

SITE AT SPEKE HALL AVENUE, LIVERPOOL, MERSEYSIDE

## ECOLOGICAL SURVEY AND ASSESSMENT

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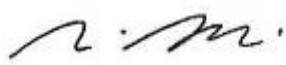
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## A SUMMARY

- a. ERAP Ltd (Consultant Ecologists) was commissioned by Barratt Homes (Manchester) to carry out an Ecological Appraisal of the site at Speke Hall Avenue, Liverpool, Merseyside.
- b. The survey was requested in connection with proposals to develop the site to residential accommodation. The ecological survey will also contribute to the assessment of the development under the Code for Sustainable Homes criteria.
- c. The assessment presents the results of a desktop study and a comprehensive ecological survey of the Site carried out in late March 2011. The scope of survey undertaken is sufficient to enable the identification and accurate assessment of any potential ecological constraints and opportunities associated with the development proposals.
- d. The site covers an area of 7.3 hectares and is located 0.8km to the north of Liverpool John Lennon Airport. It is occupied by coarse grassland, linear belts of trees and shrubs, tall-herb vegetation and hard standing. The site does not support any rare or uncommon plant species. There are no water-courses, ponds or wetlands within or adjacent to the site. None of the habitats at the site is listed as a UK Biodiversity Action Plan (BAP) Priority Habitat.
- e. It is recognised that Urban Grasslands are listed on the North Merseyside BAP and that parts of the site could be classed as the 'Urban Grassland' habitat listed in the North Merseyside BAP owing to the area covered. However, the habitats present do not consist of a good or representative Urban Grassland North Merseyside BAP Habitat and conversion/enhancement opportunities of the existing grassland community have been assessed to be constrained by the geographical location of the site.
- f. Similarly, the grassland does not have any significant secondary value in terms of the support of protected species or significant assemblages of Priority Species or other wildlife.
- g. It has been concluded that the grasslands have local ecological value only and the recommendations for compensation and mitigation to off-set the loss of the grassland (such as the financial contribution to the long-term management of good examples of this habitat in the borough) are in proportion with the evaluated scale of value.
- h. In addition, opportunities to create areas of grassland habitat within the proposed public open space that will be of benefit to invertebrates and other wildlife, in conjunction with the proposals, are detailed in the report.
- i. A single stand of Japanese Knotweed is present within the site. Recommendations regarding its removal and treatment prior to and during construction are detailed. No other invasive weeds listed under Schedule 9 of the *Wildlife and Countryside Act 1981* such as Giant Hogweed are present within the site.
- j. No evidence of the presence of protected species was detected within the site or the immediate surrounding area. A UK BAP Priority Species (House Sparrow) was noted on the site. The report provides guidance in relation to the conservation and enhancement of features for the continued support of this species and other wildlife.
- k. The trees and scrub are assessed to be suitable for use by nesting birds. All wild birds are protected by the *Wildlife and Countryside Act 1981* while they are nesting. Guidance in relation to the retention and protection of the trees and protection of nesting birds is presented in the report.

- l. Section 5 of this report describes the mandatory and pre-cautionary measures to be applied to ensure compliance with all EU and UK wildlife legislation, Natural England guidance, PPS9, local planning policy and best practice.
- m. Where possible, practical and reasonable opportunities to seek biodiversity gain by appropriate management, habitat creation and landscape planting have been identified and incorporated into the development proposals (in accord with the guidance in PPS9, associated documents and other relevant planning policy).
- n. Based on the survey information presented in this assessment, it is concluded that the principle of the proposed development at Speke Hall Avenue, Liverpool, is acceptable in terms of ecology and nature conservation. The proposals provide an opportunity to create habitats for the attraction of biodiversity and incorporate beneficial features for biodiversity, particularly House Sparrow, (a UK BAP Priority Species) through landscape planting and good design. This conclusion is valid provided that guidance detailed in Section 5 of this report is implemented.

## 1.0 INTRODUCTION

- 1.1 ERAP Ltd (Consultant Ecologists) was commissioned by Barratt Homes (Manchester) to carry out an Ecological Appraisal of the site at Speke Hall Avenue, Liverpool, Merseyside. The site covers an area of approximately 73,150m<sup>2</sup> (7.3ha) and its central grid reference is SJ 4261 8359. The site is located 0.8 kilometres to the north of Liverpool John Lennon Airport.
- 1.2 The survey was requested in connection with proposals to develop the site for residential use.
- 1.3 The scope of the ecological study is detailed below: -
1. Desktop study of existing survey information and known ecological records;
  2. The completion of an Extended Phase 1 Habitat Survey and assessment and preparation of a report describing the survey methodology applied and the habitats/wildlife present;
  3. An assessment of the ecological value of the habitats within the site with the use of the National Vegetation Classification (NVC) and the Ratcliffe criteria (A Nature Conservation Review 1977), the National Vegetation Classification (NVC) and with reference to the UK Biodiversity Action Plan (BAP) and North Merseyside BAP.
  4. The identification of any potential development constraints, and;
  5. The specification of the scope of mitigation and enhancement required in accord with wildlife legislation, planning policy guidance, other relevant guidance and best practice
- 1.4 This ecological appraisal has been prepared in a suitable format for contribution to the assessment of the development under the Code for Sustainable Homes scheme.

## 2.0 METHODOLOGY

### 2.1 Ecological Survey 2011

#### *Desktop Study and Data Search*

- 2.1.1 Merseyside Biobank, the ecological database for North Merseyside, was contacted and a search for known records of protected and notable species within a 1km radius of grid reference SJ 426 835 was requested.
- 2.1.2 Other resources were also consulted including: -
- a. Multi-Agency Geographic Information for the Countryside (MAGIC) website ([magic.gov.uk](http://magic.gov.uk))
  - b. National Biodiversity Network (NBN Gateway)
  - c. Old Maps website ([www.old-maps.co.uk](http://www.old-maps.co.uk))
  - d. UK Biodiversity Action Plan
  - e. North Merseyside Biodiversity Action Plan

## 2.2 Vegetation and Habitats

- 2.2.1 The site and surrounding land were visited on the 28<sup>th</sup> March 2011 by Mr. Brian Robinson B.Sc. (Hons) AIEEM. The weather on this date was sunny with 30% cloud cover, light wind (Beaufort scale 1) and a maximum daytime air temperature of 12°C. Conditions were suitable for a survey of this type.
- 2.2.2 A vegetation and habitat map was produced for the site and the immediate surrounding area on a scale of approximately 1:3,000 (refer to **Figure 1**). The mapping is based on the Joint Nature Conservation Committee Phase 1 Habitat Survey methodology (JNCC 2003) with minor adjustments to illustrate and examine the habitats with greater precision.
- 2.2.3 The principal and constant plant species within the site boundaries was determined with estimates of the distribution, ground cover, abundance and constancy of individual species. The estimation of abundance was based on the DAFOR system (where D = Dominant, A = Abundant, F = Frequent, O = Occasional and R = Rare) this being a widely used and accepted system employed by ecological surveyors.
- 2.2.4 Searches were made for uncommon, rare and statutorily protected plant species, those species listed as protected in the *Wildlife and Countryside Act 1981* and indicators of important and uncommon plant communities. All higher plant nomenclature follows Stace (1991). Lower plant nomenclature follows Atherton, Bosanquet & Lawley (2010).
- 2.2.5 Searches were carried out for the presence of invasive species, including those listed on the revised (April 2010) Schedule 9 Section 14(2) of the *Wildlife and Countryside Act 1981*, including Japanese Knotweed (*Fallopia japonica*), Indian Balsam (*Impatiens glandulifera*) and Giant Hogweed (*Heracleum mantegazzianum*).

