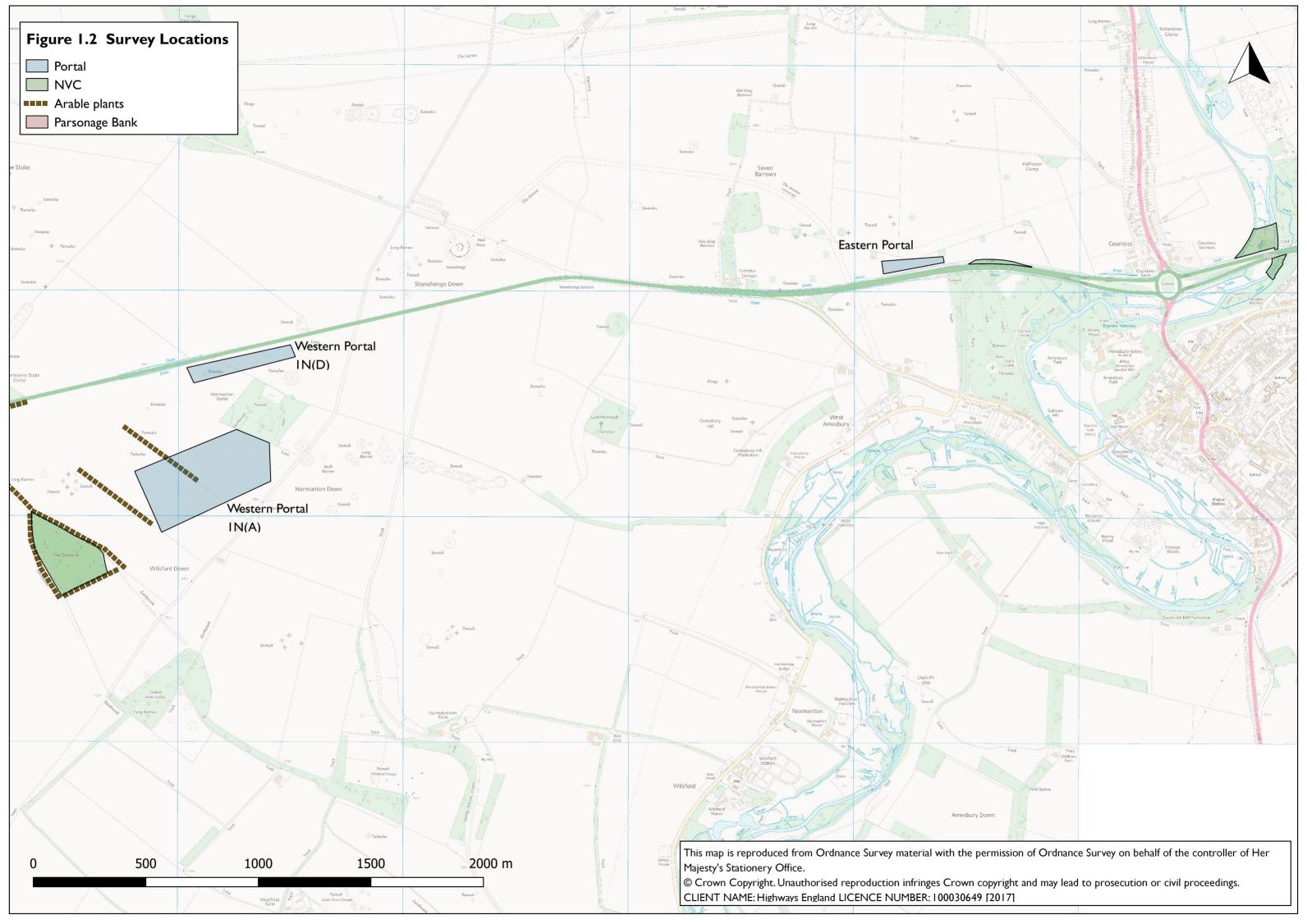
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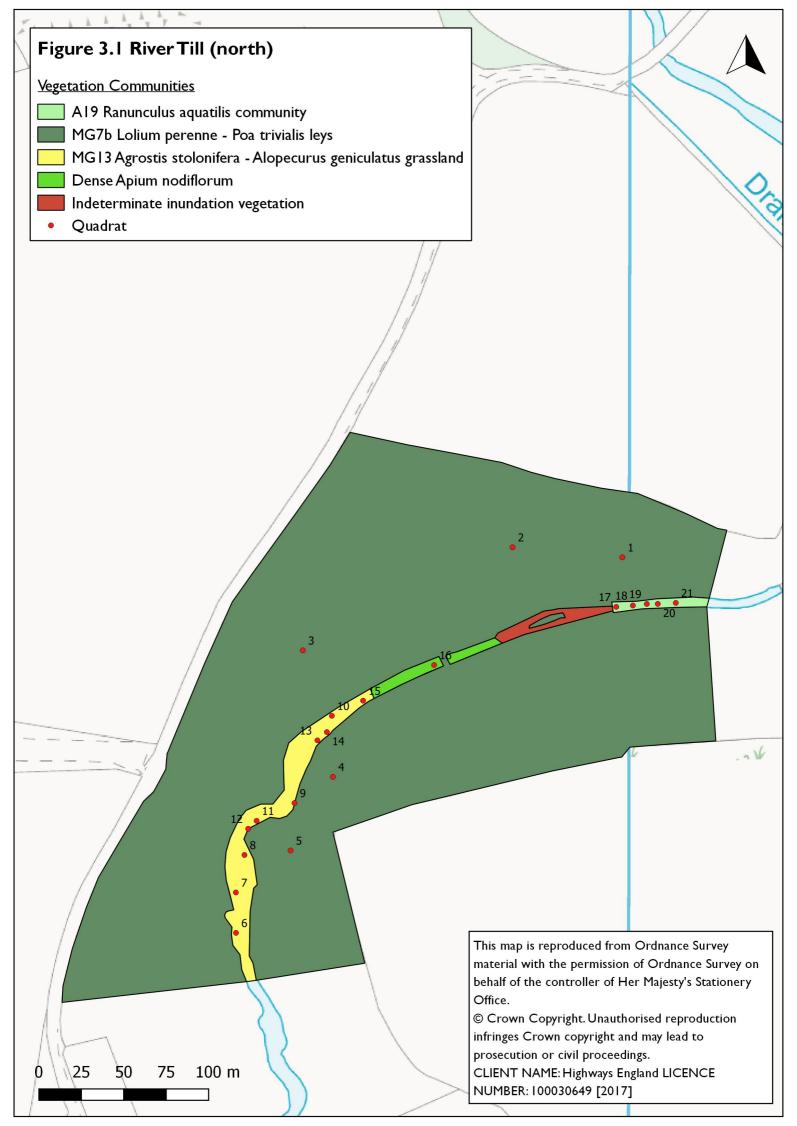
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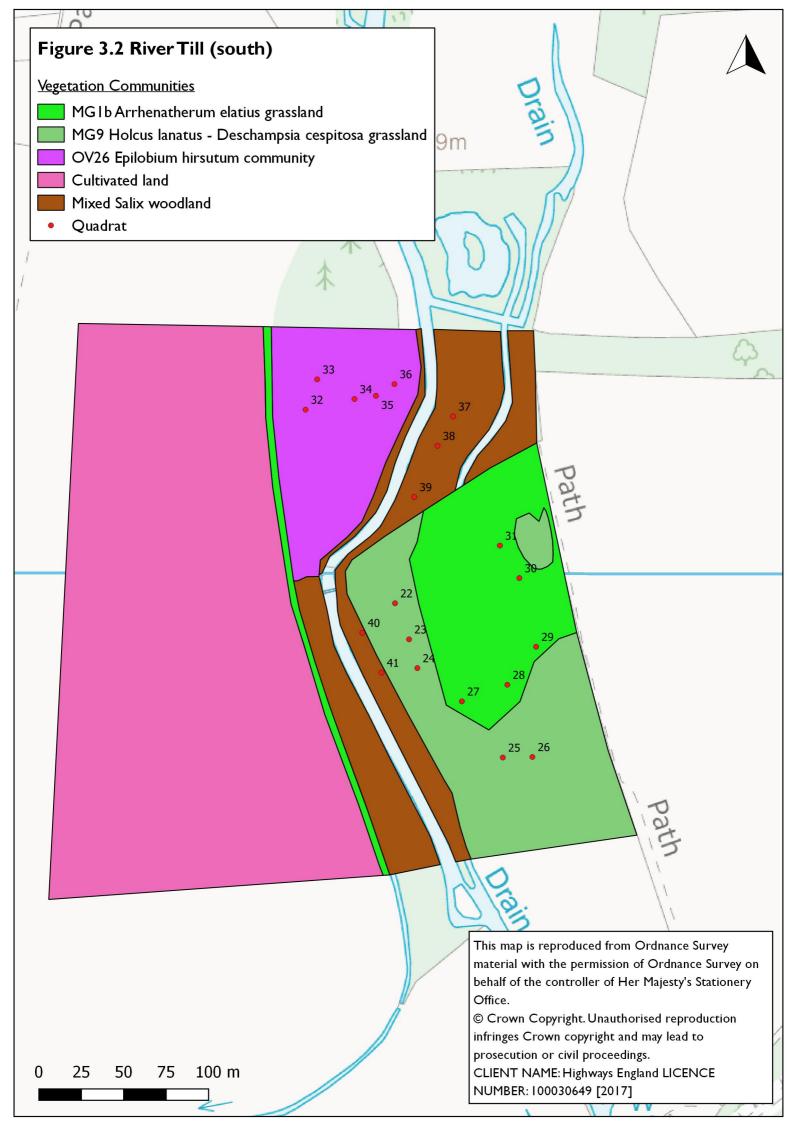
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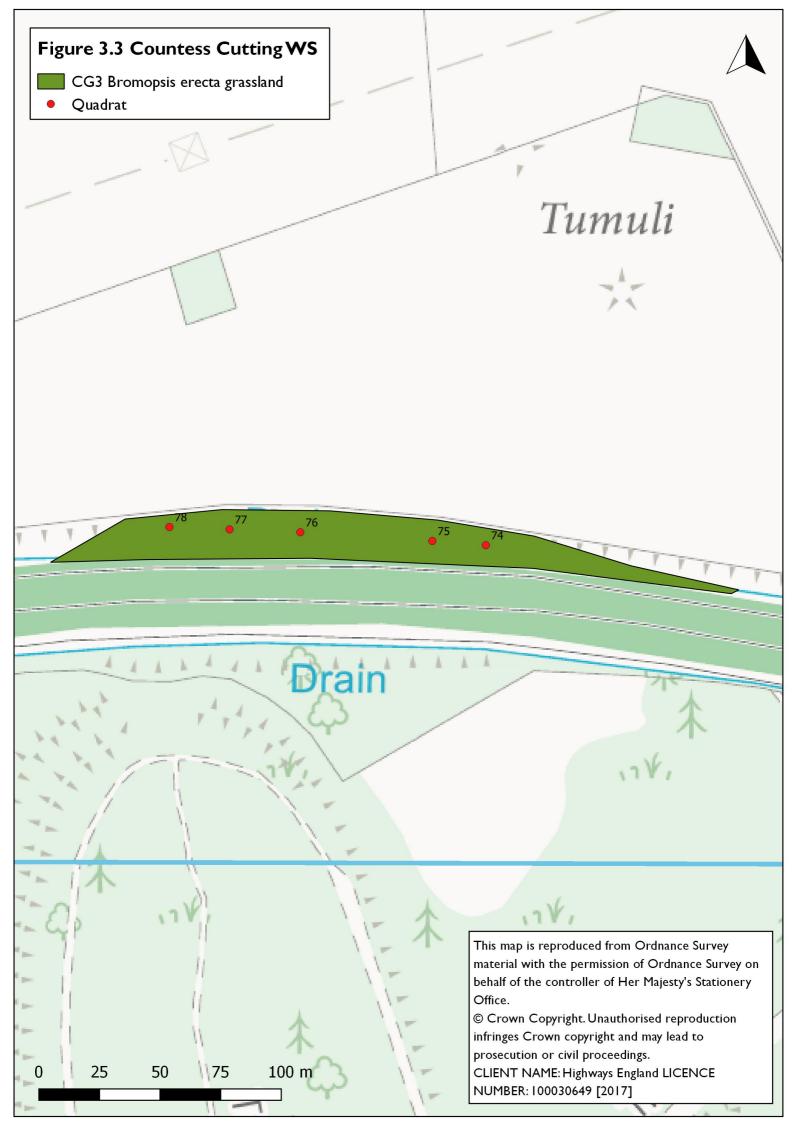
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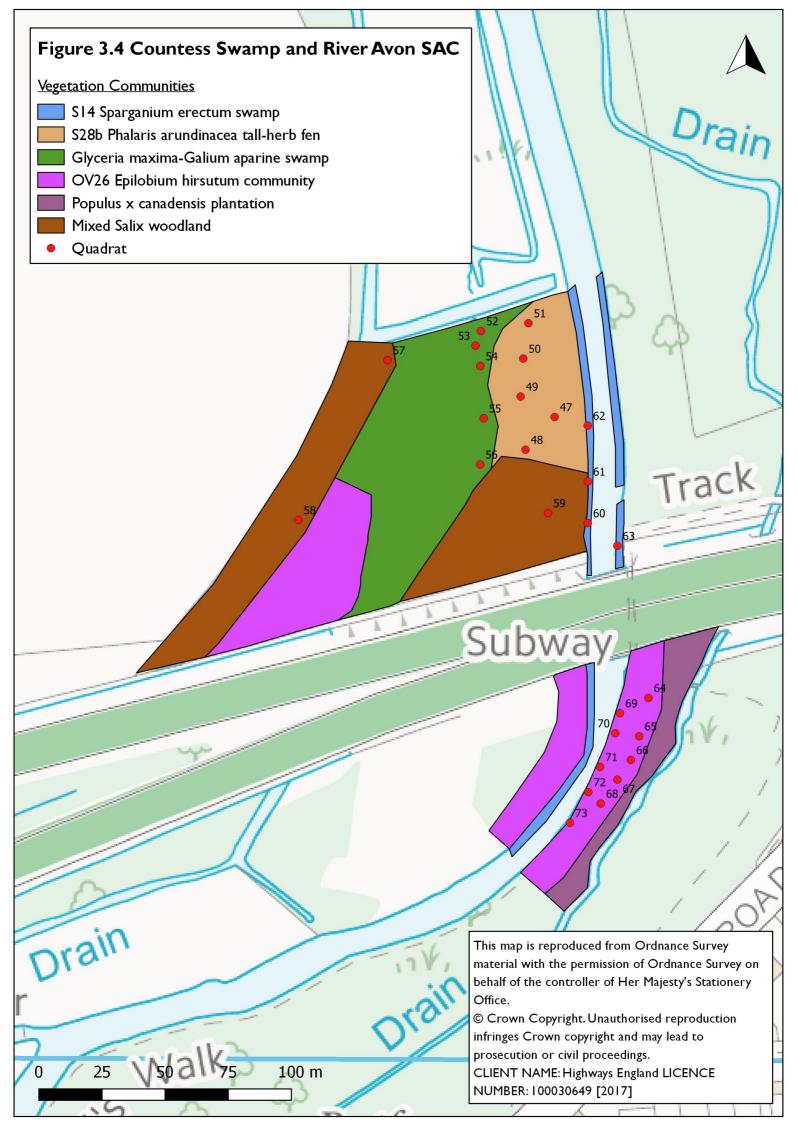
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Homalothecium lutescens					1				1 1 1		1	1	1									1 1		
Koeleria macrantha	2 1 1	1 3 1 1	1 1 1 1	1 1 1	1 1 1	2 1	2 1 1		5 1 1 1	l 2 1 1	1 5	1 1 1	. 5 1 1	1 1 5	1 1	1 5 1	. 1 1	5 1	5 1	1 1	15 1 1 1	15 1 1	1 5 1 1	1 5 1 1 1
Leucanthemum vulgare									1 1															
Linum catharticum														1				1	1				1 1	1
Lotus corniculatus	5 1 1	1 5 1 1	1 5 1 1	1 5 1 1	5 1 1	1 5 1	15 1	5 1 1	5 1 1	5 1 1	10	1 1	5 1 1	1 1 5	1 1	1 10 1	. 1 1	5 1 1	1 10 1	1 1	5 1 1 1	10 1 1	1 5 1 1	5 1 1 1
Luzula campestris				1 1	1 1																			1
Medicago lupulina					1				1 1 1				1 1 1	1 1		1					1		1	
Onobrychis viciifolia														1										
Phleum bertolonii	2 1	2 1 1	2 1 1	5 1 1	1 2 1	2 1	5 1 1	1 2 1 1		1 1					1 1			1	1 1	1	2 1			1 1 1 1
Pilosella officinarum									1				1 1		1 1		. 1 1		1 1		1	2 1 1	1	1
Plantago lanceolata	5 1 1	5 1	5 1 1	1 5 1 1	5 1 1	2	5 1	10 1 1	10 1 1	10 1 1	10	1 1 1	. 5 1 1	1 1 5	1 1	1 5 1	. 1 1	10 1 1	1 5 1	1	10 1 1 1	2 1 1	1 5 1 1	5 1 1 1
Plantago media								1																
Poa humilis	1 1 1	1						1 1																
Poa pratensis			1		1	1	1 1 1																	
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Primula veris							1			2		1 1 1	4 4 4	1 4	1	1	4 4	Т	5	4		1	2	10 1 1 1
Prunella vulgaris	1 1 1	1 1 1	1 1 1	1 1	4 4 4	10 1	10 1 1	10 1 1	1 10 1 1 1	1 10 1 1	1	1 1 1	1 1 1	1 -	1 1	1 1	. 1 1	E 1 1	1 1 1 20 1		10 1 1 1	1 20 1 1	1 10 1	E 1 1 1
Pseudoscleropodium purum	1 1 1		1 1 1	1 1	1 1 1	10 1	10 1 1	10 1 1	1	l 10 1 1	1 5	1 1 1	. 10 1 1	1 1 5	1 1	1 2 1	. 1 1	5 I I			10 1 1 1	30 1 1	1 10 1	5 1 1 1
Ranunculus bulbosus	5 1 1	1 2 1	2 1 1	1 5 1 1	5 1 1	1 10 1 1	5 1 1	2 1 1	1	1 1	1 5	1 1 1	. 5 1 1	1 1 5	1 1	5 1	. 1 1	Z 1 1	1 5 1	1	5 1 1 1	5 1 1	5 1 1	5 1 1
Rhytidiadelphus squarrosus	15 1 1	15 1 1	10 1 1	5 1 1	1	5 1 1	20 1 1	1 2 1	1 1 1	T 1	1	1 1	E 4	-	1 1	1	1 1	E 1 1	г 4	4	E 1	F 1 1		
Scabiosa columbaria	1 1 1	1		1 1	10 1 1	1 1	1 E 1	E 1 1	1	5 1 1	1 1 F	1 1 1	5 1			1 5 1		5 1 1	5 1		5 I 10 1 1 1	5 1 1	E 1 1	25 1 1 1
Schedonorus pratensis	1 1 1	1		1 1	10 1 1	1 1	5 1	5 1 1	1 5 1 1 1	1 5 1 1	1 5	1 1 1		10	1 1	5 1	. 1	10 1	10 1	1 1	10 1 1 1		5 1 1	25 1 1 1
Senecio jacobaea	1		1 1		5		1 1 1	1	1	1 1				4					1 1	1 1	2	1 1 1	2 1	2 4 4
Serratula tinctoria	2	1 1	1 1		1 1 1	F	1 1 1	J	E 1	1 1	10	1 1	10 1 1	1 10	1 1	1 10 1	1 1	10 1		1 1		1 1 1	2 1	2 1 1
Succisa pratensis	Z F 4 4	1 1	1 2 1	F 4 4	1 5 4 4	5	5		5 1	10 1		1 1	10 1 1	10	1 1	1 10 1	. 1 1		10 1		5	10 1 1		1 1
Thatch Thursus no lutrishus	5 1 1	1 10 1 1	1 2 1	5 1 1	1 5 1 1	5 1 1	1 5 1	5 1 1	1 5 1 1 1	1 5 1 1	T		5					5 1 1	1			10 1 1	1 5 1	10 1 1 1
Thymus polytrichus		1 1 1	1 1		4 4 4	2	1 1		1	E 1			1 1 1	1 4	1 1	1 2 4	1	c 1	г 4		E 1 1	_	2	1
Trifolium pratense		1 1 1	1 1		1 1 1		1 1			5 1			1 1 1	1	1 1	1 2 1	. 1	5 I	5 1		5 1 1	5	2	1
Trifolium repens	1 1 1	1 1 1		4 4		2 1 1			1							4 4	1							
Trisetum flavescens	1 1 1	1 1 1		1 1			1 1 1		1							1 1	. т							

