

Appendix 10.1

Extended Phase 1 Habitat Survey



M8 BAILLIESTON TO NEWHOUSE

EXTENDED PHASE 1 HABITAT SURVEY

Final Report

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1. INTRODUCTION

This Technical Appendix to the Environmental Statement (ES) for the M8 Baillieston to Newhouse presents the results of an extended Phase 1 habitat survey of the ecological study area, which was undertaken as part of a Stage 2 Design Manual for Roads and Bridges (DMRB) assessment during the summer of 2004.

This report formed the basis for decision-making over the need for other specialist ecological surveys as part of the subsequent Stage 3 DMRB assessment, which is reported in full in the ES. Where additional specialist surveys have been undertaken for the Stage 3 DMRB assessment, these are reported in full in other Technical Appendices to the ES, as described below.

2. METHODS

This report has been completed in accordance with the methodology for a Stage 3 assessment set out in the Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 4 Ecology and Nature Conservation, Chapter 7.

2.1 Consultations and Desk Study

A Stage 2 DMRB Environmental Impact Assessment (EIA) Report was submitted to the Scottish Executive in November 2004, and updated in 2005 (MF JV, 2005). As part of the Stage 2 assessment, comprehensive consultations had been carried out with relevant statutory and non-statutory organisations in February 2004 to provide an understanding of the study area's ecological interest and to elicit the views of consultees on the potential ecological impacts of the proposed options. Key consultees, SNH and North Lanarkshire Council, were then further consulted through meetings and correspondence during the Stage 3 DMRB assessment, to ensure that their views on impacts and preferred mitigation options and enhancement opportunities were taken fully into consideration in the specimen design proposals.

The nature conservation organisations consulted with respect to the Stage 3 DMRB assessment are listed below:

- Botanical Society of the British Isles (BSBI);
- Butterfly Conservation;
- Central Scotland Forest Trust;
- Concern for Swifts;
- Forestry Commission Strathclyde Conservancy;
- Glasgow City Council Biodiversity Officer;
- Hamilton Natural History Society;
- Local Otter and Water Vole recorder;
- North Lanarkshire Council's Ecology and Planning/Development Departments;
- Royal Society for the Protection of Birds (RSPB Scotland);
- Scottish Badgers;
- Scottish Environmental Protection Agency (SEPA);
- Scottish Executive Environment Group (Countryside and Natural Heritage); and

- Scottish Natural Heritage (SNH, Lanark Office).

In addition to consultations and review of the Stage 2 assessment, the desk study for the current Stage 3 DMRB assessment included review of the following sources of information:

- <http://www.jncc.gov> - for statutory European sites;
- <http://www.scottishwildlifetrust.org.uk> - for non-statutory wildlife sites;
- <http://www.sepa.org.uk> - for salmonid fisheries information;
- <http://www.northlan.gov.uk> - planning/biodiversity for North Lanarkshire;
- <http://www.searchnbn.net> - for species records;
- <http://www.scotland.gov.uk> - for Scotland's Biodiversity Strategy;
- <http://www.ukbap.org.uk> - for both the Glasgow City and the North Lanarkshire Council Local Biodiversity Action Plans (LBAPs); and
- <http://www.wildlifeglasgow.gov.uk>.

2.2 Extended Phase 1 Habitat Survey

The study area boundary is as shown in Figures 10.2 a – e. This area was subject to an extended Phase 1 habitat survey in the period May to July 2004, focussing primarily on semi-natural and other vegetated land up to approximately 500 m either side and at each end of the scheme. Phase 1 habitat survey is a standardised method of recording habitat types and characteristic vegetation, as set out in the “Handbook for Phase 1 Habitat Survey – a technique for Environmental Audit” (JNCC, 1993). This habitat survey method was extended in accordance with the “Guidelines for Baseline Ecological Assessment” (IEA, 1995) through the additional recording of specific features indicating the presence, or likely presence, of protected species or other species of nature conservation significance. Descriptive “target notes” (shown as red numbered circles in Figure 10.2 and referred to throughout this Appendix as TNs), were recorded to provide details of characteristic habitats, features of ecological interest, or any other features which required note to aid ecologically sensitive design or mitigation.

Whilst not a full botanical or protected species survey, the extended Phase 1 method of survey enables suitably trained and experienced ecologists to obtain an understanding of the ecology of a site such that it is possible either:

1. to confirm the conservation significance of the site and assess the potential for impacts on habitats/species likely to represent a material consideration in planning terms; or

2. to establish the scope and extent of any additional specialist ecological surveys that will be required before such confirmation can be made.

2.3 Additional Specialist Surveys

It was concluded during the Stage 2 DMRB assessment that a number of issues would require further specialist survey in order to obtain a more detailed understanding of baseline conditions for the Stage 3 DMRB assessment. The specialist surveys listed in Table 1 below were therefore carried out and are reported separately in other Technical Appendices to the ES.

Table 1 Specialist Ecological Surveys Carried Out, 2004 - 2005

Species	Status	Survey Date(s)
Flora of designated "SINCs"	Non-statutory designated local nature conservation sites	May to July 2004
River Corridor and Otter Survey	Non-statutory designated local nature conservation site with European Protected Species	June 2005
Bats	European Protected Species	July 2004 (Stage 2 DMRB) September 2005 (walkover)
Great crested newt	European Protected Species	July 2004 (Stage 2 DMRB) April/May 2005 (Stage 3 DMRB)
Kingfisher	Great Britain specially protected bird species	July and October 2005
Badger	Great Britain protected species	Feb/March 2005 (walkover survey) March 2005 (bait-marking survey)

Further information about the specialist surveys is provided in the relevant Technical Appendices to the ES, and this report should therefore be read in conjunction with the following:

- Part 1 Environmental Statement (ES), Chapter 10, Ecology and Nature Conservation;

- ES Appendix 10.2, which reports on detailed National Vegetation Classification (NVC) surveys of all SINC sites in the study area;
- ES Appendix 10.3, which reports on River Corridor Surveys carried out in 2005;
- ES Appendix 10.4, which reports on a bat survey and assessment carried out in 2005;
- ES Appendix 10.5, which reports on amphibian surveys carried out in 2004 and 2005;
- ES Appendix 10.6, which reports on kingfisher surveys carried out in 2005; and
- ES Confidential Badger Annex, available on application from the Scottish Executive due to the high incidence of badger persecution in the UK.

2.4 Data Limitations

As the extended Phase 1 habitat survey was conducted in May to July, some early - flowering species may not have been visible at the time of the survey. However, as far as practicably possible the survey was carried out at optimal times for each habitat type and all woodland communities were surveyed in spring and the majority of open habitats, grasslands and aquatic communities were surveyed in mid summer. Experienced botanical surveyors carried out the extended Phase 1 survey and it is considered that the survey results are representative of the flora of the study area, and include all the dominant and characteristic species.

In addition to permanent ponds, there are records from a recent report (HEL, 2003) relating to part of the study area to the west of the Shawhead Junction, known as the "Douglas Support Estate", of temporary/seasonal waterbodies being present. Not all of the temporary ponds recorded by HEL were in evidence during the extended Phase 1 habitat survey, and it is therefore similarly possible that during wet seasons there may be other temporary ponds/pools elsewhere within the study area which have not been shown on Figure 10.2. This limitation is considered not to be significant in terms of assessing the nature conservation value of the area.

Dense scrub vegetation and steep banks along parts of the North Calder Water restricted complete access to parts of the study area, however these areas were surveyed from as close as possible and the access limitations are considered to be minor. It is the professional opinion of the experienced surveyors that additional survey of the site would not materially alter the conclusions drawn from the survey work or the recommendations made in respect of mitigation measures.

2.5 Data Presentation

As the ecological survey area is large and geographically diverse, the Phase 1 habitat plan is divided into sections (Sheets 1 to 5, Figures 10.2 a – e) for ease of reference. From west to east the sections are:

The Baillieston Interchange (Sheet 1 of 5, Figure 10.2a). North and south of the M73 is mainly an undulating rural landscape, with Baillieston Interchange itself intensively landscaped.

Bargeddie and Kirkshaws (Sheet 2 of 5, Figure 10.2b). The river valley of the North Calder Water, including minor tributaries, is the main ecological feature of this section. Undulating farmland lies around the river valley south of the A8. North of the A8 is predominantly built-up.

Shawhead (Sheet 3 of 5, Figure 10.2c). This section is mainly farmland and also contains the North Calder Water and Shirrel Burn. Urban areas lie north of the A8 (Shawhead) and south of the river (Viewpark Industrial Estate and Bellshill).

Eurocentral and Chapelhall Junction (Sheet 4 of 5, Figure 10.2d). This is an area of flat-lying land and includes the Eurocentral Industrial Area south of the A8, a short stretch of the North Calder Water and the Kennel Burn.

Newhouse Junction (Sheet 5 of 5, Figure 10.2e). This section is the easternmost part of the study area and is mainly gently undulating, agricultural land.

3. ECOLOGICAL SITES

3.1 Statutory Protected Ecological Sites

There are no statutory Local Nature Reserves or statutory designated sites of international or national nature conservation value within or adjacent to the scheme. The nearest statutory designated Sites of Special Scientific Interest (SSSI) are the Hamilton Low Parks SSSI and Woodend Loch SSSI.

Hamilton Low Parks SSSI, which lies immediately to the west of the M73 approximately 3km to the south of Baillieston Interchange, is designated for its wetland and ornithological interest. Woodend Loch SSSI is also designated on account of its interest as a wetland bird site, and lies approximately 1 km north of the Baillieston Interchange. Both of these SSSIs are sufficiently far from the scheme for there to be no direct or indirect impact upon them as a result of the proposed scheme. These sites are therefore not considered further in this Appendix.

3.2 Non-statutory Nature Conservation Designations

Sites of Importance for Nature Conservation (SINCs)

Glasgow City and North Lanarkshire Councils confirmed that there are 19 Sites of Importance for Nature Conservation (SINCs), a non-statutory designation applied by the local planning authority to sites considered to be of local ecological importance, within the study area. These sites are listed (from west to east, approximately) in Table 1, and their locations and a brief summary of each is provided below. Further details are provided in Appendix 10.2, which contains plans showing the SINC boundaries in Figures 10.1 a - e. SINCs are afforded a degree of protection under planning policy guidance in NPPG14 and PAN 60, which are implemented through Glasgow City Local Plan policy ENV 5 and North Lanarkshire Local Plan¹ policy ENV 14.

There are seven SINCs, highlighted with an asterisk in Table 2, which will be directly affected by the proposed improvements.

¹ North Lanarkshire Council (June 2001). **Southern Area Local Plan Finalised Draft (Modified June 2001) Written Statement.**

Table 2 Non-statutory Sites of Importance for Nature Conservation

Site Name	Closest Distance from M8 Improvement Scheme	Designating Authority	Known Features of Interest
Greenwells SINC	460 m	Glasgow City Council	Hawthorn scrub.
North Calder Water : Newlands Glen – Ravel Burn SINC	270 m	North Lanarkshire Council	Block of Ancient Woodland and wetland habitats. UK and Local BAP priority wet and ash woodland habitat. European protected species – otter.
North Calder Water : Braehead/Aitkenhead (west section) SINC	70 m	North Lanarkshire Council	UK and Local BAP wet woodland priority woodland habitat. European protected species – otter.
North Calder Water : Braehead/Aitkenhead (east section) SINC	190 m	North Lanarkshire Council	UK and Local BAP priority ash woodland habitat. European protected species – otter.
Luggie Glen SINC	400 m	North Lanarkshire Council	Stream habitat with ravine woodland, including wet woodland UK and Local BAP priority habitat. European protected species – otter. This site also benefits from designation as a Scottish Wildlife Trust Wildlife Site.
North Calder Water : Bankhead to Viewpark Glen SINC	30 m	North Lanarkshire Council	Ancient mixed woodland including UK and Local BAP priority ash woodland habitat. European protected species – otter.
Crowflat Pond SINC*	Lies directly on new M8 alignment	North Lanarkshire Council	Wet woodland, swamp and open water, including UK and Local BAP priority habitat.

Site Name	Closest Distance from M8 Improvement Scheme	Designating Authority	Known Features of Interest
North Calder Water : The Wilderness – Rosehall Bridge SINC	70 m	North Lanarkshire Council	West Section - Ancient Woodland site, replanted. European protected species – otter.
			East Section - Long-established, mixed plantation. European protected species – otter.
North Calder Wood SINC*	Lies directly on new M8 alignment	North Lanarkshire Council	UK and Local BAP wet woodland priority habitat.
North Calder Water : Rosehall Bridge – Carnbroe Mains SINC*	This linear site is crossed by the new M8 alignment	North Lanarkshire Council	Ancient Woodland, including UK and Local BAP ash woodland priority habitat. European protected species – otter.
North Calder Water : Carnbroe Mains – Greenend SINC	220 m	North Lanarkshire Council	UK and Local BAP ash woodland priority habitat. European protected species – otter.
South Carnbroe Wood SINC	170 m	North Lanarkshire Council	Woodland, including wet woodland UK and Local BAP priority habitat. A pond on this site had been recently drained when surveyed during 2004.
Orchard Farm Pool SINC*	Directly adjacent to existing A8 highway boundary.	North Lanarkshire Council	Transition from open water, through swamp and tall-herb fen to rush-pasture and wet woodland. UK and Local BAP priority habitats. This site also benefits from designation as a Scottish Wildlife Trust Wildlife Site.

Site Name	Closest Distance from M8 Improvement Scheme	Designating Authority	Known Features of Interest
Faskine Estate Woodland and Pond SINC*	Mixed plantation directly affected by Eurocentral Junction. Pond 120 m away.	North Lanarkshire Council	Mixed woodland and wetland habitats, including open water, small reedbed and wet woodland UK and Local BAP habitat.
Greenend to Maggieshaugh SINC	290 m	North Lanarkshire Council	Mixed plantation woodland.
Blacklands Plantation* and Roundel Pond SINC	Corner of broadleaved plantation only, directly affected by slip road embankments. Pond 350 m away.	North Lanarkshire Council	Block of broadleaved and mixed plantation woodland, and a nearby pond with transition habitats from open water through swamp and wet woodland UK and Local BAP habitat.
North Calder Water : Maggieshaugh – Calderbank SINC	10 m	North Lanarkshire Council	Ancient Woodland, replanted. UK and Local BAP wet and ash woodland priority habitat. European protected species – otter.
O Wood SINC	20 m	North Lanarkshire Council	Broadleaved and mixed plantation, including young stands. Small fragment of rush-pasture and stand of swamp marking site of late successional pond.
Shotts Burn SINC*	Crossed by existing A8 where on-line improvements proposed.	North Lanarkshire Council	Stream habitat with ravine woodland and a mixture of habitats in area subject to historic disturbance from industrial activity. European protected species – otter.

SINC 1 Greenwells (Figure 10.1a) lies immediately west of the M73 (NGR NS695651). The site is listed by Glasgow City Council as a SINC not meeting its “City Wide Significant SINC” criteria, but nevertheless of some value in the context of the locality.

The North Lanarkshire SINC's listed below are not graded, but are all considered by the Council to be of value in the context of the Council area. This level of value is described as “local” value in this Appendix.

SINC 2 North Calder Water : Newlands Glen – Ravel Burn (east section) (North Lanarkshire Council ref. 66/8; grid ref: NS698632) is an elongated woodland site that lies to the west of A752 and south from the North Calder Water. It includes two tributary valleys of the North Calder Water.

SINC 3 North Calder Water : Braehead/Aitkenhead (west section) (NLC ref: 76/5b; grid ref: NS703633) is a small woodland site that lies north of the North Calder Water and immediately west of the A752. It includes the riparian zone where the site adjoins the river.

SINC 4 North Calder Water : Braehead/Aitkenhead (east section) (NLC ref: 76/5a; grid ref: NS705629) is a small, elongated woodland site that lies south of a meander in the North Calder Water. It includes the riparian zone where the site adjoins the river.

SINC 5 Luggie Glen (NLC ref: 76/10b; grid ref: NS705639) is a woodland dominated site situated at the northern edge of the study area.

SINC 6 North Calder Water : Bankhead to Viewpark Glen (NLC ref: 76/18; grid ref: NS710629 – NS719616) is a substantial elongated woodland site that follows a 1 km stretch of the North Calder Water river valley and the Red Burn to the northeast of Viewpark. Crowflat Wood lies within the site (grid ref: NS717625).

SINC 7 Crowflat Pond (NLC ref: 76/21; grid ref: NS721828) is a small wetland site with open water that is contiguous with adjacent SINC 6 woodland.

SINC 8 North Calder Water : The Wilderness – Rosehall Bridge (NLC ref:76/26; grid ref: NS719620 – NS732620) is an elongated woodland site that follows about a 1 km stretch of the North Calder Water. Easterwood lies at the east of the site (grid ref: NS730622).

SINC 9 North Calder Wood (NLC ref: 76/25; grid ref: NS725625) is a moderately small secondary woodland site.