## 2.3 Animal Life

- 2.3.1 All animal life present within the site on the survey date was recorded. All habitats were assessed for their suitability for the support of wildlife including bird species, bats and other mammals and invertebrates.

### *Badger*

- 2.3.2 A thorough search for Badger activity was carried out within the site and at adjacent habitats where access was possible.
- 2.3.3 The following signs of Badger activity were searched for: -
- 'D' shaped sett entrances at least 25cms wide and wider than they are high with large spoil mounds
  - Discarded bedding at sett entrances (this includes grass and leaves)
  - Scratching posts on shrubs and trees close to a sett entrance
  - The presence of Badger hairs which are coarse, up to 100mm long with a long black section and a white tip
  - Dung pit latrines and footprints
  - Trampled pathways through vegetation and beneath fences.

### *Great Crested Newt*

- 2.3.5 In accord with the current Natural England guidance all ponds within 250 metres of a site should be assessed for their potential to support Great Crested Newts. Habitats in the wider area up to a distance of 250 metres from the site were examined for the possible presence of ponds.

- 2.3.6 No ponds are present within 250m of the site. The presence of Great Crested Newt at the site can be reasonably discounted.

## 2.4 Survey Limitations

- 2.4.1 The whole of the site was easily accessible. It is possible and acceptable to carry out a Phase 1 Habitat Surveys in late March, although it is recognised that botanical surveys may have some limitations and later emerging/flowering species may not have been visible yet. However, this is not considered to be a significant limitation and the rosettes/early shoots of many later flowering plants were identified.
- 2.4.2 It is concluded that no significant survey limitations were experienced.

## 2.5 Evaluation Methodology

- 2.5.1 The habitats, vegetation and animal life were evaluated with reference to standard nature conservation criteria as described by Ratcliffe (1977) and the Nature Conservancy Council (1989). These are; size (extent), diversity, naturalness, rarity, fragility, typicalness, recorded history, position in an ecological or geographical unit, potential value and intrinsic appeal.
- 2.5.2 Government advice on wildlife, as set out in *Planning Policy Statement 9: Biodiversity and Geological Conservation (PPS9)* has been taken into consideration. The UK Biodiversity Action Plan (UK BAP) and the North Merseyside Biodiversity Action Plan have been taken into account in the evaluation of the site.

## 3.0 RESULTS

### 3.1 Desktop Study

#### *Designated Sites*

- 3.1.1 There are no national or statutorily designated areas within the site or within 1km of site.
- 3.1.2 There are no non-statutorily designated sites within the site or within 1km of the site.
- 3.1.3 Consultation of Liverpool Council's Nature Conservation Officer revealed that the site was:-

*'initially proposed as a LWS<sup>1</sup> for its grassland habitat and because Brown Hare have always used the site. The site was not subsequently surveyed and did not progress beyond this initial stage of the LWS selection progress. The 'Land off Speke Hall Avenue' site is not viewed as a local wildlife site'.*

<sup>1</sup> = Liverpool Wildlife Site (a local, non statutory designation)

- 3.1.4 The evaluation of the conditions recorded at the site has taken this previous recognition of the site's ecological value into account (refer to section 4).
- 3.1.5 Speke Hall and Stockton's Wood proposed LWS lies approximately 500 metres to the south-west of the site. The site is poorly connected to the proposed LWS, as the Spindus Road business area lies between. Given the scale of the proposed development it is not reasonably likely that Stockton's Wood will be affected by the development.

- 3.1.6 It is recognised that the Mersey Estuary Ramsar site and Site of Special Scientific Interest (SSSI) lies approximately 1.4km to the south of the site. Given the scale of the development and the distance from the Mersey Estuary, It is not reasonably likely that the proposed development will affect the Mersey Estuary and its associated features of special interest.

#### ***Protected and Notable Species***

- 3.1.7 No records of protected species are reported for the site. Protected species including bat species and Barn Owl are present in the wider area but not associated with the site or with features adjacent to the site.
- 3.1.8 Records of notable species including Brown Hare (a UK BAP Priority Species) are associated with the site. No further records of notable species are associated with the site.
- 3.1.9 Records of protected, notable and UK BAP species within 1km of the site (as reported by Merseyside Biobank) are summarised in **Table 1**, below

<b>Table 1: UKBAP and North Merseyside BAP species present within 1km of the Site</b>	
<b>Group</b>	<b>Species</b>
Amphibians	Smooth Newt, Common Frog.
Birds	Barn Owl, Common Starling, Common Swift, Grey Partridge, House Martin, House Sparrow, Northern Lapwing, Sky Lark, Song Thrush, Common Grasshopper Warbler, Reed Bunting.
Plants	Native Bluebell, Wall Germander, Townsend's Cord-grass.
Insects - Dragonflies	Azure Damselfly, Blue-tailed Damselfly, Broad-bodied Chaser, Brown Hawker, Common Darter, Emperor Dragonfly, Southern Hawker.
Insects- Moth	Cinnabar.
Terrestrial mammals	Pipistrelle Bat species, Brown Hare

- 3.1.10 The site has been assessed in terms of suitability for these species and recommendations have been made, where appropriate, in **Section 5**.
- 3.1.11 The data search also revealed the presence of invasive plants in the wider area including Canadian Waterweed (*Elodea canadensis*), Indian Balsam (*Impatiens glandulifera*) Japanese Knotweed (*Fallopia japonica*), New Zealand Pygmyweed (*Crassula helmsii*) and Rhododendron (*Rhododendron ponticum*).

## **3.2 Vegetation and Habitats**

### ***Surrounding Area***

- 3.2.1 The surrounding area is suburban with grassland to the immediate north, beyond which lies industrial units. Existing housing is present to the immediate east and grassland and industrial and commercial units are present to the south and west.

### ***Site Description***

- 3.2.2 For all site, vegetation and habitat descriptions please refer to **Figure 1**.
- 3.2.3 The 7.3ha site has a level topography. The site is open along its northern boundary to an area of grassland similar to that present within the northern portion of the site (as described below). Beyond this grassland lies Speke Boulevard (the A561). The eastern boundary of the site is marked by a 2 metres high red-brick wall which is locally interspersed by 2 metres high metal fencing. Two 1.5m high earth bunds lie adjacent to the boundary. The site's



southern boundary is marked by 2 metres high metal fencing beyond which lies Speke Hall Avenue.

- 3.2.4 Buildings associated with Liverpool fire and ambulance services are situated adjacent to the south-western corner of the site. The western boundary of the site is marked by 2 metres high metal fencing. Internal fencing divides the site into three separate areas.
- 3.2.5 Mesotrophic grassland occupies the majority (>50%) of the site. Also present are locally abundant stands of tall herb-vegetation, local young and semi-mature trees as screen planting, scrub vegetation and an area of compacted aggregate and limestone ballast which is being colonised by ruderal herbs, grasses and mosses.
- 3.2.6 Investigation of historical maps indicates the site has not been previously developed extensively. The southern portion of the site is recognised as a recreation ground in the 1992 OS map. Examination of Google Earth indicates the area of compacted aggregate was made between 2003 and 2005. It is presumed that plans to develop the area were abandoned.
- 3.2.7 The site currently has no recognised use. Access is restricted to the public in the southern portion of the site by fencing, although the northern area of the site is open to the public and contains tracks and desire lines used by dog walkers.
- 3.2.8 For the purposes of describing the vegetation within the site it has been divided into three areas. These comprise a northern area open to the public and separated from the rest of the site by fencing, grassland present in the southern section of the site, and the area of compacted aggregate hard standing present within the south of the site. These areas are described in detail below.

