



Western Link

Preliminary Ecological Appraisal

September 2017

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Executive summary

Mott MacDonald Limited (MML) was commissioned by Warrington Borough Council (WBC), to undertake a Preliminary Ecological Appraisal (PEA) in support of the development of an Outline Business case (OBC), for the Warrington Weston Link Scheme.

A desktop study was completed in July, which analysed species records within 2.0km of the scheme area and identified designated sites. A field survey was undertaken over several days in late-June-early July. All habitats were mapped according to the Extended Phase 1 Habitat Survey methodology (JNCC 2010), with attention to the schemes potential to support protected species. This report presents the results of these findings. The key findings are summarised below.

There are three international or European designated sites within 10.0km of the Scheme. The Mersey Estuary SPA will require a Habitat Regulations Assessment (HRA) due to the potential impact of designation species within the scheme area.

The proposed development has the potential to impact several habitats which have a rich floristic character of regional/national importance. Therefore, further national vegetation classification (NVC) surveys are recommended to understand the diversity present on these sites.

The desk top study and field survey suggest a variety of protected species may be present within the scheme area, these are: reptiles, great crested newt, wintering and breeding birds, bats, badgers, otter, and water vole. Further surveys are required to establish presence and, if found to be present, population dynamics to inform the design of potential mitigation procedures.

Himalayan balsam, giant hogweed and Japanese knotweed are recorded throughout the scheme area and were recorded during the field survey. An Invasive Species Management Plan (ISMP) is recommended for the scheme before any construction works take place.

1 Introduction

1.1 Background

Mott MacDonald Limited (MML) was commissioned by Warrington Borough Council (WBC), to undertake a Preliminary Ecological Appraisal (PEA) in support of the development of an Outline Business case (OBC), for the Warrington Weston Link Scheme, henceforth referred to as 'The Scheme'. The objective of The Scheme is to address the issues associated with rapid economic growth, namely increased traffic congestion, particularly around the town centre. As well as facilitate new development and continued growth.

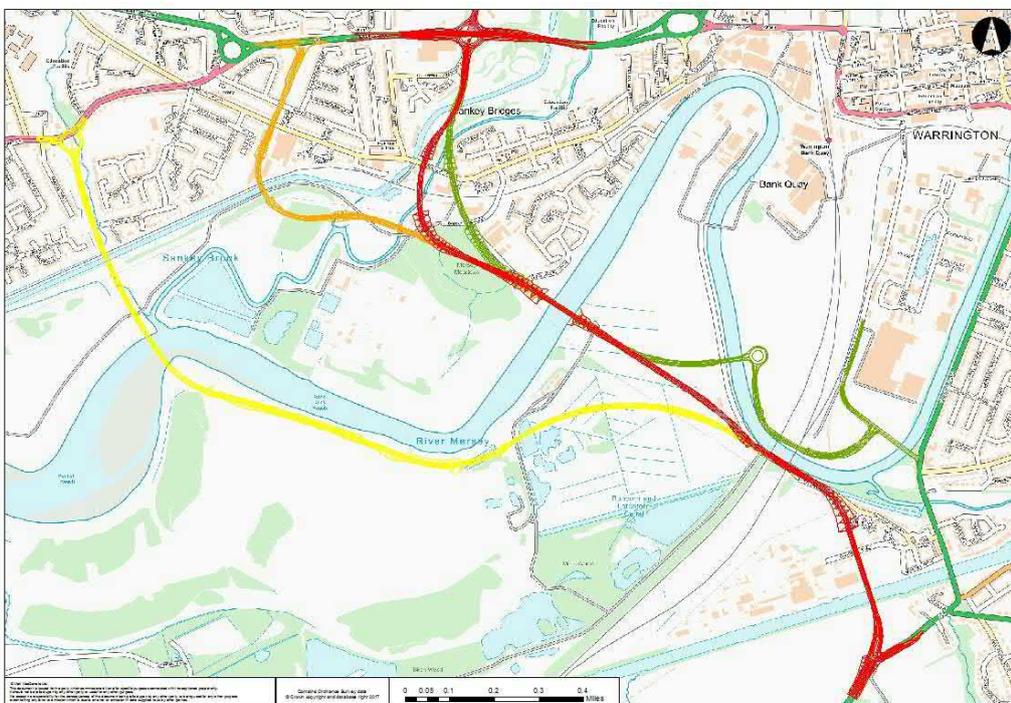
Warrington has several barriers to transport links which force north south traffic to travel through the town centre: The River Mersey, Manchester Ship Canal, and West Coast Mainline railway. The study areas include all the proposed routes with a 50m buffer surrounding these areas.

1.2 Proposed Works

There are six proposed routes, they all follow four main interchangeable routes which overlap in certain areas: Red, Green, Orange, Yellow, Purple, Pink. They connect the A57, or the A562 (Yellow route only), at the north to the A56 in the south. They span over a mixture of industrial, residential, and semi-natural landscapes.

Figure 1 below shows the Red, Green, Orange, and Yellow routes. Pink and Purple routes are not shown as these cover no separate route but interchange over two routes.

Figure 1: Western Link Red, Green, Orange, and Yellow route options.



Source: Mott MacDonald, 2017

1.3 Scope of Report

The purpose of this report is to provide an initial assessment of the ecological importance of the habitats present within the surrounding 50m of the proposed road routes and for their potential to support protected and notable species.

The scope of this study is to:

- Carry out a Phase 1 habitat survey (Joint Nature Conservation Committee (JNCC), 2010) to provide a description of the existing broad habitat types. To establish the presence or potential presence of any protected or notable species. The results of these surveys are presented in drawing form (Supplementary Information A) and target notes (Supplementary Information B);
- Undertake a desk-top study to identify any existing information regarding protected or notable species and sites with a nature conservation designation within the zone of influence of the site;
- Produce a report detailing any ecological constraints to the proposed development in terms of designated sites, habitats, and/or protected and notable species;
- Provide recommendations for further ecological survey work if considered necessary to produce an ecological baseline for the site, and;
- Identify any further surveys or mitigation measures that may be required to offset potential development impacts.

1.4 Zone of Influence

The Zone of Influence (Zoi) is the area considered to contain the extent of ecological features potentially impacted upon by the development. Given the nature of ecological the extent of the Zoi is determined by the nature of the development and the ecological features present. However, as a minimum the Zoi will include the development site and, in almost all cases, will extend beyond to some degree.

Given the scale of this development, general Zoi distances have been applied for the desktop study and a 50m buffer to the site area has been applied for the field survey.

Table 1: Zone of influence used for this assessment

Ecological features	Zone of influence
European Designated sites	10.0km buffer around site boundary
National Designated sites	2.0km buffer around site boundary
Protected species records	2.0km buffer around site boundary
Protected species evidence and field survey	Within the site boundary and 50m buffer

1.5 Legislation and Policy Framework Context

The pivotal legislation regarding nature conservation in England is the Wildlife and Countryside act 1981 (as amended) (WCA). The WCA implements, into domestic legislation, the convention on the Conservation of European Wildlife and Natural Habitats (Bern convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Bird Directive). It sets out various levels of protection for species (schedule 1 and 5) and designation of Sites of Special Scientific Interest (SSSI)

In England, the WCA is supplemented by the Countryside Rights of Way Act 2000 (CRoW) and the Natural Environment and Rural Communities Act 2006 (NERC), which enhanced the protection to certain habitats and species and places a duty on governments and public bodies/authorities to have regard for nature conservation.

In England, the Conservation of Habitats and Species Regulations 2010 (Habitat Regulations), which consolidates and updates the Conservation (Natural Habitats etc.) Regulations 1994, transpose, into domestic legislation, the Council Directive 92/43/EEC (Habitats Directive). The Habitat Regulations provide designation and protection to European protected habitats (Special area of conservation) and species (listed in Annex I and II of the Habitats Directive respectively). Additionally, the regulations require the designation and maintenance of Special Protection Areas (SPA) classified under the Bird Directive.

Developers should be aware that an unlimited fine and/or custodial sentence can be received if a development is in breach of the above legislation.

In an addition to legislation, planning policy puts responsibility on planning authorities to ensure developers assess and mitigate ecological impacts during the planning process. Specifically, in this context, section 11 Conserving and enhancing the natural environment of the National Planning Policy Framework and the Natural Environment planning practice guidance.

For habitat and species-specific legislation please see Supplementary Information C.

2 Methods

2.1 Desk Study

A desk top study was conducted following the Guidelines for Preliminary Ecological Appraisal document (GPEA) (CIEEM, 2013) to collate historical biological records and identify any presence of designated sites within the Zol. Data older than 10 years were not considered and were excluded from the results and interpretation. Protected species records are located in Supplementary Information D.

The following sources were contacted/used to collate historical biological records and identify any presence of designated sites within the Zol:

- RECORD Local Record Centre (www.record-lrc.co.uk)
- Multi Agency Geographic Information Centre website (MAGIC) (www.magic.gov.uk);
- Joint Nature Conservation Committee (JNCC) (<http://jncc.defra.gov.uk/>);
- Natural England (<https://designatedsites.naturalengland.org.uk/>)

2.2 Field Survey

The field survey followed methods set out in the GPEA document (CIEEM, 2013).

Broad habitats found on the site were identified using the Handbook for Phase 1 Habitat Survey: A technique for environmental audit (JNCC, 2010), with target notes made to describe features of interest, and noting dominant flora. Any presence/potential presence of legally protected and/or species of importance within the Zol was assessed based upon the habitat suitability of those recorded.

Species specific surveys were not undertaken; rather the potential for the survey area to support each species was assessed. However, features that would likely support protected species, holes in trees, drainage ditches, ponds, embankments etc. were all examined, on an ad hoc basis, for the possible presence of species known to utilise these areas during the survey, with any field signs or sightings of such species recorded. Such preliminary assessments followed methodologies within published guidance, such as the Bat Surveys for Professional Ecologists (Collins, 2016).

The Extended Phase 1 Habitat map is provided in Supplementary Information A, with associated target notes and images in Supplementary Information B and E respectively. Target notes are referred to in the text as TG1, TR2, TO3 etc. The second letter refers to the route on which the target note is located. Photographs are referred to in the text with the letter F followed by their figure number, F2, F17 etc. Due to limited access, some areas could not be surveyed, such areas have been identified within these maps.

2.3 Desktop Study Limitations

Biological records do not present a complete species list of the area; individuals provide records on an impromptu basis and as such can be inaccurate or skewed. Due to the scale of this project, citations for non-statutory sites, which are not freely available, were reduced to those present within the proposed routes and 50m buffer.

2.4 Field Survey Limitations

A PEA is an initial assessment, providing only a snapshot, therefore additional species may have been missed. This survey in particular was heavily restricted due to poor access, and therefore habitats/species within the development areas will have not been recorded. Additionally, seasonal constraints may have prevented the recognition of some species/field signs. As consequence, this PEA cannot be relied upon to represent a comprehensive account of the ecological interest at this site, like that found in an Ecological Impact Assessment (EclA) (CIEEM, 2016).

3 Desk Study Results

3.1 Introduction

All relevant ecological data received from the consultation exercise has been reviewed, the results of which are summarised below in Sections 3.2 and 3.3. Data older than ten years is less important than more recent data due to the length of time that has elapsed since being collected (and the chance that they are no longer valid) and have therefore been omitted where appropriate.

3.2 Statutory Designated sites

3.2.1 International and European sites

There are three international or European designated sites within 10.0km of the Scheme, one of which, the Mersey Estuary has two separate designations, see Table 2 for a summary of these sites.

Table 2: European Designated Sites within 10.0km

Name	Status	Details	Distance/ Direction
Mersey Estuary	Ramsar/SPA	The Mersey Estuary is large and sheltered. Habitats mostly comprise of saltmarsh and intertidal sand and mud-flats, which provide feeding and roosting sites for large populations of water birds throughout the year. Designated for the presence of Annex 1 species of the Bird Directive Golden Plover (<i>Puffinus aprinarius</i>) and for regularly supporting populations of European importance of the following migratory species: Redshank (<i>Tringa totanus</i>), Ringed Plover (<i>Charadrius hiaticula</i>), Dunlin (<i>Calidris alpina alpina</i>), Pintail (<i>Anas acuta</i>), Shelduck (<i>Tadorna tadorna</i>), Teal (<i>Anas crecca</i>). Additionally, it is designated for regularly support at least 20,000 waterfowl.	8.0km West
Manchester Mosses	Special Area of Conservation (SAC)	Area of wetland, designated for the presence of Annex 1 habitat of the Habitat directive: Degraded raised bogs, still capable of natural regeneration.	7.5km East
Rixton Clay Pits	SAC	A disused brick works and clay quarry, now a series of ponds of varying sizes is present. Designated for the presence of Annex II species of the Habitat Directive: Great Crested Newt (<i>Triturus cristatus</i>).	8.5km east

Source: JNCC/RECORD

3.2.2 National and Local sites

There are no national or local designated sites with 2.0km of the Scheme.

3.2.3 Non-statutory designated sites

There are five non-statutory designated sites within 50m of the scheme and some are located within the scheme area. They are designated for containing locally important habitats and for supporting locally important flora and fauna. Additionally, there are 18 within 2.0km of the scheme. Table 3 describes the sites within 50m and their distance from each route, whereas Table 4 focuses on identifying the sites distances from each route.

Table 3: Non-statutory designated sites within 50m

Name	Status	Details	Distance/Direction
Gatewarth	Local Wildlife Site (LWS) (Warrington)	Former landfill site which has naturally revegetated. Mosaic of scrub, tall ruderal and grassland. Central areas and the middle south facing slopes of the site are dominated by scrub. An immature plantation woodland is present, where white poplar is abundant. Great willowherb, creeping thistle and reed canary grass dominate tall ruderal areas. Large areas are overgrown rank grass containing false oats, field horsetail and timothy. Small areas of unimproved grassland with black knapweed, creeping cinqfoil, wild carrot and fine grasses. Rarer species include lady's bedstraw, orchids, and grass vetchling. Common reed dominated significant areas of the site are. By the river's edge couch grass, false oat-grass and creeping thistle are present in mosaic with common reeds. The site is particularly important for birds including red and amber listed Birds of Conservation Concern and UK BAP species. Particularly notable is the presence of grasshopper warbler and breeding willow tit. Brown hares which are a UK BAP species are also present.	Red: 1.1km west; Green: 1.2km west; Orange: 0.5km west; Yellow: 0km; Purple: 1.2km west; Pink: 1.1km west
Sankey Canal	LWS (Warrington)	An unpolluted disused canal with an abundance of native aquatic and marginal flora. Due to its low levels of disturbance in acts as a linear pond. Its beds contain significant areas of reed beds, most extensive areas are in the Sankey Valley Nature Park and along a dry section of the canal by Bewsey LNR. The canal's margins provide suitable habitat for small mammals and otters are recorded along the canal.	Red: 0km; Green: 0km; Orange: 0.1km south; Yellow: 1km west; Purple: 0; Pink: 0km
St Helen's Canal	LWS (Warrington)	Part of a disused canal between an inlet of the river Mersey and Moss Bank to Fiddlers Ferry Penketh. Most of the north edge of the canal has dense emergent vegetation, dominated by Common Reed, amongst others, included: Hemp agrimony, gipsywork, water mint and angelica. The southern edge has a towpath, which forms part of the Trans Pennie Way. A large section of the canal edge is concreted, providing limited opportunity for marginal plant species to colonise. The canal acts as a significant wildlife corridor and supports good numbers of breeding birds including: gadwall, white throat, reed bunting, house sparrow, willow warbler and grey wagtail. Water fern and Himalayan balsam are recorded along the canal.	Red: 1.2km; Green: 1.3km west; Orange: 0.6km west; Yellow: 0km; Purple: 1.3km west; Pink: 1.2km west
Upper Mersey Estuary	LWS (Warrington)	Large areas of intertidal sand and mudflats, with buildings and established saltmarsh. Also present are settlement lagoons used for the disposal of pulverised fuel ash at Fiddler's ferry power station, which contain a variety of open water, marsh and wet carr woodland. Of significant ecological interest is the artificial calcareous habitat unique in	Red: 0.7km south west; Green: 0.8km south west; Orange: 0.5km south west; Yellow: 0km; Purple: 0.8km south west; Pink: 0.7km south west

Name	Status	Details	Distance/Direction
		Cheshire. Collectively important for estuarine birds throughout the year providing feeding, breeding, and roosting sites.	
Walton Locks	LWS (Warrington)	Disused channel between the Manchester Ship Canal and the River Mersey, controlled by locks, silt and mud deposition had reduced the areas of open water. Common reed and willow scrub dominate the banks. Important for overwintering wildfowl, notably the pochard. Well established emergent habitats provide cover for reed bunting and reed/sedge warblers. A footpath runs along the northern edge of the site.	Red: 0km; Green: 0.1km south; Orange: 0km; Yellow: 0km; Purple: 0; Pink: 0.1km south

Source: JNCC/RECORD

Table 4: Non-statutory designated sites within 2.0km

Name	Status	Distance/Direction
Ladies Walk Wood	LWS (Warrington)	Red: 1.5km north; Green: 1.5km north; Orange: 1.6km north east; Purple: 1.5km north; Pink: 1.5km north.
Moss Side Farm	LWS (Warrington)	Red: 1.9km south west; Orange: 1.5km south west; Yellow: 0.9km west; Pink: 1.9km south west.
Norton Marsh and Upper Moss	LWS (Warrington)	Yellow: 1.6km south west
Moore Meadows	LWS (Halton)	Yellow: 1.9km south
Appleton Reservoir	LWS (Warrington)	Red: 1.3km south; Orange: 1.3km south; Yellow: 1.3km south; Purple: 1.3km south
Bewsey Meadows	LWS (Warrington)	Red: 1.5km north; Green: 1.5km north; Orange: 1.6km north east; Purple: 1.5km north
Bog Rough	LWS (Warrington)	Red: 1.8km south; Orange: 1.8km south; Yellow: 1.8km south; Purple: 1.8km south
Dennow Wood	LWS (Warrington)	Red: 1.8km south; Orange: 1.8km south; Yellow: 1.8km south Purple: 1.8km south
St Helens Canal	LWS (Warrington)	Red: 1.2km; Green: 1.3km west Orange: 0.6km west; Yellow: 0km; Purple: 1.3km west; Pink: 1.2km west
Gatewarth	LWS (Warrington)	Red: 1.1km west; Green: 1.2km west; Orange: 0.5km west; Yellow: 0km; Purple: 1.2km west Pink: 1.1km west
Latchford Railway Slidings	LWS (Warrington)	Red: 1.8km east; Green: 1.3km east; Orange: 1.8km east; Yellow: 1.8km east; Purple: 1.8km east; Pink: 1.3km east
Rows Wood	LWS (Warrington)	Red: 1.6km south west; Orange: 1.6km south west; Yellow: 1.6km south west; Purple: 1.6km south west
Stockton Heath Rifle Range	LWS (Warrington)	Red: 1.6km south east; Orange: 1.6km south east; Yellow: 1.6km south east; Purple: 1.6km south east
Twenty Acre Wood	LWS (Warrington)	Red: 1.4km north; Green: 1.4km north; Orange: 1.4km north; Purple: 1.4km north; Pink: 1.4km north
Upper Mersey Estuary	LWS (Warrington)	Red: 0.7km south west; Green: 0.8km south west; Orange: 0.5km south west; Yellow: 0km; Purple: 0.8km south west; Pink: 0.7km south west
Walton Locks	LWS (Warrington)	Red: 0km; Green: 0.1km south; Orange: 0km; Yellow: 0km; Purple: 0; Pink: 0.1km south
Moore Nature Reserve	LWS (Warrington)	Red: 0.2km west; Green: 0.3km west; Orange: 0.2km west; Yellow: 0.2km west; Purple: 0.2 west; Pink: 0.3km west
Sankey Canal Central	LWS (Warrington)	Red: 0km; Green: 0km; Orange: 0.1km south; Yellow: 1km west; Purple: 0; Pink: 0km

Source: RECORD

3.3 Species records

All protected and important species records within 2.0km of each route are summarised below for ease of interpretation; record tables for each route are located in Supplementary Information D. Full records can be made available upon request.

3.3.1 Red Route

3.3.1.1 Invertebrates

There are 30 records for white-letter hairstreak (*Satyrrium w-album*), with a total of 146 individuals, most recently in 2014. Recorded 1.3-2km from the route, and concentrated around Penketh and Cuerdley and Moore Nature Reserve.

3.3.1.2 Amphibians and reptiles

There are 95 records for common frog (*Rana temporaria*), with a total of 1,720 individuals, the most recent is from 2016. Recorded on the route and up to 2km from the route. Concentrated around Runcorn and Latchford canal and Wilderspool causeway.

There are 30 records for common toad (*Bufo bufo*), with a total of 19,444 individuals, the most recent is from 2017. Recorded from 0.2 - 2km from the route. Concentrated around Bewsey and Whitecross, Penketh and Cuerdley and Moore Nature Reserve.

There are 5 records for great crested newt (*Triturus cristatus*), with a total of 38 individuals, the most recent is from 2013. Recorded from 1.6km - 1.9km from the route. Concentrated in ponds around Moss Side Farm and Birch wood.

There are 3 records for smooth newt (*Lissotriton vulgaris*), with a total of 7 individuals, the most recent is from 2011. Recorded from 1.6km – 1.9km, concentrated around Fiddlers Ferry power station.

There are no records for native reptiles.

3.3.1.3 Birds

There are a high number bird records both within or within proximity to the route, including: WCA schedule 1, Bird Directive, local biodiversity action plan (LBAP) and national biodiversity action plan (BAP) species. Additionally, designation species associated with the Mersey Estuary SPA are recorded along the route. Further information on these designable species is available upon request.

Records are spread throughout the Zol, however, the following areas have particular high numbers of bird records: Penketh and Cuerdley, Moore Nature Reserve, Upper Moss Farm, Lapwing Lane wildfowl lake and Richmond bank.

3.3.1.4 Mammals

There are 23 records for unidentified pipistrelle species (*Pipistrellus* sp.), the most recent is from 2013. Recorded 0.1-1.9km from the route. There are 13 records for common pipistrelle (*Pipistrellus pipistrellus*), the most recent is from 2015. Recorded from 0.1-1.6km from the route. Concentrated around Penketh Cuerdley and Chapel Brow Farm. There are 8 Soprano Pipistrelle (*Pipistrellus pygmaeus*), with a total of 15 individuals, the most recent is from 2015. Recorded on the route and up to 1.9km from the route. There are 5 single count records for Daubenton's bats (*Myotis daubentonii*) from 0.6km – 1.9km from the route and are concentrated along canals. The most recent was recorded in 2013. There are 6 records for noctule bat (*Nyctalus noctula*), with a

total of 9 individuals, the most recent is from 2015. Recorded 0.4-1.9km from the route. There is 1 brown long eared bat (*Plecotus auritus*) record from 2013, at 0.7km from the route. There are 6 records for brown hare (*Lepus europaeus*), with a total of 9 individuals, the most recent is from 2015. Recorded 0.8-1.8km from the route. Concentrated around Hatton fields and Norton Marsh.

There are 8 records for otter (*Lutra lutra*), with a total of 15 individuals, the most recent is from 2017. Recorded from 0.8-1.1km from the route. Concentrated around the Manchester Ship Canal towpath and St Helen's Canal.

There is 1 record for red squirrel (*Sciurus vulgaris*) from 2016, at Walton, 1.5m from the route.

There are 287 records for badger (*Meles meles*), with a total of 305 individuals, the most recent is from 2016. Recorded within the route and up to 2km. They are not concentrated in any areas and are recorded throughout the zol.

There are 5 single count water vole (*Arvicola amphibious*) records, the most recent is from 2014. Recorded 0.6-1.8km from the route and are concentrated around the St Helen's Canal.

There are 4 single count weasel (*Mustela nivalis*) records, the most recent is from 2015. Recorded 0.3-1.8km from the route.

There are 6 single count American mink (*Neovison vison*) records, the most recent is from 2014. Recorded at 0.2-1.5km from the route. Concentrated around the Manchester Ship Canal and the Runcorn Latchford Canal east.

3.3.1.5 Bony fish

There are 3 single count records for eel (*Anguilla Anguilla*), the most recent is from 2016. Recorded at 0.7-1.8km from the route and concentrated around Sankey Canal.

3.3.1.6 Plants

Bluebells (*Hyacinthoides non-scripta*) are recorded to be present or frequent in 11 locations, most recently in 2016. Recorded 0.3-1.8km from the route.

3.3.1.7 Invasive Species

Giant hogweed (*Heracleum mantegazzianum*) is recorded in 9 locations, most recently in 2015. Recorded 0.1-1.6km from the route.

Giant knotweed (*Fallopia sachalinensis*) was recorded along the Trans Pennine Trail in 2011, on the route.

Giant-rhubarb (*Gunnera tinctorial*) was recorded in Walton Gardens, 0.7km from the route, in 2010.

Himalayan cotoneaster (*Cotoneaster simonsii*) was recorded in Sankey Valley Park, 0.3km from the route, in 2011.

Small-leaved Cotoneaster (*Cotoneaster microphyllus*) was recorded in Fairfield and Howley in 2009, 1.8km from the route.

Japanese knotweed (*Fallopia japonica*) is recorded in 35 separate locations, mostly along water courses, the most recent is from 2016. Recorded within the route area and up to 1.9km from the route.

Japanese rose (*Rosa rugosa*) is recorded in 5 locations around Bewsey and Sankey Valley park, most recently in 2015. Recorded with the route area and up to 1.6km from the route.

Rhododendron (*Rhododendron ponticum*) is recorded in 7 locations, most recent from 2016. Recorded 0.7-1.8km from the route.

3.3.2 Green Route

3.3.2.1 Invertebrates

There are 30 records for white-letter hairstreak, with a total of 146 individuals, most recently in 2014. Recorded 1.3-2km from the route, and concentrated around Penketh and Cuedley and Moore Nature Reserve.

3.3.2.2 Amphibians and reptiles

There are 93 records for common frog, with a total of 1,720 individuals, the most recent is from 2016. Recorded on the route and up to 2km from the route. Concentrated around Runcorn and Latchford canal and Wilderspool causeway.

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There are no records for native reptiles.

3.3.2.3 Birds

There is an abundance of bird records both within or within proximity to the route, including: WCA schedule 1, Bird Directive, local biodiversity action plan (LBAP) and national biodiversity action plan (BAP) species. Additionally, designation species associated with the Mersey Estuary SPA are recorded along the route. Further information on these designable species is available upon request.

Records are spread throughout the Zol, however, the following areas have particular high numbers of bird records: Penketh and Cuedley, Moore Nature Reserve, Upper Moss Farm, Lapwing Lane wildfowl lake and Richmond bank.

