



THE
ENVIRONMENT
PARTNERSHIP



HARRAS MOOR, WHITEHAVEN

VEGETATION SURVEY TECHNICAL REPORT 2018

TEP Technical Report October 2018

TEP

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1.0 General Details

Site Name	Harras Moor, Whitehaven
Site Location	Caldbeck Road, Whitehaven, Cumbria
Survey Date(s)	August 2018
Surveyor(s)	Lynsey Crellin
Weather	Foggy with rain showers
Methods	National Vegetation Classification Survey (JNCC, 2006)
Seasonal Constraints	The surveys were undertaken during the optimum NVC survey period (April to early October). There are no constraints associated with the surveys.
Drawing References	G5810.66.008

2.0 Introduction

- 2.1 National Vegetation Classification (NVC) surveys were undertaken within areas of grassland habitat across the Harras Moor site. NVC surveys assist with analysing species composition within habitat communities to provide further understanding of vegetation communities present on site and inform mitigation.
- 2.2 Details of the extended Phase 1 habitat survey undertaken across the site are provided in the TEP Technical Report 5060.Eco.Harras.007. Parcel locations are shown on drawing G5810.66.008.

National Vegetation Classification Survey

- 3.1 In order to gain an understanding of the potential impacts on grassland habitats at the site the areas of more diverse grassland were subject to an NVC survey. These areas were walked over by an experienced botanist to make a provisional assessment of the boundaries of different vegetation types (as defined by the National Vegetation Classification system (Rodwell, 1991-2000 and 2006) forming a series of provisional zones, or parcels.
- 3.2 Within each provisional zone, the vegetation was sampled using quadrats for grassland of the recommended size (2m x 2m) according to standard NVC methodology (Rodwell, 2006). Each quadrat was recorded in the field by listing all plants within it along with the abundance of each species and the percentage cover of any bare ground or leaf litter using the Domin scale of abundance. Sufficient quadrats were recorded so as to include all community types occurring within each surveyed area and to allow a robust statistical analysis of the data. A search was made for any nationally or locally notable plant species, including protected species or those listed on Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.
- 3.3 The survey was undertaken by experienced botanist, Principal Ecologist Lynsey Crellin (FISC Level 5) during August 2018 when grassland vegetation would be visible.
- 3.4 Quadrat data was analysed using the computer program TableFit to establish the “goodness of fit” to the NVC community types. The output results from TableFit analysis of the quadrats has been analysed by Lynsey Crellin to assess which vegetation types, as defined by the NVC, are represented.

3.0 Results

National Vegetation Classification Survey

- 3.1 The raw quadrat data and TableFit analysis for each quadrat is presented in Appendix B, followed by a quadrat data and TableFit analysis explanatory note, which provides further detail of the analysis process. Parcel locations are detailed in Drawing G5810.066.008.
- 3.2 A summary of the best fit NVC community for each quadrat and a description of the NVC communities present is provided below.

Table 1: Summary of best fit NVC communities – per parcel

Parcel Number	NVC Community	NVC Community Description	Goodness-of-fit
1	MG10a	Typical sub-community of <i>Holcus lanatus</i> - <i>Juncus effusus</i> rush pasture	Very poor (44)
2	OV25	<i>Urtica dioica</i> - <i>cirsium arvense</i> community	Very poor (27)
3	OV25	<i>Urtica dioica</i> - <i>cirsium arvense</i> community	Very Poor (48)
4	S11c	<i>Carex rostrata</i> sub-community of <i>Carex vesicaria</i> swamp	Very poor (12)
5	M23b	<i>Juncus effusus</i> sub-community of <i>Juncus effusus/acutiflorus</i> - <i>Galium palustre</i> rush-pasture	Very poor (42)
6	MG1/OV25	<i>Arrhenatherum elatioris</i> grassland / <i>Urtica dioica</i> - <i>cirsium arvense</i> community	Very poor (10)
7	MG 9	<i>Holcus lanatus</i> - <i>Deschampsia cespitosa</i> grassland	Very poor (31)
8	OV26a	<i>Juncus effusus</i> / <i>Ranunculus repens</i> sub-community of <i>Epilobium hirsutum</i> community	Very poor (11)

Table 2: Summary of best fit NVC communities – per quadrat

Parcel Number	Quadrat Number	NVC Community	NVC Community Description	Goodness-of-fit
1	1	OV25a	<i>Holcus lanatus</i> - <i>Poa annua</i> sub-community of <i>Urtica dioica</i> - <i>cirsium arvense</i> community	Fair (62)
	2	MG10a	Typical sub-community of <i>Holcus lanatus</i> - <i>Juncus effusus</i> rush pasture	Fair (66)
	3	MG10a	Typical sub-community of <i>Holcus lanatus</i> - <i>Juncus effusus</i> rush pasture	Very poor (48)
	4	MG10a	Typical sub-community of <i>Holcus lanatus</i> - <i>Juncus effusus</i> rush pasture	Very poor (48)
	5	MG11a	<i>Lolium perenne</i> sub-community of <i>Festuca rubra</i> - <i>Agrostis stolonifera</i> - <i>Potentilla anserina</i>	Very good (80)
2	1	OV21c	<i>Polygonum aviculare</i> - <i>Ranunculus repens</i> sub-community of <i>Poa annua</i> - <i>Plantago major</i> community	Very poor (43)
	2	MG 1a	<i>Festuca rubra</i> sub-community of <i>Arrhenatherum elatioris</i> grassland	Very good (85)
	3	MG 1a	<i>Festuca rubra</i> sub-community of <i>Arrhenatherum elatioris</i> grassland	Fair (65)
3	1	OV25	<i>Urtica dioica</i> - <i>cirsium arvense</i> community	Good (74)
	2	OV25	<i>Urtica dioica</i> - <i>cirsium arvense</i> community	Very good (90)
	3	MG 1a	<i>Festuca rubra</i> sub-community of <i>Arrhenatherum elatioris</i> grassland	Good (74)
	4	OV25a	<i>Holcus lanatus</i> - <i>Poa annua</i> sub-community of <i>Urtica dioica</i> - <i>cirsium arvense</i> community	Poor (52)
	5	MG 1a	<i>Festuca rubra</i> sub-community of <i>Arrhenatherum elatioris</i> grassland	Very good (82)

Parcel Number	Quadrat Number	NVC Community	NVC Community Description	Goodness-of-fit
4	1	M23b	<i>Juncus effusus</i> sub-community of <i>Juncus effusus/acutiflorus-Galium palustre</i> rush-pasture	Poor (58)
5	1	M23	<i>Juncus effusus/acutiflorus-Galium palustre</i> rush-pasture	Poor (57)
	2	MG10a	Typical sub-community of <i>Holcus lanatus-Juncus effusus</i> rush pasture	Good (70)
	3	S11c	<i>Carex rostrata</i> sub-community of <i>Carex vesicaria</i> swamp	Poor (51)
6	1	M23	<i>Juncus effusus/acutiflorus-Galium palustre</i> rush-pasture	Very poor (32)
	2	OV25a	<i>Holcus lanatus-Poa annua</i> sub-community of <i>Urtica dioica-cirsium arvense</i> community	Very poor (45)
	3	SD 3	<i>Matricaria maritima-Galium aparine</i> strandline community	Very poor (8)
	4	MG 1a	<i>Festuca rubra</i> sub-community of <i>Arrhenatherum elatioris</i> grassland	Very poor (40)
7	1	OV25a	<i>Holcus lanatus-Poa annua</i> sub-community of <i>Urtica dioica-cirsium arvense</i> community	Fair (61)
	2	MG10a	Typical sub-community of <i>Holcus lanatus-Juncus effusus</i> rush pasture	Poor (34)
	3	SD17a	<i>Festuca rubra-Ranunculus repens</i> sub-community of <i>Potentilla anserina-Carex nigra</i> dune slack community	Poor (48)
	4	MG10c	<i>Iris pseudacorus</i> sub-community of <i>Holcus lanatus-Juncus effusus</i> rush pasture	Fair (61)
	5	M23b	<i>Juncus effusus</i> sub-community of <i>Juncus effusus/acutiflorus-Galium palustre</i> rush-pasture	Very poor (40)
8	1	S28c	<i>Elymus repens-Holcus lanatus</i> sub-community of <i>Phalaris arundinacea</i> fen	Very poor (41)

