Welsh Government

M4 Corridor around Newport

Environmental Statement Volume 3: Appendix 10.20

NVC Survey 2015 Report

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

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Summary

S.1 RPS has undertaken a survey of grassland, woodland and saltmarsh vegetation at selected sites along the route of the proposed M4 Corridor around Newport (M4CaN) between Castleton and Magor to inform the ecological baseline for the Environmental Impact Assessment (EIA) of the Scheme. The EIA is reported in the M4CaN Environmental Statement (ES) of which this document is an appendix to the chapter on Ecology and Nature Conservation. This survey supplements a similar study of other sites along the route which was undertaken during May, June and July 2014. The vegetation survey employed a combination of walk-over and National Vegetation Classification (NVC) survey methods.

Grassland Habitats

S.2 The majority of the grassland habitat surveyed is agricultural land managed as permanent pasture. The majority of the grassland vegetation was classified as MG6 and MG7 grassland, supporting a relatively limited range of common plant species. A few of the plants in these pastures are locally significant, including Meadow Brome and Meadow Barley which occur in the Gwent Levels grassland sites at Whitecross Farm and Tatton Farm. The damp field grips at both of these sites graduated to MG10 rush pasture, which locally support Tubular Water-dropwort

S.3 The ungrazed road-verge habitat adjacent to the A48(M) and M4 at Pound Hill and adjacent to Pwll Diwaelod, supports moderately diverse MG1 grassland. These areas are dominated by tall grasses, but they include a good range of herb species. It is possible that some of the diversity has been boosted by the use of wildflower seed mix. Notable species recorded at Pound Hill include Stone Parsley, Grass Vetchling and Yellow-wort. Grass Vetchling was also noted in the verge grassland adjacent to Pwll Diwaelod.

S.4 Cattle-grazed MG6 grassland was found outside the Gwent Levels at Pwll Diwaelod. This was mostly species-poor, but locally a few drier patches graduated into slightly more diverse MG5 grassland, while some damper areas support species-poor MG10 rush pasture. MG5 grassland is present adjacent to the Rectory Woods study site at Rogiet, which is close to the Rectory Meadow - Rogiet Site of Special Scientific Interest (SSSI). The nearby SSSI is notified for Meadow Clary, but there was no sign of this rare plant within the study area.

Wetlands

S.5 The reens within the Gwent Levels SSSI were not covered as part of this study, although the field grips were included. Most of the field grips were relatively species-poor, with the main botanical interest being the occasional patches of Tubular Water-dropwort. A few other notable plants were observed incidentally in reens adjacent to the study areas. These included Arrowhead and Frogbit at Whitecross Farm and Cyperus Sedge in ditches adjacent to Pye Corner and Tatton Farm. The reens undoubtedly support many more notable plants than these incidental observations.

S.6 Other wetland habitats were observed at Pwll Diwaelod, where there is a mix of small streams, fen vegetation and wet woodland with standing water. There is also a pond with cattle-trampled margins and stands of emergent vegetation.

Woodland and Scrub

S.7 The two woodlands at Rogiet are both included in the Forestry Commission inventory of ancient woodland. Although they have been subject to felling and replanting, they still retain a mostly broadleaved canopy and a diverse ground flora with high proportion of old woodland indicator species, typical of W8 woodlands on limestone soils. The patches at Rogiett Brake where conifers are dominant contain a good range of old woodland indicators in their ground flora (and a population of Red Wood Ants).

S.8 The three main areas of woodland at Pwll Diwaelod are also classified as semi-natural ancient woodland, but they are very different in character from Rogiet, due to the much wetter conditions. These range from Alder-dominated W5 and W6, to drier W7 and W8 woodland. A few parts are currently in poor condition due to tipping and over-grazing, but they still retain a diverse structure and ground flora, and old woodland indicators.

S.9 The small scrubby plantation at Pye Corner includes a small part of an area that is shown as ancient semi-natural woodland in the ancient woodland inventory. However, with the exception of a narrow strip of mature trees beside Picked Lane, there does not appear to be any evidence of old woodland. Aerial photographs from the 1940s clearly show that the study area was a field at that time and most of the current canopy has clearly been planted relatively recently.

S.10 The two areas of scrub and plantation at Pound Hill only have a species-poor ground flora with very common plant species.

Saltmarsh

S.11 Much of the east bank of the Ebbw is unmanaged and largely dominated by dense scrub and reedbeds with limited vegetation diversity. However, the strip of low-growing vegetation in the vicinity of the proposed route supports a diverse saltmarsh flora. The saltmarsh is a little unusual in this location because much of it is formed over stony material, but the flora is relatively diverse and includes a good range of typical saltmarsh plants, grading into grassland and scrub further up the shore.

Reedbed

S.12 The TATA steelworks supports extensive reedbeds that form part of its effluent treatment system. Smaller reedbeds are present in other parts of the steelworks site, and beside the Ebbw saltmarsh. Reedbeds have a limited botanical diversity but are recognised as having value for nature conservation for other taxa, such as birds and invertebrates.

Brownfield Habitats

S.13 The study area at Alexandra Docks supports a varied mix of scrub, grassland and ruderal vegetation. The habitats of greatest nature conservation significance are the grassland areas and damp ground, especially in the more open and disturbed parts and areas of former tipping. Several uncommon locally notable plants are present; most notably including Dittander, Round-headed Club-rush, Dark Mullein and Great Lettuce. The site is vulnerable to change because it is part of a working port and recent operational activities have resulted in several areas

being cleared or built over. However, other parts have remained relatively undisturbed and are losing their botanical diversity due to becoming encroached upon by dense scrub.

S.14 The network of slag tracks, dry lagoon margins and occasional piles of tipped slag at the TATA steelworks support a sparse cover of diverse ruderal vegetation. The slag provides an unusual substratum that supports a number of locally uncommon notable plants including White Mullein, Round-leaved Wintergreen, Round-leaved Crane's-bill and large populations of Great Lettuce. The alkaline soils within the former settlement lagoons (target note areas 1 and 2) also have an unusual and rather sparse flora which is much less diverse than the slag, but they include concentrations of locally notable species including Yellow-wort and Narrow-leaved Everlasting Pea.

S.15 Several of the older lagoons at the steelworks land are in varying stages of succession. Several support a diverse, flower-rich mosaic of grassland, tall wetland herbs and scrub, which includes locally notable species including Pepper Saxifrage, Brown Sedge and Narrow-leaved Everlasting Pea. However, this is a transitional community and in the absence of management, the habitat will eventually lose much of its value as it becomes dominated by dense scrub.

Summary Evaluation

S.16 Taking account of the presence of Priority Habitat and notable species (primary and contributory species referred to in Guidelines for the selection of Wildlife Sites in Wales (Wales Biodiverity Partnership, 2008) an overall evaluation of the vegetation at each site is presented in Table S1.

Table S1: Summary Evaluation of Nature Conservation Status of Vegetation

Site	Level of value	Reason
A. Pwll Diwaelod	County	Ancient semi-natural woodland, fen and pond are all priority habitats. Greater Spearwort is a primary listed species. (The flower-rich grassland is only of local value, but may be higher if important for grassland fungi).
B. Pound Hill	Local	Flower-rich grassland on verge has good diversity, including 3 contributory species. Scrubby young woodlands are relatively species-poor, but increasing in diversity.
C. Whitecross Farm	District	Network of field grips and presence of Tubular Water-dropwort.
D. Alexandra Dock	County	Mosaic of flower-rich grassland with good numbers of locally notable species including Dark Mullein, Great Lettuce, Dittander and Round-headed Club-rush.
D. Ebbw saltmarsh	County	Priority habitat with good range of notable plant species, including large population of Dittander.
E. Pye Corner	Local	Scrubby plantation with limited ground flora diversity.
F. Tatton Farm	District	Network of field grips and presence of Tubular Water-dropwort.

Site	Level of value	Reason
G. Roggiett Brake and Rectory Woods	County	Ancient semi-natural woodland, and presence of more than 5 contributory species.
H. TATA Steelworks	County	Man-made habitat with varied alkaline substrata including ruderal flora, flower-rich damp grasslands and extensive reedbeds, with good numbers of notable species. (Less diverse parts of the site would not be considered of county value if assessed in isolation.)

1. Introduction

1.1.1 RPS has undertaken a survey of grassland, woodland and saltmarsh vegetation at selected sites along the route of the proposed M4 Corridor around Newport (M4CaN) between Castleton and Magor to inform the ecological baseline for Environmental Impact Assessment (EIA) of the Scheme. It supplements a similar study of other sites along the route which was undertaken during May, June and July 2014. The sites had been selected as being worthy of botanical investigation following habitat surveys undertaken during 2011 and 2012. The vegetation survey employed a combination of walk-over and National Vegetation Classification (NVC) survey methods. The EIA is reported in the M4CaN Environmental Statement (ES) of which this document is an appendix to the chapter on Ecology and Nature Conservation.

1.1.2 Arup had previously commissioned Sturgess Ecology to undertake a survey of grassland, woodland and saltmarsh vegetation at selected sites along the route corridor in 2014. Initial habitat surveys undertaken by Arup in 2011/ 2012 had identified several areas which were considered worthy of further botanical survey. The 2014 report presents the findings of surveys of fourteen sites undertaken during May, June and July 2014, using a combination of walk-over survey and NVC survey methods (ES Appendix 10.4).

1.1.3 At a Hyder/NRW meeting on 30th January 2015, it was agreed that the Contractor's ecologist would need to review the updated Phase 1 survey report, as well as aerial photographs of the route corridor, in order to determine whether or not any locations additional to those surveyed in 2014 would require NVC surveys.

1.1.4 Having considered the 2014 Arup Extended Phase 1 Habitat Survey report in the context of the above recommendations, and examined the aerial photography, RPS considered that further NVC survey of additional areas of good quality semi-improved grassland, marshy grassland and woodland within and in the vicinity of the new section of mototorway would be beneficial in supporting the EIA. Areas of brownfield land within Newport Docks and the Tata Steelworks, and saltmarsh on the eastern bank of the River Ebbw were also identified for survey.

1.1.5 The study sites were grouped as shown in Table 1.1 and their locations are shown in Figure 1. This also provides the dates when each site was surveyed.

Table 1.1: Study Sites, Main Habitats and Survey Dates.

Site	Habitat	Survey date(s)
A. Pwll Diwaelod	Grassland and woodland	4, 11& 25 June 2015
B. Pound Hill	Woodland	3 June 2015
C. Whitecross Farm	Grassland	5 June 2015
D. Alexandra Dock and Ebbw saltmarsh	Industrial land with grassland, scrub and saltmarsh	14, 15 & 16 July 2015
E. Pye Corner	Woodland	26 May 2015.
F. Tatton Farm	Grassland	10, 16 & 26 June 2015
G. Roggiett Brake and Rectory Woods	Woodland	28 May 2015.
H. TATA steelworks	Industrial land with reedbed, grassland and scrub	22, 28 and 31 July and 4 & 6 August 2015.

1.1.6 Hedgerows and the aquatic and bank-side vegetation associated with reens and ditches are generally not covered within this report, as these surveys are being

undertaken by others, although a few small water-bodies have been included in some sites.

1.1.7 This document gives an outline of the methodology used (Section 2) and summarises the key findings (Section 3). From these results, the report also provides an assessment of the biodiversity value of the habitats surveyed and where appropriate makes recommendations for further assessment (Section 4).

1.1.8 In Section 4 of this report, the nature conservation value of the various plant communities is assessed using a geographical frame of reference, based on the 'Guidelines for Ecological Impact Assessment' (IEEM, 2006). A summary of the recorded occurrences of invasive species is also provided.

2. Survey Method

2.1.1 The fieldwork and assessment were undertaken by Dr Peter Sturgess CEnv MCIEEM. He is an experienced botanist familiar with the flora of the Gwent Levels.

2.1.2 The survey work was carried out between 26 May and 6 August 2015. This is the optimal season for this type of survey. Within this period attempts were made to organise woodland site visits early in the season, and to visit hay-meadows before they were cut, and to survey grazed or unmanaged grassland later in June and July. The surveys will inevitably have overlooked some species, particularly those only occurring at low frequency, and/ or which cannot be reliably found or identified at the time of the survey, but provide a good account of the main species and plant communities at each site.

2.1.3 The weather during most of the visits was favourable for vegetation survey, but due to restrictions in gaining access, some sites had to be visited in showery or windy weather, and this may have reduced the number of species recorded. However, no surveys had to be carried out during heavy rain. The surveys carried out during sub-optimal conditions would still have identified all of the main species and plant communities.

2.1.4 The survey was mainly undertaken using a simple walk-through method, walking through each site to examine and map the main vegetation types. The plant communities were plotted by eye onto an aerial photograph base plan. Photographs were also taken to illustrate the main vegetation types. Some small patches of habitats were not mapped, but where they 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.

2.1.5 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.). A total of 264 quadrats were recorded during the study. The quadrat surveys generally involved recording every species within square 2x2 m sample areas which were selected as being representative samples of the stand in which they occurred. A few features such as scrub vegetation and water bodies were not easily sampled using standard quadrat methodology, and these have been included within the community descriptions on the basis of brief descriptions and species lists. In some locations 4x4 m quadrats were used to describe the ground flora of woodland and scrub communities.

2.1.6 The cover of every species within each quadrat was assessed using the Domin scale, as shown in Table 2.1. 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

2.1.7 The quadrats recorded from each similar plant community were grouped together into floristic tables for each site, mostly giving each broad vegetation type its own table. Following the NVC methodology, the occurrence of each species within the group of quadrats was assigned a constancy score as indicated in Table 2.2. The species within each table were then listed in order of their constancy score. In some cases the tables include more variation than a conventional NVC table would, to show the range of variation within a whole field rather than representing strictly homogeneous stands of vegetation (e.g. grasslands showing a transition between MG5 and MG6, or fields with a mix of dry grassland strips divided by damper field grips). This deviation from the standard method is considered appropriate in this case because the primary purpose of the study is to describe the flora at each site, rather than just to classify it. Vegetation can be very variable, and plant communities are often in a state of transition between two or more communities, perhaps due to natural succession, management changes or a gradation in environmental conditions, and some are very difficult to assign to published communities. Correlation with published NVC communities does not usually have much bearing on nature conservation significance.

Table 2.2: Constancy Scores for Quadrat Data.

Frequency within quadrats	Constancy Score
81 - 100%	V
61 - 80%	IV
41 - 60%	III
21 - 40%	II
1 - 20%	I
Associate species (A) only	

3. Survey Findings

3.1.1 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. This is based on the species recorded within each of the study areas. It is important to note that this should not be regarded as a comprehensive list for the whole study area (this is particularly relevant for the sites which are bordered by reens, because much of the botanical diversity of the Gwent Levels is present within the aquatic and bank-side vegetation). Common names are generally used for vascular plants mentioned in the text. However, NVC community titles are typically written using scientific names, so this has been done here for consistency with the published literature, and scientific names have been used in the tables and species lists. Scientific and common names for vascular plants follow Stace (2010).

3.1.2 The mapping is presented separately for each of the study areas in Maps 1 to 11. These broadly show the main blocks of different vegetation types overlaid on an aerial photograph base to provide a context for the observations. Caution needs to be applied in interpreting the boundaries shown between the different vegetation stands as they have all been plotted by eye and very few have clearly defined edges. There is a high degree of variation within some communities and many of them merge gradually into one another. In some cases the stands of vegetation comprise a complex mosaic of two or more distinct communities (for example, meadows with a network of field-grips, resulting in a mix of wet and dry grassland types). The mapping therefore concentrates on the predominant NVC types, and the accompanying descriptions highlight the main communities and mosaics found in each site, very small patches of NVC communities (e.g. open vegetation communities in gateways) have generally not been mapped.

3.1.3 The locations of the quadrats are shown on the survey maps. The quadrats were sampled from communities dispersed widely across each site to help provide an indication of the range of variation. In most cases, a minimum of 5 quadrats was recorded for each main vegetation type.

3.1.4 The various study sites are described separately below. Each description discusses the main communities present and the range of variation. Where the text includes mention of 'notable species', this refers to species listed as rare, scarce and declining in Monmouthshire, Glamorgan and Carmarthenshire, in accordance with the Wildlife Sites Guidelines (2008) (see Table 4.2 for full list of species recorded during this survey). The species in the tables are arranged in order of frequency, as denoted by the constancy score in the right-hand column. Species that were only recorded at low frequency and which were not present in quadrats are also presented, to give a more complete species list for each site.

3.2 Site A: Pwll Diwaelod, Castleton

3.2.1 This site includes a mix of woodland and grassland habitats and is divided by the M4 motorway and is shown on Map 1. The main woodland areas are included in the Forestry Commission inventory of ancient woodland. The land to the north of the M4 is an ungrazed woodland containing a small stream. The land to the south has several blocks of woodland which are mostly damp and dominated by Alders. Some of this woodland is grazed by livestock. The grassland areas are to the south of the M4 and mostly comprise damp semi-improved grassland and

rush pasture, and a small amount of marshy grassland. Most of the grassland is grazed. The land to the south of the motorway also includes a tree-fringed pond and several mature standard Oak trees.

North of M4 Motorway

3.2.2 The woodland to the north of the M4 has a mature broad-leaved canopy dominated by Oak and Ash, with a Hazel understorey. Wych Elm, Wild Cherry, Hawthorn, Field Maple, Holly and Aspen are present at a lower frequency. Most of the canopy trees are multi-stemmed, indicating former clear-felling or coppicing. There are also several older standard Oak trees, approaching veteran proportions. Some of these have fallen over, revealing a relatively shallow rooting depth due to the water-logged soil. The ground flora includes a moderate number of typical old woodland indicator species, including Wood Anemone, Wood Sorrel, Bluebell, Primrose, Wood Speedwell, Dog's Mercury, Enchanter's Nightshade, Moschatel and Yellow Archangel. The eastern strip of woodland is dominated by Alder, and is much wetter than the western part. It includes several springs and a small stream. The ground flora of this Alder-dominated woodland contains a high proportion of Nettle, and wetland plants including Hemlock Water-dropwort and Flag Iris, but still shares many species with the drier woodland on the better drained parts such as around tree bases and steeper banks. In terms of the NVC the drier western part can be classified as W8 *Fraxinus excelsior – Acer campestre – Mercurialis perennis* woodland, and the wetter eastern part as W7 *Alnus glutinosa – Fraxinus excelsior – Lysimachia nemorum* woodland. However, these merge gradually from one to another and the boundary shown in the accompanying plan must only be regarded as very approximate. The quadrat data from the northern woodland is combined with the data from the woodlands south of the M4.

3.2.3 The woodland perimeter is mostly bordered by a scrubby canopy, comprising Hawthorn, Blackthorn, Grey Willow and dense Bramble, locally merging into tall ruderal herb vegetation. A few parts at the eastern margin have been subject to tipping of rubble, soil and building refuse, and include occasional Cherry Laurel. The boundary scrub is not considered to be of significance for its flora, but can generally be categorised as variants of the NVC communities W24 *Rubus fruticosus - Holcus lanatus* underscrub, W22 *Prunus spinosa – Rubus fruticosus* scrub and OV24 *Urtica dioica – Galium aparine* community.

Photograph 1. Ash-dominated W8 Woodland North of M4 Motorway.

Photograph 2. Alder-dominated W7 Woodland North of M4 Motorway.

3.2.4 Incidental fauna observations in the woodland north of the motorway included Blackbird, Blackcap, Blue Tit, Buzzard, Great Spotted Woodpecker, Robin, Song Thrush, Wren, Common Frog, Rabbit and Green-veined White Butterfly. Several Hazelnuts that had been opened by small mammals confirmed the presence of Dormouse and Woodmouse.

South of M4 Motorway

3.2.5 The woodland areas to the south of the motorway are mostly associated with streams and have a high proportion of Alder in their canopy, and generally appear wetter than the wood to the north. The water in the wettest woodland, in the north-western part, was too deep to access its full extent, but a reasonable assessment was possible from its eastern part. This swampy mix of Alder and Grey Willow woodland has many large specimens of Greater Tussock-sedge, and can readily be assigned to the NVC community W5 *Alnus glutinosa – Carex paniculata* woodland. The W5 woodland has a high proportion of Floating Sweet-grass and Hemlock Water-dropwort and is represented by Quadrats 30 and 31. The locally notable Greater Spearwort is present in this community. This type of woodland with elements of fen vegetation is sometimes referred to as Alder carr.

Photograph 3. Alder / Grey Willow W5 Woodland with Greater Tussock-sedge.

Photograph 4. Greater Spearwort in W5 Woodland.

3.2.6 The drier woodland to the east of the W5 area immediately south of the M4 is very heavily trampled by cattle, with virtually no ground flora evident over a high proportion of the area (so no quadrats were recorded here). This very degraded habitat is difficult to assign to an NVC community, but the canopy and remnants of vegetation at the margins and around tree bases indicate elements of W8 *Fraxinus excelsior – Acer campestre – Mercurialis perennis* woodland with local transitions to W7 *Alnus glutinosa – Fraxinus excelsior – Lysimachia nemorum* woodland. The locally notable Thin-spiked Wood-sedge was observed on sloping ground near the northern boundary.

Photograph 5. Heavily Trampled W8/ W7 Woodland South of M4 Motorway.

Photograph 6. Young W6 Alder Woodland in Flushy Stream Corridor.

3.2.7 The block of woodland in the south-east of the area is grazed by horses. Most of it has a canopy dominated by tall Alder and Ash, a relatively limited understorey of Bramble and Hawthorn. The ground flora is rather species-poor, with a high proportion of Rough Meadow-grass, Creeping Buttercup and Wood Sedge. A stream channel flowing around the south-eastern side has a more diverse ground flora on its less-trampled and steeper sides. These include a higher density of species associated with older woodland, including Primrose, Yellow Archangel, Bluebell, Wood Speedwell, Wood Anemone and Enchanter's Nightshade. The main woodland area is mostly typical of the NVC W7 Alnus *glutinosa – Fraxinus excelsior – Lysimachia nemorum* woodland, locally grading to W8 *Fraxinus excelsior – Acer campestre – Mercurialis perennis* woodland. A strip of younger Alder trees to the south-west of the stream has a ground flora dominated by Nettle and Bramble, and this can be assigned to the NVC W6 *Alnus glutinosa – Urtica dioica* woodland.

Photograph 7. W7 Alder Woodland in South-East of Pwll Diwaelod.

Table 3.1: Quadrat Data for Drier W8 Woodlands at Pwll Diwaelod.

Quadrat	1	2	3	4	14	15	Frequency
Anemone nemorosa	4	3	3	2	4	4	V
Galium aparine	2	2	4	3		1	V
Geum urbanum	1	2	4	2	3	2	V
Hedera helix	8	4	2	4		1	V
Hyacinthoides non-scripta	2	4		1	5	2	V
Rubus fruticosus	5	9	1	2	1	2	V
Corylus avellana	9	10	8	10			IV
Kindbergia praelonga	4	3	3	4			IV
Lamiastrum galeobdolon		4	4	2		1	IV
Ranunculus ficaria	2	A	4	2		3	IV
Rumex sanguineus		1	2		1	2	IV
Veronica montana	A	1	3	2		4	IV
Circaea lutetiana		A	4	9	A	2	III
Viola riviniana		A	2		5	6	III
Arum maculatum	1					1	II
Carex remota			A		2	1	II
Carex sylvatica					7	2	II

Quadrat	1	2	3	4	14	15	Frequency
Conopodium majus		2				1	II
Fissidens taxifolius					2	2	II
Fraxinus excelsior	10		A		10		II
Mercurialis perennis	4		10				II
Poa trivialis				A	2	5	II
Quercus robur			10			10	II
Silene dioica		1		A		1	II
Tamus communis	1				1		II
Adoxa moschatellina		A		2			I
Atrichum undulatum					3		I
Brachythecium rutabulum				2			I
Cardamine flexuosa				1			I
Chrysosplenium oppositifolium			2				I
Deschampsia cespitosa		1					I
Epilobium montanum						2	I
Festuca gigantea					A	1	I
Galeopsis sp.						1	I
Geranium robertianum					2		I
Ilex aquifolium	A					10	I
Lysimachia nemorum			A		4		I
Mnium hornum						1	I
Moerhingia trinervia						4	I
Plagiomnium undulatum					2		I
Populus tremula				9			I
Potentilla sterilis					1		I
Primula vulgaris		A			1		I
Ranunculus acris						1	I
Sambucus nigra			A	1			I
Senecio jacobaea					1		I
Stellaria holostea		5					I
Taraxacum sp.					1		I
Ulmus glabra				4			I
Veronica hederifolia					2		I
Acer pseudoplatanus	A						
Ajuga reptans		A					
Alnus glutinosa					A		
Anthriscus sylvestris		A	A				
Crataegus monogyna	A		A				
Dryopteris dilatata						A	
Isothecium myosuroides					A		
Total species	13	15	16	18	21	27	
Cover (%)	90	95	100	95	95	95	
Average sward height (cm)	60	80	50	40	30	20	
Approx canopy height (m)	30	10	30	20	25	20	

Table 3.2: Quadrat Data for Alder-dominated Woodlands at Pwll Diwaelod.

Quadrat	5	6	8	9	10	11	12	13	16	17	29	30	31	32	34	40	Freq.
Alnus glutinosa	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	V
Rubus fruticosus	A	4	4	2	4	5	2	1		A	7	A	2		2	1	IV
Poa trivialis	1	2	A	1	4	7	A	4	7	8	2			2	A	8	IV

Quadrat	5	6	8	9	10	11	12	13	16	17	29	30	31	32	34	40	Freq.
Circaea lutetiana	9	2	6	2	6	7	6	4		2	5						IV
Urtica dioica	8	4	A	4	7	1	A			A	4	6			9	2	III
Rumex sanguineus					7	6		1	2	1	1		A	1	1	A	III
Carex remota					1	1		4		A	2	2	2		1	1	III
Veronica montana	2		2	A	2	2	4	2	2	2							III
Ranunculus ficaria	2		8	5	1	2	5	5		2							III
Chrysosplenium oppositifolium	2	9		10				2		7	5	A	5			6	III
Ranunculus repens	A			4					8	7	2	2	7	8		4	III
Oenanthe crocata	A	4	A	7	1					2		4	2	A	4	4	III
Kindbergia praelonga	6	A	4	A		2	3	2							2	2	III
Geum urbanum			1	A	4	3	2	2	A		2						II
Geranium robertianum		4		2		1	2			1							II
Lysimachia nemorum		2			A			6		4	3	1					II
Galium aparine	7	8	1	2							1					A	II
Cardamine flexuosa		2		1			2				4			2		A	II
Dryopteris dilatata	A	A	2	2				2			2	2	A			A	II
Anemone nemorosa	2	1	9					4	A								II
Corylus avellana	2	A	10	A			A	10								1	II
Lamiastrum galeobdolon	9	9	3	2													II
Silene dioica	1	2	1						A	1							II
Brachythecium rutabulum	2			A		2		2							2		II
Galium palustre										2		2	7			2	II
Hyacinthoides non-scripta		1					2	2	A								I
Hedera helix						2	5						1				I
Mnium hornum			1	A			2	2		A							I
Stellaria alsine										2		2	A	1			I
Prunella vulgaris					3	2			3								I
Callitriche sp.												2	3	4			I
Filipendula ulmaria			4					2		2							I
Glyceria fluitans												5	6	2			I
Iris pseudacorus	2	A		6								A	1				I
Veronica beccabunga						1							2	2			I
Fissidens taxifolius						2	4	A									I
Fraxinus excelsior					1	A	A	1									I
Taraxacum sp.					1					1							I
Ranunculus acris					A	2			2								I
Epilobium montanum					2	2								A			I
Heracleum sphondylium	A				5	1											I
Carex paniculata												2	4				I
Athyrium filix-femina			A	A			1	1									I
Cardamine pratensis					A			1					1				I
Viola riviniana								2									I
Carex sylvatica								1									I
Tamus communis					1												I
Atrichum undulatum							2										I
Plagiomnium undulatum			2	A													I
Arum maculatum							1										I
Adoxa moschatellina	2			A													I
Deschampsia cespitosa			1														I
Festuca gigantea									A	2							I
Sambucus nigra	A			A			1										I
Holcus lanatus									2								I
Cerastium fontanum										1							I
Lolium perenne									2								I
Agrostis stolonifera														1			I
Juncus effusus												4					I
Apium nodiflorum																1	I
Cirsium palustre											1						I
Mentha aquatica										2							I

Quadrat	5	6	8	9	10	11	12	13	16	17	29	30	31	32	34	40	Freq.
Brachythecium rivulare													2				I
Calystegia sepium						1											I
Epilobium parviflorum								1									I
Caltha palustris										A			2				I
Dryopteris filix-mas							1								A		I
Hypnum cupressiforme	2																I
Isothecium myosuroides								2									I
Phyllitis scolopendrium			A				1								A		I
Rhynchostegium confertum							2										I
Solanum dulcamara																1	I
Stachys sylvatica											1						I
Mercurialis perennis									A								
Plantago lanceolata									A								
Persicaria hydropiper														A		A	
Lythrum salicaria															A		
Crataegus monogyna						A	A										
Anthriscus sylvestris		A															
Carex strigosa												A					
Digitalis purpurea										A							
Glechoma hederacea																A	
Lonicera periclymenum												A	A				
Prunus avium		A															
Ranunculus lingua													A				
Salix fragilis												A					
Total species	17	15	17	15	17	21	20	26	9	19	16	13	16	10	8	13	
Cover (%)	100	100	100	100	100	100	80	80	100	95	100	70	60	40	100	100	
Avg sward height (cm)	120	100	100	130	150	60	40	30	30	30	100	50	30	10	140	60	
Apprx canopy height (m)	20	25	25	20	15	15	20	20	25	25	25	20	20	20	10	10	

3.2.8 The majority of the grassland habitat at Pwll Diwaelod is damp semi-improved grassland grazed by cattle, although a belt of grassland in the south-eastern part is grazed by horses. Several localised patches of Soft Rush in the central area are better classified as rush pasture. A small area of grassland and marshy grassland / fen at the south-western boundary was ungrazed at the time of the survey and did not appear to have been grazed for at least several months.

