Welsh Government

M4 Corridor around Newport

August 2017 Environmental Statement Supplement Appendix ESS5 2.4

National Vegetation Classification Survey

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CVJV/AAR
3rd Floor
Longross Court,
47 Newport Road,
Cardiff
CF24 0AD

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1 Introduction

1.1.1 This report sets out the findings of a vegetation survey of land on the Newport Docks that is proposed as a relocation site for commercial buildings located elsewhere on the Newport Docks site that would be affected by the M4 Corridor around Newport (M4CaN) Scheme.

2 Survey method

2.1.1 This study supplements the vegetation surveys undertaken in 2014 and 2015 for the M4CaN Scheme and followed the same combination of walk-over and National Vegetation Classification (NVC) survey methods as described below.

2.1.2 The survey was mainly undertaken using a simple walk-through method in order to map the main vegetation types. The plant communities were plotted by eye onto an aerial photograph base plan. Where small patches of habitats were not mapped but were considered significant they were described by target notes or single quadrats. In some cases, where the vegetation is characterised by patchiness, it was not always possible to map the variation, but to describe the vegetation types as a mosaic of several plant communities.

2.1.3 The vegetation was delineated into approximately homogeneous stands of vegetation for mapping purposes. The plant communities of these stands were then examined in more detail by quadrat sampling, and were described in terms of the published NVC communities (Rodwell, 1991, etc.). The quadrat surveys generally involved recording every species within square 2x2 metre sample areas (or where more appropriate for scrub and woodland, 4x4 metre quadrats) which were selected as being representative samples of the stand in which they occurred. Features such as scrub vegetation and water bodies that were not easily sampled using standard quadrat methodology were included within the community descriptions on the basis of brief descriptions and species lists.

2.1.4 The cover of every species within each quadrat was assessed using the Domin scale, as shown below. An estimate was also made of the percentage cover by vegetation and the approximate vegetation height (as an average through the quadrat).

Table 2.1: Domin Scale for Recording Vegetation Cover

Percentage cover	Domin score
91-100%	10
76-90%	9
51-75%	8
34-50%	7
26-33%	6
11-25%	5
4-10%	4
<4% - many individuals	3
<4% - several individuals	2
<4% - few individuals	1
Associate species (within 1 m of a quadrat)	A

2.1.5 The fieldwork was carried out on 18, 19 and 25 July 2017, by Dr Peter Sturgess CEnv MCIEEM.

2.1.6 The main focus of the study was the open grassland, ruderal and wetland habitats. The scrub was only examined briefly and from the margins because it appears to be a relatively species-poor habitat, largely limited to common plant species. Investigation of the saltmarsh that was located adjacent to the survey area was limited to a brief walk-through because it was located outside the proposed development area.

2.1.7 This survey area had a varied history of disturbance and consequently the vegetation was characterised by a high degree of patchiness. It was therefore necessary to combine much of the small-scale variation into broad categories for mapping purposes. In this type of highly varied terrain some species occurring at low-frequency would inevitably have been overlooked, but the survey provided an overview of the main plant communities.

2.1.8 A list of the plant species recorded during the survey is presented in Annex A, which includes the scientific and common names for each species. The mapping is presented separately. The locations of the quadrats are shown on the survey map.

3 Survey findings

3.1.1 As was recorded in the Newport Docks survey areas described in Appendix 10.20 to the March 2016 M4CaN Environmental Statement (ES), this southern part of Newport Docks also had a wide variety of substrata and a history of intermittent but infrequent disturbance. These factors combined to create a diverse flora that included a number of locally uncommon plant species. The quadrat data provided an indication of the most frequent species in the most widespread habitats, but most of the notable species were only present at a very low density, or were limited to particular areas of recent disturbance. One significant exception is Narrow-leaved Bird's-foot Trefoil, which occured widely throughout the survey area, and was locally abundant in the damp western grassland areas.

3.1.2 The quadrat sampling in the post-industrial grassland areas identified two main substrata, and the data have been arbitrarily split according to these. One substratum was predominantly formed from concrete or limestone chippings, while the other was a fine black material similar to that seen in the steelworks site in 2015 (although the origin of this material is unknown). This is broadly reflected in the mapping as the sparse ruderal communities tended to be on the limestone materials and old railway ballast, while the plant communities on the black material tended to be shown as unimproved grassland and ruderal mosaic. The other main communities sampled using quadrats were the mown roadside grassland and the wetland patches dominated by Common Reed. The saltmarsh, scrub and some more restricted habitats are described by notes and species lists.

3.1.3 The mown roadside grassland in the north of the study area had a relatively limited flora that was restricted by the regular cutting. It did not contain any particularly uncommon species. The plant community broadly resembled a species-poor MG5 *Centaurea nigra - Cynosurus cristatus* grassland, with elements of MG1e *Arrhenatherum elatius* grassland (which it would undoubtedly revert to if the mowing was stopped).

3.1.4 Photographs and plant species lists for habitat areas surveyed are provided below.

3.2 Mown roadside grassland

Photograph 1. Mown roadside grassland, with planting bed in foreground

Table 3.1: Quadrat data for mown roadside grassland

Quadrat	3	4	5	6	8	Frequency
	Domin score					
Festuca rubra	10	9	8	8	9	V
Plantago lanceolata	2	2	1	2	2	V
Trifolium repens	2	4	4	2	2	V
Agrostis stolonifera		4	4	2		III
Crepis capillaris	A	1	1	2	A	III
Dactylis glomerata	A	1	1	1	A	III
Ranunculus repens	1	2	3			III
Senecio jacobaea	A	1		1	1	III
Taraxacum sp.		A	3	2	2	III
Achillea millefolium				3	2	II
Centaurea nigra	2	A	A	A	1	II
Lolium perenne			4		2	II
Lotus corniculatus		A	A	2	2	II
Medicago lupulina	2	3	A		A	II
Potentilla reptans	2	2				II
Trifolium dubium		2	1			II
Agrostis capillaris	A	1				I
Arrhenatherum elatius					1	I
Brachythecium rutabulum		2				I
Calliergonella cuspidata				1		I
Cerastium fontanum			1			I
Erigeron acer				1		I
Holcus lanatus			2		A	I
Hypochaeris radicata					1	I
Lathyrus pratensis					2	I
Picris echioides		1				I
Poa pratensis					1	I
Rumex crispus				1	A	I
Tragopogon pratensis					1	I
Trifolium pratense		2				I
Cirsium arvense	A					
Conyza bilbaoana				A		
Daucus carota				A		
Geranium robertianum					A	

Quadrat	3	4	5	6	8	Frequency
	Domin score					
Geranium rotundifolium	A					
Heracleum sphondylium		A				
Hypericum perforatum				A		
Pastinaca sativa				A	A	
Pulicaria dysenterica	A			A		
Ranunculus acris			A			
Total species	7	15	12	13	14	
Cover (%)	100	100	100	100	100	
Average sward height (cm)	10	10	10	5	5	

3.3 Planting beds

3.3.1 The mown grassland was punctuated by a series of rectangular flower beds that appeared to have been left untended this year. They seemed to have been sown with an annual pollinator flower mix in previous years, and self-sown flowers from such a seed mix were still present in the beds, together with a mix of native ruderal plants. Plains Coreopsis, California Poppy and Pot Marigold were particularly prominent, and these species were also sown themselves in the nearby road-verge.