3.3.2.4 Mammals

There are 23 records for unidentified pipistrelle species, with a total of 43 individuals, the most recent is from 2013. Recorded 0.3-1.8km from the route. There are 12 records for common pipistrelle, the most recent is from 2015. Recorded from 0.2-1.6km from the route. Concentrated around Penketh Cuedley and Chapel Brow Farm. There are 7 Soprano Pipistrelle, with a total of 14 individuals, the most recent is from 2015. Recorded 0.1-1.9km from the route. There are 5 single count records for Daubenton's bats from 0.6km – 1.9km from the route and are concentrated along canals. The most recent was recorded in 2013. There are 6 records for noctule bat, with a total of 9 individuals, the most recent is from 2015. Recorded 0.5-1.9km from the route. Concentrated around Walton Hall and Walton Lea Road. There is 1 brown long eared bat record from 2013, at 1.6km from the route.

There are 6 records for brown hare, with a total of 9 individuals, the most recent is from 2015. Recorded 0.9-1.9km from the route. Concentrated around Hatton fields and Norton Marsh.

There are 8 records for otter with a total of 15 individuals, the most recent is from 2017. Recorded from 0.8-1km from the route. Concentrated around the Manchester Ship Canal towpath and St Helen's Canal.

There is 1 record for red squirrel from 2016, at Walton Lea cottage, 1.5m from the route.

There are 291 records for badger, with a total of 301 individuals, the most recent is from 2016. Recorded within the route and up to 2km. They are not concentrated in any areas and are recorded throughout the zol.

There are 5 single count water vole records, the most recent is from 2014. Recorded 0.7-1.8km from the route and are concentrated around the St Helen's Canal.

There are 4 single count weasel records, the most recent is from 2015. Recorded 1.1-1.8km from the route.

There are 6 single count American mink records, the most recent is from 2104. Recorded at 0.4-1.6km from the route. Concentrated around the Manchester Ship Canal and the Runcorn Latchford Canal east.

There are 32 single count hedgehog (*Erinaceus europaeus*) records, the most recent is from 2016. Recorded on the route and up to 1.5km from the route.

3.3.2.5 Bony fish

There are 3 single count records for eel, the most recent is from 2016. Recorded at 0.8-1.9km from the route and concentrated around Sankey Canal.

3.3.2.6 Plants

Bluebells are recorded to be present or frequent in 10 locations, most recently in 2016. Recorded 0.7-1.8km from the route.

3.3.2.7 Invasive Species

Giant hogweed is recorded in 9 locations, most recently in 2015. Recorded 0.1-1.7km from the route.

Giant knotweed was recorded along the Trans Pennine Trail in 2011, 0.1km from the route.

Giant-rhubarb was recorded in Walton Gardens, 1.5km from the route, in 2010.

Himalayan cotoneaster was recorded in Sankey Valley Park, 0.3km from the route, in 2011.

Small-leaved Cotoneaster was recorded in Fairfield and Howley in 2009, 1.3km from the route.

Japanese knotweed is recorded in 35 separate locations, mostly along water courses, the most recent is from 2016. Recorded within the route area and up to 1.9km from the route.

Japanese rose is recorded in 5 locations around Bewsey and Sankey Valley park, most recently in 2015. Recorded with the route area and up to 1.6km from the route.

Rhododendron is recorded in 7 locations, most recently from 2016. Recorded 1-1.8km from the route.

3.3.3 Orange Route

3.3.3.1 Invertebrates

There are 30 records for White-letter Hairstreak, with a total of 146 individuals, most recently in 2014. Recorded 1.3-2km from the route, and concentrated around Penketh and Cuedley and Moore Nature Reserve.

3.3.3.2 Amphibians and reptiles

There are 93 records for common frog, with a total of 1,519 individuals, the most recent is from 2016. Recorded on the route and up to 2km from the route. Concentrated around Runcorn and Latchford canal and Wilderspool causeway.

There are 30 records for common toad, with a total of 19,444 individuals, the most recent is from 2017. Recorded from 0.2 - 2km from the route. Concentrated around Bewsey and Whitecross, Penketh and Cuedley and Moore Nature Reserve.

There are 5 records for great crested newt, with a total of 38 individuals, the most recent is from 2013. Recorded from 1.5km - 1.7km from the route. Concentrated in ponds around Moss Side Farm and Birch wood

There are 3 records for smooth newt, with a total of 7 individuals, the most recent is from 2011. Recorded from 1.6km – 1.8km, concentrated around Fiddlers Ferry power station.

There are no records for native reptiles.

3.3.3.3 Birds

There is an abundance of bird records both within or within proximity to the route, including: WCA schedule 1, Bird Directive, local biodiversity action plan (LBAP) and national biodiversity action plan (BAP) species. Additionally, designation species associated with the Mersey Estuary SPA are recorded along the route. Further information on these designable species is available upon request.

Records are spread throughout the Zol, however, the following areas have particular abundance of bird records: Penketh and Cuedley, Moore Nature Reserve, Upper Moss Farm, Lapwing Lane wildfowl lake and Richmond bank.

3.3.3.4 Mammals

There are 25 records for unidentified pipistrelle species, with a total of 92 individuals, the most recent is from 2013. Recorded 0.1-2km from the route. There are 17 records for common pipistrelle, with a total of 92 individuals, the most recent is from 2015. Recorded from 0.1-2km from the route. Concentrated around Penketh Cuedley and Chapel Brow Farm. There are 8 soprano Pipistrelle, with a total of 15 individuals, the most recent is from 2015. Recorded on the route and up to 1.9km from the route. Concentrated around Eastford Road. There are 5 single count records for Daubenton's bats from 0.6km – 1.8km from the route and are concentrated along canals. The most recent was recorded in 2013. There are 6 records for noctule bat, with a total of 9 individuals, the most recent is from 2015. Recorded 0.4-1.9km from the route. Concentrated around Walton Hall and Walton Lea Road. There is 1 brown long eared bat record from 2013, at 0.7km from the route.

There are 6 records for brown hare, with a total of 9 individuals, the most recent is from 2015. Recorded 0.8-1.6km from the route. Concentrated around Moore Nature Reserve.

There are 8 records for otter with a total of 15 individuals, the most recent is from 2017. Recorded from 0.9-1.3km from the route. Concentrated around the Manchester Ship Canal towpath and St Helen's Canal.

There is 1 record for red squirrel from 2016, at Walton Lea cottage, 0.7m from the route.

There are 287 records for badger, with a total of 305 individuals, the most recent is from 2016. Recorded within the route and up to 2km. They are not concentrated in any areas and are recorded throughout the zol.

There are 5 single count water vole records, the most recent is from 2014. Recorded 0.6-2km from the route and are concentrated around the St Helen's Canal.

There are 4 single count weasel records, the most recent is from 2015. Recorded 0.3-1.8km from the route.

There are 7 single count American mink records, the most recent is from 2014. Recorded at 0.2-1.9km from the route. Concentrated around the Manchester Ship Canal and the Runcorn Latchford Canal east.

There are 35 single count hedgehog records, the most recent is from 2016. Recorded on the route and up to 2km from the route.

3.3.3.5 Bony fish

There are 3 single count records for eel, the most recent is from 2016. Recorded at 0.2-1.8km from the route and concentrated around Sankey Canal.

3.3.3.6 Plants

Bluebells are recorded to be present or frequent in 9 locations, most recently in 2016. Recorded 0.3-1.9km from the route.

3.3.3.7 Invasive Species

Giant hogweed is recorded in 9 locations, most recently in 2015. Recorded 0.1-1.1km from the route.

Giant knotweed was recorded along the Trans Pennine Trail in 2011, 0.1km from the route.

Giant-rhubarb was recorded in Walton Gardens, 0.7km from the route, in 2010.

Himalayan cotoneaster was recorded in Sankey Valley Park, on the route, in 2011.

Small-leaved Cotoneaster was recorded in Fairfield and Howley in 2009, 1.3km from the route.

Japanese knotweed is recorded in 31 separate locations, mostly along water courses, the most recent is from 2016. Recorded from 0.1-1.9km from the route.

Japanese rose is recorded in 4 locations around Bewsey and Sankey Valley park, most recently in 2015. Recorded with the route area and up to 1.5km from the route.

Rhododendron is recorded in 6 locations, most recently from 2016. Recorded 0.7-2km from the route.

3.3.4 Yellow Route

3.3.4.1 Invertebrates

There are 30 records for White-letter Hairstreak, with a total of 146 individuals, most recently in 2014. Recorded 1.3-2km from the route, and concentrated around Penketh and Cuedley and Moore Nature Reserve.

3.3.4.2 Amphibians and reptiles

There are 96 records for common frog, with a total of 1,653 individuals, the most recent is from 2015. Recorded on the route and up to 1.9km from the route. Concentrated around Runcorn and Latchford canal and Wilderspool causeway.

There are 29 records for common toad, with a total of 19,442 individuals, the most recent is from 2017. Recorded from 0.2 – 1.4km from the route. Concentrated around Bewsey and Whitecross, Penketh and Cuedley and Moore Nature Reserve.

There are 9 records for great crested newt, with a total of 39 individuals, the most recent is from 2014. Recorded from 0.8km - 1.6km from the route. Concentrated in ponds around Moss Side Farm and Birch wood

There are 3 records for smooth newt, with a total of 7 individuals, the most recent is from 2011. Recorded from 0.8km – 1.1km, concentrated around Fiddlers Ferry power station.

There are no records for native reptiles.

3.3.4.3 Birds

There is an abundance of bird records both within or within proximity to the route, including: WCA schedule 1, Bird Directive, local biodiversity action plan (LBAP) and national biodiversity action plan (BAP) species. Additionally, designation species associated with the Mersey Estuary SPA are recorded along the route. Further information on these designable species is available upon request.

Records are spread throughout the Zol, however, the following areas have particular abundance of bird records: Penketh and Cuedley, Moore Nature Reserve, Upper Moss Farm, Lapwing Lane wildfowl lake and Richmond bank.

3.3.4.4 Mammals

There are 22 records for unidentified pipistrelle species, with a total of 84 individuals, the most recent is from 2013. Recorded 0.1-1.9km from the route. There are 21 records for common pipistrelle, with a total of 99 individuals, the most recent is from 2015. Recorded from 0.1-1.7km from the route. Concentrated around Liverpool road and Chapel Brow Farm. There are 8 soprano Pipistrelle, with a total of 17 individuals, the most recent is from 2015. Recorded on the route and up to 1.4km from the route. Concentrated along Eastford Road. There are 4 single count records for Daubenton's bats from 0.5km – 2.0km from the route and are concentrated along the St Helen's Canal. The most recent was recorded in 2013. There are 7 records for noctule bat, with a total of 11 individuals, the most recent is from 2015. Recorded 0.4-1.4km from the route. Concentrated around grassland areas and Moore Nature Reserve. There is 1 brown long eared bat record from 2013, at Walton Hall 0.7km from the route.

There are 6 records for brown hare, with a total of 9 individuals, the most recent is from 2015. Recorded 0.8-1.4km from the route. Concentrated around Moore Nature Reserve.

There are 2 single count records for otter, the most recent is from 2012. Recorded from 0.9-1.1km from the route. Concentrated around the Sankey Canal.

There is 1 record for red squirrel from 2016, at Walton Lea cottage, 0.7m from the route.

There are 291 records for badger, with a total of 307 individuals, the most recent is from 2016. Recorded within the route and up to 2km. Concentrated along the Runcorn and Latchford Canal.

There are 10 single count water vole records, the most recent is from 2009. Recorded 0.1-2km from the route and are concentrated around the Moore Nature Reserve.

There are 6 single count American mink records, the most recent is from 2104. Recorded at 0.2-0.9km from the route. Concentrated around the Manchester Ship Canal and the Runcorn Latchford Canal east.

There are 36 single count hedgehog records, the most recent is from 2015. Recorded on the route and up to 1.5km from the route. Concentrated along Cromwell Avenue.

There is a single record for polecat (*Mustela putorius*) from 2013, at 1.6km from the route, west Walton cricket ground.

3.3.4.5 Bony fish

There are 2 single count records for eel, the most recent is from 2009. Recorded at 0.4-0.7km from the route and concentrated around Sankey Canal.

3.3.4.6 Plants

Bluebells are recorded to be present or frequent in 10 locations, most recently in 2015. Recorded 0.3-1.6km from the route. Concentrated around Walton cricket ground.

3.3.4.7 Invasive Species

False-acacia (*Robinia pseudoacacia*) was recorded in 2013 at Bewsey and Whitecross, 1.4km from the route.

Giant hogweed is recorded in 11 locations, most recently in 2015. Recorded 0.3-1.9km from the route. Concentrated around the Trans Pennine Trail.

Giant knotweed was recorded along the Trans Pennine Trail in 2011, 0.1km from the route.

Giant-rhubarb was recorded in Walton Gardens, 0.7km from the route, in 2010.

Himalayan cotoneaster was recorded in Sankey Valley Park, 0.7km from the route, in 2011.

Japanese knotweed is recorded in 29 separate locations, the most recent is from 2016. Recorded 0.1-1.9km from the route. Concentrated in Sankey Valley Park.

Japanese rose is recorded in 3 locations around The Dingle and Sankey Valley park, most recently in 2015. Recorded 0.7-1.4km from the route.

Rhododendron is recorded in 4 locations, most recently from 2016. Recorded 0.7-1.8km from the route. Concentrated around Fairfield and Howley.

3.3.5 Purple Route

3.3.5.1 Invertebrates

There are 30 records for White-letter Hairstreak, with a total of 146 individuals, most recently in 2014. Recorded 1.3-2km from the route, and concentrated around Penketh and Cuerdley and Moore Nature Reserve.

3.3.5.2 Amphibians and reptiles

There are 94 records for common frog, with a total of 1,720 individuals, the most recent is from 2016. Recorded on the route and up to 2km from the route. Concentrated around Runcorn and Latchford canal and Wilderspool causeway.

There are 29 records for common toad, with a total of 19,444 individuals, the most recent is from 2017. Recorded from 0.2 – 2km from the route. Concentrated around Moore Nature Reserve.

There are 5 records for great crested newt, with a total of 38 individuals, the most recent is from 2013. Recorded from 1.6km - 1.9km from the route. Concentrated in ponds around Moss Side Farm and Birch wood

There are 3 records for smooth newt, with a total of 7 individuals, the most recent is from 2011. Recorded from 1.6km – 1.9km, concentrated around Fiddlers Ferry power station.

There are no records for native reptiles.

3.3.5.3 Birds

There is an abundance of bird records both within or within proximity to the route, including: WCA schedule 1, Bird Directive, local biodiversity action plan (LBAP) and national biodiversity action plan (BAP) species. Additionally, designation species associated with the Mersey Estuary SPA are recorded along the route. Further information on these designable species is available upon request.

Records are spread throughout the Zol; however, the following areas have particular abundance of bird records: Penketh and Cuerdley, Moore Nature Reserve, Upper Moss Farm, Lapwing Lane wildfowl lake and Richmond bank.

3.3.5.4 Mammals

There are 23 records for unidentified pipistrelle species, with a total of 39 individuals, the most recent is from 2013. Recorded 0.1-1.9km from the route. There are 13 records for common pipistrelle, the most recent is from 2015. Recorded from 0.1-1.6km from the route. Concentrated around Liverpool road and Chapel Brow Farm. There are 8 soprano Pipistrelle, with a total of 15 individuals, the most recent is from 2015. Recorded 0.1-1.4km from the route. Concentrated along Eastford Road. There are 5 single count records for Daubenton's bats from 0.6km – 1.9km from the route and are concentrated along the St Helen's Canal. The most recent was recorded in 2013. There are 6 records for noctule bat, with a total of 9 individuals, the most recent is from 2015. Recorded 0.4-1.9km from the route. Concentrated around grassland areas and Moore Nature Reserve. There is 1 brown long eared bat record from 2013, at Walton Hall 0.7km from the route.

There are 6 records for brown hare, with a total of 9 individuals, the most recent is from 2015. Recorded 0.8-1.9km from the route. Concentrated around Moore Nature Reserve.

There are 8 records for otter, with a total of 15 individuals, the most recent is from 2017. Recorded from 0.8-1.1km from the route. Concentrated around the Sankey Canal.

There is 1 record for red squirrel from 2016, at Walton Lea cottage, 0.7m from the route.

There are 287 records for badger, with a total of 305 individuals, the most recent is from 2016. Recorded within the route and up to 2.0km. Concentrated along the Runcorn and Latchford Canal.

There are 5 single count water vole records, the most recent is from 2014. Recorded 0.6-1.8km from the route and are concentrated around the Moore Nature Reserve.

There are 6 single count American mink records, the most recent is from 2104. Recorded at 0.2-1.5km from the route. Concentrated around the Manchester Ship Canal and the Runcorn Latchford Canal east.

There are 34 single count hedgehog records, the most recent is from 2016. Recorded on the route and up to 1.9km from the route. Concentrated along Cromwell Avenue.

There are 4 single count weasel records, the most is from 2015. Recorded 0.3-1.8km from the route. Concentrated around a wood west of Walton cricket ground.

3.3.5.5 Bony fish

There are 3 single count records for eel, the most recent is from 2016. Recorded at 0.8-1.9km from the route and concentrated around Sankey Canal.

3.3.5.6 Plants

Bluebells are recorded to be present or frequent in 11 locations, most recently in 2016. Recorded 0.3-1.8km from the route. Concentrated along Manchester Ship Canal path.

3.3.5.7 Invasive Species

Giant hogweed is recorded in 9 locations, most recently in 2015. Recorded 0.1-1.7km from the route. Concentrated around Bewsey and Whitecross.

Giant knotweed was recorded on the route, along the Trans Pennine Trail in 2011.

Giant-rhubarb was recorded in Walton Gardens, 0.7km from the route, in 2010.

Himalayan cotoneaster was recorded in Sankey Valley Park, 0.3km from the route, in 2011.

Small-leaved cotoneaster was recorded in Fairfield and Howley, 1.8km from the route, in 2009.

Japanese knotweed is recorded in 35 separate locations, the most recent is from 2016. Recorded on the route and up to 1.9km from the route. Concentrated in Sankey Valley Park.

Japanese rose is recorded in 5 locations, most recently in 2015. Recorded on the route and up to 1.6km from the route. Concentrated around Bewsey Farm.

Rhododendron is recorded in 7 locations, most recently from 2016. Recorded 0.7-1.8km from the route. Concentrated around Walton Hall Park.

3.3.6 Pink Route

3.3.6.1 Invertebrates

There are 30 records for White-letter Hairstreak, with a total of 146 individuals, most recently in 2014. Recorded 1.3-2km from the route, and concentrated around Penketh and Cuerdley and Moore Nature Reserve.

3.3.6.2 Amphibians and reptiles

There are 94 records for common frog, the most recent is from 2016. Recorded on the route and up to 2km from the route. Concentrated around Wilderspool causeway.

There are 30 records for common toad, with a total of 19,444 individuals, the most recent is from 2017. Recorded from 0.2 – 2km from the route. Concentrated around Moore Nature Reserve.

There are 5 records for great crested newt, with a total of 38 individuals, the most recent is from 2013. Recorded from 1.6km - 1.9km from the route. Concentrated in ponds around Moss Side Farm and Birch wood

There are 3 records for smooth newt, with a total of 7 individuals, the most recent is from 2011. Recorded from 1.6km – 1.9km, concentrated around Fiddlers Ferry power station.

There are no records for native reptiles.

3.3.6.3 Birds

There is an abundance of bird records both within or within proximity to the route, including: WCA schedule 1, Bird Directive, local biodiversity action plan (LBAP) and national biodiversity action plan (BAP) species. Additionally, designation species associated with the Mersey Estuary SPA are recorded along the route. Further information on these designable species is available upon request.

Records are spread throughout the Zol; however, the following areas have particular abundance of bird records: Penketh and Cuerdley, Moore Nature Reserve, Upper Moss Farm, Lapwing Lane wildfowl lake and Richmond bank.

3.3.6.4 Mammals

There are 22 records for unidentified pipistrelle species, the most recent is from 2012. Recorded 0.2-1.8km from the route. There are 12 records for common pipistrelle, the most recent is from 2015. Recorded from 0.2-1.6km from the route. Concentrated around Liverpool road and Chapel Brow Farm. There are 7 soprano Pipistrelle, with a total of 14 individuals, the most recent is from 2015. Recorded 0.1-1.9km from the route. Concentrated along Eastford Road. There are 5 single count records for Daubenton's bats, most recently in 2013, from 0.6km – 1.9km from the route and are concentrated along the St Helen's Canal. There are 6 records for noctule bat, with a total of 9 individuals, the most recent is from 2015. Recorded 0.5-1.9km from the route. Concentrated around grassland areas and Moore Nature Reserve. There is 1 brown long eared bat record from 2013, at Walton Hall 1.6km from the route.

There are 6 records for brown hare, with a total of 9 individuals, the most recent is from 2015. Recorded from 0.9-1.8km from the route. Concentrated around Moore Nature Reserve.

There are 8 records for otter, with a total of 15 individuals, the most recent is from 2017. Recorded from 0.8-1.1km from the route. Concentrated around the Sankey Canal.

There is 1 record for red squirrel from 2016, at Walton Lea cottage, 0.7m from the route.

There are 291 records for badger, the most recent is from 2016. Recorded on the route and up to 2km. Concentrated along the Trans Pennine Trail.

There are 5 single count water vole records, the most recent is from 2014. Recorded 0.6-1.8km from the route and are concentrated along the St Helen's Canal.

There are 6 single count American mink records, the most recent is from 2104. Recorded at 0.4-1.6km from the route. Concentrated around the Manchester Ship Canal and the Runcorn Latchford Canal east.

There are 4 single count weasel records, the most is from 2015. Recorded 0.3-1.8km from the route. Concentrated around a wood west of Walton cricket ground.

3.3.6.5 Bony fish

There are 3 single count records for eel, the most recent is from 2016. Recorded at 0.7-1.8km from the route and concentrated around Sankey Canal.

3.3.6.6 Plants

Bluebells are recorded to be present or frequent in 10 locations, most recently in 2016. Recorded 0.7-1.8km from the route. Concentrated along Manchester Ship Canal path.

3.3.6.7 Invasive Species

Giant hogweed is recorded in 9 locations, most recently in 2015. Recorded 0.1-1.6km from the route. Concentrated around Bewsey and Whitecross.

Giant knotweed was recorded 0.1km from the route, along the Trans Pennine Trail in 2011.

Giant-rhubarb was recorded in Walton Gardens, 1.5km from the route, in 2010.

Himalayan cotoneaster was recorded in Sankey Valley Park, 0.3km from the route, in 2011.

Small-leaved cotoneaster was recorded in Fairfield and Howley, 1.3km from the route, in 2009.

Japanese knotweed is recorded in 35 separate locations, the most recent is from 2016. Recorded on the route and up to 1.9km from the route. Concentrated in Sankey Valley Park.

Japanese rose is recorded in 5 locations, most recently in 2015. Recorded on the route and up to 1.6km from the route. Concentrated around Bewsey Farm.

Rhododendron is recorded in 7 locations, most recently from 2016. Recorded 1-1.8km from the route. Concentrated around Walton Hall Park.

4 Field Survey Results

4.1 Site visit

A field survey was undertaken over several days in late-June-early July. Weather varied but was generally sunny or partly cloudy with mild temperatures. All habitats were mapped according to the Extended Phase 1 Habitat Survey methodology (JNCC 2010), with particular attention to the scheme's potential to support protected species. The presence of any invasive plants species was also noted. The Extended Phase 1 Habitat Map is provided in Supplementary Information A, with associated target notes and photographs in Supplementary Information B and E respectively. Target notes are referred to as TN1, TN2 etc. the in following sections.

4.2 Habitats

4.2.1 Red Route

4.2.1.1 Continuous Scrub (A2.1)

Scrub was recorded along the length of the route with a similar species composition throughout.

Species recorded in scrub areas within Sankey Valley Park (F2) included abundant bramble (*Rubus fruticosus* agg.); frequent rosebay willowherb (*Epilobium angustifolium*), common ragwort (*Jacobaea vulgaris*), and Yorkshire-fog (*Holcus lanatus*).

The patches to the southern side of Liverpool Old Road (F3) had a greater species composition including bramble, elder (*Sambucus nigra*), hazel (*Corylus avellana*), cow parsley (*Anthriscus sylvestris*), hedge bindweed (*Calystegia sepium*), common nettle (*Urtica dioica*), rosebay willowherb, broadleaved dock (*Rumex obtusifolius*), herb Robert (*Geranium robertianum*), common comfrey (*Symphytum officinale*.), common ragwort and spear thistle (*Cirsium vulgare*).

Scrub areas to the south of Forrest Way (F4) (west of the western section of the River Mersey) included bramble, hedge bindweed, common reed (*Phragmites australis*), common hogweed (*Heracleum sphondylium*), common nettle, creeping bent (*Agrostis stolonifera*), cleavers (*Galium aparine*), Himalayan balsam (*Impatiens glandulifera*), early purple flowering orchid (*Orchis mascula*), sorrel (*Rumex acetosa*), bush vetch (*Vicia sepium*), common vetch (*Vicia sativa*), marsh woundwort (*Stachys palustris*), hairy tare (*Vicia hirsuta*), field horsetail (*Equisetum arvense*).

Scrub was located to the east of the western section of the River Mersey, north and south of Forrest Way. Species comprised of; abundant bramble; frequent cow parsley, common hogweed, false oat-grass (*Arrhenatherum elatius*), common ragwort, Yorkshire-fog, annual meadow-grass (*Poa annua*), tufted vetch (*Vicia cracca*), hairy tare and bush vetch.

Scrub was located around the railway bridge where it crosses Eastford Road and was dominated by Japanese knotweed and bramble (F5). Scrub patches also lined the road verges of Eastford Road (F6), species comprised of: abundant bramble; frequent nettle, false oat-grass, cock's-foot grass (*Dactylus glomerata*), hedge bindweed, common hogweed, perennial ryegrass (*Lolium perenne*), ribwort plantain (*Plantago lanceolata*), common comfrey (*Symphytum officinale*), cleavers, giant hogweed, Japanese knotweed, greater plantain (*Plantago major*), common ragwort, Yorkshire-fog, rosebay willowherb, red clover (*Trifolium pratense*) and broadleaved dock.

An area of tall dense scrub is located in-between the carpark found next to Baronet road and Manchester Ship Canal (F7). Gorse (*Ulex sp.*) is abundant, with frequent ash (*Fraxinus excelsior*) and sycamore (*Acer pseudoplatanus*) trees scattered within. The ground layer was bare apart from a strip on its outer northern edge, comprising of: bramble, nettle, ribwort plantain, false oats, dandelion (*Taraxacum officinale* agg.) and field horsetail. There also appeared to be wildlife tracks along the outer edge (F7).