SINC 10 North Calder Water : Rosehall Bridge – Carnbroe Mains (NLC ref: 76/31) is a small, elongated woodland site that follows the North Calder Water (and a small area of land to the south) from the east of the A725 (grid ref: NS731615) to the south of the A8 at Shawhead (grid ref: NS738625).

SINC 11 North Calder Water : Carnbroe Mains - Greenend (NLC ref: 76/32) is an elongated woodland site that follows the North Calder Water river valley north of the A8 at Shawhead (grid ref: NS741626) to the border of the study area (grid ref: NS743629).

SINC 12 South Carnbroe Wood (NLC ref:76/35; grid ref: NS745627) is a small woodland site that lies about 200 m south of Carnbroe.

SINC 13 Orchard Farm Pool (NLC ref: 76/39; grid ref: NS753624) is a substantial wetland site that lies immediately to the north of the existing A8.

SINC 14 Faskine Estate Woodland and Pond (NLC ref: 76/48; grid ref: NS757624) is a moderately large woodland and wetland site. Only its southern half lies within the study area.

SINC 15 Greenend – Maggieshaugh (NLC ref:76/40; grid ref: NS757627) is a moderately large woodland site but only a small part of it lies within the study area.

SINC 16 Blacklands Plantation and Roundel Pond is separated into two sites, namely the moderate sized woodland (NLC ref: 76/52a - Blacklands Plantation; grid ref: NS767617) and the much smaller sized wetland (NLC ref: 76/52b - Roundel Pond; grid ref: NS764615).

SINC 17 North Calder Water : Maggieshaugh - Calderbank (NLC ref:76/44; grid ref: NS766624) comprises a moderately large, elongated woodland site.

SINC 18 O Wood (NLC ref: 76/55; grid ref: NS769612) is a woodland SINC situated at the south edge of the study area.

SINC 19 Shotts Burn (grid ref: NS805625) is a small burn, in a semi-natural channel through woodland and areas of former industrial disturbance, which is crossed by the existing A8 at the easternmost end of the scheme.

Scottish Wildlife Trust “Wildlife Sites”

Two of the above SINCS, Luggie Glen and Orchard Farm Pool, are additionally recognised by the Scottish Wildlife Trust (SWT) as Wildlife Sites (WSs); sites of local importance, of which there are approximately 200 in North Lanarkshire, and the planning framework for which is also set out in NPPG14. There are no further designated or proposed WSs in the study area. As the dual SINC/WS designation makes no material difference to the manner in which this EclA is carried out, for ease of reference Luggie Glen and Orchard Farm Pool will be referred to hereafter only as SINCS.

Corridors of Wildlife and Landscape Importance

As well as SINCS, Glasgow City Council has designated corridors of wildlife and landscape importance (Local Planning Policy ENV7). Desk study indicates that the road system and verges of Baillieston Interchange (including the Coatbridge to Airdrie electrified rail line)

and the northern riparian zone of the North Calder Water at the very western margin of the study area are designated as a corridor of wildlife and landscape importance. Such sites do not have as high a conservation priority as SINC's in planning terms. There is no automatic presumption against development in the Local Plan, but the principal aim of the policy is to maintain the connectivity of important wildlife corridors through careful mitigation of any development that could affect them.

Ancient Woodland

SNH provided the locations of areas within the survey corridor that are included in its Inventory of Ancient Woodland sites. Ancient Woodland is not a formal designation as such, but in Scotland is a term applied to sites whose documented history shows them to have been continuously wooded since approximately 1750, and which are by extension considered likely to have been continuously wooded since the last Ice Age. Long-established woodlands are secondary woodland with a documented history extending back from 100 – 250 years. Ancient Woodland sites and their mature soils are considerably more complex and biodiverse ecosystems than secondarily wooded sites, and long-established woodland more complex than recent plantings. Ancient and long-established woodlands therefore represent environmental capital that should be considered to be a finite resource, as it is not renewable in a human timescale.

All of the Ancient Woodland and long-established woodland within the study area lies within designated SINC's, concentrated towards the western end of the corridor of the North Calder Water, where it consists of both riparian and ravine woodland.

The inventory woodland component of the study area's SINC's is given in Table 3 below.

Table 3 Distribution of Ancient and Long-established Woodland Across SINC's

Site Name	Designating Authority	Ancient Woodland	Long-established Woodland
Greenwells SINC	Glasgow City Council		
North Calder Water : Newlands Glen – Ravel Burn SINC	North Lanarkshire Council	All mature woodland	
North Calder Water : Braehead/Aitkenhead (west section) SINC	North Lanarkshire Council	All riparian woodland	

Site Name	Designating Authority	Ancient Woodland	Long-established Woodland
North Calder Water : Braehead/Aitkenhead (east section) SINC	North Lanarkshire Council		
Luggie Glen SINC	North Lanarkshire Council		
North Calder Water : Bankhead to Viewpark Glen SINC	North Lanarkshire Council	All mature woodland	
Crowflat Pond SINC*	North Lanarkshire Council		
North Calder Water : The Wilderness – Rosehall Bridge SINC	North Lanarkshire Council	West section - all riparian woodland	East section – all mixed plantation
North Calder Wood SINC*	North Lanarkshire Council		
North Calder Water : Rosehall Bridge – Carnbroe Mains SINC*	North Lanarkshire Council	All riparian woodland	
North Calder Water : Carnbroe Mains – Greenend SINC	North Lanarkshire Council	All mature woodland	
South Carnbroe Wood SINC	North Lanarkshire Council		Southern section
Orchard Farm Pool SINC*	North Lanarkshire Council		

Site Name	Designating Authority	Ancient Woodland	Long-established Woodland
Faskine Estate Woodland and Pond SINC*	North Lanarkshire Council		All woodland
Greenend to Maggieshaugh SINC	North Lanarkshire Council		All woodland
Blacklands Plantation* and Roundel Pond SINC	North Lanarkshire Council		All woodland
North Calder Water : Maggieshaugh – Calderbank SINC	North Lanarkshire Council		
O Wood SINC	North Lanarkshire Council		
Shotts Burn SINC*	North Lanarkshire Council		

The majority of the Ancient Woodland (AW) in the study area is riparian woodland in the western part of the North Calder Water (i.e. where the river lies south of the existing A8), including the wooded tributaries of the North Calder Water in this area (e.g. TNs 3, 8, 40, 44 and 86). Excluding the riparian zone in the western North Calder Water, AW is virtually absent and the most ecologically valuable mature, semi-natural woodland is that classed as long-established.

4. HABITATS

Figures 10.2 a - e show the Phase 1 habitat types recorded within the study area, and also show the location of target noted (red circles with a corresponding description number - TN) sites. Target note numbered descriptions are provided in Table 4 at the end of this document.

The following habitats, listed in conventional order used in the Phase 1 manual rather than in order of abundance, are present within the study corridor:

- semi-natural broad-leaved woodland;
- broadleaved plantation woodland;
- mixed plantation woodland;
- conifer plantation;
- dense scrub;
- scattered scrub;
- scattered trees;
- unimproved neutral grassland;
- semi-improved neutral grassland;
- improved grassland;
- marshy grassland;
- species-poor semi-improved grassland;
- tall ruderal;
- swamp;
- standing water;
- running water;
- arable;
- amenity grassland;
- hedgerow;

- built up areas/hardstanding; and
- bare ground.

A description of these habitats, in order of abundance within the study area, starting with those that are most common, is provided below. Where appropriate, habitats have been grouped.

4.1 Man-made Habitats – Built-up & Bare Ground, Improved Grassland & Arable

The study area surrounding the proposed scheme is dominated by managed habitat, consisting mainly of intensive agricultural land supporting improved grassland and arable cultivation, or of built-up areas devoted to industrial or retail use, with some housing. All bare ground habitat within the study area was recorded on sites that had been cleared for, or were in the process of, construction at the time of survey (2004).

The Kirkshaws and Shawhead urban area is the most built-up section of the study area. It is dominated by light industry, the southwest suburbs of Coatbridge, the Showcase Cinema complex and Kirkshaws Cemetery (TN 37). Virtually no areas of natural well-established vegetated habitat, of substantial size, are present. Landscaped areas surround the numerous industrial estates, the Showcase Cinema complex and Kirkshaws Cemetery. These incorporate fairly large areas of recent planting, which include exotic trees and shrubs and areas of amenity grassland.

All of these non-natural habitats are common and widespread, both in the local area and more widely throughout Scotland and the rest of the UK and, although they support a range of flora and fauna, their intrinsic nature conservation value is assessed as being negligible.

4.2 Other Grassland Habitats

Although the majority of agricultural grassland within the study area is classified as improved, substantial areas of semi-improved grassland are also present. This grassland is also under intensive agricultural use throughout most of the study area, but a variety of less intensively managed types are also represented, especially in association with woodlands along the North Calder Water. Marshy grassland is limited to small areas towards the eastern end of the scheme. The semi-improved, unimproved and marshy grasslands of the study area are mainly neutral in character and are typically rank and of low botanical diversity. The overwhelming majority of the grassland habitat within the study area, even those areas included within the boundaries of the various SINC's, is not botanically diverse and the communities are of types that are common and widespread both locally and throughout the UK.

Whilst the intrinsic interest of the grassland habitats described above is negligible in botanical terms, they do support a range of faunal species, including farmland birds that are of conservation interest. For this reason, these commonly-occurring semi-improved and unimproved grassland habitats are assessed across the study area as being of some, low, nature conservation value. The grassland habitats in juxtaposition to woodland,

especially along the corridor of the North Calder Water, are considered to contribute to the value of the adjacent woodland SINC's in terms of functional ecology, i.e. faunal species that are resident in the woodlands are likely to forage in adjacent fields.

4.3 Woodland Habitats

Wooded habitats in the study area include semi-natural and plantation broadleaved woodland, mixed plantation woodland and a very small amount of commercial conifer plantation (e.g. TN 82). Almost all of the woodland within the North Lanarkshire part of the study area is included within designated SINC's, but surveys of the SINC's found that the ecological quality of these woodlands varies.

The majority of broadleaved semi-natural woodland is concentrated within the corridor of the North Calder Water, and therefore concentrated in the western half of the scheme where the river flows sub-parallel with the proposed scheme. A significant proportion of this woodland is listed by SNH as either Ancient Woodland (e.g. TNs 8 and 40) or Long-established Woodland (e.g. TN 43), and a proportion is wet woodland communities that are included in UK and North Lanarkshire Local Biodiversity Action Plans' (BAPs) priority wet woodland habitat. Almost all of these broadleaved semi-natural woodlands have a diverse canopy, scrub layer and ground layer of woodland plants and they generally have good age structure.

The drier woodland on the valley sides predominantly supports stands with affinities to the lowland oak woodland and upland ash woodland communities. The undisturbed/unmodified upland ash woods on the steep sides of the North Calder Water Valley are also a UK and North Lanarkshire BAP priority habitat. Within these woodlands bluebell *Hyacinthoides non-scripta* (often known as wild hyacinth in Scotland) is generally abundant, especially in the riparian zone. The native bluebell is a BAP species in the North Lanarkshire BAP and there is a Species Action Plan (SAP) specifically for it. One of the main threats to populations of this species comes from its being subject to hybridisation if it comes into contact with the non-native Spanish bluebell *H. hispanica*, which is a garden escape now well established in the wild, including in parts of the North Calder Water Valley.

All of these semi-natural woodlands, some of which contain specialist woodland ground flora species such as moschatel *Adoxa moschatellina* and primrose *Primula vulgaris* (TN 90) are assessed as being of intrinsic nature conservation value in a local context, and this finding is in accordance with their designation as SINC's.

Plantation woodland, some of which is also classified as long-established (e.g. TN 3, 16, 53, 76, 79, 80 and 81), is concentrated along the central part of the scheme, where it occurs both north and south of the existing A8. A significant area of conifer plantation lies to the northeast of the Newhouse Junction section. However, the study area only contains a small amount of commercial forestry (e.g. TN 82), but there is an appreciable amount of broadleaved and mixed plantation that falls into the Phase 1 habitat plantation category (JNCC, 2003). The older plantations of the survey area (e.g. TNs 3, 16, 53, 76, 79, 80 and 81) have been created through the generally inappropriate use of forestry

practices, such as selective felling of semi-natural woodland and underplanting with non-native species of conifer and non-native broad-leaved trees (mainly beech *Fagus sylvatica*, sycamore *Acer pseudoplatanus* and occasional horse chestnut *Aesculus hippocastanum*). This has probably reduced the ecological value of the original woodlands. Away from the mature mixed plantations of the western North Calder Water Valley, some old policy woodlands are located, some of which are SINC's (most notably TN 76 Faskine Estate).

These plantation habitats are generally unremarkable in a local and national context, and are therefore assessed as ranging from only low to local nature conservation value in their own right. However, most are closely associated with other, functionally complementary, semi-natural habitats, and may support protected or other species of conservation significance. As such, even when of relatively low intrinsic interest, the long-established woodland in particular has been assessed as contributing substantively to the local interest of designated SINC's (e.g. TN 76).

A moderately large area of willow has been fairly recently planted at the margins of the Orchard Farm Pool SINC site (TN 73) and surveys suggest that this has probably benefited the site's ecology by providing a significant amount of new wildlife habitat. However, the majority of recent tree plantings have been created for landscaping purposes, close to roads, junctions (such as the M8, A8 and M73) and industrial estates (commonplace in the Kirkshaws and Shawhead industrial section). The ecological value of these plantings is currently low.

Small and fragmented areas of younger plantation, such as that at TNs 1 (Baillieston Interchange), 83 and 87, is considered to be of negligible conservation value.

4.4 Aquatic, Marginal and Swamp Habitats

There are a number of different aquatic habitats within the survey corridor including a significant river - the North Calder Water - and associated smaller tributaries, together with limited standing water and swamp.

The study area is dominated by the river valley of the North Calder Water, which runs in a meandering course from east to west through the study area. The catchments and the names of the watercourses that form tributaries of the North Calder Water are shown in Figures 15.1 and 15.2 respectively, and further information on water quality and flows is provided in Chapter 15 on Water Quality and Drainage and the River Corridor Survey of the study area (see Appendix 10.3).

In terms of aquatic habitat, the main river is a meandering lowland river in a natural channel approximately 15–20 m wide, with fast shallow sections of riffle interspersed with deeper slacks and pools. Water quality is assessed according to the SEPA River Classification as being Class "B" (fair quality). The riverbanks are mainly composed of alluvial silt and sand. They vary from steep eroded cliffs to banks that gently slope to the water's edge. The substrate of the river channel is typified by fine sand and silt. Short sections of rapids are due to the river cutting through bedrock and boulders. Only short

sections of gorge-like valley are present (such as Newlands Glen at the southwest edge of the section) and most of the valley floor is floodplain. In part of the valley, river terraces are evident 10-20m above the level of the river. Invasive plant species are relatively common throughout the riparian zone of the western section of the North Calder Water.

Several tributaries join the North Calder Water flowing into it along steep sided, narrow valleys. The Luggie Burn is a tributary of the North Calder Water that feeds into it from the north (TN 23), where it emerges from a long culvert beneath the A8 at Bargeddie Junction. The water quality of the burn is Class "C" (poor quality) and the other tributary watercourses; Red Burn (Grade "D"), Shirrel Burn (Grade "B") and Kennel Burn (Grade "C") are of variable quality. However, poor water quality does not preclude these sites from having ecological value, as evidenced by the fact that Kennel Burn is of special ecological significance in that it supports a population of water vole.

Marginal habitat (wetland habitat that fringes watercourses) is very uncommon in the survey area as the majority of watercourses are fast flowing, with eroded banks composed of exposed sediments and very occasional rock exposure. The only site with marginal vegetation, of conservation importance, is the short stretch of the Kennel Burn that supports a population of water voles (TN 90). Its marginal vegetation comprises small stands of reed canary-grass *Phalaris arundinacea* and comfrey *Symphytum* species.

Rivers and streams are both a UK BAP and a North Lanarkshire BAP priority habitat. Consequently the North Lanarkshire BAP features a priority Habitat Action Plan for rivers and streams as they are regarded as being of local nature conservation value and several BAP species are intimately associated with them (e.g. otter and water vole). The North Lanarkshire Local BAP specifically refers to the ecological importance of the North Calder Water river valley and its woodland habitats in the context of the Council area.

Standing open water is also recognised as being of nature conservation value in the North Lanarkshire BAP. There are at least 34 areas of standing open water within the study area of varying size (e.g. TNs 15, 39, 46, 47, 48, 54, 60, 68, 73, 74, 75, 76, 81, 89, 101, 103, 107 and 111). Most of the natural ponds of the area are present in the vicinity of the North Calder Water river valley as a result of the subsidence of old mine workings or migration of meanders. However, artificial ponds are present in the vicinity of the Eurocentral and Newhouse industrial areas. A high proportion of the larger ponds of the survey area form an important ecological aspect of SINC sites, e.g. Crowflat Pond (TN 48), Orchard Farm Pool (TN 73) and Faskine Estate Pond (TN 76). These larger ponds are of value for their ornithological interest and many are also of importance for amphibians.