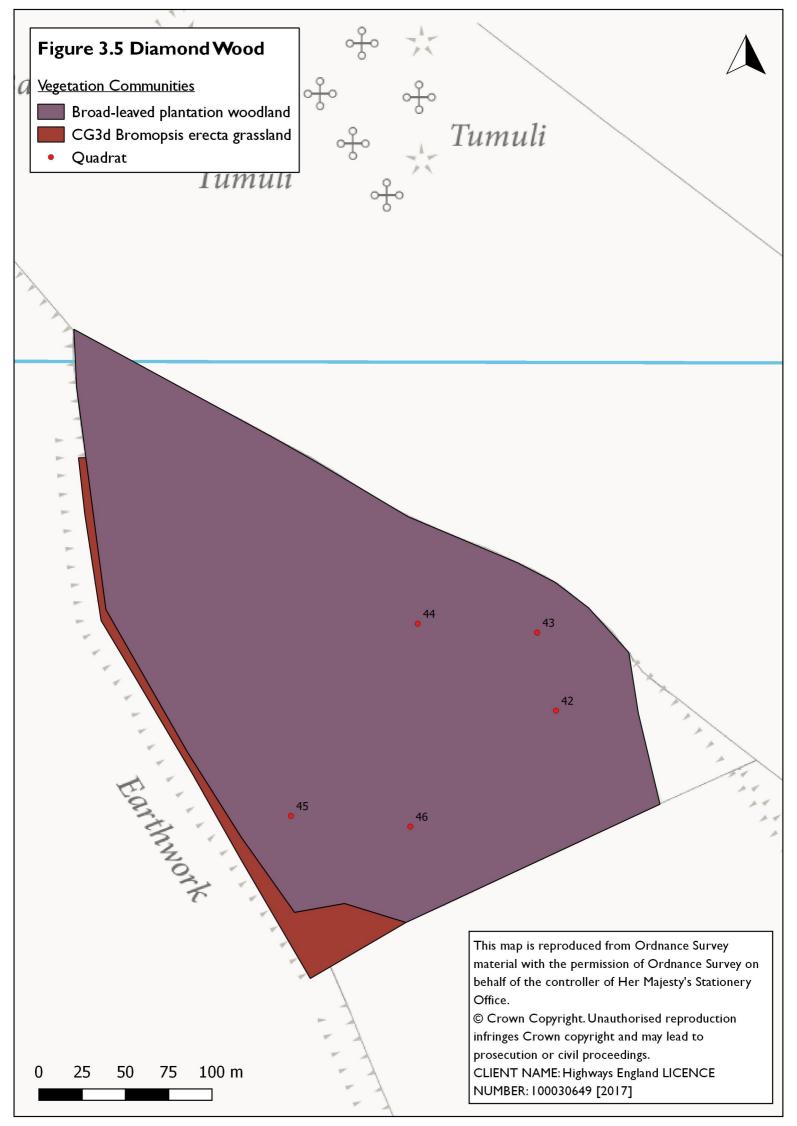
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Feel problem 1	Avenula pubescens	1 1 1	5 1 1	1 5 1		5				2 1	1	10 1			1	1 1 1							1 1					1 5	1 1					5 1	1 1	5 1	1 1	5 1 1 1
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Consistent of the content of the con		5 1 1	1 5	2 1	1	5 1	1	5 1	1			25 1		5		10 1 1	1 1	10 1	5	1 1	1 1	l5 1	1 1	5 :	1 1	10	1 1	5	1 1	1 10	1 1		10 1 1	5				15 1 1
Fettion-Memory Pettion-Memory Petrion-Memory Petrio	•							1										1			ŗ	5 1				•	_											2
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Mode indication of the continuous of the continu		75 1 1	1 70 1 1	1 75 1	1 1	75 1	1 1	50 1	1 1	50 1	1 1	65 1	1 1	70 1	1 1	50 1 1	l 1 7	70 1 1	1 35	1	4	15 1	1 1	70	1 1	1 35	1 1	1 40	1 1	1 40	1 1	1 '	25 1 1 1	45 1	1 1	40 1	1 1	65 1 1 1
See		5 1 1	1 10 1 1	1 5 1	1 1			10		15 1	1	10 1			1 1	10 1 1	1 1	5 1 1	10	1 1	1 1	10 1	1	10	1 1	5	1 1	1 10	1 1	1 15	1 1	1 :	10 1 1 1	10 1	1 1	10 1	1 1	5 1 1 1
Laybrane substitute 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1 1 1	1	1 1	1 1	_		2 1	1 1	5 1	1 1	1 1		_	1 1	2 1 1	L	1	5	1 1	1 2	2 1	1 1	2 :	1 1	1 2	1 1	1 5	1 1	1 5	1 1	1	5 1 1 1	5 1	1 1	. 1 1	1	2 1 1 1
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Lot	•															1					,	1				5	1			5	1 1	1 .	10 1 1			5 1		10 1 1 1
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Fine Probes of Ministry 1. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1 1	5 1 1	5 1							1 1					5 1 1	L .	5 1	10	1 1	1 5	5 1	1 1	5		10	1 1	10	1 1	1 5	1 1		2	10 1	1 1	5 1	1	5 1 1 1
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Post prime shore from the shore from	_									1		10 1	1	5 1	1		,	5 1	5	1 1	1		1 1	10	1 1	5	1 1	5	1 1	5	1 1		5 1 1	5	1	5 1	1	5 1 1 1
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Pseudoscieryopdium purum		3 1	-	3 1		1				1 1								5	5	1	2	2 1		5	1 1	5	1 1		1	2			10 1 1					
Ramuclus in loss in Surging in Su	_															4			1	1						4	4 4	4						4 4	4 4			4 4
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Senecic jacobiaea Senecic jacob						1 1		1 1	1					3		<i>J</i> 1		2	2	_	•	2 1		10		3	1 1											2 1
Succisa pratensis Succisa prate	•	5 1 1		5 1	1 1	2 1	1	5 1		5 1	1 1	2 1	1	5 1	1 1	1	,	5	5	1	-	1 1	1 1	5	1 1	5	1 1	1 10	1	15	1 1	?	30 1 1	15 1	1 1	30 1	1	20 1
Taraxacum agg. Thatch Thatch				1												1 1 1	L									2	1 1							1 1	1			
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Veronica chamedrys 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		5 1	10 1	10 1	1			10 1			1				1	1							1		1 1		1 1					1 :	10 1			10 1 1	1 1	
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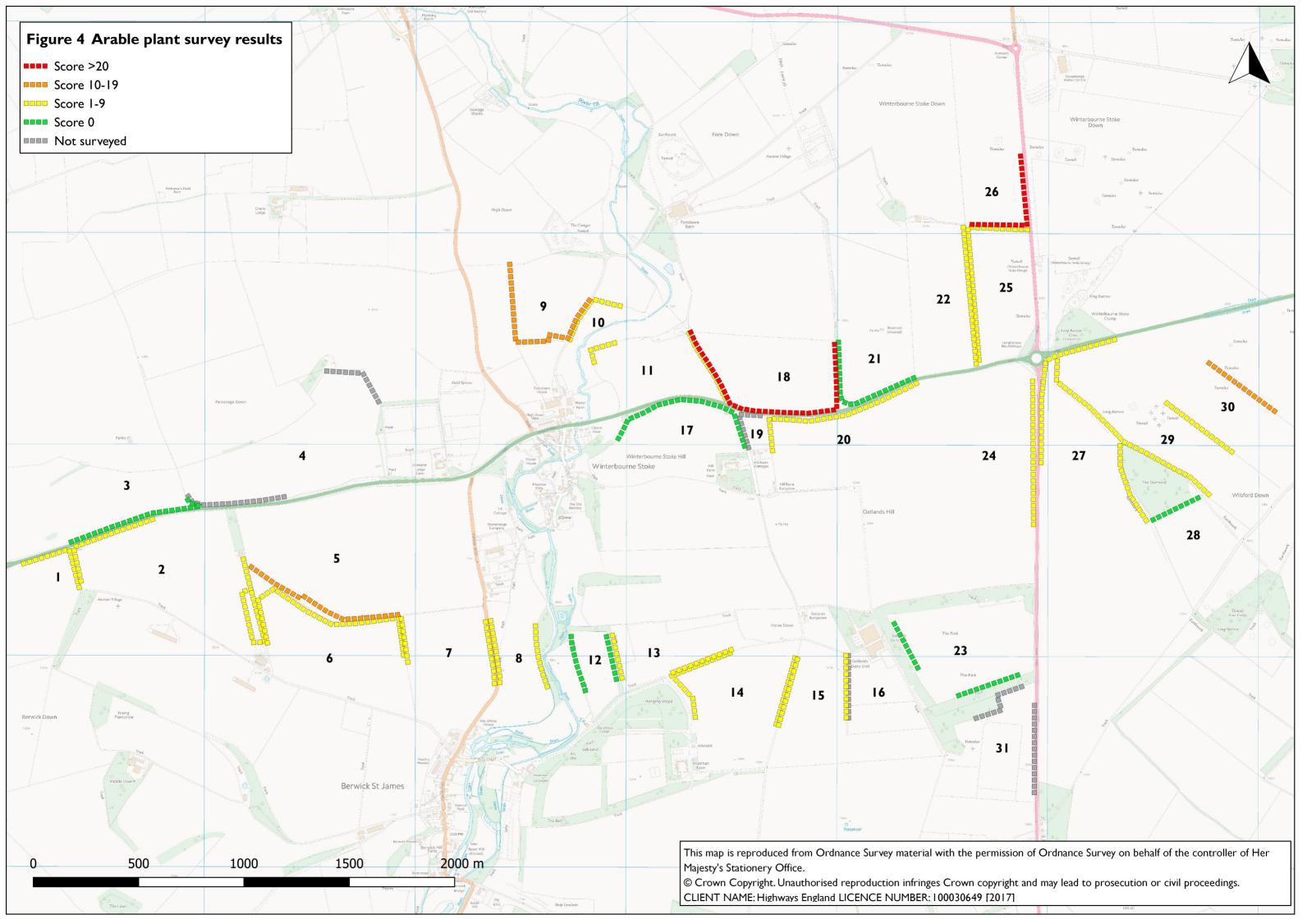