Table 3.2: Plant species associated with old planting beds in mown roadside grassland

Scientific name	Common name
Achillea millefolium	*Epilobium parviflorum*
Calendula officinalis	*Eschscholzia californica*
Centaurea cyanus	*Eupatorium cannabinum*
Cirsium arvense	*Holcus lanatus*
Cirsium vulgare	*Hypericum perforatum*
Conyza bilbaoana	*Linum cf bienne*
Coreopsis tinctoria	*Myosotis arvensis*
Crepis capillaris	*Papaver rhoeas*
Elytrigia repens	*Senecio jacobaea*
Epilobium ciliatum	*Tripleurospermum inodorum*
Epilobium obscurum	*Epilobium parviflorum*

3.4 Ruderal vegetation

3.4.1 The quadrats recorded in short, sparse ruderal vegetation on concrete rubble and limestone chippings were quite variable. They included characteristics of open vegetation and calcareous grassland communities, but it was very difficult to place such a fragmentary community within any of the published NVC categories. Most of the plant species were very common, but notable species in this community include locally abundant Yellow-wort, and one patch on former railway ballast that included Dwarf Spurge and Round-leaved Crane's-bill. Dittander was present at some of the edges of this habitat.

Photograph 2. Short ruderal vegetation on limestone chippings in north of study area

Table 3.3: Quadrat data for short ruderal vegetation on concrete rubble and limestone chippings

Quadrat	1	2	7	17	18	19	37	
	Domin score							Frequency
Agrostis stolonifera	2	4		2	4	3	2	V
Tripleurospermum inodorum	3	2	1	2	2		2	V
Buddleja davidii	4	2			4	4	2	IV
Holcus lanatus	3	4	A	1	2		2	IV
Medicago lupulina	3	4	1	1	A	3		IV
Picris echioides	A	1	3	1		2	2	IV
Vulpia bromoides	2	2	3	A		2	2	IV
Anagallis arvensis	A	2		3	A		2	III
Arenaria serpyllifolia					2	2	3	III
Blackstonia perfoliata	3				3	1		III
Conyza bilbaoana	1			A	2	4	3	III
Crepis capillaris	2	3			A	1	1	III
Epilobium obscurum	2	2	2					III
Epilobium parviflorum	2	2					1	III
Festuca rubra	2	4			2			III
Geranium robertianum	1	A	1				1	III
Homalothecium lutescens	2	2	2		A			III
Hypericum perforatum	1			2		2	1	III
Prunella vulgaris	2	2		1				III
Pulicaria dysenterica	1			2		2		III
Rubus fruticosus	2	A			A	2	2	III
Syntrichia ruralis	2	2	2			A		III
Taraxacum sp.				2	A	2	2	III
Barbula cf convoluta			6			A	4	II
Centaurium erythraea	2				A	2		II
Cerastium semidecandrum						1	1	II
Dactylis glomerata	1	2					A	II
Daucus carota	2						1	II
Eupatorium cannabinum	1				2			II
Hypochaeris radicata	1			1				II
Melilotus altissimus	A			1	4		A	II
Pastinaca sativa		1	A				1	II

Quadrat	1	2	7	17	18	19	37	
	Domin score							Frequency
Salix cinerea	1					2		II
Senecio jacobaea	2						1	II
Sonchus oleraceus		1	2					II
Trifolium repens	4	A	1					II
Verbena officinalis	1				1			II
Achillea millefolium							1	I
Anisantha madritensis			3					I
Arabidopsis thaliana			3					I
Betula cf pubescens	A					2		I
Catapodium rigidum					2			I
Cerastium fontanum	2	A						I
Cirsium arvense	2		A				A	I
Cirsium vulgare				1				I
Conyza sp.	1							I
Epilobium ciliatum			2					I
Epilobium sp.						1		I
Euphorbia exigua		3						I
Geranium rotundifolium		3						I
Lactuca serriola							1	I
Lepidium latifolium							1	I
Linaria repens		2						I
Lotus corniculatus	3						A	I
Malva sylvestris							1	I
Odontites vernus	1							I
Oenothera biennis	1							I
Ononis repens	4							I
Pilosella officinarum							1	I
Plantago major		A		3	A			I
Potentilla reptans							5	I
Ranunculus repens	2							I
Rosa canina						1		I
Rubus caesius		2						I
Salix caprea						2		I
Saxifraga tridactylites			1					I
Senecio vulgaris		A	3					I
Trifolium campestre					1			I
Trifolium pratense	2							I
Veronica arvensis				1				I
Veronica persica		A	2					I
Viola arvensis			2					I
Arrhenatherum elatius		A						
Betula pendula	A							
Carex otrubae	A							
Clematis vitalba		A						
Conium maculatum							A	
Crepis biennis					A			
Dipsacus fullonum							A	
Epilobium hirsutum						A		
Hirschfeldia incana							A	
Juncus inflexus						A		
Papaver rhoeas		A						
Poa annua							A	
Polygonum aviculare		A						
Scrophularia auriculata						A		
Sonchus asper							A	
Typha latifolia								
Zea mays		A						
Total species	37	22	18	15	13	20	26	
Cover (%)	55	60	50	10	30	20	10	
Average sward height (cm)	2	15	5	5	80	15	15	

Photograph 3. Dwarf Spurge in limestone railway ballast at Quadrat 2

3.4.2 A number of additional species not recorded in the quadrats from sparse ruderals on limestone chippings and rubble are listed below. Of particular note are the Narrow-leaved Everlasting Pea, present on railway ballast in the north and south of the area. A small number of plants of Great Lettuce and Nettle-leaved Goosefoot were present on recently tipped rubble in the south-west of the area.

Table 3.4: Additional species from short ruderal vegetation on concrete rubble and limestone chippings, not recorded in quadrats

Scientific name	Scientific name
Calystegia sepium	*Reseda luteola*
Campylopus introflexus	*Lotus glaber*
Carex flacca	*Melilotus alba*
Chenopodium album	*Persicaria maculosa*
Chenopodium murale	*Pilosella officinarum*
Chenopodium rubrum	*Reseda luteola*
Coronopus didymus	*Rorippa palustris*
Cortaderia selloana	*Sedum acre*
Crataegus monogyna	*Sedum album*
Crocosmia crocosmiiflora	*Senecio inaequidens*
Echium vulgare	*Senecio squalidus*
Euphorbia helioscopia	*Silene latifolia*
Lactuca virosa	*Solanum nigrum*
Lathyrus sylvestris	*Solidago gigantea*
Linaria vulgaris	*Symphytum x uplandicum*
Lotus glaber	*Tussilago farfara*
Melilotus alba	*Urtica dioica*
Persicaria maculosa	*Verbascum thapsus*
Pilosella officinarum	

Photograph 4. Great Lettuce in recently tipped concrete rubble

3.4.3 A very similar ruderal community was recorded on areas of hard-standing and concrete rubble apparently subject to recent compaction. Many of the most frequent species proved to be the same as listed above, although there were a few more species indicative of poor drainage. Notable species included occasional Narrow-leaved Bird's-foot Trefoil. Small numbers of Narrow-leaved Everlasting Pea and Great Lettuce were observed on hard standing in the south-west of the area.