#### ***Northern Section of Site***

- 3.2.9 The northern section of the site covers an area of 24,850m<sup>2</sup> and is defined from the rest of the site by a 2m tall metal fence. It supports grassland and locally abundant shrubs and tall herb vegetation. Two approximately 1.5 metre high rectangular mounds are situated along the eastern boundary. Tracks indicating use by dog walkers are evident throughout. During the survey works to the west of the site were being conducted, and soil and vegetation was being dumped in mounds in the mown area of the grassland.
- 3.2.10 The majority of the grassland is infrequently mown and largely unmanaged, however a portion of the northern section of the site (approximately 140m long by 65m wide) has been very recently mown to approximately 0.05m and several young and semi-mature trees have been recently felled and removed (see **Figure 1**).



Photograph 1: Recently mown grassland



Photograph 2: Unmown dense grassland

- 3.2.11 The unmown area in the northern section of the site (approximately 140m long by 135m wide) supports a dense sward of grasses growing to a height of 0.3m. The unmown grassland and the recently mown grassland support a similar floral composition.
- 3.2.12 The rank grassland is characterised by frequent and locally dominant Cock's-foot (*Dactylis glomerata*), frequent and locally very abundant Red Fescue (*Festuca rubra*) locally abundant False Oat-grass (*Arrhenatherum elatius*) and locally frequent Perennial Rye-grass (*Lolium perenne*), Common Bent (*Agrostis capillaris*), Common Couch (*Elytrigia repens*) and Ribwort Plantain (*Plantago major*). Locally abundant areas of Bramble (*Rubus fruticosus* agg.) scrub are present within the sward
- 3.2.13 Tall herb vegetation consists of areas of locally very abundant Common Nettle (*Urtica dioica*), Creeping Thistle (*Cirsium arvense*), locally very frequent Great Willowherb (*Epilobium hirsutum*), Oxeye Daisy (*Leucanthemum vulgare*), Common Michaelmas-daisy (*Aster x salignus*) and very locally frequent Broad-leaved Willowherb (*Epilobium montanum*).
- 3.2.14 An approximately 300m<sup>2</sup> area of very locally abundant Raspberry (*Rubus idaeus*) with frequent Ash (*Fraxinus excelsior*) saplings is situated along the eastern boundary. Very local Goat Willow (*Salix caprea*), Grey Willow (*Salix cinerea*) and Dog-rose (*Rosa canina*) shrubs are also present along the eastern boundary of the area.
- 3.2.15 An approximately 1,500m<sup>2</sup> area of Blackthorn (*Prunus spinosa*) scrub and tall herb vegetation including Broad-leaved Dock (*Rumex obtusifolius*) and Creeping Thistle (*Cirsium arvense*) is present along the western boundary.
- 3.2.16 The area contains a mosaic of common habitats associated with unmanaged and infrequently mown grassland. The NVC communities present are summarised below:
- MG1 False Oat-grass grassland
  - OV25 Common Nettle - Creeping Thistle tall-herb community
  - OV26 Great Willowherb tall-herb community
  - W24 Bramble - Yorkshire-fog scrub
  - W2 Blackthorn - Bramble scrub
- 3.2.17 A full plant species list for the area is appended (Table A).

### ***Grassland present within the Southern Section of the Site***

- 3.2.18 The grassland present within the southern section of the site is composed of unmanaged grassland, areas of abundant tall-herb vegetation (see **Figure 1**) and locally abundant Bramble scrub, Grey Willow (*Salix cinerea*) shrubs, very locally abundant young trees in the west of the site and a small area of concrete hard standing. The area covers approximately 32,700m<sup>2</sup>, although its north western boundary is poorly defined as it grades into the area of compacted aggregate described below.



**Photograph 3:** Grassland in the south of the site

- 3.2.19 The area is largely undisturbed by pedestrians but there is evidence that residents from the housing estate to the immediate east of the area access the site from their rear gardens.
- 3.2.20 The rank grassland is characterised by abundant and locally dominant Cock's-foot, frequent and very locally abundant Red Fescue and False Oat-grass, frequent Perennial Rye-grass, Dandelion and Ribwort Plantain, locally abundant Common Couch and very locally frequent Meadow Fescue (*Festuca pratensis*).
- 3.2.21 The tall herb vegetation includes areas of frequent and locally abundant Creeping Thistle, locally abundant Common Nettle (*Urtica dioica*) and Cleavers (*Galium aparine*), very locally frequent Broad-leaved Dock (*Rumex obtusifolius*) and Great Willowherb and locally frequent and very locally abundant Cow Parsley (*Anthriscus sylvestris*) and Ground-elder (*Aegopodium podagraria*).
- 3.2.22 Several areas of extensive locally dominant Bramble scrub have colonised the perimeters of the field unit. A 650m<sup>2</sup> area of Grey Willow scrub is present approximate halfway along the southern boundary of the site around a set of old concrete steps. The willow is approximately 3 metres tall and forms a dense cover.
- 3.2.23 Two sections of landscape/screen planting line the northern and southern boundaries of the western-most section of the site. The planting is composed of locally abundant Silver Birch (*Betula pendula*), Scots Pine (*Pinus sylvestris*), Dogwood (*Cornus sanguinea*) and Lime species (*Tilia* sp.). This planting does not represent a natural vegetation type and cannot be assigned an NVC community.
- 3.2.24 Seven concrete flags creating an area of hard standing approximately 20m long by 7m wide is situated along the southern boundary.
- 3.2.25 The area contains a mosaic of common habitats associated with unmanaged and irregularly mown grassland. The NVC communities present are summarised below:

MG1 False Oat-grass grassland  
OV25 Common Nettle - Creeping Thistle tall-herb vegetation  
OV26 Great Willowherb tall-herb vegetation  
W24 Bramble - Yorkshire-fog scrub

3.2.26 A full plant species list is appended (**Table B**).

#### ***Compacted Aggregate***

3.2.27 The area of compacted limestone ballast and aggregate hard standing situated in the middle of the site is very roughly rectangular and approximately 15,600m<sup>2</sup>. It is gated at Cartwrights Farm Road, and its northern and western boundaries are marked by 2m tall metal fencing. The southern and eastern boundaries are not well defined as the area is being encroached by the grassland associated with the southern section of the site described above.



**Photograph 4:** Hard standing

3.2.28 The vegetation colonising the hard standing ranges from sparsely colonised areas to areas where vegetation has reached a near total cover. The vegetation is characterised by constant, frequent and locally abundant Red Fescue, Black Medick (*Medicago lupulina*), frequent Dandelion (*Taraxacum officinale*) False Oat-grass and Ribwort Plantain. Creeping Bent (*Agrostis stolonifera*) is frequent and very locally abundant.

3.2.29 The hard standing supports very local and constant Goat Willow, Grey Willow, Silver Birch (*Betula pendula*) and Butterfly-bush (*Buddleja davidii*) saplings.

3.2.30 The vegetation does not currently form a NVC community and has colonised primarily from the surrounding mesotrophic grassland. A full plant species list is appended (**Table C**).