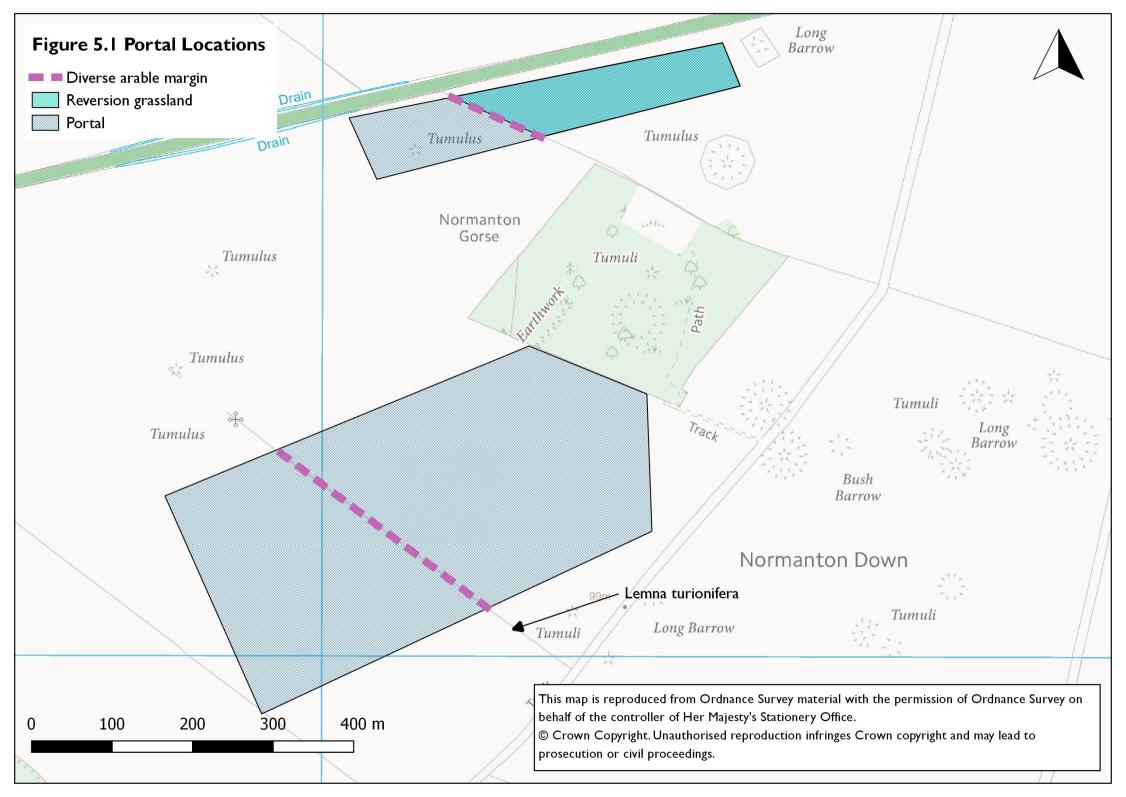


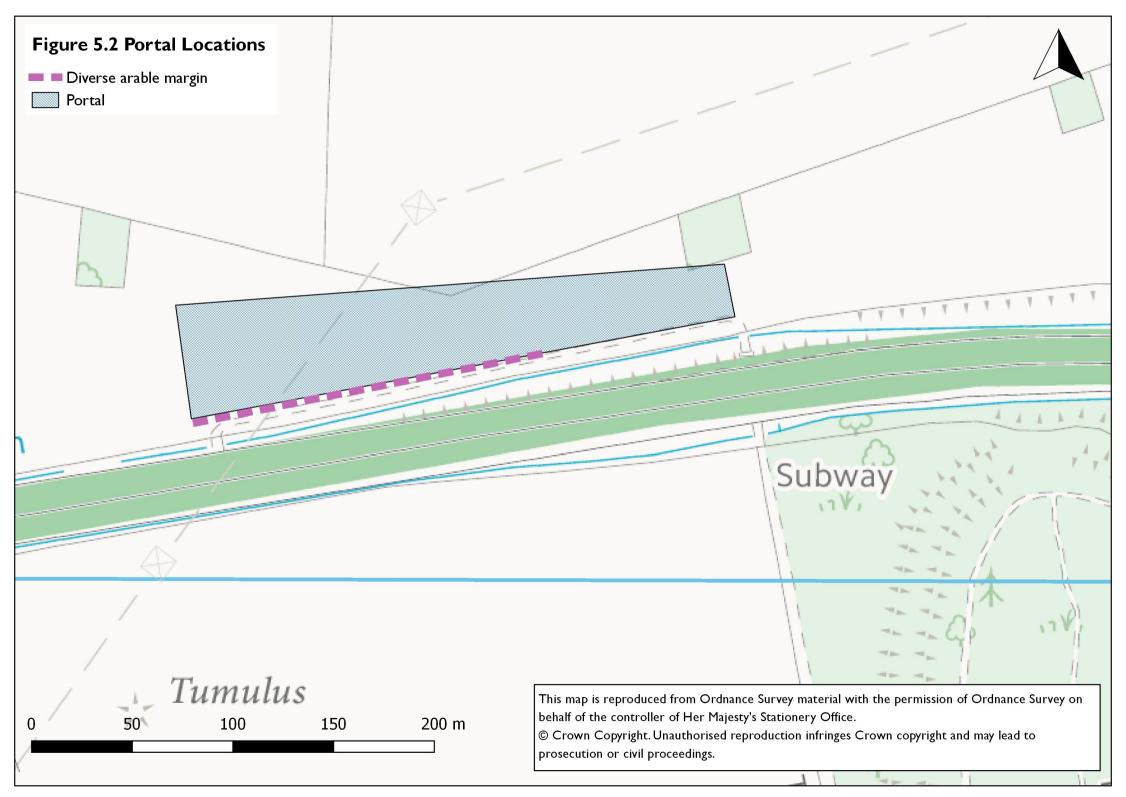












APPENDIX I: PARSONAGE BANK TRANSECT DATA

TRANSECT I

		Q1			Q2			Q3			Q4		(Q 5		Q6	i		Q7		Q8		С	19		Q10		Q11		Q:	L2		Q13		Q14		Q:	15		Q16		Q1	1/		Q18		Q:	19		Q20
	100	50 25	10	100	50 2	5 10	100 5	50 25				10 1	100 50	25	10 100	50	25 10	100 5	25 1	0 100	50 25					0 25 1	100	50 25	10 10	00 50	25 10	100 5	0 25		50 25		00 50	25 10	100	50 25	10 10	0 50	25 10		50 25	10 1	.00 50	25 10	100	50 25
grostis capillaris										1 1	1												1 1	1	1									2	1 1							\perp		1					\perp	
sperula cynanchica																				1																	1 1				1	. 1	1 1	1	1 1		1		1	1
venula pratensis	5			10	1 1	. 1	10	1 1	1				10 1	1	20	1	1 1	10 1	1	10	1 1	1	10 1	1 1	5 1	l 1	10	1 1	1 2	0 1	1 1	10 1	1	1 15	1 1	1 2	20 1	1 1	15	1 1	1 15	5 1	1 1	10	1 1	1 1	10 1	1 1	15	1 1
venula pubescens				1																																														
ellis perennis				1	1 1	1				1 1	1	1	1 1		1										1		1							1	1 1	1	1 1		1								1			
rachythecium rutabulum	1												1		1	1	1 1																																	
riza media		1 1	1	1		1				10 1	1	1	15 1	1			_	10 1	1	10	1 1	1 1	10 1	1	15 1	l 1	1 10	1 1	1 1	0 1	1 1	15 1	1	1 15	1 1		5 1	1	10	1	10	0 1	1 1	15	1 1	1 1	10 1	1 1	10	1 1
Calliergonella cuspidata		1 1		_	1 1	1	20	1 1		15 1	_	_	15 1	_	_		1	15 1		1 10	1 1		10	-	1	-	15	_		5 1		5 1			1 1		10 1			1 1					1 1		10 1	1		
Campanula rotundifolia	2.5	1 1			1 1		20	1 1	1	13 1			15 1	1	1 10	1	1	1 1	1					1	1			1 1		J 1		5 1		1			1 1	1 1	_	1 1				J	1 1		1 1	1		1 1
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Carex humilis																																									2	. 1	1 1	5			5 1		1	
Centaurea nigra				1			1	1 1	1						10	1				5	1 1						5	1											1	1 1	1			5	1		5 1		5	1 1
Centaurea scabiosa																																									1									
Cerastium fontanum																																		1																
Cirsium acaule	5	1		2	1 1		10			5 1			10 1	1	10	1	1	10 1	1	10	1 1	1	5 1	1 1	20 1	l 1	1 10	1 1	1	5 1	1	15 1	1	1 15	1 1		5 1	1 1	5	1 1	1 15	5 1	1 1	10	1	1	15 1	1 1	10	1 1
tenidium molluscum																														1		1 1										\Box	-							T
Cynosurus cristatus	1			2			2	1 1	1						2	1	1	1		1	1 1		2 1				1	1 1		2 1	1		_	1 5	1 1		1 1		\vdash		1	+	$\overline{}$				1 1	-	++	+
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eontodon hispidus	10	1 1	1	10	1 1		25	1 1	1	10 1	. 1	1	10 1	1	1 10	1	1	3 1		10	1 1	1 1	10 1	1 1	20 .	l 1	1 15	1 1	3	0 1		10 1	. 1	1 20	1 1			1	3	1 1	1 3	-				-	10 1		10	
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Medicago lupulina				1						1 1	. 1		1										1 1				1	1 1											1		1	l 1	1	1			1		1	1 1
Onobrychis viciifolia																						1	10							5 1	1 1	10		5	1 1	1			5		5	, 1	1 1				5		5	1 1
Pilosella officinarum	1	1					2	1		1 1	1	1	1 1	1	5			5 1	1	1 2	1				2 1	L	5	1 1	1 2	2		5 1	1	5			2 1	1	5	1 1	1 5	, 1	1	5	1 1	1	5 1	1 1	2	1 1
Plantago lanceolata	10	1 1	1	5	1 1	1	10	1 1	1	15 1	1	1	10 1	1	1 15	1	1 1	10 1	1	1 10	1 1	1	5 1	1 1	10 1		10	1 1	1 0	, 1	1 1	5 1	1	1 5	1 1	1	5 1	1 1	5	1 1	5	5 1	1 1	5	1 1		5 1	1	5	1 1
Plantago media	10		-	,		1	10		-	15 1	-	-	10 1	-	1 13	-		10 1	-	1 10		-	J 1		5		5		1	, -		3 1	-	1 3		-	J 1		2		- 3	+++					5	_		
Polygala calcarea																									3		3	1	1								1		-	1 1		+	$\overline{}$	2			3	-	+	_
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Polygala vulgaris	20	4 .	_		4 .	-	-			10 -								10			4 4				1 1	L	40					10 -					- 1	1 1	40	4 4	1 1	-		40	4 4		10 1		40	+
oterium sanguisorba		1 1	1		_	_			1	10 1			5 1	1			1 1			1 5								1 1	1 5) 1	1 1	10 1	1		1 1			1 1	10	1 1	1 10	J 1	1 1	10	1 1			1	10	
rimula veris	2			5	1 1	1	5	1		2 1	1		5 1		5	1	1	15 1	1	10	1 1	1 1	10 1	1 1		l 1								2	1		1					\perp					2		5	1 1
runella vulgaris	1	1		1	1 1					1															1 1		2	_		5 1							1					\perp		-	1 1		2 1		\perp	
seudoscleropodium purum	20	1 1	1	20	1 1	1	10	1		10 1	1	1	5 1		5	1				10	1 1		5 1		5 1	l 1	1 5	1 1	2	0 1	1 1	10 1	1	1 10	1 1	1 3	30 1	1 1	10	1 1	1 15	<i>i</i> 1	1	10	1 1		5		10	1 1
anunculus acris	1	1																																																
lanunculus bulbosus	2	1 1	1	2	1 1		2	1 1		2 1	1	1	2 1	1	1 5	1	1	2 1	1	2	1 1	1	1 1	1 1	2 1	l 1	1 2	1 1	1 5	5 1	1 1	2 1	1	1 1	1		1 1		2	1 1	1 2		\neg	2	1 1	1	1 1	1 1	2	1 1
cabiosa columbaria		1 1								5 1	1	1							1	2			10 1		5 1			1 1		2 1		10 1					2 1			1 1			$\overline{}$		1 1				+++	_
chedonorus arundinaceus	-		-	-	- 1	1				J 1	+	-							++	5			-5 1	-	1 1			- 1		1	-	10 1				+ + -	- +		3		- 1	+-	-	-			-	-	++	+
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chedonorus pratensis	-	-		-	-	-	1	-	+	1	-		-	+	2			2 1	+++	5	1 1		5 I	1 1	5 1	l 1	1 2	1 1		+	-	1		2	1 1	1				1 1			1 1	2	1 1	1	4 1	1	+-+	+
enecio jacobaea		-		_	_	-			+		-				1				+++				_				+			\perp									1		1	\perp	\vdash				_		1	1
erratula tinctoria	1			_			1		\perp		_		1 1	1	1			5 1		2			2 1					1 1		\perp												\perp					5 1		\perp	\perp
uccisa pratensis	15	1 1		20	1 1		1	1 1		5 1	1	1	25 1		15	1	1 1	15 1	1	10	1	1	10 1	1 1	5 1	L	5	1 1	1 5	5 1		10 1		10	1	2	20 1	1 1	15	1 1	1 25	1 ز	1 1	10	1 1	1	5 1	1 1	5	
araxacum agg.				1	1					1																																								
hymus polytrichus													1 1	1				1 1	1				1 1	1 1						1	1 1								1	1 1										
rifolium pratense	1	1 1		1	1 1	1									5				1	1 2	1						1	1				1		1			5 1			1 1	1		\neg	1			5 1		2	1 1
Frisetum flavescens	1				1 1					2 1	1	1	1 1	1				A 1	-	- 4	-						1	-				-		1		+ + -	o 1		,		-	+-	-	-			~ I	-	+++	
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/iola hirta	+++	_		_		-			+		-		_	++	-							\vdash						_		+		2 1	1	1 2	1 1		\perp		\vdash			1	\vdash		_			\vdash	+	+
(Schedolium Ioliaceum	1						1	1 1																																										

Data are presented in linear order from 0 m moving toward 100 m, where 100 = 100 cm x 100 cm quadrat size etc. Estimated percentage cover of each species is given for the largest quadrat only; in the sub-quadrats I = present and a blank cell means a species was not recorded.