Swamp habitats are only well developed in the larger ponds of the survey area but are not a major ecological feature. Swamp is present in the SINC sites at Orchard Farm Pool (TN 73), Faskine Estate Pond (TN 76) and Crowflat Pond (TN 48).

4.5 Other Habitats – Scrub, Tall Ruderals and Species-poor Hedgerow

The remaining small areas of other semi-natural vegetation, mainly dense and scattered scrub (e.g. TN 68), occasional stands of tall ruderals (e.g. TNs 39 and 41) and a small

amount of discontinuous, species-poor hawthorn hedgerow (TNs 103 and 105), represent elements of structural and species diversity in the context of surrounding agricultural land.

Tall ruderal habitats are relatively common in areas of neglected, ex-industrial land that includes recently burned ground and areas disturbed by fly tipping (e.g. TNs 12 and 14) . Tall ruderal habitat is also characteristic of the eroded riparian zones of watercourses, and several of the meanders of the western part of the North Calder Water's river valley are colonised by tall ruderal species (e.g. Target Notes 39, 41 and 67). Tall ruderal habitats in the survey area are all species poor and are mostly dominated by common colonising species such as rosebay willowherb *Chamerion angustifolia*, common nettle *Urtica dioica* and less commonly great willowherb *Epilobium hirsutum*.

These other habitats are generally of negligible intrinsic conservation value. However, the location and extent of those along the valley of the North Calder Water is such that they can be considered to be of slightly more value as they may contribute to the integrity of the east-west riparian corridor by providing functional/physical links between blocks of designated woodland (e.g. TNs 22 and 67).

5. FLORA

5.1 Species of Conservation Interest

Part of the North Calder Wood SINC (TNs 56 and 57) includes long-disused industrial land with spoil heaps. The Botanical Society of the British Isles (BSBI) provided recent records of 6 to 10 plants of Young's helleborine *Epipactis youngiana* in the OS 1 km grid square NS7262, in the vicinity of the electricity powerline that runs through the area to the north of the proposed scheme. The most recent national census² reported Young's helleborine as being known from only nine sites in Great Britain, making it a Nationally Rare species. It is a member of the orchid family that is typically found under light woodland cover on heavy, often heavy metal polluted, soils (Wiggington, 1999). The main UK locations for it are associated with old spoil-bings to the east of the Glasgow area (Dickson, 1991; Dickson *et al*, 2000).

Young's helleborine is a UK and North Lanarkshire BAP species, and in accordance with its UK SAP, genetic research has been undertaken to investigate the status of known populations. Consequently, the most recent publication on the species status of vascular plants in Great Britain (Cheffings & Farrell *et al.*, 2005) has placed Young's helleborine in the "parking list", meaning that it has been excluded from the Red Data list on the basis that the emerging genetic evidence indicates that it is within the range of broad-leaved helleborine *Epipactis helleborine*, i.e. evidence is suggesting that it does not constitute a separate species. However, Young's helleborine remains listed on Schedule 8 of the Wildlife and Countryside Act 1981, as amended, which affords it statutory protection. The colony could not be found during surveys in 2004, but it is considered more likely that it has been overlooked than that it has become extinct, so for the purpose of this assessment it is assumed to be present in suitable habitat at or around TNs 56 and 57.

Also of significance is the presence of common twayblade *Listera ovata* in the secondary woodland of the North Calder Wood SINC (TN 57). Common twayblade is an orchid species that is frequent in a variety of habitats throughout the UK, and is listed as a species of "least concern" in the Red Data list. However, its presence within the study area is considered to be of local conservation significance, as this is the first record of this species in the local area (referring to Dickson *et al.*, 2000). Similarly, the BSBI provided a record of the only known location of common fleabane *Pulicaria dysenterica* in North Lanarkshire from an area described as being between the disused railway line and the western boundary of the Orchard Farm Pool SINC. This is another species that is frequent in a variety of habitats throughout the UK, and is listed as a species of "least concern" in the Red Data list, but whose presence within the study area is considered to be of local conservation significance.

The extended Phase 1 survey included recording of higher plant species that could be identified during summer 2004. No other higher plant species of nature conservation

² Preston *et al*, (2002). **New Atlas of the British and Irish Flora**. Oxford University Press.

significance was found, but given the specialised flora often associated with slag heaps, the possibility of other, for instance early-flowering, species of conservation significance being present at TN 56 and/or 57 cannot be entirely ruled out.

The Phase 1 habitat survey confirmed that water dock *Rumex hydrolapathum* is present in the tall herb fen at the edge of the pond at Faskine Estate Woodland and Pond SINC (TN 76). This species, also one of “least concern” on the Red Data list, is reported by the North Lanarkshire Ecologist as being known from only two sites in the Council area, but is also reported (HEL, 2003) to be present in similar wetland habitat in three ponds at the North Calder Water: Wilderness – Rosehall Bridge SINC (shown in Figure 10.1 b). The populations of this species in the North Calder Water: Wilderness – Rosehall Bridge SINC and Faskine Estate Woodland and Pond SINC are features of local nature conservation value.

Consultation with the BSBI also indicates that there is the record of a rarely encountered, introduced herb species, common fiddleneck *Amsinkia micrantha*, in kilometre grid square NS7063, which includes a large open area of neutral grassland. A more precise grid reference was not available from the BSBI, and the species was not encountered during the extended Phase 1 survey. This species is a notable recently introduced species that is increasingly found in the UK as a casual species in arable land (Stace, 1997), but is uncommon in western areas and as such it is assessed as being a feature of some, low, interest.

5.2 Invasive Species

The extended Phase 1 habitat survey was not a formal survey to document the extent of invasive plant species, but evidence of the presence of species listed on Schedule 9 of the Wildlife and Countryside Act 1981, as amended, was noted. Other species that are increasingly recognised as being particularly invasive were also noted.

The invasive alien Japanese knotweed *Fallopia japonica* was recorded at TNs 9, 14, 21, 28, 31 and 95, i.e. at points throughout the study area. Japanese knotweed is a highly invasive alien species that is listed in Schedule 9 of the Wildlife and Countryside Act 1981, as amended. Under the terms of this legislation, it is an offence to introduce it to a site or cause it to spread in the wild, which means it represents a form of biological contamination that requires specialist treatment as a waste management issue during construction projects.

Another Schedule 9 species, giant hogweed *Heracleum mantegazzianum*, appears to have been successfully removed by major maintenance works in 2003/4 from a site to the south of the A8 near Bargeddie (NS699637) where it was previously reported to be present (ERM, 2001). However, this plant sheds seed prolifically and it is likely to be represented in the seed bank locally to this area, so its recurrence in the future cannot be ruled out.

Other invasive plant species are present in the western section of the North Calder Water valley, as follows:

-
- Himalayan balsam *Impatiens glandulifera* at TNs 3, 13, 21, 23, 28 and 39;
 - pick-a-back plant *Tolmiea menziesii* in the riparian zone at TNs 3, 13 and 63; and
 - Algerian ivy *Hedera algeriensis* in the North Calder Water woodland at TN 53.

None of these three species is currently subject to control under the Wildlife and Countryside Act 1981, as amended, or any other legislation. The presence of these species does, however, detract from the nature conservation value of the areas of woodland in which they have established.

6. FAUNA

6.1 Otter³

The western part of the North Calder Water, with its extensive woodlands, forms a major east-west corridor of riparian habitat along the length of the study area. Consultations indicate that following industrial pollution of the river during the 1960s to 1980s, otters have recolonised this part of the North Calder Water since the early 1990s (R. Green, *pers. comm.*). There were no records of otters being road casualties on the existing A8, or any other roads in the study area.

The extended Phase 1 survey recorded signs of otter activity throughout the corridor of the North Calder Water, with the presence of regular spraint sites (e.g. TNs 6, 21, 24 and 35) and two holt sites beneath the exposed root system of a large lime tree on the west side of the river (in the vicinity of TN 64). A further holt site, assessed as being disused in 2004 and 2005, is present in an eroding section of river bank close to the confluence of the North Calder Water and the Luggie Burn (TN 26), and crevices at the base of a sandstone cliff in this area were also considered to offer potential refuge sites for otter. A further potential holt was recorded at TN 6 in 2004. None of the above holt sites was assessed as being likely to be used for breeding, as all were easily visible, close to the banks of the main river, with sprainting activity at them or nearby. Those at TNs 26 and 64 are both situated close to busy main roads, the A8 and A725 respectively. The HEL (2003) report on the Douglas Support Estate indicated both a holt and a resting up site close to TN 41 in 2003, but in 2004 this area was heavily disturbed by use of off-road vehicles and no sign of use by otter was in evidence at this locality.

The extended Phase 1 survey found no indications of otter on the eastern section of the North Calder Water where it lies north of the A8, nor were there any signs of otter activity on any of the tributaries of the North Calder Water or ponds in the study area at that time, but the species' range in the area is nevertheless considered likely to include all watercourses and waterbodies in proximity to the main river.

Consultations and survey suggest that the study area does not as yet support a substantial population of otters but, as otters are known to be recolonising the area, it is reasonable to assume that individuals may currently range along all of the rivers and tributary burns within the study area. Furthermore, it is likely that they will increasingly do so as conditions continue to favour the expansion of populations using the area, such that in the medium- to long-term the population in this area will increase.

³ Otters *Lutra lutra* are protected as "European protected species" through inclusion on Schedule 2 of The Conservation (Natural Habitat, &c.) Regulations 1994, and the species is also protected through listing on Schedule 5 of the Wildlife and Countryside Act 1981, as amended. The otter is also the subject of UK and North Lanarkshire Local Species Action Plans (SAPs).

6.2 Bats⁴

The only recent records of bats in the study area were those presented in the report on the Douglas Support Estate by HEL (2003), confirming the presence of small numbers of foraging soprano pipistrelle bats *Pipistrellus pygmaeus* in and around the Crowflat Pond and North Calder Wood SINCs (TNs 42, 50 and 56) and along the nearby stretches of the North Calder Water, and of Daubenton's bat *Myotis daubentonii* foraging along the North Calder Water for a distance of approximately 650 m downstream from Rosehall Bridge (i.e. from where the river flows beneath the A725). No roosts were identified during that survey and no further records of bat roosts or foraging activity were held for the study area by consultees.

The entire North Calder Water corridor represents high quality bat habitat, with many mature trees offering potential roost sites in the woodland canopy along the river (e.g. TNs 18, 19, 32, 34, 38, 65 and 67), in addition to which there are several bridges and old railway abutments throughout the area with crevices (e.g. TNs 18, 20, 23, 27 and 45) and caves and crevices in riverside rock exposures (e.g. TNs 30 and 86), all of which are potentially suitable as bat roost sites. The two tunnels under Woodhall Mill Road (TN 84) were assessed as being in good repair, with only limited potential for use as a bat roost site.

Towards the eastern end of the route, the plantation woodlands between the North Calder Water and Chapelhall Junction are also areas where trees with features suitable for roosting bats exist in close proximity to habitats that represent good quality foraging habitat.

The disused Bankhead Farm on the north side of the river valley (TN 36) and other agricultural premises within the study area also represent potential bat roosting habitat, as do the modern housing developments, especially to the south east (Bellshill), but also 1 km to the north east of Shawhead Junction.

The findings of the 2005 bat survey and assessment are provided in ES Technical Appendix 10.4.

⁴ All species of British bat and their roosts are protected as "European protected species" through inclusion on Schedule 2 of The Conservation (Natural Habitat, &c.) Regulations 1994. They are also protected under the Wildlife and Countryside Act 1981, as amended. Six bat species, one of which (common pipistrelle *Pipistrellus pipistrellus*) occurs in North Lanarkshire are also UK BAP priority species, and both common and soprano pipistrelle *P. pygmaeus* and Daubenton's bat *Myotis daubentonii* have SAPs under the North Lanarkshire BAP.

6.3 Great Crested Newt⁵

The results of presence/absence level amphibian surveys carried out on a total of 20 waterbodies, mainly temporary but some permanent, within the Douglas Support Estate (HEL, 2003), were reviewed at the desk study stage and found to have confirmed the presence of good populations of common frog *Rana temporaria* and common toad *Bufo bufo*, and low populations of smooth newt *Triturus vulgaris* and palmate newt *T. helveticus* in this part of the study area. Those surveys, which included the permanent ponds shown in Figure 10.2 b as TNs 39, 48 (Crowflat Pond SINC) 54 and 60, found no evidence of the European protected species, great crested newt *Triturus cristatus*.

In order to establish whether this species was present and likely to be affected by the proposed scheme in other parts of the study area, 14 previously unsurveyed waterbodies within 500 m⁶ of the alignment were identified during the extended Phase 1 habitat survey and, following a scoping assessment of these 14 ponds in May 2004 as part of the Stage 2 DMRB assessment, great crested newt surveys were carried out on eight ponds in July 2004 (TNs 73, 75, 76, 81, 107, 111, Roundel Pond SINC and a SUDS pond at the Chunghwa Industrial Estate just south of the Eurocentral Junction).

Reports on the great crested newt surveys carried out during 2004 and 2005 are provided in the ES Technical Appendix 10.5.

6.4 Water Vole⁷

Water vole surveys were carried out on all suitable aquatic habitat within the study area in tandem with the extended Phase 1 habitat survey in summer 2004.

Glasgow (10 km grid square NS66) is reported to contain an important population of water vole *Arvicola terrestris* that is flourishing, expanding and active (R. Green, 2004, *pers. comm.*), but the habitat fragmentation and barriers represented by the road complex at the Baillieston Interchange means that it is highly unlikely that water voles from that centre of population range into the study area. A wet ditch that runs alongside the Glasgow-Airdrie

⁵ Great crested newts *Triturus cristatus* are protected as “European protected species” through inclusion on Schedule 2 of The Conservation (Natural Habitat, &c.) Regulations 1994. This species is also listed on Schedule 5 of the Wildlife and Countryside Act 1981, as amended, and is listed as a priority species under both the UK and North Lanarkshire Local BAPs.

⁶ The statutory agency for nature conservation, Scottish Natural Heritage, pays regard to guidance on GCN survey methods, published by the English statutory agency English Nature, which recommends surveys of ponds up to approximately 500 metres beyond the boundary of a planning application site.

⁷ Water voles *Arvicola terrestris* are partially protected through inclusion on Schedule 5 of the Wildlife and Countryside Act 1981, as amended. The water vole is also the subject of UK and both Glasgow and North Lanarkshire Local Species Action Plans (SAPs).

rail line just west of the Baillieston Interchange (TN 4) provides optimal habitat for water vole, but no evidence of the species was found during survey in 2004.

Similarly, surveys found no evidence of water vole along the North Calder Water at that time, and consultations confirmed that no new water vole records exist for this section of the study area (R. Green, 2004, *pers. comm.*).

The Kennel Burn to the west of the local road to Calderbank (TN 90) was found during the extended Phase 1 survey to support a population of water vole. The eastern part of the burn (just to the west of the B799 at Chapelhall) is meandering with soft banks composed of silt and mud, vegetated with rank grassland and bordered by scattered scrub and semi-natural woodland. This represents high quality water vole habitat, and the presence of several burrows and latrines provided evidence to confirm the presence of what appears to be a small population in this stretch of the watercourse.

Large-scale fly tipping is prevalent on this part of the burn, but this appears not to have adversely affected the water vole population. The western end of the Kennel Burn is culverted where it passes under the B802 and it is considered unlikely that water voles could currently travel to and from the burn to the North Calder Water downstream. The 10 km grid square within which this record was made (NS76) has not been subject to systematic survey as part of the National Water Vole Survey, but recent records exist for a locality approximately 2 km north of the present A8 and the local recorder advised that water voles have been found at most sites investigated (R. Green, 2004, *pers. comm.*).

6.5 Badger⁸

Badgers are a common and widespread species across North Lanarkshire, and the extended Phase 1 habitat survey noted two clusters of badger activity within the study area. One focus of activity is associated with the western part of the North Calder Water valley, where the combination of steep slopes with dense vegetative cover suitable for excavating setts is found in close proximity to a range of agricultural grasslands that represent good foraging habitat. There is evidence suggesting persecution of badgers in this area, with main setts abandoned and showing signs of human interference.

The second focus of badger activity within the study area is towards the eastern end of the scheme where, again, the habitat consists of densely vegetated areas containing relatively small setts surrounded by agricultural grassland. Unlike the situation further to the west, in this eastern part of the site there is more than one badger social group present and territory is being defended. Consultations indicated a number of instances of badgers having been reported dead on the existing A8 and other roads close to the Newhouse Junction, but this was assessed as being due to chance movements across roads by

⁸ Badgers *Meles meles* and their setts are protected under the Protection of Badgers Act 1992, and through listing on Schedule 5 of the Wildlife and Countryside Act 1981, as amended.

individual animals rather than as a consequence of frequent/regular badger crossings at set points.

6.6 Breeding Birds

Preliminary desk study and consultations suggest that the ornithological value of the study area is not considered to be high. For example, the RSPB held no information on the area, and the most recently published Scottish Ornithologists' Club bird report had only a limited amount of information on it (data only provided for Orchard Farm Pool; Gibson *et al*, 2003). However, it is likely that bird species had been under recorded in the survey area due to its low aesthetic appeal.