3.2.9 The large, central area supports relatively species-poor, damp semi-improved grassland. The main grassland plants include Yorkshire Fog, Sweet Vernal-grass, Rough Meadow-grass, Crested Dog's-tail and Perennial Rye-grass, although the proportion of these varies widely across the area. The frequency of herb species is also variable, with the most prominent being Meadow Buttercup, and Amphibious Bistort in the horse-grazed area. This can mostly be categorised as MG6 *Lolium perenne – Cynosurus cristatus* grassland, although there are a few areas, particularly the drier patches in the east of the site, which have local transitions to slightly more diverse MG5 *Centaurea nigra – Cynosurus cristatus* grassland. The patches of densest Soft Rush are within the cattle-grazed area and fall into the NVC category MG10 *Holcus lanatus – Juncus effusus* rush pasture. The examples of these grassland types within the site are relatively species poor. The only particularly noteworthy species seen was Grass Vetchling, which is present in small quantity immediately adjacent to the new motorway drainage attenuation pond. The motorway land was not accessed, and much of the grass had been cut shortly before the survey, but it seems likely that the Grass Vetchling originated from this area; possibly being introduced in the topsoil or seed used in the recent landscaping works.

Photograph 8. Cattle-grazed MG6 Grassland at Pwll Diwaelod.

Photograph 9. Horse-grazed MG6 Grassland at Pwll Diwaelod

Table 3.3: Quadrat Data for Grazed MG5/6 Grassland at Pwll Diwaelod.

Quadrat	18	19	20	21	22	23	24	25	26	27	28	33	45	F
Anthoxanthum odoratum		2	7	4	4	9	8	4	2	6	2	2		V
Cerastium fontanum	1	1	1	2	1	2	1	1		2	3	1		V
Holcus lanatus	5	4	4	8	6	4	4	6	8	5	4	4	7	V
Ranunculus acris	1	3	5	4	4	2	2	4	1	1	1	2	A	V
Cynosurus cristatus	A	1	7	2	2	3	5	3			7	5		IV
Lolium perenne	2		2	1		2	3	2	2	A	3	2	5	IV
Lotus corniculatus			5	2	4	2	5				7	2	2	IV
Plantago lanceolata	2	1	5	2	2	4	5	5			3	3		IV
Poa trivialis	7		4	4	4		2	4	8	5	3			IV
Ranunculus repens	6	7	4	6	4				A		4	2	2	IV
Agrostis capillaris							2	2	5	7	7	5	6	III
Carex hirta		4	4	2	2			A			2	2	4	III
Senecio jacobaea					A	2	1	A		1	1	2	1	III
Trifolium repens	2	2		1							2	4	1	III
Achillea millefolium						2	1				2			II
Agrostis stolonifera	6	2	2											II
Centaurea nigra		A	1		A	4	4	1			2			II
Cirsium arvense	A				A			3	5	2	A	A	4	II
Dactylis glomerata							A	2	7	1	1			II
Festuca rubra						2	4				4			II
Kindbergia praelonga			2	1	1									II
Lotus pedunculatus			2	4	A					2				II
Prunella vulgaris				2	A		1	2			A	A	A	II
Pulicaria dysenterica		2	1	4	7									II
Rumex acetosa					1	1	2	A		2	2			II
Rumex crispus		2	A		A			2	1		1			II
Stellaria graminea						A	2	A	1	A	A	1		II
Taraxacum sp.			1		A	1	A				2	1		II
Trifolium pratense	A	1	4	2		2	A				4			II
Bellis perennis	A	A		1										I
Brachythecium rutabulum											2			I
Calliergonella cuspidata				1										I
Carex flacca			5											I
Carex ovalis			2	2	A									I
Cirsium palustre					1		A					A		I
Cirsium vulgare											4			I
Geranium dissectum											2			I
Hypochaeris radicata						2					1			I
Juncus acutiflorus					2						A	3		I

Quadrat	18	19	20	21	22	23	24	25	26	27	28	33	45	F
Juncus effusus			2											I
Juncus inflexus			2		1						A			I
Lathyrus pratensis					2									I
Leontodon hispidus											1			I
Luzula campestris						A	4	A						I
Persicaria amphibia	4	2	A											I
Potentilla anserina	7				2									I
Rumex obtusifolius	A							1					A	I
Rumex sanguineus	1	2		A										I
Trifolium dubium											2			I
Vicia sativa												2		I
Alnus glutinosa					A									
Heracleum sphondylium										A				
Lychnis flos-cuculi					A									
Rumex conglomeratus									A					
Total species	12	15	22	20	18	16	18	15	10	11	28	17	9	
Cover (%)	100	100	95	90	100	100	95	100	100	100	100	100	100	
Avg sward height (cm)	30	30	40	50	60	20	30	25	45	15	10	35	10	

F: Frequency

Table 3.4: Quadrat Data for MG10 Rush Pasture at Pwll Diwaelod.

Quadrat	41	42	43	Frequency
Agrostis stolonifera	4	2	4	V
Anthoxanthum odoratum	2	4	4	V
Juncus effusus	9	8	4	V
Poa trivialis	4	5	5	V
Agrostis capillaris		3	2	IV
Carex hirta		1	2	IV
Cerastium fontanum	2		2	IV
Cynosurus cristatus		4	4	IV
Holcus lanatus	4		5	IV
Lolium perenne		3	4	IV
Lotus pedunculatus	1	6		IV
Senecio jacobaea	2	A	1	IV
Cardamine flexuosa	1			I
Centaurea nigra			2	I
Epilobium obscurum	1			I
Epilobium parviflorum	1			I
Juncus acutiflorus		A	4	I
Juncus conglomeratus		4		I
Juncus inflexus			4	I
Potentilla reptans			4	I
Ranunculus repens			3	I
Rumex conglomeratus	1			I
Rumex crispus			1	I
Rumex obtusifolius	1			I
Taraxacum sp.			2	I
Trifolium pratense			2	I
Trifolium repens			2	I

Quadrat	41	42	43	Frequency
Urtica dioica	2			I
Vicia tetrasperma			2	I
Cirsium palustre	A			
Lotus corniculatus			A	
Rumex acetosa			A	
Total species	14	10	21	
Cover (%)	90	100	100	
Average sward height (cm)	75	65	50	

Photograph 10. Cattle-grazed MG10 Rush Pasture at Pwll Diwaelod.

3.2.10 The small area of species-poor grassland in the south-western corner of the site is used as a shooting range and appears to have been ungrazed for at least several months. It is dominated by Yorkshire Fog and Rough Meadow-grass, with local transitions to Cock's-foot and Bramble scrub at the margins. This vegetation appears intermediate between species-poor MG1 *Arrhenatherum elatius* grassland (despite the absence of False Oat-grass) and species-poor MG9 *Holcus lanatus – Deschampsia cespitosa* grassland, and is not considered to have any special nature conservation significance.

Table 3.5: Quadrat Data for Ungrazed Species-poor Grassland at Pwll Diwaelod.

Quadrat	38	39	Frequency
Heracleum sphondylium	1	1	V
Holcus lanatus	9	10	V
Poa trivialis	4	2	V
Ranunculus repens	2	4	V
Rubus fruticosus	2	2	V
Calystegia sepium		1	III
Carex hirta		2	III
Cerastium fontanum		1	III
Cirsium vulgare		1	III
Epilobium hirsutum		1	III
Galium aparine		3	III
Hypochaeris radicata	1		III
Lotus corniculatus		1	III
Potentilla anserina		1	III

Quadrat	38	39	Frequency
Stellaria alsine		1	III
Urtica dioica	2		III
Digitalis purpurea	A		
Galeopsis sp.	A	A	
Galium palustre		A	
Oenanthe crocata	A		
Trifolium repens		A	
Total species	7	14	
Cover (%)	100	100	
Average sward height (cm)	60	90	

Photograph 11. Species-poor MG1 / MG9 Grassland at Pwll Diwaelod Shooting Range.

3.2.11 The narrow strip of tall herb fen vegetation occupies a damp valley, between a small, shaded stream to the north and a re-seeded improved grassland ley to the south. The fen vegetation is dominated by Soft Rush and tall wetland herbs, including Hemlock Water-dropwort, Nettles, Greater Willowherb and Bulrush. There are several large plants of Greater Tussock-sedge in the south-eastern part, and Purple Loosestrife and Greater Bird's-foot Trefoil are locally prominent. Unusually for an inland location there is also a small patch of Sea Club-rush. The fen is interspersed with scattered scrubby willows and Bramble, and merges into the denser scrubby woodland adjoining the stream. This vegetation appears to be transitional between the NVC S3 *Carex paniculata* swamp and OV26 *Epilobium hirsutum* community.

Table 3.6: Quadrat Data for Tall Herb Fen at Pwll Diwaelod.

Quadrat	35	36	37	Frequency
Apium nodiflorum	2	5	3	V
Epilobium hirsutum	8	7	10	V
Galium palustre	5	3	4	V
Myosotis laxa	1	2	2	V
Oenanthe crocata	4	5	2	V
Persicaria hydropiper	2	2	2	V
Stellaria alsine	3	4	6	V
Urtica dioica	2	2	3	V
Cirsium palustre	2	A	2	IV
Juncus effusus	6	5		IV
Lythrum salicaria	1	2		IV
Mentha aquatica	4	A	5	IV
Poa trivialis	2	2		IV
Rubus fruticosus	2	2	A	IV
Bolboschoenus maritimus			2	I
Brachythecium rivulare	2			I
Brachythecium rutabulum		4		I
Carex paniculata	7	A		I
Dryopteris dilatata		1		I
Epilobium obscurum		2		I
Galeopsis sp.		1		I
Galium aparine			2	I
Holcus lanatus		2		I
Juncus inflexus		4		I
Lotus pedunculatus	5			I
Ranunculus repens		4		I
Rumex conglomeratus			1	I
Typha latifolia		4	A	I
Alnus glutinosa			A	
Rumex sanguineus			A	
Silene dioica			A	
Cirsium vulgare			A	
Salix cinerea	A	A		
Total species	17	20	13	
Cover (%)	100	90	100	
Average sward height (cm)	150	120	140	

Photograph 11. Tall Herb Fen at Pwll Diwaelod.

3.2.12 Several small patches at Pwll Diwaelod are dominated by tall ruderal plants, particularly Nettle and Creeping Thistle. One of the largest patches was sampled as an example (Quadrat 44), and this is typical of the OV24 *Urtica dioica – Galium aparine* community. The ruderal plants at this site are not considered to be of any special significance for nature conservation.

Table 3.7: Quadrat Data for Tall Ruderal Herb Community.

Quadrat	44
Urtica dioica	9
Galium aparine	6
Holcus lanatus	4
Carex hirta	2
Epilobium ciliatum	2
Poa trivialis	2
Cirsium arvense	1
Senecio jacobaea	1
Dactylis glomerata	A
Total species	8
Cover (%)	100
Average sward height (cm)	90

3.2.13 A field pond in the eastern area of grassland measures approximately 45m x 15m and is fringed by a mix of mature Oak trees and smaller more scrubby Alder, Hawthorn, Crack Willow, Ash and Hazel. There are patchy stands of emergent vegetation, particularly Branched Bur-reed and Soft Rush, locally with Yellow Loosestrife, Flag Iris, Water Starwort, Water Mint, Cuckooflower, Toad Rush and Common Water-plantain. This can be categorised as S14 *Sparganium erectum* swamp vegetation. The pond margins are trampled and muddy, with limited vegetation due to access by cattle, but the less poached parts support Floating Sweet-grass, Remote Sedge, Water Cress, Celery-leaved Buttercup, Toad Rush, Small Sweet-grass, Brooklime, Gypsywort and Fool's Water-cress. In terms of the NVC this is probably best classified within the rather diffuse category S23 'other water margin vegetation'. The only aquatic plants observed from the pond margin were a large quantity of Small Pondweed and smaller amounts of Broad-leaved Pondweed and Common Duckweed.

Photograph 12. Field Pond at Pwll Diwaelod.

3.2.14 A number of species were observed at Pwll Diwaelod that did not fall within any quadrats. These included species that were only present at low density, or associated with the field pond or minor habitat features such as gateways, tracks and small ditches.

Table 3.8: Additional Species Not Present in Quadrats at Pwll Diwaelod

Acer campestre
Aegopodium podagraria
Alisma plantago-aquatica
Alopecurus geniculatus
Aneura pinguis
Angelica sylvestris
Anisantha sterilis
Arrhenatherum elatius
Betula pubescens
Brachypodium sylvaticum
Bromus hordeaceus
Conocephalum conicum
Cratoneuron filicinum
Dryopteris affinis
Equisetum arvense
Glyceria declinata
Humulus lupulus
Hypericum tetrapterum
Juncus bufonius
Lapsana communis
Lathyrus nissolia
Lemna minor
Lemna minuta
Lycopus europaeus
Lysimachia vulgaris
Pellia sp.
Phalaris arundinacea
Plantago major
Poa annua
Polypodium sp.
Polystichum setiferum
Potamogeton berchtoldii
Potamogeton natans
Prunus laurocerasus
Pteridium aquilinum
Ranunculus flammula
Ranunculus sceleratus
Rhytidiadelphus squarrosus
Ribes rubrum
Rorippa nasturtium-aquaticum
Rosa arvensis
Rosa canina
Scrophularia auriculata
Scrophularia nodosa
Sinapis arvensis
Sorbus aucuparia
Sparganium erectum
Tripleurospermum inodorum
Veronica chamaedrys
Veronica serpyllifolia
Viburnum opulus

3.2.15 Incidental bird observations from Pwll Diwaelod south of the motorway included Blackcap, Buzzard, Chaffinch, Chiffchaff, Dunnock, Great Spotted Woodpecker, Great Tit, Greenfinch, Green Woodpecker, Long-tailed Tit, Magpie, Robin, Song Thrush and Wren. Insect sightings included Burnet moth, Burnet Companion moth, Silver Y moth, Drinker moth (caterpillar), Yellow Shell moth, Common Blue butterfly, Large Skipper butterfly, Small Tortoiseshell butterfly and Speckled Wood Butterfly. A Common Toad was found in the south-eastern woodland, and Common Frog tadpoles were seen in a small unvegetated pool at the head of the western ditch in the same wood. Mammal observations included Rabbits, Molehills, Hazelnuts opened by Wood Mice, and Badger feeding signs. A Hazelnut that had been opened by a Dormouse was confirmed on the way to the site, south of the A48M along the footpath at grid reference ST25278377.

3.3 Site B: Pound Hill

3.3.1 The majority of the study area at Pound Hill lies within the highway boundary of the A48M/M4 and is shown on Map 2. It includes semi-improved neutral grassland, a mature broadleaved plantation and two areas with recently planted young trees. The eastern end of the study area includes a small area of scrub woodland outside the highway fence.

3.3.2 The grassland habitat has a patchy character and variable mix of coarse grasses, fine-leaved grasses and frequent herb species. The most prominent wild flowers are Ox-eye Daisy and Meadow Buttercup, and other frequent species include Bird's-foot Trefoil, Meadow Vetchling, Red Clover, Self-heal, Common Knapweed and Lady's Bedstraw. Common Spotted Orchid is present at a very low frequency. In terms of the NVC the abundance of Yorkshire Fog and Cock's-foot indicates a strong affinity with MG1 *Arrhenatherum elatius* grassland, although False Oat-grass is relatively sparse. It is closest to the MG1e *Centaurea nigra* sub-community, which is one of the more diverse forms of this grassland type.

Photograph 13. Flower-rich Highway Verge at Pound Hill.

3.3.3 The grassland habitat includes several locally notable plant species. The most frequent is Stone Parsley, which is present in moderate numbers at the eastern end of the plot, especially around the areas of recent tree planting. Grass Vetchling is present in very low numbers within the main area of grassland. A single plant of Yellow-wort was observed at the western end of the grassland, near to an area of young tree planting. It is likely that this species is only present as a casual in this case, possibly following the ground disturbance for tree planting, and it is unlikely to persist as the vegetation becomes denser. It is possible that some species, such as Yellow-wort, may have been introduced by wildflower seeding.

3.3.4 The quadrat sampling reflects the range of variation in the grass areas. Quadrat 6 was from an area of recent tree planting on steep ground with shallow soil and a relatively high proportion of bare ground. Use of herbicides around the tree bases in planting areas has also maintained patches of bare soil that can be colonised by ruderal species.

Table 3.9: Quadrat Data for Grassland at Pound Hill.

Quadrat	1	2	3	4	5	6	Frequency
Dactylis glomerata	2	1	6	4	5		V
Festuca rubra	8	9	5	5	4	6	V
Holcus lanatus	5	3	8	8	6	2	V
Leucanthemum vulgare	3	2	3		3	4	V
Lotus corniculatus	A	1	3	3	4	2	V
Plantago lanceolata	1	3	3	1	4	1	V
Prunella vulgaris	4	2	1		2	1	V
Ranunculus repens	3	4	6	4	4	4	V
Cerastium fontanum	2	2	1		3		IV
Galium verum	2	1	1			1	IV
Heracleum sphondylium	1	A	1	A	1	2	IV
Lathyrus pratensis	1	2	2		2		IV
Potentilla reptans	1		2	1	2		IV
Ranunculus acris		2	1	1	1		IV
Trifolium pratense	A	1	4	1	1		IV
Vicia sativa	2	3		1		1	IV
Centaurea nigra	A		2	2	4		III
Picris echioides	A	1	A	2	A	3	III
Poa trivialis			8	8	4		III
Primula vulgaris	2	2	1				III
Rubus fruticosus	A		A	1	1	1	III
Sison amomum	3	2	1				III
Trifolium repens				2	1	4	III
Vicia tetrasperma	1		1			2	III
Agrostis capillaris				5	4		II
Anagallis arvensis		1				1	II
Calliergonella cuspidata	4	5					II
Carex flacca				1	7		II
Centaurium erythraea		1				1	II
Cirsium arvense			2	A		1	II
Crataegus monogyna	2	A				1	II
Cynosurus cristatus				2	4		II
Epilobium montanum	1	1					II
Fraxinus excelsior	A		1			1	II
Geranium dissectum				1		1	II
Glechoma hederacea			2		2		II

Quadrat	1	2	3	4	5	6	Frequency
Malva moschata	2	A	A	1			II
Medicago lupulina				2		2	II
Rumex conglomeratus			1	1			II
Rumex crispus	A		1	A	A	1	II
Stellaria graminea			1	A	2		II
Acer campestre	A	1					I
Achillea millefolium		1					I
Anthoxanthum odoratum			6				I
Arabidopsis thaliana	1						I
Arrhenatherum elatius				2			I
Carex spicata			2				I
Didymodon cf fallax						3	I
Hypericum perforatum					1		I
Hypochaeris radicata		1					I
Pastinaca sativa						1	I
Poa pratensis			2	A			I
Prunus avium		2					I
Rumex acetosa				2			I
Senecio jacobaea		2					I
Taraxacum sp.	1						I
Tragopogon pratensis					1		I
Tussilago farfara						4	I
Urtica dioica				1			I
Veronica chamaedrys	3						I
Veronica serpyllifolia		2				A	I
Vicia cracca					2		I
Vicia hirsuta				1			I
Arum maculatum		A					
Brachypodium sylvaticum	A						
Buddleja davidii						A	
Chamerion angustifolium			A	A			
Crepis capillaris	A						
Epilobium ciliatum						A	
Festuca pratensis				A			
Geranium robertianum	A						
Hedera helix	A						
Pulicaria dysenterica						A	
Total species	23	27	29	26	26	25	
Cover (%)	100	95	100	100	100	50	
Average sward height (cm)	50	45	60	55	50	15	
Approx canopy height (m)							

Photograph 14. Sparse Grassland and Ruderals in New Tree-planting Area.

3.3.5 The degree of variation within the grassland habitat means that some species were recorded that did not fall within the quadrats. These are generally species that were only present at low frequency, or plants located in the scrubby margins at the site boundary and tree planting areas.

Table 3.10: Additional Grassland Plants at Pound Hill

Agrimonia eupatoria
Angelica sylvestris
Anthriscus sylvestris
Blackstonia perfoliata
Calystegia silvatica
Carex divulsa
Cirsium palustre
Clematis vitalba
Corylus avellana
Dactylorhiza fuchsii
Daucus carota
Deschampsia cespitosa
Digitalis purpurea
Epilobium hirsutum
Epilobium lanceolatum
Epilobium parviflorum
Foeniculum vulgare
Galium aparine
Hirschfeldia incana
Lathyrus nissolia
Ligustrum vulgare
Linaria vulgaris
Luzula campestris
Melilotus cf altissimus
Myosotis arvensis
Oenothera glazioviana
Primula veris
Prunus spinosa
Quercus robur
Rosa canina
Rumex obtusifolius
Salix caprea
Sambucus nigra
Sanguisorba minor
Scrophularia nodosa
Silene dioica
Sonchus asper
Stachys sylvatica
Tamus communis
Trifolium dubium
Tripleurospermum inodorum
Viburnum opulus
Vicia sepium

3.3.6 The mature plantation at the western end of the site occupies a south-facing slope that adjoins domestic gardens and a small paddock. The dominant canopy species include Field Maple, Ash, Horse Chestnut, Alder and Hazel, with less frequent species including Scots Pine, Hawthorn, Sycamore, Yew, Dogwood and

Wild Cherry. The canopy height was mostly estimated at approximately 15m. There is a patchy understorey of Bramble, and locally Dogwood. Some parts have no understorey (especially near the eastern margin) and appear to have been subject to localised thinning.

3.3.7 The ground flora of the plantation is generally quite sparse and species-poor. The main species through much of the area is Ivy. The vegetation also includes locally prominent Nettle, Cow Parsley, Pendulous Sedge and common ferns. The western half has a slightly more diverse ground flora, and this locally includes species more typical of older woodland, most notably Bluebell, Wood Avens and Primrose. It is likely that these have spread into the plantation from the old wooded lane that adjoins the boundary fence at the western end of the plot. Tipped garden and domestic refuse has accumulated beside the boundary fence adjoining several of the adjacent properties. This was mostly covered by Nettles and Bramble. A drainage ditch is present beside part of the plantation's southern boundary. However, this was dry at the time of the survey and has no significant cover by vegetation.

3.3.8 In terms of the NVC, the plantation does not easily conform to a semi-natural woodland community due to its planted origin. The ground flora is closest to W21 *Crataegus monogyna – Hedera Helix* scrub vegetation, although in time might be expected to develop towards W8 woodland if it is colonised by more typical woodland plants from the surrounding area.

Photograph 15. Sparse Ground Flora in Highway Plantation at Pound Hill.

Photograph 16. Dense Nettle and Bramble in Highway Plantation at Pound Hill.

3.3.9 The scrub woodland at the eastern end of the study area is largely formed from self-sown Ash and Hawthorn. The majority of the trees are young Ash saplings, approximately 10m tall. The southern boundary of the scrub woodland is formed by a row of much older Ash and Field Maple trees, with occasional Hazel, Hawthorn and Holly, along a steep-sided bank. Some of the trees appear to have been layered as a hedge when they were much younger. Most of the scrub woodland is accessed by horses, and their trampling has resulted in a few patches of bare ground. A steep bank at the eastern margin is ungrazed and dominated by scrubby Hawthorn. The ground flora is relatively species-poor, and mostly dominated by Ivy and Lesser Celandine, with patchy Bramble, Bluebell, Rough Meadow-grass, Nettle, Dog's Mercury and Wood Dock. This scrub vegetation can be assigned to the NVC W21 *Crataegus monogyna – Hedera Helix* scrub community, but it appears to be in transition towards W8 *Fraxinus excelsior Acer campestre – Mercurialis perennis* woodland. Several of the typical woodland ground flora species in the young scrub, including Dog's Mercury, Bluebell and Primrose, are likely to have spread from old hedgerow at its southern margin.

Photograph 17. Dense Ash Saplings in Scrub Woodland at Pound Hill.

Photograph 18. Old Remnant Hedgerow at Edge of Scrub Woodland at Pound Hill.

Table 3.11: Pound Hill Quadrat Data for Plantation (7-11) and Scrub (12-16).

Quadrat	7	8	9	10	11	12	13	14	15	16	Freq.
Fraxinus excelsior	2	A	10	2	2	10	10	10	10	10	V
Hedera helix	10	9	8	8	9	9	9	8	6	4	V
Kindbergia praelonga	A	5	7	4	2	8	2	2	4	5	V
Rubus fruticosus	8	8	5	4	4		1	2	1	2	V
Dryopteris filix-mas		1	4	2	1	1		1	1		IV
Galium aparine	2	A	2	A	4	2	3	3	4	3	IV
Rumex sanguineus		A		1	2	1	2	1	1	4	IV
Arum maculatum	A		1	1	1				1	2	III
Brachythecium rutabulum	2	2			1		1		1	1	III
Phyllitis scolopendrium		2	1			1	2		1		III
Plagiomnium undulatum	2		2			2	7		2	2	III
Ranunculus ficaria				3		3	6	7	2	5	III
Tamus communis						2	2	1	2	2	III
Urtica dioica	2	1	A		2		1	A	2		III

Quadrat	7	8	9	10	11	12	13	14	15	16	Freq.
Acer campestre	10	A	1	10	A				1	A	II
Acer pseudoplatanus		1	1	1	10						II
Crataegus monogyna					10	4	1		A	4	II
Fissidens taxifolius					2	A		2	1		II
Geranium robertianum	1	A			1			1			II
Glechoma hederacea		1	8	3					4		II
Hyacinthoides non-scripta			1			A	A		4	5	II
Poa trivialis			1	4	A			A	2		II
Polystichum setiferum		4				1	2				II
Primula vulgaris				2		4	6	A	2		II
Aesculus hippocastanum		10									I
Agrostis capillaris								1	1		I
Anthriscus sylvestris					1						I
Brachypodium sylvaticum						1					I
Cardamine flexuosa								1		1	I
Carex pendula		1									I
Corylus avellana			1	2	A						I
Dryopteris dilatata		2	A								I
Epilobium ciliatum				1							I
Epilobium montanum			2							A	I
Epilobium parviflorum				1							I
Geum urbanum				1						1	I
Heracleum sphondylium	A			2	3						I
Mercurialis perennis								A	1	7	I
Pellia sp.								1			I
Prunella vulgaris				2			A	1	A		I
Prunus avium				1							I
Quercus robur	10										I
Ranunculus repens								1			I
Rhynchostegium confertum								2			I
Rosa arvensis							A	1			I
Rosa canina	4	A								A	I
Sambucus nigra		A					1			A	I
Taraxacum sp.				1							I
Veronica serpyllifolia					1			A			I
Vicia sepium				A		1					I
Viola odorata									2	A	I
Viola riviniana						2					I
Alnus glutinosa			A								
Betula pendula			A								
Ilex aquifolium				A							
Rumex obtusifolius								A			
Total species	11	13	16	21	17	16	16	18	23	16	
Cover (%)	100	100	100	90	80	95	100	80	100	100	
Average sward height (cm)	35	45	35	35	15	10	20	30	50	45	
Approx canopy height (m)	15	15	15	15	15	10	10	10	10	10	

3.3.10 Several plant species were recorded in the plantation and scrub habitats that were not present in the quadrats. These were only present at low frequency and do not include any species of special significance.