Table 3.5: Quadrat data for ruderals on hard standing and recently compacted rubble

	Domin score									
Quadrat	**16**	**28**	**29**	**30**	**31**	**34**	**35**	**41**	**44**	**Frequency**
Tripleurospermum inodorum	2	3	4	3	3	2	3	3	3	V
Agrostis stolonifera	2		2		3	4	4	2	2	IV
Buddleja davidii		1		2	3	3	A	1	1	IV
Conyza bilbaoana		2	1	6	4	3	3	2	A	IV
Epilobium parviflorum		1	1	A	1		1	2	3	IV
Plantago major	2		2	2	3	2	3	A	A	IV
Anagallis arvensis			2	2	3	2				III
Arenaria serpyllifolia				3	2	3	3	A		III
Cirsium vulgare		1	1	2	1			1		III
Eupatorium cannabinum		A	A	A	1	1	1		2	III
Medicago lupulina		3	2	2	3					III
Picris echioides		A	1	2	1	A		2		III
Scrophularia auriculata			A	1	1	2	1			III
Bryum sp.				2	2			2		II
Cirsium arvense			1			1		1	A	II
Crepis capillaris					1			A	1	II
Dipsacus fullonum		1		1		A				II
Epilobium hirsutum		1		A				2	2	II
Hirschfeldia incana		2		A	2					II
Holcus lanatus			1	2				2		II
Hypericum perforatum		1			A	3	A			II
Lotus glaber			1			2	1			II
Melilotus alba						2	2			II
Plantago lanceolata						1	2		1	II
Pulicaria dysenterica	2								4	II
Ranunculus repens				1	2	2			A	II

	Domin score									
Quadrat	**16**	**28**	**29**	**30**	**31**	**34**	**35**	**41**	**44**	**Frequency**
Reseda luteola		1		1	A		1	A		II
Rumex crispus		1		2		1				II
Sonchus oleraceus		1					1			II
Verbena officinalis					1	2	1			II
Veronica serpyllifolia		1		A		2				II
Blackstonia perfoliata			2							I
Carex hirta				2						I
Carex otrubae							1			I
Catapodium rigidum						2				I
Chamerion angustifolium		A	1							I
Chara vulgaris	2									I
Chenopodium rubrum									2	I
Didymodon sp.								4		I
Epilobium ciliatum						1				I
Epilobium montanum		1		A						I
Epilobium obscurum								2		I
Festuca rubra									2	I
Juncus articulatus	6									I
Juncus inflexus	2									I
Lythrum salicaria	1									I
Medicago arabica							2			I
Oenothera sp.							2			I
Persicaria maculosa									2	I
Potentilla anserina			2							I
Potentilla reptans		1								I
Prunella vulgaris					2					I
Rubus fruticosus		A							1	I
Salix cinerea						1				I
Senecio inaequidens								3		I
Senecio jacobaea		A		A	2					I
Silene latifolia							1			I
Sonchus arvensis		A		1						I
Spergularia marina	1									I
Taraxacum sp.									1	I
Trifolium repens						2				I
Tussilago farfara		4								I
Melilotus altissimus		A								
Rorippa palustris									A	
Salix alba	A									
Sedum acre								A		
Sonchus asper			A							
Syntrichia ruralis								A		
Teucrium scorodonia				A						
Typha latifolia	A									
Total species	9	17	15	18	20	22	18	14	14	
Cover (%)	25	10	20	50	10	40	30	20	10	
Average sward height (cm)	20	30	10	40	20	30	40	20	10	

Table 3.6: Additional species from hard-standing, not recorded in quadrats

Scientific name	Scientific name
Alnus glutinosa	*Alnus glutinosa*
Athyrium filix-femina	*Athyrium filix-femina*
Carex arenaria	*Carex arenaria*
Cerastium fontanum	*Cerastium fontanum*
Clematis vitalba	*Clematis vitalba*

3.5 Hard-standing

Photograph 5. Poorly drained hard-standing in north of study area, with ruderal community establishing in cracks

3.5.1 The plant community associated with the fine-black material that was present in much of the south and west of the area was characterised by sparse Creeping Bent, Bilbao Fleabane and Common Centaury, often with a high proportion of Perforate St.John's-wort and Yellow-wort, indicating a probably highly alkaline substratum (possibly deriving from former steel works opetrations). The most significant species was Narrow-leaved Bird's-foot Trefoil, which was abundant in the more poorly drained parts. The quadrats covered a range of variation from recently disturbed material through to older areas developing scattered Birch scrub (particularly quadrats 45 and 46). Again, this vegetation did not conform to a readily identifiable NVC community.

Table 3.7: Quadrat data for grassland and ruderal mosaic on poorly drained fine black material

	Domin score												
Quadrat	**14**	**15**	**23**	**24**	**25**	**27**	**33**	**52**	**38**	**45**	**46**	**50**	**Freq.**
Agrostis stolonifera	5	6	3	5	4	1	5	6	3			3	V
Conyza bilbaoana		1	3	3	2	4	2	4	3	3	4	2	V
Barbula cf convoluta			4	4	2	8			4	5	2	2	IV
Centaurium erythraea	2	3	3	2	2	2	A	1	3		1		IV
Crepis capillaris			2	1	2	2	2		1	1	3		IV
Anagallis arvensis		2	2	1			4		1			3	III
Arenaria serpyllifolia	A		2		1		3		2	A	1		III
Blackstonia perfoliata		A	3	2	2	3			3	2	2		III
Cirsium arvense			1	2			2		1		1		III
Cirsium vulgare			1			1	1		1	A		1	III
Epilobium obscurum	1	1	A	1		2		A	1				III
Holcus lanatus		1	2	2	1		4					2	III
Hypericum perforatum			3	2	3	1	7	A	1	A			III
Lotus glaber	5			2				8	1			6	III
Medicago lupulina		4		3	4	A	8				4		III
Picris echioides			A				1	2	2		1	2	III
Prunella vulgaris	2	2	2	2	2								III
Pulicaria dysenterica	5	2	1	2	2	1					A	A	III
Rubus fruticosus			2		4	1	A	1		A	2		III
Tripleurospermum inodorum	2	4	A			1	2	A	A	2		2	III
Buddleja davidii		1								3	2		II
Geranium dissectum				1					1			1	II
Homalothecium lutescens			2	4	2								II
Juncus inflexus	4	3										2	II
Oenothera sp.		1	2		2								II
Peltigera sp.				A		4				4	2		II
Plantago major	1	2						2	2			A	II
Potentilla reptans		4		2	4								II
Salix cinerea	4	A								1		1	II
Senecio jacobaea				2	2		2						II
Trifolium repens		2						4				3	II
Veronica arvensis		2				1					1		II
Aira caryophyllea			3										I
Betula cf pubescens											2		I
Betula pendula						A			A	A	2		I
Calliergonella cuspidata	4			A					5				I
Catapodium rigidum		2		2									I
Cerastium fontanum				2									I
Cerastium semidecandrum						2							I
Chamerion angustifolium					A					1	A		I
Clinopodium vulgare					5								I
Cratoneuron filicinum			A	4									I
Dipsacus fullonum					3								I
Epilobium ciliatum										1	A		I
Epilobium hirsutum												1	I
Epilobium parviflorum									2		1		I
Equisetum arvense		2											I
Eupatorium cannabinum	1	2								A			I
Hippophae rhamnoides						4							I
Juncus articulatus	2												I
Juncus bufonius	3	2											I
Juncus effusus	1												I
Leontodon hispidus										1			I
Linum catharticum			A		5								I
Lotus corniculatus			7		8								I
Lycopus europaeus								2				2	I
Medicago arabica									2				I
Melilotus alba								1					I

	Domin score												
Quadrat	**14**	**15**	**23**	**24**	**25**	**27**	**33**	**52**	**38**	**45**	**46**	**50**	**Freq.**
Mentha aquatica												4	I
Myosotis discolor											1		I
Odontites vernus		1											I
Physcia tenella						A				2			I
Poa annua	2												I
Ranunculus repens	2	A											I
Rosa canina					1					1			I
Rumex crispus	2	2		A								A	I
Sagina procumbens	2												I
Sedum album									1				I
Sonchus arvensis		2											I
Sonchus oleraceus				1							A		I
Syntrichia ruralis				2			2						I
Taraxacum sp.			2								A		I
Trifolium arvense		1											I
Trifolium campestre		1											I
Trifolium dubium											2		I
Tussilago farfara		1											I
Verbena officinalis		1										A	I
Veronica serpyllifolia				1									I
Xanthoria parietina						A				2			I
Alisma plantago-aquatica	A												
Brachypodium sylvaticum					A								
Bryum pseudotriquetrum												A	
Carex otrubae		A											
Cladonia sp.			A										
Eleocharis palustris	A												
Elytrigia atherica					A								
Epilobium montanum											A		
Geranium rotundifolium									A				
Leontodon saxatilis					A					A			
Lepidium latifolium					A								
Persicaria maculosa	A												
Plantago coronopus	A												
Polygonum aviculare	A												
Salix caprea										A			
Scrophularia auriculata		A									A		
Typha latifolia	A												
Total species	19	28	20	25	22	16	14	10	20	14	18	16	
Cover (%)	30	50	60	90	95	85	90	95	10	30	80	75	
Average sward height (cm)	25	50	10	10	20	20	30	30	15	40	50	20	