Specially protected species of wild bird⁹ reported to have been recorded within the study area during the Stage 2 DMRB assessment were kingfisher *Alcedo atthis*, barn owl *Tyto alba* and red kite *Milvus milvus*. Records for red kite indicate that this species only rarely passes through the survey area and has no breeding territories. The status of the other two species within the study area was unknown. Through consultation with the statutory agency SNH, and with the Royal Society for the Protection of Birds (RSPB), it was determined that a formal breeding bird survey would not be required, but that survey should consist of a site walkover and assessment for the presence of specially protected species.

Kingfisher

There is at least one breeding territory of kingfisher in the western section of the North Calder Water and this is testament to its good ecological state and the presence of suitable nesting sites in stretches of the river with steep, fine sandy riverbanks. Kingfishers were observed to be present approximately 500 m up and downstream of the confluence of Luggie Burn and the North Calder Water, and are known to use the whole of the valley. They were not observed during any of the survey visits to the part of the watercourse where the new North Calder Water bridge is proposed, despite there being suitable habitat for nesting and feeding.

Barn Owl

A barn owl was recorded close to the west of the Baillieston Interchange in December 2003. The owl was noted flying to the north into dense young plantation woodland (TN 1), which provides potentially good hunting habitat. In the western part of the North Calder Water Valley, HEL (2003) reported the presence of barn owl pellets in an outbuilding of

⁹ Most common species of bird, their nests and eggs benefit from a degree of protection under Section 1 of the Wildlife and Countryside Act 1981, as amended. However, certain species of wild bird, benefit from a higher level of "special" protection through inclusion on Schedule 1 of The Wildlife and Countryside Act 1981, as amended. These species are often referred to as "Schedule 1 birds".

Shawhead Farm (NS723627), but the assessment of the site was that it was only used as an occasional roost and there was no evidence for it being a breeding site in 2003. No further records of this species were received from consultees or made during field surveys, despite checks of suitable nesting habitat in barns and outbuildings during the 2004 extended Phase 1 habitat survey and the 2005 bat survey.

Other Breeding Birds

It was determined through consultation with SNH and the RSPB that an assessment of the breeding bird interest of the study area would be based upon species data gathered during the course of walkover surveys, which were undertaken as part of the extended Phase 1 habitat survey during spring and summer 2004, supplemented with reliable records received from consultees. Table 4 lists the species known to occur within the study area, with those that have some formal degree of recognition in respect of their conservation status placed at the top of the table.

Table 4 Bird Species Within the Study Area, 2003 – 2005

Common name	Species	Statutory protected	UK BAP species	Local BAP species	Population status *
Barn owl	<i>Tyto alba</i>	x		x	A
Kingfisher	<i>Alcedo atthis</i>	x			A
Skylark	<i>Alauda arvensis</i>		x	x	R
Grey partridge	<i>Perdix perdix</i>		x	x	R
Linnet	<i>Carduelis cannabina</i>		x		R
Reed bunting	<i>Emberiza schoeniclus</i>		x		R
Song thrush	<i>Turdus philomelos</i>		x		R
Lapwing	<i>Vanellus vanellus</i>			x	A

Common name	Species	Statutory protected	UK BAP species	Local BAP species	Population status *
Swift	<i>Apus apus</i>			x	
Starling	<i>Sturnus vulgaris</i>				R
Yellowhammer	<i>Emberiza citrinella</i>				R
Dunnock	<i>Prunella modularis</i>				A
Goldcrest	<i>Regulus regulus</i>				A
Grey wagtail	<i>Motacilla cinerea</i>				A
Kestrel	<i>Falco tinnunculus</i>				A
Lesser black-backed gull	<i>Larus fuscus</i>				A
Meadow pipit	<i>Anthus pratensis</i>				A
Mistle thrush	<i>Turdus viscivorus</i>				A
Mute swan	<i>Cygnus olor</i>				A
Oystercatcher	<i>Haematopus ostralegus</i>				A
Ringed plover	<i>Charadrius hiaticulata</i>				A
Sand martin	<i>Riparia riparia</i>				A

Common name	Species	Statutory protected	UK BAP species	Local BAP species	Population status *
Swallow	<i>Hirundo rustica</i>				A
Willow warbler	<i>Phylloscopus trochilus</i>				A
Woodcock	<i>Scolopax rusticola</i>				A
Blackbird	<i>Turdus merula</i>				
Blackcap	<i>Sylvia atricapilla</i>				
Blue tit	<i>Parus caeruleus</i>				
Buzzard	<i>Buteo buteo</i>				
Coal tit	<i>Parus ater</i>				
Carrion crow	<i>Corvus corone</i>				
Chaffinch	<i>Fringilla coelebs</i>				
Chiffchaff	<i>Phylloscopus collybita</i>				
Chiffchaff	<i>Phylloscopus collybita</i>				
Coot	<i>Fulica atra</i>				
Dipper	<i>Cinclus cinclus</i>				

Common name	Species	Statutory protected	UK BAP species	Local BAP species	Population status *
Goosander	<i>Mergus merganser</i>				
Green finch	<i>Carduelis chloris</i>				
Grey heron	<i>Ardea cinerea</i>				
Greater spotted woodpecker	<i>Dendrocopos major</i>				
Great tit	<i>Parus major</i>				
Jackdaw	<i>Corvus monedula</i>				
Little grebe	<i>Tachybaptus ruficollis</i>				
Long-tailed tit	<i>Aegithalos caudatus</i>				
Magpie	<i>Pica pica</i>				
Mallard	<i>Anas platyrhynchos</i>				
Moorhen	<i>Gallinula chloropus</i>				
Robin	<i>Erithacus rubecula</i>				
Rook	<i>Corvus frugilegus</i>				
Ruddy duck	<i>Oxyura jamaicensis</i>				



Common name	Species	Statutory protected	UK BAP species	Local BAP species	Population status *
Sedge warbler	<i>Arcocephalus schoenobaenus</i>				
Sparrowhawk	<i>Accipiter nisus</i>				
Tawny owl	<i>Strix aluco</i>				
Tree creeper	<i>Certhia familiaris</i>				
Tufted duck	<i>Aythya fuligula</i>				
Whitethroat	<i>Sylvia communis</i>				
Wood pigeon	<i>Columba palumbus</i>				
Wren	<i>Troglodytes troglodytes</i>				

*R – RSPB BoCC¹⁰: 2002 – 2007 - red list species

*A – RSPB BoCC : 2002 – 2007 - amber list species

The study area contains a range of semi-natural habitats, which means it also supports a correspondingly good range of bird species. A total of 58 species were either observed during the surveys, or had been reported as being present since 2003 by consultees.

Hirundines

Particularly noteworthy is one of only two known colonies of the BoCC amber listed species, sand martin, in North Lanarkshire at TN10. Swallows, also an amber listed BoCC species, nest in the buildings of the disused Bankhead Farm on the north side of the river

¹⁰ In its publication “Birds of Conservation Concern : 2002 – 2007”, the RSPB has published has addressed evidence for significant declines in UK populations of a wide variety of UK bird species, by declaring species either red list (severe population decline) or amber list (moderate but significant population decline).

valley (TN 36). Consultations with “Concern for Swifts” indicated that the Douglas Support Estate contains important hirundine foraging areas (mainly open habitats such as grassland at the woodland margins), with nesting swifts in suburban Kirkshaws. Swifts are a BAP species in the North Lanarkshire BAP but they are not considered to be under direct threat at the UK level by the RSPB, and they are neither a red list nor amber list BoCC.

Farmland Birds

Although the grassland habitats of the area are mainly of low botanical interest (as they are dominated by rank and pioneering vegetation types), there is a small population of breeding skylark disseminated across the study area, in the area of unimproved and semi-improved grassland of the Baillieston Interchange section, the margins of the Kirkshaws and Shawhead urban section, the Eurocentral and Newhouse industrial section and the Newhouse junction section (see TNs 14, 29, 58, 73, 74, 95, 99, 100, 101, 104 and 113). Skylark is a national and local BAP species and is a red list BoCC species as its UK population has declined considerably in recent decades due to agricultural intensification. Yellowhammer is also present in the survey area and there is probably a breeding pair in the scrub at the southern part of the Ravel Burn (Target Note 17).

Wetland Birds

Breeding coot, moorhen and mallard are present at ponds in the study area, with mallard observed on the North Calder Water, and a record of goosander and 12 young reported on the North Calder Water at the Douglas Support Estate (HEL, 2003). The UK BAP and BoCC red list species, reed bunting, was also noted in small numbers in suitable scrub and swamp habitat.

Orchard Farm Pool provides suitable habitat for breeding and over wintering wetland birds. This has been long recognised by local ornithologists and a wetland bird survey (WeBS) has been carried out at the site for several years. Notable data are given in the Clyde Bird Report, including the most recently published one for the year 2000 (Gibson *et al*, 2003). Species that most commonly breed at the site are mute swan *Cygnus olor*, little grebe and ruddy duck *Oxyura jamicensis*. Only a single pair of the former two species bred at Orchard Farm Pool in 2000. It was the sixth most important site for ruddy duck in the Clyde area in 2000, with two pairs, one of which reared a brood of three. In the western part of the Eurocentral and Newhouse industrial area, there is an extensive flat-lying area of made ground at its western end (TN 74) that is partly colonised by unimproved wet grassland. Ground nesting birds are common in the area, and use the Orchard Farm Pool (TN 73) to the north of the A8 for foraging. Species recorded include BoCC red list species, skylark, and amber list species lapwing and ringed plover.

Woodland Birds

Common species of breeding woodland birds are present in good numbers throughout the North Calder Water valley, with the woodlands supporting breeding populations including

UK BAP and BoCC red list species song thrush and BoCC amber list woodland species goldcrest, mistle thrush, willow warbler and woodcock.

Summary

The bird fauna of the study area as a whole supports the following:

Two statutory protected species:

- barn owl (one winter sighting - non-breeding UK and Local BAP species); and
- kingfisher (probable breeding on North Calder Water).

Small numbers of a further five species listed as both UK BAP and red list BoCC:

- skylark (also a Local BAP species);
- grey partridge (also a Local BAP species);
- linnets;
- reed bunting; and
- song thrush.

An additional two red listed BoCC species:

- starling; and
- yellowhammer.

One local BAP species:

- swift; and

a further 14 amber listed BoCC species including one of only two known colonies of sand martin in North Lanarkshire.

Considered as a whole, this assemblage can be considered to represent a nature conservation resource of local value, i.e. of value in the context of the Council area.

6.7 Reptiles

No reptiles were observed during the baseline surveys, and no records of reptiles were available for the study area through consultation. It is considered unlikely that reptiles are a significant ecological issue for the purposes of this assessment.

6.8 Aquatic Fauna

The study area falls within the catchment of the North Calder Water, which does not specifically benefit from a nature conservation designation for particular fisheries or other aquatic interest.

Consultation with the Clyde River Foundation revealed that there are minimal technical data available regarding the presence of fish species in the River Clyde and its tributaries. Although it appears that there are no formally designated fisheries along the North Calder Water, the Shirrel Burn or the Kennel Burn, it is possible that migratory species from the River Clyde may utilise the North Calder Water during their life cycle.

The Clyde River Foundation has recently received a grant to carry out survey works on the River Clyde tributaries, one of which is the North Calder Water. More detailed information regarding the North Calder Water may therefore be available for consideration during future detailed design by the Contractor, and subsequent implementation of the scheme.

7. SUMMARY AND RECOMMENDATIONS MADE AT DMRB STAGE 2

A series of SINC's containing key local and UK BAP habitats are present in the study area. Most notably, wet woodlands and ravine woodlands associated with rivers and streams are habitats of intrinsic nature conservation value in the river valley of the North Calder Water, and many of its tributaries (e.g. Ravel Burn, Luggie Burn, Red Burn, Shirrel Burn and Kennel Burn).

Many of the wet woodlands are ancient and are some of the most important bluebell woodlands in the central part of North Lanarkshire. These woodlands are recognised in the Central Scotland Forest Trust's Strategy (CSFT, 2004) as native woodlands where appropriate management needs to be used to improve their "linkage" to form Forest Habitat Networks. This is demonstrated by the Phase 1 habitat survey that indicates that although the woodlands are of local nature conservation value individually, they are typically fragmented. Wet woodlands that lie adjacent to the watercourses of the area are of types that are UK BAP priority habitat, as are some of the upland ashwoods on the valley sides, and all are associated with statutory protected and UK/Local BAP species, including otter, kingfisher, badgers and bats (which have been observed foraging throughout the valley).

Otters are a local and UK BAP species that have a breeding population in the North Calder Water river valley. The species is highly dependent on wet woodland habitat and ecologically favourable conditions in the North Calder Water. Water quality in this river has improved in recent years and this is thought to be has been the critical factor in the re-establishment of otter in the survey area (R. Green, *pers. comm.*). In contrast to otters, water voles have fared less well in the study area. The long-term presence of a population of mink in the river valley of the North Calder Water is likely to have had a deleterious effect on any water vole populations historically present in this part of the catchment. Water voles have been found on a stretch of the Kennel Burn that provides ideal breeding habitat for them, but this is an isolated water vole population whose continued presence is intrinsically precarious.

Like otter, the dramatic improvement of the North Calder Water has also resulted in the establishment of a population of kingfisher (a Schedule 1 protected and North Lanarkshire BAP species). This species is also strongly dependent on wet woodland riparian habitat to provide breeding sites and suitable foraging habitat (principally perches over pools in the river).

The lower parts of the North Calder Water valleys are natural in character and wildlife habitats have developed without disturbance from intensive industrial and farming activities. Heavy industry dominated the entire area until relatively recently, and there are early successional habitats present on sites that have been left unmanaged since the cessation of industry. These provide a range of different ecological niches that have increased the variety of species present in the study area as a whole. The most significant of these are around TN 57, where an abandoned spoil bin has been colonised by the Schedule 8 protected species, Young's helleborine, which is reported to be present to the north of the new M8 alignment.

Some former industrial sites have been managed with the planting of native species. Countryside recreation has been actively encouraged in much of the area, with the development of public paths along the river valley, its tributaries and remaining parts of the Monklands Canal. Unfortunately, large-scale fly tipping is prevalent in much of the area where vehicle access is possible.

Away from the naturalised habitats of the North Calder Water river valley, there are important habitats that support UK and local BAP species. Most notably There are also locally notable, native plant species (such as water dock, common fleabane, bluebell and moschatel) which are found in the wetlands of the area and whose conservation is encouraged in the North Lanarkshire BAP.

The range of habitats means that a good range of bird species are present across the study area, with sighting of a barn owl (not breeding), kingfisher (probable breeding on the North Calder Water) and a further 56 species, including 5 UK BAP/red list BoCC species, a further 2 red listed BoCC and 14 amber listed BoCC.

On the basis of this extended Phase 1 habitat survey undertaken for the Stage 2 DMPB assessment for the M8 Baillieston to Newhouse scheme, recommendations for specialist surveys for the Stage 3 assessment reported in the ES were as follows:

- National Vegetation Classification (NVC) surveys of the SINCs;
- River Corridor Survey/Otter surveys of the NCW¹¹ areas affected by the scheme;
- Bat survey of the areas affected by the scheme;
- Kingfisher survey/assessment of the NCW areas affected by the scheme;
- Badger survey.

¹¹ North Calder Water

8. REFERENCES

Central Scotland Forest Trust (2004). Central Scotland Forest Strategy,
<http://www.csft.org.uk/pdf.pl?file=cft/file/strategy.pdf>

DEFRA (2002) UK Ruddy Duck Control Trial – Final Report,
<http://www.defra.gov.uk/wildlife-countryside/scientific/ruddy/ruddy1/index.htm>

Dickson, J.H., (1991). The Changing Flora of Glasgow: Conservation in the City and Countryside, Aberdeen University Press.

Dickson, J.H., Macpherson, P., Watson, K., Hammerton, D., Jardine, W.G. & Jarvis, M.C., (2000). The Changing Flora of Glasgow – Urban and Rural Plants through the Centuries, Edinburgh University Press Ltd.

Environmental Resources Management, (2001). A8 Trunk Road Baillieston to Newhouse Major Maintenance Environmental Statement, The Scottish Executive, August 2001.

Gibson, I.P., Wilson, J. & Wilson, V., (2003). Clyde Birds – Clyde Bird Report (2000), Number 14, March 2003, Clyde Branch – The Scottish Ornithologists' Club.

Heritage Environmental Ltd., (2003). Douglas Support Estate – Concept Masterplan Ecological Impact Assessment. Heritage Environmental Ltd.

Institute of Environmental Assessment, (1995). Guidelines for Baseline Ecological Assessment. E & FN Spon, London.

JNCC, (2003). Handbook for Phase 1 habitat survey – a technique for environmental audit. Revised Reprint.

North Lanarkshire Council (2000). North Lanarkshire's Biodiversity Action Plan 2000.