TRANSECT 2

		Q1			Q2			Q3			Q4		Q5			Q6		Q	7		Q8		Q	9		Q10		Q1	.1		Q12		Q13	3		Q14		Q15		С	Q16		Q17		C	Q18		Q19)	Q	20
	100	0 25	10 1	100	50 25	10	100	50 25	10 1	100 50	0 25	10 10	0 50 2	25 10	100	50 25	10 10	0 50	25 1	0 100	50 2	5 10 1	00 50	25 10	100	50 25	10 1	00 50	25 10	100 5	0 25	10 100	50 2	25 10	100 50	25	10 100	50 25	10 10	0 50	25 1	10 100	50 2	5 10	100 50	25	10 10	50 2	25 10	100 50	25 10
Achillea millefolium																																							1												
Agrostis capillaris	1	1 1		1			1	1 1	1	5 1	1 1	1			1	1 1	1 1	1	1	1	1 1		1 1	1 1	1			1 1	1	1 1	l 1	1	1		1 1	1	1					2	1 1	l 1			1	1	1 1	1 1	
Asperula cynanchica																	1	1		1								1 1	1 1			2					2	1 1							1 1	1	1				
Avenula pratensis	1			5						1 1	1 1						5	1		10	1	1	10 1	1 1	10	1 1	1 1	.5 1	1 1	5 1	l 1	10	1	1	5 1	1	5	1 1	5	5 1	1	10	1 1	l 1	5 1	1	1 10	1	1 1	10 1	1 1
Avenula pubescens												5	1	1 1						1			1																												
Bellis perennis																							1 1																						1						
Briza media																	5	1					5 1	1	1	1		1 1	1 1	5 1	l 1	1 5	1	1 1	5 1	1	1 10	1 1	1 5	, 1	1	10	1 1	1	15 1	1	1 10) 1	1 1	5 1	
Calliergonella cuspidata	1	1										1	1	1			1	1		1			2 1		5	1		2 1	1	1 1	l				1 1	1			1	l 1					1		1				
Campanula rotundifolia															1	1 1	1						1																1	. 1	1 1	1 1	1		1					1	
Carex caryophyllea																												1				1			1 1	1	1 1		1	l 1					1 1	1	1			1	
Carex flacca	1											1	1	1 1			1			1			1 1	1 1	1	1 1		1		2 1	l 1	1 5	1	1	5 1	1	1 2	1 1	1 5	, 1	1 1	1			1 1		1	1		1 1	1 1
Carex humilis																												5 1																	1		5			1 1	
Centaurea nigra	5	1					1	1 1	1	1		2	1	1			1			5	1		5 1	1 1	5	1 1	1	1				2	1		5 1	1	1		5	5 1	1	1	1		5 1	1	1 10) 1			
Centaurea scabiosa																									1																										
Cirsium acaule															2								1 1		2	1 1	1 1	0 1		5 1	L	10	1	1 1	10 1	1	1 10		5	5 1		10	1		10 1	1	1 5			5 1	1 1
Cynosurus cristatus				\top																												1			1		1	1		5 1							Ť			1 1	
Dactylis glomerata	2	1 1	\Box	\top			5	1 1	1			1			1		1			1					1			2 1	1	5 1	l 1				2 1		1	_		5 1		5	1		5 1	1	2	1 :	1	1 1	
Festuca ovina / rubra		1		+																					+-+			-			_	45	1	1 1			1 45		1 3						40 1						
Festuca rubra	80	1 1	1	80	1 1	1	85	1 1	1 :	80 1	1 1	1 80) 1	1 1	85	1 1	1 6	5 1	1 1	L 75	1 1	. 1 6	55 1	1 1	65	1 1	1 2	0 1	1 1	55 1	L 1					-				+			1 1	1		-	_) 1	1 1	30 1	1 1
Filipendula vulgaris			-			+-	-			-										5								-									1			_				-				+	+-		
Galium verum	10	1 1	1	10	1 1	1	10	1	1	10 1	1 1	1			10	1 1	1			10	1 1	. 1 1	10 1		5	1 1	1	5 1	1	5 1					2		2		10	0		5	1 1				10) 1 :	1		
Helianthemum nummularium	1		-	10		-	1	-		1		-			10		10	1		1			10 1	1 1		1 1			1 1			5				1	1 1	1 1			1 1		1 1		5 1			1		2 1	1 1
Homalothecium lutescens	1						1			_		1					10	,		1			1 1		3	1 1		1 1	1 1	1		3			J 1	1	1 1	1 1	- 3	+-	1 1	1 3	1	. 1	1 1		- 3	+++	1	2 1	1 1
Koeleria macrantha	2	1 1	1	3	1 1	1	1	1 1	1	1 1	1		1	1	2	1	2	1	1						2	1 1		_	1 1		1 1	1 5	1 .	1 1	5 1	1	1 5	1	5	. 1	1 1	1 15	1 1	1		1	1 5	1	1 1	5 1	1 1
Leucanthemum vulgare		1 1	1	3	1 1	-	1	1 1	-	1 1	1	1	1	_		1		1					1 1	1 1		1 1	-	, 1	1 1	3 3		1 3	1 .	1 1	J 1	1	1 3	-		+	1 1	1 13		. 1	13 1	1	1 3	+++	-	J 1	
Linum catharticum				-	-	+																	1 1									1					1		1	_					1 1	1	1 1	+	+	1	\vdash
Lotus corniculatus	5	1 1	1	5	1 1	1	5	1 1	1	5 1	1 1		1	1 1		1	10	5 1			1 1		5 1	1	5	1 1		.0 1	1	5 1	1 1	1 5	1 .	1 1	10 1	1	1 5	1 1		_	1 1	1 5	1 1				_		1	5 1	1 1
Luzula campestris	3	1 1	1	3	1 1	-	3	1 1		1 1			1	1 1	3	1	1.	, 1		3	1 1		<i>J</i>	1	3		-	.0 1	-	3 3	L	1 3	1 .	1 1	10 1	-	1 3	1 1	1 1	<u> </u>	1 1	1 3	1	. 1	10 1	-	1 3	+ + + -	-	1	
Medicago lupulina				-	-	+				1 1	1	1											1 1	1						1 1	l 1	1			1					+-		1					1	+	+	1	
Onobrychis viciifolia				-	-	+						1											1 1	1						1 1	L	1			1					+-								+	+	\vdash	
Phleum bertolonii	2	1		2	1 1		2	1 1		5 1	1 1	1 2	1		2	1		1	1 1	1 2	1 1				1	1							1	1 1	1		1		1	l 1	1	2	1						-	1 1	1 1
Pilosella officinarum		1		_	1 1			1 1		J 1	1 1	1 2	1			1			1 .	L Z	1 1		1		1	1				1 1					2 1	1				l 1	1	1	1		2 1	1	1		-	1	1 1
Plantago lanceolata	-	1 1		5	1		Е	1 1	1	E 1	1 1	-	1	1	2		-	1		10	1 1		10 1	1	10	1 1		0 1	1 1								1 10	1 1		_	1		1 1	1				1	1	5 1	1 1
Plantago media	3	1 1		5	1		3	1 1	1	3 1	1 1	3	1	1	2		3	1		10			10 1	1	10	1 1		.0 1	1 1	5 1	L I	1 3	1 .	1 1	3 1	1	1 10	1 1	1 3	-	1	10	1 1	. 1	2 1	1	1 3	1	1	3 1	1 1
Poa humilis	1	1 1	1																	1																				+			-						-	$\overline{}$	-
	1	1 1	1	-		-	1					1			1		1	1	1 1		1							_								-				+			-					+			-
Poa pratensis		-		5	1	-	1			1 1	1 1	_	1		1			1	1 .		1 1		10 1	1	10	1 1		0 1	1 1	10 1	1 1	1 15	1	1 1	10 1	1	1 10	1 1	4	0 1	1 4	1 -	1 4	1	10 1	1	1 10	1	1 1	5 1	1
Poterium sanguisorba		-		3	1	-				1 1	T T	5	1		1		1			10	1 1		IO I	1	2	1 1		.0 1	1 I	10]	LL		1	тТ	10 1	T	1 10	T T	5	_	1 1	1 2	1 1	L	10 1	1	1 10		1 1	10 1	
Primula veris		-		-	-	-											1								2			1 1	1 1	1 1	1 1	1	_		1 1	1	1		_	l 1	1	+	\vdash		1		2	++	-	10 1	1 1
Prunella vulgaris	1	1 4	1	1	1	+	1	1 1		1 1	1	.	1	1	10	1	-	0 1	1	40	1 -	4	10 4	1 1	10	1 1								1 1				1 1		_		10	1		_	-	1 10	+	+	-	1 1
Pseudoscleropodium purum		1 1		_		+		1 1		1 1			1	_	10			-		-		1 1	-	1 1	10	1 1			1 1	-							1 5			_			1 1						1	5 1	
Ranunculus bulbosus		1 1	_	2		-			1				1	1 1				1			1 1	. 1	5 1	1 1		1 1		5 1		5]	L I	1 5	1	1	5 1	1	1 2	1 1	1 5	+1	1	5	1 1	1	5 1	1	5	1 :	1	5 1	1
Rhytidiadelphus squarrosus	15	1 1		15	1 1	-	10	1 1	+	э 1	1 1	1	+		5	1 1			1]	L 5	1		1 1	1	1			1 1	1	l .		-				1	4 -		-	+		+-			- 4			++	-	+	\vdash
Scabiosa columbaria				+	-	-				1 .	1						1			-			1 1			1 1				5 1	L						1 5			5 1		5			5 1	1	-	+_+	_	25 4	
Schedonorus pratensis		1 1	1	-		-				1 1	1		1	1 1	1		5	1		5	1 1	. 1		1 1	5	1 1	1) 1	1 1			10	1 :	1	5 1	1	10	1	10) 1	1 1	1 10	1 1	1			5	1 :	1	25 1	1 1
Senecio jacobaea	1	-		-	-	-						5					H.	+					1					+				-				++			H.	+-			\vdash	+		+	-	+.+	+	-	
Serratula tinctoria		-				-	1	1				1	1	1	+-+			1	1	1					1							1				-					1 1		\vdash	+	1 1			1	+	2 1	1
Succisa pratensis	2			1		-				_					5		5			2			5 1		10			.0 1	1	10 1	1 1	10	1 :	1 1	10 1	1		1		0 1		5	\vdash		10 1		1 5		_	1 1	
Thatch	5	1 1	1	10	1 1	1	2	1		5 1	1 1	1 5	1	1	5	1 1	1 5	1		5	1 1	. 1		1 1	5	1 1	1	\perp		5				_		+	5	1 1	1	+			\vdash	\perp	10 1	1	1 5	1	_	10 1	1 1
Thymus polytrichus		-		_	_										\perp								1		\perp			-								\perp				\perp			\vdash					$\perp \perp$			\vdash
Trifolium pratense				1	1 1		1	1				1	1	1	2			1							5	1				1 1	l 1	1	1 :	1 1	2 1	1	5	1	5	5 1		5	1 1	L	5		2	\perp		1	4
Trifolium repens				_											2	1 1																								1			\perp					$\perp \perp$		4	4
Trisetum flavescens				1						1 1	1						1 1	1	1				1												1 1	1															