4.2.1.2 Scattered Scrub (A2.2) and Poor Semi-Improved Grassland (B6) mosaic

A small strip of scattered scrub and poor semi-improved grassland mosaic was located along the eastern bank of St Helens Canal (F10). Species included false barley grass (*Hordeum vulgare*) and bramble.

Another small strip was located adjacent to the roundabout leading to Forrest Way (F11). Community comprised of; bramble, cow parsley, common hogweed, false oat-grass, common ragwort, Yorkshire-fog, annual meadow grass, tufted vetch, hairy tare and bush vetch. Within the grassland areas species recorded were cock's-foot grass, false oat-grass, ribwort plantain, common ragwort, colt's-foot (*Tussilago farfara*), sheep's fescue (*Festuca ovina*), annual meadow-grass, bramble, dandelion, common cranesbill (*Geranium maculatum*), cleavers.

4.2.1.3 Broad-leaved Parkland Scattered Trees (A3.1)

Broad-leaved parkland scattered trees were located throughout the length of the route.

This habitat was recorded within the southern section of Sankey Valley Park (F12). The woodland lined amenity grassland areas with public footpaths running through. The canopy comprised of frequent downy birch (*Betula pubescens*), alder (*Alnus glutinosa*), hawthorn (*Crataegus monogyna*), silver birch (*Betula pendula*), holly (*Ilex aquifolium*) and sessile oak (*Quercus petraea*). The understory was comprised of occasional nettle, cleavers, and creeping buttercup (*Ranunculus repens*). A stand of Himalayan balsam was also observed.

The broad-leaved trees lined the southern side of Barnard Street and Forrest Way (F13). Species comprised of frequent: hawthorn, sycamore, crack willow (*Salix fragilis*) and pedunculate oak (*Quercus robur*).

Scattered broadleaved trees were located along the western edge of the western section of the River Mersey, south of Forrest Way. Species comprised of willow (*Salix sp.*), alder and dogwood (*Cornus sanguinea*).

Broad-leaved parkland scattered trees were also located between the two sections of the River Mersey. It ran along the eastern bank of the western section of the River Mersey and along the public footpath (F14). This habitat also ran along the southern edge of Forrest Way and Barnard Street. Species comprised of: hawthorn, willow (*Salix sp.*), elder and aspen (*Populus tremula*).

Two strips of scattered trees were present at the southern and eastern end of Morley Common (F15), these were young trees, species comprised of: sycamore, alder, and Rowan (*Sorbus aucuparia*). Additionally, an area of mature scattered trees is found to the north end of Morley Common, species comprised of frequent: oak, sycamore, willow, and ash. The ground layer comprised of tall ruderal species.

The north-eastern boundary of Runcorn and Catchford Canal (F16), beyond the marginal vegetation was an area of tall willow trees. The ground layer comprised of nettle.

Two small sections of scattered trees located just south of Baronet Road (F17), within newly seeded improved grassland, silver birch and cherry (*Prunus sp.*) were abundant.

4.2.1.4 Mixed Parkland Scattered Trees (A3.3)

The most dominant woodland type in Sankey Valley Park was mixed parkland scattered trees (F18). It was located in the northern part of Sankey Valley Park and provides screening from the A57. The trees were immature to semi-mature in age and the canopy consisted of sweet chestnut (*Castanea sativa*), field maple (*Acer campestre*), ash, horse chestnut (*Aesculus hippocastanum*), sessile oak, common lime (*Tilia x europaea*), downy willow (*Salix lapponum*), hawthorn and yew (*Taxus baccata*). Within the understory perennial ryegrass was abundant. Frequently recorded species included ribwort plantain, dandelion, cleavers, Yorkshire-fog and red fescue (*Festuca rubra*). Occasionally occurring species included cow parsley and rosebay willowherb. Spear thistle occurred locally occasionally.

4.2.1.5 Semi-improved Neutral Grassland (B2.2) and Scrub Dense/Continuous (A2.1) mosaic

Along the southern edge of Forrest Way and Barnard Street was a strip of scrub and semi-improved neutral grassland mosaic, adjacent to the broad-leaved parkland strip (F19). The species composition of the grassland was similar to the ephemeral/short perennial adjacent, but the sward was denser and taller. Abundant bramble was recorded within the scrub areas.

4.2.1.6 Improved Grassland (B4)

Two small areas of newly seeded Improved grassland were located just south of Baronet Road (F20), it was dominated by perennial ryegrass and forb species comprised of occasional: white clover (*Trifolium repens*), buttercup (*Ranunculus* sp.), and common daisy (*Bellis perennis*).

4.2.1.7 Poor Semi-Improved Grassland (B6)

Semi-improved species poor grassland areas were located either side of the western section of the River Mersey, where Forrest Way crosses the river. To the east of this section of the river, patches were recorded on the southern road verges of Forrest Way and along the edges of public footpaths (F21). Species comprised of: common ragwort, annual meadow-grass, ribwort plantain, dandelion, Himalayan balsam, creeping thistle (*Cirsium arvense*), avens species (*Geum* sp.), horsetail, marsh woundwort, hairy tare, and green alkanet (*Pentaglottis sempervirens*).

A strip was also recorded to the east of this section of the River Mersey, along the northern edges of the roundabout (F22). Species comprised of: cock's-foot grass, false oat-grass, ribwort plantain, common ragwort, colt's-foot, sheep's fescue, annual meadow-grass, bramble, dandelion, common cranesbill, cleavers, creeping thistle, and red clover.

4.2.1.8 Bracken (C.1)

A small patch of bracken was located along Sankey Brook, south of Old Liverpool Road. Bracken was the most dominant, additional species comprised of occasional: cranesbill, greater plantain, annual meadow-grass, colt's-foot, creeping thistle, common hogweed, cleavers, yarrow (*Achillea millefolium*), greater willowherb (*Epilobium hirsutum*), Himalayan Balsam nettle and rapeseed (*Brassica napus*).

4.2.1.9 Tall Ruderal (C3.1)

Tall ruderal patches were located throughout the route.

A tall ruderal strip was located along the northeast bank of the pond within Sankey Valley Park (F23). Species comprised of: water mint (*Mentha aquatica*), yellow flag iris (*Iris pseudacorus*),

rosebay willowherb, cleavers, alder regeneration, willow regeneration, creeping buttercup, false oat-grass, nettle, smooth meadow-grass (*Poa pratensis*), bush vetch and horsetail.

A tall ruderal strip was located south of Forrest Way either side of the fence (F24). Species comprised of occasional: nettle, rosebay willowherb, greater willowherb, Himalayan balsam, common reed and hogweed.

Another strip was also observed on the west bank of the western section of the River Mersey, south of Forrest Way (F25). Species comprised of occasional: nettle, rosebay willowherb, Himalayan balsam, common reed and hogweed. North of Forrest Way (F26) species comprised of occasional: Himalayan balsam, Japanese Knotweed, nettle, cow parsley, cleavers, broadleaved dock and rosebay willowherb.

Areas of tall ruderal were recorded along Eastford road particularly around the east side of the railway bridge (F29), and formed the ground layer to the scattered trees found in the northern end of Morley Common (F28). Himalayan balsam dominated, spear thistle and nettle were frequent. Additionally, giant hogweed was recorded in areas of tall ruderal along Eastford road and the River Mersey (F27).

4.2.1.10 Tall Ruderal (C3.1) and scrub (A2) mosaic

Tall ruderal and scrub mosaic was located around the railway bridge (F30). Himalayan balsam dominated ruderal areas whereas bramble and Japanese knotweed (TR1) dominated dense scrub areas.

4.2.1.11 Tall Ruderal (C3.1) and Semi-Improved Neutral Grassland (B2.2) mosaic

A strip of semi-improved neutral grassland and tall ruderal mosaic ran adjacent to the Sankey Brook to the north (F31). Species comprised of: timothy (*Phleum pratense*), common ragwort, ribwort plantain, Yorkshire-fog, creeping bent, false oat-grass, perennial ryegrass, sorrel, cranesbill, rosebay willowherb, cleavers, common nettle, common hogweed, common reed, creeping thistle and bush vetch.

4.2.1.12 Tall Ruderal (C3.1) and Marshy Grassland (B5) mosaic

Tall ruderal and marshy grassland mosaics were recorded in sections along the route.

An area was recorded adjacent to St Helens Canal to the southeast. Species comprised of occasional: Himalayan balsam, nettle, cock's-foot, cleavers, common reed, cow parsley, ivy (*Hedera helix*), false oat-grass and creeping thistle.

A mosaic of tall ruderal and marshy grassland was recorded on the western bank of the western section of the River Mersey, north of Forrest Way (F32). Abundant species recorded were Himalayan balsam and common reed.

A mosaic was also located between the two sections of the River Mersey, adjacent to the arable field (F33). Species recorded here included the following abundant species Himalayan balsam and common reed. Occasionally occurring species included common hogweed, common nettle, creeping thistle and hedge bindweed.

4.2.1.13 Tall Ruderal (C3.1) and Poor Semi-Improved Grassland (B6) mosaic

A mosaic of tall ruderal and semi-improved poor grassland was located on the western bank of the western section of the River Mersey, immediately north of Forrest Way. The sward height was roughly 20cm and species recorded included the following abundant species; false oat-grass,

perennial ryegrass and red fescue. Frequent species recorded included cock's-foot and rosebay willowherb. Common reed was recorded occasionally.

4.2.1.14 Marginal Vegetation (F2.1)

Sections of the running water bodies along the route had marginal vegetation.

Small patches were located along Sankey Brook dominated by common reed (F34). A dense strip was located along the east and west banks of the River Mersey which comprised of common reed (F25). A strip of dense Common Reed follows northern boundary of the Runcorn and Catchford Canal (F34).

4.2.1.15 Standing Water (G1)

A permanent pond was located within Sankey Valley Park (F23. TG2). Vegetation growing within the pond included; yellow flag iris, water mint, common sedge, white lily (*Lilium candidum*), water lily sp. and duckweed (*Lemna minor*). A strip of tall ruderal grew along the northeast bank of the pond.

The Runcorn and Catchford Canal is a disused canal and showed signs of eutrophication (areas of duckweed). It is bordered by marginal vegetation to the north and Eastford Road to the south.

4.2.1.16 Running Water (G2)

Several separate running water bodies were located along the route.

Saint Helens Canal was located to the northwest of the route which was a slow flowing water course (F35). The majority of the length was lined by broadleaved parkland scattered trees, amenity grassland, scrub and tall ruderal. Small sections had strips of marginal vegetation growing along the banks. Sections showed signs of eutrophication (areas of duckweed).

Sections of Sankey Brook (36) ran through the site and was lined by broad-leaved parkland scattered trees and tall ruderal.

The Mersey River was a large waterbody running through two sections of the site (F25, F37). Most of the length surveyed had strips of marginal vegetation growing along the banks. Tall ruderal and marshy grassland habitats were also dominant habitats recorded adjacent. Giant hogweed, Himalayan balsam and Japanese knotweed are recorded along its banks.

4.2.1.17 Arable (J1.1)

Large arable fields were recorded between the two sections of the River Mersey, to the east of the roundabout linking to Forrest Way (F38).

Arable fields are found to the southern end of the route, just north of Chester road.

4.2.1.18 Amenity Grassland (J1.2)

The species composition was similar throughout the route.

Species recorded along Cromwell Avenue South (F39) were perennial ryegrass, cock's-foot grass and red fescue which were all abundant in occurrence. White clover and daisy were frequently recorded species and yarrow was locally frequent. Occasionally recorded species were red clover, greater plantain, and creeping buttercup. Bird's foot trefoil (*Lotus corniculatus*) was locally occasional. Species that occurred rarely were ribwort plantain and common ragwort. Other species recorded within Sankey Valley Park (F18) were common vetch, sorrel, pineappleweed

(*Matricaria discoidea*), horsetail, creeping bent, annual meadow-grass, field speedwell (*Veronica persica*), colt's-foot, herb Robert, dandelion, mouse ear (*Cerastium fontanum*).

A small patch of amenity grassland adjacent to Sankey Brook, south of Old Liverpool Road (F40) had a different species composition. Species recorded included yellow archangel (*Cerastium fontanum*), nettle, false oat-grass, perennial ryegrass, cock's-foot grass, greater willowherb, creeping thistle, common cranesbill, meadow avens, bush vetch, broadleaved dock, lords and ladies (*Arum maculatum*) and colt's-foot.

The patch adjacent to Sunflower Drive comprised of red fescue, dandelion, daisy, and perennial ryegrass.

A large area of amenity grassland, known as Morley Common, is found west of Eastford road (F41). It has a dense and close mown sward with rare forb species: dandelion, buttercup, and clover. Other areas of amenity grassland with similar species composition were found along road verges, in particular Chester road.

4.2.1.19 Ephemeral and Short Perennial (J1.3)

A large area of ephemeral/short perennial grassland was recorded in the field south of Barnard Street and Forrest Way (F42). Broad-leaved parkland trees as well as a scrub and semi-improved neutral grassland mosaic lined this habitat to the north. The ground was rocky with a short sward height and lichen was observed growing on the ground. Species comprised of: ribwort plantain, crested dogs tail (*Cynosurus cristatus*), Yorkshire-fog, sticky mouse ear (*Cerastium glomeratum*), colt's-foot, selfheal (*Prunella vulgaris*), common vetch, bush vetch, tufted vetch, red clover, white clover, red fescue, hairy tare, yellow rattle (*Rhinanthus minor*), wild pansy (*Viola tricolor*), forget-me-not (*Myosotis* sp.) and field speedwell (*Veronica persica*).

Ephemeral habitat is found east of the carpark located south of Baronet road (F43). The area within the survey comprised of occasional: mosses, horse tail and lichens. It lacked higher plants in this area, only rare ruderal and vetch species, were recorded. A small area, with very similar species composition is found just west of Eastford Road where it meets a footpath leading east.

4.2.1.20 Species-poor Intact Hedge (J2.1.2)

Species poor hedges were recorded along the edges of the entrance to Sankey Valley Park from Cromwell Avenue South, adjacent to a wooden fence (F44). It was maintained at 1m in height and comprised of privet (*Ligustrum* sp.), cherry laurel (*Prunus laurocerasus*), dogwood, dog rose (*Rosa canina*), bramble, rosebay willowherb and forget-me-not.

A species-poor intact hedge runs between the amenity grassland and Eastford road (F45). It was well managed and was dominated by hawthorn with occasional: bramble, nettle, cleavers, and cow parsley recorded along its edges. Additionally, a hawthorn dominated hedge follows the Morley Common southern boundary where it meets residential areas (F46). Similar hedges followed the internal boundaries of arable fields found at the southern end of the route.

4.2.1.21 Species-poor Hedge with trees (J2.3.2)

A tall unmanaged hedge with trees follows the arable fields most southern boundary, where it follows Chester road (F47). Hawthorn dominated and sycamore frequent with a dense ground layer of occasional bramble, nettle, and cleavers. A strip of grass followed the outer edge of the ground layer and was dominated by false oat-grass.

4.2.1.22 Buildings (J3.6)

There was a mixture of residential and commercial buildings throughout.

A modern and large prefabricated corrugated metal building with a pitched roof is in an area of hardstanding, just south of Baronet road and west of the carpark (F48).

A small bricked building with a flat felt roof is found in the southern end of the carpark located next to Baronet Road (F49).

4.2.1.23 Fence (J2.4)

A wooden fence ran along the edges of the Sankey Valley Park entrance from Cromwell Avenue South, lined by a hedgerow. A small section of fence was also located south of Forrest way, west of the western section of the River Mersey.

A tall fence is located following the scrub located on the southern boundary of the carpark.

A tall metal and spike fence follows also follows the perimeter of a warehouse building located west of the carpark.

4.2.1.24 Bare ground (J4)

Patches of bare ground were recorded along the route. A patch was located within the mixed parkland woodland to the north of Sankey Valley Park. Species recorded here included some bramble and the following pioneer species; creeping buttercup and greater plantain.

4.2.1.25 Hardstanding (J5)

Hardstanding was located throughout the length of the route consisting of roads, pavements, and public footpaths. A carpark is located just south of Baronet road (F50).

4.2.2 Green Route

4.2.2.1 Continuous Scrub (A2.1)

Scrub was recorded along the length of the route with a similar species composition throughout.

Species recorded in scrub areas within Sankey Valley Park (F2) included abundant bramble; frequent rosebay willowherb, common ragwort, and Yorkshire-fog.

The patches to the southern side of Liverpool Old Road (F3) had a greater species composition including abundant bramble; frequent elder, and hazel; occasional cow parsley, hedge bindweed, nettle, rosebay willowherb, broadleaved dock, herb Robert, common comfrey, common ragwort, and spear thistle.

Scrub areas to the south of Forrest Way (F4) (west of the western section of the River Mersey) included bramble, hedge bindweed, common reed, common hogweed, nettle, creeping bent, cleavers, Himalayan balsam, early purple flowering orchid, sorrel, bush vetch, common vetch, marsh woundwort, hairy tare, horsetail.

Scrub was located to the east of the western section of the River Mersey, north and south of Forrest Way. Species comprised of: bramble, cow parsley, common hogweed, false oat-grass, common ragwort, Yorkshire-fog, annual meadow-grass, tufted vetch, hairy tare and bush vetch.

4.2.2.2 Scattered Scrub (A2.2) and Poor Semi-Improved Grassland (B6) mosaic

A small strip of scattered scrub and poor semi-improved grassland mosaic was located along the eastern bank of St Helens Canal (F10). Species included false barley grass and bramble.

Another small strip was located adjacent to the roundabout leading to Forrest Way (F11). Scrub species comprised of; bramble, cow parsley, common hogweed, false oat-grass, common ragwort, Yorkshire-fog, annual meadow-grass, tufted vetch, hairy tare and bush vetch. Within the grassland areas species recorded were cock's-foot grass, false oat-grass, ribwort plantain, common ragwort, colt's-foot, sheep's fescue, annual meadow-grass, bramble, dandelion, common cranesbill, cleavers.

4.2.2.3 Broad-leaved Parkland Scattered Trees (A3.1)

Broad-leaved parkland scattered trees were located throughout the length of the route.

This habitat was recorded within the southern section of Sankey Valley Park (F12). The woodland lined amenity grassland areas with public footpaths running through. The canopy was comprised of frequent downy birch, alder, hawthorn, silver birch, holly and sessile oak. The understory was comprised of frequent nettle, cleavers, and creeping buttercup. A stand of Himalayan balsam was also observed.

The broad-leaved trees lined the southern side of Barnard Street and Forrest Way (F13). Species recorded included hawthorn, sycamore, crack willow and pedunculate oak.

Scattered broadleaved trees were located along the western edge of the western section of the River Mersey, south of Forrest Way. Species comprised of willow, alder and dogwood.

Broad-leaved parkland scattered trees were also located between the two sections of the River Mersey. It ran along the eastern bank of the western section of the River Mersey and along the public footpath (F14). This habitat also ran along the southern edge of Forrest Way and Barnard Street. Species recorded included frequent hawthorn, willow, elder and aspen.

4.2.2.4 Mixed Parkland Scattered Trees (A3.3)

The most dominant woodland type in Sankey Valley Park was mixed parkland scattered trees (F18). It was located in the northern part of Sankey Valley Park and provides screening from the A57. The trees were immature to semi-mature in age and the canopy consisted of sweet chestnut, field maple, ash, horse chestnut, sessile oak, lime, downy willow (*Salix lapponum*), hawthorn and yew. Within the understory perennial ryegrass was abundant. Frequently recorded species included ribwort plantain, dandelion, cleavers, Yorkshire-fog and red fescue. Occasionally occurring species included cow parsley and rosebay willowherb. Spear thistle occurred locally occasionally.

4.2.2.5 Semi-improved Neutral Grassland (B2.2) and Scrub Dense/Continuous (A2.1) mosaic

Along the southern edge of Forrest Way and Barnard Street was a strip of scrub and semi-improved neutral grassland mosaic, adjacent to the broad-leaved parkland strip (F19). The species composition of the grassland was similar to the ephemeral/short perennial adjacent, but the sward was denser and taller. Abundant bramble was recorded within the scrub areas.

4.2.2.6 Poor Semi-Improved Grassland (B6)

Semi-improved species poor grassland areas were located either side of the western section of the River Mersey, where Forrest Way crosses the river. To the east of this section of the river,

patches were recorded on the southern road verges of Forrest Way and along the edges of public footpaths (F21). Species comprised of: common ragwort, annual meadow-grass, ribwort plantain, dandelion, Himalayan balsam, creeping thistle, avens species, horsetail, marsh woundwort, hairy tare, and green alkanet.

A strip was also recorded to the east of this section of the River Mersey, along the northern edges of the roundabout (F22). Species comprised of: cock's-foot, false oat-grass, ribwort plantain, common ragwort, colt's-foot, sheep's fescue, annual meadow-grass, bramble, dandelion, common cranesbill, cleavers, creeping thistle, and red clover.

4.2.2.7 Tall Ruderal (C3.1)

Tall ruderal patches were located throughout the route.

A tall ruderal strip was located along the northeast bank of the pond within Sankey Valley Park (F23). Species comprised of water mint, yellow flag iris, rosebay willowherb, cleavers, alder regeneration, willow regeneration, creeping buttercup, false oat-grass, nettle, smooth meadow-grass, bush vetch and horsetail.

A tall ruderal strip was located south of Forrest Way either side of the fence (F24). Species comprised of frequent: nettle, rosebay willowherb, greater willowherb, Himalayan balsam, common reed, and hogweed.

Another strip was also observed on the west bank of the western section of the River Mersey, south of Forrest Way (F25). Species comprised of frequent: nettle, rosebay willowherb, Himalayan balsam, common reed, and hogweed. North of Forrest Way (F26) species comprised of Himalayan balsam, Japanese Knotweed, nettle, cow parsley, cleavers, broadleaved dock, and rosebay willowherb.

Additionally, giant hogweed was recorded in areas of tall ruderal along Easftord road and the River Mersey (F27).

4.2.2.8 Tall Ruderal (C3.1) and Semi-Improved Neutral Grassland (B2.2) mosaic

A strip of semi-improved neutral grassland and tall ruderal mosaic ran adjacent to the Sankey Brook to the north (F31). Species comprised of occasional: timothy, common ragwort, ribwort plantain, Yorkshire-fog, creeping bent, false oat-grass, perennial ryegrass, sorrel, cranesbill, rosebay willowherb, cleavers, nettle, common hogweed, common reed, creeping thistle, and bush vetch.

4.2.2.9 Tall Ruderal (C3.1) and Marshy Grassland (B5) mosaic

Tall ruderal and marshy grassland mosaics were recorded in sections along the route.

An area was recorded adjacent to St Helen's Canal to the southeast. Species comprised of: Himalayan balsam, nettle, cock's-foot, cleavers, common reed, cow parsley, ivy, false oat-grass and creeping thistle.

A mosaic of tall ruderal and marshy grassland was recorded on the western bank of the western section of the River Mersey, north of Forrest Way (F32). Abundant species recorded were Himalayan balsam and common reed.

A mosaic was also located between the two sections of the River Mersey, adjacent to the arable field (F33). Species recorded here included the following abundant species Himalayan balsam and common reed. Occasionally occurring species included hogweed, nettle, creeping thistle and hedge bindweed.

4.2.2.10 Tall Ruderal (C3.1) and Poor Semi-Improved Grassland (B6) mosaic

A mosaic of tall ruderal and semi-improved poor grassland was located on the western bank of the western section of the River Mersey, immediately north of Forrest Way. The sward height was roughly 20cm and species recorded included the following abundant species; false oat-grass, perennial ryegrass and red fescue. Frequent species recorded included cock's-foot and rosebay willowherb. Common reed was recorded occasionally.

Another mosaic strip was recorded along the western road verge of Eastford Road and an arable field. Species comprised of occasional: common nettle, common hogweed, cow parsley, cleavers, perennial ryegrass, false oat-grass, cock's-foot, Japanese knotweed, giant hogweed, rosebay willowherb, and bramble.

4.2.2.11 Marginal Vegetation (F2.1)

Sections of the running water bodies along the route had marginal vegetation.

Small patches were located along Sankey Brook dominated by common reed (F34). A dense strip was located along the east and west banks of the River Mersey which comprised of common reed (F25).

4.2.2.12 Standing Water (G1)

A permanent pond was located within Sankey Valley Park (F23. TG2). Vegetation growing within the pond included; yellow flag iris, water mint, common sedge, white lily, water lily sp. and duckweed. A strip of tall ruderal grew along the northeast bank of the pond.

4.2.2.13 Running Water (G2)

Several separate running water bodies were located along the route.

Saint Helens Canal was located to the northwest of the route which was a slow flowing water course (F35). The majority of the length was lined by broadleaved parkland scattered trees, amenity grassland, scrub and tall ruderal. Small sections had strips of marginal vegetation growing along the banks. Sections showed signs of eutrophication (areas of duckweed).

Sections of Sankey Brook (36) ran through the site and was lined by broad-leaved parkland scattered trees and tall ruderal.

The Mersey River was a large waterbody running through two sections of the site (F25, F37). Most of the length surveyed had strips of marginal vegetation growing along the banks. Tall ruderal and marshy grassland habitats were also dominant habitats recorded adjacent. Giant hog weed, Himalayan balsam and Japanese knotweed are recorded along its banks.

4.2.2.14 Arable (J1.1)

Large arable fields were recorded between the two sections of the River Mersey, to the east of the roundabout linking to Forrest Way (F38).

4.2.2.15 Amenity Grassland (J1.2)

The species composition was similar throughout the route.

Species recorded along Cromwell Avenue South (F39) were perennial ryegrass, cock's-foot grass and red fescue which were all abundant in occurrence. White clover and daisy were frequently recorded species and yarrow was locally frequent. Occasionally recorded species were red clover, greater plantain, and creeping buttercup. Bird's foot trefoil was locally occasional. Species

that occurred rarely were ribwort plantain and common ragwort. Other species recorded within Sankey Valley Park (F18) were common vetch, sorrel, pineapple weed, horsetail, creeping bent, annual meadow-grass, field speedwell, colt's-foot, herb Robert, dandelion, mouse ear.

The patch adjacent to Sunflower Drive comprised of red fescue, dandelion, daisy, and perennial ryegrass.

4.2.2.16 Ephemeral and Short Perennial (J1.3)

A large area of ephemeral/short perennial grassland was recorded in the field south of Barnard Street and Forrest Way (F42). Broad-leaved parkland trees as well as a scrub and semi-improved neutral grassland mosaic lined this habitat to the north. The ground was rocky with a short sward height and lichen was observed growing on the ground. Species comprised of: ribwort plantain, crested dogs tail, Yorkshire-fog, sticky mouse ear, colt's-foot, selfheal, common vetch, bush vetch, tufted vetch, red clover, white clover, red fescue, hairy tare, yellow rattle, wild pansy, forget-me-not, and field speedwell.