#### ***Invasive Weeds***

3.2.31 A 3 metre by 3 metre stand of Japanese Knotweed was detected along the southern boundary of the site at SJ 42647 83406 (refer to **Figure 1**).

3.2.32 No other invasive weeds were detected within the site boundary or in the immediate surrounding area. Recommendations with regard Japanese Knotweed at the site are given in **section 5.2**.

### 3.3 Animal Life

#### ***Badger***

- 3.3.1 No evidence of Badger activity was recorded within the site or in the surrounding land. The presence of Badger can be discounted.

#### ***Bat species***

##### ***Roosting***

- 3.3.2 No buildings or mature trees are present within the site. None of the younger trees support features such as crevices and splits suitable for use by roosting bats. The presence of roosting bats at the site can be discounted.

##### ***Foraging/Commuting***

- 3.3.3 The line of shrubs along a portion of the western boundary (see **Figure 1**) and the landscape/screen planting located in the south-western portion of the site could provide suitable foraging habitat for use by edge-feeding species such as Pipistrelle species. The site does not support other features such as water features, woodland or extensive meadows which could provide foraging potential for a diversity of bat species or a significant abundance of bats.

- 3.3.4 Recommendations in relation to bats, in consideration of the development proposals, are made in **Section 5.5**.

#### ***Water Vole***

- 3.3.5 The site does not contain any ditches or water bodies that may support Water Vole. The presence of Water Vole can be discounted.

#### ***Further Mammal Species***

- 3.3.6 A single fox dropping was present in vegetation colonising the area of hard standing.
- 3.3.7 A record of Brown Hare (a UK BAP Priority Species) has been reported at the site (Merseyside Biobank). No Brown Hare were observed or flushed out during the walkover survey. No field signs of Brown Hare such as droppings or resting areas, known as 'forms', were detected. The majority of the site (with the exception of the grassland within the southern area of the site) currently supports sub-optimal habitat for foraging and resting Brown Hare.
- 3.3.8 The busy roads to the north, east and west of the site, and the housing estate to the east, all form major dispersal barriers to Brown Hare. It is concluded that the conditions at the site and its surrounds are now unfavourable for use by Brown Hare and the current and future presence of this species at the site can be reasonably discounted.

#### ***Reptiles***

- 3.3.9 The northern end of the site has been recently mown and is currently unsuitable for reptiles. The mosaic of grassland, tall herb vegetation and shrubs in the north provides limited suitable foraging habitat for reptiles, but no basking habitat and there is regular disturbance of this area from dog walkers. The grassland to the south of the site similarly offers low potential habitat for foraging reptiles, although again there is limited basking potential, and a limited physiognomy overall. The area of hard standing has been relatively recently created and offers some basking habitat for foraging reptiles but no sheltering habitat.

- 3.3.10 No reptile records are known in the local area and potential colonisation of the site is severely limited due to the presence of major roads on the north, west and south of the site and by housing to the east. The possible presence of reptile species can be reasonably discounted.

#### ***Bird species***

- 3.3.11 Bird species recorded at the site during the walkover survey include single observations of House Sparrow (a UK BAP Priority Species, also listed under the North Merseyside 'Urban Birds' Species Action Plan (SAP)), Wren, Magpie, Great Tit, Blackbird, Wood pigeon, a single male and two female Pheasant, and a foraging Kestrel.
- 3.3.12 The trees and denser stands of shrubs along the boundaries of the site are assessed to have potential for use by nesting birds.
- 3.3.13 The northern section of the site provides poor quality habitat for ground nesting birds due to disturbance from dog walkers. The southern section of the site provides suitable habitat for ground nesting birds such as Skylark owing to its mix of dense and sparse grassland and lack of regular disturbance. No ground nesting birds were observed during the walkover survey although the survey was carried out early in the breeding bird season.
- 3.3.14 All breeding birds are protected under the *Wildlife and Countryside Act 1981*. Guidance in relation to the potential presence of breeding birds is detailed in **Section 5.3**.

#### ***Invertebrates***

- 3.3.15 The survey was conducted at a time when invertebrate activity is limited. Invertebrates noted during the walkover survey included three common and widespread Bumblebee species (*Bombus lucorum/terrestris*, *Bombus lapidarius* and *Bombus pascuorum*), all of which were represented by queens searching for suitable nesting sites and foraging on early flowering plants. Also present were several Small Tortoiseshell butterfly (*Aglais urticae*) found throughout the site and two 7-spot ladybird (*Coccinella 7-punctata*). All are common species found throughout lowland Britain and in urban areas.
- 3.3.16 The site offers some habitat for invertebrates. In particular the areas of tall unmanaged grassland and colonizing hard standing provide low-quality foraging potential for nectaring insects such as common butterflies and bee species during the summer.
- 3.3.17 The lack of semi-natural or species-rich vegetation indicates the site is unlikely to support rare or uncommon species or rich assemblages of invertebrates.

## **4.0 EVALUATION AND ASSESSMENT**

### **4.1 Vegetation and Habitats**

#### ***Evaluation***

- 4.1.1 The site is composed of a mixture of species-poor and infrequently mown grassland, with locally abundant tall herb vegetation, scrub and young trees.
- 4.1.2 None of the habitats within the site are representative of UK BAP Priority Habitat. All recorded NVC communities are common and of widespread occurrence. The vegetation and habitats are typical of an urban greenspace; no semi-natural features are present.



- 4.1.3 The site does not contain any ponds, species-rich grassland, water-courses, wetlands or heathland habitats. The site does not contribute or function as a significant wildlife corridor owing to the absence of a water-course or linear green corridors and the presence of the busy road network and developments which isolate the site.
- 4.1.4 None of the plant species recorded at the site are rare or of local distribution in a Merseyside or north-west England context.
- 4.1.5 The recognised grassland community (MG1) recorded at the site is typical of the geographical context, the substrate present, the absence of management and agricultural improvement. However, it is important to note that, as demonstrated in **Tables A, B and C**, the plant species composition is not indicative of the more species-rich MG1e sub-community. This is demonstrated by the absence of species indicative of this community such as Common Knapweed, Common Bird's-foot-trefoil, Meadow Vetchling, Sweet Vernal-grass, Yarrow, Hogweed and Perforate St. John's-wort being absent or of rare/very local distribution with the sward. It is considered that the grassland is representative of the MG1a False Oat-grass, species-poor and grass dominated community. Further consideration of the grassland habitat in the context of the Urban Grassland North Merseyside BAP is detailed in section 4.3.
- 4.1.6 The young broadleaf trees present within the site are assessed to be of local value for their contribution to habitat structural diversity. Guidance in relation to protection of trees is detailed in **section 5.1**.
- 4.1.7 The invasive weed Japanese Knotweed was detected in the south of the site. No other invasive weeds such as Indian Balsam or Giant Hogweed was recorded at the site. This is addressed in **section 5.2**.

## 4.2 Animal Life

- 4.2.1 There is no evidence of any protected species within the site or in the immediate surrounding area
- 4.2.2 The possible use of the landscape/screen planting in the south-west of the site and the young trees and shrubs in the north-west of the site by foraging bats in the suburban area is recognised and further guidance is detailed in section 5.5.
- 4.2.3 Local areas of grassland and the trees and shrubs at the boundaries of the site are assessed to be of suitable for use by foraging and nesting birds. All wild birds are protected under the *Wildlife and Countryside Act 1981* while they are breeding. Guidance in relation to the protection of breeding birds is detailed in section 5.3.
- 4.2.4 The presence of feeding House Sparrow, a UK BAP Priority Species and species listed on the North Merseyside Urban Birds BAP, is recognised. Priority Species/Species of Principal Importance are capable of being material considerations in connection with planning decisions. The House Sparrow were using the site to feed and are likely to be nesting in the houses adjacent to the site. Habitats suitable for continued use by feeding House Sparrow will be retained and recommendations to enhance the habitats for this species (particularly for nesting) are detailed in Section 5.4.