TRANSECT 3

		Q1			Q2			Q3		Q4			Q5		Q0		Q7			Q8		Q9		Q10		Q11		Q12			13		Q14		Q15		~	,	Q			Q18		Q19			20
	100	50 2	5 10	100	50 2	5 10	100 5	50 25	10 10	00 50	25 10	100 5	0 25	10 100	50 25	10 100	50 2	25 10	100 5	0 25	10 100 50	25 10	100 5	0 25 1	0 100 5	0 25	10 100	50 25	5 10 1	100 50	25 10	100 50	25 1	100 5	0 25	10 100	50	25 10	100 50	25 10	100 50	25	10 10	50 2	25 10	100 50	25 1
Achillea millefolium									1	l 1																																					
Agrostis capillaris							1	1 1	1 1	L		1				1	1				1 1		5				1	1				1 1	1 :	1 1 :	1 1											1 1	1 1
Agrostis stolonifera																							1									1		1 :	1						1 1						
Avenula pratensis												5 1	1 1	1																				5	1	10	1	1	20 1	1	15 1	1	15	1 1	1 1	10 1	
Avenula pubescens	1	1 :	1	5	1 1	. 1	5	1	5	5		5 1	1	2	1 1	10	1	1 1	10 1	1 1	1 1	1	10 1	1 1 :	L		10	1 1	l 1	2 1		5 1	1 :	1 5 :	1 1	1 5	1		5 1		5 1	1	1 5	1 :	1 1	5 1	1 1
Bare soil							5		5	5		10 1	1	5	1 1				5 1	1	10 1		10		10	1	5	1		10 1		10 1				5	1		10 1	1 1							
Bellis perennis																			2								5	1																			
Briza media							5	1 1	1 5	5 1	1 1	1 1	1	5	1 1	1 1	1	1 1			5 1	1 1			5	1 1	1 5	1		5		5 1	1 1	1 5 :	1 1	2	1	1 1	1 1		5 1	1	2	1 :	1	10 1	
Calliergonella cuspidata																																		5													
Campanula rotundifolia																																1 1															
Carex caryophyllea																																									1 1	1	1				
Carex flacca							1	1 1				1 1	1	5	1	2	1						5 1	1 1	2		10	1 1	l 1	2 1	1	5 1	1 :	1 2 :	1	5	1		1 1	1 1	2 1	1	1 1			5 1	1
Centaurea nigra																											5					5 1									5					1	
Cerastium fontanum				1								1																				1								\neg	-				\neg		
Cirsium acaule	5	1 :	1 1	5			2	1 1	5	5 1	1	5 1	1 1			25	1		5		10 1	1	10 1	1	5	1 1	1 15	1 1	1 1	5 1	1	10 1	1	5 -	1 1	1 10	1	1	10 1	1	5				\neg	15 1	1
Cynosurus cristatus		1					_			1 1				2	1		-				5 1	-	1		10		5			J -	-	5 1				1 10	-	-	10 1							2	
Dactylis glomerata	_	1 :	_	10	1 1	1	10	1 1		0 1			1 1			10	1	1 1	10 1	1 1		1 1		1 1 :	-				1 1	10 1	1 1			1 5 :	1 1	5	1	1	5 1	1 1	10 1		10	1 .		5 1	
Festuca ovina				10			10		1	-				1 10		10	-		10 1		10 1		-		23					10 1	1 1	1 1	-	1 5 .		3	-	-	3 1		10 1			, <u> </u>		3 1	
Festuca rubra	75	1 .	1 1	70	1 1	1	75	1 1	1 7	5 1	1 1	50 1	1 1	1 50	1 1	1 65	1	1 1	70 1	1 1	1 50 1	1 1	70 1	1 1	1 35	1	45	1 1	1 1 -	70 1	1 1		1 1	1 40 :	1 1	1 40	1	1 1	25 1	1 1	45 1	1	1 40	1 1	1 1	65 1	1 1
Galium verum		1									1 1			1 15			1				1 10 1					1 1				10 1			1 1									1					
Holcus lanatus	1		1 1	10	1 1	. 1	3	1 1		5 1		10			1 1	5		1 1	5 1		1 10 1	1 1	3 .	1 1	10	1 1	1 10	1 1	L .	10 1	1	3 1	т.	1 10 .		5	1	1 1		1 1	10 1	1	1 10	, 1 .	1 1	1	1 1
Koeleria macrantha	_	1 :	1 1				1	1 1				2 1			1 1	-		1			1 2 1	1	1		-	1 1	1 2	1 1		2 1	1 1	2 1	1 1	1 5 :			1	1 1			г 1	1	1 1	1 .	1	2 1	1 1
	1	1 .	1 1				1	1 1	1 5) 1	1 1	2 1	1 1	1 5	1 1	1 1	1	1	1 1	1 1	1 2 1	1	1		5		1 2	1 1	L	2 1	1 1	2 1	1 .	1 5 .	1 1	1 5	1	1 1	5 1	1 1	5 1	1	1 1	1 .	1	2 1	1 1
Lathyrus pratensis										_			-										-		Э.	1						5 1	-			-	4	1 1	10 1		10 1	4	-	1	+	10 1	1 1
Leontodon hispidus							-													_			-									5 1			_	5	1	1 1	10 1		10 1		5	1	+	10 1	1 1
Linum catharticum	_		-				-				-										1						1										-				1 1	1			\perp		-
Lolium perenne				-			-										1	1	5 1	L			1		5		5			_		2		40						\rightarrow	10 1			-		- 4	
Lotus corniculatus	1	1		5	1 1		5	1							1 1	1					5 1		5 1	1	10	1 1			l 1			10 1	1	10	1 1	1 5	1	1	2		10 1	1	1 5	1 :	1	5 1	1 1
Medicago lupulina									2	2 1	1 1	1 1	1 1	1 1	1						2 1		1				2	1	-	2		-	-														-
Phleum bertolonii				1	1 1	. 1															5 1				1	1						1				1	1		1 1		1 1	1	1			1 1	-
Pilosella officinarum									1	l 1	1 1										2 1						1	1				5					_										-
Pimpinella saxifraga																1																													'		-
Plantago lanceolata														1		10	1	1	5 1	1 1			5 1	1	5	1 1			1 1 :	10 1	1	5 1	1	5 :	1 1	5	1	1	5 1	1	5 1	1	5	1 :	1	5 1	1 1
Plantago media																											10														5				'		-
Poa humilis	1			5	1							1 1	1	1	1				2				1			1 1																	1	1	'	1 1	
Poa pratensis									1	-		10				1			10 1		10 1		2		1		1							1											'		
Poterium sanguisorba	5	1		2			5	1 1	1 5	5 1	1	10 1		1 5		1 10				1 1	1 10 1		10 1	1 1	10		1 10		l 1	-				1 10 :	1 1	-	1	1 1	10 1	1						10 1	1
Primula veris									1	L		5 1	1	1	1 1	1 5	1		5		5 1		5		5		2	1		5 1	1	5 1	1	5 :	1	2					5 1	1	5	1 :	1	5 1	
Prunella vulgaris																									1																						
Pseudoscleropodium purum																					1				2							1 1	1 1	1							1 1					1 1	$\perp \perp$
Ranunculus bulbosus	5	1 :	1	5	1		2		2	2 1	1					2	1	1 1	5		10 1	1	5 1	1 1	5	1 1	1 1			5 1	1			5 :	1 1	2	1	1 1	5 1	1 1	2 1	1	5			5 1	1 1
Ranunculus repens																																												1			
Rumex acetosa																									1																						
Scabiosa columbaria									1	l 1									5		5 1		2		2	1	2	1		5		5 1	1													2 1	
Schedonorus arundinaceus												1 1	1 1																	10																	
Schedonorus pratensis	5	1 :	1				5	1 1	1 2	2 1	1	5 1	1	5	1 1	1 2	1	1	5 1	1 1	1 1		5		5	1	1	1 1	l 1	5 1	1	5 1	1 1	1 10 :	1	15	1	1	30 1	1	15 1	1	1 30	1 :	1	20 1	
Senecio jacobaea							1																																								
Succisa pratensis																					1 1	1										2 1	1								1 1	1					
Taraxacum agg.				5	1		5		1	l 1	1					1	1		1 1	1 1			1 1	1 1	1	1 1	1 1					1 1							2 1	1	1 1		1 5		\top		
Thatch	5	1		10				1 1		15		10 1	1	10	1 1		1		5 1				5 1		5		5	1		5 1	1 1			5	1 1	1 5	1			\neg	10 1			1 :	1 1		
Trifolium pratense				1.0					1	1 1				1			1	1	2 1		1		2		5	1 1		1 1		2		5 1	1	1 2 :		2			2	\top	1 1		1		7		
Veronica chamedrys	1	1 :	1	1	1 1					-	-		+		1 1					1 1			+-+									- 1								\neg					+		\Box
Vicia cracca	-		-	-			-	_			_			5		- 3	-	_	, I		-												-		_		-			\rightarrow		-	_		-		\vdash

APPENDIX II: NVC DATA

Site name		Till N	Till N	Till N	Till N	Till N	Till N	Till N	Till N	Till N	Till N	Till N										
Grid reference		SU 07997	SU 07933	SU 07809	SU 07820	SU 07802	SU 07772	SU 07771	SU 07771	SU 07804	SU 07823	3 SU 07782	2 SU 07780	SU 07817	SU 07824	SU 07845	SU 07884	SU 07994	SU 08004	SU 08011	SU 08017	7 SU 08030
		41620	41626	41565	41492	41448	41407	41422	41447	41476	41524	41462	41457	41515	41518	41536	41553	41591	41593	41595	41595	41595
Quadrat number		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Veg unit		MG7b	MG7b	MG7b	MG7b	MG7b	MG13	MG13	MG13	MG13	MG13	MG13	MG13	MG13	MG13	MG13	N/A	A19	A19	A19	A19	A19
Agrostis stolonifera																						
Alopecurus geniculatus	Creeping Bent	2	4	3	4	5	7	6	5	1		4	1	2	2							
Apium nodiflorum	Marsh Foxtail							3	1	5	5	7	5	5	6	7	1	5	5	4	4	5
Arrhenatherum elatius	Fool's-water-cress						2	4			4		2				9	5	5	5	4	6
Brachythecium rutabulum	False Oat-Grass		2	6	7																	
Bromus hordeaceus	Rough-stalked Feather-moss				3																	
Carex hirta	Soft-brome	2				2																
Cerastium fontanum	Hairy Sedge				5																	
Cladophora agg.	Common Mouse-ear	1		1		1						1	1									
Convolvulus arvensis	A filamentous green alga																	6		4		
Cratoneuron filicinum	Field Bindweed					4																
Dactylis glomerata	Fern-leaved Hook-moss						2							3	3	2						
Epilobium parviflorum	Cock's-foot	6	4	4	4	4																
Festuca rubra	Hoary Willowherb											4	4	5	5							
Fontinalis antipyretica	Red Fescue	7	7	5	5	5																
Galium palustre	Greater Water-moss										2						2					
Geranium dissectum	Marsh-bedstraw											2	4									
Glyceria fluitans	Cut-leaved Crane's-bill		1		2	4																
Holcus lanatus	Floating Sweet-grass									1		7	8	9	6	7	2	3		5		5
Lemna gibba	Yorkshire-fog	5	6	5	4	8			1			4	2		4	2						
Leptodictyum riparium	Fat Duckweed								3	1	2					2	4	8	8	9	9	9
Lolium perenne	Kneiff's Feather-moss						2					4	3	3	3	2	3					
Mentha aquatica	Perennial Rye-grass	3	5	6	5	4						1										
Myosotis scorpioides	Water Mint						4		2													
Nasturtium officinale	Water Forget-me-not						7	6	9	7	8		4	3	5		4	1	4	2	3	4
Phalaris arundinacea	Water-cress							6	2			1	4					1	4	4	6	1
Phleum bertolonii	Reed Canary-grass														2	1	5					
Poa trivialis	Smaller Cat's-tail	2			4	2																
Potentilla anserina	Rough Meadow-grass	3	4	4	3	4	3	3	2		1	3	4	4	5	4						
Ranunculus acris	Silverweed											4										
Ranunculus aquatilis	Meadow Buttercup	4		1																		
Ranunculus peltatus	Common Water-crowfoot										1						1	4	3	3	4	3
Ranunculus repens	Pond Water-crowfoot																	2	4	3	4	2
Rumex conglomeratus	Creeping Buttercup		4	4	1							1	1									
Schedonorus arundinaceus	Clustered Dock						1	4	1			2	1								1	1
Senecio aquaticus	Tall Fescue	2																				
Taraxacum agg.	Marsh Ragwort							1				5	4		1	1						
Veronica anagallis-aquatica	-				1																	
Veronica beccabunga	Blue Water-speedwell								5	4	1					1						
Thatch	Brooklime						7	4			4	2										
Bare ground		5	4	4	5	5																
Unvegetated open water			4		-	-	5	4	4	2	4	5	4	5	4	5	5					

Abundance within quadrats is recorded using the Domin scale, where:

I	< 4%; few individuals	6	26 - 33%
2	< 4%; several individuals	7	34 - 50%
3	< 4%: many individuals	8	51-75%
4	4 - 10%	9	76 - 90%
5	11 - 25%	10	91 - 100%

Site name			Till S									
Grid reference			SU 07653 39987	SU 07661 39967	SU 07666 39950	SU 07715 39898	SU 07734 39898	SU 07692 39931	SU 07718 39940	SU 07736 39963	SU 07726 40002	SU 07714 40023
Quadrat number			22	23	24	25	26	27	28	29	30	31
Veg unit			MG9	MG9	MG9	MG9	MG9	MG1b	MG1b	MG1b	MG1b	MG1b
		Charles and const										
Agrostis stolonifera	Creeping Bent	Structural unit	6	8	8	6	5					
Alopecurus pratensis	Meadow Foxtail							2				2
Amblystegium serpens	Creeping Feather-moss											
Angelica sylvestris	Wild Angelica		4		4		5			2		
Anisantha sterilis Anthriscus sylvestris	Barren Brome Cow Parsley								4	3	1	1
Arrhenatherum elatius	False Oat-Grass		4	5	3	4	4	6	7	9	5	8
Brachypodium sylvaticum	False-brome											
Brachythecium rutabulum	Rough-stalked Feather-moss		3	3	3	2	3					
Calliergonella cuspidata	Pointed Spear-moss				2							
Calystegia sepium Cardamine pratensis	Hedge Bindweed Cuckooflower											
Carex hirta	Hairy Sedge		4	2		2						
Cerastium fontanum	Common Mouse-ear			_		2	1					
Cirsium arvense	Creeping Thistle			1			1			4		
Cirsium palustre	Marsh Thistle										_	_
Cirsium vulgare	Spear Thistle Great Scented Liverwort						1	4	1	1	2	1
Conocephalum conicum Crataegus monogyna	Hawthorn	Understorey										
Cryphaea heteromalla	Lateral Cryphaea	onderstorey										
Dactylis glomerata	Cock's-foot								5		7	
Deschampsia cespitosa	Tufted Hair-grass		4	2	4	4	2			4		
Eleocharis palustris	Common Spike-rush				3	4						
Epilobium hirsutum Equisetum arvense	Great Willowherb Field Horsetail											
Equisetum arvense Equisetum palustre	Marsh Horsetail				4	1						
Eupatorium cannabinum	Hemp-agrimony											
Festuca rubra	Red Fescue											4
Filipendula ulmaria	Meadowsweet	e. 1.1		4								
Fraxinus excelsior	Ash	Field layer										
Fraxinus excelsior Fraxinus excelsior	Ash Ash	Understorey Canopy										
Frullania dilatata	Dilated Scalewort	запору										
Galium aparine	Cleavers		2	1		4	3	1				2
Galium palustre	Marsh-bedstraw		1	1			2					
Galium uliginosum	Fen Bedstraw											
Geranium pyrenaicum Geranium robertianum	Hedgerow Crane's-bill Herb-Robert								1	1	4	1
Glyceria maxima	Reed Sweet-grass											
Hedera helix	Common Ivy	Canopy										
Heracleum sphondylium	Hogweed									2	6	4
Holcus lanatus	Yorkshire-fog		4	5	5	7	5	8	4	4	5	5
	Silky Wall Feather-moss											
Hypnum cupressiforme agg. Hypnum cupressiforme var. r	Supine Blait moss											
Iris pseudacorus	Yellow Iris											
Juncus acutiflorus	Sharp-flowered Rush											
Juncus inflexus	Hard Rush		8	7	7	6	7					
Kindbergia praelonga	Common Feather-moss											
Lunularia cruciata Lycopus europaeus	Crescent-cup Liverwort											
Mentha aquatica	Gypsywort Water Mint											
Metzgeria consanguinea	Whiskered Veilwort											
Metzgeria furcata	Forked Veilwort											
Myosotis arvensis	Field Forget-me-not										1	3
Myosotis scorpioides	Water Forget-me-not											
Oenanthe crocata Orthotrichum affine	Hemlock Water-dropwort Wood Bristle-moss											
Orthotrichum diaphanum	White-tipped Bristle-moss											
Orthotrichum lyellii	Lyell's Bristle-moss											
Oxyrrhynchium hians	Swartz's Feather-moss					2						
Pellia endiviifolia	Endive Pellia			_		_						
Persicaria amphibia Phalaris arundinacea	Amphibious Bistort Reed Canary-grass		1	5	4	5 4	1					
Phaiaris arundinacea Phleum bertolonii	Smaller Cat's-tail		2	_	-	-	_					
Plagiomnium undulatum	Hart's-tongue Thyme-moss											
Plantago lanceolata	Ribwort Plantain			2								
Poa trivialis	Rough Meadow-grass		5	4	5	4	5	5	4	4	4	4
Ranunculus repens Rhizomnium punctatum	Creeping Buttercup Dotted Thyme-moss			2		2	2					2
Rumex obtusifolius	Broad-leaved Dock									4		
Rumex sanguineus	Wood Dock						2			4		
Salix alba	White Willow	Understorey										
Salix alba	White Willow	Canopy										
Salix cinerea subsp. oleifolia	•	Canopy										
Salix cinerea subsp. oleifolia Salix triandra	Almond Willow	Understorey										
Salix fragilis agg.	Crack Willow	Understorey										
Salix fragilis agg.	Crack Willow	Canopy										
Sambucus nigra	Elder	Understorey										
Schedonorus giganteus	Giant Fescue											
Scleropodium cespitans Scrophularia auriculata	Tufted Feather-moss Water Figwort											
	Marsh Ragwort											
	Common Ragwort											1
Silene flos-cuculi	Ragged-Robin											
Solanum dulcamara	Bittersweet											
Stachys palustris	Marsh Woundwort											
Stachys sylvatica Taraxacum agg.	Hedge Woundwort Dandelion					1				1	1	
Ulmus procera	English Elm	Understorey				-				_	1	
Urtica dioica	Common Nettle		2	1	4	1	6	4	8	5	5	4
	Germander Speedwell											2
Veronica chamaedrys		District Company of the Company										
Viburnum opulus	Guelder-rose	Understorey										
•	Guelder-rose Green Yoke-moss	Understorey	4	4	2	4	4		4	3	3	4