3.6 Grassland

Photograph 6. Mosaic of sparse grassland and ruderals on fine black substratum, showing abundant Narrow-leaved Bird's-foot Trefoil (yellow flowers)

Photograph 7. Older area of fine black substratum, still sparsely vegetated but becoming colonised by scrub

3.6.1 The longer grass areas throughout the study area were typically associated with scrub margins and appeared to have been subject to less disturbance than the more open parts. They tended to have a higher proportion of grasses and young scrubby bushes and a lower proportion of bare ground and small ruderal plants than most other areas. The quadrats recorded from longer grassland areas covered a broad range of substrata, grass heights and scrub density and were more grouped together for convenience rather than trying to describe a particular NVC community. They most closely indicated a general succession towards MG1 grassland, but most quadrats are not a close fit with this community.

Table 3.8: Quadrat data for areas of longer grassland

	Domin score											
Quadrat	9	13	20	22	26	32	36	39	40	43	48	Freq.
Agrostis stolonifera		2	3	4	8	5	2	4	9	1	9	V
Hypericum perforatum	2	4		1	1	1	2	2	1	2	2	V
Holcus lanatus	8	2	2	4	8	8		2	4		9	V
Medicago lupulina		2	3		8	3		8	2	4	4	IV
Conyza bilbaoana		2	2			1	3	4	2	1	A	IV
Rubus fruticosus	1	2	A	4	A		4	3		2		III
Daucus carota	3	2		2		1		1		2		III
Potentilla reptans	3	7		5	4			4		8		III
Pulicaria dysenterica		8		1	1			2	4		1	III
Prunella vulgaris			3	2	1		2	2				III
Blackstonia perfoliata		1	2		1	A			1			II
Centaurium erythraea		3	3		1		1					II
Cirsium arvense		A	2	2	A	3					2	II
Salix cinerea					4	1		2	1			II
Cerastium fontanum		2	2	2			2					II
Dipsacus fullonum		2		1	A			2		5		II
Eupatorium cannabinum	1	A		A	4	2		A	1			II
Festuca rubra		2		2			3	2				II
Trifolium repens		A				2	4	2	4			II
Barbula cf convoluta			2	1			4					II
Crepis capillaris						2				1	2	II
Picris echioides	A	3				1		1				II
Dactylis glomerata	2			2			2					II
Epilobium obscurum							1	3		3	A	II
Lotus corniculatus	6			7	1							II
Oenothera sp.			3		1		2					II
Pastinaca sativa	A	2		2				A		1		II
Ranunculus repens	2							3		2		II
Senecio jacobaea	A		2		A	A			A	2	3	II
Tussilago farfara			3		A	2			2			II
Buddleja davidii	2	A		A	A	1	A	A	A		A	I
Epilobium parviflorum						2		2			A	I
Achillea millefolium	2			3								I
Arrhenatherum elatius	8			4								I
Calliergonella cuspidata		4		2								I
Centaurea nigra				5			2					I
Dactylorhiza praetermissa					1				1			I
Epilobium hirsutum						1		A	1			I
Hirschfeldia incana	A						1	4	A			I
Homalothecium lutescens			4	2								I
Lathyrus sylvestris							4		4			I
Leucanthemum vulgare								2		7		I
Medicago arabica						8	4					I
Odontites vernus		A	2				3					I
Oenothera biennis		2						4				I
Plantago lanceolata	3			2								I
Potentilla anserina		3								2		I
Rumex crispus		A			1					1		I
Verbena officinalis				1			1					I
Vicia sativa		1			1							I
Peltigera sp.			2									I
Arenaria serpyllifolia			3									I
Betula cf pubescens									2			I
Myosotis discolor										2		I
Rosa canina		A		1								I
Trifolium dubium										2		I
	Domin score											
Quadrat	9	13	20	22	26	32	36	39	40	43	48	Freq.
Tripleurospermum inodorum			3						A			I

Agrostis capillaris						2						I
Anthoxanthum odoratum							2					I
Brachypodium sylvaticum					1							I
Brachythecium rutabulum										2		I
Catapodium rigidum			3									I
Cirsium vulgare				A	A			1	A			I
Cornus sanguinea						1		A				I
Crataegus monogyna	1	A		A								I
Festuca arundinacea				2								I
Foeniculum vulgare	2			A								I
Geranium dissectum	1											I
Glechoma hederacea		4										I
Hypochaeris radicata	1											I
Lepidium latifolium		1			A							I
Linum catharticum							1					I
Lotus glaber							1					I
Melilotus altissimus	7			A								I
Myosotis arvensis			3									I
Orobanche minor	1											I
Plantago major			1									I
Poa trivialis				3								I
Rubus caesius				5								I
Salix caprea					1							I
Scrophularia auriculata				A	A	A			1			I
Sonchus asper								1				I
Sonchus oleraceus								1				I
Symphytum x uplandicum				1								I
Taraxacum sp.											1	I
Urtica dioica				A				1				I
Verbascum thapsus		A							1			I
Betula pendula					A							
Chamerion angustifolium				A		A						
Epilobium ciliatum	A											
Artemisia vulgaris	A			A								
Carex hirta	A											
Carex otrubae								A				
Cerastium semidecandrum			A									
Cotoneaster integrifolius										A		
Echium vulgare							A					
Elytrigia atherica					A							
Epilobium montanum						A						
Galium aparine	A											
Lactuca virosa									A			
Linaria repens				A								
Malva sylvestris										A		
Melilotus alba				A			A					
Oenothera glazioviana								A				
Origanum vulgare										A		
Papaver rhoeas	A											
Phragmites australis					A			A				
Sagina procumbens			A									
Senecio inaequidens						A						
Sison amomum				A								
Total species	19	22	21	28	18	19	22	25	17	19	9	
Cover (%)	100	90	70	95	95	95	95	95	90	95	100	
Average sward height (cm)	100	50	20	80	50	40	40	110	40	100	40	

Photograph 8. Taller grassland and ruderal habitat with scattered scrub

3.7 Wetland vegetation

3.7.1 The study area supported several small stands of reedbed and wetland vegetation, mainly dominated by Common Reed, and locally by Bulrush. The larger reed-beds tended to be very species-poor (e.g. Quadrat 49, which has just one species), while the smaller ones formed on hard-standing with impeded drainage, and the reedbed margins were botanically richer. In terms of the NVC, the reed-beds are probably best classified as S4 *Phragmites australis* reedbed.

3.7.2 Few notable species were present within the reed-beds, but the locally uncommon Pink Water-speedwell was present at the margins of the western reedbed (east of Quadrat 49) and a small quantity of Spiked Water-milfoil was present on flooded hard-standing near the reedbed margin at Quadrat 10.