## 4.3 Further Consideration of the 'Urban Grassland North Merseyside BAP Habitat'

- 4.3.1 As stated earlier, the grassland within the site does not qualify or meet the criteria to be classed as a UK BAP Priority Habitat/Habitat of Principal Importance.

- 4.3.2 It is recognised that 'Urban Grasslands' are listed as a North Merseyside BAP Priority Habitat. This BAP encompasses a wide range of grasslands including unimproved, semi-improved and improved grasslands occurring in urban and urban fringe areas.
- 4.3.3 This site supports mesotrophic (neutral) grassland which covers a total area of 57,550m<sup>2</sup> (5.8ha), and can be described as 'extensive' in terms of the amount of grassland in the surrounding area. However it is considered that the site is not a 'good' or 'representative' example of an Urban Grassland North Merseyside BAP Habitat for the following reasons: -
- a. The site does not support the 'key species' as described in the Urban Grasslands North Merseyside BAP such as assemblages of orchids. Similarly, the grassland habitats are not favourable for the attraction of significant numbers of ground nesting birds owing to the regular disturbance by pedestrians and dogs and proximity to a busy road network;
  - b. The grassland is not species-rich nor does it represent a semi-natural habitat;
  - c. The grassland is mesotrophic (neutral) which is widespread in North Merseyside and the UK. The site does not support any acid or calcareous grassland communities which can have a more localised distribution and occur on specific substrates;
  - d. The habitats present are not comparable with the quality of habitats represented at other sites cited in the Urban Grasslands description e.g. at Cressington Heath and parts of Otterspool including those that have received local wildlife site status;
  - e. The NVC community present (MG1a) is widespread. The more species-rich community (MG1e) is not represented;
  - f. The site is bound on all sides by major roads and housing developments and so represents an isolated area of limited current and future ecological potential; and,
  - g. The current and future presence of Brown Hare (a UK BAP Priority Species) has been reasonably discounted.
- 4.3.4 In the evaluation of this site consideration has to be given to the potential for improvement/enhancement of existing features which may upgrade the ecological value of the site. However examination of the baseline survey data suggests that this site is not suitable for easy/simple improvement owing to: -
- a. **Isolation:** the site is bounded on all sides by busy roads and existing development. There is no easy, existing source/route of colonisation by plant species that would improve the ecological value of the grassland;
  - b. **Disturbance:** the site is regularly disturbed by pedestrian/dog walkers and local residents which limits its value for the attraction of wildlife such as ground nesting birds;
  - c. **Existing plant community and species assemblage:** The MG1a community currently present is not as easily converted to a more species-rich sward as, for example, an MG1e community would be;
- 4.3.5 Similarly, the site's geographical location is not complementary to enhancement for the attraction of, for example, ground nesting birds. The site is 0.8 kilometres from Liverpool John Lennon airport. It is understood that concern has been expressed in the relation to the



potential for bird strikes as a result of habitats suitable for birds within proximity to the airport.

#### ***Consideration of the Liverpool Wildlife Sites Selection Criteria***

- 4.3.6 In order to provide a full evaluation of the ecological value of the grassland habitats it was considered necessary, to further support the statements made above, to evaluate the grasslands at the site in accord with the Liverpool Wildlife Sites Selection Criteria.
- 4.3.7 As detailed in section 3.1 the site was listed as a potential Liverpool Wildlife Site (LWS) but this was not progressed. This indicates that the site did not meet the criteria.
- 4.3.8 It is difficult to assess the site under some of the criteria detailed in 'North Merseyside Local Wildlife Sites Selection Guidelines' (MEAS Jan 2008) as some information held on databases is not available; but again, as the site was not taken forward it suggests these criteria were not applicable and the site is unlikely to qualify on the basis of the habitats and species present (for example the site no longer supports Brown Hare).

#### ***Assessment***

- 4.3.9 The ecological value of the grasslands at the site is assessed as **local** (i.e. an example of a common or widespread habitat/species in the local area; or areas of internationally or nationally important habitats that are degraded and have little or no potential for restoration and of low value to species of nature conservation interest).
- 4.3.10 Nevertheless the site has some, but not significant, biodiversity interest and this is considered further in section 5.1 in connection with the development proposals to ensure compliance with the requirements of PPS9, local planning policy, and best practice.
- 4.3.11 Section 5 of this report details opportunities to enhance the ecological interest and seek biodiversity gain through appropriate landscape planting and habitat creation at the site in association with the proposed development.

#### **4.4 Summary**

- 4.4.1 The site is assessed to be of **local ecological value**. Part of the site represents an extensive area of grassland within an urban area, however, the grassland supports only species-poor assemblages of common plant communities and is not representative of UK BAP Priority Habitat.
- 4.4.2 The habitats at the site do not consist of a good or representative Urban Grassland North Merseyside BAP Habitat and conversion/enhancement opportunities have been assessed to be constrained by the geographical location of the site.
- 4.4.3 The site is unlikely to meet the criteria for designation as a Liverpool Wildlife Site (LWS). The site does not have any significant secondary value in terms of the support of protected species or significant assemblages of Priority Species or other wildlife.
- 4.4.4 There are no significant ecological constraints to the principle of the development proposals at this site however it is recognised that biodiversity must be taken into account to ensure compliance with PPS9, local planning policy, UK and North Merseyside BAPs and best practice. Further guidance that aims to address these matters is detailed in section 5.
- 4.4.5 The following identified features are considered further in the recommendation section: -
  - a. Presence of 5.7ha of mesotrophic grassland assessed to be of local value;

- b. Use of the site by feeding and possibly nesting UK BAP Priority Species e.g. House Sparrow;
- c. Presence of a stand of Japanese Knotweed;
- d. Opportunities to provide features for the benefit of wildlife as part of good design (and compliance with the Code for Sustainable Homes criteria).

## 5.0 RECOMMENDATIONS

### 5.1 Protection of Existing Vegetation and Use of Demarcation Fencing

#### *Trees*

- 5.1.1 Where possible, existing trees should be retained. Any tree removal should be compensated for with the introduction of appropriate, native landscape planting, as recommended in Section 5.6.
- 5.1.2 During the construction phase, temporary protective demarcation fencing should be used to protect any retained trees within and on the margins of the site. Overhanging trees must be protected. The fencing must remain in position until all construction works have been completed to ensure protection is provided throughout the construction phase.
- 5.1.3 The fencing should be in accord with BS5837: 2005 *Trees in Relation to Construction*.

#### *Grassland*

- 5.1.4 The development of the site will result in the loss of 5.7ha of neutral grassland which as discussed in section 4.3 has no more than local value and has limited opportunity for enhancement/improvement.
- 5.1.5 In this instance it is considered that retention of the grassland at the site is not warranted and there are minimal ecological merits in the retention of the habitat in this location.
- 5.1.6 It is however recommended that a contribution to the long-term management/enhancement of an alternative grassland and perhaps an example of Urban Grasslands or a Local Wildlife Site in the North Merseyside area would appropriately and proportionately off-set any minor adverse effects of the loss of this area of grassland. This is likely to be in the form of a financial contribution that should be appropriate to the impact, size and scale of the development.
- 5.1.7 The figure should be determined through discussion between Liverpool City Council and the developer, with their ecological advisers.