Site name			Till S SU 07599	Till S SU 07607	Till S SU 07628	Till S SU 07641	Till S SU 07652	Till S SU 07686	Till S SU 07678	Till S SU 07663	Till S SU 07632	Till S SU 07645
Grid reference			40102	40119	40110	40110	40116	40096	40077	40050	39972	39947
Quadrat number			32	33	34	35	36	37		x Mixed Sali:		
Veg unit			OV26	OV26	OV26	OV26	OV26	Mixed	Mixed	Mixed	Mixed	Mixed
								Salix	Salix	Salix	Salix	Salix
								woodland	woodland	woodland	woodland	woodlan
		Structural unit		_		_						
Agrostis stolonifera Alopecurus pratensis	Creeping Bent Meadow Foxtail			2		2						
Amblystegium serpens	Creeping Feather-moss							2		3		3
Angelica sylvestris	Wild Angelica		7	4	6	1		_	1	1		3
Anisantha sterilis	Barren Brome					_			_	-	1	
Anthriscus sylvestris	Cow Parsley											
Arrhenatherum elatius	False Oat-Grass				4	3	2					
Brachypodium sylvaticum	False-brome										4	
Brachythecium rutabulum	Rough-stalked Feather-moss				3			3	3	3	4	4
Calliergonella cuspidata	Pointed Spear-moss											
Calystegia sepium	Hedge Bindweed					4	4		3			
Cardamine pratensis	Cuckooflower									1		1
Carex hirta	Hairy Sedge											
Cerastium fontanum	Common Mouse-ear				_							
Cirsium arvense	Creeping Thistle Marsh Thistle			1	2	1	3					
Cirsium palustre Cirsium vulgare	Spear Thistle				4	1						
Conocephalum conicum	Great Scented Liverwort					1			1	2		3
Crataegus monogyna	Hawthorn	Understorey						4	1	4		3
Cryphaea heteromalla	Lateral Cryphaea	onderstorey						2	1	-		2
Dactylis glomerata	Cock's-foot							_	-			1
· -	Tufted Hair-grass		4	4	4		2					_
Eleocharis palustris	Common Spike-rush											
Epilobium hirsutum	Great Willowherb		4	4	2							
Equisetum arvense	Field Horsetail		1			2						
Equisetum palustre	Marsh Horsetail											
Eupatorium cannabinum	Hemp-agrimony									4		
Festuca rubra	Red Fescue											
Filipendula ulmaria	Meadowsweet				2	2		1	4	1		2
Fraxinus excelsior	Ash	Field layer						1			3	4
Fraxinus excelsior	Ash	Understorey							4	4	4	
Fraxinus excelsior	Ash	Canopy						1	4	4		
Frullania dilatata	Dilated Scalewort							3	2	2	3	3
Galium aparine	Cleavers		3	4	4	4	5	2	4			
Galium palustre	Marsh-bedstraw					2						1
Galium uliginosum	Fen Bedstraw					3						
Geranium pyrenaicum	Hedgerow Crane's-bill									_		_
Geranium robertianum	Herb-Robert							4	2	2	3	6
Glyceria maxima Hedera helix	Reed Sweet-grass Common Ivy	Canopy						1	2	1	4	
Heracleum sphondylium	Hogweed	Сапору						1		1	4	
	Yorkshire-fog						2					
	Silky Wall Feather-moss						_		3	3		3
Hypnum cupressiforme agg.	omy train came moss							3	3		4	3
Hypnum cupressiforme var. r	Supine Plait-moss								_		2	
	Yellow Iris								1	4		
Juncus acutiflorus	Sharp-flowered Rush					5						
Juncus inflexus	Hard Rush		3				2					
Kindbergia praelonga	Common Feather-moss							2	2	3		3
Lunularia cruciata	Crescent-cup Liverwort									3		
Lycopus europaeus	Gypsywort									3		
Mentha aquatica	Water Mint		2	1		3	3	3	1	4	4	2
Metzgeria consanguinea	Whiskered Veilwort							3				
Metzgeria furcata	Forked Veilwort							3	2		2	2
Myosotis arvensis	Field Forget-me-not									_	_	
Myosotis scorpioides	Water Forget-me-not			_	_	_		3	4	6	4	4
Oenanthe crocata	Hemlock Water-dropwort		8	9	7	7	9	8	9	8	3	4
Orthotrichum affine	Wood Bristle-moss							2	1		3	3
Orthotrichum diaphanum Orthotrichum lyellii	White-tipped Bristle-moss Lyell's Bristle-moss							_			2	1
Oxyrrhynchium hians	Swartz's Feather-moss										-	-
Pellia endiviifolia	Endive Pellia											2
Persicaria amphibia	Amphibious Bistort					2						-
Phalaris arundinacea	Reed Canary-grass		5	4	4	5	3					
Phleum bertolonii	Smaller Cat's-tail											
Plagiomnium undulatum	Hart's-tongue Thyme-moss							2		3		
Plantago lanceolata	Ribwort Plantain											
Poa trivialis	Rough Meadow-grass		3	3	3	3	4	3	2	5	4	4
Ranunculus repens	Creeping Buttercup					1		1			1	
Rhizomnium punctatum	Dotted Thyme-moss										2	3
Rumex obtusifolius	Broad-leaved Dock		1	1		1						
Rumex sanguineus	Wood Dock		4	1		2	1	1		1	1	2
Salix alba	White Willow	Understorey							4			
Salix alba	White Willow	Canopy							6	6		
Salix cinerea subsp. oleifolia	•	Canopy						_		_	8	10
Salix cinerea subsp. oleifolia	· ·	Understorey						5	5	7	7	6
Salix triandra	Almond Willow	Hader-t-						0	4	_	_	
Salix fragilis agg.	Crack Willow	Understorey						8	4	5	5	
Salix fragilis agg.	Crack Willow	Canopy						8	6	5	6	
Sambucus nigra Schedonorus giganteus	Elder Giant Fescue	Understorey	1		2		2		5		3	
	Tufted Feather-moss		_		_		_		1	3	3	2
Scrophularia auriculata	Water Figwort		2	1	3		2			3		1
Senecio aquaticus	Marsh Ragwort		_	_			_					_
Senecio jacobaea	Common Ragwort											
	Ragged-Robin											
Silene flos-cuculi	Bittersweet		1	2	1			2	2	2	3	2
			1									
Solanum dulcamara	Marsh Woundwort									2		
Solanum dulcamara Stachys palustris	Marsh Woundwort Hedge Woundwort											
Silene flos-cuculi Solanum dulcamara Stachys palustris Stachys sylvatica Taraxacum agg.					1							
Solanum dulcamara Stachys palustris Stachys sylvatica Taraxacum agg.	Hedge Woundwort	Understorey			1			2				
Solanum dulcamara Stachys palustris Stachys sylvatica	Hedge Woundwort Dandelion	Understorey	4	4	5	5	4	2 5	5	4	5	4
Solanum dulcamara Stachys palustris Stachys sylvatica Taraxacum agg. Ulmus procera Urtica dioica	Hedge Woundwort Dandelion English Elm	Understorey	4	4		5	4		5	4	5	4
Solanum dulcamara Stachys palustris Stachys sylvatica Taraxacum agg. Ulmus procera Urtica dioica	Hedge Woundwort Dandelion English Elm Common Nettle	Understorey	4	4		5	4		5	4	5	4
Solanum dulcamara Stachys palustris Stachys sylvatica Taraxacum agg. Ulmus procera Urtica dioica Veronica chamaedrys	Hedge Woundwort Dandelion English Elm Common Nettle Germander Speedwell		4	4		5	4		5			4

Site name		Countess	Countess	Countess	Countess	Countess
		Cutting	Cutting	Cutting	Cutting	Cutting
Grid reference		SU 14683	SU 14663	SU 14607	SU 14577	SU 14553
		42134	42137	42136	42141	42138
Quadrat number		74	75	76	77	78
Veg unit		CG3	CG3	CG3	CG3	CG3
Achillea millefolium	Yarrow					1
Anacamptis pyramidalis	Pyramidal Orchid	1				
Anthyllis vulneraria	Kidney Vetch				1	
Arrhenatherum elatius	False Oat-Grass	2	2		2	4
Brachypodium sylvaticum	False-brome	2	2		3	1
Bromopsis erecta	Upright Brome	4	5	5	4	4
Centaurium erythraea	Common Centaury	1		1		
Cirsium acaule	Dwarf Thistle	1		4		
Clematis vitalba	Traveller's-joy	4		4	1	4
Crataegus monogyna (seedlir	Hawthorn					1
Dactylis glomerata	Cock's-foot	1			1	2
Dactylorhiza fuchsii	Common Spotted-orchid	3	4	1	3	4
Dactylorhiza x grandis	D. fuchsii x praetermissa	1				
Daucus carota	Carrot	2	2		3	1
Erigeron acris	Blue Fleabane			1	3	
Euphrasia nemorosa	Eyebright			1	3	3
Festuca rubra	Red Fescue		2		2	3
Fissidens dubius	Rock Pocket-moss			2		
Fraxinus excelsior (seedling)	Ash		1	1	2	1
Galium album	Hedge Bedstraw		1	4	4	4
Hieracium Section Hieracium		7	8	8	7	7
Hippocrepis comosa	Horseshoe Vetch			4		
Inula conyzae	Ploughman's-spikenard			1		
Leontodon hispidus	Rough Hawkbit	3	4			1
Leucanthemum vulgare	Oxeye Daisy	2	2	3	4	4
Linum catharticum	Fairy Flax	3		3	3	3
Melilotus altissimus	Tall Melilot			2		
Pilosella officinarum	Mouse-ear-hawkweed	6	4	4		
Plantago lanceolata	Ribwort Plantain	3	4	2	4	4
Poterium sanguisorba subsp.		5	6	4	5	6
Prunella vulgaris	Selfheal	1	-		,	3
Senecio jacobaea	Common Ragwort			1		1
Taraxacum agg.	Dandelion	4	2	_	1	2
Weissia species	A moss		3	3	2	4
Bare ground		5	5	5	6	6

			Countess	Countess	Countess	Countess	Countess	Countess	Countess	Countess	Countess	Countess	Countess	Countess	Countess
Site name			Swamp	Swamp	Swamp	Swamp	Swamp	Swamp	Swamp	Swamp	Swamp	Swamp	Swamp	Swamp	Swamp
Grid reference					-		-	SU 15824		-	SU 15826				SU 15849
			42255	42241	42262	42277	42291	42292	42286	42274	42257	42238	42284	42216	42216
Quadrat number			47	48	49	50	51	52	53	54	55	56	57	58	59
Veg unit		Structural	Carex-	Carex-	Carex-	Carex-	Carex-	Glyceria-	Glyceria-	Glyceria-	Glyceria-	Glyceria-	Mixed	Mixed	Mixed
		unit	Phalaris	Phalaris	Phalaris	Phalaris	Phalaris	Galium	Galium	Galium	Galium	Galium	Salix	Salix	Salix
			swamp	swamp	swamp	swamp	swamp	veg	veg	veg	veg	veg	woodland	woodland	woodland
Acer pseudoplatanus	Sycamore	Canopy											4		
Alliaria petiolata	Garlic Mustard														
Amblystegium serpens	Creeping Feather-moss		4			4								3	
Angelica sylvestris	Wild Angelica		1		1	1	4	1						1	
Anthriscus sylvestris Arctium minus	Cow Parsley												1		
Arrhenatherum elatius	Lesser Burdock False Oat-Grass							2					1		
Arum maculatum	Lords-and-Ladies							Z					2	3	2
Brachypodium sylvaticum	False-brome												3	3	
Brachythecium rutabulum	Rough-stalked Feather-moss								3				3	3	3
Bromopsis ramosa	Hairy-brome								3				3	2	3
Bryum capillare	Capillary Thread-moss													2	3
Callitriche agg.	Water-starwort													_	
Calystegia sepium	Hedge Bindweed		4	5	5	4	4	4	3	4	4				
Cardamine sp.	Bitter-cress														
Carex acutiformis	Lesser Pond-sedge		10	8	10	9	8	5	1		4	4			
Cirsium arvense	Creeping Thistle		10		10						, ·	7			
Cirsium vulgare	Spear Thistle														
Crataegus monogyna	Hawthorn	Understorey											5	6	8
Cryphaea heteromalla	Lateral Cryphaea													2	2
Epilobium hirsutum	Great Willowherb		1								2				
Equisetum arvense	Field Horsetail							1			1	1			
Equisetum palustre	Marsh Horsetail									1					
Eupatorium cannabinum	Hemp-agrimony			1				5			1				
Filipendula ulmaria	Meadowsweet			2			1	3			2	2			
Fissidens taxifolius	Common Pocket-moss														
Frullania dilatata	Dilated Scalewort													2	
Galium aparine	Cleavers		4	5	5	6	4	4	3	3	3	2	3	4	3
Galium palustre	Marsh-bedstraw														
Geranium robertianum	Herb-Robert												5		
Geum urbanum	Wood Avens												2		
Glechoma hederacea	Ground-ivy												_		2
Glyceria maxima	Reed Sweet-grass		1	3		1	3	8	10	10	9	10			
Hedera helix	Common Ivy	Canopy											1	4	
Hedera helix	Common Ivy	Field layer													2
Heracleum sphondylium	Hogweed	, .				1									
Homalothecium sericeum	Silky Wall Feather-moss												3	3	
Hypericum tetrapterum	Square-stalked St John's-wort														
Hypnum cupressiforme agg.													3	3	3
Hypnum cupressiforme var. resupinatum	Supine Plait-moss														
Iris pseudacorus	Yellow Iris										4				
Kindbergia praelonga	Common Feather-moss												3	3	4
Lemna gibba	Fat Duckweed								3	2		2		3	
Lemna minor	Common Duckweed								3			2			
Leucodon sciuroides	Squirrel-tail Moss													1	
Lythrum salicaria	Purple-loosestrife									1	1				
Mentha aquatica	Water Mint														
Metzgeria furcata	Forked Veilwort													2	
Myosotis scorpioides	Water Forget-me-not														
Nasturtium officinale	Water-cress														
Nuphar lutea	Yellow Water-lily														
Oenanthe crocata	Hemlock Water-dropwort			2					1	1	4	5			
Orthotrichum affine	Wood Bristle-moss														2
Orthotrichum diaphanum	White-tipped Bristle-moss												2		
Orthotrichum lyellii	Lyell's Bristle-moss													2	
Orthotrichum tenellum	Slender Bristle-moss													2	2
Oxyrrhynchium hians	Swartz's Feather-moss			2		1	3	3	3	2	2				
Persicaria amphibia	Amphibious Bistort														
Phalaris arundinacea	Reed Canary-grass		4	6	2	2	7		1	2	4	2			
Poa trivialis	Rough Meadow-grass														
Polypodium interjectum	Intermediate Polypody												2		
Radula complanata	Even Scalewort													3	
Ranunculus repens	Creeping Buttercup														
Rumex sanguineus	Wood Dock				1		3							1	
Sagittaria sagittifolia	Arrowhead														
Salix cinerea subsp. oleifolia	Rusty Willow	Understorey													1
Salix viminalis	Osier														
Salix x rubens	Crack Willow x White Willow	Canopy											9	9	8
Sambucus nigra	Elder	Understorey												1	
Schedonorus giganteus	Giant Fescue														
Scrophularia auriculata	Water Figwort														
Solanum dulcamara	Bittersweet		1						1	4	1			1	
Sparganium emersum	Unbranched Bur-reed														
Sparganium erectum	Branched Bur-reed														1
Stachys sylvatica	Hedge Woundwort														
Symphytum officinale	Common Comfrey		1	5	1	4	5	5		1	1	4	1	1	
Thalictrum flavum	Common Meadow-rue										5				
Ulmus glabra	Wych Elm	Understorey											4	2	
Ulmus procera	English Elm	Understorey												4	
Ulota phyllantha	Frizzled Pincushion													1	
Urtica dioica	Common Nettle		2	1	4	4	4	4		2	1	2	10	9	9
Valeriana officinalis	Common Valerian											1			
	Blue Water-speedwell														