Photograph 9. Reedbed habitat in west of study area

Table 3.9: Quadrat data for areas of reedbed and wetland habitat

	Domin score							
Quadrat	**10**	**11**	**12**	**21**	**47**	**49**	**51**	**Frequency**
Phragmites australis	9	2	8	1	10	10	10	V
Agrostis stolonifera	2	2	4					III
Epilobium hirsutum	4	4	3	4		A	A	III
Holcus lanatus		4	1	1			1	III
Juncus articulatus	8	2	2	4				III
Juncus inflexus	4	5	8	9				III
Pulicaria dysenterica	2	4	2	4				III
Salix cinerea	A	1	1	2			1	III
Scrophularia auriculata		2		1	1			III
Typha latifolia	2	8	A	4				III
Eleocharis palustris	2	5	A					II
Eupatorium cannabinum			A	2	A		1	II
Lemna minor		2		2				II
Lycopus europaeus					1	A	1	II
Marchantia polymorpha			2				2	II
Rorippa nasturtium-aquaticum		7	1					II
Solanum dulcamara	2		A	A	1			II
Bolboschoenus maritimus	3							I
Carex otrubae	A		2					I
Cratoneuron filicinum				2				I
Pellia sp.			A	2				I
Plantago major		1						I
Ranunculus repens				2				I
Ranunculus sceleratus	A	1						I
Sagina procumbens			2					I
Salix alba		A	1					I
Tripleurospermum inodorum		1						I
Epilobium parviflorum		A						
Myriophyllum spicatum	A							
Populus trichocarpa				A				
Rumex crispus			A					
Trifolium repens				A				
Tussilago farfara				A				
Total species	10	16	13	14	4	1	6	
Cover (%)	75	100	80	100	100	100	100	
Average sward height (cm)	100	120	120	140	220	210	240	

3.7.3 Much of the study area appeared to be poorly drained and a number of other small wetland patches were present that were not part of the largest reed-beds. In addition there were several ditches crossing the site that supported localised concentrations of wetland plants, often also dominated by Common Reed. Associates also included Bulrush, Reed Sweet-grass and Sea Club-rush. The ditch with the greatest botanical value was the central one south of the Atlantic Shed, which had recently been reprofiled prior to the point where it dischargeed to the River Usk. This recently disturbed wetland habitat supported a large plant of Marsh Mallow, with associates including Celery-leaved Buttercup, False Fox-sedge, Water Plantain, Water Bent, Jointed Rush and Clustered Dock. However, Japanese Knotweed was also present through much of the reprofiled material.

Photograph 10. Marsh Mallow in recently reprofiled ditch

Table 3.10: Additional species associated with wetland habitat not recorded in quadrats

Scientific name	Scientific name
Alisma plantago-aquatica	*Lactuca virosa*
Alnus glutinosa	*Mentha aquatica*
Althaea officinalis	*Oenanthe crocata*
Bellis perennis	*Picris echioides*
Buddleja davidii	*Polypogon viridis*
Calystegia sepium	*Rosa canina*
Carex hirta	*Rumex conglomeratus*
Carex remota	*Salix fragilis*
Cirsium arvense	*Salix viminalis*
Cirsium vulgare	*Senecio erucifolius*
Dipsacus fullonum	*Senecio jacobaea*
Fallopia japonica	*Stachys sylvatica*
Glyceria maxima	*Urtica dioica*
Hirschfeldia incana	*Veronica catenata*
Juncus conglomeratus	*Vicia cracca*
Juncus effusus	
Juncus gerardii	

3.8 Scrub

3.8.1 The scrub within the study area was not investigated in detail. Most of it comprised Butterfly Bush on the drier areas, and Grey Willow, Crack Willow, White Willow and Silver Birch on the damper parts. There were also planted windbreaks of Monterey Cypress and Western Balsam Poplar around parts of the western margin. The following species list for the scrub is limited to observations from the margins to document some of the main species, with no attempt to quantify them or describe them using the NVC. Most of the species recorded were common and widespread, although the observation of a Grape Vine in scrub near the Atlantic Shed is of local interest (as a curiosity rather than for its nature conservation value).

Table 3.11: Species recorded in association with scrub habitat

Scientific name	Scientific name
Acer pseudoplatanus	*Impatiens glandulifera*
Alchemilla mollis	*Kindbergia praelonga*
Alnus glutinosa	*Lathyrus sylvestris*
Apium nodiflorum	*Lepidium latifolium*
Arabidopsis thaliana	*Leycesteria formosa*
Arctium minus	*Linaria vulgaris*
Arenaria serpyllifolia	*Lonicera periclymenum*
Arrhenatherum elatius	*Malus pumila*
Artemisia vulgaris	*Medicago lupulina*
Avena sativa	*Melilotus altissimus*
Bellis perennis	*Myosotis arvensis*
Betula pendula	*Oenothera biennis*
Brachypodium sylvaticum	*Oenothera glazioviana*
Brassica nigra	*Pastinaca sativa*
Buddleja davidii	*Persicaria amphibia*
Buxus sempervirens	*Phragmites australis*
Calliergonella cuspidata	*Phyllitis scolopendrium*
Calystegia sepium	*Picris echioides*
Carex flacca	*Pilosella officinarum*
Carex hirta	*Plantago lanceolata*
Carex otrubae	*Poa trivialis*
Carex pendula	*Populus alba*
Centaurium erythraea	*Populus trichocarpa*
Chamerion angustifolium	*Potentilla reptans*
Cirsium arvense	*Prunella vulgaris*
Cirsium vulgare	*Prunus spinosa*
Clematis vitalba	*Pteridium aquilinum*
Clinopodium vulgare	*Pulicaria dysenterica*
Convolvulus arvensis	*Ranunculus repens*
Cornus sanguinea	*Reseda alba*
Cotoneaster horizontalis	*Reseda luteola*
Cotoneaster integrifolius	*Rosa canina*
Crataegus monogyna	*Rubus fruticosus*
Crocosmia crocosmiiflora	*Salix alba*
Cupressus macrocarpa	*Salix caprea*
Cytisus scoparius	*Salix cinerea*
Dactylis glomerata	*Salix fragilis*
Daucus carota	*Salix viminalis*
Dipsacus fullonum	*Sambucus nigra*
Dryopteris filix-mas	*Sedum album*
Elytrigia repens	*Senecio erucifolius*
Epilobium parviflorum	*Senecio inaequidens*
Equisetum arvense	*Senecio jacobaea*
Equisetum telmateia	*Senecio viscosus*
Eupatorium cannabinum	*Senecio vulgaris*
Fallopia japonica	*Sison amomum*
Festuca arundinacea	*Solanum dulcamara*
Festuca rubra	*Sonchus asper*
Foeniculum vulgare	*Sonchus oleraceus*
Fragaria vesca	*Stachys sylvatica*
Fuchsia magellanica	*Symphoricarpos albus*
Galega officinalis	*Tanacetum vulgare*
Geranium lucidum	*Teucrium scorodonia*
Geranium robertianum	*Tragopogon pratensis*
Geum urbanum	*Tussilago farfara*
Glechoma hederacea	*Urtica dioica*
Hedera helix	*Verbascum thapsus*
Heracleum sphondylium	*Verbena officinalis*
Hippophae rhamnoides	*Veronica serpyllifolia*

Scientific name	Scientific name
Hirschfeldia incana	*Vicia cracca*
Hypericum androsaemum	*Vitis vinifera*
Hypericum perforatum	

Photograph 11. Grape Vine growing through willow scrub near Atlantic Shed

3.9 Saltmarsh

3.9.1 The saltmarsh habitat on the banks of the River Usk was located outside the study area and was not subject to a detailed survey. It was dominated by extensive, species-poor stands of Common Reed (NVC S4d *Phragmites australis* reedbed, *Atriplex prostrata* sub-community), and smaller but equally low-diversity stands of Sea Couch (NVC SM24 *Elytrigia atherica* saltmarsh vegetation). The greatest botanical diversity was generally observed at the seaward margin, particularly where the saltmarsh was punctuated by numerous small gullies. These marginal parts supported a moderate diversity of common saltmarsh plants including Sea Aster, Sea Milkwort, Annual Seablite, Sea Arrow-grass, Common Cord-grass and Sea Plantain (NVC SM11 *Aster-tripolium* community, and SM13b *Puccinellia maritima* saltmarsh, *Glaux maritima* sub-community). Dittander, Sea Beet, Red Valerian and Blue Fleabane were amongst the plants observed at the upper shore-line.