### 5.2 Invasive Species: Japanese Knotweed

- 5.2.1 It is an offence under the *Wildlife and Countryside Act 1981* to cause the spread of Japanese Knotweed in the wild. A method statement for the treatment of the stand of Japanese Knotweed along the southern boundary of the site (**SJ 42647 83406**) must be prepared and implemented prior to any construction works in the vicinity of the stand (refer to **Figure 1**). Owing to the position and small size of the stand it is likely that a treatment programme may involve the following: -
  - a. Demarcation of the stand and an appropriate buffer (typically 4 metres) with fencing;

- b. Treatment with an approved herbicide (leaf-wipe and/or stem injection) taking into account the proximity of the stands to a water body. Late August to September is an ideal time of year as the plant is beginning to die back and will absorb the herbicide into the rhizomes more effectively;
  - c. Excavation of the plant and all rhizomes and either continued treatment on site or disposal at a licensed tip, and;
  - d. Monitoring for and treatment of any re-growth
- 5.2.2 Specialist advice from a knotweed eradication firm will be required in relation to the preparation and implementation of an eradication method statement and the subsequent monitoring for and treatment of any re-growth.

### 5.3 Protection of Breeding Birds

- 5.3.1 As identified in this report the trees and shrubs and grassland habitats within the site have potential for use by nesting birds. The shrubs in growing in the area of compacted aggregate offer poor quality habitat for nesting birds, but it is recommended that the following advice is adhered to across the site a matter of best practice.
- 5.3.2 All wild birds are protected under the *Wildlife and Countryside Act 1981* while they are breeding. It is mandatory that any shrubs, grassland and other suitable breeding bird habitat which are to be removed as part of the proposals are only removed outside the bird breeding season, unless it can be adequately demonstrated by an ecologist that no breeding birds, active nests, eggs or fledglings are present in the area to be cleared. The bird breeding season typically extends between March to August inclusive.

### 5.4 Consideration of House Sparrow

- 5.4.1 During the survey in March 2011 House Sparrow were recorded in the local area. Data search records indicate that House Sparrow is present in the local area and the construction of housing at the sites presents an opportunity to provide suitable habitat for this species. House Sparrow are UK BAP Priority Species due to declines in number of 62% over 25 years (1977 to 2002) (RSPB)).
- 5.4.2 The use of native species in the landscape planting (which will provide berry and invertebrate food for the adult and young birds) in conjunction with the installation of House Sparrow terrace nest boxes at the new properties will aim to conserve urban populations of House Sparrow in this area. The maintenance of the breeding range of House Sparrow is in accord with the targets of the North Merseyside BAP.
- 5.4.3 The boxes should be fitted to suitable elevation walls. The boxes should be sited at a height of over 2.5 metres (to avoid damage). Care must be taken to avoid siting the box over windows or doorways where droppings may cause a nuisance. Once the development layout has been finalised an Ecologist can advise on appropriate positions for the bird boxes.
- 5.4.4 The boxes (see **Insert 1**) are available from Alana Ecology ([www.alanaecology.co.uk](http://www.alanaecology.co.uk)) or Bioquip ([www.bioquip.net](http://www.bioquip.net)).



**Insert 1: House Sparrow terrace**

## 5.5 Consideration of Bats

- 5.5.1 The development of the site offers opportunities to improve the roosting potential at the site for bats. The incorporation of features such as bat bricks into suitable elevations of the new properties would enhance the opportunities for use by roosting bats.
- 5.5.2 Commercially available bat bricks/tubes can be faced with the same construction material as the new property elevations. The bricks/tubes should be sited over 4 metres from ground level on the outer margins of the sites, close to areas of landscape planting or existing linear planting. The bricks/tubes should not be positioned over windows or doorways where droppings may become a nuisance. Once the development layout has been finalised an Ecologist can advise on appropriate positions for the bat bricks/tubes.
- 5.5.3 Examples of suitable bricks/tubes (as available from Alana Ecology ([www.alanaecology.co.uk](http://www.alanaecology.co.uk)), IBStock or Bioquip ([www.bioquip.net](http://www.bioquip.net))) are presented at **Insert 2**.



**Insert 2: Examples of commercially available bat bricks/tubes suitable for housing (middle and left).**

## 5.6 Ecological Enhancement and Landscape Planting

- 5.6.1 The key principles of Planning Policy Statement 9: Biodiversity and Geological Conservation (PPS9) advise that planning policies and decisions should not only avoid, mitigate or compensate for harm but seek ways to enhance and restore biodiversity and geology.
- 5.6.2 The development proposals provide an opportunity to incorporate features for the attraction of biodiversity through appropriate landscape planting and long-term management.
- 5.6.3 All recommendations detailed below are complementary to the type and style of development, the geographical area and the habitats in the local area. Their main function is to contribute to and enhance the nature conservation and biodiversity value of the site.

### ***Enhancement of Habitats and Habitat Connectivity within the Sites***

- 5.6.4 Native trees, shrubs and hedgerows should be incorporated into the landscape planting to improve the habitat connectivity within and around the sites and to provide additional habitats for use by nesting and feeding birds, particularly small passerine birds which are not a large concern in relation with the proximity of the site to the airport.

#### ***Trees***

- 5.6.5 In an article published by Land (2004) which detailed the results of transect surveys of garden habitats and the abundance and diversity of bird species present, trees were confirmed to be important features for birds within street landscapes. The importance of the trees was indicated in the field study as the highest percentage of registrations of birds was recorded in gardens with trees. The article demonstrated the importance of the provision of a range of features within a landscape scheme for the attraction of bird species. At this Site it is recommended that small native trees are incorporated into the landscape planting.
- 5.6.6 It is recommended that trees which support blossom and fruit which will attract insects are incorporated into the landscape planting. This will aim to encourage foraging bats and birds. Suitable species include Crab Apple, Rowan, Silver Birch, Wild Cherry, Field Maple, Hazel, Hawthorn and Blackthorn.

#### ***Understorey, Ground Cover Planting and Wildflower Grassland***

- 5.6.7 The understorey and ground cover planting design can be prepared to optimise the attraction of invertebrates such as feeding bumblebees and butterflies. Where possible the use of native species should be maximised but where necessary non-native species known to be attractive to invertebrates should be used.
- 5.6.8 Planting schemes that include flowering species such as Lavender, Rosemary, *Hebe*, *Potentilla*, *Calluna*, *Ceanothus* and *Vinca* can maximise opportunities for feeding invertebrates.
- 5.6.9 It is recommended that plant species that produce berries such as *Berberis*, *Pyracantha* and *Cotoneaster* (not the invasive *C. horizontalis*, *C. integrifolius*, *C. simonsii*, or *C. microphyllus*) are introduced into the planting scheme for the attraction of feeding birds.
- 5.6.10 The creation of a low maintenance wildflower grassland into public open space areas within the site will maximise opportunities for the conservation and continued attraction of invertebrates to the urban area. Suitable seeding and subsequent management of the public open space will provide habitat for feeding and sheltering invertebrates including butterfly, bee and moth species.