North Lanarkshire Council (2001). North Lanarkshire Biodiversity Action Plan, November 1999 – November 2001.

RSPB (2004) The Population Status of Birds in the UK - Birds of Conservation Concern 2002-2007, <http://www.rspb.org.uk/>

Scottish Office, (1998). National Planning Policy Guidelines, NPPG 14: Natural Heritage, <http://www.scotland.gov.uk/library/nppg/npg14-00.htm>.

Stace, C., (1997). New Flora of the British Isles (2nd Edition), Cambridge University Press.

Watson, E.V., (1981). British Mosses and Liverworts (3rd Edition). Cambridge University Press.



Tables 5, 6 and 7

Table 5 Target Notes (see Figures 10.2 a – 10.2 e)

Target Note GR	No.	Target Note
NS689642	1	Large block of young mixed plantation to west of Baillieston Interchange. Species present include downy birch, <i>Betula pubescens</i> willow <i>Salix</i> and pine <i>Pinus</i> species. Common woodland birds nest in the plantation. A barn owl <i>Tyto alba</i> was recorded flying low and northwards into the plantation in December 2003 (about 11pm).
NS692647	2	The garden of the manse of a large church contains a small area of mature woodland. The area has good bat potential due to the site's mature woodland and its large old buildings. Common woodland birds nest in the woodland. Birds may also nest either under the eaves or within the roof spaces of the buildings.
NS694633	3	Newlands Glen area. Semi-natural mature woodland on the steep northern bank and valley slope of the North Calder Water. Sycamore <i>Acer pseudoplatanus</i> is dominant in the canopy layer. The age diversity of the woodland is good and the ground layer is rich and diverse. Most notably, it includes bluebell <i>Hyacinthoides non-scripta</i> , moschatel <i>Adoxa moschatellina</i> , wood speedwell <i>Veronica montana</i> , ground-ivy <i>Glechoma hederacea</i> , pignut <i>Conopodium majus</i> , wood anemone <i>Anemone nemorosa</i> and great wood-rush <i>Luzula sylvatica</i> . Invasive species are moderately abundant and include pick-a-back-plant <i>Tolmiea menziesii</i> , sweet cicely <i>Myrrhis odorata</i> and Indian balsam <i>Impatiens glandulifera</i> . Bracken <i>Pteridium aquilinum</i> is locally abundant. The southern bank of the river is partly overhanging rock cliff. Mature beech <i>Fagus sylvatica</i> plantation fringes the river in this area.
NS693648	4	Partly culverted minor watercourse in small east-west trending valley immediately north of the electrified railway line and Bargeddie Church. It is a 1 m wide generally quite fast flowing burn with fairly good water quality. Its banks are composed of soft soil and they are steep and the vegetation is comparable with the semi-improved pastureland that surrounds it. Tufted hair-grass <i>Deschampsia cespitosa</i> and Yorkshire fog <i>Holcus lanatus</i> are co-dominant. There is a line of hawthorn <i>Crataegus monogyna</i> along the eastern part of the burn. The burn is potentially good water vole <i>Arvicola terrestris</i> habitat, though no signs of their presence were found.
NS697629	5	Mature semi-natural broadleaved woodland covers the steep valley of a tributary of the North Calder Water. Roe deer <i>Capreolus capreolus</i> tracks were prevalent in the area.
NS696632	6	Otter <i>Lutra lutra</i> spraint on a log on the northern bank of the North Calder Water. Nearby there are possible otter footprints on a small section of muddy riverbank. The adjacent southern section of riverbank contains a possible otter holt at the base of a tree that overhangs the river.
NS697638	7	A small stone and brick-built bridge carries a minor access road under the Baillieston to Coatbridge rail line. The area has moderate bat foraging potential with abundant scrub, tall ruderals, semi-improved grassland and mature broad-leaved woodland. The bat roost potential of the bridge is similarly good and there are several gaps in the mortar, both on the bridge faces and in the arch.
NS696631	8	Semi-natural woodland, dominated by ash <i>Fraxinus excelsior</i> , with occasional sycamore on the steep southern valley sides of the North Calder Water (where a small tributary joins the river). Cattle have poached and grazed some of the woodland and creeping soft-grass <i>Holcus mollis</i> is dominant. Nevertheless, in steeper parts of the woods the ground flora is diverse and rich with bluebell, enchanter's-nightshade <i>Circea lutetiana</i> , wood anemone and other spring woodland plants. Common woodland birds

Target Note GR	No.	Target Note
		nest in the area. Flat lying ground adjacent to the northern edge of the woodland contains a moderately large area of swamp and marsh.
NS697637	9	Dense hawthorn and willow scrub colonising railway line. Common woodland birds nest in the area. Area of Japanese knotweed <i>Fallopia japonica</i> by the minor access road.
NS698632	10	Sand martin <i>Riparia riparia</i> colony present in southern bank of North Calder Water. There are approximately 20-25 sand martin holes in the bank.
NS698637	11	Scattered hawthorn scrub surrounds a small fast-flowing burn in a small steep sided valley. Water quality appears poor. Common woodland birds nest in the scrub.
NS695651	12	Mainly dense hawthorn scrub, with subordinate amounts of goat willow <i>Salix caprea</i> and elder <i>Sambucus nigra</i> that has colonised a former industrial site. The land slopes to the south quite steeply. The ground layer vegetation is dominated by tall ruderal vegetation. Species include rosebay willowherb <i>Chamerion angustifolium</i> , common nettle <i>Urtica dioica</i> and bramble <i>Rubus fruticosus</i> agg. The canopy also includes low amounts of alder <i>Alnus glutinosa</i> , downy birch and sycamore. A cattle creep links the scrub to comparable habitat to the east. See TN 14 as it is ecologically very similar to this area.
NS700632	13	Mature semi-natural woodland fringes the banks and land immediately adjacent to the North Calder Water. It is a small floodplain with some ancient river terraces present on the valley sides. The canopy layer includes ash, high canopy willow species, alder and sycamore. The age structure is diverse and the shrub layer commonly includes young, already mentioned, trees species and hawthorn. The ground flora is rich and diverse. Most notably, it includes native species of bluebell, moschatel, dog's mercury <i>Mercurialis perennis</i> and nipplewort <i>Lapsana communis</i> and the naturalised species sweet cicely and pink purslane <i>Claytonia sibirica</i> . However, invasive species are also abundant and include Indian balsam and pick-a-back-plant. Some of the canopy trees have collapsed due to storms. The age structure of the bank side woodland is good. The area has good potential for foraging bats, water vole <i>Arvicola terrestris</i> , otter and kingfisher <i>Alcedo atthis</i> . The latter was observed flying along the river on several occasions. There is also some potential habitat for roosting bats in the form of large stone-built railway bridge abutments (NS702632), but they are rather too exposed to be highly suitable. Water quality of the North Calder Water is moderately good. However, the water quality of many of the small tributaries and artificial outfalls that flow into it are typically of poor quality.
NS698649	14	Mainly dense hawthorn scrub, with subordinate amounts of goat willow and elder that has colonised a former industrial site. The land slopes to the south quite steeply. The ground layer vegetation is dominated by tall ruderal vegetation. Species include; rosebay willowherb, common nettle and bramble and rare patches of lesser celandine <i>Ranunculus ficaria</i> and Spanish bluebell <i>Hyacinthoides hispanica</i> . There is a small stand of Japanese knotweed at the west edge of the scrub. A cattle creep links the scrub to comparable habitat to the east. Foxes <i>Vulpes vulpes</i> are using a disused badger <i>Meles meles</i> sett within the scrub. There are numerous rabbit <i>Oryctolagus cuniculus</i> warrens in the scrub. Common woodland birds nest in the scrub (e.g. wren <i>Troglodytes troglodytes</i> , willow warbler <i>Phylloscopus trochilus</i> and blue tit <i>Parus caeruleus</i>) and a skylark <i>Alauda arvensis</i> and a lapwing <i>Vanellus vanellus</i> were recorded in the farmland that surrounds the scrub.
NS701633	15	A shallow series of interconnected ponds in a disused railway cutting. The

Target Note GR	No.	Target Note
		ponds are quite well vegetated. Frog <i>Rana temporaria</i> tadpoles were noted. Cattle have poached some of the pond's banks.
NS701628	16	The steep sided parts of the Ravel burn are covered by fairly mature broad-leaved woodland, composed of sycamore, ash and hawthorn. The water quality of the burn is poor. Floristically the woodland is moderately rich, with abundant bluebell, dog's mercury and lesser celandine. Mature beech plantation is more prevalent close to where the burn meets the North Calder Water. Common woodland birds nest in the area (e.g. blue tit, blackbird <i>Turdus merula</i> and chaffinch <i>Fringilla coelebs</i>).
NS702629	17	A fast flowing minor burn flows along a disused railway cutting. It joins the Ravel Burn to the west. The banks of the burn are swampy (bulrush <i>Typha latifolia</i> is abundant). The banks of the cutting have become overgrown with hawthorn and bramble. Bluebell is occasionally present on the banks. Common woodland birds nest in the scrub. A yellowhammer <i>Emberiza citronella</i> was heard singing in the vicinity.
NS702631	18	Mature beech dominated northern part of the Ravel burn has good bat potential due to numerous crevices and holes in the mature trees and in massive stone abutments of a disused railway line that once crossed the burn.
NS705630	19	Mature semi-natural broad-leaved woodland. Oak <i>Quercus</i> sp., rowan <i>Sorbus aucuparia</i> and birch <i>Betula</i> sp. are frequent in the canopy with occasional ash, sparse alder and willow species. The shrub layer is poorly developed with occasional hawthorn. The ground layer is mostly wet and spring woodland plants are not common, for example, dog's mercury is sparse. Many of the mature trees have cavities that could have bat potential. Common woodland birds nest in the area.
NS705632	20	Old disused bridge over the North Calder Water just downstream of the modern bridge (A752). The area has very good bat foraging habitat with abundant semi-natural riparian woodland and farmland. The bridge itself has moderate bat roosting potential as its dressed stonework contains numerous cavities between the two rows of stones that lie over its arches, on the face of the bridge.
NS706630	21	A wide strip of mature willow carr is present on the northern bank of the North Calder Water immediately east of where the A752 crosses over it. Crack willow <i>Salix fragilis</i> is dominant. An otter spraint was present on a boulder near the middle of the river. The ground layer is mostly dominated by Indian balsam, with sparse bluebell and moschatel. Moreover, there is a large stand of Japanese knotweed at NS70540.63040. There is a fox earth at NS70601.63031. There are also brown rat <i>Rattus norvegicus</i> prints on the muddy riverbank and numerous, approximately 5 cm diameter, holes in the south bank of the river.
NS706633	22	Steep bank of old spoil heap, vegetated by dense hawthorn scrub.
NS706640	23	The Luggie Burn flows through a small steep-sided valley that is covered by semi-natural woodland. The western end of the woodland (south of the railway) comprises a diverse range of native tree and shrub species (oak, birch, ash, sycamore and willow species). The ground layer is not well developed due to the steep and dense nature of these woodlands. A stand of Indian balsam is present near the start of the culvert that passes under the A8. A large railway viaduct, over the wooded river valley of the Luggie Burn, is constructed of fairly well maintained stonework, with steel bracing. It has fairly low bat roost potential as there is a lack of suitable crevices. However, the general habitats of the area (e.g. riparian woodland) provide potentially good bat foraging habitat. Water quality in the Luggie Burn is of noticeably

Target Note GR	No.	Target Note
		poor quality.
NS707626	24	Disused railway cutting in open disused land that lies on the south side of the North Calder Water valley. It includes a drainage ditch colonised by abundant soft rush <i>Juncus effusus</i> with frequent bramble and willow. The ground layer is fairly diverse and made up of common grassland herbs, grasses and bryophytes. The area appears to suffer from pollution but there is a possible animal burrow at NS70409.62691 with a slide into the ditch. A footprint was evident and was attributed to otter.
NS706631	25	Steeply sloping bank (about 4m above the North Calder Water). Sycamore dominated mature semi-natural woodland. Ground-layer is dominated by pioneering species (rosebay willowherb and common nettle).
NS707633	26	Just above the banks of the confluence of the North Calder Water and Luggie Burn (NS7072263293) there is a possible otter holt. It is totally vegetated by bluebell and the two holes of the holt do not appear to have been recently used. There is the trace of a path going directly down to the riverbank.
NS707633	27	Area comprised of scrub and semi-natural broad-leaved woodland. Moderate bat roost potential in old railway abutment (NS70716.63379) built from dressed sandstone. Areas of mortar are missing, and some stones are loose, allowing access deep into the structure. A wren was nesting within the abutment.
NS704633	28	Semi-natural broad-leaved woodland dominated by ash characterises the very steeply sloping riparian zone of the North Calder Water west of the A752. There are large stands of Japanese knotweed present also in the riparian zone and some smaller stands of Indian balsam. To the south of the river unimproved neutral grasslands and bare ground are being colonised by hawthorn and gorse <i>Ulex europaeus</i> scrub with a dense ground layer of bramble, rosebay willowherb and false oat-grass <i>Arrhenatherium elatius</i> .
NS695642	29	Unimproved neutral grassland with defunct hawthorn hedge and scattered willows. At least one singing skylark was present above this area.
NS708632	30	Oak and willow semi-natural woodland surrounds a section of steep rock cliff on the south bank of the North Calder Water. It has moderate bat roost potential as the 10m high cliff is shattered and cracked in places, allowing bat access, but it seems to take some drainage from the overlying woodland.
NS711632	31	There is a small patch of Japanese knotweed in an area of flat lying bare ground close to the A8 at NS71134.63231.
NS712628	32	Rank vegetation bordered by scrub with four mature broad-leaved trees. The latter have potential for bats and nesting birds.
NS712630	33	Scrub with rank vegetation. It is very wet in areas with bulrush wetland, which has good potential for amphibians.
NS713626	34	Improved pasture with scrubby woodland edges. Species in the latter comprise ash, sycamore, alder, beech and hawthorn. Ground layer flora is moderately diverse with some typical spring woodland herbs. Natural woodland regeneration is evident. The mature trees have good bat potential. Common woodland birds nest in the trees and a grey partridge <i>Perdix perdix</i> was recorded at the edge of the pasture.
NS713627	35	On the north bank of the North Calder Water (NS7126362774) there is an upturned bath with otter spraint. There is also a possible holt on the opposite bank below a mature tree.
NS713630	36	The recently disused buildings of Bankhead Farm have good potential to

Target Note GR	No.	Target Note
		contain bat roosts. They are in good condition and provide good shelter, yet there is suitable bat access via the eaves and missing windows. Swallows <i>Hirundo rustica</i> nest in the buildings.
NS715633	37	Large modern cemetery slopes gently south towards the A8. The area is well maintained with amenity grassland, scattered trees and shrubs (exotic and native broadleaved and conifer species) and some hedging composed of introduced species. Scattered broad-leaved trees surround an old stone-built church in the northeast of the cemetery. Common woodland passerine birds nest in the area.
NS716623	38	Semi-natural broad-leaved woodland on steep ground. Pedunculate oak <i>Quercus robur</i> is common. The canopy is open, there is hardly any scrub layer nor any evidence of regeneration and 50% of the ground is bare. Ground layer flora is not very diverse, but is composed of herbs and bryophytes typical of native woodland Common woodland birds nest in the woodland. The area is good for bat foraging. The mature oak trees are suitable for bat roosts.
NS717624	39	Tall ruderal habitat dominates the northern part of a large meander of the North Calder Water. The area is an isolated floodplain enclosed by a steep, wooded river valley. Rosebay willowherb and nettles dominate the vegetation. Present in lesser amounts near, and on, the river bank are Indian balsam, bluebell, hedge woundwort <i>Stachys sylvatica</i> , meadowsweet <i>Filipendula ulmaria</i> , ground elder <i>Aegopodium podagraria</i> , hogweed <i>Heracleum sphondylium</i> , colt's-foot <i>Tussilago farfara</i> , figwort <i>Scrophularia nodosa</i> , wild angelica <i>Angelica sylvestris</i> and red campion <i>Silene dioica</i> . The riverbank is steep and mostly made up of sandy silt. Only a few scattered shrubs cover the area and the riverbank. They are mainly hawthorn and willow with subordinate amounts of young oak and elder. Common wetland and woodland birds were noted in the general area. A pond is located at the eastern edge of the area at the base of Crowflat Wood. Its water quality appears poor and it appears to have little ecological interest.
NS716627	40	A semi-natural woodland on a steep south facing slope (an old river terrace) of the valley of the North Calder Water. It is primary woodland (possibly ancient woodland). The canopy layer cover is sycamore (40%), birch (30%), ash (15%), oak (10%), beech (10%) and rowan (5%). The woodland has a well-developed age structure and the abundant scrub layer is made up of hawthorn (30%), hazel <i>Coryllus avellana</i> (5%), immature beech (5%), immature wych elm <i>Ulmus glabra</i> (5%), dog rose <i>Rosa canina</i> agg., (10%), elder (5%), holly <i>Ilex aquifolium</i> (5%), broom <i>Cytisus scoparius</i> (1%) and gorse (1%). The ground layer is lush with bluebell (90%), cleavers <i>Galium aparine</i> (60%), bramble (30%), common nettle (10%), lesser celandine (5%), raspberry <i>Rubus idaeus</i> (5%), wood avens <i>Geum urbanum</i> (5%), red campion (5%), ivy <i>Hedera helix</i> on the ground and in the canopy (5%), sycamore seedlings (3%), rowan seedlings (1%), beech seedlings (1%), hawthorn seedlings (5%), herb-Robert <i>Geranium robertianum</i> (5%) and wood sorrel <i>Oxalis acetosella</i> (5%). Present as a few scattered patches are wood speedwell, dog violet <i>Viola riviniana</i> , nipplewort, hedge woundwort, common chickweed <i>Stellaria media</i> , barren strawberry <i>Potentilla sterilis</i> , dandelion <i>Taraxacum officinalis</i> agg., broad-leaved willowherb <i>Epilobium montanum</i> , pink purslane, male fern <i>Dryopteris filix-mas</i> , broad-buckler fern <i>Dryopteris dilatata</i> , lady-fern <i>Athyrium filix-femina</i> , dog's mercury, ground elder and mosses; <i>Mnium hornum</i> , <i>Rhytidiadelphus squarrosus</i> and <i>Eurhynchium praelongium</i> . The northern edge of the woodland is defined by an old overgrown hawthorn hedge at the edge of farmland. The very eastern edge of the woodland is open in character with virtually no