Table 3.12: Additional Species Not Present in Plantation and Scrub Quadrats at Pound Hill

Arctium minus
Artemisia vulgaris
Atrichum undulatum
Bromopsis ramosa
Cerastium fontanum
Chamerion angustifolium
Circaea lutetiana
Cornus sanguinea

Dactylis glomerata
Dipsacus fullonum
Holcus lanatus
Lapsana communis
Pinus sylvestris
Prunus laurocerasus
Scrophularia nodosa
Senecio jacobaea
Silene dioica
Sonchus oleraceus
Taxus baccata

3.3.11 Incidental sightings of birds during the survey at Pound Hill included Blackcap, Dunnock, Green Woodpecker, Robin and Wren. Other fauna observations included Burnet Companion moth, Common Blue butterfly, Speckled Wood butterfly, Yellow Shell moth, Grey Squirrel and Rabbit.

3.4 Site C: Whitecross Farm

3.4.1 The fields at Whitecross Farm are typical of the permanent pasture that occurs on much of the Gwent Levels and the survey area is shown on Map 3. They are divided by a network of reens and ditches, some of which also have hedges or scattered scrub beside them. Most of the fields also have a series of smaller, shallower field-grips providing drainage within the fields. The fields are grazed by cattle.

3.4.2 The fields can broadly be classified as semi-improved grassland, and they have been subject to varying degrees of re-seeding and treatment by fertilisers. One of the fields in the north-west of the site is better classified as improved grassland, having been reseeded with Perennial Rye-grass and White Clover relatively recently. This is considered separately from the other fields. In terms of the NVC this field can be categorised as MG7 *Lolium perenne – Trifolium repens* ley. This is a very low diversity sward with no significance for nature conservation. It had been cut, and the grass crop removed, shortly before the survey, but sufficient of the sward was left at the edges to be confident in this assessment.

Table 3.13: Quadrat Data for MG7 Improved Grassland at Whitecross Farm.

Quadrat	7	18	19	20	21	Frequency
Lolium perenne	8	9	10	5	10	V
Ranunculus repens	4	2	1	6	1	V
Trifolium repens	8	6		4	4	IV
Poa trivialis	6	2	4			III
Rumex obtusifolius		3	2	A	3	III
Alopecurus geniculatus			1	4		II
Glyceria fluitans				4		I
Holcus lanatus			4			I
Juncus inflexus				4		I
Plantago major					1	I
Ranunculus acris			1			I
Rumex crispus	1					I
Taraxacum sp.	2					I
Cirsium arvense			A			
Juncus effusus	A					
Total species	6	5	7	6	5	
Cover (%)	95	75	95	60	90	
Average sward height (cm)	15	30	40	15	10	

Photograph 19. MG7 Perennial Rye-grass Ley at Whitecross Farm

3.4.3 The semi-improved grassland fields are all quite similar, supporting relatively low diversity grassland in the raised parts, and a network of field-grips dominated by Hard Rush and Floating Sweet-grass. The grassland and field grips are discussed separately below, but they actually form a close mosaic and sometimes merge gradually from one to another rather than having distinct boundaries.

3.4.4 The drier grassland is dominated by a mix of Rough Meadow-grass, Yorkshire Fog, Perennial Rye-grass, Crested Dog's-tail, Creeping Buttercup and White Clover. Meadow Buttercup is frequent, and its yellow flowers are locally very prominent. The diversity of herb species is relatively poor, but a few areas (mainly in the east of the area) support species more characteristic of older grasslands, including Rough Hawk's-beard and Common Knapweed. The grassland can readily be assigned to the NVC MG6 *Lolium perenne - Cynosurus cristatus* grassland, and many parts are close to the MG6b *Anthoxanthum odoratum* sub-community. The locally notable species Meadow Barley and Meadow Brome were recorded in this community, but only at a low density.

Table 3.14: Quadrat Data for MG6 Semi-improved Grassland at Whitecross Farm.

Quadrat	1	4	6	11	12	14	16	17	23	25	26	28	Freq.
Cynosurus cristatus	2	4	1	2	5	4	4	4	6	6	2	7	V
Holcus lanatus	3	2	2	4	4	5	4	7	5	3	4	4	V
Lolium perenne	8	4	2	5	2	2	4	6	4	4	7	2	V
Poa trivialis	4	4	4	8	5	7	6	4	7	7	8	8	V
Ranunculus acris	A	2	1	1	1	4	4	2		4	2	3	V
Ranunculus repens	6	7	6	4	4	6	6	5	6	7	5	4	V
Trifolium repens	2	2	2	2	2	8	7	7	8	4			V
Anthoxanthum odoratum		3	2	5	3	4	4	5				5	IV
Alopecurus pratensis	3	4	A	4	4	4	2	A			5		III
Carex hirta	2	2	3	3			2			1	2		III
Juncus effusus		2		2	2	4	A		A	A	2	A	III
Juncus inflexus		5	5	1	A	2	4	4					III
Rumex acetosa		1	4	2	2	A	1	3					III

Quadrat	1	4	6	11	12	14	16	17	23	25	26	28	Freq.
Taraxacum sp.			2		1			2		2		2	III
Trifolium pratense	2		A			1	2	4	1	4			III
Agrostis stolonifera		7	6	4	2								II
Alopecurus geniculatus				1		A			4	2	A		II
Cardamine pratensis				1	1					4			II
Hordeum secalinum						2					2	1	II
Bellis perennis									2	3			I
Bromus hordeaceus								3					I
Bromus racemosus	1												I
Carex ovalis		1			5	A				A			I
Centaurea nigra										2		2	I
Cerastium fontanum				A	1			1					I
Cerastium glomeratum	2												I
Cirsium arvense	A							1					I
Dactylis glomerata	2									2			I
Festuca rubra										2			I
Lathyrus pratensis			1										I
Leontodon hispidus										A		2	I
Lotus corniculatus					1								I
Plantago major	1												I
Rumex crispus	1	1			A								I
Rumex obtusifolius	1												I
Glyceria fluitans							A						
Plantago lanceolata												A	
Total species	15	16	14	16	17	13	13	15	9	16	10	11	
Cover (%)	95	95	100	100	100	100	95	95	100	100	100	100	
Average sward height (cm)	20	35	15	15	10	40	30	10	5	15	35	30	

Photograph 20. MG6 Semi-improved Grassland at Whitecross Farm, With Field Grip in Left of Picture.

Photograph 21. Field Grip with Standing Water at Whitecross Farm.

3.4.5 The field-grips support a species-poor wetland flora dominated by Hard Rush and Floating Sweet-grass. A few places have other rush species, and Common Spike-rush is locally frequent in the wetter grips. The locally notable species Tubular Water-dropwort is present in several of the field grips, sometimes with patches of more than 100 plants. Within the NVC the majority of the field grips are best categorised as MG10b *Holcus lanatus* – *Juncus effusus* rush pasture *Juncus inflexus* sub-community. The deeper ones dominated by Floating Sweet-grass fall within the S22c *Glyceria fluitans* water-margin vegetation, *Alopecurus geniculatus* sub-community. However, these communities are often indistinct and merge from one to another.

Table 3.15: Quadrat Data for Field Grips at Whitecross Farm.

Quadrat	2	3	5	8	9	10	13	15	22	24	27	29	Freq.
Alopecurus geniculatus	2	2	6	4	4		8	6	6	7	A	4	V
Glyceria fluitans	10	8	5	8	7	9	2		4	2	A	2	V
Poa trivialis	4	5	2	2	6	2	4	8	4	5	6	7	V
Ranunculus repens	4	4	5	6	5	1	4	4	7	6	4	5	V
Anthoxanthum odoratum			2	1	3		4	2	A	2	4	4	IV
Juncus effusus		1	A		2	3		9	2	2	7	6	IV
Agrostis stolonifera			8	2	4	2			4	2			III
Alopecurus pratensis	2	1	3	2			1					4	III
Cardamine pratensis		2		1	3		2		A	3	2	1	III
Carex hirta	2	3		2	2	A		4		5	A	2	III
Cynosurus cristatus		2		1	A		A		2	4	4		III
Holcus lanatus	A	5			4	A	A	2		2	6	6	III
Juncus inflexus	A	2		4	4	2				2		1	III
Lolium perenne	A	2		2	A		A	3	1	A	4		III
Oenanthe fistulosa			4	3	5	2			2				III
Ranunculus acris	A	1		A			2	1	2	2	4	2	III
Bromus racemosus		2		1				3					II
Cerastium fontanum		2		1			1		1				II
Rumex crispus	1	A	A	A	1		A	1					II
Trifolium repens					A		A	A	1	2	2		II
Apium nodiflorum				A		2							I
Berula erecta						1							I
Brachythecium rutabulum						1							I
Calliergonella cuspidata										2			I
Callitriche sp.						2							I
Carex ovalis				A						2	1		I

Quadrat	2	3	5	8	9	10	13	15	22	24	27	29	Freq.
Centaurea nigra										A	2		I
Crataegus monogyna						1							I
Eleocharis palustris		4			5								I
Equisetum fluviatile						4							I
Galium palustre						3							I
Juncus articulatus			5				5						I
Juncus bufonius				2									I
Lemna minor						3							I
Leontodon hispidus										1			I
Lotus corniculatus											2		I
Myosotis laxa						2							I
Ranunculus sceleratus						2							I
Rorippa nasturtium-aquaticum						3							I
Rumex acetosa		A				A					1	A	I
Stellaria alsine					1	2							I
Taraxacum sp.		1											I
Trifolium pratense		4						A			2		I
Carex riparia								A					
Cerastium glomeratum		A											
Dactylis glomerata						A							
Heracleum sphondylium						A							
Oenanthe crocata						A							
Rumex conglomeratus						A							
Scrophularia auriculata						A							
Senecio aquaticus								A					
Urtica dioica						A							
Total species	7	18	9	16	15	19	10	11	12	17	15	12	
Cover (%)	100	100	100	90	95	100	100	100	95	95	95	95	
Average sward height (cm)	45	30	20	20	15	30	15	35	20	20	50	45	

3.4.6 Several plant species recorded at Whitecross Farm did not occur within the quadrats. These tended to be associated with the field margins and adjacent hedges and ditches. The locally notable Frogbit and Arrowhead were frequent in several of the ditches adjoining the site (though not within the grassland site itself). Another species noted in an adjacent ditch at the north-east boundary was the non-native invasive Water Fern.

Table 3.16: Additional Species Not Present in Grassland Quadrats at Whitecross Farm

Alisma plantago-aquatica
Azolla filiculoides
Capsella bursa-pastoris
Cardamine flexuosa
Chenopodium album
Cirsium palustre
Coronopus didymus
Deschampsia cespitosa
Epilobium hirsutum
Equisetum arvense
Filipendula ulmaria
Galium aparine
Geranium dissectum
Glechoma hederacea
Glyceria maxima
Hedera helix
Hydrocharis morsus-ranae
Hypericum tetrapterum
Iris pseudacorus
Juncus acutiflorus
Lycopus europaeus
Matricaria discoidea
Persicaria amphibia
Phragmites australis
Poa annua
Polygonum aviculare
Prunus spinosa
Quercus robur
Rorippa palustris
Rosa canina
Rubus fruticosus
Sagittaria sagittifolia

Sambucus nigra
Scutellaria galericulata
Solanum dulcamara
Stachys palustris
Ulmus minor

3.4.7 Incidental fauna sightings at Whitecross Farm included Buzzard, Carrion Crow, Cetti's Warbler, Goldfinch, Greenfinch, Grey Heron, Magpie, Mallard, Moorhen, Reed Warbler, Starling, Swallow, Wren and Speckled Wood butterfly. A large Grass Snake was observed crossing the track near the north-east boundary.

3.5 Site D: Alexandra Dock

Docks Habitats

3.5.1 Newport Docks has long been recognised as supporting a diverse and interesting flora. This interest is partly due to the accidental introduction of alien plants arriving on ships from around the world. It is also because of the varied range of substrata, which include rubble, gravel, estuarine mud and organic detritus, with both wet and dry areas. There are many areas of unoccupied land which are only infrequently disturbed, allowing them to develop a mix of grassland and scrub vegetation. The area selected for the vegetation survey is a relatively large and varied strip of land on the west side of the docks, which is likely to support a moderate proportion of the docks flora and is shown on Map 5. However, it must be remembered that a survey on such a patchy site as this is unlikely to record every species, especially because some species are only present in very small numbers and because many of the early flowering species would have died back by late July. Some notable species that have been recorded from the docks in the past, such as Deptford Pink and Southern Yarrow, have not been recorded in this part of the area, but may still be present in other parts of the docks outside the current study area.

Photograph 22. Grassland Patch Amongst Scrub in Northern Area at Alexandra Docks.

3.5.2 On such a variable site as this the quadrat data provides an indication of the more common species in the grassland habitats, but doesn't include many of the significant species that only occur at very low density, which are often the ones of

greatest interest. The quadrat sampling from the drier grassland area was split arbitrarily between the north and south parts. The northern area is generally on a slightly damper substratum than the south, and much of it occurs within a patchwork of dense Willow, Butterfly Bush and Bramble scrub. It does not readily conform to the published NVC communities, although some of the more grassy patches resemble MG1 *Arrhenatherum elatius* grassland, and others have elements of MG5 *Centaurea nigra - Cynosurus cristatus* grassland. There are many patches of more open ground and stands of ruderal vegetation, with some similarity to the OV23 *Lolium perenne - Dactylis glomerata* and OV24 *Urtica dioica - Galium aparine*, but most of the area is difficult to place within the NVC.

Table 3.17: Quadrat Data for Dry Grassland in Northern Part of Alexandra Dock Study Area.

Quadrat	1	4	5	6	7	9	10	11	14	17	Freq.
Centaurium erythraea	A	1	1	2	3	3	2		1	2	IV
Hypericum perforatum	1	A	A	2	1	2	1		8	3	IV
Prunella vulgaris	1		A	2	3	4	2	2		1	IV
Rubus fruticosus	1	A		4	4	2	1	6	1	2	IV
Agrostis stolonifera	9	5	A		2		8	3			III
Arenaria serpyllifolia			3	1	A	1			1	2	III
Cirsium arvense	1	2		2	A	2	1	A	A		III
Conyza sp.			3	2	2	4			1		III
Holcus lanatus	4	3	A		1	1				1	III
Homalothecium lutescens		2			6	5	2		4	2	III
Pastinaca sativa					2		2	2	1	1	III
Veronica serpyllifolia			2	2	2	4			1		III
Carex hirta	2			A	2	2					II
Cirsium vulgare		1	2				1	1			II
Dipsacus fullonum	1	A		2	A	A		2			II
Geranium molle				2	1	1		1			II
Leontodon autumnalis				3	2	1				1	II
Medicago lupulina	2	2					6				II
Myosotis arvensis						3		1	1		II
Oenothera biennis	1	A			2	2	2				II
Picris echioides	1	1	1						A		II
Potentilla reptans	2			2	6	4					II
Rumex crispus	1	1					1			1	II
Scrophularia auriculata	1				1	A	1		A		II
Tripleurospermum inodorum			4	1	A				1		II
Vulpia bromoides		8	1	1			4				II
Aira praecox			2								I
Anagallis arvensis			2						2		I
Anisantha madritensis		1									I
Arrhenatherum elatius	5						2				I
Blackstonia perfoliata				3		3					I
Brachythecium rutabulum	2										I
Bromus hordeaceus	2	A									I
Bryum sp.			6								I
Buddleja davidii				4	2					A	I
Calliergonella cuspidata								4			I
Carduus crispus									1		I
Carex flacca				2				A			I
Cerastium semidecandrum			2								I
Conyza bilbaoana							3				I
Conyza canadensis		2									I
Epilobium montanum					2					1	I
Epilobium obscurum					1			1			I
Epilobium parviflorum								2		1	I
Erigeron acer					1				1		I
Erodium cicutarium			2	2						A	I

Quadrat	1	4	5	6	7	9	10	11	14	17	Freq.
Fragaria vesca						2		A		8	I
Geranium dissectum					1	3					I
Glechoma hederacea				3	2						I
Hirschfeldia incana		A			1		A		2		I
Hypnum lacunosum									2		I
Juncus bufonius			4								I
Lotus corniculatus				A		1		9			I
Plantago lanceolata							1				I
Poa annua			2								I
Polypogon viridis	2										I
Pulicaria dysenterica			A			1					I
Ranunculus repens		1				2					I
Rhytidiadelphus squarrosus								3			I
Rosa canina					1						I
Rubus caesius					2						I
Sagina procumbens										1	I
Salix cinerea								2			I
Senecio jacobaea			3								I
Silene vulgaris		1									I
Sonchus asper			1				1				I
Syntrichia ruralis				2							I
Trifolium campestre		1					2				I
Trifolium pratense					1						I
Verbena officinalis					2						I
Vicia sativa		4									I
Achillea millefolium							A				
Bellis perennis									A		
Cerastium fontanum				A							
Chamerion angustifolium										A	
Crepis capillaris							A				
Epilobium hirsutum				A							
Juncus inflexus						A					
Melilotus cf altissimus	A										
Oenothera fallax							A				
Orobanche minor							A				
Poa trivialis				A							
Populus x canadensis						A					
Sonchus oleraceus									A		
Tanacetum vulgare		A									
Trifolium dubium	A										
Verbascum thapsus									A		
Total species	18	16	17	20	27	22	19	14	15	14	
Cover (%)	100	100	20	90	95	95	100	100	95	70	
Average sward height (cm)	100	30	5	50	30	20	60	40	55	10	

Photograph 23. Grassland Habitat in Northern Area at Alexandra Docks.

3.5.3 The grassland quadrats recorded in the southern area reflect that it is a generally drier and more grass-dominated area, but it is also difficult to place within the NVC. The closest match is with MG1 *Arrhenatherum elatius* grassland, of which this would be a very diverse example. There are also elements of sand-dune and ruderal open vegetation communities. Narrow-leaved Bird's-foot Trefoil and Grass Vetchling are both locally frequent in this area, and there are several plants of Dark Mullein and Viper's Bugloss. Much of the grassland is formed on or between piles of tipped refuse, or within a matrix of Butterfly Bush scrub.

Photograph 24. Diverse Grassland Vegetation in Southern Area at Alexandra Docks, Showing Patch of Restharrow.

Table 3.18: Quadrat Data for Dry Grassland in Southern Part of Alexandra Dock Study Area.

Quadrat	19	18	21	22	23	24	25	27	28	Freq.
Agrostis stolonifera	8	4	4	6	5	2	6	4	6	V
Holcus lanatus	4	8	5	7	4	4	7	9	5	V
Hypericum perforatum		1	1	5	3	2		3	1	IV
Medicago lupulina		5	4	2	3	2			3	IV
Plantago lanceolata	3			4	4	2	2	2		IV
Potentilla reptans	2	2	2	2	7		A		2	IV
Senecio jacobaea	2	1	A	1	1	2		2	2	IV
Cirsium arvense					5		4	2	1	III
Conyza sp.	2	1	1			1				III
Crepis capillaris		1	1	1				A	1	III
Lotus glaber	1	2	7	4						III
Pastinaca sativa	1				2	2	A	3		III
Rubus fruticosus					5	7	9	4	5	III
Rumex crispus	1			A	A	1	1	A	1	III
Brachythecium rutabulum					2				2	II
Carex hirta				2	2				5	II
Centaurium erythraea		1	3							II
Cerastium fontanum		1							3	II
Cirsium vulgare				1		A			1	II
Dactylis glomerata						4			4	II
Daucus carota			A	4		1			2	II
Dipsacus fullonum	A		1		1	2		A		II
Geranium dissectum	2				A				1	II
Hirschfeldia incana	A	A	1			4		1		II
Lotus corniculatus	1						A		2	II
Oenothera sp.		1	1					A		II
Orobanche minor				1	1					II
Picris echioides	1		1	1	A					II
Plantago major	1	2	2							II
Poa trivialis					2		4			II
Ranunculus repens	5							4	6	II
Trifolium dubium		4		2						II
Trifolium repens	4			A					3	II
Unidentified mosses		4	2							II
Urtica dioica					A		2	2		II
Verbena officinalis					1			1		II
Vicia hirsuta				2					2	II
Vicia sativa					A	1			1	II
Agrostis capillaris									2	I
Arrhenatherum elatius						2			A	I
Betula pendula			1							I
Bromus hordeaceus				2						I
Buddleja davidii		2				A		A		I
Calliergonella cuspidata	5									I
Calystegia sepium							1			I
Echium vulgare								1		I
Elytrigia repens				1						I
Eupatorium cannabinum									2	I
Galium aparine						2		A		I
Lathyrus nissolia				4					A	I
Leontodon autumnalis		2								I
Leucanthemum vulgare				1						I

Quadrat	19	18	21	22	23	24	25	27	28	Freq.
Linaria vulgaris					3					I
Melilotus cf altissimus						1				I
Oenothera glazioviana						1				I
Poa compressa				2						I
Potentilla anserina								2		I
Prunella vulgaris						2			A	I
Pseudoscleropodium purum									2	I
Ranunculus bulbosus	1									I
Salix cinerea			1							I
Scrophularia auriculata		1								I
Sonchus arvensis							2			I
Sonchus asper	1									I
Sonchus oleraceus									1	I
Tanacetum vulgare						2				I
Taraxacum sp.			2							I
Trifolium arvense		1								I
Trifolium campestre		1					A			I
Trifolium pratense	1									I
Tussilago farfara		2								I
Verbascum thapsus		1								I
Veronica persica						1				I
Vicia cracca				1						I
Agrostis gigantea						A				
Anisantha madritensis				A						
Artemisia vulgaris						A	A		A	
Aster x salignus							A			
Carex spicata									A	
Epilobium hirsutum						A				
Epilobium parviflorum	A									
Festuca rubra						A				
Geranium endressii								A		
Juncus inflexus					A					
Lathyrus sylvestris							A			
Myosotis arvensis								A		
Ononis repens						A				
Ranunculus acris							A			
Reseda luteola							A			
Senecio vulgaris								A		
Tripleurospermum inodorum	A							A		
Verbascum nigrum				A						
Total species	19	22	18	22	17	22	10	14	26	
Cover (%)	90	100	95	100	100	100	100	100	100	
Average sward height (cm)	15	40	45	50	40	70	100	60	35	

Photograph 25. Damp Ground With Hard Rush Community at Alexandra Docks

Photograph 26. Round-headed Club-rush in Marshy Ground at Alexandra Docks.

3.5.4 The grassland quadrats recorded in damper grassland were mainly from the northern half of the study area. In terms of the NVC these were closest to the MG10b *Holcus lanatus* - *Juncus inflexus* community. However, there are also elements more typical of dune-slack or saltmarsh vegetation, particularly in the marshy area represented by Quadrat 8, which included the locally notable Round-headed Club-rush, together with Salt-marsh Rush and abundant Jointed Rush. Sea Club-rush, Common Reed and the locally notable Dittander were observed in several other small damp patches.

Table 3.19: Quadrat Data for Damp Grassland in Alexandra Dock Study Area.

Quadrat	2	3	8	12	13	15	16	20	26	Freq.
Agrostis stolonifera	7	9	A	4	5	4	4	8	9	V
Juncus inflexus	5	4	7	4	4	A	2	6	4	V
Holcus lanatus			2		2	2	6	4	5	IV
Potentilla reptans	1		4	5		4	4		4	IV
Cirsium arvense	2		A	1	A	1		1	2	III
Dipsacus fullonum			1	1	1	1	1	A		III
Calliergonella cuspidata	5	5	8	2	6					III
Prunella vulgaris				1	4		2		2	III
Pulicaria dysenterica		A	7	8	7	A		5	A	III
Pastinaca sativa					2	4	2		5	III
Carex otrubae	2	A	2	4	1					III
Cratoneuron filicinum	6	5	A	5	4					III
Rumex conglomeratus	1		1	1		1	A			III
Rubus fruticosus				A	A	2	4	A	2	II
Carex hirta					2	2	4		A	II
Lotus corniculatus					2	1	2			II
Rumex crispus	2	2	A					1		II
Scrophularia auriculata						A	A	1	1	II
Brachythecium rutabulum							3		2	II
Poa trivialis						2		A	4	II
Trifolium repens				4			5			II
Eupatorium cannabinum					A		1		2	II
Potentilla anserina						4	2			II
Juncus articulatus	6	5	A							II
Hypericum perforatum						A	1			I
Centaurium erythraea							1			I
Ranunculus repens				4						I
Geranium dissectum				2		A				I
Senecio jacobaea								1		I
Plantago lanceolata								4		I
Cirsium vulgare								1		I
Picris echioides								1		I
Daucus carota								2		I
Plantago major	2									I
Verbena officinalis									1	I
Vicia sativa					1			A		I
Cerastium fontanum							1			I
Epilobium parviflorum									1	I
Glechoma hederacea						2				I
Trifolium pratense					1					I
Melilotus cf altissimus					A	7				I
Sonchus arvensis									2	I
Taraxacum sp.									2	I
Brachypodium sylvaticum							5			I
Carex spicata							1			I
Centaurea nigra						2				I
Crocosmia crocosmiiflora						5				I
Juncus gerardii			A	4						I
Kindbergia praelonga								2		I
Lactuca serriola									1	I
Lepidium latifolium				2						I
Lysimachia punctata						4				I
Odontites vernus				A	A	2	A			I
Persicaria amphibia						4				I
Phragmites australis		A	A	2						I
Scirpoides holoschoenus			1							I
Senecio erucifolius					3					I
Vicia tetrasperma							2			I

Quadrat	2	3	8	12	13	15	16	20	26	Freq.
Lotus glaber						A				
Arrhenatherum elatius							A	A		
Buddleja davidii									A	
Salix cinerea			A							
Urtica dioica							A		A	
Ranunculus bulbosus		A								
Rosa canina							A			
Bolboschoenus maritimus				A						
Lathyrus pratensis					A					
Artemisia vulgaris						A				
Calystegia silvatica				A						
Carex ovalis					A					
Chamerion angustifolium							A			
Deschampsia cespitosa		A								
Epilobium hirsutum									A	
Lotus pedunculatus						A				
Lycopus europaeus		A	A							
Sambucus nigra									A	
Solanum dulcamara			A	A						
Typha(cf x glauca)	A									
Typha latifolia	A									
Total species	11	6	9	17	15	19	20	13	17	
Cover (%)	100	100	100	100	100	100	100	100	90	
Average sward height (cm)	110	60	60	70	60	80	20	70	80	

3.5.5 The quadrat lists indicate the relatively high diversity of the grassland areas, even though the number of species per quadrat is very variable, and some only support relatively common plants. Many additional species were recorded that are present in only small numbers, and these include some of the notable species. One such species was Yellow-horned Poppy, which was only recorded in small numbers on a gravel-pile at the south of the area. Others included Thorn

Photograph 27. Yellow-horned Poppy on Aggregate Stock-pile at Alexandra Docks.

Apple, Black Horehound and Beard-grass, which were present amongst ruderals growing from organic waste at the edge of the operational yard at the south of the area. A single plant of Balm-leaved Figwort was recorded in gravel beside a wall in the south of the site. Several uncommon ruderals were associated with the

piles of tipped rubble and other debris in the south and central parts of the site, including Viper's Bugloss, Great Lettuce, Dittander and Hawkweed Oxtongue.

Table 3.20: Additional Species Not Present in Grassland Quadrats at Alexandra Dock

Acer campestre
Aegopodium podagraria
Aira caryophyllea
Alchemilla mollis
Amaranthus retroflexus
Anacamptis pyramidalis
Anisantha sterilis
Aphanes australis
Arctium minus
Ballota nigra
Barbarea vulgaris
Brachyglottis x jubar
Carex divulsa
Carex pendula
Carex riparia
Carex sylvatica
Centranthus ruber
Cerastium glomeratum
Chenopodium album
Chenopodium ficifolium
Chenopodium rubrum
Clematis vitalba
Cornus sanguinea
Cornus sericea
Coronopus didymus
Cortaderia selloana
Crataegus monogyna
Crepis vesicaria
Dactylorhiza praetermissa
Datura stramonium
Didymodon sp.
Eleocharis palustris
Epilobium ciliatum
Epilobium lanceolatum
Equisetum arvense
Equisetum telmateia
Euonymus europaeus
Euphorbia peplus
Fallopia japonica
Festuca arundinacea
Filipendula ulmaria
Foeniculum vulgare
Galega officinalis
Geranium robertianum
Geranium rotundifolium
Geum urbanum
Glaucium flavum
Hedera helix
Heracleum sphondylium
Hieracium sect*. sabauda*
Juncus effusus
Lactuca virosa
Leontodon saxatilis
Leycesteria formosa
Lolium perenne
Malus pumila
Malva moschata
Malva sylvestris
Matricaria recutita
Mentha sp.
Myosotis laxa
Origanum vulgare
Parthenocissus sp.
Peltigera cf hymenina
Persicaria hydropiper
Persicaria maculosa
Polypogon monspeliensis
Primula vulgaris
Prunus spinosa
Ranunculus sceleratus
Reseda alba
Rorippa palustris
Rumex acetosella
Rumex obtusifolius
Sagina apetala
Salix caprea
Salix fragilis
Saponaria officinalis
Scrophularia nodosa
Scrophularia scorodonia
Sedum acre
Sedum anglicum
Senecio squalidus
Senecio viscosus
Silene latifolia
Sison amomum
Solanum nigrum
Stachys sylvatica
Stellaria media
Tamus communis
Teucrium scorodonia
Torilis japonica
Ulex europaeus
Vicia faba
Vulpia myuros
Zea mays

3.5.6 A young plant of a narrow-leaved Bulrush was recorded in the damp ground in the northern part of the area. This may have been Lesser Bulrush or a hybrid of this species, but the plant had insufficient characters to confirm the identification at the time of the survey.