Table 3.12: Species observed in saltmarsh habitat adjacent to the River Usk

Scientific name	Scientific name
Agrostis stolonifera	*Glaux maritima*
Aster tripolium	*Lepidium draba*
Atriplex prostrata	*Lepidium latifolium*
Beta vulgaris	*Persicaria amphibia*
Calystegia sepium	*Phragmites australis*
Centranthus ruber	*Plantago maritima*
Cochlearia anglica	*Puccinellia maritima*
Convolvulus arvensis	*Solanum dulcamara*
Elytrigia atherica	*Spartina anglica*
Erigeron acer	*Suaeda maritima*
Fallopia japonica	*Triglochin maritimum*
Festuca rubra	*Puccinellia maritima*

Photograph 12. Saltmarsh vegetation beside the river Usk.

3.9.2 Incidental fauna observations at the site included Gatekeeper, Peacock, Comma, Meadow Brown, Ringlet and Small White Butterflies. The only mammals noted were Rabbit, and signs of Fox. Birds included Blackbird, Black-headed Gull, Dunnock, Goldfinch, Jackdaw, Herring Gull, House Sparrow, Kestrel, Lesser Black-backed Gull, Linnet, Magpie, Reed Warbler, Sand Martin, Swallow and Wren. Dunlin, Oystercatcher and Redshank were noted on the mudflats adjacent to the saltmarsh.

4 Evaluation

4.1 Evaluation method

4.1.1 The evaluation method followed the same approach as used for the 2015 survey (Appendix 10.20 to the March 2016 ES), assessing the vegetation to place it within a geographical frame of reference. The evaluation method was undertaken as described below.

4.1.2 The nature conservation value of the various plant communities was assessed using a geographical frame of reference, based on the 'Guidelines for Ecological Impact Assessment' (CIEEM, 2006). This is summarised in Table 4.1.

Table 4.1: Evaluation of Habitats

Level of Value	Habitats
International	Areas designated as Special Areas of Conservation (SAC), Special Protection Areas (SPA) or Ramsar sites in response to European Directives and International Conventions.
National	Areas designated as Sites of Special Scientific Interest (SSSI), National Nature Reserve (NNR), or equivalent for key areas, habitats and plant communities.
Regional	Areas of habitat of suitable size and quality to be considered for notification as SSSI (based on the Guidelines for the Selection of Biological SSSIs). Extensive areas of UK Biodiversity Action Plan (UK BAP) Priority Habitats. Extensive areas designated for Species and Natural Environment & Rural Communities Act 2006: Section 42 Habitats of Principle Importance for the Conservation of Biological Diversity (S42 Priority Habitat).
County	Areas of UK BAP Priority habitats and extensive areas of Local Biodiversity Action Plan (LBAP) habitats; areas of Ancient Woodland. Local Wildlife Sites Guidance.
District/Local	Areas of LBAP habitat. Important hedgerows classified under The Hedgerow Regulations 1997. Any non-designated habitat assemblage of moderate biodiversity value.

4.2 Overview of habitats

4.2.1 The majority of the study area comprised previously disturbed and post-industrial land that had developed a mosaic of scrub, sparse grassland and ruderal vegetation, with localised wetland habitats. The areas of sparsely vegetated open ground would qualify as the UK BAP priority habitat 'open mosaic habitat on previously developed land'. Much of this area supported a high diversity of plant species, including a good number of locally notable plants. The most significant of these is Narrow-leaved Bird's-foot trefoil, which is present in great abundance in some of the damper areas. The railway ballast in various parts of the site supported a relatively high proportion of uncommon plants, including Dwarf Spurge, Round-leaved Crane's-bill, Narrow-leaved Everlasting Pea, Viper's Bugloss and Narrow-leaved Bird's-foot Trefoil. Other areas of tipped rubble supported Great Lettuce, Rough Hawk's-beard and Nettle-leaved Goosefoot, but only in low numbers. Overall, this diverse brownfield land is considered important in a county context.

4.2.2 The reedbed and wetland habitats had a relatively low botanical diversity, but Pink Water-speedwell, Spiked Water Milfoil and Marsh Mallow were all recorded in damp wetland habitat (possibly seasonally inundated), but in very small quantity. The wetlands and ditches probably also had nature conservation value for birds and invertebrates.

4.2.3 The scrub habitats generally only had a species-poor ground flora that was mostly limited to common plant species, so they were excluded from the detailed inspection. However, they did have a few species of local value, including Narrow-leaved Everlasting Pea at some of the margins.

4.2.4 The River Usk saltmarsh was unmanaged and largely dominated by low diversity stands of Common Reed and Sea Couch. However, any extensive area of saltmarsh vegetation is considered important as a UK BAP priority habitat. In terms of its nature conservation value the saltmarsh is important in at least a county context. The more diverse lower part of the saltmarsh located at the edge of the River Usk SAC and River Usk (Lower Usk) SSSI and as such this part would be considered important in at least a national context.

4.3 Occurrence of notable species

4.3.1 The notable species recorded in the Newport Docks study area, as based on the list of Rare, Scarce and Declining species in the Guidelines for the Selection of Wildlife Sites in South Wales, are shown in Table 4.2. Sites supporting one or more of the guidelines' Primary Species or five or more Contributory Species can be considered significant in a county context. This site clearly exceeds this criterion.

Table 4.2: Notable species recorded at Newport Docks

Primary species	Contributory species
Chenopodium murale	*Althaea officinalis*
Crepis biennis	*Blackstonia perfoliata*
Euphorbia exigua	*Echium vulgare*
Lactuca virosa	*Geranium rotundifolium*
Lepidium latifolium	*Lathyrus sylvestris*
Lotus glaber	*Medicago arabica*
	Myriophyllum spicatum
	Orobanche minor
	Sison amomum
	Spergularia marina
	Veronica catenata

4.4 Summary evaluation

4.4.1 Taking account of the presence of Priority Habitat and notable species, the overall evaluation of the diverse brownfield land is that it is considered important in a county context. However, the value was widely variable within the study area due to the patchy nature of the vegetation. For example, the scrub is generally only of value in a local context, and some areas of recently cleared land are not at all significant as they have not yet been colonised by many plants. It is important to note that the habitats have developed through a combination of the varied substrata and intermittent disturbance. The infrequent but irregular disturbance has maintained a mix of transitional and successional stages within the site. In the absence of such disturbance much of the value would eventually decline as the more interesting habitats are taken over by low-diversity scrub.

4.5 Invasive Species

4.5.1 Several species listed as non-native invasive plants under Schedule 9 of the Wildlife and Countryside Act (1981) were encountered during the survey. These are summarised in Table 4.3.

Table 4.3: Schedule 9 non-native invasive plant species

Schedule 9 species	Summary
Japanese Knotweed	Several patches dispersed through the site, mainly in scrub margins and associated with tipped material. Some Knotweed has apparently been dug up and placed in piles near the northern wind turbine. Others have been treated with herbicide.
Himalayan/ Indian Balsam	Occasional patches near scrub margin at western boundary.
Montbretia	Small numbers of plants in several places, mainly associated with bund at eastern margin.
Entire-leaved Cotoneaster	Rare, in scrub and grassland in south of site (near Q32), and possibly planted near road-side shelterbelt at western margin.
Wall Cotoneaster	Rare, on ditch margin south-east of Atlantic Shed.

Annex A. Plant species list

The following list summarises the plant species recorded during the survey of land at Newport Docks during July 2017, giving the scientific and common names for each one.