Target Note GR	No.	Target Note
		<p>scrub layer. Here, there are small patches of bracken.</p> <p>Common woodland passerine birds nest in the woodland, including; chiffchaff (<i>Phylloscopus collybita</i>), willow warbler, great tit (<i>Parus major</i>) and dunnock <i>Prunella modularis</i>.</p> <p>There is evidence of roe deer and rabbit in the area. Orange tip <i>Anthocharis caradamines</i> and green-veined white <i>Artogeia napi</i> butterflies were present in the woodland.</p>
NS718621	41	<p>An area of open tall ruderal vegetation is located on the north side of a meander of the North Calder Water. Its vegetation is composed of mainly rosebay willowherb and bramble with some mature beech and sycamore growing on the riverbank. There has been disturbance due to off-road driving (the area is accessible from both sides of the river).</p>
NS718626	42	<p>Semi-natural broad-leaved woodland, fringing a minor tributary of the North Calder Water. It is high canopy dominated woodland with a moderately good age structure. The canopy layer is composed of sycamore (80%), beech (30%), common lime <i>Tilia X vulgaris</i> (20%), oak (20%) and birch (10%). Oak is more prevalent in the western part of the wood with sycamore dominating the eastern part. The shrub layer is not abundant with occasional hawthorn, elder and young sycamore, rowan and wych elm. The ground layer comprises: bluebell (100%), lesser celandine (20%), herb-Robert (10%), and greater stitchwort <i>Stellaria holostea</i> (5%). Present at lower levels of abundance are tree seedlings, wood sorrel, wood anemone, broad-leaved willowherb, bramble, cleavers, ground-ivy, broad-buckler fern, hedge woundwort, pignut and wood avens. Dog's mercury is locally present in the western section of the wood.</p> <p>Common woodland birds nest in the woodland. Two buzzards <i>Buteo buteo</i> were noted flying low over the west of the woodland. A rabbit warren is present on the northern banks of the burn. A fox earth is present in the western part of the woods.</p>
NS719627	43	<p>An area of secondary woodland that has developed on an area of former industrial land including spoil areas (foundry slag and shale). The canopy cover of the woodland is composed of downy birch (30%), sycamore (30%), ash (20%), hazel (20%), hawthorn (30%) and wych elm (10%). The woodland has a moderately poor age structure and there is little of a scrub layer. The ground layer is not lush but it does have a good floral diversity. Species coverage includes; ivy (10%), ground-elder (10%), common nettle (10%), cleavers (10%), rosebay willowherb (10%), broad-buckler fern (10%), dog's mercury (5%), male fern (5%), hogweed (5%), raspberry (5%), herb-Robert (5%), lesser celandine (5%), wood sorrel (4%), wood avens (5%) and bluebell (3%). Species present with low levels of abundance are bracken, moschatel, hart's-tongue fern <i>Phyllitis scolopendrium</i>, dog violet, red campion, enchanter's-nightshade, barren strawberry, a gooseberry species (<i>Ribes</i> sp.), common comfrey <i>Symphytum officinalis</i>, dandelion and a few common bryophyte species.</p>
NS719618	44	<p>Semi-natural, broad-leaved woodland dominated by sycamore covers the narrow, mostly steep, valley of the Red Burn at the east side of Viewpark estate. Human disturbance levels are high (fly tipping mainly) and the ground layer is predominantly rank, pioneering species (such as rosebay willowherb).</p> <p>Woodland birds nest in the woodland. A pair of woodcock <i>Scolopax rusticola</i> was recorded at NS71983.61905).</p>
NS719620	45	<p>Old stone built bridge over the North Calder Water near the confluence with the Red Burn. Beech woodland dominates the area with a shrub layer of rhododendron <i>Rhododendron ponticum</i>, young beech, sycamore and ash.</p>

Target Note GR	No.	Target Note
		The ground layer flora is not rich nor particularly diverse. Nevertheless, bluebell is abundant. Common woodland birds nest in the area. The stone built bridge has good bat potential. There is very good bat foraging potential in this area. Furthermore, the sandstone bridge and nearby mature trees are potentially very suitable bat roost habitat. The bridge is especially good as it has numerous gaps and much of the original mortar is missing.
NS720618	46	Soft rush dominated neutral grassland with frequent silver birch <i>Betula pendula</i> , sparsely scattered rhododendron and scattered bracken. In the southwest of the area is a well-vegetated pond. A common toad was noted in its vicinity. The area also has good foraging potential for birds that prey on small mammals (e.g. owl species).
NS720627	47	Strip of downy birch woodland to the south of a large pond.
NS720628	48	Crowflat Pond. Just to the north of semi-natural woodland (that has colonised an old spoil area) is a moderately large wetland area, with swamp and open water. It is situated just to the east of an area where large-scale dumping of rubble has formed a "dam" that has contributed to the formation of the wetland. The wetland is made up of a central area of open water, fringed by swamp and marsh and small area of open water. Vegetation includes bottle sedge <i>Carex rostrata</i> dominated swamp and a more varied swamp community made up of bulrush and water plantain <i>Alisma plantago-aquatica</i> . The northern edge of the wetland is marshier and soft rush is dominant. The rubble area at the east side of the wetland is partly vegetated by a diverse variety of dicotyledonous herb species. The main habitat type is tall ruderal. This area potentially forms suitable amphibian hibernacula. The open water and swamp is suffering from willow encroachment. Wetland birds present are coot <i>Fulica atra</i> , grey heron <i>Ardea cinerea</i> , willow warbler and sedge warbler <i>Arcocephalus schoenobaenus</i> .
NS721622	49	An avenue of mature trees in a rank grassland area. Common lime trees dominate the avenue. Woodland birds nest in the area.
NS721627	50	Unimproved neutral grassland on a mounded gently sloping hill surrounded by woodland. The hill has been landscaped, probably artificially seeded, and recently planted with a variety of trees and shrubs including; willow species, birch, elder, gorse and horse chestnut <i>Aesculus hippocastanum</i> . The ground layer vegetation is made up of a sward of sweet vernal-grass <i>Anthoxanthum odoratum</i> and Yorkshire fog <i>Holcus lanatus</i> containing a good diversity of herbaceous species. There are common bird's-foot trefoil <i>Lotus corniculatus</i> , common-spotted orchid <i>Dactylorhiza fuchsii</i> , colt's-foot, dandelion, common ragwort <i>Senecio jacobaea</i> , meadow buttercup <i>Ranunculus acris</i> , creeping buttercup, clover <i>Trifolium</i> species., oxeye daisy, <i>Leucanthemum vulgare</i> , rosebay willowherb, creeping thistle <i>Cirsium arvense</i> , a hawkbit <i>Leontodon</i> species and daisy <i>Bellis perennis</i> . Also present are the mosses <i>Rhytidiadelphus squarrosus</i> and <i>Pleurozium schreberi</i> , and compact rush <i>Juncus conglomeratus</i> .
NS723623	51	Hedgehog <i>Erinaceus europaeus</i> footprints on a muddy track that passes through mature woodland.
NS722626	52	A small area of willow carr and open water is located about the banks of a slow flowing ditch. Willows totally dominate the canopy. The majority of the ground layer is marshy with a ground layer flora comprising meadowsweet, broad-buckler fern, dog lichen <i>Peltigera canina</i> , great willowherb, dog violet, common nettle, curled dock <i>Rumex crispus</i> , marsh willowherb <i>Epilobium palustre</i> , cleavers, field horsetail <i>Equisetum arvense</i> , hairy bitter-cress <i>Cardamine hirsuta</i> , a pincerwort (liverwort) <i>Cephalozia</i> species, and

Target Note GR	No.	Target Note
		opposite-leaved golden saxifrage <i>Chrysosplenium oppositifolium</i> . The open water areas are not well vegetated with only duckweed species <i>Lemna</i> sp. evident. The area has amphibian potential
NS724624	53	A broad strip of long-established mixed plantation. Canopy species are; Scots pine <i>Pinus sylvestris</i> (30%), sycamore (30%), lime (20%, on the southern edge) beech (10%), horse chestnut (5%), and birch (5%). Less abundant species are yew <i>Taxus baccata</i> and an introduced poplar species <i>Populus</i> sp. The shrub layer is locally dominated by rhododendron (40%) but there is also elder (5%) with lesser amounts of hawthorn, , wych elm, goat willow and garden privet <i>Ligustrum ovalifolium</i> . Structurally the habitat is diverse with high, open canopy woodland forming the eastern section and multi-stemmed sycamore characterising the western section of the wood (where Algerian ivy <i>Hedera algeriensis</i> is present in both the ground layer and canopy.) The former section has a diverse ground flora with bluebell (10%), broad-buckler fern (30%), rosebay willowherb (10%), cleavers (15%), wood sorrel (5%), bramble (10%), creeping soft-grass (10%), red campion (5%), ground ivy (5%), wood avens (5%), ground elder (5%) and common hogweed (4%). Less abundant are honeysuckle <i>Lonicera periclymenum</i> , wood dock <i>Rumex sanguineum</i> , common comfrey and pink purslane.
NS724625	54	Wetland composed of swamp and marsh, in an area located in a shallow topographic depression of a semi-improved neutral grassland area. About 20% of the wetland's centre is open water. This is fringed by swamp with marsh at its outer edge. The vegetation comprises soft rush (80%), meadow fescue <i>Festuca pratensis</i> (40%), marsh willowherb (20%), greater bird's-foot trefoil <i>Lotus pedunculatus</i> (20%), meadow buttercup (10%), field horsetail (40%), cuckooflower <i>Cardamine pratensis</i> (10%), jointed rush <i>Juncus articulatus</i> (20%), yellow iris <i>Iris pseudacorus</i> (5%), common sorrel (5%) and great willowherb (5%). Present at lower levels of cover are: common chickweed, daisy, and broad-leaved dock <i>Rumex obtusifolius</i> . Connecting the wetland is a ditch that runs along the northern edge of the field. At its western end is a small pond (NS72280.62561), with shallow open water. It is not as vegetated as the main pond described above. The area has potential for amphibians. The grassland's vegetation consists of sweet vernal-grass (30%), creeping soft-grass (30%), red fescue <i>Festuca rubra</i> (20%), tufted hair-grass <i>Deschampsia cespitosa</i> (10%) and field horsetail.
NS724627	55	The western edge of the woodland is located in a mostly flattened area of spoil. There is a long-established plantation of lime (80%), beech (40%) and aspen <i>Populus tremula</i> (20%). The plantation is coppice-like in places. The ground flora is not rich nor diverse with occasional bluebell, bramble, enchanter's-nightshade, broad-buckler fern and the moss species <i>Eurynchium praelongum</i> .
NS726626	56	Secondary semi-natural woodland that has colonised a large area of spoil (shale and boulder like remains of slag heaps). Much of the area is wet and has the appearance of willow carr. The canopy comprises goat willow (40%), birch (30%), aspen (10%) and sycamore (10%). Regeneration levels of these species are high. The ground flora is composed of pioneer or coloniser species. There are; meadow buttercup (30%), creeping buttercup (50%), curled dock <i>Rumex crispus</i> (10%), cuckooflower (10%), colt's-foot (10%), water avens (30%), broad-leaved dock (10%), wavy bittercross <i>Cardamine flexuosa</i> (5%), <i>Rhytidadelphus squarrosus</i> (10%), rosebay willowherb (5%), marsh willowherb (5%), germander speedwell <i>Veronica chamaedrys</i> (5%), greater bird's-foot trefoil (5%), broad-buckler fern (5%)

Target Note GR	No.	Target Note
		and <i>Polytrichum commune</i> (5%). Present at much lower levels of cover are; common-spotted orchid, lesser spearwort <i>Ranunculus flammula</i> , ribwort plantain <i>Plantago lanceolata</i> , tufted hair-grass, soft rush, wild angelica and silverweed <i>Potentilla anserina</i> . In the centre of the area are large slag boulders with abundant lichens and broad-buckler fern, bryophytes and smooth sow-thistle <i>Sonchus oleraceus</i> .
NS726627	57	Semi-natural woodland with a rather scrubby appearance, has colonised the remnants of an old slagheap. Possibly the woodland has been initially planted (a couple of mature black poplars <i>Populus nigra</i> are present at the eastern edge of the area.) The area is topographically complex with the cores of old slag heaps having eroded into prominent large boulders, with low lying (typically wet) areas in between. Some shale heaps are also present. The woodland's structure is made up of birch (30%), hawthorn (15%), aspen (10%), sycamore (10%), goat willow (10%) and sparse elder. The ground layer is moderately diverse, but not lush, with bluebell, marsh hawk's-beard <i>Crepis paludosa</i> , broad-buckler fern, water avens, barren strawberry and cleavers. Species typical of disturbed ground are present and are: foxglove (<i>Digitalis purpurea</i>), common nettle and a single plant of common twayblade (<i>Listera ovata</i> , an orchid species).
NS726624	58	A long-established mixed plantation adjoining an avenue of limes. As well as lime the canopy species are horse chestnut, beech, sycamore and Norway maple <i>Acer platanoides</i> . These fringe a stand of mature Scot's pine that dominates the centre of the plantation. The ground flora is not diverse and creeping soft grass is dominant. Small patches of native bluebell and Spanish bluebell are present. Also present are abundant common nettle, wild angelica, frequent sneezewort <i>Achillea ptarmica</i> and greater bird's-foot-trefoil and occasional meadowsweet. A pair of great-spotted woodpeckers <i>Dendrocopos major</i> nests near the top of a high dead tree at the eastern edge of the plantation. To the east is marshy grassland. A skylark was singing overhead.
NS729624	59	Approximately 500m long avenue of mature lime trees. It forms part of a long-since disused track into a private estate. The area has good bat foraging and roosting habitat as many of the trees contain hollows, rot holes and splits.
NS732624	60	Eastern edge of an avenue of mature lime trees with an understorey of mixed species. Tree species are: sycamore, beech and wych elm. The lush ground layer comprises meadowsweet, bluebell, wood crane's-bill <i>Geranium sylvaticum</i> , curled dock, broad-leaved dock, common nettle, water avens <i>Geum rivale</i> , ground-elder, cow parsley <i>Anthriscus sylvestris</i> , rosebay willowherb, pignut, lesser celandine, dog's mercury, male fern, a burdock species <i>Arctium</i> sp., raspberry, dandelion, bramble, cleavers, common vetch <i>Vicia sativa</i> , creeping soft-grass, wood horsetail <i>Equisetum sylvaticum</i> and chives <i>Allium schoenoprasum</i> . Scattered rhododendron bushes are common. A ditch with low water level (poor water quality) follows the north side of the woodland avenue. There is abundant standing dead wood in part of the avenue. Levels of fly tipping are very high. At NS73253.62367 there is a 30 x 20m pond in an advanced stage of succession. The vegetation is dominated by bulrush. Less than 20% of the wetland is open water.
NS734620	61	There is a fenced off area of semi-natural beech woodland in the south of the area, which is the least long-established woodland, as it has carpets of wood anemone and bluebell, mainly stands of hybrid bluebell (<i>Hyacinthoides non-scripta</i> x <i>H. hispanica</i>) with only a small amount of