Parcel Number	Quadrat Number	NVC Community	NVC Community Description	Goodness-of-fit
	2	M23b	<i>Juncus effusus</i> sub-community of <i>Juncus effusus/acutiflorus-Galium palustre</i> rush-pasture	Very poor (49)
	3	M 6d	<i>Juncus acutiflorus</i> sub-community of <i>Carex echinata-Sphagnum recurvum/auriculatum</i> mire	Very poor (33)
	4	H 1e	Species-poor <i>Calluna vulgaris-Festuca ovina</i> heath	Very poor (13)

Discussion

- 3.3 When the quadrats were analysed together for each parcel, the grassland vegetation communities sampled during the survey were found to have a very poor goodness-of-fit to any semi-natural community type as defined by the NVC (Table 1). However when the goodness-of-fit of individual quadrats was looked at, a number of the quadrats were found to have a much closer affinity for recognised NVC communities (Table 2).
- 3.4 Within Parcel 1 (abandoned playing field), Quadrat 5 was found to have a 'very good' goodness-of-fit to MG11a (*Lolium perenne* sub-community of *Festuca rubra-Agrostis stolonifera-Potentilla anserina* grassland).
- 3.5 Within Parcel 2 (triangular area of modified neutral grassland, unmanaged but heavily used by dog walkers), Quadrats 2 and 3 showed 'very good' and 'fair' goodness-of-fit respectively to MG 1a (*Festuca rubra* sub-community of *Arrhenatherum elatioris* grassland).
- 3.6 Within Parcel 3 (previously quarried area), Quadrats 1 and 2 showed a 'good' and 'very good' goodness-of-fit respectively to OV25 (*Urtica dioica-Cirsium arvense* community). Quadrats 3 and 5 showed a 'good' and 'very good' goodness-of-fit respectively to MG 1a (*Festuca rubra* sub-community of *Arrhenatherum elatioris* grassland).
- 3.7 Within Parcel 5 (marshy grassland dominated by soft rush) Quadrat 2 showed a 'good' match to MG10a (*Holcus lanatus-Juncus effusus* rush pasture).
- 3.8 None of the quadrats within Parcels 4, 6, 7 and 8 showed more than a 'fair' match to any particular community, and the majority displayed only 'poor' or 'very poor' goodness-of-fit to any semi-natural NVC community.

4.0 Conclusions

- 5.1 The variation between the quadrats within each parcel suggests patchy or mosaic habitats. In some cases this is due to spatial variations in stages of vegetation succession, as is likely in Parcel 1 (the abandoned playing field), which is more scrubby around the margins. Variations in soil moisture levels may also account for this mosaic effect; Harras Moor is a very wet site with pooling in certain seasons. The Parcels which showed most variation between Quadrats and least goodness-of fit to any particular community were noted on site to be heavily influenced by anthropogenic disturbance, in particular large numbers of introduced plant species which had presumably escaped from nearby residential gardens. Certain areas are criss-crossed by paths and are subject to eutrophication from dog waste.
- 5.2 None of the grassland areas surveyed would qualify as protected or priority habitat under Annex 1 of the the Habitats Directive (2017) or Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006). However some of the Parcels surveyed are particularly diverse and provide a variety of niches for a range of invertebrates and other animals, in particular Parcels 6 and 8.

5.0 Recommendations

- 5.3 It is recommended that the grassland at Parcels 6 and 8 should be retained or translocated if necessary. These areas should be protected through maintenance of current hydrology and fencing to prevent encroachment by machinery and vehicles. They should also be enhanced through a combination of the measures outlined below. It may also be appropriate to fence some areas during the operation phase of development to protect them from encroachment.
- 5.4 All parcels of grassland surveyed have the potential to be enhanced and managed to improve their biodiversity interest, through measures such as control of garden escapes and invasive plant species, reduction of nutrient load from animal waste, seeding or plug planting with locally appropriate grassland species and implementing a management regime which supports biodiversity. This may include measures such as scrub control in certain areas and mowing in late summer after plants have set seed.

6.0 References

Rodwell, J S (2006) National Vegetation Classification: Users' Handbook. Joint Nature Conservation Committee, Peterborough.



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APPENDIX A

Harras Moor NVC Data and TableFit Analysis

Parcel 1

Parcel Species List

KEY - D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

Former football pitch, currently unmanaged with long grass and bramble/tall ruderal species around margins. Marshy tendencies.

<i>Holcus lanatus</i>	Yorkshire-fog	A
<i>Ranunculus repens</i>	Creeping Buttercup	A
<i>Agrostis stolonifera</i>	Creeping Bent	F
<i>Cirsium arvense</i>	Creeping Thistle	F
<i>Elytrigia repens</i>	Common Couch	F
<i>Equisetum arvense</i>	Field Horsetail	F
<i>Lolium perenne</i>	Perennial Ryegrass	F
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	O
<i>Arrhenatherum elatius</i>	False Oat-grass	O
<i>Cerastium fontanum</i>	Common Mouse-ear	O
<i>Epilobium montanum</i>	Broad-leaved Willowherb	O
<i>Juncus conglomeratus</i>	Compact Rush	O
<i>Plantago lanceolata</i>	Ribwort Plantain	O
<i>Poa trivialis</i>	Rough Meadow-grass	O
<i>Ranunculus acris</i>	Meadow Buttercup	O
<i>Rubus fruticosus agg.</i>	Bramble	O
<i>Rumex obtusifolius</i>	Broad-leaved Dock	O
<i>Senecio jacobaea</i>	Common Ragwort	O
<i>Trifolium repens</i>	White Clover	O
<i>Athyrium filix-femina</i>	Lady-fern	R
<i>Bellis perennis</i>	Daisy	R
<i>Centaurea nigra</i>	Knapweed	R
<i>Dactylis glomerata</i>	Cock's-foot	R
<i>Dryopteris filix-mas</i>	Male-fern	R
<i>Epilobium hirsutum</i>	Great Willowherb	R
<i>Heracleum sphondylium</i>	Hogweed	R
<i>Juncus articulatus</i>	Jointed Rush	R
<i>Juncus effusus</i>	Soft Rush	R
<i>Lathyrus pratensis</i>	Meadow Vetchling	R
<i>Phalaris arundinacea</i>	Reed Canary-grass	R
<i>Phleum pratense</i>	Timothy	R
<i>Potentilla anserina</i>	Silverweed	R
<i>Stachys sylvatica</i>	Hedge Woundwort	R
<i>Tussilago farfara</i>	Colt's-foot	R

Tablefit results by parcel

MG10a 44 | 60 60 38 82| Holc lana-Junc effusus Typical
 OV28 34 | 58 40 37 55| A sto-R rep muddy grass
 OV28a 32 | 48 45 38 56| A sto-R rep muddy grass Pers hy-Ror syl
 MG 9 32 | 47 69 21 90| Holc lana-Desch cespit
 MG 9a 31 | 44 74 21 91| Holc lana-Desch cespit Poa trivialis

Tablefit results by quadrat

Quadrat 1

Species List

Equisetum arvense	4
Holcus lanatus	7
Cirsium arvense	5
Ranunculus repens	7
Ranunculus acris	4
Rubus fruticosus agg.	1
Cerastium fontanum	3
Plantago lanceolata	2
Elytrigia repens	4

TableFit Results

OV25a 62 | 65 64 97 56| Urtic-Cir arv tall herb Hol lan-Poa ann
 OV25 41 | 46 41 100 41| Urtic-Cir arv tall herb
 MG10a 37 | 59 39 47 54| Holc lana-Junc effusus Typical
 W24a 36 | 57 64 29 50| Rub fr-Hol la underscb Cir arv-Cir vul
 MG 9a 34 | 57 57 25 63| Holc lana-Desch cespit Poa trivialis