### **5.7 Conclusion**

- 5.7.1 Based on the survey information presented in this ecological assessment, it is concluded that the principle of development at the site at Speke Hall Avenue, Liverpool is feasible and acceptable. This conclusion is valid provided that guidance detailed in Section 5 of this assessment is applied throughout the design and construction of the site.

## 6.0 REFERENCES

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## 7.0 TABLES AND FIGURES

**Table A: Species Composition, Frequency and Abundance for Unmanaged Mesotrophic Grasslands, Scrub and Tall-herb Vegetation in the Northern Section of the Site**

Scientific Name	Common Name	Frequency	Abundance
<b>Woody Species</b>			
<i>Crataegus monogyna</i>	Hawthorn	R	<1%
<i>Fraxinus excelsior</i>	Ash	VLF	1%
<i>Prunus spinosa</i>	Blackthorn	VLA	1%
<i>Rosa canina</i>	Dog-rose	VL	<1%
<i>Salix caprea</i>	Goat Willow	VL	<1%
<i>Salix cinerea</i>	Grey Willow	VL	<1%
<i>Sambucus nigra</i>	Elder	R	<1%
<i>Sorbus aucuparia</i>	Rowan	R	<1%
<b>Moss species</b>			
<i>Brachythecium rutabulum</i>	Rough-stalked Feather-moss	LA	<1%
<b>Herbaceous Species</b>			
<i>Achillea millefolium</i>	Yarrow	R	<1%
<i>Aegopodium podagraria</i>	Ground-elder	LVF	5%
<i>Agrostis capillaris</i>	Common Bent	LF	2%
<i>Agrostis stolonifera</i>	Creeping Bent	VLF	<1%
<i>Anthriscus sylvestris</i>	Cow Parsley	VLF	2%
<i>Arrhenatherum elatius</i>	False Oat-grass	LA	12%
<i>Artemisia vulgaris</i>	Mugwort	VL/VLA	<1%
<i>Aster x salignus</i>	Common St. Michaelmas-daisy	VLA	1%
<i>Calystegia</i> sp.	Bindweed sp.	R	<1%
<i>Cardamine flexuosa</i>	Wavy Bitter-cress	VLF	<1%
<i>Centaurea nigra</i>	Common Knapweed	LF	<1%
<i>Cerastium fontanum</i>	Common Mouse-ear	VL	<1%
<i>Chamerion angustifolium</i>	Rosebay Willowherb	VLF	<1%
<i>Cirsium arvense</i>	Creeping Thistle	LVF	5%
<i>Cirsium vulgare</i>	Spear Thistle	O	<1%
<i>Dactylis glomerata</i>	Cock's-foot	F/LD*	25%
<i>Dryopteris filix-mas</i>	Broad Buckler-fern	R	<1%
<i>Elytrigia repens</i>	Common Couch	LF	5%
<i>Epilobium hirsutum</i>	Great Willowherb	LVF	<1%
<i>Epilobium montanum</i>	Broad-leaved Willowherb	VLF	<1%
<i>Festuca rubra</i>	Red Fescue	F/LVA*	12%
<i>Galium aparine</i>	Cleavers	VLF	<1%
<i>Holcus lanatus</i>	Yorkshire-fog	LF	5%
<i>Juncus articulatus</i>	Jointed Rush	R	<1%
<i>Lamium purpureum</i>	Red Dead-nettle	R	<1%
<i>Lolium perenne</i>	Perennial Rye-grass	LF	10%
<i>Narcissus pseudonarcissus</i>	Daffodil	VLF	<1%
<i>Phalaris arundinacea</i>	Reed Canary-grass	VLA	1%
<i>Plantago lanceolata</i>	Ribwort Plantain	LF	1%
<i>Plantago major</i>	Great Plantain	R	<1%
<i>Poa annua</i>	Annual Meadow-grass	VL	<1%
<i>Ranunculus repens</i>	Creeping Buttercup	LF	<1%
<i>Rubus fruticosus</i> agg.	Bramble	VLA	3%
<i>Rubus idaeus</i>	Raspberry	VLA	1%
<i>Rumex acetosa</i>	Common Sorrel	LF	<1%
<i>Rumex obtusifolius</i>	Broad-leaved Dock	VLA/F	5%
<i>Senecio jacobaea</i>	Common Ragwort	VL	<1%
<i>Taraxacum officinale</i>	Dandelion	LF	<1%
<i>Trifolium repens</i>	White Clover	VL	<1%
<i>Tussilago farfara</i>	Colt's-foot	VLF	<1%
<i>Urtica dioica</i>	Common Nettle	LF/VLA	3%
<b>Key to DAFOR:</b> D=Dominant, A=Abundant, F=Frequent, O=Occasional, R=Rare, V=Very, L=Local and *denotes a constant species			

**Table B: Species Composition, Frequency and Abundance for Unmanaged Mesotrophic Grassland, Scrub and Tall-herb Vegetation in the Southern Section of the Site**

Scientific Name	Common Name	Frequency	Abundance
<b>Woody Species</b>			
<i>Betula pendula</i>	Silver Birch		
<i>Buddleja davidii</i>	Butterfly-bush	VLF	<1%
<i>Cornus sanguinea</i>	Dogwood	VLA	<1%
<i>Crataegus monogyna</i>	Hawthorn	VL	<1%
<i>Pinus sylvestris</i>	Scots Pine	R	<1%
<i>Prunus sp.</i>	Cherry	O	<1%
<i>Quercus robur</i>	Pedunculate Oak	VL	<1%
<i>Rosa canina</i>	Dog-rose	VL	<1%
<i>Salix caprea</i>	Goat Willow	VLA	2%
<i>Salix cinerea</i>	Grey Willow	VLA	2%
<i>Sambucus nigra</i>	Elder	R	<1%
<i>Symphoricarpos albus</i>	Snowberry	VLA	<1%
<i>Tilia sp.</i>	Lime species.	VLA	<1%
<b>Moss species</b>			
<i>Brachythecium rutabulum</i>	Rough-stalked Feather-moss	LA	<1%
<i>Kindbergia praelongium</i>	Common Feather-moss	LA	<1%
<b>Herbaceous Species</b>			
-	Exotic species	R	<1%
<i>Achillea millefolium</i>	Yarrow	VL	<1%
<i>Aegopodium podagraria</i>	Ground-elder	LVA	1%
<i>Agrostis capillaris</i>	Common Bent	F/VLA*	2%
<i>Agrostis stolonifera</i>	Creeping Bent	LA	7%
<i>Anthriscus sylvestris</i>	Cow Parsley	LF/LVA	5%
<i>Arrhenatherum elatius</i>	False Oat-grass	F/LA*	10%
<i>Artemisia vulgaris</i>	Mugwort	VLF	<1%
<i>Aster x salignus</i>	Common St. Michaelmas-daisy	LA	<1%
<i>Calystegia sp.</i>	Bindweed species	VLF	<1%
<i>Cardamine flexuosa</i>	Wavy Bitter-cress	VLF	<1%
<i>Centaurea nigra</i>	Common Knapweed	VL	<1%
<i>Cerastium fontanum</i>	Common Mouse-ear	L	<1%
<i>Chamerion angustifolium</i>	Rosebay Willowherb	R	<1%
<i>Cirsium arvense</i>	Creeping Thistle	F/LA	7%
<i>Cirsium vulgare</i>	Spear Thistle	VL	<1%
<i>Dactylis glomerata</i>	Cock's-foot	A/LD*	20%
<i>Elytrigia repens</i>	Common Couch	LA	3%
<i>Epilobium hirsutum</i>	Great Willowherb	VLF	<1%
<i>Epilobium montanum</i>	Broad-leaved Willowherb	LA	5%
<i>Fallopia japonica</i>	Japanese Knotweed	R	<1%
<i>Festuca pratensis</i>	Meadow Fescue	VLF	<1%
<i>Festuca rubra</i>	Red Fescue	F/VLA*	10%
<i>Galium aparine</i>	Cleavers	VLA	<1%
<i>Geranium molle</i>	Dove's-foot Crane's-bill	VL	<1%
<i>Hieracium sp.</i>	Hawkweed sp.	VLF	<1%
<i>Holcus lanatus</i>	Yorkshire-fog	VL	<1%
<i>Juncus effusus</i>	Soft-rush	VL	<1%
<i>Juncus inflexus</i>	Hard Rush	VL	<1%
<i>Leucanthemum vulgare</i>	Oxeye Daisy	VLF	<1%
<i>Lolium perenne</i>	Perennial Rye-grass	F	2%
<i>Lonicera periclymenum</i>	Honeysuckle	R	<1%
<i>Medicago lupulina</i>	Black Medick	VLF	<1%
<i>Narcissus pseudonarcissus</i>	Daffodil	VLF	<1%
<i>Phalaris arundinacea</i>	Reed Canary-grass	VLA	<1%
<i>Phleum pratense</i>	Timothy	VLF	<1%
<i>Picris echinoides</i>	Bristly Oxtongue	R	<1%
<i>Plantago lanceolata</i>	Ribwort Plantain	F*	1%
<i>Potentilla reptans</i>	Creeping Cinquefoil	R	<1%
<i>Ranunculus repens</i>	Creeping Buttercup	LF	<1%
<b>Continued overleaf</b>			