Target Note GR	No.	Target Note
		native bluebell, and frequent dog's mercury and lesser celandine. There is a bramble and hawthorn understorey. A buzzard nest was seen on the top of a mature beech and a pair was seen. A kestrel <i>Falco tinnunculus</i> was also observed and roe deer footprints were present.
NS735616	62	Shirral Burn. About 2.5 m wide and 10 cm deep. Bordered by hawthorn and bramble scrub. Footprints, probably brown rat, were recorded.
NS735622	63	The North Calder Water is about 7 m wide with overhanging trees. The banks are dominated in parts by the introduced plant pick-a-back-plant, with frequent foxglove, cuckooflower, occasional meadowsweet and opposite-leaved golden saxifrage. Mink <i>Mustela vison</i> footprints were found.
NS736624	64	Unimproved neutral grassland next to woodland on east side of North Calder Water. It consists of scattered hawthorn scrub with dense gorse scrub on the slope. There are abundant tall ruderals, such as hogweed, with dominant soft rush and tufted hair-grass. Two buzzards and some meadow pipits <i>Anthus pratensis</i> were recorded in the area.
NS738624	65	Semi-natural broad-leaved woodland strip in a steep sided river valley bordering the North Calder River. There are young trees and hawthorn at the top and mature trees on the slope. Ash dominates the northern section and beech dominates the southern section. There is quite a dense bramble understorey on the slopes. The ground flora is denser in the south, with hybrid bluebell and foxglove dominating parts, with frequent amounts of dog's mercury, lesser celandine and occasional wood avens, herb-Robert, opposite-leaved golden saxifrage and wood sorrel. Raspberry and barren strawberry are locally frequent in the northern part of the woodland. Many of the mature trees are covered with ivy. There are remnants of old buildings at the bottom of the northern section with only a few walls standing, which are covered with ivy and hart's-tongue fern.
NS738625	66	Open area at the top of the northern edge of the woodland on the western side of the North Calder Water. It is a former slag bin. There is some bare ground with patches of short perennials, such as devil's-bit scabious <i>Succisa pratensis</i> , barren strawberry, creeping buttercup, red fescue and creeping bent <i>Agrostis stolonifera</i> . Some of the slope in this area is quite bare with sparse ash and oak saplings.
NS743628	67	Scrub and a subordinate amount of semi-natural broad-leaved woodland, in the steep sided river valley of the North Calder Water. It supports a variety of woodland passerine birds. These include song thrush <i>Turdus philomelos</i> , great tit, chaffinch and blackbird. Common shrew <i>Sorex araneus</i> is present in the tall ruderal vegetation by the riverbank. The area has good potential for bats with tall mature trees with some suitable crevices. Rock cliffs on the east bank of the river also have potentially suitable cracks and crevices for roosting bats. The general area also has very good bat foraging potential with river woodland habitats that are well suited to pipistrelle and Daubenton's bat species. The woodland canopy is dominated by ash, with occasional sycamore, beech and both tree and shrub sized willows. Elder and hawthorn characterise the shrub layer. Alder and willow species are abundant on the riverbank. The woodland displays a good age structure. The ground flora is typified by bluebell, dog's mercury, common comfrey, lesser celandine, bramble and seedlings of a variety of tree and shrub species. Ivy is occasional in the ground layer and in the canopy. Cherry species <i>Prunus</i> sp. and alder have been planted in areas of tall ruderal vegetation at the

Target Note GR	No.	Target Note
		base of the valley. Tall ruderal vegetation dominates flat lying ground beside the river. Rosebay willowherb is dominant with abundant raspberry and bramble. The upper tracts of the western valley sides are planted with willow species. A poorly maintained footpath follows the west bank of the North Calder Water. Human disturbance levels are appreciable in the local area.
NS744627	68	Areas of dense and scattered scrub have colonised a flattened area, which was formerly a landfill site. Ground conditions vary from dry (grass dominated) to areas of ephemeral ponds and marsh (often with abundant glaucous sedge <i>Carex flacca</i>). Common woodland birds nest in the area. The area is subject to considerable human disturbance.
NS745621	69	Open semi-natural broad-leaved woodland with hardly any understorey or ground flora, except within its central area. Dominated by beech and sycamore. Roe deer tracks were recorded and common woodland birds. There is moderate potential for bat roosts in the mature trees as they contain rot holes and large fractures where limbs have fallen off.
NS746623	70	Orchard Farm lies close to the A8 and is surrounded by pastureland and scrub. It has moderate bat roost and foraging potential as the disused farm contains a variety of buildings with various roof coverings. However, large parts of the farm buildings' roofs have been burned down, leaving them unsuitable for use by bats.
NS746627	71	A moderately large area of semi-natural broad-leaved woodland. The woodland canopy is dominated by moderately mature sessile oak <i>Quercus petraea</i> with abundant sycamore, occasional ash, birch, hawthorn, dog rose, hazel and rare (shrub sized) wych elm. A few examples of an exotic pine species and lime have been planted in the woodland. The ground layer is not luxuriant but it is quite diverse. It includes occasional bluebell, abundant brambles, lesser celandine, red campion and some other common woodland herbs and woodland fern species. The age structure of the woodland is diverse and there is much standing and fallen deadwood. It is likely that the majority of the woodland is ancient in origin. However, the northern part of the woodland has been affected by industrial activities in past times (a railway line is adjacent to this area) and it has only been recolonised by woodland (mainly birch) in recent times. The woodland has good potential for bats.
NS751615	72	Reset Plantation is a moderately large, mature broadleaved birch dominated and Scot's pine plantation on high ground at the western edge of Eurocentral.
NS751624	73	Orchard Farm Pool is an area of wetland with marshland at the edge, going through to swamp with shallow open water at its centre. The pond has good amphibian potential. Immature willow-dominated plantation and species-rich hedges form its margins. Water birds, are common in the wetland area, e.g. coot, ruddy duck <i>Oxyura jamaicensis</i> and tufted duck <i>Aythya fuligula</i> . Woodland and farmland birds are abundant in the immediate area surrounding the wetlands, e.g. skylark, great tit, carrion crow <i>Corvus corone</i> and wood pigeon <i>Columba palumbus</i> .
NS753620	74	A large flat area of made ground (the western part of the Eurocentral development area) has been colonised by grasses, sedges and rushes. Small drainage ditches cross the area. The area is predominately vegetated by poor semi-improved grassland (with some acid grassland influence), with poor draining characteristics. A few small shallow interconnected ponds are present. They are partly vegetated and are populated by aquatic invertebrates.

Target Note GR	No.	Target Note
		Ground nesting birds are present in the area. These were 5 lapwing, 2 ringed plover <i>Charadrius hiaticula</i> , 2 oystercatcher <i>Haematopus ostralegus</i> and a skylark.
NS753624	75	Small ponds and a common reed <i>Phragmites australis</i> dominated swamp in an area at the base of old spoil heaps. The area has good amphibian potential. The ponds are shallow, eutrophic and well vegetated. A pond is also present within the spoil heap area. Its ecological value appears to be low.
NS760624	76	Faskine Estate comprises a large pond with tall herb fen and swamp habitats surrounded by mature mixed plantation. Water dock <i>Rumex hydrolapathum</i> is present in the tall herb fen. A pair of mute swans <i>Cygnus olor</i> nest at the edge of an island in the middle of the pond. Woodland birds nest in the woodland. These include tree creeper <i>Certhia familiaris</i> , goldcrest <i>Regulus regulus</i> , great tit, blue tit and robin <i>Erithacus rubecula</i> . The mature trees in the area have some crevices and cracks suitable for bats. The pond is eutrophic in nature, with well-developed marginal vegetation. It is potentially a good area for amphibians including newt species. The woodland is open and dominated by tall mature trees. Sycamore is the most abundant species with occasional birch and some parts of the canopy are dominated by stands of Scot's pine and Cypress tree species <i>Chamaecyparis</i> sp. Rhododendrons, Portugal laurel <i>Prunus lusitanica</i> , dogwood <i>Cornus sanguinea</i> and snowberry <i>Symphoricarpos rivularis</i> are locally common in woodland to the west and north of the pond. Ground layer vegetation is poorly developed and not diverse. Creeping soft-grass and cock's-foot <i>Dactylis glomerata</i> dominate. A small, elongated shallow pond is also present at the north margin of a semi-improved neutral grassland field approximately 30m south of the main pond. It is younger than the main pond and consequently it is in an early stage of becoming vegetated.
NS760627	77	Remnants of an old walled garden, surrounded by mixed, mature woodland plantation. The walled garden area is vegetated by tall ruderal vegetation. The area has some bat potential, as there are old trees within the woodland that contain features of use to bats. The remains of the old wall itself are not suited to bats.
NS762626	78	Birch dominated, immature semi-natural woodland, with occasional sycamore that has colonised an old industrial site. It has good structural diversity. The ground flora is well developed. It includes bluebell, wood sorrel, lesser stitchwort <i>Stellaria graminea</i> , barren strawberry, common nettle and creeping soft-grass. Common woodland birds nest in the woodland.
NS763626	79	Mixed mature plantation. Larch <i>Larix decidua</i> with abundant sycamore and occasional birch dominate the canopy layer. The shrub layer is sparse and composed of rare hazel. The ground layer features abundant bluebell with abundant wood-sorrel and occasional hedge woundwort, lesser celandine, herb-Robert, bramble, raspberry and opposite-leaved golden saxifrage. The plantation has a quite poor age structure; nevertheless the rich ground flora suggests it is a site of at least long-established woodland. Birch bracket fungus <i>Piptoporus betulinus</i> is present on some of the birch trees.
NS765616	80	Blacklands Plantation. Plantation woodland with the eastern half broad-leaved and the western half mixed. The broad-leaved plantation is dominated by semi-mature and some mature beech, with some young beech and Sitka spruce <i>Picea sitchensis</i> saplings. The mixed section is

Target Note GR	No.	Target Note
		dominated by Sitka spruce with beech saplings. Throughout the plantation, the understorey is quite dense and dominated by bramble with frequent amounts of honeysuckle and common gorse with occasional goat willow and alder. The ground layer is partially covered by mosses (including <i>Polytrichum formosum</i>), frequent Yorkshire fog with occasional bluebell, great willowherb and soft rush. The northern section is damp in places with a number of ditches. There are many piles of dead wood.
NS769612	81	This area is called "O Wood". It comprises a mixture of young, semi-natural, broad-leaved woodland, (to the south of the power line), young mixed plantation (to the north of the power line) and a subordinate amount of young mixed plantation (at the south west edge of the area) on flat lying land just north of Holytown. Common passerine woodland birds nest in the woodland. These include great tit, dunnock and willow warbler. The woodland and scrub is dominated by birch, with abundant willow species, rowan, oak species, hawthorn and pine species. The ground layer vegetation is rank in nature and composed of tufted hair-grass, bramble, soft rush and marsh thistle <i>Cirsium palustre</i> . Heather <i>Calluna vulgaris</i> is common in an open area of scattered scrub in the north west of the area. This suggests that the underlying soil conditions in the woodland are acidic. There is a small pond in rush dominated marshland at the eastern edge of the area with bulrush swamp. A female mallard <i>Anas platyrhynchos</i> was present in the pond and four more mallards were noted flying overhead.
NS769620	82	Mature plantation, just to the north of the A8. It is dense and mature in character. Birds of prey nest in the canopy.
NS770618	83	Young, broad-leaved plantation, about 5 m tall by dual carriageway, with frequent sycamore, occasional silver birch, horse chestnut and hawthorn with a bramble understorey. The ground layer consists of frequent amounts of tufted hair-grass, occasional bracken, common nettle, common ragwort, hogweed, marsh thistle, creeping thistle and low amounts of foxglove.
NS770623	84	Two long tunnels (one with a footpath and one with the North Calder water) cross under the Woodhall Mill Road. The area has very good bat foraging potential but the brickwork of the tunnels is in too good a condition to allow bats access for roosting. However, there is some bat access possible at the top of the structures.
NS771614	85	Small area of unimproved, neutral grassland, with scattered scrub adjacent to Bo'ness road and fenced off from an improved field. Moss species dominate the ground, with abundant, tufted hair-grass, frequent Yorkshire fog and glaucous sedge and a variety of herb species including occasional amounts of meadow vetchling <i>Lathyrus pratensis</i> , devil's-bit scabious, lesser trefoil <i>Trifolium dubium</i> and silverweed. Tall ruderals, mainly great willowherb, are frequent. There is scattered scrub, such as hawthorn and goat willow and planted trees, such as silver birch and oak saplings throughout, with an area of denser scrub leading into a woodland copse. There is a marshy area along the western edge, which is dominated by water horsetail <i>Equisetum fluviatile</i> with frequent soft rush and great willowherb. Two lapwings were recorded in the area and two bird nests were present in the planted trees.
NS771622	86	Semi-natural woodland in steep sided river valley (Kennel Burn). Mature broad-leaved trees dominate the canopy. In addition, there are rock crevices and an appreciably large cave at the base of the steepest part of the valley. Hence, the area has very good bat potential. The woodland is ancient in character. Common passerine woodland birds nest in the

Target Note GR	No.	Target Note
		woodland. The canopy layer is composed of ash, sycamore and beech. The ground layer vegetation is sparse and composed of wood sorrel, lords-and-ladies <i>Arum maculatum</i> and bluebell and on rock ledges hard-shield fern <i>Polystichum aculeatum</i> . Ivy and honeysuckle are common in the field layer and in the canopy. Human disturbance levels in the woodland are moderately low.
NS772614	87	Young, mixed plantation about 5 m tall with a variety of species, such as Sitka spruce. Moss species dominate the ground, with abundant tufted hair-grass, frequent Yorkshire fog and glaucous sedge and a variety of herb species including occasional meadow vetchling, (devil's-bit scabious, lesser trefoil, and silverweed. Tall ruderals, such as great willowherb, are frequent. A ditch borders the area.
NS772615	88	Marshy grassland. Dominated by soft rush and tufted hair-grass, with abundant great willowherb, locally abundant liverwort species, frequent wavy bitter-cress and occasional common marsh bedstraw, <i>Galium palustre</i> , bryophytes, broad-leaved dock, common sorrel, creeping thistle and marsh thistle.
NS773616	89	Small planted woodland copse at the bottom of a slope. It is damp in places with ditches on the west side and a shallow pond has formed in the middle that is about 3m wide. The east side of the woodland is dominated by semi-mature sycamore and the west side is dominated by semi-mature beech. The understorey is predominately bramble with some hawthorn. The ground layer consists of frequent amounts of tufted hair-grass, cock's-foot, bracken, nettle and bryophytes, with occasional great willowherb, lesser celandine, cleavers and herb-Robert. The west side is quite sparse and the east is dominated by butterbur <i>Petasites hybridus</i> . There are many dead and fallen trees throughout which make good refuges for reptiles, amphibians and invertebrates.
NS776623	90	Kennel Burn. Numerous water vole burrows, runs and a latrine (on a boulder in the burn). The burn comprises steep banks (0.5m high) composed of very soft alluvial soil. Some marginal vegetation is present. Common passerine woodland birds nest in the woodland. Semi-natural woodland surrounds the Kennel Burn, with some underplanted trees and shrubs. The woodland is open in nature with good species and structural diversity. The canopy consists of alder, ash and willow species. The scrub layer is composed of hawthorn, elder, willow species, cherry species, dog rose and bramble. The ground layer is made up of ground-elder, lesser celandine, dog's mercury, great willowherb, soft rush, meadowsweet, primrose <i>Primula vulgaris</i> , hogweed, raspberry, hedge woundwort, cleavers, cock's-foot, reed canary-grass, common comfrey, herb-Robert, hart's-tongue fern and opposite-leaved golden saxifrage. Human disturbance levels in the local area are high. There are high levels of fly tipping including the Kennel Burn channel.
NS779617	91	Burn with some mature and semi-mature beech and sessile oak. The trees have bat potential. Small burrow holes (6-8 cm in diameter) were noted on the bank of the burn. There were no signs of water vole activity in the area, such as fresh feeding signs and latrines, but the holes were not overgrown by vegetation (with smooth entrances).
NS780616	92	Sandy embankment with scrub borders the north side of the A8.
NS781618	93	A rookery in the western part of a long-established plantation composed of a variety of mature and semi-mature broad-leaved tree species. Beech is dominant. There are 48 nests in the rookery and 20 rooks <i>Corvus frugilegus</i> were recorded. Common woodland birds nest in the plantation. The area

Target Note GR	No.	Target Note
		has good bat potential. It has good foraging habitat with large, mature trees abundant. Many could potentially have bat roosts.
NS783616	94	A line of mature limes, sycamore and willows at the edge of a field. There is scope for bats and nesting birds.
NS783619	95	A skylark was present in an arable field. A small stand of Japanese knotweed is present at its margins.
NS784614	96	Line of mature oak and ash trees that have good bat potential due to the presence of rot holes, slits and cracks. The general lack of scrub and open nature of the woodland means that the area does not have high bat foraging potential.
NS785618	97	Disused railway colonised by unimproved neutral grassland of moderately low botanical diversity and lesser amounts of scrub (dog rose). A buzzard pellet was found in the area (2 x 3.5 cm in size). Common field vole <i>Microstis agrestis</i> activity in the area was high.
NS785619	98	Marshy grassland and a subordinate amount of semi-improved neutral grassland of low botanical diversity. Two mature beech trees are present at the southern edge of the grassland. They have some rot holes that could have bat potential.
NS786618	99	Rush pasture farmland field (marshy grassland). The field is partly delineated by a disused railway line and a row of planted rowan. Soft rush and creeping soft-grass are co-dominant in the sward with frequent tufted hair-grass. Herb and bryophyte species diversity is relatively high. A skylark was recorded in the local area.
NS787618	100	Rush pasture. Two skylarks were present in the vicinity.
NS787617	101	Disused railway partly colonised by hawthorn and blackthorn <i>Prunus spinosa</i> scrub and a small pond. A skylark was present in the vicinity.
NS787619	102	Farmland composed of semi-improved neutral grassland with some rush pasture. A group of five roe deer were noted in the area.
NS788617	103	A neutral grassland area bounded by a disused railway, hedges with areas of mature, broad-leaved trees. The northern end of the disused railway has a small, partly vegetated, pond. The mature trees have bat roost potential as they feature small holes and cracks. Moreover, there is possible bat foraging habitat in the area. There is a small rookery at the western end of the disused railway. 13 nests and 25 rooks were recorded.
NS789621	104	A field of semi-improved rush pasture. A skylark was present in the area.
NS786618	105	A rush pasture field of low botanical species diversity. It was dominated by Yorkshire fog and abundant soft rush, creeping buttercup and crested dog's-tail <i>Cynosurus cristatus</i> . A burn and a hawthorn and blackthorn hedge define its eastern edge. There were possible signs of foraging in the area.
NS789619	106	A line of six mature trees. Some have rot holes that may have bat potential.
NS789620	107	Rush pasture dominated farmland with a pond. The area is generally very marshy. The pond is vegetated by bulrush.
NS789624	108	Hawthorn scrub on a bank beside a burn.
NS792622	109	In an arable field a pair of grey wagtails <i>Monticilla cinerea</i> was noted.
NS792616	110	Semi-improved neutral grassland, with patches of tall ruderal and scattered hawthorn scrub.
NS794616	111	Possible newt habitat. There is a shallow pond with some emergent and floating vegetation, but there is no marginal vegetation. Surrounding the pond is partly colonised bare ground with some area of rubble.
NS794618	112	Avenue of mature trees beside track. Beech is dominant. Many of the trees have bat potential as they have some splits, cracks, holes and hollows. However, bat foraging habitat in the area is fairly poor quality due to the open nature of the woodland and lack of scrub. Common woodland birds nest in the trees.