4.2.2.17 Species-poor Intact Hedge (J2.1.2)

Species poor hedges were recorded along the edges of the entrance to Sankey Valley Park from Cromwell Avenue South, adjacent to a wooden fence (F44). It was maintained at 1m in height and comprised of privet, cherry laurel, dogwood, dog rose, bramble, rosebay willowherb and forget-me-not.

4.2.2.18 Buildings (J3.6)

There was a mixture of residential and commercial buildings throughout.

4.2.2.19 Fence (J2.4)

A wooden fence ran along the edges of the Sankey Valley Park entrance from Cromwell Avenue South, lined by a hedgerow. A small section of fence was also located south of Forrest way, west of the western section of the River Mersey.

4.2.2.20 Bare ground (J4)

Patches of bare ground were recorded along the route. A patch was located within the mixed parkland woodland to the north of Sankey Valley Park. Species recorded here included some bramble and the following pioneer species; creeping buttercup and greater plantain.

4.2.2.21 Hardstanding (J5)

Hardstanding was located throughout the length of the route consisting of roads, pavements, and public footpaths.

4.2.3 Orange Route

4.2.3.1 Plantation Woodland (A1)

A fenced planted broadleaved woodland with a dense canopy of immature trees(F51) with footpaths throughout and recent coppicing (F52) was located just west of Gatewarth Recycling centre in between Sankey Brook and St Helen's Canal. The canopy varied through the woodland, however, Scots pine (*Pinus sylvestris*), alder, ash, willow, sycamore, and birch were frequent. The under canopy, where present, again varied but comprised of frequent: dog rose, elder, hazel, cherry, blackthorn (*Prunus spinosa*), and hawthorn. Ground layers varied greatly: in areas with a

dense canopy the ground layer was bare or dense abundant bramble was present (F53); in open areas, small patches of semi-improved grassland were noted (TF1); and towards the edges of the woodland ruderal plants were found (F54), comprised of abundant: greater/rosebay willowherb, Himalayan Balsam, and horsetail.

4.2.3.2 Continuous Scrub (A2)

Scrub was recorded along the length of the route with a similar species composition throughout.

The patches to the southern side of Liverpool Old Road (F3) had a greater species composition including abundant bramble; frequent elder and hazel; occasional cow parsley, hedge bindweed, nettle, rosebay willowherb, broadleaved dock, herb Robert, common comfrey, common ragwort, and spear thistle.

Scrub areas to the south of Forrest Way (F4) (west of the western section of the River Mersey where comprised of: bramble, hedge bindweed, common reed, common hogweed, nettle, creeping bent, cleavers, Himalayan balsam, early purple flowering orchid, sorrel, bush vetch, common vetch, marsh woundwort, hairy tare, horsetail.

Scrub was located to the east of the western section of the River Mersey, north and south of Forrest Way. Species comprised of: abundant bramble; frequent cow parsley, common hogweed, false oat-grass, common ragwort, Yorkshire-fog, annual meadow-grass, tufted vetch, hairy tare and bush vetch.

Scrub was located around the railway bridge where it crosses Eastford Road and was dominated by Japanese knotweed or bramble (F5). Scrub patches also lined the road verges of Eastford Road (F6), species comprised of: abundant bramble; occasional nettle, false oat-grass, cock's-foot grass, hedge bindweed, common hogweed, perennial ryegrass, ribwort plantain, common comfrey, cleavers, giant hogweed, Japanese knotweed, greater plantain, common ragwort, Yorkshire-fog, rosebay willowherb, red clover and broadleaved dock.

An area of tall dense scrub is located in-between the carpark found next to Baronet road and Manchester Ship Canal (F7). It is dominated by gorse, with frequent ash and sycamore trees scattered within. The ground layer was bare, apart from a strip on its outer northern edge. This strip contained: bramble, nettle, ribwort plantain, false oats, dandelion and horsetail. There also appeared to be wildlife tracks along the outer edge (F7).

4.2.3.3 Broad-leaved Parkland Scattered Trees (A3.1)

Broad-leaved parkland scattered trees were located throughout the length of the route.

Within the playing field in between Sankey way and Liverpool Road there are various locations of scattered trees. Towards the northern boundary along the A57, is a dense structured area of screening trees (F55). The canopy is around 20m in height and comprised of frequent: willow, silver birch, and ash. Dog rose, hawthorn, sycamore, and oak, are abundant in the under canopy. The ground layer is bare and there are signs of fly tipping and regular use from the public (F56). Within the centre of the playing field is an area of scattered trees (F57), which comprised of frequent: ash, willow, oak, rowan ash and alder. The ground layer was dominated by perennial ryegrass, other species included occasional: dock, rosebay willowherb, dandelion, soft rush (*Juncus effusus*) and bindweed. Near the southern end of the playing field there are few immature scattered trees (F58), which frequent: alder, rowan ash, and sycamore.

An area of tall screening trees is located just south of where the St Helen's Canal passes through this route (F59). The canopy is dense and ash and willow are abundant; some of the trees had a

dense coverage of ivy. The under canopy was sparse with occasional elder and willow. The ground layer is a dense area of ruderal species dominated by rosebay willowherb.

The broad-leaved trees lined the southern side of Barnard Street and Forrest Way (F13). Species comprised of frequent: hawthorn, sycamore, crack willow and pedunculate oak.

Scattered broadleaved trees were located along the western edge of the western section of the River Mersey, south of Forrest Way. Species comprised of frequent: willow, alder and dogwood.

Broad-leaved parkland scattered trees were also located between the two sections of the River Mersey. It ran along the eastern bank of the western section of the River Mersey and along the public footpath (F14). This habitat also ran along the southern edge of Forrest Way and Barnard Street. Species comprised of frequent: hawthorn, willow, elder and aspen.

Two strips of scattered trees were present at the southern and eastern end of Morley Common (F15), these were young trees, species comprised of frequent: sycamore, alder, and rowan ash. Additionally, an area of mature scattered trees is found to the north end of Morley Common, where species comprised of frequent: oak, sycamore, willow, and ash. Tall ruderal species dominated the ground layer.

The north-eastern boundary of Runcorn and Catchford Canal (F16), beyond the marginal vegetation was an area of tall willow trees. Ruderal species comprised the ground layer, nettle was abundant.

Two small sections of scattered trees located just south of Baronet Road (F17), within newly seeded improved grassland, species comprised of abundant: silver birch and cherry (*Prunus sp.*).

4.2.3.4 Semi-improved Neutral Grassland species good (B2.2)

A large area of tall species-good semi-improved neutral grassland is found on a flat area of land between the planted woodland just west of Gatewath recycling centre and screening trees just south of St Helen's Canal where it passes through this route (F60). It is mostly uniformly structured and at a height of around 30cm, species comprised of frequent: Yorkshire-fog, ruff meadow-grass (*Poa trivialis*), false oat-grass, cock's-foot, red fescue, sheep's fescue, meadow foxtail (*Alopecurus pratensis*), creeping bent and meadow bent (*Agrostis stolobifera*). Some small areas of shallow depression are more open, less densely structured and contained marsh species: abundant soft Rush and meadow butter (*Ranunculus acris*) cup; rare southern marsh orchid (*Dactylorhiza praetermissa*). Where this habitat transitioned into tall ruderal to the north, it mixed into abundant dock, nettle, and rosebay willowherb. There were very limited and scattered scrubs: bramble and hawthorn.

Small patches of specie-good semi-improved neutral grassland were located within the planted woodland where the canopied opened (TF1), species comprised of frequent: crested dog tail, Yorkshire-fog, false oat, sheep's fescue, hairy sedge (*Carex hirta*), red fescue, smooth meadow-grass, annual meadow-grass. Other species included: occasional creeping buttercup and meadow buttercup; rare early purple orchid (*Orchis mascula*), southern marsh orchid, herb Robert, and Himalayan balsam.

4.2.3.5 Semi-improved Neutral Grassland (B2.2) and Scrub Dense/Continuous (A2.1) mosaic

Along the southern edge of Forrest Way and Barnard Street was a strip of scrub and semi-improved neutral grassland mosaic, adjacent to the broad-leaved parkland strip (F19). The species composition of the grassland was similar to the ephemeral/short perennial adjacent, but the sward was denser and taller. Abundant bramble was recorded within the scrub areas.

4.2.3.6 Semi-improved Neutral Grassland species good (B2.2) and C3.1 Tall Ruderal mosaic

Just east of the planted woodland, in full sun at the top of a drain and Sankey Brook, tall ruderal transitions into a mosaic with semi-improved grassland (F61). Grass and ruderal species are equally mixed and species comprised of frequent: common nettle, cow parsley, annual meadow-grass, perennial ryegrass, red fescue, creeping gent, and false oat-grass.

4.2.3.7 Improved Grassland (B4)

Two small areas of newly seeded Improved grassland were located just south of Baronet Road (F20), it was dominated by perennial ryegrass and forb species comprised of occasional: white clover, buttercup, and common daisy.

4.2.3.8 Poor Semi-Improved Grassland (B6)

Poor semi-improved grassland areas were located either side of the western section of the River Mersey, where Forrest Way crosses the river. To the east of this section of the river, patches were recorded on the southern road verges of Forrest Way and along the edges of public footpaths (F21). Species comprised of: common ragwort, annual meadow-grass, ribwort plantain, dandelion, Himalayan balsam, creeping thistle, avens species, horsetail, marsh woundwort, hairy tare, and green alkanet.

A strip was also recorded to the east of this section of the River Mersey, along the northern edges of the roundabout (F22). Species comprised of: cock's-foot grass, false oat-grass, ribwort plantain, common ragwort, colt's-foot, sheep's fescue, annual meadow-grass, bramble, dandelion, common cranesbill, cleavers, creeping thistle, and red clover.

4.2.3.9 Marshy Grassland (B5)

An area of marshy grassland was recorded between St Helen's Canal and Sankey Brook, near Gatewath recycling centre (F62). Species comprised of: frequent common reed, marsh woundwort, false oat-grass, bush vetch, red fescue and Yorkshire-fog; occasional horsetail red campion (*Silene dioica*), trefoil species (*Lotus sp.*), meadow buttercup, creeping thistle (*Cirsium arvense*), rosebay willowherb, common ragwort, hairy sedge, tufted vetch, dog rose, silver weed (*Argentina anserina*), hairy tare and cornflower (*Centaurea cyanus*).

4.2.3.10 Tall Ruderal (C3.1)

Tall ruderal patches were located throughout the route.

A large dense and homogenous structured area of ruderal species surrounds the drain and Sankey Brook banks, just west of the recycling centre (F63). Species comprised of abundant: marsh willowherb, common hogweed, nettle, and Himalayan balsam. There are small areas where bramble and common reeds are frequent.

A dense strip of ruderal vegetation, dominated by rosebay willowherb and occasional bramble, follows between the track running parallel to St Helen's Canal and screening trees to the north (F64).

A tall ruderal strip was located south of Forrest Way either side of the fence (F24). Species comprised of frequent: nettle, rosebay willowherb, greater willowherb, Himalayan balsam, common reed and common hogweed.

Another strip was also observed on the west bank of the western section of the River Mersey, south of Forrest Way (F25). Species comprised of nettle, rosebay willowherb, Himalayan balsam,

common reed and hogweed. North of Forrest Way (F26) species comprised of Himalayan balsam, Japanese Knotweed, nettle, cow parsley, cleavers, broadleaved dock, and rosebay willowherb.

Areas of tall ruderal were recorded along Eastford road particularly around the east side of the railway bridge (F29), and formed the ground layer to the scattered trees found in the northern end of Morley Common (F28). Himalayan balsam dominated, spear thistle and nettle frequent. Additionally, giant hogweed was recorded in areas of tall ruderal along Eastford road and the River Mersey (F27).

4.2.3.11 Tall Ruderal (C3.1) and scrub (A2) mosaic

Tall ruderal and scrub mosaic was located around the railway bridge (F30). Himalayan balsam dominated ruderal whereas bramble and Japanese knotweed (TR1) dominated dense scrub areas.

4.2.3.12 Tall Ruderal (C3.1) and Marshy Grassland (B5) mosaic

Tall ruderal and marshy grassland mosaics were recorded in sections along the route.

A mosaic of tall ruderal and marshy grassland was recorded on the western bank of the western section of the River Mersey, north of Forrest Way (F32). Abundant species recorded were Himalayan balsam and common reed.

A mosaic was also located between the two sections of the River Mersey, adjacent to the arable field (F33). Species recorded here included the following abundant species Himalayan balsam and common reed. Occasionally occurring species included hogweed, nettle, creeping thistle and hedge bindweed.

4.2.3.13 Tall Ruderal (C3.1) and Poor Semi-Improved Grassland (B6) mosaic

A mosaic of tall ruderal and semi-improved poor grassland was located on the western bank of the western section of the River Mersey, immediately north of Forrest Way. The sward height was roughly 20cm and species recorded included the following abundant species; false oat-grass, perennial ryegrass and red fescue. Frequent species recorded included cock's-foot and rosebay willowherb. Common reed was recorded occasionally.

4.2.3.14 Marginal Vegetation (F2.1)

Sections of the running water bodies along the route had marginal vegetation.

A strip follows the St Helens Canal northern edge, which comprised of common reed (F65).

A dense strip was located along the east and west banks of the River Mersey which comprised of common reed (F25). A strip of dense Common Reed follows northern boundary of the Runcorn and Catchford Canal (F34).

4.2.3.15 Standing Water (G1)

The Runcorn and Catchford Canal is a disused canal and showed signs of eutrophication (areas of duckweed). It bordered by marginal vegetation to the north and Eastford Road to the south.

4.2.3.16 Running Water (G2)

Several separate running water bodies were located along the route.

Sections of Sankey Brook (36) ran through the site and was lined by broad-leaved parkland scattered trees and tall ruderal.

A narrow and shallow drain, with a silted bed flows just west of the recycling centre from the St Helens Canal to the Sankey Brook (F63). It has very steep banks covered in dense ruderal vegetation.

Saint Helens Canal was located to the northwest of the route which was a slow flowing water course (F35). The majority of the length was lined by broadleaved parkland scattered trees, amenity grassland, scrub and tall ruderal. Small sections had strips of marginal vegetation growing along the banks. Sections showed signs of eutrophication (areas of duckweed).

The Mersey River was a large waterbody running through two sections of the site (F25, F37). Most of the length surveyed had strips of marginal vegetation growing along the banks. Tall ruderal and marshy grassland habitats were also dominant habitats recorded adjacent. Giant hog weed, Himalayan balsam and Japanese knotweed are recorded along its banks.

4.2.3.17 Arable (J1.1)

Large arable fields were recorded between the two sections of the River Mersey, to the east of the roundabout linking to Forrest Way (F38).

Arable fields are found to the southern end of the route, just north of Chester road.

4.2.3.18 Amenity Grassland (J1.2)

A large area of close mown grassland with playground areas situated between the A57 and Marina Avenue, surrounded by residential development (F66). The western boundary is a strip dominated by horsetail, whereas the eastern boundary is a fence with very scattered introduced shrub species, including frequent cotoneaster. Forb species included frequent: daisy, buttercup, clover, ribwort.

The patch adjacent to Sunflower Drive comprised of red fescue, dandelion, daisy, and perennial ryegrass.

A large area of amenity grassland, known as Morley Common, is found west of Eastford road (F41). It has a dense and close mown sward with rare forb species: dandelion, buttercup, and clover. Other areas of amenity grassland with similar species composition were found along road verges, in particular Chester road.

4.2.3.19 Ephemeral and Short Perennial (J1.3)

A large area of ephemeral/short perennial grassland was recorded in the field south of Barnard Street and Forrest Way (F42). Broad-leaved parkland trees as well as a scrub and semi-improved neutral grassland mosaic lined this habitat to the north. The ground was rocky with a short sward height and lichen was observed growing on the ground. Species recorded included ribwort plantain, crested dogs tail, Yorkshire-fog, sticky mouse ear, colt's-foot, selfheal, common vetch, bush vetch, tufted vetch, red clover, white clover, red fescue, hairy tare, yellow rattle, wild pansy, forget-me-not and field speedwell.

Ephemeral habitat is found east of the carpark located south of Baronet road (F43). The area within the survey was dominated by mosses, horse tail and lichens. It lacked higher plants in this area, only rare ruderal and vetch species, were recorded. A small area, with of very similar species composition is found just west of Eastford Road where it meets a footpath leading east.

4.2.3.20 Introduced Shrub (J1.4)

Along the edges of the entrance to the playing field (amenity grassland) from Marina Avenue are areas of short introduced shrub species, including frequent cotoneasters, and cherry trees.

4.2.3.21 Species-poor intact Hedge (J2.1.2)

Along the A57 is a tall, dense, and unmanaged hedge dominated blackthorn with frequent hawthorn (F66). Towards the western end there is an area of mixed tall and unmanaged frequent species: elder, blackthorn, dog rose, sycamore and a dense ground layer of dense Ivy.

Part of the southern boundary of the playing field near the A57 is a tall unmanaged hedge dominated by hawthorn (F67) with frequent hazel. The western edge has recently been felled and mulched, now, saplings and ruderal species are present (F68) species comprised of: thistle, rosebay willowherb, wood avens (*Geum urbanum*), cleavers, horsetail, welsh poppy (*Meconopsis cambric*), herb Robert, ramsons (*Allium ursinum*), holly, ash, and hazel.

A species-poor intact hedge runs between the amenity grassland and Eastford road (F45). It was well managed and was dominated by hawthorn. Frequent bramble, nettle, cleavers, and cow parsley were recorded along its edges. Additionally, a hawthorn dominated hedge follows the Morley Common southern boundary where it meets residential areas (F46). Similar hedges followed the internal boundaries of arable field found at the southern end of the route.

4.2.3.22 Species-poor Hedge with trees (J2.3.2)

A tall unmanaged hedge with trees follows the arable fields most southern boundary, where it follows Chester road (F47). Hawthorn dominated and sycamore is frequent with a dense ground layer of abundant bramble, nettle, and cleavers. A strip of grass followed the outer edge of the ground layer and was dominated by false oat-grass.

4.2.3.23 Fence (J2.4)

A tall fence is located following the scrub located on the southern boundary of the carpark.

A tall metal and spike fence follows also follows the perimeter of a warehouse building located west of the carpark.

4.2.3.24 Buildings (J3.6)

There was a mixture of residential and commercial buildings throughout.

Residential housing around Marina Avenue and north of Penketh Business Park vary slightly in structure. However, all houses were made from brick, and most had either a pitched or hipped roof with concrete, asbestos, or natural stone tiles. Houses had either plastic or wood soffits, and/or gutters boards. All the roofs and soffits appeared to be in good condition, although, some houses have hanging tiles around bay windows.

Penketh Business Park contained large warehouse buildings with a mixture of prefabricated and brick walls, with either metal or asbestos pitched roofs.

A modern and large prefabricated corrugated metal building with a pitched roof is in an area of hardstanding, just south of Baronet road and west of the carpark (F48).

A small bricked building with a flat felt roof is found in the southern end of the carpark located next to Baronet Road (F49).

4.2.3.25 Hardstanding (J5)

Hardstanding was located throughout the length of the route consisting of roads, pavements, and public footpaths. A carpark is located just south of Baronet road (F50).

4.2.4 Yellow Route

4.2.4.1 Semi-Natural Broadleaved Woodland (A1)

A dense semi-natural immature woodland runs along the southern end of the Whittle Brook (F70). The canopy comprised of frequent: willow, downy Birch, rowan ash, alder, and oak. The under canopy and edges comprised of frequent: sycamore, willow, hawthorn, hazel. The ground layer is sparse due to a dense canopy, however, in more open areas wild flowers species are present, including occasional: oxeye daisy (*Leucanthemum vulgare*), buttercup, and red champion. There are strips of ruderal vegetation along the central path (F71) where: Himalayan balsam, spear thistle and teasel (*Dipsacus fullonum*) are abundant.

4.2.4.2 Continuous Scrub (A2.1)

An area of dense continuous scrub on a small hill, its situated just south of the track running parallel to the River Mersey where it meets the Sankey Brook (F8); bramble, hawthorn, and willow are abundant. The scrub transitions into tall ruderal at the base of the hill, where rosebay willowherb, marsh willowherb (*Epilobium palustre*), spear thistle, teasel, and common nettle are frequent. Japanese Knotweed was recorded within the scrub, on the eastern edge.

Areas of scrub are scattered along the Whittle Brook (F9); Japanese knotweed, dog Rose, bindweed and bramble are abundant in such areas.

Scrub was located around the railway bridge where it crosses Eastford Road and was dominated by Japanese knotweed or bramble (F5). Scrub patches also lined the road verges of Eastford Road (F6), species comprised of abundant bramble, and nettle, false oat-grass, cock's-foot, hedge bindweed, common hogweed, perennial ryegrass, ribwort plantain, common comfrey, cleavers, giant hogweed, Japanese knotweed, greater plantain, common ragwort, Yorkshire-fog, rosebay willowherb, red clover and broadleaved dock.

An area of tall dense scrub is located in-between the carpark found next to Baronet road and Manchester Ship Canal (F7). It is dominated by gorse, with frequent ash and sycamore trees scattered within. The ground layer was bare apart from a strip on its outer northern edge. This strip contained frequent: bramble, nettle, ribwort plantain, false oats, dandelion and horsetail. There also appeared to be wildlife tracks along the outer edge (F7).

4.2.4.3 Parkland and Scattered Trees (A3)

Some scattered trees follow the Whittle Brook where it flows through improved grassland (F72), species comprised of frequent: ash, willow, and sycamore. Additionally, in this area, a section of tall parkland trees is found within the centre of the improved grassland (F73). It is dominated by sycamore, other species were frequent: elder, hawthorn, willow and cherry.

An area of tall screening trees flanks the southern edge of the path following the St Helens canal. The canopy is tall, around 20m, and dense. Birch and willow are abundant within the canopy, whereas sycamore, willow, and elder are frequent within the under canopy towards the outer edges.

Two strips of scattered trees were present at the southern and eastern end of Morley Common (F15), these were young trees, species included frequent: sycamore, alder and rowan ash. Additionally, an area of mature scattered trees is found to the north end of Morley Common, where several tree species comprised of frequent: oak, sycamore, willow, and ash. Tall ruderal species dominated the ground layer.

The north-eastern boundary of Runcorn and Catchford Canal (F16), beyond the marginal vegetation was an area of tall willow trees. Ruderal species comprised ground layer, nettle was frequent.

Two small sections of scattered trees located just south of Baronet Road (F17), within newly seeded improved grassland, species comprise of abundant: silver birch and cherry.

4.2.4.4 Species Good Semi-Improved Neutral Grassland (B2)

A large area of unmanaged species rich grassland raised on a small hill in full sunlight is located on the western fringe of the survey area where it crosses the Gatewarth Landfill Site (F74). The sward height varied, but was generally around 25cm. It has a mixed structure due to uneven ground and small areas of scrub, tall ruderal, and marsh. Grass species included frequent: cock's-foot grass, false oat-grass, red fescue, Yorkshire-fog, creeping bent and rough meadow-grass. Forb diversity was high and in some areas bird's-foot-trefoil (*Lotus corniculatus*) was abundant, other forbs amongst the sward included frequent: oxeye daisy, red clover, coltsfoot, silver weed, self-heal, tufted vetch, buttercup, ribwort, ribbed melilot (*Melilotus officinalis*), lesser-bird's-foot-trefoil (*Lotus corniculatus*) and black medic (*Medicago lupulina*). Marsh orchid, bee orchid (*Ophrys apifera*) were rare. In other denser areas: bramble, dog rose and gorse were frequent in areas of scrub; rosebay willowherb, knapweed (*Centaurea sp.*), and cow parsley were frequent in tall ruderal areas; common reed, hard rush (*Juncus inflexus*) and false fox-sedge (*Carex otrubae*) were frequent in marsh/wet areas.

4.2.4.5 Species Good Semi-Improved Neutral Grassland (B2) and Marshy grassland (B5) mosaic

A small area of species-good semi-improved grassland is situated between the transition zone of scrub and ruderal, and follows a foot path where there are areas of previous disturbance (F75). Grass species comprised of frequent: cock's-foot grass, Yorkshire-fog, sheep's fescue, red fescue, smooth meadow-grass, ruff meadow-grass, creeping bent, crested dog's-tail, and soft brome (*Bromus hordeaceus*). Forb species comprised of frequent: silverweed, ribwort, white clover, meadow buttercup, creeping buttercup, bird's-foot-trefoil, lesser-bird's-foot-trefoil and meadow vetchling. Wetter areas contained: marsh cinquefoil (*Potentilla palustris*), soft rush, hard rush, and false fox-sedge.

4.2.4.6 Improved Grassland (B4)

Due to limited access, this habitat could not be fully investigated, however, it was clear this habitat was mostly used for grazing; most areas the sward height was around 5cm (F76). There were limited grass species with over 50% perennial ryegrass, but there was a mixed structure between field boundaries (fences) due to grazed and un-grazed areas. To the east and west are residential areas and the Whittle Brook follows the eastern boundary. There are some grassland marsh areas, practically within the southern field, which show signs of poaching and contained (F77). The southern field has a manmade depression within the centre with an earth bund following the Brook. In the northern field, where the field meets outbuildings there is a small earth bank made up of soil, rubbish, and rubble (TD2). There were very limited scattered scrub and trees (<5m) which included occasional: hawthorn, ash, elder, and dog rose. Forb species included occasional: common daisy, white clover, silverweed, ribwort, buttercup, chamomile (*Chamaemelum nobile*), yarrow (*Achillea millefolium*), selfheal, pineappleweed, common ragwort, nettle, and broadleaved dock. There was a large area of Japanese knotweed recorded (TD2 and TD3) and was identified within the north field where it followed the Whittle Brook and along the access road.

Two small areas of newly seeded Improved grassland were located just south of Baronet Road (F20), it was dominated by perennial ryegrass and forb species included rare: white clover, buttercup, and common daisy.

4.2.4.7 Marshy Grassland (B5)

Where the River Mersey crosses this route, there was a dense homogenous sward dominated couch grass (*Elymus repens*), with areas of abundant common reed along the River Mersey (F81).

4.2.4.8 Tall Ruderal (C3.1)

Areas of dense homogenous structured tall ruderal following the Whittle Brook (F78), dominated by marsh Willowherb or Himalayan balsam, but also included frequent: dock, nettle, rosebay willowherb, cleavers, spear thistle, bindweed and cow parsley. Towards the southern end, where the Whittle Brook meets the River Mersey and this habitat is in transition with scrub, areas of previous disturbance and a foot path have recovered to become species good-improved grassland.