**Table B: Species Composition, Frequency and Abundance for Unmanaged Mesotrophic Grassland, Scrub and Tall-herb Vegetation in the Southern Section of the Site**

Scientific Name	Common Name	Frequency	Abundance
<i>Continued</i>			
<i>Rubus fruticosus</i> agg.	Bramble	VLA	2%
<i>Rumex acetosa</i>	Common Sorrel	VL	<1%
<i>Rumex obtusifolius</i>	Broad-leaved Dock	VLF	1%
<i>Senecio jacobaea</i>	Common Ragwort	LF	<1%
<i>Sisymbrium officinale</i>	Hedge Mustard	VLF	<1%
<i>Sonchus oleraceus</i>	Smooth Sow-thistle	VL	<1%
<i>Stachys sylvatica</i>	Hedge Woundwort	R	<1%
<i>Taraxacum officinale</i>	Dandelion species	F*	<1%
<i>Trifolium repens</i>	White Clover	LF	<1%
<i>Tussilago farfara</i>	Colt's-foot	VLF	<1%
<i>Urtica dioica</i>	Common Nettle	LA	20%
<i>Veronica chamaedrys</i>	Germander Speedwell	R	<1%
<i>Vicia cracca</i>	Tufted Vetch	R	<1%
<i>Vicia sepium</i>	Bush Vetch	R	<1%
<b>Key to DAFOR:</b> D=Dominant, A=Abundant, F=Frequent, O=Occasional, R=Rare, V=Very, L=Local and *denotes a constant species			

**Table C: Species Composition, Frequency and Abundance for Vegetation Colonising Hard Standing**

Scientific Name	Common Name	Frequency	Abundance
<b><u>Woody Species</u></b>			
<i>Betula pendula</i>	Silver Birch	VL	<1%
<i>Buddleja davidii</i>	Butterfly-bush	VLF	<1%
<i>Salix caprea</i>	Goat Willow	VL	<1%
<i>Salix cinerea</i>	Grey Willow	VL	<1%
<b><u>Moss species</u></b>			
<i>Brachythecium rutabulum</i>	Rough-stalked Feather-moss	VLF	<1%
<i>Kindbergia praelongium</i>	Common Feather-moss	VLA	<1%
<b><u>Herbaceous Species</u></b>			
<i>Achillea millefolium</i>	Yarrow	VL	<1%
<i>Agrostis capillaris</i>	Common Bent	VLF	2%
<i>Agrostis stolonifera</i>	Creeping Bent	F/VLA	7%
<i>Anthriscus sylvestris</i>	Cow Parsley	R	<1%
<i>Aphanes arvensis</i>	Parsley Piert	VL	<1%
<i>Arrhenatherum elatius</i>	False Oat-grass	F*	2%
<i>Artemisia vulgaris</i>	Mugwort	VLF	<1%
<i>Aster x salignus</i>	Common St. Michaelmas-daisy	VLF	<1%
<i>Cardamine flexuosa</i>	Wavy Bitter-cress	VL	<1%
<i>Carex hirta</i>	Hairy Sedge	R	<1%
<i>Cerastium fontanum</i>	Common Mouse-ear	LF	<1%
<i>Chamerion angustifolium</i>	Rosebay Willowherb	R	<1%
<i>Cirsium arvense</i>	Creeping Thistle	VL	<1%
<i>Cirsium vulgare</i>	Spear Thistle	R	<1%
<i>Dactylis glomerata</i>	Cock's-foot	VL	<1%
<i>Epilobium hirsutum</i>	Great Willowherb	VLA	<1%
<i>Epilobium montanum</i>	Broad-leaved Willowherb	VLF	<1%
<i>Erophila verna</i>	Common Whitlow-grass	VLF	<1%
<i>Festuca rubra</i>	Red Fescue	F/LA*	10%
<i>Geranium molle</i>	Dove's-foot Crane's-bill	VL	<1%
<i>Hieracium sp.</i>	Hawkweed species	VLA	<1%
<i>Lathyrus pratensis</i>	Meadow Vetchling	R	<1%
<i>Leucanthemum vulgare</i>	Oxeye Daisy	LF	<1%
<i>Lolium perenne</i>	Perennial Rye-grass	VL	<1%
<i>Medicago lupulina</i>	Black Medick	F/LA*	5%
<i>Picris echioides</i>	Bristly Oxtongue	VL	<1%
<i>Plantago lanceolata</i>	Ribwort Plantain	F*	1%
<i>Potentilla reptans</i>	Creeping Cinquefoil	VLF	<1%
<i>Ranunculus repens</i>	Creeping Buttercup	VLF	<1%
<i>Rubus fruticosus</i> agg.	Bramble	VL	<1%
<i>Rumex obtusifolius</i>	Broad-leaved Dock	VLF	<1%
<i>Senecio jacobaea</i>	Common Ragwort	LF*	<1%
<i>Senecio sp.</i>	Ragwort sp.	R	<1%
<i>Senecio vulgaris</i>	Groundsel	VL	<1%
<i>Sonchus oleraceus</i>	Smooth Sow-thistle	R	<1%
<i>Taraxacum officinale</i>	Dandelion sp.	F*	5%
<i>Trifolium repens</i>	White Clover	VLF	<1%
<i>Tripleurospermum inodorum</i>	Scentless Mayweed	R	<1%
<i>Tussilago farfara</i>	Colt's-foot	VLA	<1%
<i>Urtica dioica</i>	Common Nettle	R	<1%
<i>Vicia sativa</i>	Common Vetch	R	<1%
<i>Vicia sepium</i>	Bush Vetch	R	<1%
<b>Key to DAFOR:</b> D=Dominant, A=Abundant, F=Frequent, O=Occasional, R=Rare, V=Very, L=Local and *denotes a constant species			