Photograph 28. Narrow-leaved Bird's-foot Trefoil in Grassland at Alexandra Docks.

Photograph 29. Thorn Apple on Organic Waste at Alexandra Docks.

3.5.7 Incidental fauna observations at Alexandra Docks included Marbled White, Gatekeeper, Peacock, Comma, Meadow Brown and Ringlet Butterflies, Southern Hawker Dragonfly, Blue-tailed Damselfly and signs of Rabbit and Fox. Brown Rats appeared to be locally abundant. A colony of Sand Martins was present in the aggregate pile at the south of the area. Other birds included Blackbird, Collared Dove, Dunnock, Goldfinch, Greenfinch, Jackdaw, Herring Gull, House Sparrow, Kestrel, Lesser Black-backed Gull, Linnet, Magpie, Moorhen, Swallow,

Whitethroat, Wood Pigeon and Wren. Coot, Great-crested Grebe, Kingfisher, Mute Swan and Reed Warbler were noted in the dock to the south.

Ebbw Saltmarsh

3.5.8 The eastern bank of the Ebbw supports a varied range of saltmarsh habitats, including a transition from regularly inundated habitats to dry grassland and scattered scrub and is shown on Map 4. There are also large areas of dense reeds. The higher ground supports areas of dense scrub, and some areas with a mosaic of patchy scrub and grassland. No livestock have access to the saltmarsh, but some areas of the drier grassland higher up the bank are kept open by Rabbit grazing.

3.5.9 Large areas of the bank to the north and south of the study area are dominated by Common Reed. This forms a dense and relatively species-poor cover which is over 2m tall in many areas. The presence of large accumulations of driftwood, plastic bottles and other flotsam through the reedbed habitat indicates that it lies within the inundation zone of the Ebbw. The reed extends to the edge of the steep muddy banks, where it is fringed by a fragmentary strip of Sea Aster and English Scurvy-grass. A few small patches of Sea Club-rush are also present at the seaward edge of the reeds, especially at the southern extent of the study area (represented by Quadrat 1). The reedbed is best classified as NVC S4d *Phragmites australis* reedbed, *Atriplex prostrata* sub-community. The Sea Club-rush patches would fall into the category of S21 *Bolboschoenus maritimus* swamp.

Table 3.21: Quadrat Data for Reed Dominated Habitat at Ebbw Saltmarsh.

Quadrat	1	2	3	4	10	Frequency
Phragmites australis	4	10	10	6	10	V
Aster tripolium	2	1		4	2	IV
Atriplex prostrata		2	2	1	2	IV
Cochlearia anglica	1	2		8		III
Agrostis stolonifera		2	1			II
Bolboschoenus maritimus	10	1				II
Calystegia sepium		4	4			II
Elytrigia repens		2	3			II
Lepidium draba		2	1			II
Apium graveolens		2				I
Glaux maritima		1				I
Puccinellia maritima					2	I
Sonchus arvensis			2			I
Triglochin maritimum					1	I
Oenanthe lachenalii					A	
Total species	4	11	7	4	5	
Cover (%)	90	100	100	90	100	
Average sward height (cm)	100	160	190	100	250	

Photograph 30. Saltmarsh Reedbed, With Scattered Plants of Perennial Sow-thistle.

3.5.10 The central part of the Ebbw study area, between the tall stands of reeds to the north-west and south-east, includes approximately 200m of lower-growing vegetation, some of which appears to have been formed over rubble and other fill materials. This relatively open section shows a gradual succession from Sea Aster-dominated saltmarsh vegetation at the seaward edge to coarse grassland and scrub on the higher ground. Quadrats were taken from the lower and upper parts of the saltmarsh habitat to assist in describing the vegetation, although this was a very arbitrary division because the edges of the communities are not clearly defined. The lower zone of the salt-marsh has a high proportion of salt-tolerant low-growing plants, while the upper level includes a more diverse mix of saltmarsh and grassland plants that merges into the adjacent grassland and tall herb vegetation.

Photograph 31. Central Area of Low-growing Saltmarsh.

3.5.11 The lower saltmarsh vegetation can mostly be described as the NVC SM13b *Puccinellia maritima* saltmarsh, *Glaux maritima* sub-community. It also has

elements of the SM11 *Aster-tripolium* community where Sea Aster is particularly dominant at its lower edges. There are occasional plants of Common Cord-grass, but they do not form extensive stands here.

Table 3.22: Quadrat Data for Lower Zone of Saltmarsh Habitat.

Quadrat	5	6	7	8	9	Frequency
Aster tripolium	2	5	6	7	5	V
Glaux maritima	4	10	5	2	4	V
Plantago maritima	2	4	5	2	4	V
Puccinellia maritima	5	7	6	9	9	V
Agrostis stolonifera	A	3	4	2	2	IV
Cochlearia anglica	3	2	A	2	5	IV
Spergularia media	1	A	2	2	2	IV
Spartina anglica		2		2	1	III
Suaeda maritima	2	2	2	A		III
Apium graveolens			1			I
Atriplex prostrata			2	A		I
Festuca rubra			A	A	1	I
Triglochin maritimum					1	I
Beta vulgaris				A		
Lepidium latifolium					A	
Plantago coronopus		A		A		
Total species	7	8	9	8	10	
Cover (%)	80	90	95	100	100	
Average sward height (cm)	30	20	25	30	40	

3.5.12 The upper saltmarsh vegetation broadly falls within the SM16 *Festuca rubra* - *Juncus gerardii* saltmarsh community, although Saltmarsh Rush is not constant in this situation. It is more diverse than the lower zone, and supports several locally notable species including abundant Dittander, and small amounts of Wild Celery, Parsley Water-dropwort and Hard-grass.

Photograph 32. Hard-grass in Short Vegetation in the Upper Saltmarsh.

Table 3.23: Quadrat Data for Upper Zone of Saltmarsh Habitat.

Quadrat	11	14	15	16	17	Frequency
Festuca rubra	10	9	8	4	7	V
Glaux maritima	2	3	2	5	2	V
Agrostis stolonifera	4	4	9		7	IV
Plantago maritima	2	3	2	4		IV
Aster tripolium	1			2	1	III
Hordeum secalinum		4	2		1	III
Lepidium latifolium		2	3	A	2	III
Plantago coronopus	A	2	A	5	2	III
Apium graveolens	A			2	2	II
Beta vulgaris	A	1		2	A	II
Carex otrubae	A	A	1		1	II
Cirsium arvense		2			1	II
Festuca arundinacea		2	1			II
Leontodon autumnalis	1	1				II
Lolium perenne		2			2	II
Oenanthe lachenalii		1	1			II
Parapholis strigosa			6	2		II
Picris echioides		1		1		II
Plantago lanceolata		A	2		1	II
Trifolium repens	A		5		1	II
Anagallis arvensis				2		I
Cochlearia anglica	A			2		I
Juncus gerardii		2			A	I
Oenanthe crocata		1				I
Plantago major	A	1				I
Spergularia media	1			A		I
Suaeda maritima	1			A		I
Trifolium pratense		5	A			I
Triglochin maritimum		2			A	I
Elytrigia repens	A			A	A	
Melilotus cf altissimus					A	
Rosa rugosa		A	A			
Rubus fruticosus			A		A	
Total species	8	19	12	11	13	
Cover (%)	100	100	100	90	100	
Average sward height (cm)	10	40	15	15	10	

Photograph 33. Abundant Dittander Flowering at the Upper Edge of the Saltmarsh.

3.5.13 One small patch of the upper shore is dominated by Sea Couch and this can be classified as SM24 *Elytrigia atherica* saltmarsh vegetation. Only two quadrats were recorded here due to the size of the patch. Common Couch was also present in other parts of the upper saltmarsh and reedbed, but not forming this type of dense vegetation. The upper edge of the patch merges into the adjacent MG1 grassland and scattered scrub.

Table 3.24: Quadrat Data for SM24 Sea Couch Vegetation.

Quadrat	12	13	Frequency
Festuca rubra	2	2	V
Elytrigia atherica	10	10	V
Lepidium latifolium		2	III
Beta vulgaris	1		III
Lepidium draba	1		III
Oenanthe lachenalii		1	III
Oenanthe crocata	1		III
Rubus fruticosus	1	A	III
Aster tripolium		A	
Atriplex prostrata	A		
Phragmites australis	A		
Triglochin maritimum		A	
Calystegia sepium	A		
Cirsium arvense		A	
Festuca arundinacea	A		
Arrhenatherum elatius	A		
Rumex crispus		A	
Fraxinus excelsior	A		
Melilotus cf altissimus		A	
Total species	6	4	
Cover (%)	100	100	
Average sward height (cm)	110	100	

Photograph 34. SM24 Sea Couch Vegetation.

3.5.14 The highest ground at the eastern side of the strip, adjacent to the landfill site and operational areas of the docks, is mostly dominated by dense scrub. This largely comprises dense Bramble with Grey Willow and Butterfly Bush, and occasional Crack Willow and Alder. Japanese Knotweed is locally common. Other prominent tall ruderal herbs in this habitat include Nettle, Hedge Bindweed and Cleavers. The scrub was only examined briefly from the margins because it was considered very unlikely to support any plant communities of significance for nature conservation.

3.5.15 A few more open places above the saltwater inundation zone support scattered scrub with patchy grassland vegetation, maintained by Rabbit-grazing. Quadrats were not recorded in this area due to the small-scale and fragmented nature of the community, but it was broadly considered to be a mosaic of MG1 *Arrhenatherum elatius* grassland and W24 *Rubus fruticosus - Holcus lanatus* underscrub. The pink form of Scarlet Pimpernel, noted as being the least common variant of this species in Monmouthshire (Evans, 2007), and Wall Bedstraw, a recent colonist to South Wales, were present on stony ground at the upper fringe of the saltmarsh. A single dead leaf of Giant Knotweed was found on the edge of the upper saltmarsh, but no actual plants of this species were seen and it may have blown into the area from a nearby site.

Table 3.25: Additional Grassland and Scrub Species at Upper Edge of Ebbw Saltmarsh

Acer pseudoplatanus
Alnus cordata
Alnus glutinosa
Artemisia vulgaris
Brachypodium sylvaticum
Brachythecium rutabulum
Bromus hordeaceus
Buddleja davidii
Carex divulsa
Carex flacca
Carex hirta
Carex pendula
Carex spicata
Centaurea nigra
Centaurium erythraea
Cotoneaster horizontalis
Crataegus monogyna
Crepis capillaris
Dactylis glomerata
Dipsacus fullonum

Eupatorium cannabinum
Fallopia japonica
Galium aparine
Galium parisiense
Geranium dissectum
Hirschfeldia incana
Holcus lanatus
Hypericum perforatum
Leontodon saxatilis
Lotus corniculatus
Malus pumila
Malva moschata
Medicago lupulina
Mentha sp.
Odontites vernus
Oenothera fallax
Pastinaca sativa
Primula vulgaris
Ranunculus acris
Rosa canina
Rumex conglomeratus
Salix cinerea
Salix fragilis
Sambucus nigra
Solanum dulcamara
Tripleurospermum inodorum
Ulex europaeus
Urtica dioica
Verbena officinalis
Vicia sativa

3.5.16 Incidental fauna observations during the saltmarsh vegetation survey included Redshank, Oystercatcher, Mallard and signs of Rabbit and Fox.

3.6 Site E: Woodland at Pye Corner

3.6.1 This is a small area of broad-leaved plantation with a dense scrub-woodland character shown on Map 6. The dominant canopy species include Hawthorn, Field Maple, Hornbeam, Ash and Spindle, although other trees also occur, including Downy and Silver Birch, Pedunculate Oak, Bird Cherry, Sycamore, Horse Chestnut and Hybrid Black Poplar, especially near the margins. The trees appear to be mostly less than about 30 years old, although some of the larger trees at the margins are clearly older than this and probably formed part of the former field boundaries. These boundary species also include Small-leaved Elm, Blackthorn and Wild Plum. In addition, a number of Apple trees in the eastern part of the plot may be remnants of a former orchard. The tree canopy is mostly dense and closed, and there is a thick understorey of Bramble and Nettles through many parts. Other areas, where the canopy is particularly dense, are relatively free from Bramble and have a mainly low-growing, species-poor ground flora, which is largely dominated by Ivy. A central corridor adjacent to a recently constructed cycle-path has a more open character, and is locally fringed by grassland and tall herb vegetation. A shaded wet ditch is present beside the southern margin. This appears to be largely unvegetated except for a localised cover by duckweed. A shaded ditch adjoining part of the north-east boundary was dry at the time of the survey. This is largely filled by dead leaves, with vegetation mainly limited to occasional Nettle and Bittersweet.

Photograph 35. Dense Plantation, Showing Species-poor Ground Flora.

3.6.2 The quadrat data for the woodland habitats covers the broad range of variation within the plot. It includes two quadrats from relatively wet woodland near to the ditch (Quadrats 3 and 6) and one from dense Bramble scrub below overhead lines. Several of the quadrats include plants which are more typically associated with grassland and tall herb communities, and this reflects the local transitions to these communities near to the more open areas including the cycle path and site margins. In terms of the NVC the plantation is probably best described as the W21 *Crataegus monogyna – Hedera helix* scrub community. It is probably in transition towards W8 *Fraxinus excelsior – Acer campestre – Mercurialis perennis* woodland, particularly because of the canopy, which has largely been derived from planting. However, the ground flora contains very few species typically indicative of older woodlands.

Table 3.26: Quadrat Data for Scrub Woodland Vegetation at Pye Corner.

Quadrat	1	3	5	6	7	8	9	10	Frequency
Hedera helix	10	2	10	8	10	8	9	10	V
Urtica dioica	1	6	A	4	9	7	2	4	V
Acer campestre	1		10			10	1	1	IV
Arum maculatum	1	2			2		1	1	IV
Brachythecium rutabulum	2	3		2	2	2			IV
Heracleum sphondylium	2		1		1	2	2	8	IV
Kindbergia praelonga	3	2	2	2	8	4			IV
Phyllitis scolopendrium		1		1	2	2	2		IV
Rubus fruticosus	1	2	A	8	A	4	9	1	IV
Galium aparine	2		A	1		1		1	III
Anthriscus sylvestris	2							2	II
Carpinus betulus	8				4	4			II
Crataegus monogyna	1	A	1					1	II
Dryopteris dilatata					2	1			II
Epilobium hirsutum	A	6					2	1	II
Euonymus europaeus	A	A	2		1	A		1	II
Fraxinus excelsior			2				2		II
Glechoma hederacea	1				2	2			II
Oenanthe crocata		8		1			5		II
Rumex sanguineus		1	2					1	II
Acer pseudoplatanus			1				A		I
Athyrium filix-femina				2					I

Quadrat	1	3	5	6	7	8	9	10	Frequency
Betula pubescens					8				I
Bromopsis ramosa								1	I
Calystegia silvatica		1							I
Cardamine flexuosa		1							I
Carex otrubae		1							I
Circaea lutetiana		2							I
Cirsium arvense							1	A	I
Dryopteris filix-mas	2				A	A		A	I
Eupatorium cannabinum							1		I
Geranium robertianum		2							I
Ligustrum vulgare					1				I
Malus pumila							A	9	I
Plagiomnium undulatum		2							I
Poa trivialis					2				I
Polystichum setiferum					1				I
Populus x canadensis				1					I
Prunus cf domestica						1			I
Prunus padus	9		A	A					I
Ranunculus repens					1				I
Rosa canina							1		I
Sison amomum					1				I
Solanum dulcamara					1				I
Ulmus minor				2			A		I
Aesculus hippocastanum		A		A					
Betula pendula	A								
Clematis vitalba							A		
Quercus robur					A				
Stachys sylvatica	A								
Symphoricarpos albus		A							
Torilis japonica			A						
Weigela florida		A							
Total species	15	16	9	11	18	13	13	14	
Cover (%)	100	100	100	100	100	100	100	100	
Average sward ht (cm)	800	70	900	60	600	600	150	600	

Photograph 36. Dense Nettle and Bramble Vegetation Near to Shaded Ditch.

3.6.3 The plot margins are locally dominated by tall herb vegetation and Bramble, which generally falls within the NVC OV24 *Urtica dioica – Galium aparine* community, with local transitions into grassland and weed communities at the

sunnier edges. Quadrat 11 was recorded from tall vegetation at the edge of the cycle path as an example of this transition. Stone Parsley occurs in several parts of the plot, but the main concentrations of this species are at the path sides and more open margins. Montbretia and several other non-native species are also present at the margins, especially beside Picked Lane, where they have presumably been planted or established from garden throw-outs.

Table 3.27: Quadrat Data for Tall Herb Vegetation at Pye Corner.

Quadrat	2	4	11	12	Frequency
Urtica dioica	8	9	2	5	V
Galium aparine	5	4	4	2	V
Epilobium hirsutum	5	4	7	2	V
Rubus fruticosus	A	6	7	4	IV
Rumex sanguineus		2	2	3	IV
Anthriscus sylvestris		2	2	2	IV
Poa trivialis		2	5	2	IV
Calystegia sepium		2	3	2	IV
Hedera helix	4	A	3		III
Brachythecium rutabulum	1	1			III
Glechoma hederacea	4	2			III
Oenanthe crocata			1	1	III
Dryopteris filix-mas			1	1	III
Ranunculus repens			2	4	III
Cirsium vulgare	1		1		III
Ranunculus acris	A	2	2		III
Rumex obtusifolius		1		6	III
Heracleum sphondylium			2		II
Kindbergia praelonga	1				II
Acer campestre	1				II
Cirsium arvense				2	II
Eupatorium cannabinum			1	A	II
Geranium robertianum	1				II
Sison amomum				2	II
Agrostis capillaris		1			II
Anisantha sterilis				1	II
Clematis vitalba				1	II
Dactylis glomerata		A		2	II
Equisetum arvense		4			II
Geranium dissectum			1		II
Lotus pedunculatus			1		II
Malva moschata				2	II
Prunus spinosa	1				II
Stachys sylvatica	1				II
Trifolium repens				1	II
Epilobium ciliatum	2			A	II
Aesculus hippocastanum	A				
Betula pendula			A		
Carpinus betulus	A				
Cirsium palustre	A				
Crataegus monogyna	A				
Dryopteris dilatata	A				
Epilobium parviflorum	A				
Malus pumila				A	
Plantago lanceolata				A	
Plantago major		A			
Poa annua		A			
Potentilla reptans				A	
Prunus padus		A			
Salix fragilis	A				
Senecio jacobaea				A	
Taraxacum sp.		A			

Quadrat	2	4	11	12	Frequency
Total species	13	14	18	19	
Cover (%)	90	100	100	100	
Average sward height (cm)	60	110	120	70	

Photograph 37. Nettle-dominated Tall Herb Vegetation at Path Margins.

Table 3.28: Additional Species Not Present in Quadrats at Pye Corner.

Acer platanoides
Aegopodium podagraria
Apium nodiflorum
Arrhenatherum elatius
Bellis perennis
Brachypodium sylvaticum
Bromus hordeaceus
Buddleja davidii
Carex pseudocyperus
Centaurea nigra
Cerastium fontanum
Corylus avellana
Crepis vesicaria
Crocosmia crocosmiiflora
Elytrigia repens
Festuca rubra
Geum urbanum
Holcus lanatus
Hyacinthoides cf hispanica
Ilex aquifolium
Juncus inflexus
Lapsana communis
Lathyrus pratensis
Lemna minor
Lemna minuta
Lolium perenne
Medicago lupulina
Myosotis arvensis
Narcissus sp. (ornamental)
Pellia sp.
Polypodium sp.
Potentilla anserina
Prunella vulgaris
Salix cinerea
Sambucus nigra
Scrophularia auriculata
Sonchus asper
Sonchus oleraceus
Tamus communis
Taxus baccata
Trifolium dubium
Trifolium pratense
Vicia sativa
Viola odorata

3.6.4 The reen adjoining the western margin was not part of the wooded study area but observations made in passing suggested that it supports a diverse waterside and aquatic flora, including several plants of Hop Sedge.

3.6.5 Incidental fauna observations within the plot include Blackbird, Blue Tit, Carrion Crow, Chaffinch, Chiffchaff, Great Tit, Jackdaw, Robin, Song Thrush, Wood Pigeon, Wren, Speckled Wood butterfly, Yellow Shell Moth and several Lackey Moth larvae. Whitethroat and Cetti's Warbler were heard calling from a nearby field boundary beyond the eastern margin, and a family of Moorhens were present on the eastern reen.

3.7 Site F: Tatton Farm

3.7.1 This site is entirely made up of grazed pasture, with the western part grazed by sheep and the eastern part by cattle and is shown on Map 7. The fields are broadly very similar, and typical of pasture on the Gwent Levels. They are divided by a series of ditches, many of which also have hedges over and/or beside them. There is also a series of shallower field-grips providing drainage within the fields. The damp and dry communities are discussed separately in the following text, but it is important to note that they form a very close mosaic and often merge gradually from one to another.

Photograph 38. Typical View of Field at Tatton Farm, Showing Mix of Species-poor Semi-improved Grassland and Rush-dominated Field-grips.

3.7.2 The drier grassland areas are generally rather species-poor, being dominated by grasses, particularly Rough Meadow-grass, Crested Dog's-tail, Perennial Rye-grass, Meadow Barley, Yorkshire Fog, Red Fescue and Sweet Vernal-grass. Hairy Sedge is also common. The most prominent herb species at the time of the survey was Meadow Buttercup which was flowering. Other frequent species include Creeping Buttercup, White Clover, Common Sorrel and Common Mouse-ear. None of the drier grassland was considered to have a high diversity, but a few relatively diverse fields had occasional plants of Common Knapweed, Meadow Vetchling, Tufted Vetch, Rough Hawkbit, Meadow Brome and Glaucous Sedge, indicating that they had not been subject to much recent agricultural improvement. Other fields that have been reseeded relatively recently have a higher proportion of Perennial Rye-grass and White Clover, and a much lower proportion of associate grasses and herbs (although Creeping Thistle can be locally prominent). In terms of the NVC, most of the dry grassland can be classified as MG6 *Lolium perenne – Cynosurus cristatus* grassland, and within

this category most of it fits within the MG6b *Anthoxanthum odoratum* sub-community. However, the less diverse fields are typical of MG7b Lolium perenne – *Poa trivialis* ley, and the more diverse fields are in a state of transition towards MG5 *Centaurea nigra – Cynosurus cristatus* grassland. The fields show a range of transition between all of these vegetation types. The quadrat sampling confirmed that there was little difference between the fields grazed by sheep and those grazed by cattle.

Table 3.29: Quadrat Data for Sheep-grazed Semi-improved Grassland at Tatton Farm.

Quadrat	1	5	7	9	12	14	15	17	18	22	24	25	27	Freq
Anthox.odoratum	7	8	1	9	4	2		9	5	4	4	7	8	V
Carex hirta	4	4	2		5		6	6	2	5	7	5	4	V
Cerastium fontanum	1	3	1	1	2	1		2	2	2	2	2	2	V
Cynosurus cristatus	3	5	3	5	7	2	2	4	5	7	7	7	4	V
Hordeum secalinum	4	2	3	3	3	1		1	5	2	3	4	2	V
Lolium perenne	4	4	6	2	2	8	5	2	4	5	3	5	6	V
Ranunculus repens	4	4	2	3	2	A	A	4	4	4	4	5	4	V
Trifolium repens	4	5	2	4		2	A	4	5	5	7	4	5	V
Cirsium arvense	2		2	A		2	5		3	5	4	4	3	IV
Festuca rubra	8	7	A		2	2		1	8		3		4	IV
Holcus lanatus	2	A	5	4				2	2	2	2	4	2	IV
Poa trivialis		A	9	5		7	9	2	2	2	4	5	2	IV
Luzula campestris	2	5		2	2			2	5		2			III
Alopecurus pratensis			A	1	A		4	A				1	1	II
Bellis perennis		A	1		2			2						II
Brachy.rutabulum								1		1	2	2		II
Callierg. cuspidata		1	1		1									II
Cirsium vulgare					1	1					1			II
Dactylis glomerata			2	1		1								II
Ranunculus bulbosus		4			4				2					II
Rumex acetosa	A		1		A				2			2		II
Taraxacum sp.	A	1								2	2	A		II
Trifolium pratense					2			1	2				1	II
Agrostis capillaris												4	4	I
Agrostis stolonifera				1										I
Bromus racemosus											3		2	I
Carex flacca											2			I
Centaurea nigra													2	I
Cirsium palustre					1									I
Juncus inflexus			A		A			A		A		2		I
Lathyrus pratensis										1				I
Lotus corniculatus	1													I
Poa pratensis	2	1												I
Potentilla reptans										1				I
Rumex crispus						1								I
Rumex obtusifolius						2								I
Urtica dioica						4	1							I
Ranunculus acris					A									
Juncus effusus								A			A			
Alopec. geniculatus							A							
Carex spicata											A			
X Festulol. loliaceum	A													
Total species	14	14	15	13	15	14	7	15	16	15	18	16	17	
Cover (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	
Avg. sward height (cm)	10	15	30	20	10	30	35	15	10	25	30	20	20	

Table 3.30: Quadrat Data for Cattle-grazed Semi-improved Grassland at Tatton Farm.

Quadrat	28	33	36	38	41	44	47	Frequency
Anthoxanthum odoratum	2	4	4	4	2	5	2	V
Carex hirta	5	4	1	7	2	4	2	V
Cynosurus cristatus	5	1	5	3	5	6	7	V
Holcus lanatus	3	6	4	4	2	7	2	V
Hordeum secalinum		7	2	2	3	7	7	V
Lolium perenne	5	4	8	4	5	4	6	V
Poa trivialis	4	7	2	2	3	3	4	V
Ranunculus acris	1	2	2	3	2	1	A	V
Trifolium repens	7	3	8	6	8	4	5	V
Agrostis capillaris			6	5	6	6	4	IV
Cerastium fontanum	A	1	2	1	2	2	A	IV
Ranunculus repens	4	4	3		2	2		IV
Rumex acetosa	1	1	1		1	2		IV
Dactylis glomerata		4		3	2			III
Kindbergia praelonga			2	2	2			III
Potentilla reptans		3	2	2				III
Taraxacum sp.	1	2	2		3			III
Trifolium pratense	2	2	2	A	4			III
Agrostis stolonifera	4	5						II
Alopecurus pratensis		1				1		II
Brachythecium rutabulum				2	2			II
Lathyrus pratensis		2	1					II
Lotus corniculatus			A		4	1		II
Vicia cracca	1				1			II
Bromus hordeaceus	2							I
Bromus racemosus	1							I
Centaurea nigra				A	1			I
Cirsium arvense							2	I
Festuca rubra	2							I
Juncus effusus	2							I
Juncus inflexus	2					A		I
Lotus pedunculatus		2						I
Luzula campestris						1		I
Rumex crispus	1							I
Festuca pratensis	A	A						
Juncus acutiflorus						A		
Juncus conglomeratus				A				
Total species	20	20	18	15	21	16	10	
Cover (%)	100	100	100	100	100	100	100	
Average sward height (cm)	20	25	10	10	15	45	50	

3.7.3 The flora of the field grips also shows little difference between the sheep-grazed and cattle-grazed areas. Most are characterised by tall rushes, particularly Hard Rush, but locally also Soft Rush and/ or Sharp-flowered Rush. The margins of the cattle-grazed grips are slightly less distinct than in the sheep-grazed fields, so that some more trampled parts resemble rush pasture. The vegetation of the shallower field grips is mostly made up of very common damp grassland species, particularly Rough Meadow-grass, Hairy Sedge, Marsh Foxtail, Meadow Foxtail, Yorkshire Fog and Creeping Bent. The slightly deeper ones tend to support a higher proportion of Floating Sweet-grass, often with Common Spike-rush. None of the grips supported standing water at the time of the survey, but the deeper ones probably have shallow water in them during the winter.