Quadrat 2

Species List

Holcus lanatus	7
Anthoxanthum odoratum	4
Ranunculus repens	7
Ranunculus acris	5
Agrostis stolonifera	5
Cerastium fontanum	2
Rumex obtusifolius	1

TableFit Results

MG10a 66 | 75 68 68 75| Holc lana-Junc effusus Typical
 MG10b 55 | 58 76 56 80| Holc lana-Junc effusus Junc inflexus
 OV28 51 | 78 45 82 46| A sto-R rep muddy grass
 OV28a 51 | 64 52 83 47| A sto-R rep muddy grass Pers hy-Ror syl
 MG 9 47 | 65 78 34 79| Holc lana-Desch cespit

Quadrat 3

Species List

Juncus conglomeratus	3
Anthoxanthum odoratum	4
Holcus lanatus	7
Agrostis stolonifera	2
Ranunculus repens	7
Lolium perenne	4
Dactylorhiza sp.	1

TableFit Results

MG10a 48 | 68 56 47 66| Holc lana-Junc effusus Typical
 MG11a 43 | 70 69 28 52| Fes rub-Agr sto-Pot ans Lolium perenne
 OV28 39 | 78 45 46 38| A sto-R rep muddy grass
 MG 9 39 | 58 71 27 77| Holc lana-Desch cespit
 OV28a 39 | 64 52 46 39| A sto-R rep muddy grass Pers hy-Ror syl

Quadrat 4

Species List

Holcus lanatus	8
Ranunculus repens	7
Potentilla anserina	3
Ranunculus acris	1
Lolium perenne	4
Juncus conglomeratus	1

TableFit Results

MG10a 48 | 59 66 45 81| Holc lana-Junc effusus Typical
 MG11a 39 | 60 67 28 63| Fes rub-Agr sto-Pot ans Lolium perenne
 MG10 34 | 44 68 30 87| Holc lana-Junc effusus
 MG11 33 | 60 60 26 37| Fes rub-Agr sto-Pot ans
 MG10c 33 | 42 67 29 84| Holc lana-Junc effusus Iris pseudacor

Quadrat 5

Species List

Lolium perenne	7
Ranunculus repens	7
Holcus lanatus	3
Agrostis stolonifera	4
Trifolium repens	3

TableFit Results

MG11a 80 | 84 100 78 86| Fes rub-Agr sto-Pot ans Lolium perenne
MG 7a 73 | 96 63 100 60| Lolium perenne ley Lol per-Tri rep
OV28 64 | 89 72 65 54| A sto-R rep muddy grass
OV28a 61 | 73 82 66 54| A sto-R rep muddy grass Pers hy-Ror syl
OV23c 57 | 50 88 67 83| Loli-Dactyl weedy grass Pla maj-Tri rep

Parcel 2

Parcel Species Lit

KEY - D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

Triangular area of modified neutral grassland, unmanaged but heavily used by dog walkers.

<i>Arrhenatherum elatius</i>	False Oat-grass	D
<i>Cirsium arvense</i>	Creeping Thistle	F
<i>Dactylis glomerata</i>	Cock's-foot	F
<i>Heracleum sphondylium</i>	Hogweed	F
<i>Rumex obtusifolius</i>	Broad-leaved Dock	F
<i>Epilobium hirsutum</i>	Great Willowherb	O
<i>Equisetum arvense</i>	Field Horsetail	O
<i>Galium aparine</i>	Cleavers	O
<i>Holcus lanatus</i>	Yorkshire-fog	O
<i>Lolium perenne</i>	Perennial Ryegrass	O
<i>Odontites verna</i>	Red Bartsia	O
<i>Phleum pratense</i>	Timothy	O
<i>Poa annua</i>	Annual Meadow-grass	O
<i>Ranunculus repens</i>	Creeping Buttercup	O
<i>Rubus fruticosus agg.</i>	Bramble	O
<i>Trifolium repens</i>	White Clover	O
<i>Cerastium fontanum</i>	Common Mouse-ear	R
<i>Crocsmia x crocosmiiflora</i>	Montbretia	R
<i>Filago vulgaris</i>	Common Cudweed	R
<i>Juncus effusus</i>	Soft Rush	R
<i>Matricaria discoidea</i>	Pineapple-weed	R
<i>Persicaria maculosa</i>	Redshank	R
<i>Polygonum aviculare</i>	Knotgrass	R
<i>Potentilla anserina</i>	Silverweed	R
<i>Pteridium aquilinum</i>	Bracken	R
<i>Rumex acetosa</i>	Common Sorrel	R
<i>Senecio vulgaris</i>	Groundsel	R
<i>Sonchus oleraceus</i>	Smooth Sow-thistle	R
<i>Stellaria graminea</i>	Lesser Stitchwort	R
<i>Taraxacum officinale agg.</i>	Dandelion	R

Tablefit results by parcel

OV25 27 | 44 56 18 100| Urtic-Cir arv tall herb
MG 1a 25 | 44 50 16 100| Arrhenatherum elatius Festuca rubra
MG 1 23 | 37 60 16 100| Arrhenatherum elatius
MG 1b 22 | 46 45 12 100| Arrhenatherum elatius Urtica dioica
OV25c 21 | 32 47 20 100| Urtic-Cir arv tall herb Lol per-Pap rho

Tablefit results by quadrat

Quadrat 1

Species List

Phleum pratense	7
Ranunculus repens	7
Polygonum aviculare	3
Lolium perenne	4
Senecio vulgaris	2
Cirsium arvense	4
Filago vulgaris	3
Matricaria discoidea	2
Persicaria maculosa	3
Juncus effusus	1
Potentilla anserina	2
Heracleum sphondylium	1
Cerastium fontanum	2

TableFit Results

OV21c 43 | 71 51 41 55| Poa ann-Plant maj weed Pol avi-Ran rep
 OV10d 39 | 72 44 71 29| Poa ann-Senec vulg weed Dac glo-Agr cap
 OV 4b 36 | 54 48 43 50| Chrys seg-Sper arv weed Ran rep-Son asp
 OV19b 34 | 74 44 42 28| Poa ann-Tripl inod weed Lol per-Cap bur
 OV10a 33 | 40 49 46 56| Poa ann-Senec vulg weed Persic-Ran repe

Quadrat 2

Species List

Cirsium arvense	5
Heracleum sphondylium	2
Galium aparine	4
Arrhenatherum elatius	8
Dactylis glomerata	4
Rumex obtusifolius	3

TableFit Results

MG 1a 85 | 73 97 97 100| Arrhenatherum elatius Festuca rubra
 MG 1 77 | 63 100 91 100| Arrhenatherum elatius
 MG 1b 70 | 73 85 70 87| Arrhenatherum elatius Urtica dioica
 MG 1c 63 | 57 95 70 94| Arrhenatherum elatius Filip ulmaria
 OV25 61 | 76 100 46 96| Urtic-Cir arv tall herb

Quadrat 3

Species List

Arrhenatherum elatius	9
Galium aparine	3
Cirsium arvense	2
Heracleum sphondylium	2
Rumex acetosa	2
Stellaria graminea	2

TableFit Results

MG 1a 65 | 58 70 79 100| Arrhenatherum elatius Festuca rubra
 MG 1 63 | 54 93 73 100| Arrhenatherum elatius
 MG 1b 56 | 63 65 56 100| Arrhenatherum elatius Urtica dioica
 MG 1c 53 | 53 87 55 100| Arrhenatherum elatius Filip ulmaria
 OV24b 44 | 60 72 32 88| Urtica-Gal ap tall herb Arr ela-Rub fru

Parcel 3

Parcel Species Lit

KEY - D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

Old quarried area, currently rank, ungrazed grassland apart from at Q4 which has a different composition with finer grasses and some orchid species.