Tall ruderal forms two dense strips of vegetation along the canal's southern edge and along the southern edge of the path which runs parallel to the canal. Species comprised of frequent: common hogweed, nettle, marsh willowherb, and dock. Ground layer species included frequent: ribwort, colts foot, white clover, buttercup, dandelion, red campion, oxeye daisy and bird's-foot-trefoil. There were also some small infrequent areas of scrub species: bramble and hawthorn.

Areas of tall ruderal were recorded along Eastford road particularly around the east side of the railway bridge (F29), and formed the ground layer to the scattered trees found in the northern end of Morley Common (F28). Himalayan balsam dominated, spear thistle and nettle were also abundant. Additionally, giant hogweed was recorded in areas of tall ruderal along Eastford road and the River Mersey (F27).

4.2.4.9 Tall ruderal (C3.1) and scrub (A2) mosaic

Small areas of tall ruderal and scrub mosaic ran along the Whittle brook amongst the more humongous habitats. Willowherb species and Himalayan balsam were abundant in tall ruderal areas, bramble dominated scrub areas.

Tall ruderal and scrub mosaic was located around the railway bridge. Himalayan balsam dominated ruderal whereas bramble or Japanese knotweed (TR1) dominated dense scrub areas.

4.2.4.10 Marginal Vegetation (F2.1)

Some areas of Common Reed were noted in patches along the Whittle Brook, however, it was mostly situated along the St Helens Canal northern boundary where it forms a dense homogenous strip (F79).

A strip of dense common reed follows northern boundary of the Runcorn and Catchford Canal (F34).

4.2.4.11 Standing Water (G1)

The Runcorn and Catchford Canal is a disused canal and showed signs of eutrophication (areas of Duck Weed). It bordered by marginal vegetation to the north and Eastford Road to the south (F34).

4.2.4.12 Running Water (G2)

The Whittle Brook flows south along the eastern boundary of Yellow route, under the St Helens Canal through Sankey Valley Park and into the River Mersey. Tall ruderal and scattered trees surround the Brook (F80). It was shallow with limited stones and has steep, densely vegetated banks with a mixture of vegetation communities. Some areas of scrub on raised areas with bramble and hawthorn. On lower areas, there is swamp/marginal vegetation dominated by common Reed. Himalayan balsam and Japanese Knotweed were recorded along its banks, with a large section where the brook come out from under the canal (TD5).

Saint Helens Canal was located to the northwest of the route which was a slow flowing water course (F35). The majority of the length was lined by broadleaved parkland scattered trees, amenity grassland, scrub and tall ruderal. Small sections had strips of marginal vegetation growing along the banks. Sections showed signs of eutrophication (areas of duckweed).

The Mersey River was a large waterbody running through two sections of the site (F25, F37). Most of the length surveyed had strips of marginal vegetation growing along the banks. Tall ruderal and marshy grassland habitats were also dominant habitats recorded adjacent. Giant hog weed, Himalayan balsam and Japanese knotweed are recorded along its banks.

4.2.4.13 Intertidal Mud/Sand (H1.1)

Areas of flat and bare sand/mud were located along the banks of the River Mersey.

4.2.4.14 Arable (J1.1)

Large arable fields were recorded between the two sections of the River Mersey, to the east of the roundabout linking to Forrest Way (F38).

Arable fields are found to the southern end of the route, just north of Chester road.

4.2.4.15 Amenity Grassland (J1.2)

A small access road is found at the western end of Lytham Close which leads to a fenced area of mown grassland, with a dense sward of around 5cm in height, but this could not be sufficiently surveyed to describe due to poor access.

A large area of amenity grassland, known as Morley Common, is found west of Eastford road (F41). It has a dense and close mown sward with rare forb species: dandelion, buttercup, and clover. Other areas of amenity grassland with similar species composition were found along road verges, in particular Chester road.

4.2.4.16 Species Poor Intact Hedge (J2.2)

A tall dense and unmanaged species-poor hedge follows the northern boundary of the continuous scrub and follows the track which runs parallel to the River Mersey, blackthorn dominated.

A species-poor intact hedge runs between the amenity grassland and Eastford road (F45). It was well managed and was dominated by hawthorn. Abundant bramble, nettle, cleavers, and cow parsley were recorded along its edges. Additionally, a hawthorn hedge follows the Morley Common southern boundary where it meets residential areas (F46). Similar hedges followed the internal boundaries of arable field found at the southern end of the route.

4.2.4.17 Species Poor Intact Hedge with Trees (J2.3)

A species poor hedge with trees follows the northern boundary of this route, along the A562, which contained was dominated by hawthorn with frequent sycamore (F83). It had a sparse ground layer of mostly garlic mustard (*Alliaria petiolata*) along the edges.

A tall unmanaged hedge with trees follows the arable fields most southern boundary, where it follows Chester road (F47). Hawthorn dominated and sycamore is frequent, with a dense ground layer of bramble, nettle, and cleavers. A strip of grass followed the outer edge of the ground layer and was dominated by false oat-grass.

4.2.4.18 Dry ditch (J2.6)

A mostly dry ditch with a bed of rubble runs through the rough centre of the semi-natural woodland found just south of St Helens' canal and west of the Whittle Brook and curves west to its northern end (F84).

4.2.4.19 Earth Bank (J2.8)

A small earth bank, roughly 1.5m high, follows the Whittle Brook where it runs through the improved grassland found just north of the St Helen's Canal.

4.2.4.20 Ephemeral and Short Perennial (J1.3)

Ephemeral habitat is found east of the carpark located south of Baronet road (F43). The area within the survey was dominated by mosses, horse tail and lichens. It lacked higher plants in this area, only rare ruderal and vetch species, were recorded. A small area, with of very similar species composition is found just west of Eastford Road where it meets a footpath leading east.

4.2.4.21 Buildings (J3.6)

There is a single building at the end of an access road leading from Lytham Close. It is made from brick, has a flat roof with ridge paves and appeared to be in good condition, however, it could not be sufficiently surveyed due to poor access (F82).

A modern and large prefabricated corrugated metal building with a pitched roof is in an area of hardstanding, just south of Baronet road and west of the carpark (F48).

A small bricked building with a flat felt roof is found in the southern end of the carpark located next to Baronet Road (F49).

4.2.4.22 Fence (J2.4)

Stock fencing split the improved-grassland fields along the Whittle Brook.

A tall fence is located following the scrub located on the southern boundary of the carpark.

A tall metal and spike fence follows also follows the perimeter of a warehouse building located west of the carpark.

4.2.4.23 Hardstanding (J5)

Hardstanding was located throughout the length of the route consisting of roads, pavements, and public footpaths. A carpark is located just south of Baronet road (F50).

4.2.5 Purple Route

4.2.5.1 Continuous Scrub (A2.1)

Scrub was recorded along the length of the route with a similar species composition throughout.

Species recorded in scrub areas within Sankey Valley Park (F2) comprised of: abundant bramble; frequent rosebay willowherb, common ragwort, and Yorkshire-fog.

The patches to the southern side of Liverpool Old Road (F3) had a greater species composition including: abundant bramble, elder and hazel; frequent cow parsley, hedge bindweed, nettle, rosebay willowherb, broadleaved dock, herb Robert, common comfrey, common ragwort and spear thistle.

Scrub areas to the south of Forrest Way (F4) (west of the western section of the River Mersey) included abundant bramble, hedge bindweed, common reed, common hogweed, nettle, creeping bent, cleavers, Himalayan balsam, early purple flowering orchid, sorrel, bush vetch, common vetch, marsh woundwort, hairy tare, horsetail.

Scrub was located to the east of the western section of the River Mersey, north and south of Forrest Way. Species comprised of: abundant bramble; frequent cow parsley, common hogweed, false oat-grass, common ragwort, Yorkshire-fog, annual meadow-grass, tufted vetch, hairy tare and bush vetch.

Scrub was located around the railway bridge where it crosses Eastford Road and was dominated by Japanese knotweed or bramble (F5). Scrub patches also lined the road verges of Eastford Road (F6), bramble was abundant other species recorded included: nettle, false oat-grass, cock's-foot grass, hedge bindweed, common hogweed, perennial ryegrass, ribwort plantain, common comfrey, cleavers, giant hogweed, Japanese knotweed, greater plantain, common ragwort, Yorkshire-fog, rosebay willowherb, red clover, and broadleaved dock.

An area of tall dense scrub is located in-between the carpark found next to Baronet road and Manchester Ship Canal (F7). It is dominated by gorse, with frequent ash and sycamore trees scattered within. The ground layer was bare apart from a strip on its outer northern edge. This strip contained: bramble, nettle, ribwort plantain, false oats, dandelion and horsetail. There also appeared to be wildlife tracks along the outer edge (F7).

4.2.5.2 Scattered Scrub (A2.2) and Poor Semi-Improved Grassland (B6) mosaic

A small strip of scattered scrub and poor semi-improved grassland mosaic was located along the eastern bank of St Helens Canal (F10). Species comprised of: false barley grass and bramble.

Another small strip was located adjacent to the roundabout leading to Forrest Way (F11). Species comprised of bramble, cow parsley, common hogweed, false oat-grass, common ragwort, Yorkshire-fog, annual meadow-grass, tufted vetch, hairy tare and bush vetch. Within the grassland areas species recorded were cock's-foot grass, false oat-grass, ribwort plantain, common ragwort, colt's-foot, sheep's fescue, annual meadow-grass, dandelion, common cranesbill, and cleavers.

4.2.5.3 Broad-leaved Parkland Scattered Trees (A3.1)

Broad-leaved parkland scattered trees were located throughout the length of the route.

This habitat was recorded within the southern section of Sankey Valley Park (F12). The woodland lined amenity grassland areas with public footpaths running through. The canopy was comprised of frequent downy birch, alder, hawthorn, silver birch, holly and sessile oak. The understory was

comprised of frequent nettle, cleavers, and creeping buttercup. A stand of Himalayan balsam was also observed.

The broad-leaved trees lined the southern side of Barnard Street and Forrest Way (F13). Species recorded included frequent hawthorn, sycamore, crack willow, and pedunculate oak.

Scattered broadleaved trees were located along the western edge of the western section of the River Mersey, south of Forrest Way. Species comprised of willow (*Salix sp.*), alder and dogwood.

Broad-leaved parkland scattered trees were also located between the two sections of the River Mersey. It ran along the eastern bank of the western section of the River Mersey and along the public footpath (F14). This habitat also ran along the southern edge of Forrest Way and Barnard Street. Species recorded comprised of frequent: hawthorn, willow, elder and aspen.

Two strips of scattered trees were present at the southern and eastern end of Morley Common (F15), these were young trees, species comprise of frequent: sycamore, alder and rowan ash. Additionally, an area of mature scattered trees is found to the north end of Morley Common, where several tree species are frequent: oak, sycamore, willow, and ash. Tall ruderal species dominated the ground layer.

The north-eastern boundary of Runcorn and Catchford Canal (F16), beyond the marginal vegetation was an area of tall willow trees. Ruderal species comprised ground layer, nettle is abundant.

Two small sections of scattered trees located just south of Baronet Road (F17), within newly seeded improved grassland, silver birch and cherry are abundant.

4.2.5.4 Mixed Parkland Scattered Trees (A3.3)

The most dominant woodland type in Sankey Valley Park was mixed parkland scattered trees (F18). It was located in the northern part of Sankey Valley Park and provides screening from the A57. The trees were immature to semi-mature in age and the canopy consisted of sweet chestnut, field maple, ash, horse chestnut, sessile oak, lime, downy willow, hawthorn and yew. Within the understory perennial ryegrass was abundant. Frequently recorded species included ribwort plantain, dandelion, cleavers, Yorkshire-fog and red fescue. Occasionally occurring species included cow parsley and rosebay willowherb. Spear thistle occurred locally occasionally.

4.2.5.5 Semi-improved Neutral Grassland (B2.2) and Scrub Dense/Continuous (A2.1) mosaic

Along the southern edge of Forrest Way and Barnard Street was a strip of scrub and semi-improved neutral grassland mosaic, adjacent to the broad-leaved parkland strip (F19). The species composition of the grassland was similar to the ephemeral/short perennial adjacent, but the sward was denser and taller. Abundant bramble was recorded within the scrub areas.

4.2.5.6 Improved Grassland (B4)

Two small areas of newly seeded Improved grassland were located just south of Baronet Road (F20), it was dominated by perennial ryegrass and forb species included rare: white clover, buttercup, and common daisy.

4.2.5.7 Poor Semi-Improved Grassland (B6)

Semi-improved species poor grassland areas were located either side of the western section of the River Mersey, where Forrest Way crosses the river. To the east of this section of the river, patches were recorded on the southern road verges of Forrest Way and along the edges of public

footpaths (F21). Species comprised of: common ragwort, annual meadow-grass, ribwort plantain, dandelion, Himalayan balsam, creeping thistle, avens species, horsetail, marsh woundwort, hairy tare, and green alkanet.

A strip was also recorded to the east of this section of the River Mersey, along the northern edges of the roundabout (F22). Species comprised of: cock's-foot grass, false oat-grass, ribwort plantain, common ragwort, colt's-foot, sheep's fescue, annual meadow-grass, bramble, dandelion, common cranesbill, cleavers, creeping thistle, and red clover.

4.2.5.8 Tall Ruderal (C3.1)

Tall ruderal patches were located throughout the route.

A tall ruderal strip was located along the northeast bank of the pond within Sankey Valley Park (F23). Species comprised of water mint, yellow flag iris, rosebay willowherb, cleavers, alder regeneration, willow regeneration, creeping buttercup, false oat-grass, nettle, smooth meadow-grass, bush vetch and horsetail.

A tall ruderal strip was located south of Forrest Way either side of the fence (F24). Species comprise of frequent: nettle, rosebay willowherb, greater willowherb, Himalayan balsam, common reed and hogweed.

Another strip was also observed on the west bank of the western section of the River Mersey, south of Forrest Way (F25). Species comprised of nettle, rosebay willowherb, Himalayan balsam, common reed and hogweed. North of Forrest Way (F26) species comprised of Himalayan balsam, Japanese Knotweed, nettle, cow parsley, cleavers, broadleaved dock and rosebay willowherb.

Areas of tall ruderal were recorded along Eastford road particularly around the east side of the railway bridge (F29), and formed the ground layer to the scattered trees found in the northern end of Morley Common (F28). Himalayan balsam dominated, spear thistle and nettle were also abundant. Additionally, giant hogweed was recorded in areas of tall ruderal along Eastford road and the River Mersey (F27).

4.2.5.9 Tall Ruderal (C3.1) and scrub (A2) mosaic

Tall ruderal and scrub mosaic was located around the railway bridge (F30). Himalayan balsam dominated ruderal whereas bramble or Japanese knotweed (TR1) dominated dense scrub areas.

4.2.5.10 Tall Ruderal (C3.1) and Marshy Grassland (B5) mosaic

Tall ruderal and marshy grassland mosaics were recorded in sections along the route.

An area was recorded adjacent to St Helens Canal to the southeast. Species comprised of: were Himalayan balsam, nettle, cock's-foot, cleavers, common reed, cow parsley, ivy, false oat-grass and creeping thistle.

A mosaic of tall ruderal and marshy grassland was recorded on the western bank of the western section of the River Mersey, north of Forrest Way (F32). Abundant species recorded were Himalayan balsam and common reed.

A mosaic was also located between the two sections of the River Mersey, adjacent to the arable field (F33). Species recorded here included the following abundant species Himalayan balsam and common reed. Occasionally occurring species included hogweed, nettle, creeping thistle and hedge bindweed.

4.2.5.11 Tall Ruderal (C3.1) and Poor Semi-Improved Grassland (B6) mosaic

A mosaic of tall ruderal and semi-improved poor grassland was located on the western bank of the western section of the River Mersey, immediately north of Forrest Way. The sward height was roughly 20cm and species recorded included the following abundant species; false oat-grass, perennial ryegrass and red fescue. Frequent species recorded included cock's-foot and rosebay willowherb. Common reed was recorded occasionally.

4.2.5.12 Marginal Vegetation (F2.1)

Sections of the running water bodies along the route had marginal vegetation.

Small patches were located along Sankey Brook dominated by common reed (F34). A dense strip was located along the east and west banks of the River Mersey which comprised of common reed (F25). A strip of dense Common Reed follows northern boundary of the Runcorn and Catchford Canal (F34).

4.2.5.13 Standing Water (G1)

A permanent pond was located within Sankey Valley Park (F23. TG2). Vegetation growing within the pond included; yellow flag iris, water mint, common sedge, white lily (*Lilium candidum*), water lily sp. and duckweed (*Lemna minor*). A strip of tall ruderal grew along the northeast bank of the pond.

The Runcorn and Catchford Canal is a disused canal and showed signs of eutrophication (areas of duckweed). It bordered by marginal vegetation to the north and Eastford Road to the south.

4.2.5.14 Running Water (G2)

Several separate running water bodies were located along the route.

Saint Helens Canal was located to the northwest of the route which was a slow flowing water course (F35). The majority of the length was lined by broadleaved parkland scattered trees, amenity grassland, scrub and tall ruderal. Small sections had strips of marginal vegetation growing along the banks. Sections showed signs of eutrophication (areas of duckweed).

Sections of Sankey Brook (36) ran through the site and was lined by broad-leaved parkland scattered trees and tall ruderal.

The Mersey River was a large waterbody running through two sections of the site (F25, F37). Most of the length surveyed had strips of marginal vegetation growing along the banks. Tall ruderal and marshy grassland habitats were also dominant habitats recorded adjacent. Giant hog weed, Himalayan balsam and Japanese knotweed are recorded along its banks.

4.2.5.15 Arable (J1.1)

Large arable fields were recorded between the two sections of the River Mersey, to the east of the roundabout linking to Forrest Way (F38).

Arable fields are found to the southern end of the route, just north of Chester road.

4.2.5.16 Amenity Grassland (J1.2)

The species composition was similar throughout the route.

Species recorded along Cromwell Avenue South (F39) were perennial ryegrass, cock's-foot grass and red fescue which were all abundant in occurrence. White clover and daisy were frequently

recorded species and yarrow was locally frequent. Occasionally recorded species were red clover, greater plantain, and creeping buttercup. Bird's foot trefoil was locally occasional. Species that occurred rarely were ribwort plantain and common ragwort. Other species recorded within Sankey Valley Park (F18) were common vetch, sorrel, pineapple weed, horsetail, creeping bent, annual meadow-grass, field speedwell, colt's-foot, herb Robert, dandelion, mouse ear.

The patch adjacent to Sunflower Drive comprised of red fescue, dandelion, daisy, and perennial ryegrass.

A large area of amenity grassland, known as Morley Common, is found west of Eastford road (F41). It has a dense and close mown sward with rare forb species: dandelion, buttercup, and clover. Other areas of amenity grassland with similar species composition were found along road verges, in particular Chester road.

4.2.5.17 Ephemeral and Short Perennial (J1.3)

A large area of ephemeral/short perennial grassland was recorded in the field south of Barnard Street and Forrest Way (F42). Broad-leaved parkland trees as well as a scrub and semi-improved neutral grassland mosaic lined this habitat to the north. The ground was rocky with a short sward height and lichen was observed growing on the ground. Species comprise of: ribwort plantain, crested dogs tail, Yorkshire-fog, sticky mouse ear, colt's-foot, selfheal, common vetch, bush vetch, tufted vetch, red clover, white clover, red fescue, hairy tare, yellow rattle, wild pansy, forget-me-not and field speedwell.

Ephemeral habitat is found east of the carpark located south of Baronet road (F43). The area within the survey was dominated by mosses, horse tail and lichens. It lacked higher plants in this area, only rare ruderal and vetch species, were recorded. A small area, with of very similar species composition is found just west of Eastford Road where it meets a footpath leading east.

4.2.5.18 Species-poor Intact Hedge (J2.1.2)

Species poor hedges were recorded along the edges of the entrance to Sankey Valley Park from Cromwell Avenue South, adjacent to a wooden fence (F44). It was maintained at 1m in height and comprised of privet, cherry laurel, dogwood, dog rose, bramble, rosebay willowherb and forget-me-not.

A species-poor intact hedge runs between the amenity grassland and Eastford road (F45). It was well managed and was dominated by hawthorn and abundant: bramble, nettle, cleavers, and cow parsley were recorded along its edges. Additionally, a hawthorn hedge follows the Morley Common southern boundary where it meets residential areas (F46). Similar hedges followed the internal boundaries of arable field found at the southern end of the route.

4.2.5.19 Species-poor Hedge with trees (J2.3.2)

A tall unmanaged hedge with trees follows the arable fields most southern boundary, where it follows Chester road (F47). Hawthorn dominated and sycamore was frequent with a dense ground layer of bramble, nettle, and cleavers. A strip of grass followed the outer edge of the ground layer and was dominated by false oat-grass.

4.2.5.20 Buildings (J3.6)

There was a mixture of residential and commercial buildings throughout.

A modern and large prefabricated corrugated metal building with a pitched roof is in an area of hardstanding, just south of Baronet road and west of the carpark (F48).

A small bricked building with a flat felt roof is found in the southern end of the carpark located next to Baronet Road (F49).

4.2.5.21 Fence (J2.4)

A wooden fence ran along the edges of the Sankey Valley Park entrance from Cromwell Avenue South, lined by a hedgerow. A small section of fence was also located south of Forrest way, west of the western section of the River Mersey.

A tall fence is located following the scrub located on the southern boundary of the carpark.

A tall metal and spike fence follows also follows the perimeter of a warehouse building located west of the carpark.

4.2.5.22 Bare ground (J4)

Patches of bare ground were recorded along the route. A patch was located within the mixed parkland woodland to the north of Sankey Valley Park. Species recorded here included some bramble and the following pioneer species; creeping buttercup and greater plantain.

4.2.5.23 Hardstanding (J5)

Hardstanding was located throughout the length of the route consisting of roads, pavements, and public footpaths. A carpark is located just south of Baronet road (F50).

4.2.6 Pink Route

4.2.6.1 Continuous Scrub (A2.1)

Scrub was recorded along the length of the route with a similar species composition throughout.

Species recorded in scrub areas within Sankey Valley Park (F2) comprised of: abundant bramble; frequent rosebay willowherb, common ragwort, and Yorkshire-fog.

The patches to the southern side of Liverpool Old Road (F3) had a greater species composition including bramble, elder, hazel, cow parsley, hedge bindweed, nettle, rosebay willowherb, broad-leaved dock, herb Robert, common comfrey, common ragwort and spear thistle.

Scrub areas to the south of Forrest Way (F4) (west of the western section of the River Mersey) comprised of: abundant bramble; hedge bindweed, common reed, common hogweed, nettle, creeping bent, cleavers, Himalayan balsam, early purple flowering orchid, sorrel, bush vetch, common vetch, marsh woundwort, hairy tare, horsetail.

Scrub was located to the east of the western section of the River Mersey, north and south of Forrest Way. Species comprised of: abundant bramble; cow parsley, common hogweed, false oat-grass, common ragwort, Yorkshire-fog, annual meadow-grass, tufted vetch, hairy tare and bush vetch

4.2.6.2 Scattered Scrub (A2.2) and Poor Semi-Improved Grassland (B6) mosaic

A small strip of scattered scrub and poor semi-improved grassland mosaic was located along the eastern bank of St Helens Canal (F10). Species included false barley grass and bramble.

Another small strip was located adjacent to the roundabout leading to Forrest Way (F11). Species comprised of: abundant bramble; cow parsley, common hogweed, false oat-grass, common ragwort, Yorkshire-fog, annual meadow-grass, tufted vetch, hairy tare and bush vetch. Within the grassland areas species recorded were cock's-foot grass, false oat-grass, ribwort plantain,

common ragwort, colt's-foot, sheep's fescue, annual meadow-grass, bramble, dandelion, common cranesbill, cleavers.

4.2.6.3 Broad-leaved Parkland Scattered Trees (A3.1)

Broad-leaved parkland scattered trees were located throughout the length of the route.

This habitat was recorded within the southern section of Sankey Valley Park (F12). The woodland lined amenity grassland areas with public footpaths running through. The canopy was comprised of frequent: downy birch, alder, hawthorn, silver birch, holly and sessile oak. The understory was comprised of frequent: nettle, cleavers, and creeping buttercup. A stand of Himalayan balsam was also observed.

The broad-leaved trees lined the southern side of Barnard Street and Forrest Way (F13). Species comprised of frequent: hawthorn, sycamore, crack willow and pedunculate oak.

Scattered broadleaved trees were located along the western edge of the western section of the River Mersey, south of Forrest Way. Species comprised of willow, alder and dogwood.

Broad-leaved parkland scattered trees were also located between the two sections of the River Mersey. It ran along the eastern bank of the western section of the River Mersey and along the public footpath (F14). This habitat also ran along the southern edge of Forrest Way and Barnard Street. Species recorded included hawthorn, willow, elder and aspen.

4.2.6.4 Mixed Parkland Scattered Trees (A3.3)

The most dominant woodland type in Sankey Valley Park was mixed parkland scattered trees (F18). It was located in the northern part of Sankey Valley Park and provides screening from the A57. The trees were immature to semi-mature in age and the canopy consisted of sweet chestnut, field maple, ash, horse chestnut, sessile oak, lime, downy willow (*Salix lapponum*), hawthorn and yew. Within the understory perennial ryegrass was abundant. Frequently recorded species included ribwort plantain, dandelion, cleavers, Yorkshire-fog and red fescue. Occasionally occurring species included cow parsley and rosebay willowherb. Spear thistle occurred locally occasionally.

4.2.6.5 Semi-improved Neutral Grassland (B2.2) and Scrub Dense/Continuous (A2.1) mosaic

Along the southern edge of Forrest Way and Barnard Street was a strip of scrub and semi-improved neutral grassland mosaic, adjacent to the broad-leaved parkland strip (F19). The species composition of the grassland was similar to the ephemeral/short perennial adjacent, but the sward was denser and taller. Abundant bramble was recorded within the scrub areas.

4.2.6.6 Poor Semi-Improved Grassland (B6)

Semi-improved species poor grassland areas were located either side of the western section of the River Mersey, where Forrest Way crosses the river. To the east of this section of the river, patches were recorded on the southern road verges of Forrest Way and along the edges of public footpaths (F21). Species comprise of: common ragwort, annual meadow-grass, ribwort plantain, dandelion, Himalayan balsam, creeping thistle, avens species, horsetail, marsh woundwort, hairy tare, and green alkanet.

A strip was also recorded to the east of this section of the River Mersey, along the northern edges of the roundabout (F22). Species comprise of: cock's-foot grass, false oat-grass, ribwort plantain,

common ragwort, colt's-foot, sheep's fescue, annual meadow-grass, bramble, dandelion, common cranesbill, cleavers, creeping thistle, and red clover.