Target Note GR	No.	Target Note
NS795621	113	Two skylarks were recorded by an area of improved pasture.
NS797621	114	Mature beech at the boundary of a semi-improved pasture. The trees have some bat potential.

Table 6 Plant Species Present Within the Survey Area

Common Name	Scientific Name
TREES	
Norway maple	<i>Acer platanoides</i>
Sycamore	<i>Acer pseudoplatanus</i>
Horse chestnut	<i>Aesculus hippocastanum</i>
Alder	<i>Alnus glutinosa</i>
Silver birch	<i>Betula pendula</i>
Downy birch	<i>Betula pubescens</i>
Birch species	<i>Betula sp.</i>
Cypress species	<i>Chamaecyparis sp.</i>
Beech	<i>Fagus sylvatica</i>
Ash	<i>Fraxinus excelsior</i>
Larch	<i>Larix decidua</i>
Sitka spruce	<i>Picea sitchensis</i>
Pine species	<i>Pinus sp.</i>
Scots pine	<i>Pinus sylvestris</i>
Poplar species	<i>Populus sp.</i>
Black poplar	<i>Populus nigra</i>
Aspen	<i>Populus tremula</i>
Wild cherry	<i>Prunus avium</i>
Cherry species	<i>Prunus sp.</i>
Bird cherry	<i>Prunus padus</i>
Blackthorn	<i>Prunus spinosa</i>
Turkey oak	<i>Quercus cerris</i>
Sessile oak	<i>Quercus petraea</i>
Pedunculate oak	<i>Quercus robur</i>
Oak species	<i>Quercus sp.</i>
Willow species	<i>Salix sp.</i>
White willow	<i>Salix alba</i>
Crack willow	<i>Salix fragilis</i>
Rowan	<i>Sorbus aucuparia</i>
Yew	<i>Taxus baccata</i>
Lime species	<i>Tilia sp.</i>
Wych elm	<i>Ulmus glabra</i>
SHRUBS	
Common heather	<i>Calluna vulgaris</i>
Dogwood	<i>Cornus sanguinea</i>
Hazel	<i>Coryllus avellana</i>
Cotoneaster species	<i>Cotoneaster sp.</i>
Hawthorn	<i>Crataegus monogyna</i>
Broom	<i>Cytisus scoparius</i>
Holly	<i>Ilex aquifolium</i>
Garden privet	<i>Ligustrum ovalifolium</i>
Portugal laurel	<i>Prunus lusitanica</i>
Rhododendron	<i>Rhododendron ponticum</i>
Gooseberry species	<i>Ribes sp.</i>
Dog rose	<i>Rosa canina agg.</i>

Common Name	Scientific Name
Raspberry	<i>Rubus idaeus</i>
Bramble	<i>Rubus fruticosus</i> agg.
Goat willow	<i>Salix caprea</i>
Willow species	<i>Salix</i> sp.
Elder	<i>Sambucus nigra</i>
Snowberry	<i>Symphoricarpos rivularis</i>
Gorse	<i>Ulex europaeus</i>
Guelder rose	<i>Viburnum opulus</i>
CLIMBERS	
Hedge Bindweed	<i>Calystegia sepium</i>
Algerian ivy	<i>Hedera algeriensis</i>
Ivy	<i>Hedera helix</i>
Honeysuckle	<i>Lonicera periclymenum</i>
GRASSES	
Creeping bent-grass	<i>Agrostis stolonifera</i>
Sweet vernal-grass	<i>Anthoxanthum odoratum</i>
Crested dog's-tail	<i>Cynosurus cristatus</i>
Cock's-foot	<i>Dactylis glomerata</i>
Tufted hair-grass	<i>Deschampsia cespitosa</i>
Wavy hair-grass	<i>Deschampsia flexuosa</i>
Common couch	<i>Elymus repens</i>
Red fescue	<i>Festuca rubra</i>
Fescue species	<i>Festuca</i> sp.
Yorkshire fog	<i>Holcus lanatus</i>
Creeping soft-grass	<i>Holcus mollis</i>
Reed canary-grass	<i>Phalaris arundinacea</i>
Common reed	<i>Phragmites australis</i>
SEDGES	
Glaucous sedge	<i>Carex flacca</i>
Bottle sedge	<i>Carex rostrata</i>
RUSHES	
Jointed rush	<i>Juncus articulatus</i>
Compact rush	<i>Juncus conglomeratus</i>
Soft rush	<i>Juncus effusus</i>
Great woodrush	<i>Luzula sylvatica</i>
AQUATIC PLANTS	
Duckweed species	<i>Lemna</i> sp.
HERBS	
Sneezewort	<i>Achillea ptarmica</i>
Moschatel	<i>Adoxa moschatellina</i>
Ground-elder	<i>Aegopodium podagraria</i>
Bugle	<i>Ajuga reptans</i>

Common Name	Scientific Name
Chives	<i>Allium schoenoprasum</i>
Wood anemone	<i>Anemone nemorosa</i>
Wild angelica	<i>Angelica sylvestris</i>
Cow parsley	<i>Anthriscus sylvestris</i>
Burdock species	<i>Arctium sp.</i>
Lords-and-ladies	<i>Arum maculatum</i>
Daisy	<i>Bellis perennis</i>
Wavy bitter-cress	<i>Cardamine flexuosa</i>
Hairy bitter-cress	<i>Cardamine hirsuta</i>
Cuckooflower	<i>Cardamine pratensis</i>
Black knapweed	<i>Centaurea nigra</i>
Common mouse-ear	<i>Cerastium fontanum</i>
Rosebay willowherb	<i>Chamerion angustifolium</i>
Opposite-leaved golden-saxifrage	<i>Chrysosplenium oppositifolium</i>
Enchanter's-nightshade	<i>Circea lutetiana</i>
Creeping thistle	<i>Cirsium arvense</i>
Marsh thistle	<i>Cirsium paluste</i>
Pink purslane	<i>Claytonia sibirica</i>
Pignut	<i>Conopodium majus</i>
Marsh hawk's-beard	<i>Crepis paludosa</i>
Cruciata laevipes	<i>Crosswort</i>
Common spotted-orchid	<i>Dactylorhiza fuchsii</i>
Foxglove	<i>Digitalis purpurea</i>
Great willowherb	<i>Epilobium hirsutum</i>
Broad-leaved willowherb	<i>Epilobium montanum</i>
Marsh willowherb	<i>Epilobium palustre</i>
Japanese knotweed	<i>Fallopia japonica</i>
Meadowsweet	<i>Filipendula ulmaria</i>
Cleavers	<i>Galium aparine</i>
Marsh bedstraw	<i>Galium palustre</i>
Fen bedstraw	<i>Galium uliginosum</i>
Herb-robert	<i>Geranium robertianum</i>
Wood crane's-bill	<i>Geranium sylvaticum</i>
Water avens	<i>Geum rivale</i>
Wood avens	<i>Geum urbanum</i>
Ground ivy	<i>Glechoma hederacea</i>
Hogweed	<i>Heracleum sphondylium</i>
Dame's violet	<i>Hesperis matronalis</i>
Spanish bluebell	<i>Hyacinthoides hispanica</i>
Bluebell	<i>Hyacinthoides non-scripta</i>
Hybrid bluebell	<i>Hyacinthoides non-scripta x H. hispanica</i>
Perforate St.John's-wort	<i>Hypericum perforatum</i>
Indian balsam	<i>Impatiens glandulifera</i>
Yellow iris	<i>Iris pseudacorus</i>
Nipplewort	<i>Lapsana communis</i>
Meadow vetchling	<i>Lathyrus pratensis</i>
Hawkbit species	<i>Leontodon sp.</i>
Oxeye daisy	<i>Leucanthemum vulgare</i>
Common twayblade	<i>Listera ovata</i>

Common Name	Scientific Name
Common bird's-foot-trefoil	<i>Lotus corniculatus</i>
Greater bird's-foot-trefoil	<i>Lotus pedunculatus</i>
Great woodrush	<i>Luzula sylvatica</i>
Dog's mercury	<i>Mercurialis perennis</i>
Water forget-me-not	<i>Myosotis scorpioides</i>
Sweet cicely	<i>Myrrhis odorata</i>
Wood sorrel	<i>Oxalis acetosella</i>
Butterbur	<i>Petasites hybridus</i>
Ribwort plantain	<i>Plantago lanceolata</i>
Silverweed	<i>Potentilla anserina</i>
Barren strawberry	<i>Potentilla sterilis</i>
Primrose	<i>Primula vulgaris</i>
Selfheal	<i>Prunella vulgaris</i>
Meadow buttercup	<i>Ranunculus acris</i>
Lesser celandine	<i>Ranunculus ficaria</i>
Lesser spearwort	<i>Ranunculus flammula</i>
Creeping buttercup	<i>Ranunculus repens</i>
Common sorrel	<i>Rumex acetosa</i>
Sheep's sorrel	<i>Rumex acetosella</i>
Curled dock	<i>Rumex crispus</i>
Broad-leaved dock	<i>Rumex obtusifolius</i>
Wood dock	<i>Rumex sanguineus</i>
Figwort	<i>Scrophularia nodosa</i>
Common ragwort	<i>Senecio jacobaea</i>
Red campion	<i>Silene dioica</i>
Smooth sow-thistle	<i>Sonchus oleraceus</i>
Hedge woundwort	<i>Stachys sylvatica</i>
Lesser stitchwort	<i>Stellaria graminea</i>
Greater stitchwort	<i>Stellaria holostea</i>
Common chickweed	<i>Stellaria media</i>
Devil's-bit scabious	<i>Succisa pratensis</i>
Common comfrey	<i>Symphytum officinalis</i>
Dandelion	<i>Taraxacum officinalis</i> agg.
Pick-a-back plant	<i>Tolmiea mezierei</i>
Lesser trefoil	<i>Trifolium dubium</i>
White clover	<i>Trifolium repens</i>
Colt's-foot	<i>Tussilago farfara</i>
Bulrush	<i>Typha latifolia</i>
Common nettle	<i>Urtica dioica</i>
Germander speedwell	<i>Veronica chamaedrys</i>
Wood speedwell	<i>Veronica montana</i>
Common vetch	<i>Vicia sativa</i>
Bush vetch	<i>Vicia sepium</i>
Dog violet	<i>Viola riviniana</i>
FERNS & ALLIES	
Lady-fern	<i>Athyrium filix-femina</i>
Hard fern	<i>Blechnum spicant</i>

Common Name	Scientific Name
Broad buckler-fern	<i>Dryopteris dilatata</i>
Scaly male-fern	<i>Dryopteris affinis</i>
Male fern	<i>Dryopteris filix-mas</i>
Hart's-tongue fern	<i>Phyllitis scolopendrium</i>
Hard shield fern	<i>Polystichum aculeatum</i>
Bracken	<i>Pteridium aquilinum</i>
Field horsetail	<i>Equisetum arvense</i>
Water horsetail	<i>Equisetum fluviatile</i>
Wood horsetail	<i>Equisetum sylvaticum</i>
MOSSES *	
<i>Dicranium scoparium</i>	
<i>Eurhynchium praelongium</i>	
<i>Isoetes macrospora</i>	
<i>Mnium hornum</i>	
<i>Pleurozium schreberi</i>	
<i>Polytrichum commune</i>	
<i>Polytrichum formosum</i>	
<i>Rhytidiadelphus squarrosus</i>	
<i>Sphagnum palustre</i>	
LIVERWORTS *	
<i>Lophocolea bidentata</i>	
<i>Pellia epiphylla</i>	

* This represents those species positively identified by surveyors and is not intended to provide a complete list.

Table 7 Species Records from Extended Phase 1 Survey

Common Name*	Scientific Name
Mammals	
Water vole	<i>Arvicola terrestris</i>
Roe deer	<i>Capreolus capreolus</i>
Hedgehog	<i>Erinaceus europaeus</i>
Otter	<i>Lutra lutra</i>
Badger	<i>Meles meles</i>
Common field vole	<i>Microstis agrestis</i>
Mink	<i>Mustela vison</i>
Rabbit	<i>Oryctolagus cuniculus</i>
Brown rat	<i>Rattus norvegicus</i>
Grey squirrel	<i>Sciurus carolinensis</i>
Common shrew	<i>Sorex araneus</i>
Fox	<i>Vulpes vulpes</i>
Birds	
Skylark	<i>Alauda arvensis</i>
Kingfisher	<i>Alcedo atthis</i>
Mallard	<i>Anas platyrhynchos</i>
Meadow pipit	<i>Anthus pratensis</i>
Swift	<i>Apus apus</i>
Sedge warbler	<i>Arcocephalus schoenobaenus</i>
Grey heron	<i>Ardea cinerea</i>
Tufted duck	<i>Aythya fuligula</i>
Buzzard	<i>Buteo buteo</i>
Treecreeper	<i>Certhia familiaris</i>
Ringed plover	<i>Charadrius hiaticula</i>
Woodpigeon	<i>Columba palumbus</i>
Carrion crow	<i>Corvus corone</i>
Rook	<i>Corvus frugilegus</i>
Mute swan	<i>Cygnus olor</i>
Great spotted woodpecker	<i>Dendrocopos major</i>
Yellowhammer	<i>Emberiza citrinella</i>
Robin	<i>Erithacus rubecula</i>
Kestrel	<i>Falcon tinnunculus</i>
Chaffinch	<i>Fringilla coelebs</i>
Coot	<i>Fulica atra</i>
Oystercatcher	<i>Haematopus ostralegus</i>
Swallow	<i>Hirundo rustica</i>
Grey wagtail	<i>Motacilla cinerea</i>
Ruddy duck	<i>Oxyura jamaicensis</i>
Blue tit	<i>Parus caeruleus</i>
Great tit	<i>Parus major</i>
Grey partridge	<i>Perdix perdix</i>
Chiffchaff	<i>Phylloscopus collybita</i>
Willow warbler	<i>Phylloscopus trochilus</i>
Dunnock	<i>Prunella modularis</i>
Goldcrest	<i>Regulus regulus</i>

Common Name*	Scientific Name
Sand martin	<i>Riparia riparia</i>
Woodcock	<i>Scolopax rusticola</i>
Wren	<i>Troglodytes troglodytes</i>
Blackbird	<i>Turdus merula</i>
Song thrush	<i>Turdus philomelos</i>
Barn owl	<i>Tyto alba</i>
Lapwing	<i>Vanellus vanellus</i>
Amphibians	
Common toad	<i>Bufo bufo</i>
Common frog	<i>Rana temporaria</i>
Invertebrates	
Orange tip butterfly	<i>Anthocharis caradamines</i>
Green-veined white	<i>Artogeia napi</i>
7-spot ladybird	<i>Coccinella punctata</i>

*This represents those species positively identified by surveyors and is not intended to provide a complete list.