<i>Arrhenatherum elatius</i>	False Oat-grass	A
<i>Dactylis glomerata</i>	Cock's-foot	A
<i>Elytrigia repens</i>	Common Couch	F
<i>Galium aparine</i>	Cleavers	F
<i>Holcus lanatus</i>	Yorkshire-fog	F
<i>Ranunculus repens</i>	Creeping Buttercup	F
<i>Cirsium arvense</i>	Creeping Thistle	O
<i>Heracleum sphondylium</i>	Hogweed	O
<i>Urtica dioica</i>	Nettle	O
<i>Chaerophyllum temulem</i>	Rough Chervil	R
<i>Dactylorhiza fuchsii</i>	Common Spotted-orchid	R
<i>Dryopteris filix-mas</i>	Male-fern	R
<i>Hippophae rhamnoides</i>	Sea Buckthorn	R
<i>Impatiens glandulifera</i>	Himalayan Balsam	R
<i>Lathyrus pratensis</i>	Meadow Vetchling	R
<i>Rumex acetosa</i>	Common Sorrel	R

Tablefit results by parcel

OV25 48 | 60 76 39 93| Urtic-Cir arv tall herb
 MG 1a 37 | 61 69 18 89| Arrhenatherum elatius Festuca rubra
 OV25a 36 | 47 67 37 58| Urtic-Cir arv tall herb Hol lan-Poa ann
 MG 1 34 | 52 84 18 100| Arrhenatherum elatius

MG 1c 28 | 44 69 17 75| Arrhenatherum elatius Filip ulmaria

Tablefit results by quadrat

Quadrat 1

Species List

Elytrigia repens	4
Phleum pratense	3
Cirsium arvense	1
Heracleum sphondylium	2
Arrhenatherum elatius	8
Galium aparine	2
Agrostis stolonifera	2

TableFit Results

OV25 74 | 76 88 75 83| Urtic-Cir arv tall herb
 MG 1a 74 | 73 75 79 100| Arrhenatherum elatius Festuca rubra
 MG 1 63 | 54 80 73 100| Arrhenatherum elatius
 MG 1b 56 | 66 61 56 87| Arrhenatherum elatius Urtica dioica
 MG 1c 48 | 48 68 53 91| Arrhenatherum elatius Filip ulmaria

Quadrat 2

Species List

Rumex obtusifolius	3
Urtica dioica	4
Heracleum sphondylium	1
Galium aparine	3
Sonchus oleraceus	1
Poa trivialis	1
Cirsium arvense	2
Elytrigia repens	9
Phleum pratense	3
Holcus lanatus	2
Arrhenatherum elatius	3

TableFit Results

OV25 90 | 96 78 100 90| Urtic-Cir arv tall herb
 OV25b 75 | 91 62 80 91| Urtic-Cir arv tall herb Rum obt-Art vul
 OV13d 50 | 50 48 65 83| Stel med-Caps burs weed Urt dio-Gal apa

OV25a 49 | 82 71 26 79| Urtic-Cir arv tall herb Hol lan-Poa ann
MG 1 45 | 79 76 18 52| Arrhenatherum elatius

Quadrat 3

Species List

Achillea millefolium	7
Cirsium arvense	6
Arrhenatherum elatius	5
Dactylis glomerata	5
Elytrigia repens	4

TableFit Results

MG 1a 74 | 77 100 73 80| Arrhenatherum elatius Festuca rubra
OV25 73 | 61 100 100 77| Urtic-Cir arv tall herb
MG 1 68 | 63 100 72 100| Arrhenatherum elatius
OV25b 58 | 73 100 51 61| Urtic-Cir arv tall herb Rum obt-Art vul
MG 1b 56 | 66 86 53 64| Arrhenatherum elatius Urtica dioica

Quadrat 4

Species List

Dactylorhiza fuchsii	1
Achillea millefolium	4
Cirsium arvense	5
Holcus lanatus	5
Phleum pratense	4
Agrostis stolonifera	4
Festuca rubra	2
Anthoxanthum odoratum	4
Rumex acetosa	1

TableFit Results

OV25a 52 | 48 48 100 57| Urtic-Cir arv tall herb Hol lan-Poa ann
U 4b 41 | 49 74 45 57| Fes ovi-Agr cap-Gal sax Hol lan-Tri rep
MG 9 39 | 65 61 29 51| Holc lana-Desch cespit
MG11 34 | 69 46 33 38| Fes rub-Agr sto-Pot ans
W24a 33 | 41 46 51 50| Rub fr-Hol la underscb Cir arv-Cir vul

Quadrat 5

Species List

Rumex acetosa	4
Agrostis stolonifera	7
Arrhenatherum elatius	7
Holcus lanatus	4
Dactylis glomerata	4
Cirsium arvense	4

TableFit Results

MG 1a 82 | 77 97 98 81| Arrhenatherum elatius Festuca rubra
 MG 1 76 | 63 100 97 83| Arrhenatherum elatius
 MG 9b 70 | 75 100 69 79| Holc lana-Desch cespit Arrhen elatius
 MG 1c 66 | 59 100 81 71| Arrhenatherum elatius Filip ulmaria
 OV25 57 | 69 92 48 73| Urtic-Cir arv tall herb

Parcel 4

Parcel Species Lit

KEY - D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

Marshy grassland dominated by soft rush, not species rich and similar species to surrounding field.

<i>Juncus effusus</i>	Soft Rush	D
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	F
<i>Agrostis stolonifera</i>	Creeping Bent	O
<i>Ranunculus repens</i>	Creeping Buttercup	O
<i>Rumex acetosa</i>	Common Sorrel	O
<i>Senecio jacobaea</i>	Common Ragwort	O
<i>Urtica dioica</i>	Nettle	O
<i>Alopecurus pratensis</i>	Meadow Foxtail	R
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	R
<i>Dactylis glomerata</i>	Cock's-foot	R
<i>Dryopteris dilatata</i>	Broad Buckler-fern	R
<i>Dryopteris filix-mas</i>	Male-fern	R
<i>Epilobium palustre</i>	Marsh Willowherb	R
<i>Phleum pratense</i>	Timothy	R

Tablefit results by parcel

S11c 12 | 6 17 23 100| Carex vesicaria swamp Carex rostrata
 MG 9 8 | 17 86 0 39| Holc lana-Desch cespit
 M23b 7 | 13 78 3 100| Junc eff/acfl-Gal palu Junc effusus
 MG 9a 7 | 14 78 0 39| Holc lana-Desch cespit Poa trivialis
 MG 9b 6 | 15 73 0 0| Holc lana-Desch cespit Arrhen elatius

Tablefit results by quadrat

Quadrat 1

Species List

Juncus effusus	9
Deschampsia cespitosa	5
Epilobium palustre	1
Dactylis glomerata	1
Rumex acetosa	1

TableFit Results

M23b 58 | 40 78 78 100| Junc eff/acfl-Gal palu Junc effusus
M23 51 | 31 60 76 100| Junc eff/acfl-Gal palu
MG 9 46 | 52 86 48 65| Holc lana-Desch cespit
S11c 45 | 18 17 100 76| Carex vesicaria swamp Carex rostrata
M 6c 42 | 37 48 57 96| Carex echin-Sph rec/aur Junc effusus

Parcel 5

Parcel Species Lit

KEY - D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

Marshy grassland dominated by soft rush in wetter areas of field.