Vascular plants

Acer pseudoplatanus	Sycamore
Achillea millefolium	Yarrow
Agrostis capillaris	Common Bent
Agrostis stolonifera	Creeping Bent
Aira caryophyllea	Silver Hair-grass
Alchemilla mollis	Lady's Mantle
Alisma plantago-aquatica	Common Water-plantain
Alnus glutinosa	Alder
Althaea officinalis	Marsh Mallow
Anagallis arvensis	Scarlet Pimpernel
Anisantha madritensis	Compact Brome
Anthoxanthum odoratum	Sweet Vernal-grass
Apium nodiflorum	Fool’s Water-cress
Arabidopsis thaliana	Thale Cress
Arctium minus	Lesser Burdock
Arenaria serpyllifolia	Thyme-leaved Sandwort
Arrhenatherum elatius	False Oat-grass
Artemisia vulgaris	Mugwort
Aster tripolium	Sea Aster
Athyrium filix-femina	Lady Fern
Atriplex prostrata	Spear-leaved Orache
Avena sativa	Wild Oat
Bellis perennis	Daisy
Beta vulgaris	Sea Beet
Betula cf pubescens	Downy Birch
Betula pendula	Silver Birch
Betula pubescens	Downy Birch
Blackstonia perfoliata	Yellow-wort
Bolboschoenus maritimus	Sea Club-rush
Brachypodium sylvaticum	False Brome
Brassica nigra	Black Mustard
Buddleja davidii	Butterfly Bush
Buxus sempervirens	Box
Calendula officinalis	Pot Marigold
Calystegia sepium	Hedge Bindweed
Carex arenaria	Sand Sedge
Carex flacca	Glaucous Sedge
Carex hirta	Hairy Sedge
Carex otrubae	False Fox-sedge
Carex pendula	Pendulous Sedge
Carex remota	Remote Sedge
Catapodium rigidum	Fern-grass
Centaurea cyanus	Cornflower
Centaurea nigra	Common Knapweed
Centaurium erythraea	Common Centaury
Centranthus ruber	Red Valerian
Cerastium fontanum	Common Mouse-ear

Cerastium semidecandrum	Little Mouse-ear
Chamerion angustifolium	Rose-bay Willowherb
Chenopodium album	Fat Hen
Chenopodium murale	Nettle-leaved Goosefoot
Chenopodium rubrum	Red Goosefoot
Cirsium arvense	Creeping Thistle
Cirsium vulgare	Spear Thistle
Clematis vitalba	Traveller's Joy
Clinopodium vulgare	Wild Basil
Cochlearia anglica	English Scurvy-grass
Conium maculatum	Hemlock
Convolvulus arvensis	Field Bindweed
Conyza bilbaoana	Bilbao Fleabane
Conyza sp.	Fleabane (indeterminate)
Coreopsis tinctoria	Plains Coreopsis
Cornus sanguinea	Dogwood
Coronopus didymus	Lesser Swine-cress
Cortaderia selloana	Pampas Grass
Corylus avellana	Hazel
Cotoneaster horizontalis	Wall Cotoneaster
Cotoneaster integrifolius	Entire-leaved Cotoneaster
Crataegus monogyna	Hawthorn
Crepis biennis	Rough Hawk's-beard
Crepis capillaris	Smooth Hawk's-beard
Crocosmia crocosmiiflora	Montbretia
Cupressus macrocarpa	Monterey cypress
Cytisus scoparius	Broom
Dactylis glomerata	Cock's-foot
Dactylorhiza praetermissa	Southern Marsh-orchid
Daucus carota	Wild Carrot
Dipsacus fullonum	Teasel
Dryopteris filix-mas	Male Fern
Echium vulgare	Viper's Bugloss
Eleocharis palustris	Common Spike-rush
Elytrigia atherica	Sea Couch
Elytrigia repens	Couch
Epilobium ciliatum	American Willowherb
Epilobium hirsutum	Greater Willowherb
Epilobium montanum	Broad-leaved Willowherb
Epilobium obscurum	Short-fruited Willowherb
Epilobium parviflorum	Hoary Willowherb
Equisetum arvense	Field Horsetail
Equisetum telmateia	Great Horsetail
Erigeron acer	Blue Fleabane
Eschscholzia californica	California Poppy
Eupatorium cannabinum	Hemp Agrimony
Euphorbia exigua	Dwarf Spurge
Euphorbia helioscopia	Sun Spurge
Euphorbia peplus	Petty Spurge
Fallopia japonica	Japanese Knotweed
Festuca arundinacea	Tall Fescue
Festuca rubra	Red Fescue
Foeniculum vulgare	Fennel
Fragaria vesca	Wild Strawberry

Fraxinus excelsior	Ash
Fuchsia magellanica	Fuchsia
Galega officinalis	Goat's-rue
Galium aparine	Cleavers
Geranium dissectum	Cut-leaved Crane’s-bill
Geranium lucidum	Shining Crane's-bill
Geranium robertianum	Herb Robert
Geranium rotundifolium	Round-leaved Crane's-bill
Geum urbanum	Wood Avens
Glaux maritima	Sea Milkwort
Glechoma hederacea	Ground Ivy
Glyceria declinata	Small Sweet-grass
Glyceria maxima	Reed Sweet-grass
Hedera helix	Ivy
Heracleum sphondylium	Hogweed
Hippophae rhamnoides	Sea Buckthorn
Hirschfeldia incana	Hoary Mustard
Holcus lanatus	Yorkshire Fog
Hypericum androsaemum	Tutsan
Hypericum perforatum	Perforate St.John’s-wort
Hypochaeris radicata	Common Cat’s-ear
Impatiens glandulifera	Indian / Himalayan Balsam
Juncus articulatus	Jointed Rush
Juncus bufonius	Toad Rush
Juncus conglomeratus	Compact Rush
Juncus effusus	Soft Rush
Juncus gerardii	Salt-marsh Rush
Juncus inflexus	Hard Rush
Lactuca serriola	Prickly Lettuce
Lactuca virosa	Great Lettuce
Lathyrus pratensis	Meadow Vetchling
Lathyrus sylvestris	Narrow-leaved Everlasting-pea
Lemna minor	Common Duckweed
Leontodon hispidus	Rough Hawkbit
Leontodon saxatilis	Lesser Hawkbit
Lepidium draba	Hoary Cress
Lepidium latifolium	Dittander
Leucanthemum vulgare	Ox-eye Daisy
Leycesteria formosa	Himalayan Honeysuckle
Linaria repens	Pale Toadflax
Linaria vulgaris	Common Toadflax
Linum catharticum	Fairy Flax
Linum cf bienne	Pale Flax
Lolium perenne	Perennial Rye-grass
Lonicera periclymenum	Honeysuckle
Lotus corniculatus	Common Bird’s-foot Trefoil
Lotus glaber	Narrow-leaved Bird’s-foot Trefoil
Lycopus europaeus	Gypsywort
Lythrum salicaria	Purple Loosestrife
Malus pumila	Apple
Malva sylvestris	Common Mallow
Medicago arabica	Spotted Medick
Medicago lupulina	Black Medick
Melilotus alba	White Melilot