4.2.6.7 Tall Ruderal (C3.1)

Tall ruderal patches were located throughout the route.

A tall ruderal strip was located along the northeast bank of the pond within Sankey Valley Park (F23). Species comprised of water mint, yellow flag iris, rosebay willowherb, cleavers, alder regeneration, willow regeneration, creeping buttercup, false oat-grass, nettle, smooth meadow-grass, bush vetch and horsetail.

A tall ruderal strip was located south of Forrest Way either side of the fence (F24). Species comprised of frequent: nettle, rosebay willowherb, greater willowherb, Himalayan balsam, common reed and hogweed.

Another strip was also observed on the west bank of the western section of the River Mersey, south of Forrest Way (F25). Species comprised of nettle, rosebay willowherb, Himalayan balsam, common reed and hogweed. North of Forrest Way (F26) species comprised of Himalayan balsam, Japanese Knotweed, nettle, cow parsley, cleavers, broadleaved dock, and rosebay willowherb.

Additionally, giant hogweed was recorded in areas of tall ruderal along Eastford road and the River Mersey (F27).

4.2.6.8 Tall Ruderal (C3.1) and Semi-Improved Neutral Grassland (B2.2) mosaic

A strip of semi-improved neutral grassland and tall ruderal mosaic ran adjacent to the Sankey Brook to the north (F31). Species comprised of: timothy, common ragwort, ribwort plantain, Yorkshire-fog, creeping bent, false oat-grass, perennial ryegrass, sorrel, cranesbill, rosebay willowherb, cleavers, nettle, common hogweed, common reed, creeping thistle, and bush vetch.

4.2.6.9 Tall Ruderal (C3.1) and Marshy Grassland (B5) mosaic

Tall ruderal and marshy grassland mosaics were recorded in sections along the route.

An area was recorded adjacent to St Helen's Canal to the southeast. Species comprised of: Himalayan balsam, nettle, cock's-foot, cleavers, common reed, cow parsley, ivy, false oat-grass and creeping thistle.

A mosaic of tall ruderal and marshy grassland was recorded on the western bank of the western section of the River Mersey, north of Forrest Way (F32). Abundant species recorded were Himalayan balsam and common reed.

A mosaic was also located between the two sections of the River Mersey, adjacent to the arable field (F33). Species recorded here included the following abundant species Himalayan balsam and common reed. Occasionally occurring species included hogweed, nettle, creeping thistle and hedge bindweed.

4.2.6.10 Tall Ruderal (C3.1) and Poor Semi-Improved Grassland (B6) mosaic

A mosaic of tall ruderal and semi-improved poor grassland was located on the western bank of the western section of the River Mersey, immediately north of Forrest Way. The sward height was roughly 20cm and species recorded included the following abundant species; false oat-grass, perennial ryegrass and red fescue. Frequent species recorded included cock's-foot and rosebay willowherb. Common reed was recorded occasionally.

Another mosaic strip was recorded along the western road verge of Eastford Road and an arable field. Species comprised of nettle, common hogweed, cow parsley, cleavers, perennial ryegrass, false oat-grass, cock's-foot, Japanese knotweed, giant hogweed, rosebay willowherb, and bramble.

4.2.6.11 Marginal Vegetation (F2.1)

Sections of the running water bodies along the route had marginal vegetation.

Small patches were located along Sankey Brook dominated by common reed (F34). A dense strip was located along the east and west banks of the River Mersey which comprised of common reed (F25).

4.2.6.12 Standing Water (G1)

A permanent pond was located within Sankey Valley Park (F23. TG2). Vegetation growing within the pond included; yellow flag iris, water mint, common sedge, white lily, water lily sp. and duckweed. A strip of tall ruderal grew along the northeast bank of the pond.

4.2.6.13 Running Water (G2)

Several separate running water bodies were located along the route.

Saint Helens Canal was located to the northwest of the route which was a slow flowing water course (F35). The majority of the length was lined by broadleaved parkland scattered trees, amenity grassland, scrub and tall ruderal. Small sections had strips of marginal vegetation growing along the banks. Sections showed signs of eutrophication (areas of duckweed).

Sections of Sankey Brook (36) ran through the site and was lined by broad-leaved parkland scattered trees and tall ruderal.

The Mersey River was a large waterbody running through two sections of the site (F25, F37). Most of the length surveyed had strips of marginal vegetation growing along the banks. Tall ruderal and marshy grassland habitats were also dominant habitats recorded adjacent. Giant hog weed, Himalayan balsam and Japanese knotweed are recorded along its banks.

4.2.6.14 Arable (J1.1)

Large arable fields were recorded between the two sections of the River Mersey, to the east of the roundabout linking to Forrest Way (F38).

4.2.6.15 Amenity Grassland (J1.2)

The species composition was similar throughout the route.

Species recorded along Cromwell Avenue South (F39) were perennial ryegrass, cock's-foot grass and red fescue which were all abundant in occurrence. White clover and daisy were frequently recorded species and yarrow was locally frequent. Occasionally recorded species were red clover, greater plantain, and creeping buttercup. Bird's foot-trefoil was locally occasional. Species that occurred rarely were ribwort plantain and common ragwort. Other species recorded within Sankey Valley Park (F18) were common vetch, sorrel, pineapple weed, horsetail, creeping bent, annual meadow-grass, field speedwell, colt's-foot, herb Robert, dandelion, mouse ear.

A small patch of amenity grassland adjacent to Sankey Brook, south of Old Liverpool Road (F40) had a different species composition. Species comprised of: yellow archangel, nettle, false oat-

grass, perennial ryegrass, cock's-foot, greater willowherb, creeping thistle, common cranesbill, meadow avens, bush vetch, broadleaved dock, lords and ladies and colt's-foot.

The patch adjacent to Sunflower Drive comprised of red fescue, dandelion, daisy, and perennial ryegrass.

4.2.6.16 Ephemeral and Short Perennial (J1.3)

A large area of ephemeral/short perennial grassland was recorded in the field south of Barnard Street and Forrest Way (F42). Broad-leaved parkland trees as well as a scrub and semi-improved neutral grassland mosaic lined this habitat to the north. The ground was rocky with a short sward height and lichen was observed growing on the ground. Species comprised of: ribwort plantain, crested dogs tail, Yorkshire-fog, sticky mouse ear, colt's-foot, selfheal, common vetch, bush vetch, tufted vetch, red clover, white clover, red fescue, hairy tare, yellow rattle, wild pansy, forget-me-not, and field speedwell.

4.2.6.17 Species-poor Intact Hedge (J2.1.2)

Species poor hedges were recorded along the edges of the entrance to Sankey Valley Park from Cromwell Avenue South, adjacent to a wooden fence (F44). It was maintained at 1m in height and comprised of privet, cherry laurel, dogwood, dog rose, bramble, rosebay willowherb and forget-me-not.

4.2.6.18 Buildings (J3.6)

There was a mixture of residential and commercial buildings throughout.

4.2.6.19 Fence (J2.4)

A wooden fence ran along the edges of the Sankey Valley Park entrance from Cromwell Avenue South, lined by a hedgerow. A small section of fence was also located south of Forrest way, west of the western section of the River Mersey.

4.2.6.20 Bare ground (J4)

Patches of bare ground were recorded along the route. A patch was located within the mixed parkland woodland to the north of Sankey Valley Park. Species recorded here included some bramble and the following pioneer species; creeping buttercup and greater plantain.

4.2.6.21 Hardstanding (J5)

Hardstanding was located throughout the length of the route consisting of roads, pavements, and public footpaths.

4.3 Protected or Notable species

4.3.1.1 Invertebrates

No protected or important invertebrate species were recorded during the field survey.

4.3.1.2 Amphibians and Reptiles

No amphibians or reptiles were recorded during the field survey.

4.3.1.3 Birds

Only common species were recorded along all routes during the survey: swallow (*Hirundo rustica*), robin (*Erithacus rubecula*), pied wagtail (*Motacilla alba*), black bird (*Turdus merula*), moorhen (*Gallinula chloropus*), coot (*Fulica atra*), swan (*Cygnus olor*), wood pigeon (*Columba palumbus*), jay (*Garrulus glandarius*), and chiffchaff (*Phylloscopus collybita*).

4.3.1.4 Mammals

Grey squirrel (*Sciurus carolinensis*) was recorded during the survey in Sankey Valley Park and the remains of a dead hedgehog was recorded in Morley Common (TR2).

4.3.1.5 Fisheries and Aquatic

No fishery or aquatic species were recorded during the survey.

4.3.1.6 Invasive species

Several invasive plant species were recorded along all routes: Japanese knotweed, Himalayan balsam and giant hogweed. They were mostly concentrated along water courses.

Grey squirrel was recorded in Sankey Valley Park.

Harlequin ladybird (*Harmonia axyridis*) was recorded on the yellow route where the Whittle Brook meets the River Mersey.

5 Interpretation

For ease of interpretation the following is given in terms of 'The Scheme' instead of routes.

5.1 Designated sites

There are three designated sites of international or European importance within the Zol.

The Manchester Mosses SAC is 7.5km away from the scheme and is designated for the presence of annex 1 habitat, of the Habitats Directive: Degraded raised bogs still capable of natural regeneration. Therefore, it is very unlikely, due to the nature and distance of this SAC, that it will be impacted from the Scheme.

The Rixton Clay Pits SAC is designated due to the presence great crested newts and is 8.5km from the Scheme. Due to the distance of this SAC it is very unlikely it will be impacted.

The Mersey Estuary SPA and Ramsar is designated for internationally important assemblages of migratory species and the presence of annex 1 species of the Birds Directive. These designation species and their supporting habitats are recorded throughout the Scheme. Consequently, the SPA's designation features may be impacted upon, therefore a Habitat Regulations Assessment HRA will be required to understand how The Scheme might impact these features.

5.2 Non-designated sites

There are several non-designated sites found both within and proximity to the scheme (<50m). These will receive both direct impacts (habitat removal/damage) and indirect impacts (noise, light and air pollution). Therefore, further consultation with these stakeholder's is recommended.

5.3 Habitats

The scheme will require the direct removal and damage of several habitats.

There are several botanically diverse habitats within the scheme, namely the semi-improved grassland and ephemeral areas. The scheme will impact these areas both directly and indirectly.

There are several water courses through the scheme area and there is some potential for these to be impacted upon through pollution during construction and post construction.

5.4 Protected and notable species

5.4.1 Invertebrates

The only protected invertebrates recorded in Zol are white-letter hairstreak, none were recorded during the field survey. White-letter hairstreak uses elm as its sole foodplant, and are known to use the same tree/group of trees year after year. Elm was not recorded within the scheme area and it is very unlikely the recorded individuals would migrate the 1.3-2km to the scheme area. Therefore, given the results of this report, it is unlikely protected invertebrates will be impacted through this scheme. However, further recommendations are advised.

5.4.2 Amphibians and reptiles

Common amphibians are found within the scheme area and great crested newts are, at their closest, 0.8km from the scheme (yellow route); however, none were recorded during the field

survey. Suitable breeding habitat was recorded within the scheme area: a pond in the Sankey Valley Park, water inundation east of the Whittle Brook and the disused Runcorn and Latchford Canal. Terrestrial habitat is found throughout the scheme area. Therefore, further recommendations and surveys are advised.

No reptile species are recorded within the Zol and none were recorded during the field survey. However, suitable reptile habitat is recorded throughout the scheme area. Mosaic and ephemeral habitats where the scheme sits between the River Mersey and the St Helen's Canal are suitable for reptile species. Therefore, further recommendations and surveys are advised.

5.4.3 Birds

Despite only common birds being recorded during the survey, an abundance of bird species are recorded throughout the scheme area, including WCA schedule 1, Bird directive, LBAP and BAP species.

Additionally, there is suitable breeding, feeding and overwintering habitat for these species throughout the scheme. These areas will be impacted upon through direct habitat removal/damage and indirect habitat degradation through disturbance. Thus, further recommendations and surveys are advised.

5.4.4 Mammals

A variety of bat species are recorded within the scheme area, and there is suitable roosting, foraging, and commuting habitat for bats throughout the scheme area. No bats or signs of bats were recorded during the field survey. However, it is very likely bats will be impacted upon through disturbance and habitat fragmentation throughout the scheme; potentially displacing bats from roosts, foraging and commuting areas. There is also potential for bat roosts to be damaged or destroyed if found to be present within the scheme area. Further recommendations and surveys are advised.

Badgers are recorded within the scheme area and there is suitable habitat for foraging and setts within the scheme area. No fields signs or setts were recorded during the field survey, however, given the unlikelihood in locating badger setts when not directly surveying for badgers it cannot be said badger setts are not present within the scheme area. Given the records and habitats present there is potential for badger setts to be present within the scheme area, and if present these will be impacted upon through direct removal and/or disturbance and habitat fragmentation. Further recommendations and surveys are advised.

Otters are recorded within the Zol and within proximity to the scheme area, though no evidence of otters was recorded during the field survey. Otters were recorded in 2017 along the St Helen's Canal which runs through the scheme. Otters are known to have territories up to several kilometres and it is very likely they will be present within the scheme area. If found to be present they will be directly impacted upon through habitat removal/fragmentation and disturbance. Further recommendations and surveys are advised.

Water voles are recorded within the Zol and within proximity to the scheme area, specifically within the St Helen's Canal. No evidence of water vole was recorded during the field survey. Water voles have smaller territories (around 150m) and there is limited suitable habitat for water vole within or where the St Helen's Canal passes through the scheme area. Despite this, there is a potential for water voles to be present within the scheme and if they are found to be present they will be directly impacted upon through habitat removal/fragmentation and disturbance. Further recommendations and surveys are advised.

5.4.5 Fisheries and aquatic

Eel is recorded within the Zol, along the Sankey Canal which passes through the scheme area, therefore, are likely to be present within the scheme area. It is likely any subsurface impact, pollution etc, upon the Sankey Canal will also impact this species. Further recommendations to avoid entrainment and/or impingement as well as prevention passage are advised.

There are no records for fresh water white-clawed crayfish, however, there is suitable habitat within the scheme area. If found to be present they will be directly impacted upon through habitat removal/fragmentation, disturbance and potentially impacted upon through pollution into water courses. Further recommendations and surveys are advised.

5.4.6 Invasive species

A variety of botanical invasive species are recorded and were recorded during the field survey in the scheme area. These species will be directly impacted upon, requiring removal and/or management to prevent spreading. Therefore, further recommendations are advised.

6 Conclusion

This PEA was undertaken to inform the potential impact on protected and notable habitats and species from the proposed Warrington western link scheme, and inform the optioneering process.

6.1 Designated Sites

The Mersey Estuary SPA is designated for internationally important assemblages of migratory species and the presence of annex 1 species of the Birds Directive. The proposed works are not likely to directly impact the SPA due to the distance to the scheme, however, SPA designation species and their supporting habitats are recorded throughout the scheme. Consequently, the SPA's designation features may be impacted upon, therefore a Habitat Regulations Assessment (HRA) will be required to further understand the potential and level of impact the proposed development may have to the SPA designation features.

6.2 Habitats

The proposed development has the potential to impact several habitats which have a rich floristic character of regional/national importance. Therefore, further national vegetation classification (NVC) surveys are recommended to understand the diversity present on these sites. NVC surveys are suggested between June and August to allow for most floral species to be present.

6.3 Protected and/or Notable species

6.3.1 Birds

Where works include heavy construction on a large scale or impact to breeding bird habitat, further breeding bird's surveys will be required to understand the usage of The Scheme, with regarding to these species. Three surveys should be conducted, this will include one visit April to mid-May and then a second visit, minimum of four weeks later, in mid-May to the end of June.

Additionally, as many SPA qualifying bird species have been noted in the area, further wintering bird surveys are recommended to understand the usage of The Scheme. Wintering bird surveys are recommended to be conducted between November and February, with a minimum of three surveys recommended a month a part, to understand usage on The Scheme.

6.3.2 Mammals

Given the records and habitats present the scheme has the potential to damage/destroy or disturb badger setts. Further badger activity surveys are recommended to understand the level of activity present within the Scheme, and to identify if any setts are present. Badger activity surveys can be conducted throughout the whole year, however the optimum period is between September and October and March to May, due to food availability and vegetation cover. If setts are found further activity surveys using camera traps maybe required to determine usage of setts.

There are a number of potential roost sites with the scheme. Once proposed works are known, bat suitability assessment should be conducted on potential roost sites and further bat activity/emergence surveys will be recommended. Activity and emergence surveys take place between March – October, with at least one survey in the May to July window to capture maternity activity. Furthermore, there is suitable foraging and commuting habitat throughout. Disturbance

or damage to these areas may displace bats, therefore suitable mitigation will be required to avoid or compensate for this affect.

The River Mersey and St Helen's Canal presented with suitable bank side vegetation for resting/sheltering otters as well as providing food stuffs for this species. Further otter surveys are recommended to understand usage of site by this species as well as to identify any resting places. An otter walkover survey is recommended to be conducted in spring (March – May), when otters are more active and water levels are suitable. If resting places are found further activity surveys using camera traps maybe required to determine usage of resting places.

The waterbodies provide suitable habitat and vegetation for water voles. Further surveys are recommended for this species to identify sites of activity i.e. latrines, runs and/or burrows. A water vole survey is recommended to be conducted in the early half of summer (May – June), with an additional survey required if activity is noted, in the latter half of summer (July – August).

6.3.3 Reptiles and Amphibians

Reptile presence or absence surveys are recommended in suitable habitat areas, namely where well-connected mosaic habitats are present, which are going to be impacted as part of the work. The surveys should be conducted in April, May and September during suitable weather conditions.

Further great crested newt surveys are recommended if waterbodies are going to be impacted as part of the work. Initially, great crested newt habitat suitability index surveys should be conducted, then if required presence or absence surveys between Mid-April and Mid-June, with a minimum of four surveys to determine usage by amphibian species. If great crested newts are found in the pond a further two surveys are required in this period to determine population status in these features.

6.3.4 Invasive Species

Stands of Himalayan balsam, giant hogweed and Japanese knotweed were noted during the site visit. An Invasive Species Management Plan (ISMP) is recommended for The Scheme before any construction works take place.

6.4 General Site Practices

It is recommended that general good practice is encouraged to limit any disturbance or effect on protected or notable species. If areas are to be excavated it is suggested that any holes are covered to avoid entrapment of species when the Site is not in operation.

To limit the potential disturbance to protected and notable species, night time working is not advised. Where night time working is unavoidable, lighting should follow the good practice guidance set out in the Bat Conservation Trust (2016).

Before the commencement of works on Site, a toolbox talk would be advisable to inform on protected and notable species and/or invasive species, that have potential to be encountered during the works. The toolbox talk will also notify workers on what to do if a protected species is encountered on Site.

7 Recommendations

As the details of the proposed works are currently unknown these recommendations will need to be reassessed by an ecologist. Recommendations for ecological constraints are provided in Table 4 below.

Toolbox talks as recommended below, should be delivered to all site personnel to define the risks and appropriate actions to take in the event that anything of ecological significance is discovered. Activities such as vegetation clearance and breaking ground should be conducted under ecological supervision unless it is specifically stated by the Site ecologist that supervision is not necessary. Best practise guidance should be adhered to at all times.

Table 5: Table of recommendations

Feature	Recommendations
Mersey Estuary SPA	SPA species have been recorded within the Scheme boundary, as such the habitats supporting these features are to be treated as an extension to the designated sites. Therefore, a Habitat Regulation Assessment (HRA) screening is recommended to further understand the level of impact the proposed development will have to the SPA designable features. Depending on the level of impact compensation and enhancement locally may be required.
Habitats	The proposed development has the potential to go through several habitats which have a rich floristic character of regional/national importance. Therefore, further national vegetation classification (NVC) surveys are recommended to understand the diversity present on these sites. NVC surveys are suggested between June and August to allow for most floral species to be present.
Birds	Further breeding surveys are recommended. These surveys will determine the usage of site with regarding to these species. Three surveys should be conducted April to mid-May, with a second visit, no earlier than four weeks, between May to Mid-June. Additionally, many SPA bird species have been noted in the records, further wintering bird surveys are recommended to understand the usage of Site by these species. These surveys are recommended between November and February.
Bats	Once proposed works are known, bat suitability assessment should be conducted on the proposed features and further bat activity/emergence surveys will be recommended. Activity and emergence surveys take place between March – October. The works have the potential to have a significant impact on commuting and foraging habitat for bats. To prevent any potential impact, the following recommendations are to be followed: <ul style="list-style-type: none"> • Any lighting schemes associated with the works should be reviewed by an experienced bat ecologist once the development proposals have been finalised. Light spillage onto any of the identified foraging areas should be avoided by the use of sensitive, directional lighting, hoods and/or cowls. Artificial lighting should be minimised across the Site where it cannot be otherwise reasonably avoided. In instances where it is deemed necessary for construction, operational or security reasons, lighting guidance detailed in the BCT (Collins, 2016) should be followed. • The construction works are to be undertaken under a Construction Environmental Management Plan (CEMP). The CEMP will ensure best practice will be followed and indirect impacts such as increased noise, dust, and vibration are minimised.
Badger	Further badger activity surveys are recommended to understand the level of activity present along the Scheme, with regards to badger. Badger activity surveys can be conducted throughout the whole year, however the optimum period is between September and October and March to May, due to food availability and vegetation cover. If setts are found further activity surveys using camera traps maybe required to determine usage of setts.
Otter and Water voles	If works are impacting the River Mersey or the Canal, further otter and water vole surveys are recommended.

Feature	Recommendations
Reptiles and Amphibians	<p>Otter surveys are recommended to be conducted in spring (March -May) to identify activity and resting places. Further activity surveys, using camera traps maybe required to identify level of usage, if activity and resting places have been identified. Water vole surveys are recommended to be conducted in early summer (May-June), with an additional survey in later summer (July – August) if activity is noted.</p> <p>Reptile presence or absence surveys are recommended in suitable habitat areas, namely where well-connected mosaic habitats are present, which are going to be impacted as part of the work. The surveys should be conducted in April, May and September during suitable weather conditions.</p> <p>Further great crested newt surveys are recommended if waterbodies are going to be impacted as part of the work. Initially, great crested newt habitat suitability index surveys should be conducted, then if required presence or absence surveys between Mid-April and Mid-June, with a minimum of four surveys to determine usage by amphibian species. If great crested newts are found in the pond a further two surveys are required in this period to determine population status in these features.</p>
Invasive Species	<p>No further surveys are required. An Invasive Species Management Plan (ISMP) is recommended for The Scheme, before any construction works take place. The ISMP will form a chapter of the Pre-Construction Plan document</p>

8 References

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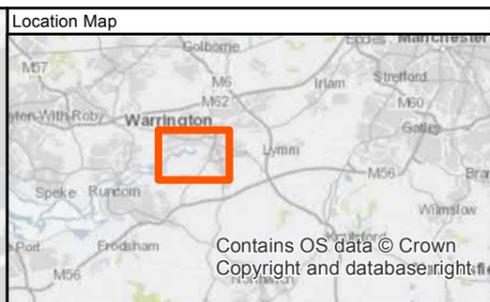
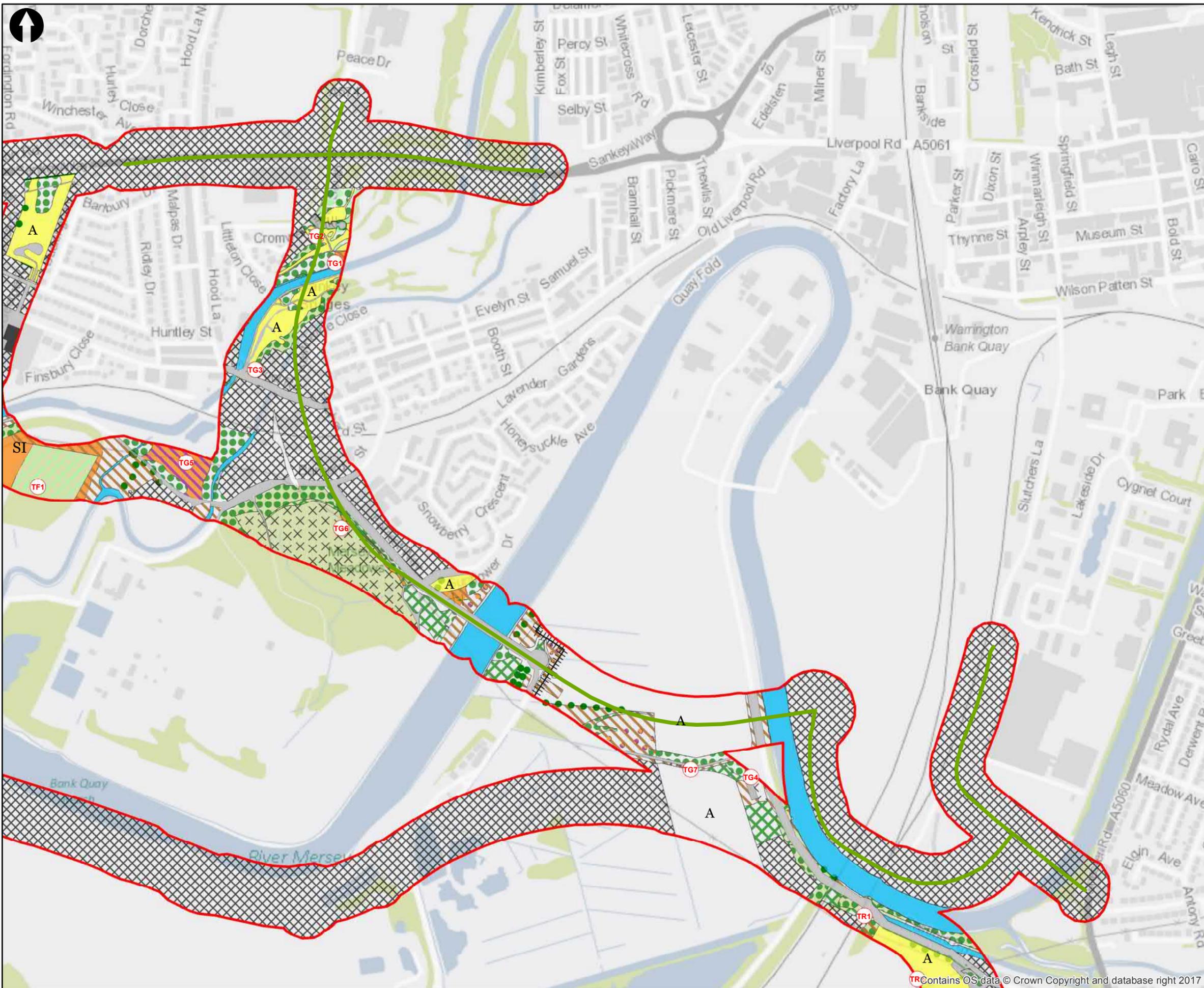
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Supplementary Information