<i>Juncus effusus</i>	Soft Rush	D
<i>Holcus lanatus</i>	Yorkshire-fog	F
<i>Angelica sylvestris</i>	Wild Angelica	O
<i>Galium aparine</i>	Cleavers	O
<i>Glyceria fluitans</i>	Floating Sweet-grass	O
<i>Cardamine flexuosa</i>	Wavy Bitter-cress	R
<i>Cirsium palustre</i>	Marsh Thistle	R
<i>Epilobium palustre</i>	Marsh Willowherb	R
<i>Ranunculus repens</i>	Creeping Buttercup	R
<i>Stellaria alsine</i>	Bog Stitchwort	R

Tablefit results by parcel

M23b 42 | 26 85 58 100| Junc eff/acfl-Gal palu Junc effusus
M23 41 | 26 84 57 100| Junc eff/acfl-Gal palu
S11c 40 | 13 22 75 100| Carex vesicaria swamp Carex rostrata
MG10a 32 | 36 68 31 100| Holc lana-Junc effusus Typical
M 6c 29 | 22 47 42 100| Carex echin-Sph rec/aur Junc effusus

Tablefit results by quadrat

Quadrat 1

Species List

Ranunculus repens	1
Juncus effusus	9

Angelica sylvestris	4
Epilobium palustre	2
Dryopteris filix-mas	1
Stellaria alsine	2

TableFit Results

M23 57 | 42 67 77 100| Junc eff/acfl-Gal palu
M23b 57 | 40 65 78 100| Junc eff/acfl-Gal palu Junc effusus
S11c 45 | 18 14 100 78| Carex vesicaria swamp Carex rostrata
M 6c 36 | 29 31 57 98| Carex echin-Sph rec/aur Junc effusus
MG10a 34 | 41 39 42 90| Holc lana-Junc effusus Typical

Quadrat 2

Species List

Juncus effusus	9
Holcus lanatus	4
Agrostis stolonifera	3
Cynosurus cristatus	2

TableFit Results

MG10a 70 | 71 100 68 100| Holc lana-Junc effusus Typical
M23b 68 | 45 100 92 100| Junc eff/acfl-Gal palu Junc effusus
M23 66 | 42 100 90 100| Junc eff/acfl-Gal palu
M27c 45 | 50 93 40 100| Filipend vulg-Ange sylv Jun eff-Hol lan
S11c 45 | 18 22 100 73| Carex vesicaria swamp Carex rostrata

Quadrat 3

Species List

Juncus effusus	9
Glyceria fluitans	4

TableFit Results

S11c 51 | 18 44 100 83| Carex vesicaria swamp Carex rostrata
M23b 48 | 19 95 78 100| Junc eff/acfl-Gal palu Junc effusus
M23 48 | 20 99 76 100| Junc eff/acfl-Gal palu
M 6c 43 | 29 95 57 100| Carex echin-Sph rec/aur Junc effusus
S22 42 | 82 74 28 18| Glycer fluit water-marg

Parcel 6

Parcel Species Lit

KEY - D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

Strip of marshy grassland sandwiched between horse field and woodland. Criss-crossed by occasionally wet ditches.

<i>Juncus effusus</i>	Soft Rush	A
<i>Angelica sylvestris</i>	Wild Angelica	F
<i>Arrhenatherum elatius</i>	False Oat-grass	F
<i>Equisetum arvense</i>	Field Horsetail	F
<i>Ranunculus repens</i>	Creeping Buttercup	F
<i>Alnus glutinosa</i>	Alder	O
<i>Cirsium arvense</i>	Creeping Thistle	O
<i>Elytrigia repens</i>	Common Couch	O
<i>Galium aparine</i>	Cleavers	O
<i>Lolium perenne</i>	Perennial Ryegrass	O
<i>Lotus pedunculatus</i>	Marsh Bird's-foot Trefoil	O
<i>Plantago lanceolata</i>	Ribwort Plantain	O
<i>Rubus fruticosus</i> agg.	Bramble	O
<i>Rumex obtusifolius</i>	Broad-leaved Dock	O
<i>Senecio jacobaea</i>	Common Ragwort	O
<i>Athyrium filix-femina</i>	Lady-fern	R
<i>Centaurea nigra</i>	Knapweed	R
<i>Fraxinus excelsior</i>	Ash	R
<i>Galeopsis tetrahit</i>	Common Hemp-nettle	R
<i>Juncus conglomeratus</i>	Compact Rush	R
<i>Lathyrus pratensis</i>	Meadow Vetchling	R
<i>Lysimachia vulgaris</i>	Yellow Loosestrife	R
<i>Phleum pratense</i>	Timothy	R
<i>Poa trivialis</i>	Rough Meadow-grass	R
<i>Populus tremula</i>	Aspen	R
<i>Stachys palustris</i>	Marsh Woundwort	R
<i>Trifolium pratense</i>	Red Clover	R
<i>Trifolium repens</i>	White Clover	R
<i>Vicia sepium</i>	Bush Vetch	R

Tablefit results by parcel

MG 1 10 | 33 41 0 11| Arrhenatherum elatius
 OV25 10 | 35 34 3 16| Urtic-Cir arv tall herb
 MG 1a 9 | 35 31 0 6| Arrhenatherum elatius Festuca rubra
 MG 1c 8 | 29 35 0 11| Arrhenatherum elatius Filip ulmaria
 M27 7 | 32 24 2 20| Filipend vulg-Ange sylv

Tablefit results by quadrat

Quadrat 1

Species List

Equisetum arvense	5
Galeopsis tetrahit	2
Fraxinus excelsior	1
Athyrium filix-femina	5
Galium aparine	5
Juncus effusus	7
Arrhenatherum elatius	3
Cirsium arvense	1
Angelica sylvestris	3
Lathyrus pratensis	1
Elytrigia repens	2

TableFit Results

M23 32 | 26 22 77 50| Junc eff/acfl-Gal palu
M23b 31 | 24 21 78 47| Junc eff/acfl-Gal palu Junc effusus
OV25 23 | 61 44 16 16| Urtic-Cir arv tall herb
M 6c 23 | 29 17 57 41| Carex echin-Sph rec/aur Junc effusus
S11c 23 | 18 8 100 33| Carex vesicaria swamp Carex rostrata

Quadrat 2

Species List

Angelica sylvestris	5
Phleum pratense	5
Cirsium arvense	6
Holcus lanatus	5
Lathyrus pratensis	2
Ranunculus acris	2
Equisetum arvense	5
Agrostis stolonifera	1
Senecio jacobaea	1

TableFit Results

OV25a 45 | 48 48 82 49| Urtic-Cir arv tall herb Hol lan-Poa ann
MG10a 26 | 61 39 37 21| Holc lana-Junc effusus Typical
MG 9a 25 | 51 51 20 32| Holc lana-Desch cespit Poa trivialis
MG 9 24 | 52 49 21 32| Holc lana-Desch cespit
W24a 23 | 41 46 29 38| Rub fr-Hol la underscb Cir arv-Cir vul

Quadrat 3

Species List

Juncus conglomeratus	7
Galium aparine	4

Senecio jacobaea	1
Rumex obtusifolius	1
Centaurea nigra	1
Stachys palustris	7
Equisetum arvense	6
Angelica sylvestris	4
Athyrium filix-femina	1

TableFit Results

SD 3 8 | 37 16 24 12| Matri mari-Galium apar
W 7a 7 | 24 32 4 13| Aln glu-Fra exc-Lys nem Urtica dioica
SD18b 6 | 33 21 0 6| Hippophae rhamnoides Urtica dioica
S26c 5 | 22 26 0 24| Phragmites-Urtica fen Oenanthe crocat
MG 1 4 | 22 25 0 4| Arrhenatherum elatius

Quadrat 4

Species List

Equisetum arvense	4
Angelica sylvestris	3
Senecio jacobaea	2
Potentilla anserina	7
Phleum pratense	7
Cirsium arvense	4
Lathyrus pratensis	3
Rumex obtusifolius	1
Epilobium montanum	2
Arrhenatherum elatius	5
Dactylis glomerata	3
Epilobium palustre	1

TableFit Results

MG 1a 40 | 70 44 59 34| Arrhenatherum elatius Festuca rubra
MG 1 39 | 58 51 56 38| Arrhenatherum elatius
OV25 31 | 61 41 46 30| Urtic-Cir arv tall herb
MG 1c 29 | 48 40 54 30| Arrhenatherum elatius Filip ulmaria
MG11b 26 | 34 17 81 35| Fes rub-Agr sto-Pot ans Atrippl hastata

Parcel 7

Parcel Species Lit

KEY - D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

Long field, currently not grazed or managed. Tussocky semi-improved grassland.