3.7.4 The field grips at Tatton Farm are generally a species-poor habitat, but they support the notable plant species Meadow Brome and Tubular Water-dropwort. Spiked Sedge is also present, and is of interest in a local context. Small quantities of Meadow Brome and Spiked Sedge also occur in the slightly drier grassland, but these species were mostly found between rush tussocks at the edges of the grips (possibly because the tussocks provide a degree of protection from grazing). Tubular Water-dropwort occurs patchily in field grips throughout the area, but mostly at a low frequency. The majority of plants were observed at the margins of the wetter grips.

Photograph 39. Field Grip at Tatton Farm, Showing Hard Rush at Margins With Floating Sweet-grass and Tubular Water-dropwort in Damper Part.

3.7.5 In terms of the NVC the majority of the field grips are closest to MG10b *Holcus lanatus – Juncus effusus* rush pasture *Juncus inflexus* sub-community. The deeper ones dominated by Floating Sweet-grass are best assigned to S22c *Glyceria fluitans* water-margin vegetation, *Alopecurus geniculatus* sub-community. The grip margins are often indistinct and the relatively narrow width of these features inevitably means that the quadrat data for them includes some species which are more typical of the adjacent drier grassland.

Table 3.31: Quadrat Data for Field Grips and Rush Pasture in Sheep-grazed Areas at Tatton Farm.

Quadrat	2	6	11	13	16	19	20	23	26	Freq.
Carex hirta	6	2	2	2	2	1	4	7	A	V
Juncus inflexus	8	9	8	7	4	4	A	4	9	V
Alopecurus geniculatus			2	2	2	1	1	8		IV
Alopecurus pratensis	2	1	1	2		1	A	2		IV
Poa trivialis	6	8		2	A	A	2	4	7	IV
Anthoxanthum odoratum	5	2		2		A	A	4	2	III
Cynosurus cristatus	3	3		2			A	4	2	III
Glyceria fluitans			4		9	10	10			III
Holcus lanatus	4	2						2	1	III
Hordeum secalinum	2	2		2		A		3	1	III
Bromus racemosus		1		1					2	II
Carex spicata		1						2	2	II
Eleocharis palustris			4		4					II
Festuca rubra	4	2				A	A			II
Juncus effusus				4			4	4	A	II

Quadrat	2	6	11	13	16	19	20	23	26	Freq.
Lemna minor					2	3				II
Lolium perenne	2	A						2	A	II
Oenanthe fistulosa					2		2			II
Ranunculus repens	4	2	A		A		A	A	A	II
Trifolium repens	2	A		2				A		II
Calliergonella cuspidata		A				2				I
Cardamine pratensis							1			I
Cerastium fontanum	A								1	I
Cirsium arvense		A		A				A	1	I
Luzula campestris	1	A								I
Poa pratensis	2									I
Potentilla anserina								4		I
Rumex acetosa	1									I
Rumex crispus								1		I
Lathyrus pratensis	A									
Lotus corniculatus	A									
Ranunculus acris			A							
Trifolium pratense		A								
Total species	15	12	6	11	7	7	7	14	10	
Cover (%)	100	100	100	70	100	95	95	100	100	
Average sward height (cm)	35	45	90	95	70	70	50	60	50	

Table 3.32: Quadrat Data for Field Grips and Rush Pasture in Cattle-grazed Areas at Tatton Farm.

Quadrat	29	30	34	37	39	42	43	45	46	48	Freq.
Juncus inflexus	8	7	9	9	8	8	7	9	5	2	V
Alopecurus pratensis	5	2	3	A	2		2	1	1	A	IV
Anthoxanthum odoratum	2		2	2	2	2	4	2			IV
Carex hirta	6	4	5	3	A	A	8	5		4	IV
Glyceria fluitans		2	2	4	5	4			9	5	IV
Holcus lanatus	5	4	4		2	4	2	4			IV
Poa trivialis	8	3	A	4	5	2	4	3	2		IV
Agrostis stolonifera	4	3	2	3			4		A		III
Alopecurus geniculatus	2	3	A		2	4			2	A	III
Bromus racemosus	2	2	2	A	1	1	4				III
Cynosurus cristatus		4	A	2	2		4	2			III
Festuca pratensis		2			1	1	2	2			III
Lathyrus pratensis	1	1	2	2	1		1				III
Hordeum secalinum		A					1	6	1		II
Lolium perenne		2		A	A		3	1			II
Lotus pedunculatus				2	2	1	A				II
Ranunculus acris	A	A	1	1	1	A	1	A			II
Ranunculus repens	2	A			2	A	3	A		A	II
Trifolium repens	A	1		1	A		A	2			II
Brachythecium rutabulum	A	A					2				I
Calliergonella cuspidata					4	4					I
Cardamine pratensis				1	1						I
Carex ovalis				1	2		A				I
Cerastium fontanum			A		A		1	2			I
Eleocharis palustris						6			A	8	I
Juncus effusus	2	4							A	A	I
Lotus corniculatus		2		A							I
Oenanthe fistulosa									2		I
Persicaria amphibia					4	A			A		I
Rumex acetosa					1		1				I
Rumex crispus						2					I
Trifolium pratense		A		A				1			I
Vicia cracca	1				A		A				I
Agrostis capillaris		A									

Quadrat	29	30	34	37	39	42	43	45	46	48	Freq.
Dactylis glomerata			A								
Festuca rubra	A						A				
Juncus conglomeratus							A				
Potentilla reptans			A				A				
Taraxacum sp.				A							
Total species	13	16	10	13	19	12	18	13	7	4	
Cover (%)	95	95	100	90	95	90	95	100	100	90	
Average sward height (cm)	65	50	75	90	80	70	55	100	120	40	

3.7.6 One feature that is particularly visible along the southern boundary of the study area is a bund of dredged material that lies parallel with the ditch. This dredged material has become vegetated by ruderal plants, particularly Nettles and Thistles, and locally by Bramble scrub. There are also regenerating remnants of scrubby Hawthorn, Blackthorn and Dog Rose bushes. Stone Parsley is locally abundant in this bund of dredgings.

Photograph 40. Bank of Tall Ruderal and Scrub Vegetation on Ditch Dredgings at Tatton Farm.

3.7.7 Similar, but smaller, patches of tall ruderal herbs are present in other parts of the study area, mainly where nutrient-rich materials have been left in piles. They can generally be assigned to the NVC category OV25 *Urtica dioica – Cirsium arvense* community.

Table 3.33: Quadrat Data for Tall Ruderal Vegetation at Tatton Farm.

Quadrat	8	21	31	32	35	40	Frequency
Cirsium arvense	A	8	9	4	4	5	V
Poa trivialis	4	8	2	2	4	2	V
Urtica dioica	10	9	8	4	8	9	V
Alopecurus pratensis	1	2	1			1	IV
Calystegia sepium			2	2	2	2	IV
Rubus fruticosus			1	9	5	2	IV
Carex hirta	2	2			1		III
Cirsium vulgare		1		1	1		III
Elytrigia repens			2		2	2	III
Holcus lanatus				2	2	2	III
Lolium perenne	A	4	A	1	1		III
Ranunculus acris		1	1	A		1	III
Rumex sanguineus			1		2	1	III

Quadrat	8	21	31	32	35	40	Frequency
Sison amomum			4	2	6		III
Dactylis glomerata	2	1				A	II
Galium aparine					3	4	II
Hordeum secalinum	2	A		2			II
Juncus inflexus	4	A				1	II
Ranunculus repens	A	4				1	II
Rosa canina			1	A		1	II
Rumex conglomeratus				2	A	1	II
Rumex obtusifolius		1	2				II
Sonchus oleraceus					1	1	II
Anthoxanthum odoratum	1						I
Bromus hordeaceus	1						I
Bromus racemosus				1			I
Cardamine flexuosa			2				I
Cirsium palustre						1	I
Epilobium ciliatum				1			I
Epilobium hirsutum				A	2		I
Epilobium parviflorum					1		I
Festuca rubra	2						I
Galium palustre				1			I
Glechoma hederacea					2	A	I
Lathyrus pratensis				1			I
Prunus spinosa					2		I
Tamus communis					1		I
Agrostis stolonifera					A		
Arctium minus			A			A	
Bellis perennis	A						
Carex riparia		A					
Cynosurus cristatus	A						
Juncus effusus						A	
Potentilla reptans				A			
Rumex crispus						A	
Scrophularia auriculata					A		
Torilis japonica				A			
Trifolium repens		A	A				
Total species	10	11	13	15	19	17	
Cover (%)	100	100	100	100	100	100	
Average sward height (cm)	110	80	110	120	110	125	

3.7.8 The track that leads to Tatton Farm has a sparse covering by ruderal species, and these were sampled by Quadrats 4 and 10. The vegetation is closest to the NVC OV18 *Polygonum aviculare – Matricaria discoidea* community. This is a very common community of no special nature conservation significance for its flora.

Table 3.34: Quadrat Data for Sparsely Vegetated Track at Tatton Farm.

Quadrat	4	10	Frequency
Lolium perenne	3	1	V
Matricaria discoidea	1	2	V
Plantago major	2	2	V
Poa annua	2	4	V
Cynosurus cristatus	1		III
Trifolium repens	4		III
Festuca rubra	3		III
Agrostis stolonifera	2		III
Taraxacum sp.	2		III
Bellis perennis	2		III
Capsella bursa-pastoris	1		III
Medicago lupulina	2		III

Quadrat	4	10	Frequency
Polygonum aviculare		2	III
Sagina apetala	1		III
Cirsium arvense		A	
Total species	13	5	
Cover (%)	20	10	
Average sward height (cm)	5	5	

3.7.9 There is an old orchard adjacent to the derelict buildings at Tatton Farm. This includes a number of mature Apple and Pear trees, set among sheep-grazed grassland similar to that seen in the other parts of the site. Surprisingly, no Mistletoe plants were seen on the orchard trees during the survey. However, small amounts of Mistletoe were observed on Hawthorn in several hedges in the wider study area.

Photograph 41. Orchard West of Tatton Farm.

3.7.10 A number of species were observed at Tatton Farm that did not fall within any quadrats. Most were only observed in low numbers and at a very low density. The only ones of particular significance are Mistletoe from several of the hedges, and Hop Sedge which was observed at the site of the reen adjacent to the western boundary. This is just outside of the study area, but included here because it is a locally notable species.

Table 3.35: Additional species not present in quadrats at Tatton Farm

Arrhenatherum elatius
Berula erecta
Carex otrubae
Carex pseudocyperus
Carex remota
Cornus sanguinea
Coronopus didymus
Crataegus monogyna
Dipsacus fullonum
Filipendula ulmaria
Fraxinus excelsior
Glyceria maxima
Hedera helix
Iris pseudacorus
Juncus articulatus
Juncus bufonius
Lysimachia nummularia
Malus pumila
Myosotis laxa
Oenanthe crocata
Phalaris arundinacea
Phragmites australis
Phyllitis scolopendrium
Prunus cf domestica

Pyrus communis
Quercus robur
Ranunculus sceleratus
Rorippa nasturtium-aquaticum
Salix alba
Salix cinerea
Salix fragilis
Sambucus nigra
Solanum dulcamara
Sonchus asper
Stachys sylvatica
Ulmus minor
Veronica beccabunga
Vicia sativa
Viscum album

3.7.11 Incidental bird observations at Tatton Farm include Blackbird, Buzzard, Carrion Crow, Cetti's Warbler, Chiffchaff, Cuckoo, Goldfinch, Great Tit, House Martin, Long-tailed Tit, Magpie, Mistle Thrush, Moorhen, Pheasant, Reed Bunting, Swallow, Wood Pigeon, Wren and Whitethroat. Insects noted during the survey included Meadow Brown, Painted Lady, Peacock and Ringlet butterflies, Silver Y and Yellow Shell moths, and Four-spotted Chaser dragonfly. A Common Toad was observed near the derelict farm buildings.

3.8 Site G: Roggiett Brake and Rectory Woods

3.8.1 These two woodlands are both shown in the Forestry Commission's inventory of ancient woodlands, and are both formed over a shallow limestone soil, but they are very different in character. The survey areas are shown on Map 8. Roggiett Brake is part of a larger woodland that has mostly been replanted with conifers, although it retains much of its old woodland ground flora and locally still has a high proportion of broad-leaved trees in its canopy. Rogiet Rectory Woods is dominated by mature broad-leaved trees but is grazed by cattle. It has a discontinuous canopy, being broken up by patches of dense scrub, Nettles and grassland, and is criss-crossed by cattle-paths.

Roggiett Brake

3.8.2 The woodland at Roggiett Brake exhibits a transition from dense Bramble and Hawthorn scrub to semi-natural broadleaved woodland, and also between semi-natural broad-leaved woodland and coniferous plantation. The divisions shown on the vegetation map must only be considered as a broad generalisation of the communities because there is much intergrading between the different woodland types. The oldest trees at Roggiett Brake are generally at the margins, and these include several pollarded Oaks, at least one of these just outside the southern boundary is over 1.5 m diameter. There is also a patch in the north of the plot which is shaded by a large mature Beech which appears to be older than the conifers. This has an understorey of Holly and Yew. Where the woodland margins adjoin agricultural land they have been trimmed back as dense hedges.

3.8.3 The canopy and shrub-layer trees in the main southern part of the woodland include Ash, Wild Cherry, Wych Elm, Field Maple, Hazel, Oak and occasionally Spindle. There is a relatively low cover by Bramble and the ground flora has a high proportion of old woodland indicator species, including Bluebell, Wood Anemone, Dog's Mercury and Early Purple-orchid. Further north, the canopy is dominated by mature Corsican Pines and has a shrub-layer dominated by Bramble. The ground flora still includes a good number of old woodland indicators, including Bluebell, Wood Anemone, Common Dog-violet, Spurge Laurel, Wood Melick, Columbine, Hairy Woodrush and Wood Spurge. There is a gradual transition between the conifer and broad-leaved canopy, so for the

purposes of the survey the quadrats have been grouped together. Quadrats 1 and 2 are from below the conifer canopy, Quadrats 3 and 10 are from transition areas between broadleaves and conifers, and 4, 5, 6, 7, 9 and 12 from the main broad-leaved areas. Quadrat 8 is from an area of younger, more scrubby woodland in the west of the plot, and Quadrat 11 from the area of Beech, Holly and Yew.

Table 3.36: Quadrat Data for Woodland at Roggiett Brake.

Quadrat	1	2	3	4	5	6	7	8	9	10	11	12	Freq.
Hedera helix	7	8	9	9	8	9	9	10	9	5	2	6	V
Mercurialis perennis	5	2	2	3	7	10	5	1	5	4	9	7	V
Anemone nemorosa	1	2	2	3	7	2	3		2	1	A	7	V
Hyacinthoides non-scripta	5	3	5	6	4	4	3	1		A	7	4	V
Fraxinus excelsior	5	7	10	10	10	10	A	10		A	2	10	IV
Rubus fruticosus	4	5	4	2	1	1	A		2	6	6		IV
Arum maculatum	2		3	1	1	1	2	2		A		1	IV
Corylus avellana	1		A	1	A	10	10	1	10	A	2	8	IV
Ranunculus ficaria			3		2	3	2		1	2		3	III
Thamnobryum alopecurum			2	5	4		7		8	2		4	III
Kindbergia praelonga					2	4			2	2	2	4	III
Prunus avium	1			1	10		A		4	4	2		III
Viola riviniana	1	1	2							5	2	A	III
Tamus communis	A	A	1	A		1			1		1	A	II
Acer campestre	1		A	2	1			10					II
Clematis vitalba	1	2				1					1	A	II
Crataegus monogyna	A		1			A			1		2	A	II
Melica uniflora			2						4	3			II
Pinus nigra	10	10	A	A						10			II
Brachypodium sylvaticum	A		1							1			I
Bromopsis ramosa						2	1						I
Conopodium majus			1	A	A		A					1	I
Dryopteris dilatata	1										1		I
Dryopteris filix-mas					1		A		1				I
Euonymus europaeus					4				1				I
Geum urbanum	1					1		A					I
Lamiastrum galeobdolon		2									2		I
Ligustrum vulgare			5				A			A		2	I
Lonicera periclymenum	2	3											I
Orchis mascula				2								1	I
Acer pseudoplatanus			1								A		I
Cornus sanguinea										1			I
Daphne laureola		1											I
Euphorbia amygdaloides											2		I
Eurhynchium striatum									2				I
Fagus sylvatica											10		I
Galium aparine						1							I
Ilex aquifolium			A	1									I
Plagiomnium undulatum					1								I
Rosa arvensis					A						4		I
Viola odorata							2						I
Rumex sanguineus						A							
Geranium robertianum	A												
Phyllitis scolopendrium					A								
Quercus robur												A	
Rosa canina	A												
Taxus baccata											A		
Ulmus glabra				A									
Total species	16	12	17	13	15	15	10	7	15	13	17	13	
Cover (%)	90	80	95	90	100	100	95	95	100	100	100	90	
Approx ground flora ht (cm)	100	70	50	30	30	35	20	10	30	50	60	40	
Approx canopy ht (m)	30	30	30	25	25	30	20	20	20	25	30	20	

3.8.4 In terms of the NVC the majority of the woodland can be described as W8 *Fraxinus excelsior – Acer campestre – Mercurialis perennis* woodland, with greatest affinity to the W8b *Anemone nemorosa* sub-community. The areas planted with conifers are not typical of this community, presumably due to the evergreen shade and development of a more acid soil. These areas still retain many W8 ground flora species, but appear to be in transition to something closer to W10 *Quercus robur – Pteridium aquilinum - Rubus fruticosus* woodland ground flora (though notably lacking an Oak canopy and Bracken).

Photograph 42. Early Purple Orchids in Broad-leaved Woodland at Roggiett Brake.

Photograph 43. Conifers with Bramble Understorey at Roggiet Brake.

3.8.5 The scrub woodland to the west of the plot has trees which are generally younger than the other parts and the ground flora is relatively species-poor. The canopy comprises a mix of Hawthorn, Ash and Field Maple, with occasional Wayfaring Tree and Dogwood. The ground flora is mainly covered by Ivy. This area is

close to the W21 *Crataegus monogyna – Hedera helix* scrub*, Viburnum lantana* sub-community, but in a state of transition to W8, especially near to the margins.

3.8.6 The scrub woodland in the southern part of the plot includes a patchy mix of self-sown dense Bramble scrub, overgrown hedges, and some small areas of tree planting, grading into tall herb and short ruderal vegetation beside the open tracks. Bramble and Hawthorn are common species here, with other trees including Elder, Wild Plum, Blackthorn, Field Maple, Ash, Wild Cherry, Wych Elm, Butterfly Bush and Guelder Rose. Bracken occurs in a few places. There is also a small disused quarry that is largely shaded and has been partly infilled by tipping. It has a relatively species-poor flora, dominated by Nettle, Ivy and Dog's Mercury.

3.8.7 The dense scrub was not investigated in detail; mainly because it was not considered likely to be of high botanical significance, and also due to likely disturbance that would be caused to nesting birds. However, a quadrat was recorded at the relatively open northern edge of the scrub, close to the edge of the older woodland. The scrub communities can mostly be categorised as a patchy mosaic of W21 *Crataegus monogyna – Hedera helix* scrub, W22 *Prunus spinosa – Rubus fruticosus* scrub, and W24 *Rubus fruticosus – Holcus lanatus* underscrub, grading into sparse grassland at the edges of the paths.

Table 3.37: Quadrat Data for Dense Scrub at Roggiett Brake.

Quadrat	13
Rubus fruticosus	10
Urtica dioica	9
Glechoma hederacea	8
Hedera helix	4
Rumex sanguineus	2
Sambucus nigra	2
Fraxinus excelsior	1
Tamus communis	1
Silene dioica	1
Crataegus monogyna	A
Prunus domestica	A
Quercus robur	A
Total species	9
Cover (%)	100
Average sward height (cm)	150

Photograph 44. Veteran Oak Tree Amongst Bramble Scrub at Roggiet Brake.

3.8.8 A number of additional species were observed that did not fall within any quadrats. Most of these were only observed at a low density or represented by a few individuals, and the majority were associated with the grassy margins and scrub beside the paths at the southern end of the site. There are a number of locally significant species, including Columbine and Primrose in the woods, Stinking Iris in the old quarry, and White Bryony in the strip of scrub south of the main path. The grassland margins include Salad Burnet, Agrimony and Bird's-foot Trefoil. There is also a small quantity of non-native Montbretia in the tipped material in the disused quarry.

Table 3.38: Additional Species Not Present in Quadrats at Roggiett Brake.

Achillea millefolium
Agrimonia eupatoria
Alliaria petiolata
Alnus glutinosa
Anthriscus sylvestris
Aquilegia vulgaris
Arctium minus
Arrhenatherum elatius
Bellis perennis
Bryonia dioica
Buddleja davidii
Carex sylvatica
Centaurea nigra
Cerastium fontanum
Cirsium arvense
Cirsium vulgare
Crepis capillaris
Crocosmia crocosmiiflora
Dipsacus fullonum
Festuca gigantea
Festuca rubra
Fissidens taxifolius
Galium mollugo
Heracleum sphondylium
Iris foetidissima
Leucanthemum vulgare
Lotus corniculatus
Luzula pilosa
Malva moschata
Medicago lupulina
Myosotis arvensis
Plantago lanceolata
Poa trivialis
Polystichum setiferum
Potentilla reptans
Potentilla sterilis
Primula vulgaris
Prunella vulgaris
Prunus laurocerasus
Prunus spinosa
Pteridium aquilinum
Quercus ilex
Ranunculus repens
Rhinanthus minor

Rumex crispus
Sanguisorba minor
Senecio jacobaea
Sonchus asper
Sonchus oleraceus
Stachys sylvatica
Trifolium pratense
Veronica chamaedrys
Veronica hederifolia
Viburnum lantana
Viburnum opulus
Vicia sativa

Photograph 45. White Bryony in Scrub at Roggiet Brake.

3.8.9 Incidental observations made during the botanical survey included good numbers of birds, including Blackcap, Blue Tit, Buzzard, Chiffchaff, Great Spotted Woodpecker, Great Tit, Green Woodpecker, Jay, Nuthatch and Wren. There were at least two nests of Red Wood Ant in the area of conifers. A large specimen of Sulphur Polypore fungus was also noted growing from an Oak stump in the northern part of the plot.

Rogiet Rectory Woods

3.8.10 The Rectory Woods have a rather gappy canopy, mainly comprising mature Ash and Oak, with some lower canopy of Hawthorn, Field Maple and Wych Elm, but broken up by more open scrubby areas of Bramble and Hawthorn. There is evidence of former mixed planting, with occasional mature non-native trees including Sycamore, Horse Chestnut and Japanese Larch. Cattle have access right through the wood, with the only exception being the hedgerow at the north-western boundary, which is protected by a barbed wire fence.

3.8.11 The most typical woodland habitat occurs where the canopy casts its densest shade, and this is characterised by a relatively sparse understorey, with dense patches of Nettles and Dog's Mercury. Ivy and Lesser Celandine are locally abundant. A number of old woodland indicator species are present, including Wood Anemone and Bluebells which are widespread, although often rather trampled by the cattle. Other indicators which are present at a low density include Goldilocks Buttercup, Primrose, Three-nerved Sandwort and Wood Speedwell.

Photograph 46. Woodland Habitat at Rogiet Rectory Woods.

3.8.12 The woodland margins are variable, with some parts merging gradually into a scrubby fringe of Bramble and Nettles, with occasional Hawthorn and Elder, while in others the canopy becomes more open with a grass-dominated ground flora that intergrades with the adjacent semi-improved pasture. The woodland margin at the north-west side is formed by a hedge on a low, stony bank. This contains several large Ash trees, and other dominants including Hawthorn, Hazel, Field Maple, Holly and Blackthorn. Quadrats 1 and 2 were taken from this hedge. Wood Melick and Greater Stitchwort were largely confined to this ungrazed strip of the wood.

Photograph 47. Cattle-trampled Ground Flora at Rogiet Rectory Woods, With Fenced-off Hedge in Right of Picture.

3.8.13 In terms of the NVC the woodland is best categorised as W8 *Fraxinus excelsior – Acer campestre – Mercurialis perennis* woodland, with patches of W21 *Crataegus monogyna – Hedera helix* scrub and local transitions to W24 *Rubus fruticosus – Holcus lanatus* underscrub at the margins..

Table 3.39: Quadrat Data for Woodland at Rogiet Rectory Woods.

Quadrat	1	2	3	9	10	Frequency
Anemone nemorosa	2	5	6	2	2	V
Hedera helix	2	5	9	5	1	V
Hyacinthoides non-scripta	2	8	5	2	5	V
Mercurialis perennis	1	6	9	9	9	V
Ranunculus ficaria	6	3	4	4	2	V
Viola riviniana	2	2	2	1	4	V
Geum urbanum	2	1	2		2	IV
Urtica dioica	9		2	1	2	IV
Acer campestre		4	10	4		III
Crataegus monogyna		4	4	1	A	III
Fraxinus excelsior	10	10		10		III
Glechoma hederacea	3	1	A	2		III
Rumex sanguineus	3	1	A		2	III
Veronica hederifolia	2	A	2		2	III
Alliaria petiolata		1	2			II
Anthriscus sylvestris	4	1				II
Arum maculatum			1	2		II
Brachythecium rutabulum			1	2		II
Carex sylvatica		1		1		II
Galium aparine		1	A		2	II
Kindbergia praelonga				4	1	II
Melica uniflora		3	2			II
Moerhingia trinervia		2	A		2	II
Poa trivialis	2	A			4	II
Primula vulgaris	A	4	2	A		II
Quercus robur			10		10	II
Rubus fruticosus	A	7		10		II
Sambucus nigra	1		1			II
Acer pseudoplatanus				4		I
Arctium minus					1	I
Bromopsis ramosa	1					I
Circaea lutetiana	6					I
Cirriphyllum crassinervium			2			I
Clematis vitalba			4			I
Conopodium majus	A		A		2	I
Geranium robertianum					1	I
Lamiastrum galeobdolon			1			I
Plagiomnium undulatum				1		I
Poa nemoralis		A			2	I
Potentilla sterilis					2	I
Prunus spinosa			1			I
Ranunculus acris	1					I
Ranunculus auricomus					2	I
Rhynchostegium confertum	1					I
Rosa arvensis		A	1			I
Rosa canina			2		A	I
Rumex obtusifolius					1	I
Silene dioica	3					I
Spergularia media			2			I
Stellaria holostea		3				I
Stellaria media					2	I
Thamnobryum alopecurum				4		I
Veronica chamaedrys	2	A				I
Veronica montana	2					I
Viola odorata					2	I
Cirsium arvense	A					
Ilex aquifolium	A	A				
Tamus communis			A	A		
Total species	22	21	25	19	24	
Cover (%)	100	100	100	100	100	

Quadrat	1	2	3	9	10	Frequency
Avg. ground flora ht (cm)	140	100	60	100	30	
Approx canopy height (m)	20	20	20	20	20	

3.8.14 The grassland habitats within the Rectory Woods are generally rather species-poor, grading between the dense Bramble scrub and shaded woodland canopy. Several quadrats were recorded from places where grasses form the dominant ground flora. Quadrats 4 and 5 are from grassy path-sides near the western margin while Quadrat 6 is from the middle of an open clearing at the western side. Quadrats 7 and 8 are from grass-dominated areas overshadowed by open-spaced mature trees near the southern margin. A careful check was made for any plants of Meadow Clary in the grassland areas, because this species is a special feature of the grassland at Rectory Meadow - Rogiet SSSI, which lies less than 100m away to the west of the woodland. However, no Meadow Clary was found.

3.8.15 In terms of the NVC, the grassland habitats at the woodland edge appear to exhibit a transition from W24 *Rubus fruticosus – Holcus lanatus* underscrub at the margins, to MG1 *Arrhenatherum elatius* grassland. Further from the wood edge this becomes closer to *Centaurea nigra- Cynosurus cristatus* grassland (Quadrat 6 is the most typical of MG5). Although some of the usual constants for this community are absent from the quadrats, Cowslip and Agrimony are represented, and other indicators occur nearby.

Table 3.40: Quadrat Data for Grasslands at Rogiet Rectory Woods.