Melilotus altissimus	Tall Melilot
Mentha aquatica	Water Mint
Myosotis arvensis	Field Forget-me-not
Myosotis discolor	Changing Forget-me-not
Myriophyllum spicatum	Spiked Water Milfoil
Odontites vernus	Red Bartsia
Oenanthe crocata	Hemlock Water-dropwort
Oenothera biennis	Common Evening-primrose
Oenothera glazioviana	Large-flowered Evening-primrose
Oenothera sp.	Evening-primrose (indeterminate)
Ononis repens	Restharrow
Origanum vulgare	Marjoram
Orobanche minor	Common Broomrape
Papaver rhoeas	Common Poppy
Pastinaca sativa	Wild Parsnip
Persicaria amphibia	Amphibious Bistort
Persicaria maculosa	Redshank
Phalaris arundinacea	Reed Canary-grass
Phragmites australis	Common Reed
Phyllitis scolopendrium	Hart's-tongue Fern
Picris echioides	Bristly Ox-tongue
Pilosella officinarum	Mouse-ear Hawkweed
Plantago coronopus	Buck's-horn Plantain
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Plantago maritima	Sea Plantain
Poa annua	Annual Meadow-grass
Poa pratensis	Smooth Meadow-grass
Poa trivialis	Rough Meadow-grass
Polygonum aviculare	Knotgrass
Polypogon viridis	Water-bent
Populus alba	White Poplar
Populus trichocarpa	Western Balsam-poplar
Populus x canadensis	Hybrid Black-poplar
Potentilla anserina	Silverweed
Potentilla reptans	Creeping Cinquefoil
Prunella vulgaris	Selfheal
Prunus spinosa	Blackthorn
Pteridium aquilinum	Bracken
Puccinellia maritima	Common Saltmarsh-grass
Pulicaria dysenterica	Fleabane
Quercus robur	Pedunculate Oak
Ranunculus acris	Meadow Buttercup
Ranunculus flammula	Lesser Spearwort
Ranunculus repens	Creeping Buttercup
Ranunculus sceleratus	Celery-leaved Buttercup
Reseda alba	White Mignonette
Reseda luteola	Weld
Rorippa nasturtium-aquaticum	Water-cress
Rorippa palustris	Marsh Yellow-cress
Rosa canina	Dog Rose
Rubus caesius	Dewberry
Rubus fruticosus	Bramble
Rumex conglomeratus	Clustered Dock

Rumex crispus	Curled Dock
Rumex obtusifolius	Broad-leaved Dock
Sagina procumbens	Procumbent Pearlwort
Salix alba	White Willow
Salix caprea	Goat Willow
Salix cinerea	Grey Willow
Salix fragilis	Crack Willow
Salix viminalis	Osier
Sambucus nigra	Elder
Saxifraga tridactylites	Rue-leaved Saxifrage
Scrophularia auriculata	Water Figwort
Sedum acre	Biting Stonecrop
Sedum album	White Stonecrop
Senecio erucifolius	Hoary Ragwort
Senecio inaequidens	Narrow-leaved Ragwort
Senecio jacobaea	Ragwort
Senecio squalidus	Oxford Ragwort
Senecio viscosus	Sticky Groundsel
Senecio vulgaris	Groundsel
Silene latifolia	White Campion
Sison amomum	Stone Parsley
Solanum dulcamara	Bittersweet
Solidago gigantea	Early Goldenrod
Sonchus arvensis	Perennial Sow-thistle
Sonchus asper	Prickly Sow-thistle
Sonchus oleraceus	Soft Sow-thistle
Spartina anglica	Common Cord-grass
Spergularia marina	Lesser Sea-spurrey
Stachys sylvatica	Hedge Woundwort
Suaeda maritima	Annual Sea-blite
Symphoricarpos albus	Snowberry
Symphytum x uplandicum	Russian Comfrey
Tanacetum vulgare	Tansy
Taraxacum sp.	Dandelion
Taxus baccata	Yew
Teucrium scorodonia	Wood Sage
Tragopogon pratensis	Goat’s-beard
Trifolium arvense	Hare's-foot Clover
Trifolium campestre	Hop Trefoil
Trifolium dubium	Lesser Trefoil
Trifolium pratense	Red Clover
Trifolium repens	White Clover
Triglochin maritimum	Sea Arrow-grass
Tripleurospermum inodorum	Scentless Mayweed
Tussilago farfara	Colt’s-foot
Typha latifolia	Bulrush
Urtica dioica	Nettle
Verbascum thapsus	Great Mullein
Verbena officinalis	Vervain
Veronica arvensis	Wall Speedwell
Veronica beccabunga	Brooklime
Veronica catenata	Pink Water-speedwell
Veronica persica	Common Field-speedwell
Veronica serpyllifolia	Thyme-leaved Speedwell

Vicia cracca	Tufted Vetch
Vicia sativa	Common Vetch
Vitis vinifera	Grape Vine
Vulpia bromoides	Squirreltail Fescue
Zea mays	Maize

Lower plants (mosses, liverworts, stoneworts and lichens) (Prominent species only)

Barbula cf convoluta	Lesser Bird's-claw beard-moss
Brachythecium rutabulum	Rough-stalked Feather-moss
Bryum argenteum	Silver Moss
Bryum pseudotriquetrum	Marsh Bryum
Calliergonella cuspidata	Pointed Spear-moss
Campylopus introflexus	Heath Star-moss
Chara vulgaris	Stonewort
Cladonia sp.	Lichen
Cratoneuron filicinum	Fern-leaved Hook-moss
Didymodon sp.	Beard-moss
Homalothecium lutescens	Yellow Feather-moss
Kindbergia praelonga	Common Feather-moss
Marchantia polymorpha	Common Liverwort
Pellia sp.	Pellia
Peltigera sp.	Dog-lichen
Physcia tenella	Fringed rosette lichen
Syntrichia ruralis	Great Hairy Screw-moss
Xanthoria parietina	Common orange lichen

Figure 1 National Vegetation Classification Survey and Locations of Plant Species of Nature Conservation

Patchy strip of scrub, grassland and tall herbs, including treated Japanese Knotweed.

Saltmarsh, dominated by Common Reed

Railway and stone chippings with diverse ruderal flora

Poorly drained hard-standing with patchy wetland vegetation, ruderals and willow scrub

Mown grassland with several old planting beds

Railway and stone chippings with diverse ruderal flora including Dwarf Spurge and Round-leaved Crane's-bill

Hard-standing and chippings with sparse ruderals and scrub

Mound with tall ruderals, dominated by White Melilot

Poorly drained area with sparse grassland and ruderals, including Narrow-leaved Bird's-foot Trefoil

Old rail track with Vipers Bugloss and Narrow-leaved Everlasting Pea

Poorly drained disturbed ground, with sparse patchy grassland, wetland plants and ruderals, including abundant Narrow-leaved Bird's-foot Trefoil

Not accessed. Only sparse ruderal vegetation evident from margin.

Spare grassland and ruderals

Himalayan Balsam

Saltmarsh, dominated by Common Reed and Sea Couch

Recently tipped rubble, with Great Lettuce

Recently disturbed ground, with sparse ruderals

Recently disturbed ditch, with ruderal plants. Marsh Mallow and Japanese Knotweed present.

Sparse grassland with abundant birch scrub

Recently disturbed ground, with sparse ruderals

Saltmarsh, dominated by Common Reed and Sea Couch

Sparsely-vegetated hard-standing, with Great Lettuce

Poorly drained, sparsely-vegetated hard-standing

Former dock with dense Common Reed and saltmarsh vegetation

Legend

- Land Parcels
- Quadrat
- Planted conifers
- Ditch
- Fence
- Scattered scrub
- Mown roadside grassland
- Tall ruderal herbs
- Marginal wetland plants
- Standing water
- Reedbed/ wetland
- Dense scrub
- Road and hard-standing
- Unimproved grassland and ruderal mosaic
- Sparse ruderals
- Bare ground
- Building
- Ephemeral/ short perennial vegetation
- Rubble mound (unvegetated)

Llywodraeth Cymru
Welsh Government

Appendix ESS5 2.4

National Vegetation Classification Survey and Locations of Plant Species of Nature Conservation

Figure: 1	Revision: 1
Date: August 2017	Status: AT ISSUE
Drawn: CR	Checked: JW

Scale: A3 @ 1:4,480

0 100 200 m

N

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