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A. Phase 1 maps



Key to Symbols

- Target_Note
- Site extent
- A3.1 - Broadleaved parkland/scattered trees
- A1.2.2 - Coniferous woodland - plantation
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.3 - Mixed parkland/scattered trees
- B2.2 - Neutral grassland - semi-improved
- B5 - Marsh/marshy grassland
- B6 - Poor semi-improved grassland
- C3.1 - Other tall herb and fern - ruderal
- F2.2 - Marginal and inundation - inundation vegetation
- G1 - Standing water
- G2 - Running water
- J1.1 - Cultivated/disturbed land - arable
- J1.2 - Cultivated/disturbed land - amenity grassland
- J1.3 - Cultivated/disturbed land - ephemeral/short perennial
- J1.4 - Introduced shrub
- No Access
- J3.6 - Buildings & infrastructure
- J4 - Bare ground
- J5 - Hardstanding
- X A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- J2.1.2 - Intact hedge - species-poor
- J2.4 - Fence

Notes

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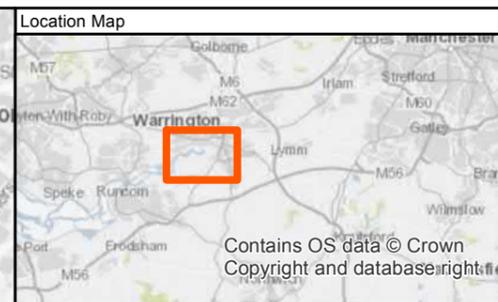
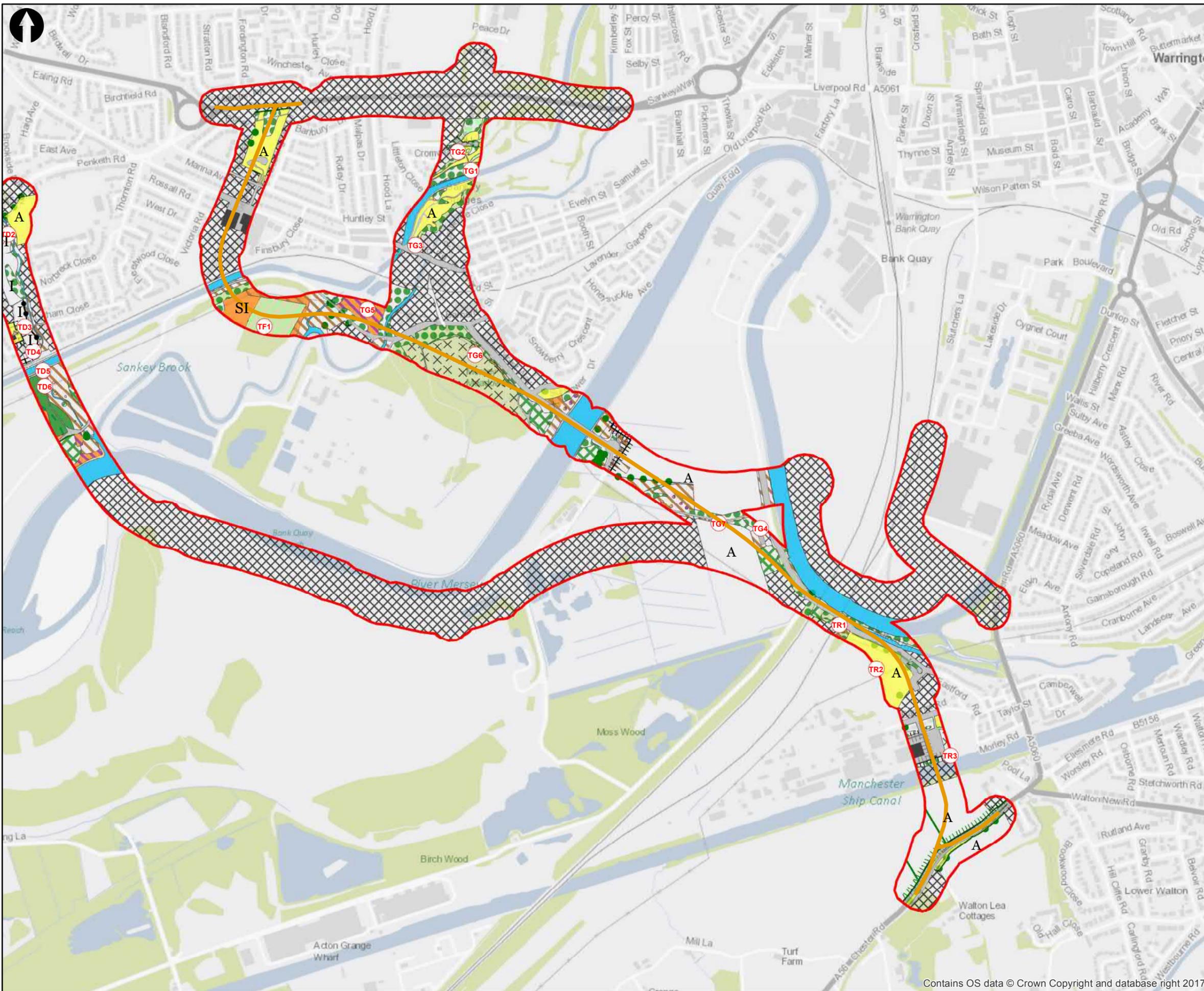
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**Western Link
Phase 1 Habitat Survey
Green Route**

Scale at A3	Status	Rev	Security
1:7,710	PRE	P1	STD

Drawing Number
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Key to Symbols

- Target_Note
- ▭ Site extent
- A3.1 - Broadleaved parkland/scattered trees
- A1.1.1 - Broadleaved woodland - semi-natural
- A1.2.2 - Coniferous woodland - plantation
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.3 - Mixed parkland/scattered trees
- B2.2 - Neutral grassland - semi-improved
- B4 - Improved grassland
- B5 - Marsh/marshy grassland
- B6 - Poor semi-improved grassland
- C3.1 - Other tall herb and fern - ruderal
- F2.2 - Marginal and inundation - inundation vegetation
- G1 - Standing water
- G1.1 - Standing water - eutrophic
- G2 - Running water
- H1.1 - Intertidal - mud/sand
- J1.1 - Cultivated/disturbed land - arable
- J1.2 - Cultivated/disturbed land - amenity grassland
- J1.3 - Cultivated/disturbed land - ephemeral/short perennial
- J1.4 - Introduced shrub
- No Access
- J3.6 - Buildings & infrastructure
- J4 - Bare ground
- J5 - Hardstanding
- ⊗ A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.2 - Coniferous parkland/scattered trees
- J2.1.2 - Intact hedge - species-poor
- J2.3.2 - Hedge with trees - species-poor
- J2.4 - Fence
- J2.6 - Dry ditch
- J2.8 - Earth bank

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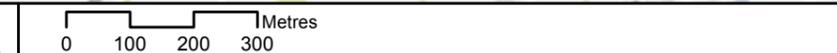
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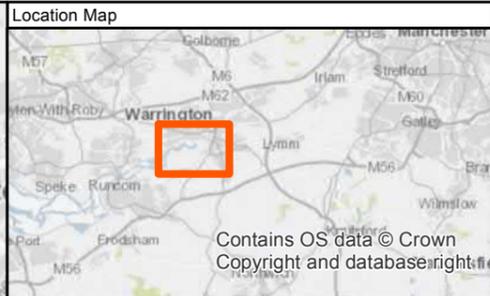
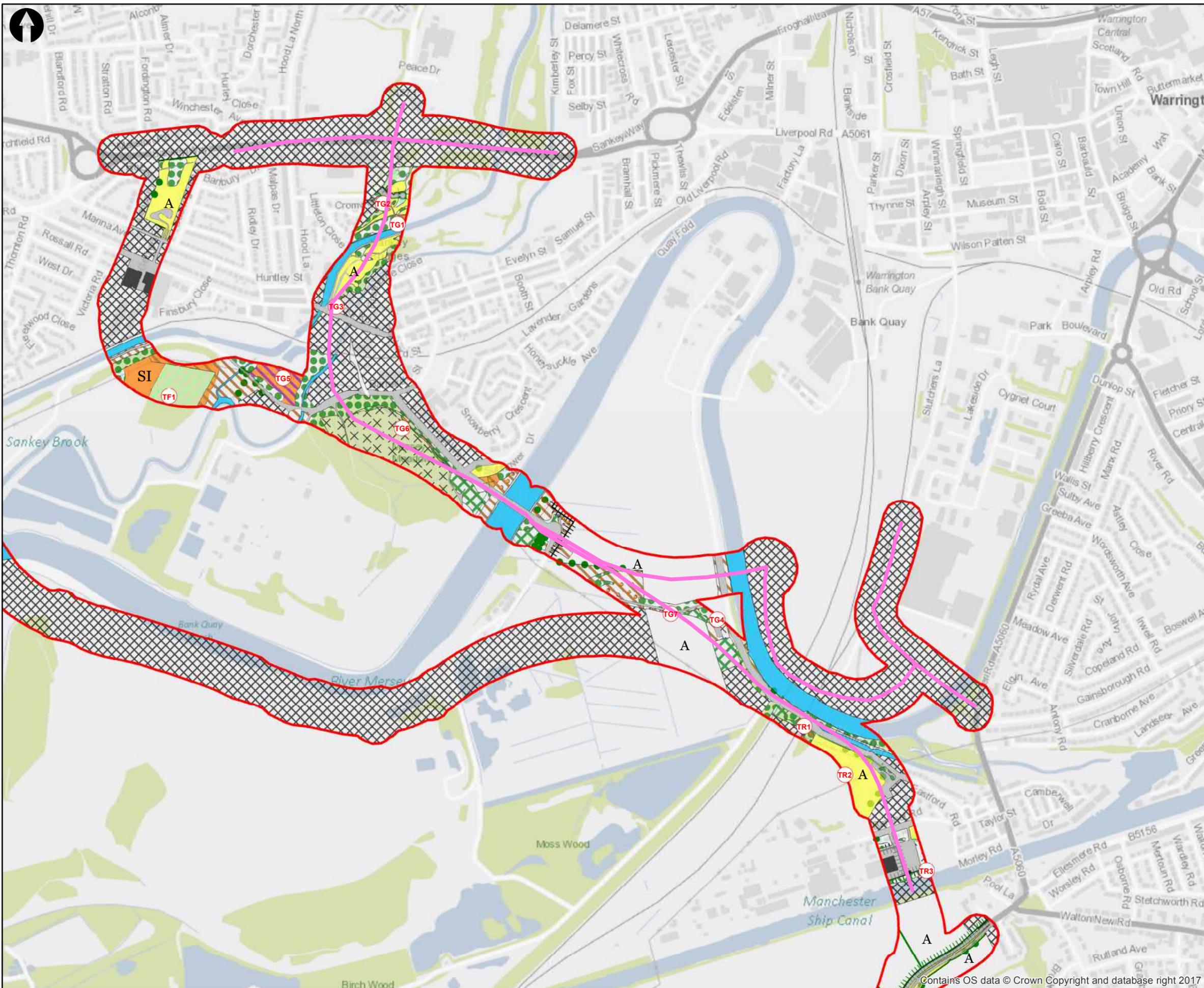
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Title
Western Link
Phase 1 Habitat Survey
Orange Route

Scale at A3	Status	Rev	Security
1:11,110	PRE	P1	STD

Drawing Number
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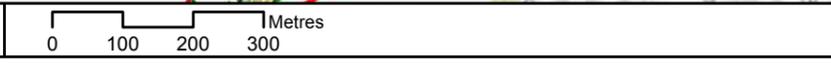
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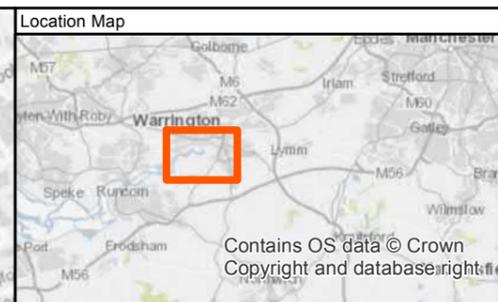
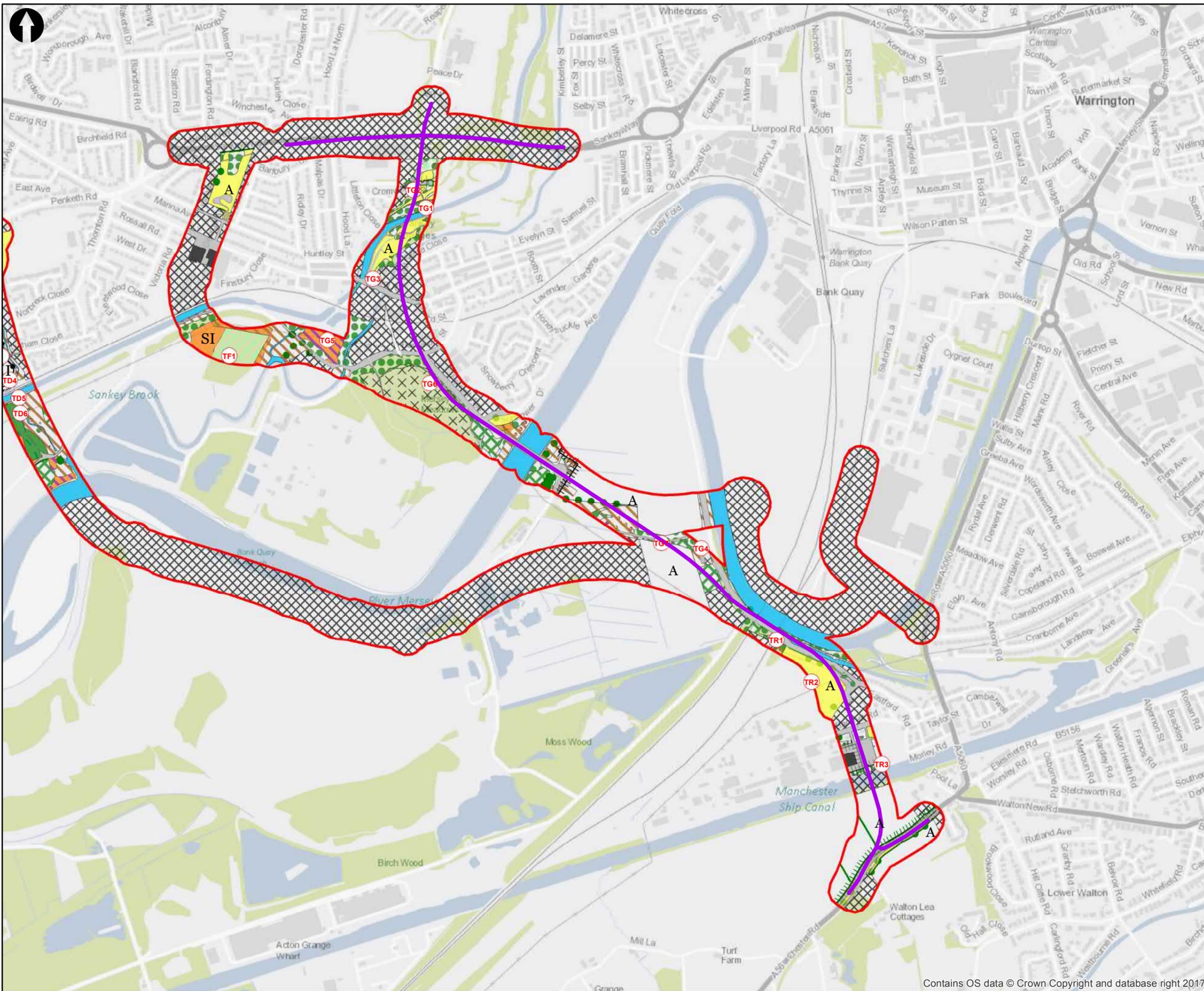
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Title
Western Link
Phase 1 Habitat Survey
Pink Route

Scale at A3	Status	Rev	Security
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- J1.2 - Cultivated/disturbed land - ephemeral/short perennial
- J1.3 - Cultivated/disturbed land - ephemeral/short perennial
- J1.4 - Introduced shrub
- No
- J3.6 - Buildings & infrastructure
- J4 - Bare ground
- J5 - Hardstanding
- X A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.2 - Coniferous parkland/scattered
- J2.1.2 - Intact hedge - species-poor
- J2.3.2 - Hedge with trees - species-poor
- J2.4 - Fence
- J2.6 - Dry ditch
- J2.8 - Earth bank

Notes
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Rev	Date	Drawn	Description	Ch'k'd	App'd
A	24/08/17	CS	Draft for comment	CS	AS

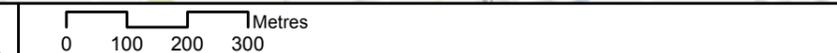
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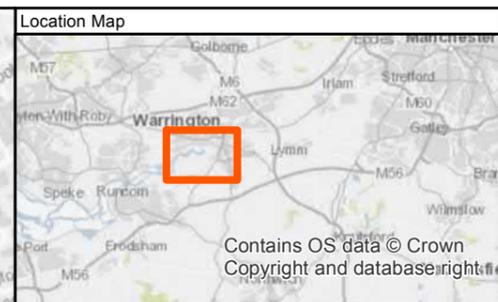
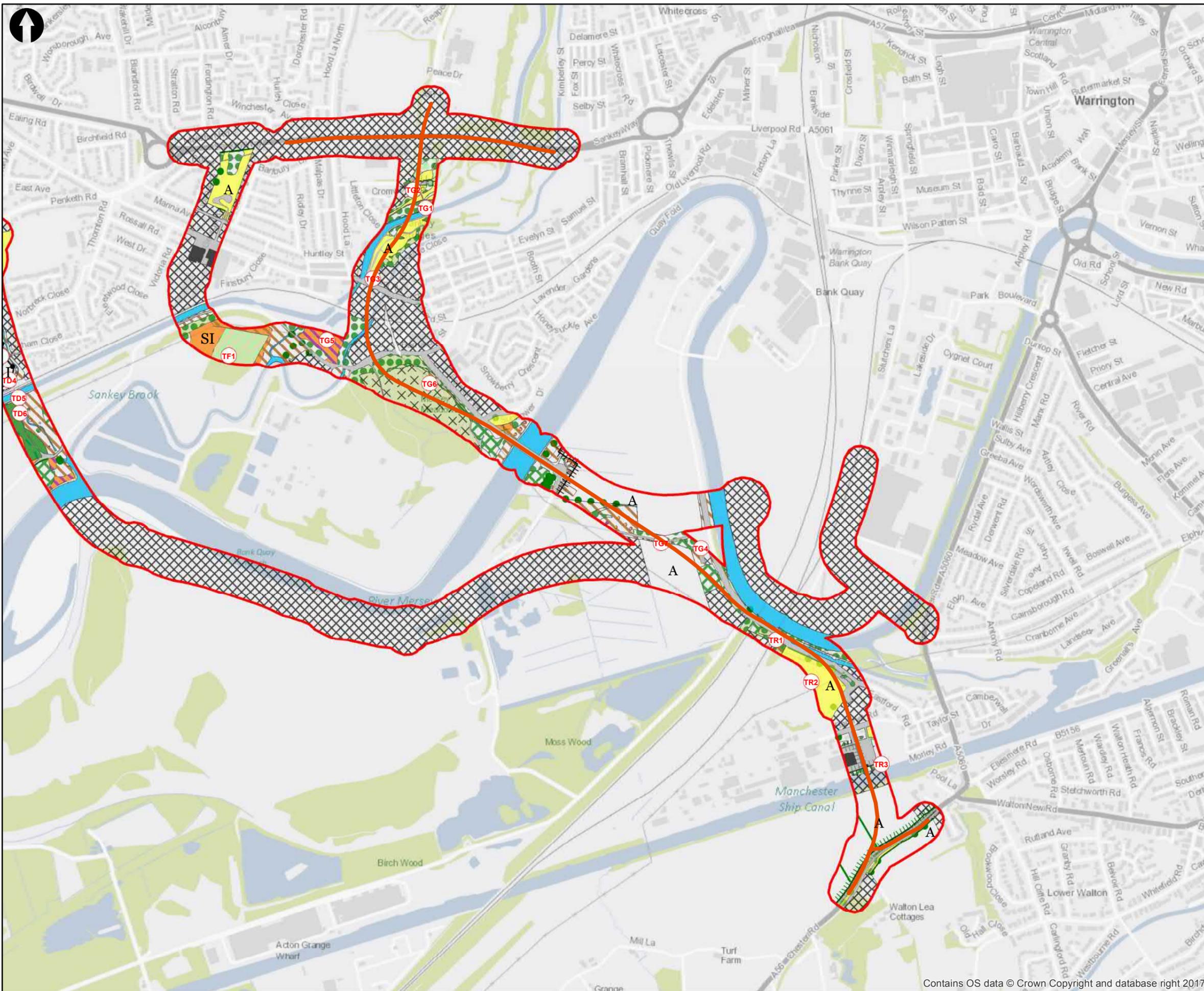
Warrington Borough Council

Title
Western Link
Phase 1 Habitat Survey
Purple Route

Scale at A3	Status	Rev	Security
1:11,680	PRE	P1	STD

Drawing Number
382900-WL-MMD-07-XX-GIS-Y-0010





Key to Symbols

- Target_Note
- ▭ Site extent
- A3.1 - Broadleaved parkland/scattered trees
- A1.1.1 - Broadleaved woodland - semi-natural
- A1.2.2 - Coniferous woodland -
- A2.1 - Scrub -
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.3 - Mixed parkland/scattered
- B2.2 - Neutral grassland - semi-
- B4 - Improved grassland
- B5 - Marsh/marshy
- B6 - Poor semi-improved
- C3.1 - Other tall herb and fern -
- F2.2 - Marginal and inundation - inundation vegetation
- G1 - Standing water
- G1.1 - Standing water -
- G2 - Running water
- H1.1 - Intertidal -
- J1.1 - Cultivated/disturbed land -
- J1.2 - Cultivated/disturbed land - amenity grassland
- J1.3 - Cultivated/disturbed land - ephemeral/short perennial
- J1.4 - Introduced shrub
- No
- J3.6 - Buildings &
- J4 - Bare ground
- J5 - Hardstanding
- X A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.2 - Coniferous parkland/scattered
- J2.1.2 - Intact hedge - species-poor
- J2.3.2 - Hedge with trees - species-poor
- J2.4 - Fence
- J2.6 - Dry ditch
- J2.8 - Earth bank

Notes
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Rev	Date	Drawn	Description	Ch'k'd	App'd
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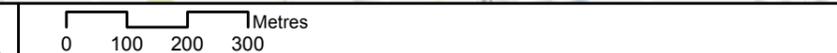
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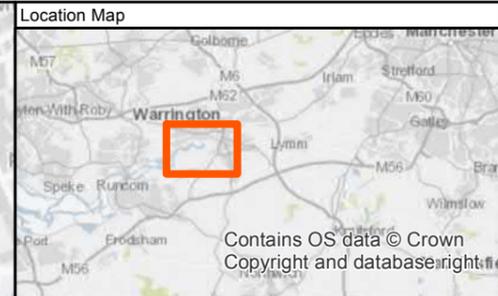
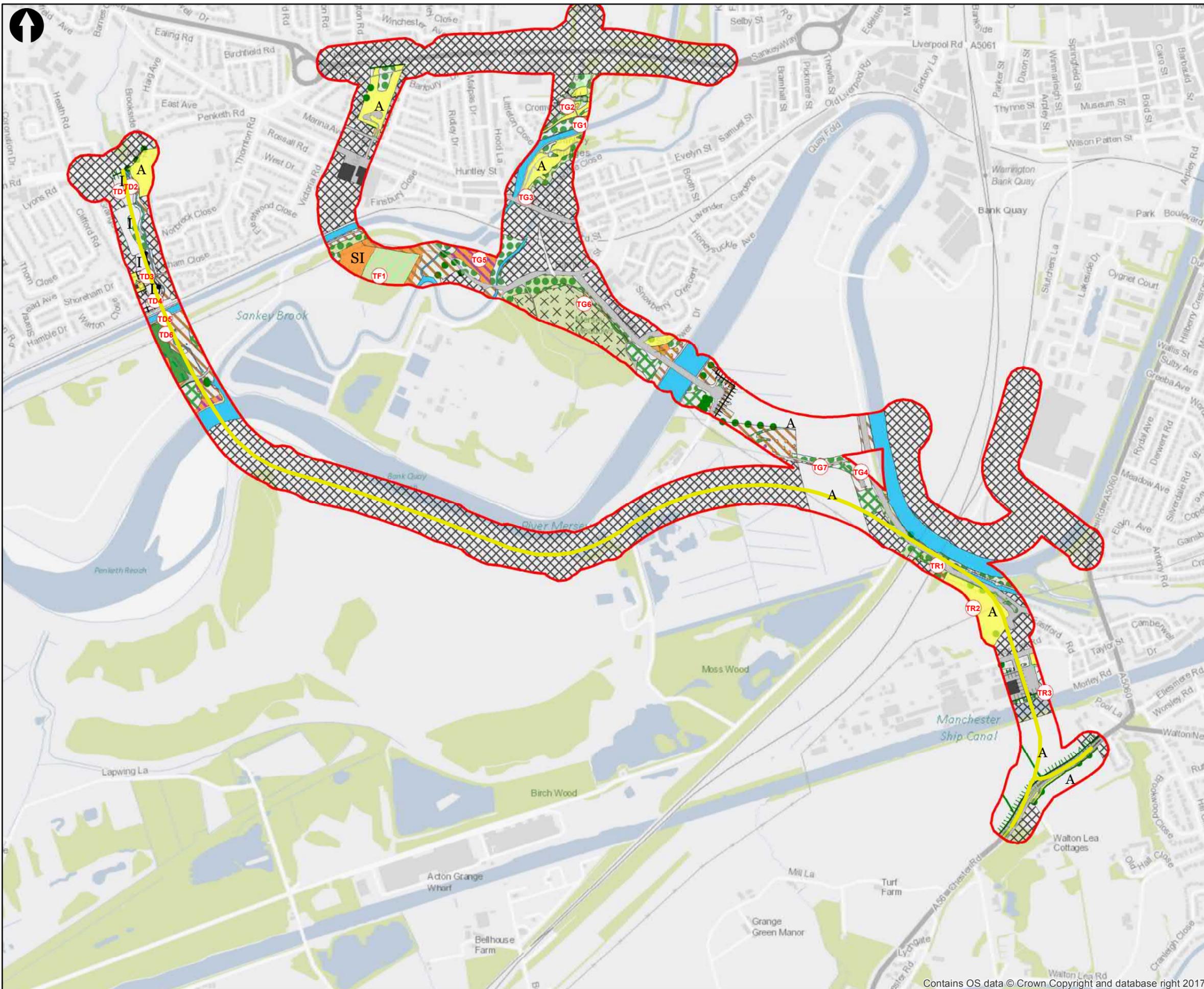
Warrington Borough Council

Title
**Western Link
 Phase 1 Habitat Survey
 Red Route**

Scale at A3	Status	Rev	Security
1:11,680	PRE	P1	STD

Drawing Number
 382900-WL-MMD-07-XX-GIS-Y-0010





Key to Symbols

- Target_Note
- ▭ Site extent
- A3.1 - Broadleaved parkland/scattered trees
- A1.1.1 - Broadleaved woodland - semi-natural
- A1.2.2 - Coniferous woodland -
- A2.1 - Scrub -
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.3 - Mixed parkland/scattered
- B2.2 - Neutral grassland - semi-
- B4 - Improved grassland
- B5 - Marsh/marshy
- B6 - Poor semi-improved
- C3.1 - Other tall herb and fern -
- F2.2 - Marginal and inundation - inundation vegetation
- G1 - Standing water
- G1.1 - Standing water -
- G2 - Running water
- H1.1 - Intertidal -
- J1.1 - Cultivated/disturbed land -
- J1.2 - Cultivated/disturbed land - amenity grassland
- J1.3 - Cultivated/disturbed land - ephemeral/short perennial
- J1.4 - Introduced shrub
- No
- J3.6 - Buildings &
- J4 - Bare ground
- J5 - Hardstanding
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.2 - Coniferous parkland/scattered
- J2.1.2 - Intact hedge - species-poor
- J2.3.2 - Hedge with trees - species-poor
- J2.4 - Fence
- J2.6 - Dry ditch
- J2.8 - Earth bank

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Warrington Borough Council

Title
**Western Link
Phase 1 Habitat Survey
Yellow Route**

Scale at A3	Status	Rev	Security
1:11,450	PRE	P1	STD

Drawing Number
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B. Target notes

Table 6: Target notes

Target Number	Details	Image
TD1		
TD2	Japanese knotweed along Whittle brook fdgff	
TD3	Japanese knotweed along access road to United utilities compound	
TD4	Wood piles in tall ruderal, just north of St Helen's Canal	

Target Number	Details	Image
TD5	Japanese knotweed where Whittle brook meets St Helen's Canal	
TD6	Water inundation	
TF1	Area of semi-improved grassland in planted woodland	
TR1	Japanese knotweed near railway bridge on Eastford road.	
TR2	Dead hedgehog found in Morley Common	

Target Number	Details	Image
TR3	Potential wildlife tracks	
TG1	Reptile potential in the tall ruderal and semi-improved neutral grassland mosaic	
TG2	GCN potential in the pond	
TG3	6 ivy covered trees with bat roosting potential	
TG4	Japanese Knotweed	
TG5	Marshy grassland with potential for amphibians and reptiles	

Target Number	Details	Image
TG6	Ephemeral grassland with potential for reptiles	 A photograph showing a field of green grass and low-lying vegetation under a cloudy sky. A power line tower is visible in the background.
TG7	Marshy grassland and tall ruderal mosaic with reptile potential	 A photograph showing a field of tall, green grasses and other vegetation under a cloudy sky.