Quadrat	4	5	6	7	8	
Dactylis glomerata	5	6	2	6	2	V
Glechoma hederacea	2	2	4	2	7	V
Poa trivialis	6	8	4	7	3	V
Ranunculus repens	2	4	5	5	2	V
Taraxacum sp.	2	2	3	1	2	V
Veronica chamaedrys	1	3	3	2	5	V
Geum urbanum	2		1	1	2	IV
Plantago lanceolata	2	3	7	2		IV
Prunella vulgaris	2		4	2	4	IV
Ranunculus acris		2	4	1	1	IV
Rumex sanguineus	2	1		1	1	IV
Cirsium arvense	2	6	4			III
Rubus fruticosus	6	5		2	A	III
Silene dioica	2			3	4	III
Trifolium repens	2	2	6	A		III
Urtica dioica	5	4		3		III
Anthriscus sylvestris	3			2		II
Cerastium fontanum		2	2			II
Heracleum sphondylium	1		1			II
Hyacinthoides non-scripta				1	4	II
Potentilla reptans	2		4			II
Potentilla sterilis			2		2	II
Senecio jacobaea			4		1	II
Stachys sylvatica	2	4				II
Trifolium pratense		2	2			II
Veronica hederifolia	1	2				II
Achillea millefolium			2			I
Agrimonia eupatoria			2			I
Agrostis capillaris			4			I
Alliaria petiolata	2					I
Alopecurus pratensis	2					I
Anemone nemorosa					2	I

Quadrat	4	5	6	7	8	
Anthoxanthum odoratum				4		I
Arctium minus	A				1	I
Arrhenatherum elatius		2				I
Brachypodium sylvaticum				2		I
Conopodium majus					1	I
Festuca rubra			4			I
Galium aparine	4					I
Holcus lanatus			4			I
Lolium perenne			2			I
Mentha sp.		1				I
Mercurialis perennis				2	A	I
Moerhingia trinervia					2	I
Potentilla anglica					2	I
Primula veris			6			I
Ranunculus ficaria		2				I
Rosa canina	3					I
Rumex acetosa			1			I
Rumex obtusifolius					1	I
Viola odorata	2					I
Viola riviniana					1	I
Arum maculatum				A		
Bellis perennis			A			
Clematis vitalba	A					
Corylus avellana	A					
Geranium robertianum					A	
Myosotis arvensis	A					
Primula vulgaris					A	
Ulmus glabra	A					
Total species	25	20	26	19	21	
Cover (%)	100	100	100	100	100	
Average sward height (cm)	60	60	20	50	30	

Photograph 48. Grassland and Scrub at Wood Margin at Rogiet Rectory Woods.

Photograph 49. Nettle-dominated Margin at Rogiet Rectory Woods.

3.8.16 Other parts of the woodland margins support stands of tall herbs, mainly dominated by Nettle. This vegetation is best categorised within the NVC as the OV24 *Urtica dioica – Galium aparine* community, but it also includes elements of the woodland ground flora and W24 *Rubus fruticosus – Holcus lanatus* underscrub, so is slightly more diverse than the typical NVC community.

Table 3.41: Quadrat Data for Nettle Edge Community at Rectory Woods.

Quadrat	11	12	13	Frequency
Alliaria petiolata	3	2	2	V
Geum urbanum	1	2	2	V
Urtica dioica	9	8	10	V
Anemone nemorosa	2		1	IV
Cirsium arvense		1	4	IV
Conopodium majus	2	2		IV
Dactylis glomerata		7	2	IV
Geranium robertianum		1	1	IV
Hyacinthoides non-scripta	4	1	A	IV
Ranunculus ficaria	6	2		IV
Ranunculus repens		4	5	IV
Rumex obtusifolius		2	2	IV
Rumex sanguineus	A	4	1	IV
Veronica chamaedrys		4	2	IV
Veronica hederifolia	3	3		IV
Arctium minus		2	A	III
Arum maculatum	1			III
Carex sylvatica		1		III
Circaea lutetiana	5			III
Festuca gigantea		1		III
Galium aparine			4	III
Glechoma hederacea			2	III
Hedera helix	1			III
Lapsana communis			2	III
Lolium perenne		2		III
Mercurialis perennis	7			III
Poa trivialis		4	A	III
Quercus robur	10			III
Rubus fruticosus		2		III
Silene dioica		2	A	III

Quadrat	11	12	13	Frequency
Veronica montana			1	III
Viola riviniana	2			III
Anthriscus sylvestris		A		
Crataegus monogyna	A			
Ilex aquifolium	A			
Ranunculus acris		A	A	
Stachys sylvatica		A		
Taraxacum sp.			A	
Total species	14	21	15	
Cover (%)	100	100	100	
Average sward height (cm)	120	120	150	

3.8.17 A number of species were observed at the Rectory Woods that did not fall within any quadrats. These were generally only present at low density, or associated with tracks or grassy margins.

Table 3.42: Additional Species Not Present in Quadrats at Rogiet Rectory Woods.

Aesculus hippocastanum
Cardamine flexuosa
Centaurea nigra
Dryopteris filix-mas
Fagus sylvatica
Fissidens taxifolius
Fragaria vesca
Larix cf kaempferi
Phyllitis scolopendrium
Plantago major
Poa annua

3.8.18 Incidental bird observations from Rogiet Rectory Woods included Blackcap, Buzzard, Carrion Crow, Chaffinch, Chiffchaff, Goldfinch, Great Tit, Green Woodpecker, Jay, Long-tailed Tit, Nuthatch, Robin, Wood Pigeon and Wren. Grey Squirrel, Rabbit, Speckled Wood butterfly and Common Tubic moth were also seen.

3.9 Site H: TATA Steelworks

3.9.1 Several sites were examined to the south of the TATA steelworks, on land which is used for treatment of waste water, or which has been used for water treatment in the past and has largely remained undisturbed for several years. The steelworks sites include a high proportion of low-lying grassland, scrub and reed-bed habitat, but they are different from most other parts of the Gwent Levels because they are divided by a network of tracks formed from slag and the soil chemistry of the former lagoons has been influenced by the alkaline effluent from the works. In addition, the study areas have largely been left to colonisation by natural successional processes, being rarely disturbed by people, and not managed by grazing or other agriculture. The larger grassland and tall herb communities at the TATA West and East sites were examined in a similar level of detail to similar habitats in the other study areas. However, the relatively species-poor scrub-dominated habitats and four smaller study sites were only described as simple target notes with a basic species list.

TATA West: Reed-beds and Former Reed-growing Area

3.9.2 The western area includes part of the current reed-bed water-treatment system, and an area that was previously used for reed-growing to stock the treatment beds, but which has been left unmanaged for several years and is shown on Map 9. The reed-beds were mostly very species-poor, with very few associated

species. There was very little difference between the reed vegetation in the treatment areas and the unmanaged areas, except that there was a higher proportion of Bramble scrub in the reeds outside the treatment beds. The only plant species of nature conservation significance noted in the reed vegetation was Brown-sedge which is locally frequent at the fringes of several beds. The reed dominated vegetation would be categorised as S4 *Phragmites australis* swamp and reed-bed within the NVC.

Photograph 50. Extensive Reed-bed Water Treatment Area at TATA West.

Table 3.43: Quadrat Data for Reedbed Vegetation at TATA West.

Quadrat	8	11	12	16	17	24	30	33	Freq.
Phragmites australis	10	10	10	10	10	10	10	10	V
Persicaria amphibia	2	A	1	1	1	A			III
Rubus fruticosus	2	1			2	2			III
Urtica dioica	4				2	1		4	III
Calystegia sepium		2			2	3			II
Galium aparine	2			2	1				II
Vicia cracca		3			2				II
Carex riparia		2	A			A			I
Chamerion angustifolium								1	I
Cirsium arvense	1								I
Crataegus monogyna		A			1				I
Epilobium hirsutum	9								I
Equisetum arvense		1							I
Eupatorium cannabinum				1					I
Geranium robertianum	1								I
Kindbergia praelonga		2							I
Leptodictyum riparium			2						I
Oenanthe crocata		A			4				I
Prunus spinosa		1				A			I
Solanum dulcamara			A				2		I
Vicia hirsuta		1							I
Vicia tetrasperma					1				I
Epilobium ciliatum						A			
Total species	8	9	3	4	10	4	2	3	
Cover (%)	100	100	100	100	100	100	100	100	
Average sward height (cm)	200	200	250	250	300	250	220	180	

3.9.3 The slag-formed tracks bordering the reed-beds mostly support a sparse mix of grasses, ruderal plants and small acrocarpous mosses, maintained by occasional cutting. There is a high proportion of Biting Stonecrop, Thyme-leaved Sandwort and small annual grasses including Squirrel-tail Fescue, Rat's-tail Fescue and Fern-grass. There are several patches of the locally notable plants Round-leaved Stork's-bill and Great Lettuce, and other species of local interest including Carline Thistle, Small Toadflax and Compact Brome.

Photograph 51. Sparse Vegetation on Slag-formed Tracks at TATA West.

3.9.4 The slag-formed tracks do not easily conform to any of the published NVC communities. They include characteristics of some calcareous grassland and open vegetation communities, and also appear to have a strong affinity with some sand-dune vegetation. The quadrats recorded from the tracks have been grouped together, reflecting the range of variation in the flora. Most were from dry areas, but quadrats 28 and 32 were from damper parts. It is likely that additional species of annual plants would have been recorded if the study had been carried out earlier in the year.

Table 3.44: Quadrat Data for Tracks and Sparse Vegetation at TATA West.

Quadrat	1	2	3	20	28	29	31	32	Freq.
Holcus lanatus	2	1	2	1		1	2	2	V
Undetermined mosses	6	7	2	7	4	7	2		V
Arenaria serpyllifolia	3	3	2	3		3			IV
Geranium dissectum	1	1		2	1		A	1	IV
Myosotis arvensis	2	1	A	2		1	2		IV
Sedum acre	4	3	2	4	1	1	A		IV
Agrostis stolonifera	2		A		5		2	6	III
Anisantha madritensis			2	A	2	4	2		III
Dactylis glomerata	1	A	1		1	2			III
Epilobium parviflorum					2		2	2	III
Geranium molle	3	2	1						III
Hirschfeldia incana	5	1	2	A		2			III
Homalothecium lutescens		4	4	2					III
Juncus inflexus					4	1		2	III
Peltigera sp.	1	2	4	2					III
Poa trivialis	2		2					2	III
Rosa canina		A	A	1	1	1			III
Rubus fruticosus	A	1		1	1	3	A		III

Quadrat	1	2	3	20	28	29	31	32	Freq.
Senecio jacobaea	1	A	2	1		1	A		III
Sonchus oleraceus		2			1	1			III
Taraxacum sp.	1			1	1		A		III
Vulpia myuros					2		1	2	III
Agrostis capillaris			1	1					II
Bromus hordeaceus						1		1	II
Catapodium rigidum		2	2	A					II
Cerastium fontanum	1			2					II
Chamerion angustifolium		1			1				II
Crataegus monogyna		A			2	1			II
Elytrigia repens					2		2		II
Epilobium hirsutum	A		A		2			1	II
Eupatorium cannabinum						1		1	II
Geranium rotundifolium		2				1			II
Lycopus europaeus					2		1	A	II
Medicago lupulina		1	4						II
Salix cinerea					4		2	A	II
Torilis japonica	1		A			1			II
Vulpia bromoides		4	3	A					II
Arrhenatherum elatius	A	A	1					A	I
Betula pubescens					1		A		I
Brachythecium rutabulum	2								I
Bryum pseudotriquetrum								2	I
Buddleja davidii					1		A		I
Calliergonella cuspidata							2		I
Calystegia sepium					2		A		I
Carex hirta					4		A		I
Carex riparia					2			A	I
Carlina vulgaris				2					I
Chaenorhinum minus							3		I
Cirsium arvense					1				I
Cirsium vulgare			1			A			I
Conyza sp.		1							I
Epilobium ciliatum					1				I
Epilobium montanum				2					I
Festuca rubra	2	A		A					I
Geranium robertianum				1					I
Glechoma hederacea	1								I
Hypochaeris radicata				2					I
Juncus bufonius								6	I
Lactuca virosa						2			I
Melilotus altissimus								1	I
Persicaria amphibia	A				A	2			I
Picris echioides	A					1			I
Plantago lanceolata								3	I
Poa annua				2					I
Prunella vulgaris						1			I
Rumex conglomeratus			A	1					I
Rumex crispus			1						I
Solanum dulcamara			A		1	A			I
Trifolium dubium		1							I
Trifolium repens					2				I
Veronica arvensis					2	A			I
Vicia sativa					A			1	I
Anthoxanthum odoratum					A				
Carex disticha						A			
Carex otrubae								A	
Dipsacus fullonum		A							
Erigeron acer	A								
Galium aparine	A						A		
Lythrum salicaria								A	
Phragmites australis	A		A		A	A	A		

Quadrat	1	2	3	20	28	29	31	32	Freq.
Ranunculus repens			A		A				
Rumex acetosa				A					
Scrophularia auriculata						A			
Senecio erucifolius			A						
Sonchus asper					A				
Urtica dioica	A								
Verbascum thapsus			A						
Verbena officinalis			A						
Veronica persica	A								
Total species	19	19	19	20	29	22	12	15	
Cover (%)	80	85	80	70	70	70	20	90	
Average sward height (cm)	5	<5	15	<5	20	5	5	10	

3.9.5 The study area includes several areas of flower-rich damp grassland, which forms a patchy mosaic with tall wetland herb vegetation, locally intergrading with stands of Common reed or Greater Pond-sedge. The vegetation associated with the track through the former Reed-growing area has a high proportion of grasses, and resembles MG1 *Arrhenatherum elatius* grassland; however the rest has a relatively low proportion of grass and dominant plants include Fleabane and Hard-rush, resembling MG10b *Holcus lanatus - Juncus inflexus* rush pasture. The locally notable species Pepper Saxifrage is locally frequent in this community. Other areas merge into tall herb vegetation with dense Creeping Thistle and Greater Willowherb, and others into dense Willow scrub. Hawthorn and Bramble scrub are present through most of the damp grassland habitat, and the vegetation appears to be undergoing a rapid transition towards dense scrub. The quadrats recorded in this vegetation are mostly from the more open rush-dominated areas. Quadrats 14 and 19 are from communities dominated by tall herbs.

Table 3.45: Quadrat Data for Damp Grassland and Tall Herb Vegetation at TATA West.

Quadrat	4	5	6	9	10	13	14	19	21	22	25	26	27	Freq
Carex hirta	2	4		5	4					2	2	2	2	IV
Juncus inflexus		2	4	2			7		5	2	6	8		IV
Lathyrus pratensis		2	2	4	5	8	2		4			2	3	IV
Pulicaria dysenterica			4	5			6		10	9	8	9	9	IV
Rumex conglomeratus	2		1	2	A	2	1	1	A	A		1	1	IV
Holcus lanatus	6	8	6		A	1		2			1	1		III
Persicaria amphibia	A	2	2	2	5		5						1	III
Vicia cracca		2	2		A	4		2	4		1			III
Agrostis stolonifera	7	8	5								A			II
Angelica sylvestris				4	A						2	1	1	II
Arrhenatherum elatius	2	2		A	1	A		4					6	II
Calliergonella cuspidata					5					8	4	3		II
Calystegia sepium	2	2				4	2							II
Carex flacca				5	4					3	4	A	2	II
Cirsium arvense	1					A	6	2				1	1	II
Cirsium palustre					1				2	A	1	1		II
Dactylor. praetermissa					1						1		2	II
Elytrigia repens					2	4		4				A		II
Epilobium hirsutum	1	1				A		9	A			2		II
Epilobium palustre					2					2	2			II
Epilobium parviflorum				1	2							1		II
Eupatorium cannabinum					A		1	3		1		2	3	II
Galium aparine						1	2	3						II
Heracleum sphondylium	A	1				2							2	II
Juncus effusus		1							2	5				II
Lotus pedunculatus									3	1	3			II

Quadrat	4	5	6	9	10	13	14	19	21	22	25	26	27	Freq
Lythrum salicaria		1					1				2			II
Phleum pratense	3	4	4	2		A						A		II
Poa trivialis	4	5		2		4						2		II
Potentilla reptans				4	4						4	2	2	II
Ranunculus repens	2	2	2	2	A				A	2				II
Rubus fruticosus							2	2	2			A	2	II
Senecio erucifolius				2	A		1				A		1	II
Torilis japonica				1							1	1	A	II
Vicia tetrasperma	2	2	2											II
Alopecurus pratensis		2												I
Athyrium filix-femina							1							I
Bellis perennis				1										I
Brachythecium rivulare									1					I
Brachythec. rutabulum								2						I
Bromus hordeaceus						2								I
Carex disticha									2					I
Carex otrubae										2				I
Carex riparia						2								I
Centaurea nigra	2	A											A	I
Cerastium fontanum	1													I
Crataegus monogyna				1	1						A	A		I
Dactylis glomerata									A			A	2	I
Dipsacus fullonum				2				A						I
Eleocharis palustris										3				I
Equisetum arvense											1	4		I
Festuca pratensis			2											I
Festuca rubra						2								I
Filipendula ulmaria			1			4								I
Geranium dissectum				A								1		I
Geranium molle			1											I
Geranium robertianum							1	2						I
Hordeum secalinum			1											I
Hypericum tetrapterum			1	2	A									I
Iris pseudacorus		1				1								I
Kindbergia praelonga							1				1			I
Leontodon hispidus											1			I
Leptodictyum riparium											1			I
Lotus corniculatus				1							2			I
Lycopus europaeus										2				I
Melilotus altissimus	A		1											I
Oenanthe crocata	1	A						2						I
Picris echioides	1			1										I
Plantago lanceolata				1	2									I
Prunella vulgaris				1										I
Ranunculus acris				1									1	I
Rosa canina									1					I
Rumex acetosa												1	1	I
Rumex crispus			1											I
Salix cinerea				A						A	1			I
Silaum silaus				A	4								3	I
Stachys palustris	2						4							I
Urtica dioica							2	2						I
Vicia sativa	1													I
Epilobium ciliatum				A										
Prunus spinosa			A						A					
Juncus conglomeratus											A	A		
Plantago major											A			
Rumex obtusifolius	A													
Trifolium pratense			A											
Typha latifolia										A				
Total species	18	19	18	24	15	14	17	14	11	13	21	19	19	
Cover (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	

Quadrat	4	5	6	9	10	13	14	19	21	22	25	26	27	Freq
Av. sward height (cm)	45	80	75	60	50	60	120	110	100	40	50	100	70	

Photograph 52. Flower-rich Damp Grassland With Pepper Saxifrage at TATA West.

Photograph 53. Mosaic of Damp Grassland, Reeds and Scrub at TATA West.

3.9.6 Several patches within the damp grassland mosaic support beds of Greater Pond-sedge. These were sufficiently distinct to record as a different vegetation type, and they fall within the NVC community S6 *Carex riparia* swamp. However, there is a high degree of overlap with the adjacent damp grassland vegetation at the margins of the stands.

Photograph 54. Stand of Dense Greater Pond-sedge at TATA West.

Table 3.46: Quadrat Data for Sedge-bed Vegetation at TATA West.

Quadrat	7	15	18	23	Frequency
Carex riparia	10	9	10	10	V
Calystegia sepium	4	2	1		IV
Juncus inflexus	2	7	4	A	IV
Persicaria amphibia	5	2		1	IV
Epilobium hirsutum	1		2		III
Lythrum salicaria		2	2		III
Scrophularia auriculata		1	2		III
Vicia cracca	A	2	1		III
Angelica sylvestris		2			II
Calliergonella cuspidata			2		II
Carex otrubae		1			II
Cirsium arvense			1		II
Elytrigia repens		2			II
Epilobium palustre			1		II
Eupatorium cannabinum		2		A	II
Filipendula ulmaria	1				II
Iris pseudacorus		1			II
Lathyrus pratensis			1		II
Phalaris arundinacea	4				II
Pulicaria dysenterica		9	A	A	II
Rubus fruticosus			3		II
Cirsium palustre			A		
Crataegus monogyna	A			A	
Galium palustre		A			
Juncus conglomeratus				A	
Juncus effusus		A		A	
Oenanthe crocata	A		A		
Phragmites australis				A	
Populus x canadensis	A				
Salix cinerea			A	A	
Solanum dulcamara		A	A	A	
Vicia hirsuta	A				
Total species	7	13	12	2	
Cover (%)	100	100	100	100	
Average sward height (cm)	80	65	110	100	

3.9.7 Species observed at the TATA West site that did not occur within any quadrats were mostly limited to species associated with the scrub margins, or only present at a very low density. The most significant of these was a single patch of Round-leaved Wintergreen which was present in damp ground beside Willow scrub at the edge of the slag track beside the western edge of the reedbeds.

Table 3.47: Additional Species Not Present in Quadrats at TATA West.

Agrimonia eupatoria
Aira caryophyllea
Anagallis arvensis
Apium nodiflorum
Arctium minus
Aster x salignus
Barbula convoluta
Betula pendula
Centaurium erythraea
Cladonia sp.
Cynosurus cristatus
Dactylorhiza sp.
Dryopteris filix-mas
Erodium cicutarium
Fragaria vesca
Fraxinus excelsior
Hedera helix
Hypericum perforatum
Juncus articulatus
Lemna minor
Ligustrum vulgare
Lolium perenne
Malus hupehensis
Malus pumila
Mentha aquatica
Pilosella officinarum
Polypodium vulgare
Pyrola rotundifolia
Rumex sanguineus
Sagina procumbens
Salix alba
Salix fragilis
Salix viminalis
Sison amomum
Tripleurospermum inodorum
Tussilago farfara
Veronica beccabunga
Viscum album

Photograph 55. Round-leaved Wintergreen at TATA West.

3.9.8 Incidental sightings of birds at TATA West included Blackcap, Buzzard, Great Tit, Green Woodpecker, Long-tailed Tit, Reed Warbler and Wood Pigeon. Signs of Rabbits were widespread and Otter spraint was noted on a penning board on the main reen through the area. Butterflies included Comma, Common Blue, Gatekeeper, Peacock and Small Copper. Common Darter, Emperor and Southern Hawker dragonflies were also noted.

TATA East: Scrub, Grassland and Tall Herb Mosaic

3.9.9 The eastern study area within the TATA site comprises three low-lying fields that appear to have been left unmanaged for several years and now support a mosaic of scrub, grassland and tall herb vegetation and are shown on Map 11. Two of the fields were too heavily dominated by dense scrub to be able to gain access without cutting tools, and the survey of these was therefore limited to observations from the margins and a few places where it was possible to push through the less thorny undergrowth.

3.9.10 The western field is almost entirely dominated by dense Hawthorn, Bramble and Dog Rose, and this proved largely inaccessible. It was only possible to enter the southern part of the field, where Grey Willow is the dominant canopy species. Observations from the margins confirmed that the central scrub area includes small patches of a remnant marshy grassland flora, although these are largely limited to taller species, including Fleabane, Angelica, Hemp Agrimony, Reed Sweet-grass and Common Reed, and plants which appear to be reasonably tolerant of the shading by scrub, including Bittersweet, Gypsywort and Marsh Bedstraw. The patches were generally too small to map, and appear unlikely to persist for more than a few years because they appear to be becoming quickly overgrown by the scrub canopy.

Photograph 56. One of the Open Patches Within the Dense Scrub at TATA East.

3.9.11 The central field is the only field that was readily accessible for survey and still supports grassland vegetation. There is a gradual transition from species-poor dry grassland in the northern part to marshy grassland dominated by tall wetland herbs in the southern half. Dense Bramble scrub is present around all of the field margins. The drier grassland is dominated by coarse grasses, particularly false Oat-grass, Couch and Meadow Foxtail, and associated herbs include Hogweed, Greater Willowherb, Nettle and Angelica. A few small patches support Red Fescue, apparently as a remnant from when it was managed as a shorter sward. In terms of the NVC, this species-poor tall grassland readily fits within the MG1 *Arrhenatherum elatius* grassland.

Photograph 57. Central Field of Species-poor Grassland at TATA East, Viewed From North Side of Reen.

Table 3.48: Quadrat Data for MG1 Grassland Vegetation at TATA East.

Quadrat	1	2	7	8	9	10	Frequency
Angelica sylvestris	1	5	2	2		4	V
Arrhenatherum elatius	8	2	10	10	9	8	V
Galium aparine	2	1	2	3	2	2	V
Urtica dioica	8	A	2	7	5	2	V
Epilobium hirsutum	1			5	8	2	IV
Torilis japonica		3	2		1	2	IV
Brachythecium rutabulum	4	2			2		III
Cirsium arvense	1	2		1		A	III
Dactylis glomerata	2	1				4	III
Heracleum sphondylium	1	A	1	A	1	A	III
Carex hirta		2				2	II
Elytrigia repens	5	A		3		A	II
Epilobium ciliatum	1	1					II
Lathyrus pratensis				1		4	II
Rumex sanguineus	2	2					II
Vicia cracca	1	1					II
Alopecurus pratensis	A	9					I
Anthriscus sylvestris						2	I
Dipsacus fullonum						1	I
Festuca rubra				2	A		I
Geranium dissectum		1					I
Myosotis arvensis	1						I
Rosa canina	A	1				A	I
Rumex acetosa					1		I
Senecio erucifolius						1	I
Senecio jacobaea		1					I
Solanum dulcamara					1		I
Vicia sativa	1						I
Cirsium palustre	A	A					
Dryopteris filix-mas	A						
Hedera helix	A						
Rumex crispus						A	
Rumex obtusifolius		A	A				
Total species	15	15	6	9	9	12	
Cover (%)	100	100	100	100	100	100	
Average sward height (cm)	120	120	110	140	120	100	

3.9.12 The southern half of the central field is dominated by tall wetland herbs, including Nettle, Angelica, Greater Willowherb, Creeping Thistle, Marsh Thistle, Hemlock Water-dropwort, Meadowsweet and Reed Sweet-grass. The dominant species in this community are often restricted to distinct patches, but taking the habitat together it appears to fit reasonably well with the NVC M27b *Filipendula ulmaria - Angelica sylvestris* mire*, Urtica dioica - Vicia cracca sub-community*. However, some of the patches could be placed within the OV25 *Urtica dioica - Galium aparine* community or the OV26 *Epilobium hirsutum* community if considered in isolation.

Table 3.49: Quadrat Data for Tall Wetland Herb Vegetation at TATA East.

Quadrat	3	4	5	6	Frequency
Brachythecium rutabulum	2	5	2	2	V
Cirsium arvense	6	4	5	8	V
Elytrigia repens	2	2	4	2	V
Galium aparine	2	2	4	5	V
Urtica dioica	2	5	5	6	V
Alopecurus pratensis	2		2	6	IV
Angelica sylvestris	5	A	5	4	IV
Epilobium ciliatum	1	1	3	A	IV
Myosotis arvensis	1	2	1		IV
Carex hirta	4	1			III
Epilobium hirsutum	9	10	A	A	III
Lathyrus pratensis			2	4	III
Rumex obtusifolius		1		1	III
Torilis japonica	3			2	III
Arrhenatherum elatius	5				II
Cirsium palustre	A	A		1	II
Filipendula ulmaria				4	II
Heracleum sphondylium			2		II
Kindbergia praelonga		2			II
Oenanthe crocata		4			II
Persicaria amphibia	2				II
Pulicaria dysenterica			6		II
Rubus fruticosus	2	A			II
Rumex sanguineus	2	A			II
Sison amomum			2		II
Vicia cracca				2	II
Eupatorium cannabinum			A		
Glyceria maxima		A	A		
Lythrum salicaria			A		
Rosa canina	A				
Rumex conglomeratus				A	
Salix fragilis			A		
Sambucus nigra				A	
Senecio erucifolius	A				
Solanum dulcamara			A		
Total species	16	12	13	13	
Cover (%)	100	100	100	100	
Average sward height (cm)	150	140	120	110	

Photograph 58. Tall Wetland Herbs in Central Field at TATA East.

3.9.13 The eastern field in the TATA East study area is largely overgrown by dense Bramble, with patchy Blackthorn and Hawthorn, so that the survey could only be carried out from the margins. There are also occasional Apple trees near to the margins. The northern part of the field and some of the eastern margin supports a mosaic of tall, species-poor grassland, tall herbs and Bramble scrub, which is similar in character to the central field. However, elsewhere the flora appears much less diverse and is largely limited to tall herbs such as Great Willowherb and Nettle, growing up through the Bramble, and Field Bindweed scrambling over it. The grassy patches at the margins are similar to the MG1 *Arrhenatherum elatius* grassland in the central field, forming a mosaic with patches of OV25 *Urtica dioica - Galium aparine* community and OV26 *Epilobium hirsutum* vegetation.

3.9.14 Species observed at the TATA East site that were not seen inside the quadrats are summarised below. Most of these are associated with the dense scrub at the overgrown field margins. These appear to be old boundaries, and some of them include large pollarded Crack Willows. Other tree species include White Willow, Hawthorn, Oak and Field Maple. None of the species are especially noteworthy and they are all relatively widespread within the Gwent Levels.

Table 3.50: Additional Species Not Present in Quadrats at TATA East.