		D:	D:	Di	D:	Landa	Landa	11-	11-	Landa	11-	11-	11-	1 1 -	1 1 -
Site name		River	River Avon	River Avon	River Avon	Lords Walk									
Grid reference		Avon SU 15871		SU 15868		SU 15889		SU 15886							SU 15863
dia reference		42217	42228	42248	42200	42143	42125	42119	42113	42102	42144	42134	42117	42100	42092
Quadrat number		60	61	62	63	64	65	66	67	68	69	70	71	72	73
Veg unit		S14	S14	S14	S14	OV26	OV26	OV26	OV26		OV26	OV26	OV26	OV26	OV26
Acer pseudoplatanus	Sycamore														
Alliaria petiolata	Garlic Mustard						1	2	1			4			
Amblystegium serpens	Creeping Feather-moss														
Angelica sylvestris	Wild Angelica					1									
Anthriscus sylvestris	Cow Parsley													1	1
Arctium minus	Lesser Burdock														
Arrhenatherum elatius	False Oat-Grass								1				2		
Arum maculatum	Lords-and-Ladies														
Brachypodium sylvaticum	False-brome														
Brachythecium rutabulum	Rough-stalked Feather-moss					3	2	2	3	4	3		2	3	
Bromopsis ramosa	Hairy-brome														
Bryum capillare	Capillary Thread-moss														
Callitriche agg.	Water-starwort		2												
Calystegia sepium	Hedge Bindweed				2			2							
Cardamine sp.	Bitter-cress								1		2				
Carex acutiformis	Lesser Pond-sedge	3													
Cirsium arvense	Creeping Thistle						2				2				
Cirsium vulgare	Spear Thistle										1		2	4	1
Crataegus monogyna	Hawthorn														
	Lateral Cryphaea														
Epilobium hirsutum	Great Willowherb				5		1		1	4	10	10	9	10	10
Equisetum arvense	Field Horsetail														
Equisetum palustre	Marsh Horsetail														
Eupatorium cannabinum	Hemp-agrimony														
Filipendula ulmaria	Meadowsweet							2			2	1	4		
Fissidens taxifolius	Common Pocket-moss											2			
Frullania dilatata	Dilated Scalewort														
Galium aparine	Cleavers					6	5	4	4	5	5	4	3	4	3
Galium palustre	Marsh-bedstraw				4										
Geranium robertianum	Herb-Robert														
Geum urbanum	Wood Avens														
	Ground-ivy														
	Reed Sweet-grass								1						
Hedera helix	Common Ivy								-						
	Common Ivy														
Heracleum sphondylium	Hogweed							1			1				
·	Silky Wall Feather-moss							1			_				
	Square-stalked St John's-wort									1	3		3	3	
Hypnum cupressiforme agg.	Square stance sessing work									-	3				
	Supine Plait-moss														
Iris pseudacorus	Yellow Iris														
Kindbergia praelonga	Common Feather-moss								3	3	4	3	3	3	
Lemna gibba	Fat Duckweed	4	5	5											
Lemna minor	Common Duckweed	3	-												
Leucodon sciuroides	Squirrel-tail Moss														
	Purple-loosestrife			1	1										
Mentha aquatica	Water Mint			_	4						1				
Metzgeria furcata	Forked Veilwort				-						_				
	Water Forget-me-not		4	4	4				1						
Nasturtium officinale	Water-cress		2	7	-				-						
	Yellow Water-lily	2	_												
•	Hemlock Water-dropwort														
	Wood Bristle-moss														
•	White-tipped Bristle-moss														
Orthotrichum topollum	Lyell's Bristle-moss Slender Bristle-moss														
Orthotrichum tenellum Oxyrrhynchium hians	Swartz's Feather-moss														
														1	
	Amphibious Bistort											2		1	
	Reed Canary-grass											2			
	Rough Meadow-grass											2			
	Intermediate Polypody														
Radula complanata	Even Scalewort														
•	Creeping Buttercup											3	4	4	
Ranunculus repens								1				2	3	3	
Ranunculus repens Rumex sanguineus	Wood Dock														
Ranunculus repens Rumex sanguineus Sagittaria sagittifolia	Wood Dock Arrowhead														
Ranunculus repens Rumex sanguineus Sagittaria sagittifolia	Wood Dock														
Ranunculus repens Rumex sanguineus Sagittaria sagittifolia	Wood Dock Arrowhead													1	
Ranunculus repens Rumex sanguineus Sagittaria sagittifolia Salix cinerea subsp. oleifolia	Wood Dock Arrowhead Rusty Willow													1	
Ranunculus repens Rumex sanguineus Sagittaria sagittifolia Salix cinerea subsp. oleifolia Salix viminalis	Wood Dock Arrowhead Rusty Willow Osier													1	
Ranunculus repens Rumex sanguineus Sagittaria sagittifolia Salix cinerea subsp. oleifolia Salix viminalis Salix x rubens Sambucus nigra Schedonorus giganteus	Wood Dock Arrowhead Rusty Willow Osier Crack Willow x White Willow Elder Giant Fescue							1			2		2	1	
Ranunculus repens Rumex sanguineus Sagittaria sagittifolia Salix cinerea subsp. oleifolia Salix viminalis Salix x rubens Sambucus nigra Schedonorus giganteus Scrophularia auriculata	Wood Dock Arrowhead Rusty Willow Osier Crack Willow x White Willow Elder							1			2		2	1	
Ranunculus repens Rumex sanguineus Sagittaria sagittifolia Salix cinerea subsp. oleifolia Salix viminalis Salix x rubens Sambucus nigra Schedonorus giganteus	Wood Dock Arrowhead Rusty Willow Osier Crack Willow x White Willow Elder Giant Fescue	5	6	4	4			1					2	1	
Ranunculus repens Rumex sanguineus Sagittaria sagittifolia Salix cinerea subsp. oleifolia Salix viminalis Salix x rubens Sambucus nigra Schedonorus giganteus Scrophularia auriculata	Wood Dock Arrowhead Rusty Willow Osier Crack Willow x White Willow Elder Giant Fescue Water Figwort	5	6	4	4			1			4		2	1	
Ranunculus repens Rumex sanguineus Sagittaria sagittifolia Salix cinerea subsp. oleifolia Salix viminalis Salix x rubens Sambucus nigra Schedonorus giganteus Scrophularia auriculata Solanum dulcamara	Wood Dock Arrowhead Rusty Willow Osier Crack Willow x White Willow Elder Giant Fescue Water Figwort Bittersweet	5	6	4	4			1			4		2	1	
Ranunculus repens Rumex sanguineus Sagittaria sagittifolia Salix cinerea subsp. oleifolia Salix viminalis Salix x rubens Sambucus nigra Schedonorus giganteus Scrophularia auriculata Solanum dulcamara Sparganium emersum Sparganium erectum	Wood Dock Arrowhead Rusty Willow Osier Crack Willow x White Willow Elder Giant Fescue Water Figwort Bittersweet Unbranched Bur-reed							1			4		2	1	
Ranunculus repens Rumex sanguineus Sagittaria sagittifolia Salix cinerea subsp. oleifolia Salix viminalis Salix x rubens Sambucus nigra Schedonorus giganteus Scrophularia auriculata Solanum dulcamara Sparganium emersum Sparganium erectum Stachys sylvatica	Wood Dock Arrowhead Rusty Willow Osier Crack Willow x White Willow Elder Giant Fescue Water Figwort Bittersweet Unbranched Bur-reed Branched Bur-reed					1	4		5		4		2	5	5
Ranunculus repens Rumex sanguineus Sagittaria sagittifolia Salix cinerea subsp. oleifolia Salix viminalis Salix x rubens Sambucus nigra Schedonorus giganteus Scrophularia auriculata Solanum dulcamara Sparganium emersum Sparganium erectum Stachys sylvatica	Wood Dock Arrowhead Rusty Willow Osier Crack Willow x White Willow Elder Giant Fescue Water Figwort Bittersweet Unbranched Bur-reed Branched Bur-reed Hedge Woundwort					1			5		1		2		5
Ranunculus repens Rumex sanguineus Sagittaria sagittifolia Salix cinerea subsp. oleifolia Salix viminalis Salix x rubens Sambucus nigra Schedonorus giganteus Scrophularia auriculata Solanum dulcamara Sparganium emersum Sparganium erectum Stachys sylvatica Symphytum officinale Thalictrum flavum	Wood Dock Arrowhead Rusty Willow Osier Crack Willow x White Willow Elder Giant Fescue Water Figwort Bittersweet Unbranched Bur-reed Branched Bur-reed Hedge Woundwort Common Comfrey Common Meadow-rue					1			5		1		2		5
Ranunculus repens Rumex sanguineus Sagittaria sagittifolia Salix cinerea subsp. oleifolia Salix viminalis Salix x rubens Sambucus nigra Schedonorus giganteus Scrophularia auriculata Solanum dulcamara Sparganium emersum Sparganium erectum Stachys sylvatica Symphytum officinale Thalictrum flavum Ulmus glabra	Wood Dock Arrowhead Rusty Willow Osier Crack Willow x White Willow Elder Giant Fescue Water Figwort Bittersweet Unbranched Bur-reed Branched Bur-reed Hedge Woundwort Common Comfrey Common Meadow-rue Wych Elm					1			5		1		2		5
Ranunculus repens Rumex sanguineus Sagittaria sagittifolia Salix cinerea subsp. oleifolia Salix viminalis Salix x rubens Sambucus nigra Schedonorus giganteus Scrophularia auriculata Solanum dulcamara Sparganium emersum Sparganium erectum Stachys sylvatica Symphytum officinale Thalictrum flavum Ulmus glabra Ulmus procera	Wood Dock Arrowhead Rusty Willow Osier Crack Willow x White Willow Elder Giant Fescue Water Figwort Bittersweet Unbranched Bur-reed Branched Bur-reed Hedge Woundwort Common Comfrey Common Meadow-rue Wych Elm English Elm					1			5		1		2		5
Ranunculus repens Rumex sanguineus Sagittaria sagittifolia Salix cinerea subsp. oleifolia Salix viminalis Salix x rubens Sambucus nigra Schedonorus giganteus Scrophularia auriculata Solanum dulcamara Sparganium emersum Sparganium erectum Stachys sylvatica Symphytum officinale Thalictrum flavum Ulmus glabra Ulmus procera	Wood Dock Arrowhead Rusty Willow Osier Crack Willow x White Willow Elder Giant Fescue Water Figwort Bittersweet Unbranched Bur-reed Branched Bur-reed Hedge Woundwort Common Comfrey Common Meadow-rue Wych Elm English Elm Frizzled Pincushion						4	4		2	1	4		5	
Ranunculus repens Rumex sanguineus Sagittaria sagittifolia Salix cinerea subsp. oleifolia Salix viminalis Salix x rubens Sambucus nigra Schedonorus giganteus Scrophularia auriculata Solanum dulcamara Sparganium emersum Sparganium erectum Stachys sylvatica Symphytum officinale Thalictrum flavum Ulmus glabra Ulmus procera Ulota phyllantha Urtica dioica	Wood Dock Arrowhead Rusty Willow Osier Crack Willow x White Willow Elder Giant Fescue Water Figwort Bittersweet Unbranched Bur-reed Branched Bur-reed Hedge Woundwort Common Comfrey Common Meadow-rue Wych Elm English Elm					1	4	4		2	1	4	2		5

Site name			Diamond Wood	Diamond Wood	Diamond Wood	Diamond Wood	Diamond Wood
Grid reference			SU 10625	SU 10614	SU 10545	SU 10472	SU 10541
dia reference			40799	40844	40849	40738	40732
Quadrat number			42	43	44	45	46732
Veg unit			BL	BL	BL	BL	BL
veg unit			Plantation	Plantation	Plantation	Plantation	Plantation
		Structural	Trantation	Trantation	Trantation	Trantation	Tiditation
		unit					
Agrimonia eupatoria	Agrimony						1
Anisantha sterilis	Barren Brome						2
Betula species	Birch	Understorey			1	5	
Arrhenatherum elatius	False Oat-Grass						3
Betula pendula	Silver Birch	Canopy		5			
Brachypodium sylvaticum	False-brome		6	5	3	3	4
Brachythecium rutabulum	Rough-stalked Feather-moss		4	3	3	3	2
Bryonia dioica	White Bryony						1
Chaerophyllum temulum	Rough Chervil			4			2
Corylus avellana	Hazel	Understorey		4			
Crataegus monogyna	Hawthorn	Understorey	7	8	7	7	5
Cryphaea heteromalla	Lateral Cryphaea	,	2	2	2		2
Dactylis glomerata	Cock's-foot		_	1	_		4
Euonymus europaeus	Spindle	Understorey		_	4		
Fagus sylvatica	Beech	Canopy			7	4	
Galium aparine	Cleavers	carropy	4	7	4	1	4
Geranium robertianum	Herb-Robert		1	5	1	1	3
Geum urbanum	Wood Avens		4	4	1	1	3
Glechoma hederacea	Ground-ivy		3	2	4	3	3
Hedera helix	Common Ivy	Field layer	J	2	4	8	3
Hedera helix	Common Ivy			2		4	
	·	Canopy				4	1
Heracleum sphondylium	Hogweed		2		2		1
Hypnum cupressiforme agg.	C		2	2	2		
Kindbergia praelonga	Common Feather-moss		5	3	4	4	
Ligustrum vulgare	Wild Privet	Understorey	1		4	1	1
Lophocolea heterophylla	Variable-leaved Crestwort		_	_	3		_
Metzgeria consanguinea	Whiskered Veilwort		2	2	3		3
Metzgeria furcata	Forked Veilwort		3				
Orthotrichum affine	Wood Bristle-moss		3	2	2	3	3
Orthotrichum diaphanum	White-tipped Bristle-moss					3	
Orthotrichum pulchellum	Elegant Bristle-moss			1			
Orthotrichum tenellum	Slender Bristle-moss						1
Pinus sylvestris	Scots Pine	Canopy	8	5	6	8	5
Poa trivialis	Rough Meadow-grass			2			4
Prunus spinosa	Blackthorn	Understorey	4		5		4
Radula complanata	Even Scalewort		2				
Rhamnus cathartica	Buckthorn	Understorey	5	4			4
Rhynchostegium confertum	Clustered Feather-moss					3	
Rubus fruticosus agg.	Bramble	Field layer	2	5	2		4
Sambucus nigra	Elder	Understorey	4	2	4	4	1
Urtica dioica	Common Nettle		7	6	7	9	6
Veronica chamaedrys	Germander Speedwell		1				3
Viburnum lantana	Wayfaring-tree	Understorey	4	4	4		1
Zygodon viridissimus	Green Yoke-moss	·			2	2	