Holcus lanatus
Ranunculus repens

Yorkshire-fog
Creeping Buttercup

A
F

<i>Agrostis stolonifera</i>	Creeping Bent	O
<i>Cerastium fontanum</i>	Common Mouse-ear	O
<i>Cirsium arvense</i>	Creeping Thistle	O
<i>Dactylis glomerata</i>	Cock's-foot	O
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	O
<i>Equisetum arvense</i>	Field Horsetail	O
<i>Heracleum sphondylium</i>	Hogweed	O
<i>Lolium perenne</i>	Perennial Ryegrass	O
<i>Plantago lanceolata</i>	Ribwort Plantain	O
<i>Poa trivialis</i>	Rough Meadow-grass	O
<i>Ranunculus acris</i>	Meadow Buttercup	O
<i>Rumex acetosa</i>	Common Sorrel	O
<i>Trifolium pratense</i>	Red Clover	O
<i>Achillea millefolium</i>	Yarrow	R
<i>Athyrium filix-femina</i>	Lady-fern	R
<i>Carex flacca</i>	Glaucous Sedge	R
<i>Centaurea nigra</i>	Knapweed	R
<i>Eupatorium cannabinum</i>	Hemp-agrimony	R
<i>Iris pseudacorus</i>	Yellow Flag Iris	R
<i>Lathyrus pratensis</i>	Meadow Vetchling	R
<i>Lotus corniculatus</i>	Bird's-foot Trefoil	R
<i>Odontites verna</i>	Red Bartsia	R
<i>Potentilla anserina</i>	Silverweed	R
<i>Potentilla reptans</i>	Creeping Cinquefoil	R
<i>Rumex crispus</i>	Curled Dock	R
<i>Rumex obtusifolius</i>	Broad-leaved Dock	R
<i>Vicia sepium</i>	Bush Vetch	R

Tablefit results by parcel

MG 9 31 | 60 53 16 68| Holc lana-Desch cespit
 MG 9a 28 | 54 52 16 68| Holc lana-Desch cespit Poa trivialis
 MG10a 27 | 59 36 20 68| Holc lana-Junc effusus Typical
 MG10c 23 | 42 43 19 72| Holc lana-Junc effusus Iris pseudacor
 MG10 21 | 42 42 14 76| Holc lana-Junc effusus

Tablefit results by quadrat

Quadrat 1

Species List

<i>Cirsium arvense</i>	5
<i>Rumex obtusifolius</i>	3
<i>Phleum pratense</i>	3
<i>Dactylis glomerata</i>	4
<i>Potentilla anserina</i>	4
<i>Cerastium fontanum</i>	2
<i>Ranunculus repens</i>	4
<i>Poa trivialis</i>	2
<i>Centaurea nigra</i>	1

Agrostis stolonifera	2
Plantago lanceolata	2
Holcus lanatus	8

TableFit Results

OV25a 61 | 70 52 86 64| Urtic-Cir arv tall herb Hol lan-Poa ann
 MG 9 48 | 75 69 31 69| Holc lana-Desch cespit
 MG 9a 45 | 73 66 29 66| Holc lana-Desch cespit Poa trivialis
 MG10a 42 | 75 43 47 56| Holc lana-Junc effusus Typical
 W24a 41 | 59 54 40 67| Rub fr-Hol la underscb Cir arv-Cir vul

Quadrat 2

Species List

Lotus corniculatus	2
Trifolium pratense	2
Potentilla anserina	5
Ranunculus repens	8
Rumex obtusifolius	4
Equisetum arvense	3
Phleum pratense	3
Lolium perenne	2
Holcus lanatus	8

TableFit Results

MG10a 34 | 52 35 45 62| Holc lana-Junc effusus Typical
 SD17a 30 | 38 36 46 59| Poten anse-Carex nigra Fes rub-Ran rep
 MG11a 30 | 67 50 13 47| Fes rub-Agr sto-Pot ans Lolium perenne
 SD17 29 | 41 38 35 71| Poten anse-Carex nigra
 MG11 28 | 52 34 51 31| Fes rub-Agr sto-Pot ans

Quadrat 3

Species List

Agrostis stolonifera	4
Ranunculus repens	7
Phleum pratense	7
Holcus lanatus	5
Potentilla anserina	5
Centaurea nigra	1
Cerastium fontanum	1
Lathyrus pratensis	1
Anthoxanthum odoratum	2
Ranunculus acris	1

TableFit Results

SD17a 48 | 57 48 62 65| Potan anse-Carex nigra Fes rub-Ran rep
MG10a 47 | 75 51 53 48| Holc lana-Junc effusus Typical
MG11 46 | 76 47 76 37| Fes rub-Agr sto-Pot ans
SD17 44 | 58 50 49 68| Potan anse-Carex nigra
MG 9 44 | 72 66 32 48| Holc lana-Desch cespit

Quadrat 4

Species List

Potentilla anserina	5
Iris pseudacorus	5
Rumex obtusifolius	6
Holcus lanatus	6
Centaurea nigra	2
Poa trivialis	6
Ranunculus acris	1
Dactylis glomerata	4
Cirsium arvense	5
Ranunculus repens	5
Lathyrus pratensis	1

TableFit Results

MG10c 61 | 69 60 83 58| Holc lana-Junc effusus Iris pseudacor
M28 50 | 54 73 57 63| Iris pseudac-Fili ulma
M28b 49 | 54 75 55 64| Iris pseudac-Fili ulma Urt dio-Gal apa
MG10 46 | 65 57 48 56| Holc lana-Junc effusus
MG 9 45 | 75 65 33 49| Holc lana-Desch cespit

Quadrat 5

Species List

Arrhenatherum elatius	2
Galium aparine	1
Athyrium filix-femina	1
Equisetum arvense	7
Eupatorium cannabinum	1
Juncus effusus	7
Rubus fruticosus agg.	2
Potentilla anserina	1
Heracleum sphondylium	1
Deschampsia cespitosa	2
Rumex acetosa	1
Plantago lanceolata	1
Senecio jacobaea	1
Silene dioica	1

TableFit Results

M23b 40 | 34 24 78 63| Junc eff/acfl-Gal palu Junc effusus
M23 37 | 26 17 76 66| Junc eff/acfl-Gal palu
S11c 30 | 18 6 100 45| Carex vesicaria swamp Carex rostrata
M 6c 29 | 37 17 57 57| Carex echin-Sph rec/aur Junc effusus
MG 1 24 | 65 48 3 6| Arrhenatherum elatius

Parcel 8

Parcel Species Lit

KEY - D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

Three parcels of marshy grassland adjacent to housing estate. Includes numerous garden escapes and scattered willow scrub.