Acer campestre
Acer pseudoplatanus
Arctium minus
Calystegia sepium
Carex nigra
Carex remota
Carex riparia
Cirsium vulgare
Clematis vitalba
Conium maculatum
Cornus sanguinea
Crataegus monogyna
Dactylorhiza fuchsii
Fraxinus excelsior
Galium palustre
Geranium robertianum
Juncus inflexus
Lotus pedunculatus
Lycopus europaeus
Malus pumila
Mentha aquatica
Phragmites australis
Phyllitis scolopendrium
Polystichum setiferum
Prunus cf domestica
Prunus spinosa

Quercus robur
Ranunculus repens
Salix alba
Salix cinerea

TATA Target Note Area 1

3.9.15 This area is a lagoon that was formerly used for settlement of iron compounds from steelworks effluent (Lagoon 12) shown on Map 10. It has a powdery black substratum and appears well drained, with no areas of damp ground or standing water. The lagoon is bordered by banks formed from steelworks slag, and the majority of the species recorded were associated with these banks and the edges of the lagoon closest to them, rather than the main part of the lagoon. The lagoon is mostly covered by scattered scrub, largely comprising Silver Birch and Butterfly Bush. A small number of other self-sown trees include Goat Willow, Ash and Stranvaesia. The ground flora is very sparse and the only notable species recorded within it is Narrow-leaved Everlasting Pea, which is locally frequent in the southern part, and Yellow-wort, which is present at some of the margins. Other species of local interest include Ploughman's Spikenard and Pale Toadflax, which are limited to the margins. Bracken occurs patchily at the southern margin.

Table 3.51: Species Recorded at TATA Target Note Area 1.

Arenaria serpyllifolia
Betula pendula
Blackstonia perfoliata
Buddleja davidii
Centaurium erythraea
Chamerion angustifolium
Cotoneaster cf lacteus
Crataegus monogyna
Dactylorhiza praetermissa
Dipsacus fullonum
Epilobium ciliatum
Eupatorium cannabinum
Fraxinus excelsior
Geranium robertianum
Glechoma hederacea
Hedera helix
Hirschfeldia incana
Homalothecium lutescens
Hypericum perforatum
Hypnum lacunosum
Inula conyzae
Lathyrus sylvestris
Leontodon hispidus
Linaria repens
Melilotus cf altissimus
Oenothera glazioviana
Peltigera sp.
Picris echioides
Prunella vulgaris
Pteridium aquilinum
Rubus fruticosus
Salix caprea
Salix cinerea
Scrophularia auriculata
Sedum acre
Senecio jacobaea
Sonchus oleraceus
Stranvaesia davidiana
Tripleurospermum inodorum
Verbascum thapsus
Vicia hirsuta

Photograph 59. Sparse Scrub in Target Note Area 1, Showing Narrow-leaved Everlasting Pea.

TATA Target Note Area 2

3.9.16 Like Target Note Area 1, this is a former settlement lagoon (Lagoon 25) with a substratum of dusty, black iron compounds, which is becoming colonised by scrub and is shown on Map 10. The vegetation appears to be at an earlier stage of succession in this area, with sparser trees and ground flora, and several patches have no vegetation at all. The main scrub species are Butterfly Bush and Silver Birch, with small amounts of Bramble. The trees only form a continuous canopy in the south-western part of the area, and the cover becomes less dense to the north and east. The sparse ground flora is formed by a low diversity of herbs and small acrocarpous mosses, which like the trees become increasingly sparse towards the eastern side of the lagoon. The most frequent herbs include Common Centaury, Blue Fleabane, Perforate St.John's-wort, Yellow-wort and Thyme-leaved Sandwort.

Photograph 60. Sparse Scrub in Eastern Part of Target Note Area 2.

Photograph 61. Denser Scrub and Slag Track Beside West of Target Note Area 2.

3.9.17 The track around the edge of the lagoon is formed from slag and has a sparse flora which is only slightly more diverse than the lagoon. It supports small amounts of Blue Fleabane, Yellow-wort and Ploughman's Spikenard, and a small plant of Narrow-leaved Everlasting Pea was noted at the scrubby southern edge.

3.9.18 The western edge of the lagoon appears to have been disturbed by recent earth-works and this area supports the densest vegetation, with a number of tall ruderal herbs including frequent Ragwort, Rose-bay Willowherb and Hoary Mustard.

Table 3.52: Species Recorded at TATA Target Note Area 1.

Anagallis arvensis
Arenaria serpyllifolia
Barbula convoluta
Betula pubescens
Blackstonia perfoliata
Bryum sp.
Buddleja davidii
Catapodium rigidum
Centaurium erythraea
Cerastium glomeratum
Chamerion angustifolium
Cirsium arvense
Cirsium vulgare
Conyza bilbaoana
Cymbalaria muralis
Epilobium hirsutum
Epilobium montanum
Erodium cicutarium
Erigeron acer
Hirschfeldia incana
Hypericum perforatum
Inula conyzae
Peltigera sp.
Rubus fruticosus
Salix cinerea
Sedum acre
Senecio jacobaea
Sonchus oleraceus
Taraxacum sp.
Tripleurospermum inodorum
Urtica dioica
Verbascum thapsus
Veronica arvensis
Vulpia bromoides

TATA Target Note Area 3

3.9.19 The western part of this area is a low-lying area of damp grassland and tall herbs shown on Map 11. The most frequent species include Greater Willowherb, Sharp-flowered Rush, Soft Rush, Angelica, Brown Sedge, Amphibious Bistort, Marsh Thistle, Hoary Ragwort, Nettle and Greater Bird's-foot Trefoil. Bramble

scrub is scattered through the area, and forms a dense belt around much of the margin. The west side of the lagoon is formed from tall scrub, with dominant species including White Willow, Crack Willow and Hawthorn, with a relatively species-poor ground flora including Bramble, Nettle, Greater Willowherb and Hedge Bindweed. The eastern edge of the lagoon is mostly dominated by a tall dense thicket of Hawthorn, Bramble and Blackthorn. Narrow-leaved Everlasting Pea is locally prominent scrambling over this scrub, especially adjacent to the track.

3.9.20 The track passing through the area and adjoining its south-eastern margin is formed by steel-works slag and supports a mix of sparse grasses, mosses and ruderal plants. There are also several piles of tipped slag material immediately to the north of the track, where the flora also includes patchy Butterfly Bush, Grey Willow and Dog Rose scrub. This relatively open vegetation supports a diverse mix of plant species, including Greater Mullein, Evening Primrose species, Hemp Agrimony, Black Medick, Bilbao Fleabane, Ox-eye Daisy, Thyme-leaved Sandwort, Common Stork's-bill, Teasel, Wild Parsnip, Rose-bay Willowherb, Bristly Ox-tongue, Ragwort, Biting Stonecrop, Upright Hedge-parsley, Agrimony and Yorkshire Fog. Two plants of the locally notable plant White Mullein were observed at the track margin.

Photograph 62. Damp Grassland in Western Part of TATA Target Note Area 3.

Photograph 63. Open Vegetation and Scrub on Piles of Tipped Slag at TATA Target Note Area 3.

3.9.21 A ditch passing through the centre of the area is fringed by a bed of dense Common Reed, which extends for several metres either side of the banks. The western reed-bed merges into a mosaic of tall herbs and Bramble scrub, with a high proportion of Amphibious Bistort and occasional Marsh Thistle, Meadowsweet, Meadow Vetchling and Narrow-leaved Everlasting Pea. The eastern reed-bed merges into a mosaic of Grey Willow scrub, Bulrush, Brown Sedge and larger areas of dense Common Reed with Yellow Loosestrife.

Table 3.53: Species Recorded at TATA Target Note 3

Achillea millefolium
Agrimonia eupatoria
Agrostis stolonifera
Aira caryophyllea
Alopecurus pratensis
Anagallis arvensis
Angelica sylvestris
Arctium lappa
Arctium minus
Arenaria serpyllifolia
Arrhenatherum elatius
Brachythecium rivulare
Brachythecium rutabulum
Buddleja davidii
Calystegia sepium
Carex disticha
Carex hirta
Carex otrubae
Catapodium rigidum
Cirsium arvense
Cirsium palustre
Cirsium vulgare
Conium maculatum
Conyza bilbaoana
Crataegus monogyna
Cratoneuron filicinum
Dactylis glomerata
Dipsacus fullonum
Elytrigia repens
Epilobium hirsutum
Epilobium palustre
Epilobium parviflorum
Erodium cicutarium
Eupatorium cannabinum
Festuca arundinacea
Filipendula ulmaria
Galium aparine
Geranium molle
Geranium robertianum
Hedera helix
Heracleum sphondylium
Hirschfeldia incana
Holcus lanatus
Homalothecium lutescens
Hydrocharis morsus-ranae
Hypericum perforatum
Juncus acutiflorus
Juncus effusus

Juncus inflexus
Lactuca virosa
Lathyrus pratensis
Lathyrus sylvestris
Lemna trisulca
Leucanthemum vulgare
Lotus pedunculatus
Lysimachia vulgaris
Medicago lupulina
Myosotis arvensis
Oenanthe crocata
Oenothera fallax
Oenothera glazioviana
Pastinaca sativa
Peltigera sp.
Persicaria amphibia
Phalaris arundinacea
Phleum pratense
Phragmites australis
Picris echioides
Plantago lanceolata
Potentilla anserina
Prunus spinosa
Quercus robur
Reseda luteola
Rosa canina
Rubus fruticosus
Rumex obtusifolius
Salix alba
Salix cinerea
Salix fragilis
Sedum acre
Senecio erucifolius
Senecio jacobaea
Solanum dulcamara
Sonchus asper
Torilis japonica
Trifolium repens
Typha latifolia
Urtica dioica
Verbascum lychnitis
Verbascum thapsus
Vicia cracca
Vicia tetrasperma

Photograph 64. Reed-dominated Vegetation at TATA Target Note Area 3.

TATA Target Note Area 4

3.9.22 Target note area 4 is mostly dominated by dense scrub and is shown on Map 11. The southern part comprises mature White Willow, Crack Willow and Ash with a dense understorey of Bramble, Hawthorn and Nettle, and this grades into a grassier mix with False Oat-grass, Hogweed, Hemp Agrimony, Couch and Reed Sweet-grass at its margin. The western edge includes a species-poor bed of Common Reed, which merges into a large block of Grey Willow scrub that occupies much of the central area. The Grey Willow scrub has a very sparse ground flora which includes Ivy, Gypsywort, Remote Sedge and Nettle. To the north, there is a more open marshy grassland habitat, with Creeping Bent,

Yorkshire Fog, Hard Rush, Greater Willowherb, Fleabane, Nettle and Greater Bird's-foot Trefoil. Scattered scrub of Hawthorn, Grey Willow and Dog Rose occur throughout the area, and several plants of the invasive Indian Balsam were also observed. An overgrown hedge and boundary ditch divides the area. This is formed from mature Hawthorn, Elm and Oak, and bordered by a dense fringe of Bramble and Dog Rose. The eastern margin includes a widened section of the slag track, which supports several plants of Great Lettuce and a similar mix of other ruderal plants as described in TATA West.

Table 3.54: Species Recorded at TATA Target Note Area 4.

Agrostis stolonifera
Angelica sylvestris
Arctium minus
Arenaria serpyllifolia
Brachythecium rivulare
Calliergon cordifolium
Calliergonella cuspidata
Calystegia sepium
Carex hirta
Carex otrubae
Carex remota
Carex riparia
Catapodium rigidum
Centaurea nigra
Cirsium arvense
Cirsium palustre
Cirsium vulgare
Crataegus monogyna
Cratoneuron filicinum
Dactylis glomerata
Dryopteris filix-mas
Elytrigia repens
Epilobium ciliatum
Epilobium hirsutum
Epilobium montanum
Epilobium palustre
Eupatorium cannabinum
Filipendula ulmaria
Fraxinus excelsior
Galium aparine
Galium palustre
Geranium robertianum
Hedera helix
Heracleum sphondylium
Holcus lanatus
Hypericum tetrapterum
Impatiens glandulifera
Juncus conglomeratus
Juncus effusus
Juncus inflexus
Kindbergia praelonga
Lactuca virosa
Lathyrus pratensis
Lotus pedunculatus
Lycopus europaeus
Lythrum salicaria
Medicago lupulina
Myosotis arvensis
Oenanthe crocata
Peltigera sp.
Persicaria amphibia
Phalaris arundinacea
Phleum pratense
Phragmites australis
Picris echioides
Prunus spinosa
Quercus robur
Ranunculus repens
Rhytidiadelphus squarrosus
Rosa canina
Rubus fruticosus
Rumex conglomeratus
Rumex crispus
Salix alba
Salix cinerea
Salix fragilis
Sedum acre
Senecio erucifolius
Senecio vulgaris
Sison amomum
Solanum dulcamara
Sonchus oleraceus
Stachys palustris
Stellaria graminea
Torilis japonica
Trifolium pratense
Tripleurospermum inodorum
Typha latifolia
Ulmus sp.
Urtica dioica
Vicia cracca

Photograph 65. Marshy Grassland, Reeds and Scrub in Target Note Area 4.

4. Evaluation

4.1 Evaluation Method

4.1.1 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' (IEEM, 2006). This is summarised in Table 4.1. Many of the sites are within the Gwent Levels Site of Special Scientific Interest (SSSI) and should therefore be considered important in a national context if taken as a whole. However, the principal SSSI interest is associated with the ditches and many of the terrestrial habitats could be considered to be of lower nature conservation value if examined separately (reseeded improved grassland being one example).

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 the Main Habitat Types within the Selected Sites

Grassland Habitats

4.2.1 The majority of the grassland habitat surveyed is agricultural land managed as permanent pasture. This is mostly grazed by cattle, but some fields have sheep or horses. The majority of the grassland vegetation was classified as MG6 and MG7 grassland, supporting a relatively limited range of common plant species. A few of the plants in these pastures are locally significant, including Meadow Brome and Meadow Barley which occur in the Gwent Levels grassland sites at Whitecross Farm and Tatton Farm. The damp field grips at both of these sites graduated to MG10 rush pasture, which locally support Tubular Water-dropwort. The pasture sites within the Gwent Levels would qualify as the S42 and UK BAP Priority Habitat 'Coastal and floodplain grazing marsh' if considered together with the network of ditches.

4.2.2 The ungrazed road-verge habitat adjacent to the A48M and M4, seen at Pound Hill and adjacent to Pwll Diwaelod, supports moderately diverse MG1 grassland. These areas are dominated by tall grasses, but they include a good range of herb

species. It is possible that some of the diversity has been boosted by use of wildflower seed mix. Notable species recorded at Pound Hill include Stone Parsley, Grass Vetchling and Yellow-wort. Grass Vetchling was also noted in the verge grassland adjacent to Pwll Diwaelod. These verges are considered to be of local value for nature conservation.

4.2.3 Cattle-grazed MG6 grassland was found outside of the Gwent Levels at Pwll Diwaelod. This was mostly species-poor, but locally a few drier patches graduated into slightly more diverse MG5 grassland, while some damper areas support species-poor MG10 rush pasture. MG5 grassland is present adjacent to the Rectory Woods study site at Rogiet, which is close to the Rectory Meadow - Rogiet SSSI. The nearby SSSI is notified for Meadow Clary, but there was no sign of this rare plant within the current study area. The pasture at these sites is considered to be of no more than local importance for nature conservation.

Wetlands

4.2.4 The reens within the Gwent Levels SSSI were not covered as part of this study, although the field grips were included. As described above, most of the field grips were relatively species-poor, with the main botanical interest being the occasional patches of Tubular Water-dropwort. A few other notable plants were observed incidentally in reens adjacent to the study areas. These included Arrowhead and Frogbit at Whitecross Farm and Cyperus Sedge in ditches adjacent to Pye Corner and Tatton Farm. The reens undoubtedly support many more notable plants than these incidental observations. The network of reens, ditches and field-grips is the most important feature of the Gwent Levels SSSI, and a key element of the UK BAP/ S42 priority habitat 'Coastal and floodplain grazing marsh'.

4.2.5 Other wetland habitats were observed at Pwll Diwaelod, where there is a mix of small streams, fen vegetation and wet woodland with standing water. There is also a pond with cattle-trampled margins and stands of emergent vegetation. Fen and carr vegetation of this nature is uncommon in this part of south Wales, and there are sufficient wetland plants, including the locally notable Greater Spearwort, to consider this habitat mosaic as being significant in a county context. The pond is significant in a local context for its vegetation, although its conservation value may be higher than this if other aspects, such as amphibians or invertebrates, are considered.

Woodland and Scrub

4.2.6 Of the woodlands included in the current study, the woodlands at Rogiet and Pwll Diwaelod are considered to constitute UK BAP / S42 Priority Habitat. The smaller, more scrubby woodlands and plantations are not.

4.2.7 The two woodlands at Rogiet are both included in the Forestry Commission inventory of ancient woodland. Although they have been subject to felling and replanting, they still retain a mostly broadleaved canopy and a diverse ground flora with high proportion of old woodland indicator species, typical of W8 woodlands on limestone soils. The patches at Rogiett Brake where conifers are dominant contain a good range of indicators in their ground flora (and a population of Red Wood Ants), and should still be considered to be of value for nature conservation in a county context.

4.2.8 The three main areas of woodland at Pwll Diwaelod are also classified as semi-natural ancient woodland, but they are very different in character from Rogiet, due to the much wetter conditions, and range from Alder-dominated W5 and W6, to drier W7 and W8 woodland. A few parts are currently in poor condition due to tipping and over-grazing, but they still retain a diverse structure and ground flora, and sufficient old woodland indicators to be evaluated as having county significance for nature conservation.

4.2.9 The small scrubby plantation at Pye Corner includes a small part of an area that is shown as ancient semi-natural woodland in the ancient woodland inventory. However, with the exception of a narrow strip of mature trees beside Picked Lane there does not appear to be any evidence of old woodland. Aerial photographs from the 1940s clearly show that the study area was a field at that time, and most of the current canopy has clearly been planted relatively recently. This plantation is evaluated as being of local value for its flora, although it is undoubtedly also of value for birds, insects and other fauna.

4.2.10 The two areas of scrub and plantation at Pound Hill only have a species-poor ground flora with very common plant species. They were assessed as being of nature conservation value only in a local context.

Saltmarsh

4.2.11 Much of the east bank of the Ebbw is unmanaged and largely dominated by dense scrub and reedbeds with limited vegetation diversity. However, the strip of low-growing vegetation in the vicinity of the proposed route supports a diverse saltmarsh flora, which is UK BAP and S42 priority habitat. The saltmarsh is a little unusual in this location because much of it is formed over stony material, but the flora is relatively diverse and includes a good range of typical saltmarsh plants, grading into grassland and scrub further up the shore. In terms of its nature conservation value the saltmarsh is important in at least a county context.

Reedbed

4.2.12 The TATA steelworks supports extensive reedbeds that form part of its effluent treatment system. Smaller reedbeds are present in other parts of the steelworks site, and beside the Ebbw saltmarsh. Reedbeds have a limited botanical diversity but are recognised as having value for nature conservation for other taxa, such as birds and invertebrates, and are a UK BAP and S42 priority habitat. These larger reedbed areas are considered important for nature conservation in a county context.

Brownfield Habitats

4.2.13 The study area at Alexandra Docks supports a varied mix of scrub, grassland and ruderal vegetation. The habitats of greatest nature conservation significance are the grassland areas and damp ground, especially in the more open and disturbed parts, and areas of former tipping. The more open parts would qualify as the UK BAP habitat 'open mosaic habitat on previously developed land', and several locally notable plants are present; including Dittander, Round-headed Club-rush, Dark Mullein and Great Lettuce. The site is especially vulnerable to change because it is part of a working port, and recent operational activities have resulted in several areas being cleared or built over. However, other parts have

remained relatively undisturbed and are losing their botanical diversity due to becoming encroached upon by dense scrub.

4.2.14 The network of slag tracks, dry lagoon margins and occasional piles of tipped slag at the TATA steelworks support a sparse cover of diverse ruderal vegetation that would qualify as the UK BAP 'open mosaic habitat on previously developed land'. The slag provides an unusual substratum that supports a number of locally notable plants including White Mullein, Round-leaved Wintergreen, Round-leaved Crane's-bill and large populations of Great Lettuce. The alkaline soils within the former settlement lagoons (target note areas 1 and 2) also have an unusual and rather sparse flora which is much less diverse than the slag, but they include concentrations of locally notable species including Yellow-wort and Narrow-leaved Everlasting Pea.

4.2.15 Several of the older lagoons at the steelworks land are in varying stages of succession. Several support a diverse, flower-rich mosaic of grassland, tall wetland herbs and scrub, which includes locally notable species including Pepper Saxifrage, Brown Sedge and Narrow-leaved Everlasting Pea. These areas are significant for nature conservation in a county context. However, this is a transitional community and in the absence of management the habitat will eventually lose much of its value as it becomes dominated by dense scrub.

4.3 Occurrence of Notable Species within the Selected Sites

4.3.1 The accounts of individual sites in Section 3 includes full species lists and there are references in the text to particular notable or uncommon species where these were recorded. Table 4.2 below summarises the occurrence of notable species within the selected study areas, using the list of Rare, Scarce and Declining species from the Guidelines for the Selection of Wildlife Sites in South Wales. Sites supporting one or more of the guidelines' Primary Species or five or more Contributory Species can be considered significant in a county context.

4.3.2 The Wildlife Sites criteria also states that sites should be considered for selection if they support plant species listed as Nationally Scarce, Nationally Rare, Vulnerable, Endangered or Critically Endangered in the Red Data Book (Cheffings, C.M. & Farrell, L. (Eds.) 2005) (RDB species) or are included on the List of Species and Habitats of Principal Importance for the Conservation of Biological Diversity (S42). The Welsh Red Data Book for Vascular Plants (Dines, 2008) has re-evaluated the status of certain species in a Welsh Context. The species to which these apply are indicated in Table 4.2 below.

Table 4.2: Occurrence of Notable Species within the Selected Sites.

Species / RDB status	Site A. Pwll Diwaelod	Site B. Pound Hill	Site C. Whitecross Farm	Site D. Alexandra Dock	Site D. Ebbw Saltmarsh	Site E. Pye Corner	Site F. Tatton Farm	Site G. Roggiett Brake and Rectory Woods	Site H. TATA steelworks
PRIMARY SPECIES									
Galium parisiense (NS/VU)(NA*)					+				
Hydrocharis morsus-ranae (VU)			(+)						(+)
Lactuca virosa (LC)				+					+
Lepidium latifolium (NS/LC)				+	+				
Oenanthe fistulosa (VU/ S42)			+				+		
Ranunculus lingua (LC)	+								
Sagittaria sagittifolia (LC/ VU*)			(+)						(+)
Scirpoides holoschoenus (NR/EN) (NA*)				+					
Verbascum lychnitis (NS/LC) (NA*)									+
Verbascum nigrum (LC/NT*)				+					
CONTRIBUTORY SPECIES									
Anacamptis pyramidalis (LC)				+					
Apium graveolens (LC)					+				
Ballota nigra (LC)				+					
Blackstonia perfoliata (LC)		+		+					+
Bromus racemosus (LC)			+				+		
Bryonia dioica (LC)								+	
Carex disticha (LC)									+
Carex pseudocyperus (LC/NT*)						(+)	(+)		
Carex strigosa (LC)	+								
Daphne laureola (LC)								+	
Echium vulgare (LC)				+					
Euphorbia amygdaloides (LC)								+	
Geranium rotundifolium (LC)				+					+
Glaucium flavum (LC)				+					
Hordeum secalinum (LC)			+		+		+		+
Iris foetidissima (LC)								+	
Lathyrus nissolia (LC)	+	+		+					
Lathyrus sylvestris (LC)				+					+
Lotus glaber (LC)				+					
Oenanthe lachenalii (LC)					+				
Parapholis strigosa (LC)					+				
Picris hieracioides (LC)				+					
Pyrola rotundifolia (LC)									+
Ranunculus auricomus (LC)								+	
Silaum silaus (LC)									+
Sison amomum (LC)		+		+		+	+		+
Spergularia media (LC)					+				
Viburnum lantana (LC)								+	
Viscum album (LC)							+		+

Status abbreviations: Least Concern (LC), Nationally Scarce (NS), Near Threatened (NT), Nationally Rare (NR), Vulnerable (VU), Endangered (EN) or Critically Endangered (CR) in the Red Data Book. Where different, from the GB RDB, the status in the Welsh RDB is shown and marked with an asterisk. (NA = Not applicable to Welsh RDB, because not native in Wales)

(NB The records shown in brackets were incidental observations from the adjacent reens rather than in the formal study area for this assessment, so these have not been included in the evaluation of the terrestrial habitats at these sites).

4.3.3 In this case several sites meet these notable species criteria for county significance, as follows:

- Pwll Diwaelod (1 Primary, 2 Contributory species)
- Whitecross Farm (1 Primary species, 2 Contributory species)
- Tatton Farm (1 Primary, 4 Contributory species)
- Alexandra Docks (4 Primary, 11 Contributory species)
- Ebbw saltmarsh (2 Primary, 5 Contributory species)
- Rogiett Brake and Rectory Woods (6 Contributory species)
- TATA steelworks (2 Primary and 9 Contributory species).

4.4 Summary Evaluation

4.4.1 Taking account of the presence of Priority Habitat and notable species, an overall evaluation of the vegetation at each site is presented in Table 4.3.

Table 4.3: Summary Evaluation of Nature Conservation Status of Vegetation

Site	Level of value	Reason
A. Pwll Diwaelod	County	Ancient semi-natural woodland, fen and pond are all priority habitats. Greater Spearwort is a primary listed species. (The flower-rich grassland is only of local value, but may be higher if important for grassland fungi).
B. Pound Hill	Local	Flower-rich grassland on verge has good diversity, including 3 contributory species. Scrubby young woodlands are relatively species-poor, but increasing in diversity.
C. Whitecross Farm	District	Network of field grips and presence of Tubular Water-dropwort.
D. Alexandra Dock	County	Mosaic of flower-rich grassland with good numbers of locally notable species including Dark Mullein, Great Lettuce, Dittander and Round-headed Club-rush.
D. Ebbw saltmarsh	County	Priority habitat with good range of notable plant species, including large population of Dittander.
E. Pye Corner	Local	Scrubby plantation with limited ground flora diversity.
F. Tatton Farm	District	Network of field grips and presence of Tubular Water-dropwort.
G. Roggiett Brake and Rectory Woods	County	Ancient semi-natural woodland, and presence of more than 5 contributory species.
H. TATA Steelworks	County	Man-made habitat with varied alkaline substrata including ruderal flora, flower-rich damp grasslands and extensive reedbeds, with good numbers of notable species. (Less diverse parts of the site would not be considered of county value if assessed in isolation.)

4.5 Invasive Species

4.5.1 Several species listed as non-native invasive plants under Schedule 9 of the Wildlife and Countryside Act were encountered during the vegetation surveys. These are summarised in Table 4.4.

Table 4.4: Schedule 9 Non-native Invasive Plant Species Observed During Vegetation Survey

Site	Schedule 9 species	Summary
A. Pwll Diwaelod	(None seen within study area)	
B. Pound Hill	Montbretia	Occasional plants. mainly at edge of Picked Lane.
C. Whitecross Farm	Water Fern	Locally abundant in ditch adjoining north-east boundary.
D. Alexandra Dock	Japanese Knotweed	Several patches in grassland and areas of tipped material.
	Virginia creeper	One very small plant at scrub margin in north of study area.
	Montbretia	Small quantity in scrub margins.
D. Ebbw saltmarsh	Japanese Knotweed	Several patches at upper edge of bank.
	Giant Knotweed	No plants found within study area, but dead leaves found beside landfill site, so possibly present on adjacent land.
	Wall Cotoneaster	Rare, on tipped rubble at top of bank.
	Japanese Rose	Rare at top of bank.
E. Pye Corner	Montbretia	Occasional, mainly beside Picked Lane
F. Tatton Farm	(None seen within study area)	
G. Roggiett Brake and Rectory Woods	Montbretia	Small quantity in overgrown quarry at Roggiett Brake
H. TATA Steelworks	Indian Balsam	Occasional patches in Target Note Area 4.