APPENDIX III: ARABLE PLANT SPECIES LIST

Scientific Name	Common Name
Aethusa cynapium	Fool's Parsley
Agrostis stolonifera	Creeping Bent
Alopecurus myosuroides	Black-grass
Anagallis arvensis	Scarlet Pimpernel
Anisantha diandra	Great Brome
Anisantha sterilis	Barren Brome
Anthriscus sylvestris	Cow Parsley
Aphanes arvensis	Parsley-piert
Arctium minus	Lesser Burdock
Arenaria serpyllifolia	Thyme-leaved Sandwort
Arrhenatherum elatius	False Oat-Grass
Artemisia vulgaris	Mugwort
<u> </u>	Spear-leaved Orache
Atriplex prostrata Avena fatua	Wild-oat
Bromus hordeaceus	Soft-brome
Bromus secalinus	Rye Brome
Bryonia dioica	White Bryony
Capsella bursa-pastoris	Shepherd's-purse
Carduus nutans	Musk Thistle
Cerastium fontanum	Common Mouse-ear
Chaenorhinum minus	Small Toadflax
Chaerophyllum temulum	Rough Chervil
Chenopodium album	Fat-hen
Chenopodium hybridum	Maple-leaved Goosefoot
Cirsium arvense	Creeping Thistle
Cirsium vulgare	Spear Thistle
Convolvulus arvensis	Field Bindweed
Dactylis glomerata	Cock's-foot
Dipsacus fullonum	Wild Teasel
Elytrigia repens	Common Couch
Epilobium ciliatum	American Willowherb
Epilobium parviflorum	Hoary Willowherb
Epilobium tetragonum	Square-stalked Willowherb
Euphorbia exigua	Dwarf Spurge
Euphorbia helioscopia	Sun Spurge
Euphorbia peplus	Petty Spurge
Fallopia convolvulus	Black-bindweed
Festuca rubra	Red Fescue
Fraxinus excelsior	Ash
Fumaria densiflora	Dense-flowered Fumitory
Fumaria officinalis	Common Fumitory
Galium aparine	Cleavers
Geranium dissectum	Cut-leaved Crane's-bill
Geranium molle	Dove's-foot Crane's-bill
Geranium pyrenaicum	Hedgerow Crane's-bill
Geum urbanum	Wood Avens
Glechoma hederacea	Ground-ivy
Heracleum sphondylium	Hogweed
Holcus lanatus	Yorkshire-fog
Kickxia spuria	Round-leaved Fluellen
•	Henbit Dead-nettle
Lamium amplexicaule	Red Dead-nettle
Lamium purpureum	
Lapsana communis	Nipplewort
Legousia hybrida	Venus's-looking-glass

Scientific Name	Common Name
Lepidium coronopus	Swine-cress
Linaria vulgaris	Common Toadflax
Lolium perenne	Perennial Rye-grass
Malva neglecta	Dwarf Mallow
Malva sylvestris	Common Mallow
Matricaria chamomilla	Scented Mayweed
Matricaria discoidea	Pineappleweed
Medicago lupulina	Black Medick
Mercurialis annua	Annual Mercury
Myosotis arvensis	Field Forget-me-not
Orobanche minor	Common Broomrape
Papaver argemone	Prickly Poppy
Papaver dubium	Long-headed Poppy
Papaver hybridum	Rough Poppy
Papaver rhoeas	Common Poppy
Pastinaca sativa subsp. sylvestris	Wild Parsnip
Petroselinum segetum	Corn Parsley
Pimpinella saxifraga	Burnet-saxifrage
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Poa annua	Annual Meadow-grass
Poa trivialis	Rough Meadow-grass
Polygonum aviculare	Knotgrass
Prunus spinosa	Blackthorn
Ranunculus repens	Creeping Buttercup
Reseda lutea	Wild Mignonette
Rumex crispus	Curled Dock
Rumex obtusifolius	Broad-leaved Dock
Senecio jacobaea	Common Ragwort
Senecio vulgaris	Groundsel
Sherardia arvensis	Field Madder
Silene latifolia	White Campion
Sinapis arvensis	Charlock
Sisymbrium officinale	Hedge Mustard
Solanum nigrum	Black Nightshade
Sonchus arvensis	Perennial Sow-thistle
Sonchus asper	Prickly Sow-thistle
Stellaria media	Common Chickweed
Taraxacum agg.	Dandelion
Trifolium repens	White Clover
Tripleurospermum inodorum	Scentless Mayweed
Urtica dioica	Common Nettle
Urtica urens	Small Nettle
Valerianella dentata	Narrow-fruited Cornsalad
\/aua==i=a=a===i=	\A/all C= aaduuall

Wall Speedwell
Common Field-speedwell
Grey Field-speedwell
Tufted Vetch
Field Pansy

Rat's-tail Fescue

Veronica arvensis

Veronica persica Veronica polita Vicia cracca

Viola arvensis

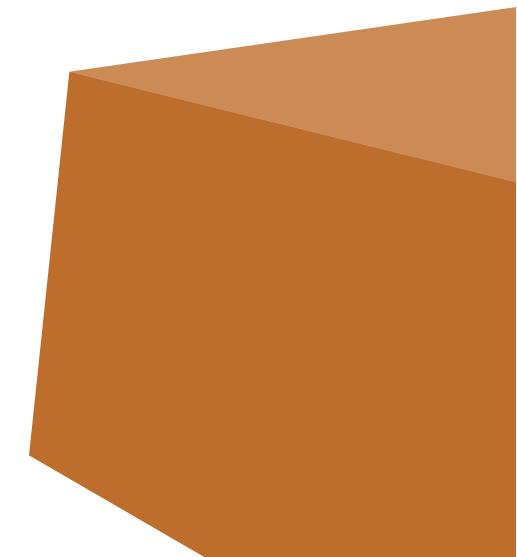
Vulpia myuros

APPENDIX IV: PORTAL DATA

Presence of species is indicated by $\, {\sf I} \,$

		Western	Western	Western	Western	Eastern Porta	Eastern Portal	Eastern Portal Bowtie Field	
	_	Portal	Portal	Portal	Portal	Dawsia Field	Daweia Field		
Species	Common name	IN(A) Arable	Arable and sown headlands	Permanent Grassland	IN(D) Reversion grassland	Bowtie Field Arable	Bowtie Field Scrub and rough grassland	Broad-leaved plantation	
Acer campestre	Field Maple		Headiands					1	
Acer pseudoplatanus	Sycamore						I		
Achillea millefolium	Yarrow						ı		
Aethusa cynapium	Fool's Parsley	ı	I			ı			
Agrimonia eupatoria	Agrimony						I		
Agrostis stolonifera	Creeping Bent					I			
Alliaria petiolata	Garlic Mustard							I	
Alopecurus myosuroides	Black-grass	I				I			
Anagallis arvensis	Scarlet Pimpernel	I	I			I		I	
Anisantha sterilis	Barren Brome	I	I			I	I	I	
Anthoxanthum odoratum	Sweet Vernal-grass					I			
Anthriscus sylvestris	Cow Parsley							l	
Anthyllis vulneraria	Kidney Vetch		l						
Aphanes arvensis	Parsley-piert		l						
Arctium minus	Lesser Burdock	<u> </u>				l			
Arenaria serpyllifolia	Thyme-leaved Sandwort	<u> </u>	l						
Arrhenatherum elatius	False Oat-Grass	1	l		I	<u> </u>	<u>l</u>	I	
Artemisia vulgaris	Mugwort	l	I			I	I		
Asperula cynanchica	Squinancywort	<u> </u>							
Atriplex prostrata	Spear-leaved Orache	Į.	l						
Avena fatua	Wild-oat					l l			
Ballota nigra	Black Horehound							l	
Brachypodium sylvaticum	False-brome				ı			I	
Briza media	Quaking-grass			1	<u> </u>				
Bromopsis erecta	Upright Brome Soft-brome			1	I				
Bromus hordeaceus				I			l l		
Bryonia dioica	White Bryony							I	
Calystegia sepium Capsella bursa-pastoris	Hedge Bindweed Shepherd's-purse					1	1		
Carduus nutans	Musk Thistle	<u> </u>	l I	1		I			
Centaurea nigra	Common Knapweed	ı	1	1	1		1		
Centaurea nigra Centaurea scabiosa	Greater Knapweed				I		ı		
Cerastium fontanum	Common Mouse-ear			1	1		1		
Chaenorhinum minus	Small Toadflax	l	 	1	ı	ı	<u>'</u>		
Chaerophyllum temulum	Rough Chervil	·	· ·			i i			
Chamerion angustifolium	Rosebay Willowherb					•	ı		
Chenopodium album	Fat-hen							ı	
Chenopodium hybridum	Maple-leaved Goosefoot	<u>'</u>				•		•	
Cirsium arvense	Creeping Thistle	<u>'</u> 	I		ı				
Cirsium vulgare	Spear Thistle	<u>'</u> 	·	1	·	•	ı		
Clematis vitalba	Traveller's-joy			·	•		i	ı	
Clinopodium vulgare	Wild Basil						i		
Conium maculatum	Hemlock		1						
Convolvulus arvensis	Field Bindweed					ı		ı	
Cornus sanguinea	Dogwood						1	-	
Corylus avellana	Hazel			1					
Crataegus monogyna	Hawthorn						ı	I	
Crepis capillaris	Smooth Hawk's-beard	l		ı	I				
Crepis vesicaria	Beaked Hawk's-beard		ı		I				
Cynosurus cristatus	Crested Dog's-tail				I				
Dactylis glomerata	Cock's-foot		ı		I		ı		
Daucus carota	Carrot		ı						
Elytrigia repens	Common Couch					ı			
Epilobium ciliatum	American Willowherb	ı		ı					
Epilobium parviflorum	Hoary Willowherb	I							
Euonymus europaeus	Spindle						I	I	
Euphorbia exigua	Dwarf Spurge		I			ı			
Euphorbia helioscopia	Sun Spurge	l				I			
Fagus sylvatica	Beech							I	
Fallopia convolvulus	Black-bindweed	I	I			I			
Festuca rubra	Red Fescue		I	I	I		I		
Fraxinus excelsior	Ash						I		
Fumaria densiflora	Dense-flowered Fumitory	I				I			
Fumaria officinalis	Common Fumitory	I	I			I			
Galium album	Hedge Bedstraw		I				I		
Galium aparine	Cleavers					I	I	I	

		Western Portal	Western Portal	Western Portal	Western Portal	Eastern Porta	Eastern Portal	Eastern Portal
Species	Common name	IN(A)	IN(D)	IN(D)	IN(D)	Bowtie Field	Bowtie Field	Bowtie Field
-pecies	Common name	Arable	Arable and	Permanent	Reversion	Arable	Scrub and rough	
			sown headlands	Grassland	grassland		grassland	plantation
Galium verum	Lady's Bedstraw		I					
Geranium dissectum	Cut-leaved Crane's-bill	I	I	I		I		
Geranium molle	Dove's-foot Crane's-bill	I	I			I		
Geranium pyrenaicum	Hedgerow Crane's-bill	I		I				
Geum urbanum	Wood Avens			I			I	
Glechoma hederacea	Ground-ivy						I	
Hedera helix	Common Ivy						l	_
Heracleum sphondylium	Hogweed					l	I	l
Holcus lanatus	Yorkshire-fog			I	I			
Hypericum hirsutum	Hairy St John's-wort						l .	
Hypericum perforatum	Perforate St John's-wort						I	
Knautia arvensis	Field Scabious		l	l				
Lamium album	White Dead-nettle						I	
Lamium amplexicaule	Henbit Dead-nettle	<u> </u>	l					
Lapsana communis	Nipplewort	I				l		
Legousia hybrida	Venus's-looking-glass					l		
Lepidium coronopus	Swine-cress	I						
Leucanthemum vulgare	Oxeye Daisy		l		I			
Ligustrum vulgare	Wild Privet						l i	
Lolium perenne	Perennial Rye-grass		1				l l	
Lotus corniculatus	Common Bird's-foot-trefoil Common Mallow		l I		I			
Malva sylvestris			1					
Matricaria discoidea Medicago lupulina	Pineappleweed Black Medick	1	ı	ı	ı	1	1	
		I	1	I	I		ı	ı
Mercurialis perennis Myosotis arvensis	Dog's Mercury Field Forget-me-not		l I			ı	1	1 1
Onobrychis viciifolia	Sainfoin		'	1	I	I	· · ·	ı
Papaver dubium	Long-headed Poppy			1	·			
Papaver hybridum	Rough Poppy	<u>'</u>	1					
Papaver rhoeas	Common Poppy		· ·					ı
Pastinaca sativa subsp. sylvest			· ·	ı		'	1	
Persicaria maculosa	Redshank	•	1	·			•	
Plantago lanceolata	Ribwort Plantain		i	ı			ı	
Plantago major	Greater Plantain						i	
Plantago media	Hoary Plantain				I			
Poa annua	Annual Meadow-grass				·	ı		
Poa pratensis	Smooth Meadow-grass	·			I			
Polygonum arenastrum	Equal-leaved Knotgrass	I			·			
Polygonum aviculare	Knotgrass	I	I					
Potentilla reptans	Creeping Cinquefoil						I	
Prunus spinosa	Blackthorn						I	
Ranunculus acris	Meadow Buttercup				I			
Reseda lutea	Wild Mignonette	I	I					
Rhamnus cathartica	Buckthorn						I	
Rosa canina	Dog-rose						I	
Rubus fruticosus agg.	Bramble			I			I	I
Rumex acetosa	Common Sorrel				I			
Rumex crispus	Curled Dock		I				I	
Sambucus nigra	Elder						I	I
Scabiosa columbaria	Small Scabious		I					
Schedonorus pratensis	Meadow Fescue				I			
Senecio jacobaea	Common Ragwort	I		I	I			
Senecio vulgaris	Groundsel	I	I			I	I	
Sherardia arvensis	Field Madder		I			I		
Silene latifolia	White Campion	I					I	
Sinapis arvensis	Charlock		I			I	I	
Sisymbrium officinale	Hedge Mustard	I	I					
Sonchus arvensis	Perennial Sow-thistle					I		
Sonchus asper	Prickly Sow-thistle	I	I			I		I
Sonchus oleraceus	Smooth Sow-thistle					I		
Stachys palustris	Marsh Woundwort						I	
Stellaria media	Common Chickweed	I						
Taraxacum agg.	Dandelion		I		I			
Torilis japonica	Upright Hedge-parsley			I				
Trifolium campestre	Hop Trefoil			I				
Trifolium pratense	Red Clover		l		I			
Trifolium repens	White Clover		l	I			I	
Tripleurospermum inodorum		l						
Trisetum flavescens	Yellow Oat-grass			I			l ·	
Urtica dioica	Common Nettle	I	1				I	I
Veronica arvensis	Wall Speedwell		l			I		
Veronica chamaedrys	Germander Speedwell	I					I	
Veronica persica	Common Field-speedwell		I			l l		
Veronica polita	Grey Field-speedwell					I		
Viburnum lantana	Wayfaring-tree						I	
Viburnum opulus	Guelder-rose						I	
Vicia sativa	Common Vetch		I					
Viola arvensis	Field Pansy	I						



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