<i>Juncus effusus</i>	Soft Rush	A
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	F
<i>Epilobium hirsutum</i>	Great Willowherb	F
<i>Urtica dioica</i>	Nettle	F
<i>Angelica sylvestris</i>	Wild Angelica	O
<i>Cirsium arvense</i>	Creeping Thistle	O
<i>Dactylis glomerata</i>	Cock's-foot	O
<i>Elytrigia repens</i>	Common Couch	O
<i>Equisetum arvense</i>	Field Horsetail	O
<i>Juncus acutiflorus</i>	Sharp-flowered Rush	O
<i>Phalaris arundinacea</i>	Reed Canary-grass	O
<i>Plantago lanceolata</i>	Ribwort Plantain	O
<i>Ranunculus repens</i>	Creeping Buttercup	O
<i>Rumex obtusifolius</i>	Broad-leaved Dock	O
<i>Achillea ptarmica</i>	Sneezewort	R
<i>Calluna vulgaris</i>	Heather	R
<i>Carex flacca</i>	Glaucous Sedge	R
<i>Centaurea nigra</i>	Knapweed	R
<i>Cerastium fontanum</i>	Common Mouse-ear	R
<i>Chamerion angustifolium</i>	Rosebay Willowherb	R
<i>Crocosmia x crocosmiiflora</i>	Montbretia	R
<i>Eupatorium cannabinum</i>	Hemp-agrimony	R
<i>Fraxinus excelsior</i>	Ash	R
<i>Heracleum sphondylium</i>	Hogweed	R
<i>Hypochaeris radicata</i>	Common Cat's-ear	R
<i>Iris pseudacorus</i>	Yellow Flag Iris	R
<i>Juncus articulatus</i>	Jointed Rush	R
<i>Lathyrus pratensis</i>	Meadow Vetchling	R
<i>Lotus pedunculatus</i>	Marsh Bird's-foot Trefoil	R
<i>Lysimachia vulgaris</i>	Yellow Loosestrife	R
<i>Peltigera canina</i>	Dog Lichen	R
<i>Polygonum aviculare</i>	Knotgrass	R
<i>Potentilla anserina</i>	Silverweed	R
<i>Rubus fruticosus agg.</i>	Bramble	R

<i>Rumex crispus</i>	Curled Dock	R
<i>Salix cinerea</i>	Grey Willow	R
<i>Salix fragilis</i>	Crack Willow	R
<i>Sonchus asper</i>	Prickly Sow-thistle	R
<i>Stachys palustris</i>	Marsh Woundwort	R
<i>Stachys sylvatica</i>	Hedge Woundwort	R
<i>Taraxacum officinale agg.</i>	Dandelion	R
<i>Trifolium pratense</i>	Red Clover	R
<i>Vicia cracca</i>	Tufted Vetch	R

Tablefit results by parcel

OV26a 11 | 48 25 1 35| Epil hirsut tall herb Jun eff-Ran rep
 MG 9 9 | 33 32 0 24| Holc lana-Desch cespit
 MG 9a 7 | 28 30 0 24| Holc lana-Desch cespit Poa trivialis
 S28c 6 | 44 16 0 0| Phalaris arundinac fen Ely rep-Hol lan

Tablefit results by quadrat

Quadrat 1

Species List

<i>Cirsium arvense</i>	4
<i>Lathyrus pratensis</i>	4
<i>Phalaris arundinacea</i>	5
<i>Potentilla anserina</i>	5
<i>Stachys palustris</i>	5
<i>Elytrigia repens</i>	6
<i>Poa trivialis</i>	4
<i>Ranunculus repens</i>	4
<i>Epilobium hirsutum</i>	2

TableFit Results

S28c 41 | 100 43 51 31| Phalaris arundinac fen Ely rep-Hol lan
 OV25 32 | 38 34 100 32| Urtic-Cir arv tall herb
 OV25b 30 | 42 32 77 32| Urtic-Cir arv tall herb Rum obt-Art vul
 OV25a 30 | 37 37 82 31| Urtic-Cir arv tall herb Hol lan-Poa ann
 MG11b 25 | 48 33 42 33| Fes rub-Agr sto-Pot ans Atrip hastata

Quadrat 2

Species List

<i>Rumex acetosa</i>	4
<i>Centaurea nigra</i>	4
<i>Juncus effusus</i>	9
<i>Epilobium palustre</i>	2
<i>Plantago lanceolata</i>	3

Epilobium hirsutum	4
Senecio jacobaea	1
Carex flacca	3
Fraxinus excelsior	1
Juncus conglomeratus	1
Ranunculus repens	3
Rumex crispus	1

TableFit Results

M23b 49 | 40 32 79 79| Junc eff/acfl-Gal palu Junc effusus
M23 46 | 37 29 76 80| Junc eff/acfl-Gal palu
OV26a 33 | 81 35 37 43| Epil hirsut tall herb Jun eff-Ran rep
S11c 32 | 18 7 100 50| Carex vesicaria swamp Carex rostrata
M 6c 32 | 37 20 57 67| Carex echin-Sph rec/aur Junc effusus

Quadrat 3

Species List

Juncus acutiflorus	9
Senecio jacobaea	3
Phalaris arundinacea	3
Rubus fruticosus agg.	2
Arrhenatherum elatius	3
Galium aparine	1
Deschampsia cespitosa	1

TableFit Results

M 6d 33 | 20 24 58 98| Carex echin-Sph rec/aur Junc acutiflor
M23a 32 | 15 25 57 96| Junc eff/acfl-Gal palu Junc acutifl
W24 22 | 49 63 8 10| Rub fr-Hol la underscb
OV24b 20 | 52 49 10 9| Urtica-Gal ap tall herb Arr ela-Rub fru
SD18b 18 | 50 48 3 12| Hippophae rhamnoides Urtica dioica

Quadrat 4

Species List

Centaurea nigra	2
Hypochaeris radicata	3
Calluna vulgaris	5
Juncus conglomeratus	4
Festuca rubra	1
Juncus articulatus	3
Equisetum arvense	3
Carex flacca	5
Juncus effusus	4

Polytrichum sp.	4
Prunella vulgaris	3
Bare Ground	7
Potentilla reptans	1
Deschampsia cespitosa	2
Trifolium pratense	3

TableFit Results

H 1e 13 | 93 8 51 17| Calluna-Fest ovine heath Species-poor
H 7e 13 | 34 26 27 24| Calluna-Scilla vern heath Calluna vulgar
MG 9 13 | 52 30 3 8| Holcus lanatus-Desch cespit
H 7 13 | 29 27 24 31| Calluna-Scilla vern heath

Quadrat Data and TableFit Explanation

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

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

- 1.2 These percentage bands give an approximation of the abundance of each species in a quadrat in the field. Whilst it is frequent for the upper limits of each band to exceed 100% when the score for each plant is accumulated, especially in layered vegetation such as woodlands, the total upper percentage cannot be less than 100% unless other features such as bare ground, leaf litter or open water are recorded, a quick calculation in the field prevents species being under-recorded.
- 1.3 The second way that plant species can make their presence felt in any NVC community is by frequency, also known as constancy. Common Reed is expected to be dominant in a set of reedbed samples and it is also very likely to be constant; that is occurring in a high percentage of the samples. On the other hand a species such as Hemp Agrimony often occurs with reeds and can be at very low levels of abundance. It is quite possible for Hemp Agrimony to be present at a Domin level of 2 in eight out of ten reedbed samples. In this case Hemp Agrimony (occurring in 80% of the samples) would also be a constant species, that is to say it is almost as equally frequent as Common Reed, although nowhere near as abundant. The combinations of abundance and frequency are used to define NVC communities and in this case reedbeds with constant Hemp Agrimony would more likely be S26 type than S4 which is more of a reed monoculture. The definitions of frequency are as follows, depending on what percentage of samples a particular species is recorded in:

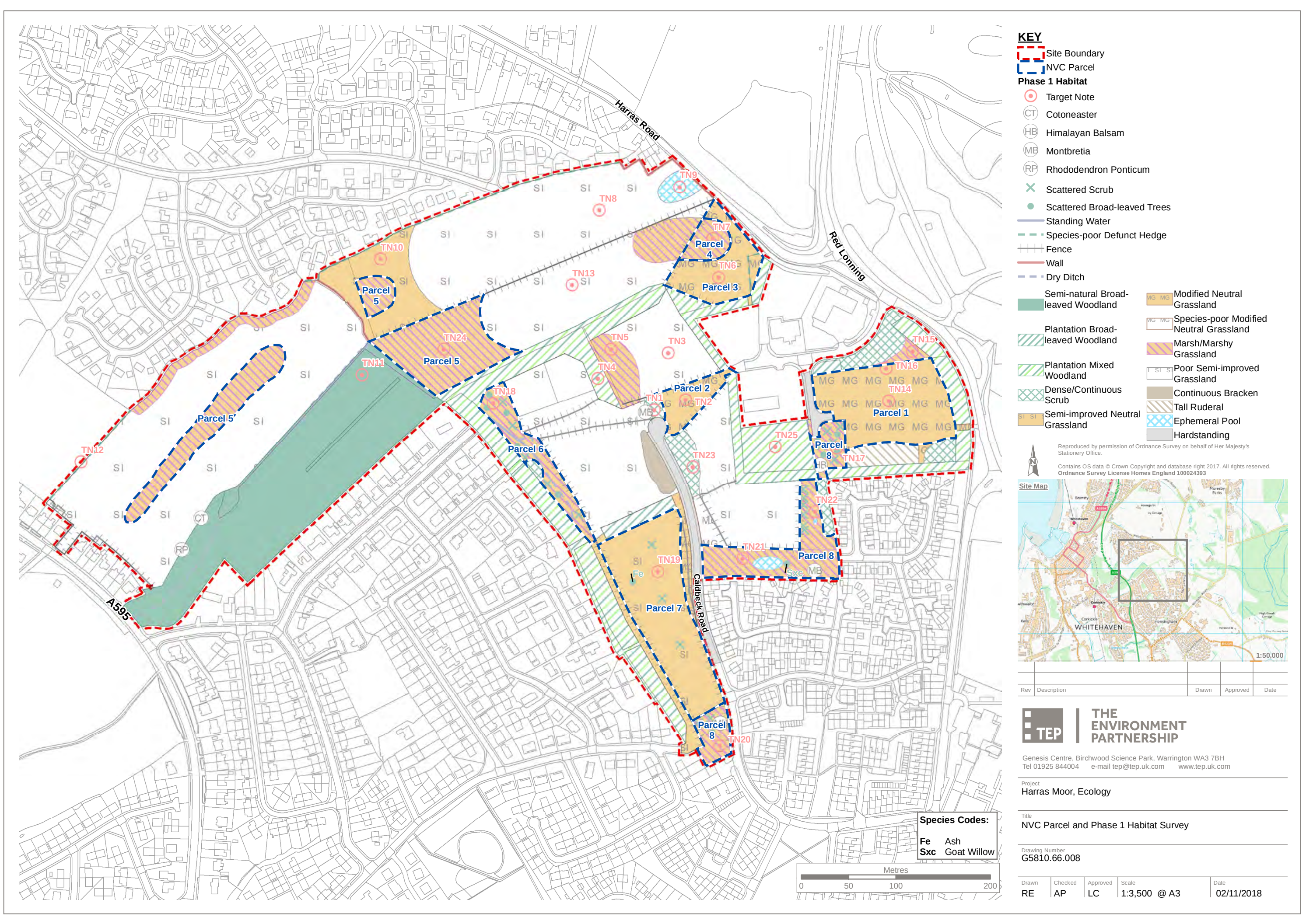
Percentage occurrence	Description	Frequency Class
81 - 100%	Constant	V
61 - 80%	Constant	IV

41 - 60%	Frequent	III
21 - 40%	Occasional	II
1 - 20%	Scarce	I

- 1.4 In the NVC floristic tables, published for every vegetation community and sub-community described in the National Vegetation Classification, the frequency is always expressed at a Roman numeral (from I -V) with the range of dominances recorded (Domin 1 -10) expressed in Arabic numerals, say (7 - 9) for a more dominant species and (1 - 2) for a much less dominant species. In recognising many NVC communities the frequency of a species can be just as significant as the dominance.
- 1.5 When entering data into TableFit, or other similar programmes such as MATCH, MAVIS or TURBOVEG, it usually only the Domin levels of each species that are known, the frequency can then be worked out once a full dataset has been entered; how this is done varies from programme to programme. It is possible to work out frequency values for each species in advance of allocating NVC types if so desired. In that case the manual dichotomous keys in each of the five volumes of the NVC can be utilised, having first drawn up floristic tables specific to the site to compare with the floristic tables nationally.
- 1.6 TableFit version 1.0 is a tried and tested vegetation analysis programme compiled by Dr Mark Hill of the Institute of Terrestrial Ecology in 1996. TableFit has been adopted as standard by TEP ecologists. When NVC samples have been collected, using the approved methodology, the species and Domin data are entered and the programme makes an objective analysis of which vegetation community it most closely matches. However, as the 2000 review of the NVC shows, the classification system is still evolving to some extent and there are some communities that occur in the British Isles that have not yet been classified, this has an effect on the accuracy of some of the output and it is very frequent, for example, for inland grasslands dominated by Red Fescue to be spuriously analysed as Maritime Grasslands even though far from any coastal influence. Therefore, the TableFit output needs to be interpreted carefully, especially when the goodness-of-fit rating descends to Fair or lower (Poor and Very Poor). Whilst the TableFit output is always useful as a guide, the manual keys, the community descriptions and the floristic tables are just as useful and they should all be used together to help an experienced ecologist make the best interpretation.
- 1.7 The TableFit goodness-of-fit rating can range from 0 to 100, with increasing closeness of fit with ascending scores, the ratings are as follows:

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

- 1.8 Even when a very good rating is indicated it is always worth checking through the community descriptions and floristic tables to double check, but these higher ratings are more often than not accurate and provide a very useful tool in helping to identify NVC community types.
- 1.9 However there are many instances where the top rating of the five best fits should not simply be accepted, in some cases different communities have very similar scores or the scores are simply too low to give any confidence. There are many factors involved: there may well be zones of transition between communities that have been sampled, or in the case of many sites that we are called on to survey, the vegetation is still simply too young to have developed fully into one of the semi-natural community types that the NVC was designed to define. TableFit analysis can be very useful in recognising different communities in transition and sometimes a transitional type is identified and mapped as such. Many samples of developing vegetation simply cannot be identified to sub-community level and are allocated as undifferentiated communities with no sub-community suffix. The experience of the ecological surveyors is important as they will be able to balance the dominant and frequent species recorded from site and compare various floristic tables and descriptions to arrive at logical conclusions.
- 1.10 The TableFit output indicates the NVC community type of the top five matches in the first column, the second column then gives the overall 'goodness-of-fit' rating, this is not a percentage but a classification derived from the average of four individual values that are also included in the output table.
- 1.11 The first column of these four values relates to the fit of the species composition of each sample with the NVC data nationally, but with increased weighting for the species with higher frequency values (III-V).
- 1.12 The second column is the mean constancy of species in the sample, as a proportion of what would be expected for each community. For species-poor sample this column 2 number tends to be low, but column 1 value would be high.
- 1.13 In the third column the figures represent dominance satisfaction, that is to say it checks that species that are expected to have a high Domin value in that community do in fact fulfil that characteristic. This number can be high in samples with a single dominant where that species is present at high Domin levels.
- 1.14 For the final column the species are weighted by the 0.75 power of their cover value to give a weighted mean constancy
- 1.15 TableFit carries out all these background calculations and leaves us with simply the 'goodness-of-fit' value to help with interpretation of the field data.



KEY

Site Boundary

NVC Parcel

Phase 1 Habitat

Target Note

Cotoneaster

Himalayan Balsam

Montbretia

Rhododendron Ponticum

Scattered Scrub

Scattered Broad-leaved Trees

Standing Water

Species-poor Defunct Hedge

Fence

Wall

Dry Ditch

Semi-natural Broad-leaved Woodland

Plantation Broad-leaved Woodland

Plantation Mixed Woodland

Dense/Continuous Scrub

Semi-improved Neutral Grassland

Modified Neutral Grassland

Species-poor Modified Neutral Grassland

Marsh/Marshy Grassland

Poor Semi-improved Grassland

Continuous Bracken

Tall Ruderal

Ephemeral Pool

Hardstanding

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Site Map

Rev	Description	Drawn	Approved	Date

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Project
Harras Moor, Ecology

Title
NVC Parcel and Phase 1 Habitat Survey

Drawing Number
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Drawn	Checked	Approved	Scale	Date
RE	AP	LC	1:3,500 @ A3	02/11/2018



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