5. References

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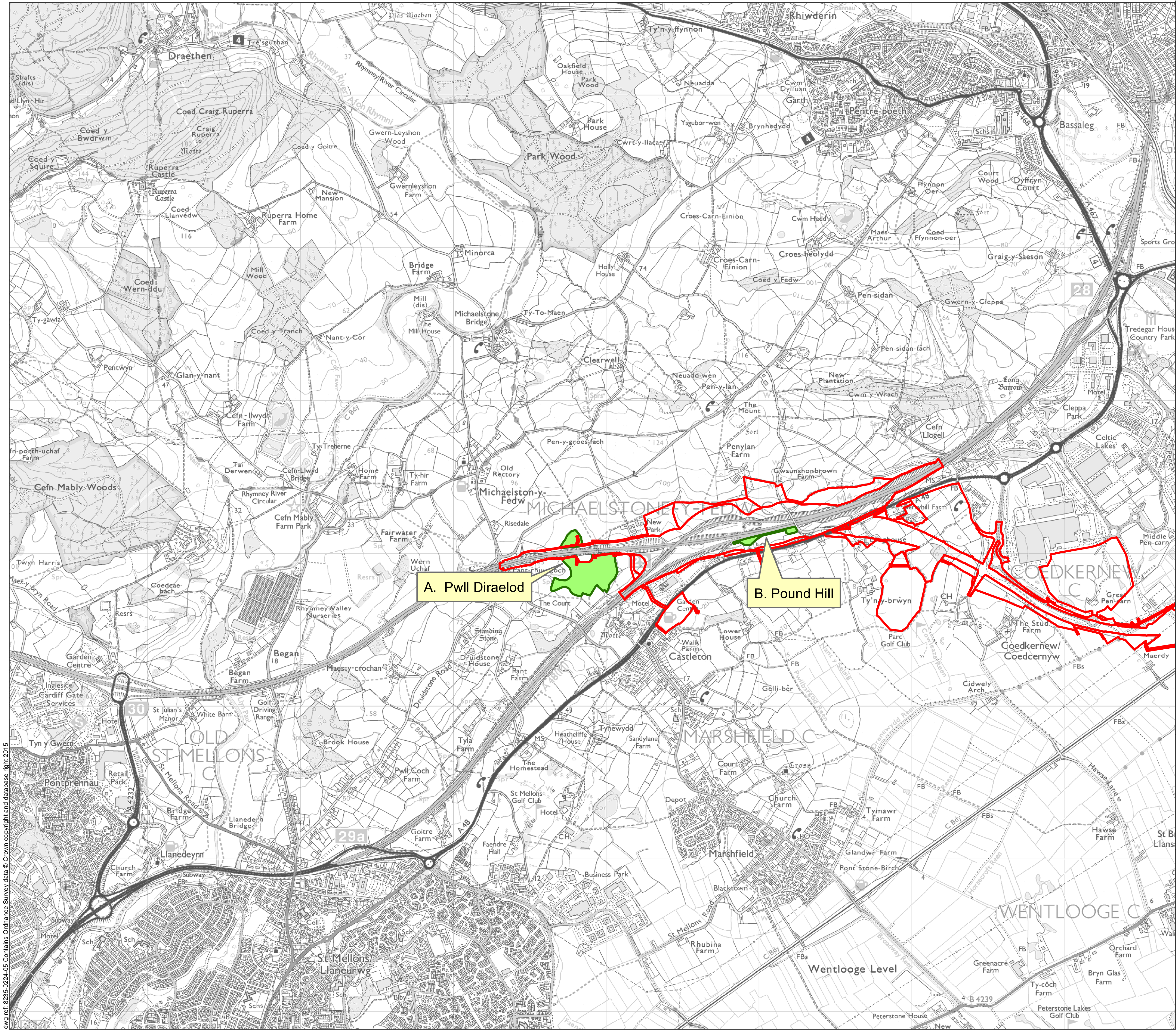
Figures



Legend

- Limit of Permanent and Temporary Works for new section of Motorway
- Study area boundary

The scheme shown reflects the design at time of survey

Appendix 10.20 NVC Survey Report

Locations of Survey Areas

Figure: 1a	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MS	Checked:

Scale: A3 @ 1:24,000

0 500 1,000m

N

dwg ref: 8235-0224-05

D. Alexandra Dock and Ebbw Saltmarsh

C. Whitecross Farm

E. Pye Corner

F. Tatton F

Legend

- Limit of Permanent and Temporary Works for new section of Motorway
- Study area boundary

The scheme shown reflects the design at time of survey

Appendix 10.20 NVC Survey Report

Locations of Survey Areas

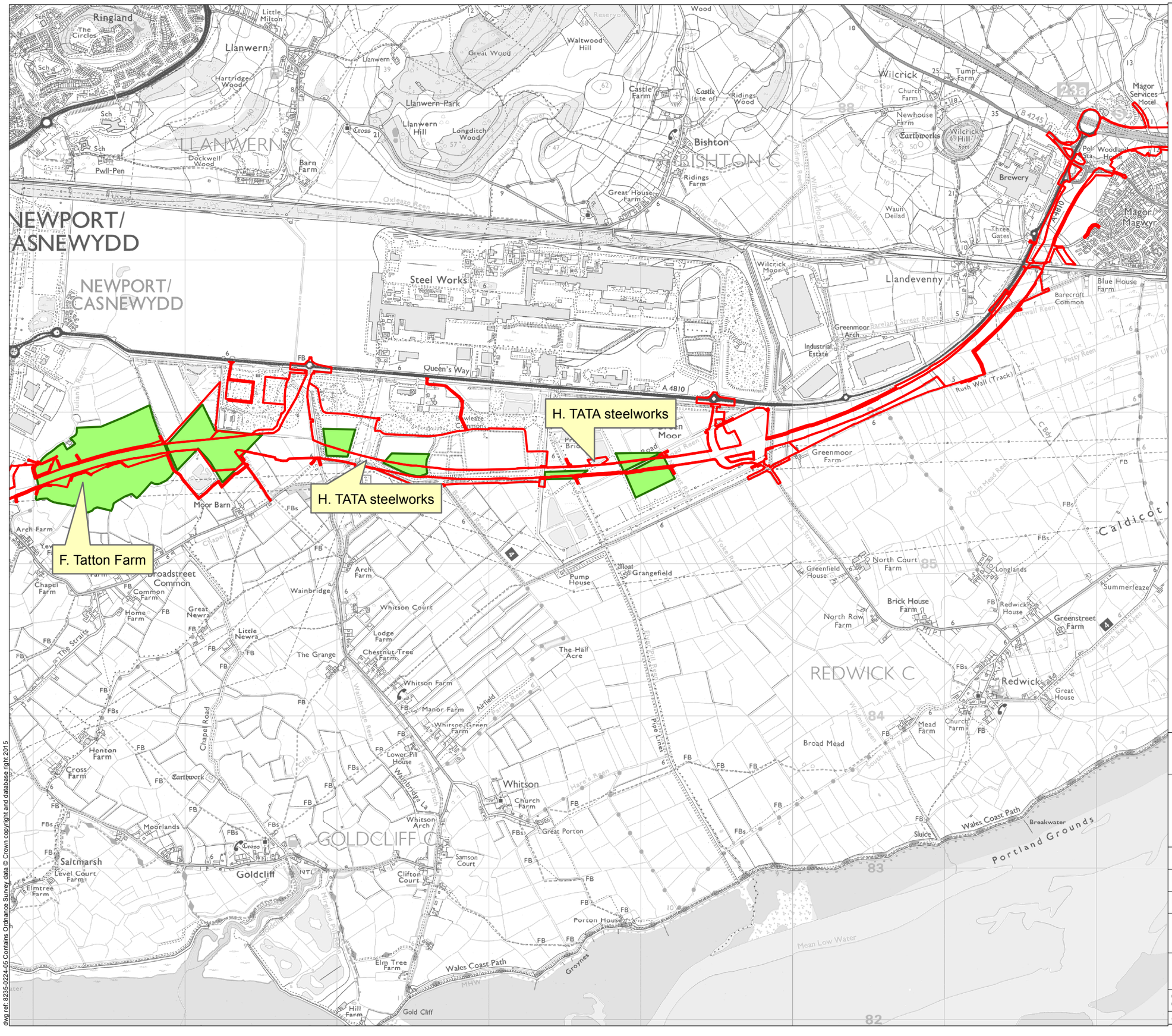
Figure: 1b	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MS	Checked:

Scale: A3 @ 1:24,000

0 500 1,000m

N

dwg ref: 8235-0224-05



Legend

- Limit of Permanent and Temporary Works for new section of Motorway
- Study area boundary

The scheme shown reflects the design at time of survey

Appendix 10.20 NVC Survey Report

Locations of Survey Areas

Figure: 1c	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MS	Checked:

Scale: A3 @ 1:24,000

0 500 1,000m

N

dwg ref: 8235-0224-05

G. Roggiett Brake and Rectory Woods

Legend

- Limit of Permanent and Temporary Works for new section of Motorway
- Study area boundary

The scheme shown reflects the design at time of survey

Appendix 10.20 NVC Survey Report

Locations of Survey Areas

Figure: 1d	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MS	Checked:

Scale: A3 @ 1:24,000

0 500 1,000m

N

dwg ref: 8235-0224-05

Annexes

Annex A. Plant Species List

The following list summarises the plant species recorded on the sites described in this report, giving the scientific and common names for each one. The list should not be considered a comprehensive list of plant species within these areas, and many more could probably be recorded if the sites were re-visited, especially if searching at different times of year, or from a wider area (e.g. if species from the adjacent reens and hedges were included). Only the most abundant and prominent mosses and liverworts occurring on the ground have been listed here, and a specialist survey would undoubtedly confirm the presence of many more species.

Vascular plants

Acer campestre	Field Maple
Acer platanoides	Norway Maple
Acer pseudoplatanus	Sycamore
Achillea millefolium	Yarrow
Adoxa moschatellina	Moschatel
Aegopodium podagraria	Ground Elder
Aesculus hippocastanum	Horse Chestnut
Agrimonia eupatoria	Agrimony
Agrostis capillaris	Common Bent
Agrostis gigantea	Black Bent
Agrostis stolonifera	Creeping Bent
Aira caryophyllea	Silver Hair-grass
Aira praecox	Early Hair-grass
Ajuga reptans	Bugle
Alchemilla mollis	Lady's Mantle
Alisma plantago-aquatica	Common Water-plantain
Alliaria petiolata	Garlic Mustard
Alnus glutinosa	Alder
Alopecurus geniculatus	Marsh Foxtail
Alopecurus pratensis	Meadow Foxtail
Amaranthus retroflexus	Common Amaranth
Anacamptis pyramidalis	Pyramidal Orchid
Anagallis arvensis	Scarlet Pimpernel
Anemone nemorosa	Wood Anemone
Angelica sylvestris	Angelica
Anisantha madritensis	Compact Brome
Anisantha sterilis	Barren Brome
Anthoxanthum odoratum	Sweet Vernal-grass
Anthriscus sylvestris	Cow Parsley
Aphanes australis	Slender Parsley-piert
Apium graveolens	Wild Celery
Apium nodiflorum	Fool’s Water-cress
Aquilegia vulgaris	Columbine
Arabidopsis thaliana	Thale Cress
Arctium lappa	Greater Burdock
Arctium minus	Lesser Burdock
Arenaria serpyllifolia	Thyme-leaved Sandwort
Arrhenatherum elatius	False Oat-grass
Artemisia vulgaris	Mugwort
Arum maculatum	Lords and Ladies
Aster tripolium	Sea Aster

Aster x salignus	Common Michaelmas Daisy
Athyrium filix-femina	Lady Fern
Atriplex prostrata	Spear-leaved Orache
Azolla filiculoides	Water-fern
Ballota nigra	Black Horehound
Barbarea vulgaris	Winter-cress
Bellis perennis	Daisy
Berula erecta	Lesser Water-parsnip
Beta vulgaris	Sea Beet
Betula pendula	Silver Birch
Betula pubescens	Downy Birch
Blackstonia perfoliata	Yellow-wort
Bolboschoenus maritimus	Sea Club-rush
Brachyglottis x jubar	Shrub Ragwort
Brachypodium sylvaticum	False Brome
Bromopsis ramosa	Hairy Brome
Bromus hordeaceus	Soft Brome
Bromus racemosus	Smooth Brome
Bryonia dioica	White Bryony
Buddleja davidii	Butterfly Bush
Callitriche sp.	Water Starwort
Caltha palustris	Marsh Marigold
Calystegia sepium	Hedge Bindweed
Calystegia silvatica	Large Bindweed
Capsella bursa-pastoris	Shepherd's Purse
Cardamine flexuosa	Wavy Bittercress
Cardamine pratensis	Cuckoo-flower
Carduus crispus	Welted Thistle
Carex disticha	Brown Sedge
Carex divulsa	Grey Sedge
Carex flacca	Glaucous Sedge
Carex hirta	Hairy Sedge
Carex nigra	Common Sedge
Carex otrubae	False Fox-sedge
Carex ovalis	Oval Sedge
Carex pendula	Pendulous Sedge
Carex pseudocyperus	Cyperus Sedge
Carex remota	Remote Sedge
Carex riparia	Greater Pond-sedge
Carex spicata	Spiked Sedge
Carex strigosa	Thin-spiked Wood-sedge
Carex sylvatica	Wood Sedge
Carlina vulgaris	Carline Thistle
Carpinus betulus	Hornbeam
Catapodium rigidum	Fern-grass
Centaurea nigra	Common Knapweed
Centaurium erythraea	Common Centaury
Centranthus ruber	Red Valerian
Cerastium fontanum	Common Mouse-ear
Cerastium glomeratum	Sticky Mouse-ear
Cerastium semidecandrum	Little Mouse-ear
Chaenorhinum minus	Small Toadflax
Chamerion angustifolium	Rose-bay Willowherb
Chenopodium album	Fat Hen

Chenopodium ficifolium	Fig-leaved Goosefoot
Chenopodium rubrum	Red Goosefoot
Chrysosplenium oppositifolium	Opposite-leaved Golden-saxifrage
Circaea lutetiana	Enchanter's Nightshade
Cirsium arvense	Creeping Thistle
Cirsium palustre	Marsh Thistle
Cirsium vulgare	Spear Thistle
Clematis vitalba	Traveller's Joy
Cochlearia anglica	English Scurvy-grass
Conium maculatum	Hemlock
Conopodium majus	Pignut
Conyza bilbaoana	Bilbao Fleabane
Conyza canadensis	Canadian Fleabane
Conyza sp.	Fleabane (indeterminate)
Cornus sanguinea	Dogwood
Cornus sericea	Red-osier Dogwood
Coronopus didymus	Lesser Swine-cress
Cortaderia selloana	Pampas Grass
Corylus avellana	Hazel
Cotoneaster cf lacteus	Late Cotoneaster
Cotoneaster horizontalis	Wall Cotoneaster
Crataegus monogyna	Hawthorn
Crepis capillaris	Smooth Hawk's-beard
Crepis vesicaria	Beaked Hawk's-beard
Crocosmia crocosmiiflora	Montbretia
Cymbalaria muralis	Ivy-leaved Toadflax
Cynosurus cristatus	Crested Dog's-tail
Dactylis glomerata	Cock's-foot
Dactylorhiza fuchsii	Common Spotted-orchid
Dactylorhiza praetermissa	Southern Marsh-orchid
Dactylorhiza sp.	Marsh Orchid (indeterminate)
Daphne laureola	Spurge Laurel
Datura stramonium	Thorn Apple
Daucus carota	Wild Carrot
Deschampsia cespitosa	Tufted Hair-grass
Digitalis purpurea	Foxglove
Dipsacus fullonum	Teasel
Dryopteris affinis	Scaly Male-fern
Dryopteris dilatata	Broad Buckler-fern
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 lanceolatum	Spear-leaved Willowherb
Epilobium montanum	Broad-leaved Willowherb
Epilobium obscurum	Short-fruited Willowherb
Epilobium palustre	Marsh Willowherb
Epilobium parviflorum	Hoary Willowherb
Equisetum arvense	Field Horsetail
Equisetum fluviatile	Water Horsetail
Equisetum telmateia	Great Horsetail

Erigeron acer	Blue Fleabane
Erodium cicutarium	Common Stork's-bill
Euonymus europaeus	Spindle
Eupatorium cannabinum	Hemp Agrimony
Euphorbia amygdaloides	Wood Spurge
Euphorbia peplus	Petty Spurge
Fagus sylvatica	Beech
Fallopia japonica	Japanese Knotweed
Festuca arundinacea	Tall Fescue
Festuca gigantea	Giant Fescue
Festuca pratensis	Meadow Fescue
Festuca rubra	Red Fescue
Filipendula ulmaria	Meadowsweet
Foeniculum vulgare	Fennel
Fragaria vesca	Wild Strawberry
Fraxinus excelsior	Ash
Galega officinalis	Goat's-rue
Galeopsis sp.	Hemp-nettle
Galium aparine	Cleavers
Galium mollugo	Hedge Bedstraw
Galium palustre	Marsh Bedstraw
Galium parisiense	Wall Bedstraw
Galium verum	Lady's Bedstraw
Geranium dissectum	Cut-leaved Crane’s-bill
Geranium molle	Dove's-foot Crane's-bill
Geranium robertianum	Herb Robert
Geranium rotundifolium	Round-leaved Crane's-bill
Geum urbanum	Wood Avens
Glaucium flavum	Yellow-horned Poppy
Glaux maritima	Sea Milkwort
Glechoma hederacea	Ground Ivy
Glyceria declinata	Small Sweet-grass
Glyceria fluitans	Floating Sweet-grass
Glyceria maxima	Reed Sweet-grass
Hedera helix	Ivy
Heracleum sphondylium	Hogweed
Hieracium sp.	Hawkweed (indeterminate)
Hirschfeldia incana	Hoary Mustard
Holcus lanatus	Yorkshire Fog
Hordeum secalinum	Meadow Barley
Humulus lupulus	Wild Hop
Hyacinthoides cf hispanica	Spanish Bluebell
Hyacinthoides non-scripta	Bluebell
Hydrocharis morsus-ranae	Frog-bit
Hypericum perforatum	Perforate St.John’s-wort
Hypericum tetrapterum	Square-stalked St.John’s-wort
Hypochaeris radicata	Common Cat’s-ear
Ilex aquifolium	Holly
Impatiens glandulifera	Indian Balsam
Inula conyzae	Ploughman’s Spikenard
Iris foetidissima	Stinking Iris
Iris pseudacorus	Yellow Iris
Juncus acutiflorus	Sharp-flowered Rush
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
Lamiastrum galeobdolon	Yellow Archangel
Lapsana communis	Nipplewort
Larix cf kaempferi	Japanese Larch
Lathyrus nissolia	Grass Vetchling
Lathyrus pratensis	Meadow Vetchling
Lathyrus sylvestris	Narrow-leaved Everlasting-pea
Lemna minor	Common Duckweed
Lemna minuta	Least Duckweed
Lemna trisulca	Ivy-leaved Duckweed
Leontodon autumnalis	Autumn Hawkbit
Leontodon hispidus	Rough Hawkbit
Leontodon saxatilis	Lesser Hawkbit
Lepidium draba	Hoary Cress
Lepidium latifolium	Dittander
Leucanthemum vulgare	Ox-eye Daisy
Leycesteria formosa	Himalayan Honeysuckle
Ligustrum vulgare	Wild Privet
Linaria repens	Pale Toadflax
Linaria vulgaris	Common Toadflax
Lolium perenne	Perennial Rye-grass
Lonicera periclymenum	Honeysuckle
Lotus corniculatus	Common Bird’s-foot Trefoil
Lotus glaber	Narrow-leaved Bird’s-foot Trefoil
Lotus pedunculatus	Greater Bird’s-foot Trefoil
Luzula campestris	Field Wood-rush
Luzula pilosa	Hairy Woodrush
Lychnis flos-cuculi	Ragged Robin
Lycopus europaeus	Gypsywort
Lysimachia nemorum	Wood Pimpernel
Lysimachia nummularia	Creeping Jenny
Lysimachia punctata	Dotted Loosestrife
Lysimachia vulgaris	Yellow Loosestrife
Lythrum salicaria	Purple Loosestrife
Malus hupehensis	Hupeh Crab
Malus pumila	Apple
Malva moschata	Musk Mallow
Malva sylvestris	Common Mallow
Matricaria discoidea	Pineappleweed
Matricaria recutita	Scented Mayweed
Medicago lupulina	Black Medick
Melica uniflora	Wood Melick
Melilotus alba	White Melilot
Melilotus altissimus	Tall Melilot
Mentha aquatica	Water Mint
Mercurialis perennis	Dog’s Mercury
Moerhingia trinervia	Three-nerved Sandwort
Myosotis arvensis	Field Forget-me-not

Myosotis laxa	Tufted Forget-me-not
Narcissus sp. (ornamental)	Daffodil
Odontites vernus	Red Bartsia
Oenanthe crocata	Hemlock Water-dropwort
Oenanthe fistulosa	Tubular Water-dropwort
Oenanthe lachenalii	Parsley Water-dropwort
Oenothera biennis	Common Evening-primrose
Oenothera fallax	Intermediate Evening-primrose
Oenothera glazioviana	Large-flowered Evening-primrose
Oenothera sp.	Evening-primrose (indeterminate)
Ononis repens	Restharrow
Orchis mascula	Early Purple-orchid
Origanum vulgare	Marjoram
Orobanche minor	Common Broomrape
Parapholis strigosa	Hard-grass
Parthenocissus sp.	Virginia Creeper
Pastinaca sativa	Wild Parsnip
Persicaria amphibia	Amphibious Bistort
Persicaria hydropiper	Water-pepper
Persicaria maculosa	Redshank
Phalaris arundinacea	Reed Canary-grass
Phleum pratense	Timothy
Phragmites australis	Common Reed
Phyllitis scolopendrium	Hart’s-tongue Fern
Picris echioides	Bristly Ox-tongue
Pilosella officinarum	Mouse-ear Hawkweed
Pinus nigra	Corsican Pine
Pinus sylvestris	Scots Pine
Plantago coronopus	Buck’s-horn Plantain
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Plantago maritima	Sea Plantain
Poa annua	Annual Meadow-grass
Poa compressa	Flattened Meadow-grass
Poa nemoralis	Wood Meadow-grass
Poa pratensis	Smooth Meadow-grass
Poa trivialis	Rough Meadow-grass
Polygonum aviculare	Knotgrass
Polypodium vulgare	Common Polypody
Polypogon monspeliensis	Annual Beard-grass
Polypogon viridis	Water-bent
Polystichum setiferum	Soft Shield-fern
Populus tremula	Aspen
Populus x canadensis	Hybrid Black-poplar
Potamogeton berchtoldii	Small Pondweed
Potamogeton natans	Broad-leaved Pondweed
Potentilla anglica	Trailing Tormentil
Potentilla anserina	Silverweed
Potentilla reptans	Creeping Cinquefoil
Potentilla sterilis	Barren Strawberry
Primula veris	Cowslip
Primula vulgaris	Primrose
Prunella vulgaris	Selfheal
Prunus avium	Wild Cherry

Prunus domestica	Wild Plum
Prunus laurocerasus	Cherry Plum
Prunus padus	Bird Cherry
Prunus spinosa	Blackthorn
Pteridium aquilinum	Bracken
Puccinellia maritima	Common Saltmarsh-grass
Pulicaria dysenterica	Fleabane
Pyrola rotundifolia	Round-leaved Wintergreen
Pyrus communis	Pear
Quercus ilex	Holm Oak
Quercus robur	Pedunculate Oak
Ranunculus acris	Meadow Buttercup
Ranunculus auricomus	Goldilocks Buttercup
Ranunculus bulbosus	Bulbous Buttercup
Ranunculus ficaria	Lesser Celandine
Ranunculus lingua	Greater Spearwort
Ranunculus repens	Creeping Buttercup
Ranunculus sceleratus	Celery-leaved Buttercup
Reseda alba	White Mignonette
Reseda luteola	Weld
Rhinanthus minor	Yellow Rattle
Ribes rubrum	Redcurrant
Rorippa nasturtium-aquaticum	Water-cress
Rorippa palustris	Marsh Yellow-cress
Rosa arvensis	Field Rose
Rosa canina	Dog Rose
Rubus caesius	Dewberry
Rubus fruticosus	Bramble
Rumex acetosa	Common Sorrel
Rumex conglomeratus	Clustered Dock
Rumex crispus	Curled Dock
Rumex obtusifolius	Broad-leaved Dock
Rumex sanguineus	Wood Dock
Sagina apetala	Annual Pearlwort
Sagina procumbens	Procumbent Pearlwort
Sagittaria sagittifolia	Arrowhead
Salix alba	White Willow
Salix caprea	Goat Willow
Salix cinerea	Grey Willow
Salix fragilis	Crack Willow
Salix viminalis	Osier
Sambucus nigra	Elder
Sanguisorba minor	Salad Burnet
Saponaria officinalis	Soapwort
Scirpoides holoschoenus	Round-headed Clubrush
Scrophularia auriculata	Water Figwort
Scrophularia nodosa	Common Figwort
Scrophularia scorodonia	Balm-leaved Figwort
Scutellaria galericulata	Skullcap
Sedum acre	Biting Stonecrop
Sedum anglicum	English Stonecrop
Senecio aquaticus	Marsh Ragwort
Senecio erucifolius	Hoary Ragwort
Senecio jacobaea	Ragwort

Senecio squalidus	Oxford Ragwort
Senecio viscosus	Sticky Groundsel
Senecio vulgaris	Groundsel
Silaum silaus	Pepper Saxifrage
Silene dioica	Red Campion
Silene latifolia	White Campion
Silene vulgaris	Bladder Campion
Sinapis arvensis	Charlock
Sison amomum	Stone Parsley
Solanum dulcamara	Bittersweet
Solanum nigrum	Black Nightshade
Sonchus arvensis	Perennial Sow-thistle
Sonchus asper	Prickly Sow-thistle
Sonchus oleraceus	Soft Sow-thistle
Sorbus aucuparia	Rowan
Sparganium erectum	Branched Bur-reed
Spartina anglica	Common Cord-grass
Spergularia media	Greater Sea-spurrey
Spirodela polyrhiza	Greater Duckweed
Stachys palustris	Marsh Woundwort
Stachys sylvatica	Hedge Woundwort
Stellaria graminea	Lesser Stitchwort
Stellaria holostea	Greater Stitchwort
Stellaria media	Common Chickweed
Stranvaesia davidiana	Stranvaesia
Suaeda maritima	Annual Sea-blite
Symphoricarpos albus	Snowberry
Tamus communis	Black Bryony
Tanacetum vulgare	Tansy
Taraxacum sp.	Dandelion
Taxus baccata	Yew
Teucrium scorodonia	Wood Sage
Torilis japonica	Upright Hedge-parsley
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
Ulex europaeus	Common Gorse
Ulmus glabra	Wych Elm
Ulmus minor	Small-leaved Elm
Urtica dioica	Nettle
Verbascum lychnitis	White Mullein
Verbascum nigrum	Dark Mullein
Verbascum thapsus	Great Mullein
Verbena officinalis	Vervain
Veronica arvensis	Wall Speedwell
Veronica beccabunga	Brooklime
Veronica chamaedrys	Germander Speedwell

Veronica hederifolia	Ivy-leaved Speedwell
Veronica montana	Wood Speedwell
Veronica persica	Common Field-speedwell
Veronica serpyllifolia	Thyme-leaved Speedwell
Viburnum lantana	Wayfaring Tree
Viburnum opulus	Guelder Rose
Vicia cracca	Tufted Vetch
Vicia faba	Broad Bean
Vicia hirsuta	Hairy Tare
Vicia sativa	Common Vetch
Vicia sepium	Bush Vetch
Vicia tetrasperma	Smooth Tare
Viola odorata	Sweet Violet
Viola riviniana	Common Dog-violet
Viscum album	Mistletoe
Vulpia bromoides	Squirreltail Fescue
Vulpia myuros	Rat's-tail Fescue
Weigela florida	Weigelia
Zea mays	Maize

Mosses and liverworts (Prominent species only)

Aneura pinguis	Greasewort
Atrichum undulatum	Common Smooth-cap
Barbula convoluta	Lesser Bird's-claw beard-moss
Brachythecium rivulare	River Feather-moss
Brachythecium rutabulum	Rough-stalked Feather-moss
Bryum pseudotriquetrum	Marsh Bryum
Calliergon cordifolium	Heart-leaved Spear-moss
Calliergonella cuspidata	Pointed Spear-moss
Cirriphyllum crassinervium	Beech Feather-moss
Conocephalum conicum	Great Scented Liverwort
Cratoneuron filicinum	Fern-leaved Hook-moss
Didymodon sp.	Beard-moss
Eurhynchium striatum	Common Striated Feather-moss
Fissidens taxifolius	Common Pocket-moss
Homalothecium lutescens	Yellow Feather-moss
Hypnum cupressiforme	Cypress-leaved Plait-moss
Hypnum lacunosum	Great Plait-moss
Isothecium myosuroides	Slender Mouse-tail Moss
Kindbergia praelonga	Common Feather-moss
Leptodictyum riparium	Kneiff's Feather-moss
Mnium hornum	Swan's-neck Thyme-moss
Pellia sp.	Pellia
Plagiomnium undulatum	Hart's-tongue Thyme-moss
Pseudoscleropodium purum	Neat Feather-moss
Rhynchostegium confertum	Clustered Feather-moss
Rhytidiadelphus squarrosus	Springy Turf-moss
Syntrichia ruralis	Great Hairy Screw-moss
Thamnobryum alopecurum	Foxtail Feather-moss