Source: A.Crowl, J. Stephenson

C. Species specific legislation

C.1 Special Areas of Conservation (SAC)

SACs are European designated sites under the EC Habitats Directive due to their important habitat or species. Under domestic law SACs are protected under The Conservation of Habitats and Species Regulations 2010 (as amended) and any development likely to have impacts upon such a site must be assessed for its implications on the site's conservation status, through a Habitat Regulations Assessment (HRA).

C.2 Special Protection Areas (SPA)

SPAs are European designated sites under the EC Birds Directive due to the presence of important and vulnerable, listed in Annex I of the directive, and for the migratory bird species. Under domestic law SPAs are protected under The Conservation of Habitats and Species Regulations 2010 (as amended) and any development likely to have impacts upon such a site must be assessed for its implications on the site's conservation status, through a Habitat Regulations Assessment (HRA).

C.3 Ramsar

A Ramsar site is a wetland designated under the Ramsar Convention. The Ramsar Convention is an international environmental treaty which provides the framework for international cooperation in protecting wetlands.

C.4 Local Wildlife Site/Reserve (LNS/R)

Local planning authorities identify these due to their value for wildlife within the county. These receive a measure of protection through local planning policies. Further consultation with stakeholders will be required.

C.5 Common Amphibians

All common amphibians are protected under the Wildlife and Countryside Act 1981 (as amended), by their inclusion of Schedule 5 under section 9(5), which make it an offence to sell amphibians.

C.6 Great Crested Newts (GCN)

GCN are protected under the Habitats and Species Regulations 2010 (as amended) through their designation as a European Protected Species, which makes it an offence to: deliberately capture, injure, kill, disturb, damage or destroy a breeding site or resting place of a GCN; possess, transport, sell, exchange an otter. GCN are also partially protected under the Wildlife and Countryside Act 1981 (as amended), through their inclusion of Schedule 5 under section 9(4b, 4c and 5). Which makes it an offence to: intentionally or recklessly obstruct access to any structure or place used for shelter or protection; intentionally or recklessly disturbs a great crested newt while occupying any structure or place used for shelter or protection; sell, offers, exposes for sale and live or dead great crested newt.

C.7 Common Reptiles

All common reptiles are protected under the Wildlife and Countryside Act 1981 (as amended), by their inclusion of Schedule 5 under section 9(1 and 5), which make it an offence to intentionally: kill, injure, or take any reptile; sell, offer, or exposes for sale any reptiles.

C.8 Birds

All wild birds in England and Wales are protected under the Wildlife and Countryside Act, 1981 (as amended) section 1 which make it an offence to intentionally: kill, injure, take any wild bird; take, damage or destroy the nest (whilst being built or in use) or its eggs. Further protection is given to species by their inclusion of Schedule 1 of The Act, which makes it an offence to intentionally or recklessly: disturb these species while building a nest, or in, on or near a nest containing eggs or young; or to disturb dependent young of such a bird. Additionally, enhanced statutory protection is provided for bird species included on Annex 1 of the Wild Birds Directive.

C.9 Bats

All UK bat species are under the Habitats and Species Regulations 2010 (as amended) through their designation as a European Protected Species, which makes it an offence to: deliberately capture, injure, kill, disturb, damage or destroy a breeding site or resting place of a bat; possess, transport, sell, exchange a bat. Bats are also partially protected under the Wildlife and Countryside Act 1981 (as amended), through their inclusion of Schedule 5 under section 9(4b, 4c and 5). Which makes it an offence to: intentionally or recklessly obstruct access to any structure or place used for shelter or protection; intentionally or recklessly disturbs a bat while occupying any structure or place used for shelter or protection; sell, offers, exposes for sale and live or dead bat.

C.10 Otter

Otters are protected under the Habitats and Species Regulations 2010 (as amended) through their designation as a European Protected Species, which makes it an offence to: deliberately capture, injure, kill, disturb, damage or destroy a breeding site or resting place of an otter; possess, transport, sell, exchange an otter. Otters are also partially protected under the Wildlife and Countryside Act 1981 (as amended), through their inclusion of Schedule 5 under section 9(4b, 4c and 5). Which makes it an offence to: intentionally or recklessly obstruct access to any structure or place used for shelter or protection; intentionally or recklessly disturbs an otter while occupying any structure or place used for shelter or protection; sell, offers, exposes for sale and live or dead an otter.

C.11 Water vole

Water voles are partially protected under the Wildlife and Countryside Act 1981 (as amended) through their inclusion of Schedule 5 under section 9. Which makes it an offence to: intentionally kill, take or injure any water vole; intentionally or recklessly obstruct access to or damage/destroy any structure or place used for shelter or protection; intentionally or recklessly disturbs a water vole while occupying any structure or place used for shelter or protection; sell, offers, exposes for sale and live or dead water vole.

C.12 Badger

Badgers and their setts are protected under the Protection of Badgers Act (1992). It is an offence to: kill or injure a badger; to damage, destroy or block access to setts; and to disturb a badger within a sett

C.13 White Clawed Crayfish

White Clawed Crayfish are protected under the Wildlife and Countryside Act 1981 (as amended), by their inclusion of Schedule 5 under section 9(1 and 5) which makes it an offence to: kill, injure, take, or trade. White Clawed Crayfish are also included in Annex II of the Habitats directive, which qualifies for SAC designation, as such, receive additional protection through SAC legislation (see C.1).

C.14 Non-native invasive species

It is an offence to plant or cause to grow non-native invasive species, such as Himalayan Balsam and Japanese Knotweed, under section 14 of the Wildlife and Countryside Act 1981 (as amended).

D. Biological Records

Species Record tables for each route (for up to 2km from site). The 'number of records' shows both 'data entries' and 'exact count of animals' (in brackets where applicable).

Source: Records Centre for Cheshire, Halton, Warrington and Wirral (RECORD)

D.1 Red Route

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹
MAMMALS					
Badger					
Eurasian Badger <i>Meles meles</i>	287 (305)	2007-2016	Grass verges. Back gardens. Trans-Penine Trail	0-2km	BAct
Bat					
Bats Chiroptera	1	2011		1.1km	WCA5, S41, HabRegs2
Brown Long-eared Bat <i>Plecotus auritus</i>	1	2013		0.7km	LBAP, WCA5, S41, HabRegs2, UKBAP
Common Pipistrelle <i>Pipistrellus pipistrellus</i>	13	2008-2015	Penketh & Cuerdley. Chapel Brow Farm.	0.1-1.6km	WCA5, S41, HabRegs2
Daubenton's Bat <i>Myotis daubentonii</i>	5	2006-2013	Canals.	0.6-1.9km	LBAP, WCA5, S41, HabRegs2
Noctule Bat <i>Nyctalus noctula</i>	6 (9)	2010-2015		0.4-1.9km	LBAP, WCA5, S41, HabRegs2, UKBAP
Pipistrelle <i>Pipistrellus sp.</i>	23 (39)	2006-2013		0.1-1.9km	LBAP, WCA5, HabRegs2
Soprano Pipistrelle <i>Pipistrellus pygmaeus</i>	8 (15)	2009-2015		0-1.9km	LBAP, WCA5, S41, HabRegs2, UKBAP
Unidentified Bat <i>Myotis</i>	1	2014		1.4km	WCA5, S41, HabRegs2
Deer					
Roe Deer <i>Capreolus capreolus</i>	1 (0)	2009-2009		0-0km	

¹ European Protected Species (EPS), Habitats Directive (HDir), Wildlife and Countryside Act 1985 (as amended) (WCA5), Schedule 42 (S42), UK Biodiversity Action Plan (UKBAP), Bern, Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), Red Data List 1 [UK] (RD1), Red Data List 2 [UK] (RD2), International Union for Conservation of Nature least-concern species (IUCN LC), Local Biodiversity Action Plan (LBAP) [CE,PE]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹
Hares					
Brown Hare <i>Lepus europaeus</i>	6 (9)	2007-2015		0.8-1.8km	LBAP, S41, UKBAP
Misc					
American Mink <i>Neovision vison</i>	6	2008-2014	Manchester ship canal. Runcorn Latchford canal east.	0.2-1.5km	INNS, WCA9
Bank Vole <i>Myodes glareolus</i>	9 (22)	2008-2014	Middle Moss Wood. Lapwing Lane Pool.	0.4-1.9km	
European Water Vole <i>Arvicola amphibius</i>	5	2008-2014	St Helens canal.	0.6-1.8km	LBAP, WCA5, S41, UKBAP
Weasel <i>Mustela nivalis</i>	4	2006-2015		0.3-1.8km	
Otter					
European Otter <i>Lutra lutra</i>	8 (15)	2012-2017	Ship canal towpath. St Helens canal.	0.8-1.1km	LBAP, WCA5, S41, HabRegs2, UKBAP
Squirrels					
Eurasian Red Squirrel <i>Sciurus vulgaris</i>	1	2016	Walton Lea Cottage	0.7-0.7km	WCA5, S41, UKBAP
BIRDS					
Barn Owl <i>Tyto alba</i>	5 (7)	2009-2014	Penketh & Cuedley.	0.7-2km	LBAP, WCA1, BAm [RSPB], WCA9
Barnacle Goose <i>Branta leucopsis</i>	1	2012-2012		1.5-1.5km	BAm [RSPB], WCA9
Bittern <i>Botaurus stellaris</i>	56 (66)	2006-2013	Moore reserve.	0.4-1.9km	WCA1, BRd [RSPB], S41, UKBAP
Black Swan <i>Cygnus atratus</i>	17	2011-2012	Moore reserve.	1.5-2km	INNS, WCA9
Black Tern <i>Chlidonias niger</i>	1 (2)	2010-2010	Latchford West.	1.5-1.5km	WCA1, BAm [RSPB]
Black-necked Grebe <i>Podiceps nigricollis</i>	15 (17)	2006-2014	Moore reserve	1.1-1.6km	LBAP, WCA1, BAm [RSPB]
Black-tailed Godwit	6 (14)	2014-2014	Penketh & Cuedley	0.4-1.1km	WCA1, BRd [RSPB], S41

BIRDS					
Limosa limosa			(Gatewarth Phase 111). Moore reserve.		
Brambling Fringilla montifringilla	18 (19)	2006-2014	Moore reserve	1.3-1.8km	WCA1
Bullfinch Pyrrhula pyrrhula	147 (185)	2006-2015	Penketh & Cuedley (Gatewarth Phase 111). Moore reserve.	0.1-1.9km	LBAP, BAm [RSPB], S41
Canada Goose Branta canadensis	233 (3538)	2006-2017		0.1-2km	INNS, WCA9
Cetti's Warbler Cettia cetti	3	2010-2015		0-1.5km	WCA1
Cuckoo Cuculus canorus	9	2007-2011	Penketh & Cuedley	0.9-1.9km	BRd [RSPB], S41, UKBAP
Curlew Numenius arquata	18 (44)	2006-2015	Upper Moss Side Farm, Richmond Bank Moore reserve	0.8-1.9km	BAm [RSPB], S41, UKBAP
Dark-bellied Brent Goose Branta bernicla subsp. bernicla	1	2009-2009		1.4-1.4km	BRd [RSPB], S41, UKBAP
Dunlin Calidris alpina	4 (7)	2007-2012	Moore Nature Reserve	1.1-1.5km	BRd [RSPB]
Dunnock Prunella modularis	727 (883)	2006-2017	Penketh & Cuedley. 3 Sandringham Drive.	0.1-2km	BAm [RSPB], S41
Fieldfare Turdus pilaris	30 (106)	2006-2015	Moore Nature Reserve.	0.1-1.8km	WCA1, BRd [RSPB]
Goldeneye Bucephala clangula	53 (62)	2006-2015		0.4-1.9km	WCA1, BAm [RSPB]
Grasshopper Warbler Locustella naevia	20 (29)	2007-2015	Moore Nature Reserve.	0.7-1.9km	BRd [RSPB], S41, UKBAP
Green Sandpiper Tringa ochropus	40 (49)	2006-2014	Lapwing Lane Wildfowl Lake.	0.4-1.9km	WCA1, BAm [RSPB]
Greylag Goose Anser anser	32 (59)	2009-2015	Lapwing Lane Wildfowl Lake.	0.5-1.9km	WCA1, BAm [RSPB]

BIRDS					
Herring Gull <i>Larus argentatus</i>	110 (18379)	2006-2015	Moore nature reserve. Warrington dock.	0.5-1.7km	BRd [RSPB]
Hobby <i>Falco subbuteo</i>	6	2006-2014	Moore nature reserve.	0.4-2km	WCA1
House Sparrow <i>Passer domesticus</i>	1187 (2200)	2006-2016		0-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Kingfisher <i>Alcedo atthis</i>	117	2006-2016	Moore Nature Reserve	0-2km	WCA1, BAm [RSPB]
Lapwing <i>Vanellus vanellus</i>	74 (2199)	2006-2015	Richmond Bank	0.1-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Lesser Spotted Woodpecker <i>Dendrocopos minor</i>	63	2006-2015		0.4-2km	BRd [RSPB], S41
Little Ringed Plover <i>Charadrius dubius</i>	21 (29)	2007-2015	Moore nature reserve	0.8-1.5km	WCA1
Marsh Tit <i>Poecile palustris</i>	5	2006-2010	Memorial Alders	1.5-1.9km	BRd [RSPB], S41
Mediterranean Gull <i>Larus melanocephalus</i>	32 (39)	2006-2014	Richmond Bank	1.1-1.5km	WCA1, BAm [RSPB]
Merlin <i>Falco columbarius</i>	1	2014-2014		1.9-1.9km	WCA1, BAm [RSPB]
Peregrine <i>Falco peregrinus</i>	25	2006-2014	Penketh. Community woodland.	0.2-1.8km	WCA1
Pintail <i>Anas acuta</i>	3	2006-2011	Lapwing Lane Wildfowl Lake	0.5-1.5km	WCA1, BAm [RSPB]
Red-crested Pochard <i>Netta rufina</i>	2 (3)	2011-2011		1.5-1.9km	WCA9
Redwing <i>Turdus iliacus</i>	125 (600)	2006-2015	Manchester Ship Canal Path	0.1-1.9km	WCA1, BRd [RSPB]
Reed Bunting <i>Emberiza schoeniclus</i>	314 (594)	2006-2015	Gatewarth Phase 111, Upper Moss Side Farm	0-2km	LBAP, BAm [RSPB], S41, UKBAP
Ring Ouzel <i>Turdus torquatus</i>	1	2007-2007		1.6-1.6km	BRd [RSPB], S41, UKBAP
Ring-necked Parakeet <i>Psittacula krameri</i>	1	2010-2010		1.5-1.5km	INNS, WCA9

BIRDS					
Ruddy Duck <i>Oxyura jamaicensis</i>	19 (24)	2006-2010	Penketh & Cuerdley	0.4-1.9km	INNS, WCA9
Skylark <i>Alauda arvensis</i>	20	2006-2013	Penketh & Cuerdley. Upper Moss Side Farm.	0.3-1.9km	LBAP, BRd [RSPB], S41
Song Thrush <i>Turdus philomelos</i>	371 (408)	2006-2016	St Helens canal, Penketh & Cuerdley	0-2km	LBAP, BRd [RSPB]
Spotted Flycatcher <i>Muscicapa striata</i>	3	2006-2011	Penketh & Cuerdley	1.6-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Starling <i>Sturnus vulgaris</i>	508 (35841)	2006-2015		0-1.9km	LBAP, BRd [RSPB], S41
Tree Pipit <i>Anthus trivialis</i>	1	2010-2010		1.1-1.1km	BRd [RSPB], S41, UKBAP
Tree Sparrow <i>Passer montanus</i>	4 (24)	2006-2010	Upper Moss Side Farm	1-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Wood Sandpiper <i>Tringa glareola</i>	4	2011-2011		1.1-1.2km	WCA1, BAm [RSPB]
Yellow Wagtail <i>Motacilla flava</i>	5	2010-2013	Penketh & Cuerdley	0.4-1.8km	BRd [RSPB], S41
Yellowhamm er <i>Emberiza citrinella</i>	3 (4)	2006-2010	Upper Moss Side Farm	0.8-1.5km	LBAP, BRd [RSPB], S41, UKBAP
PLANTS					
Bluebell <i>Hyacinthoides non-scripta</i>	11	2009-2016	Walton cricket ground	0.3-1.8km	LBAP, WCA8, IUCN LC
Giant Hogweed <i>Heracleum mantegazzianum</i>	9	2010-2015	Bewsey & Whitecross - CP, Warrington	0.1-1.6km	INNS, WCA9
Giant Knotweed <i>Fallopia sachalinensis</i>	1	2011	Trans Pennine Trail	0km	INNS
Giant-rhubarb <i>Gunnera tinctoria</i>	1	2010	Ornamental Pond, Walton Gardens	0.7km	INNS, WCA9
Himalayan Cotoneaster <i>Cotoneaster simonsii</i>	1	2011	Sankey Valley Park	0.3km	WCA9

PLANTS					
Japanese Knotweed <i>Fallopia japonica</i>	35	2007-2016	Sankey Valley Park	0-1.9km	INNS, WCA9
Japanese Rose <i>Rosa rugosa</i>	5	2007-2015	Sankey Valley Park	0-1.6km	INNS, WCA9
Rhododendron <i>Rhododendron ponticum</i>	7	2010-2016	The Dingle. Warrington. Sankey Valley	0.7-1.8km	INNS, WCA9
Small-leaved Cotoneaster <i>Cotoneaster microphyllus</i>	1	2009	Fairfield & Howley.	1.8km	WCA9

BONY FISH					
European Eel <i>Anguilla anguilla</i>	3	2009-2016	Sankey Canal	0.7-1.8km	S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²
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INSECTS					
BUTTERFLIES					
White-letter Hairstreak <i>Satyrrium w-album</i>	30 (146)	2011-2014	Penketh & Cuedley - CP, Moore Nature Reserve	1.3-2km	LBAP, WCA5, IUCN En, S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ³
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REPTILES AND AMPHIBIANS					
Common Frog <i>Rana temporaria</i>	95 (1720)	2006-2016	Runcorn Latchford canal. Wilderspool causeway	0-2km	WCA5
Common Toad <i>Bufo bufo</i>	30 (19444)	2006-2017	Bewsey & Whitecross. Penketh & Cuedley.	0.2-2km	WCA5, S41, UKBAP

² Schedule 41 (S41), UK Biodiversity Action Plan (UKBAP)

³ European Protected Species (EPS), Wildlife and Countryside Act 1985 (as amended) (WCA5), Schedule 41 (S41), UK Biodiversity Action Plan (UKBAP), Local Biodiversity Action Plan (LBAP)[CE,PE]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ³
Moore Nature Reserve.					
NEWTS					
Great Crested Newt <i>Triturus cristatus</i>	5 (38)	2013-2013	Ponds around Moss side farm and Birch wood.	1.6-1.9km	LBAP, WCA5, S41, HabRegs2, UKBAP
Smooth Newt <i>Lissotriton vulgaris</i>	3 (7)	2010-2011	Pond 6, Fiddlers Ferry Power Station.	1.6-1.9km	WCA5
REPTILES					
Red-eared Terrapin <i>Trachemys scripta</i>	4	2006-2011	St. Helen's Canal, Sankey Valley Park Section	0-0.7km	INNS

D.2 Green Route

Species	Number of records	Date	Detail	Distance from site (km)	Protection ⁴
MAMMALS					
Badger					
Eurasian Badger <i>Meles meles</i>	291 (301)	2007-2016	Grass verges. Back gardens. Trans-Penine Trail	0-2km	BAct
Hares					
Brown Hare <i>Lepus europaeus</i>	6 (9)	2007-2015		0.9-1.9km	LBAP, S41, UKBAP
Bat					
Bats Chiroptera	1	2011	CP, 245, Wilderspool causeway	0.8km	WCA5, S41, HabRegs2
Brown Long-eared Bat <i>Plecotus auritus</i>	1	2013	Walton Hall	1.6km	LBAP, WCA5, S41, HabRegs2, UKBAP
Common Pipistrelle <i>Pipistrellus pipistrellus</i>	12	2008-2015	Penketh & Cuerdley. Chapel Brow Farm.	0.2-1.6km	WCA5, S41, HabRegs2
Daubenton's Bat <i>Myotis daubentonii</i>	5	2006-2013	St. Helen's Canal, Sankey Valley Park Section	0.6-1.9km	LBAP, WCA5, S41, HabRegs2

⁴ European Protected Species (EPS), Habitats Directive (HDi), Wildlife and Countryside Act 1985 (as amended) (WCA5), Schedule 42 (S42), UK Biodiversity Action Plan (UKBAP), Bern, Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), Red Data List 1 [UK] (RD1), Red Data List 2 [UK] (RD2), International Union for Conservation of Nature least-concern species (IUCN LC), Local Biodiversity Action Plan (LBAP) [CE,PE]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ⁴
Noctule Bat <i>Nyctalus noctula</i>	6 (9)	2010-2015	Walton hall, Walton Lea Rd,	0.5-1.9km	LBAP, WCA5, S41, HabRegs2, UKBAP
Pipistrelle <i>Pipistrellus pipistrellus</i>	22 (43)	2006-2012		0.3-1.8km	LBAP, WCA5, HabRegs2
Soprano Pipistrelle <i>Pipistrellus pygmaeus</i>	7 (14)	2009-2015		0.1-1.9km	LBAP, WCA5, S41, HabRegs2, UKBAP
Unidentified Bat <i>Myotis</i>	1	2014	Chapel Brow Farm, Liverpool Road	1.4-1.4km	WCA5, S41, HabRegs2
Misc					
American Mink <i>Neovision vison</i>	6	2008-2014	Manchester ship canal. Runcorn Latchford canal east.	0.4-1.6km	INNS, WCA9
Bank Vole <i>Myodes glareolus</i>	9 (22)	2008-2014	Middle Moss Wood. Lapwing Lane Pool.	0.5-1.9km	
European Water Vole <i>Arvicola amphibius</i>	5	2008-2014	St Helens canal.	0.7-1.8km	LBAP, WCA5, S41, UKBAP
Weasel <i>Mustela nivalis</i>	4	2006-2015		1.1-1.8km	
West European Hedgehog <i>Erinaceus europaeus</i>	32	2006-2016		0-1.5km	S41, UKBAP
Otters					
European Otter <i>Lutra lutra</i>	8 (15)	2012-2017	Ship canal towpath. St Helens canal.	0.8-1km	LBAP, WCA5, S41, HabRegs2, UKBAP
Squirrels					
Eurasian Red Squirrel <i>Sciurus vulgaris</i>	1	2016	Walton Lea Cottage	1.5km	WCA5, S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ⁵
BIRDS					

⁵ European Protected Species (EPS), Habitats Directive (HDi), Wildlife and Countryside Act 1985 (as amended) (WCA5), Schedule 42 (S42), UK Biodiversity Action Plan (UKBAP), Bern, Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), Red Data List 1 [UK] (RD1), Red Data List 2 [UK] (RD2), Local Biodiversity Action Plan (LBAP)[CE,PE]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ⁵
Barn Owl <i>Tyto alba</i>	3 (4)	2011-2014	Penketh & Cuedley.	0.8-1.9km	LBAP, WCA1, BAm [RSPB], WCA9
Barnacle Goose <i>Branta leucopsis</i>	1	2012-2012		1.6-1.6km	BAm [RSPB], WCA9
Bittern <i>Botaurus stellaris</i>	56 (66)	2006-2013	Moore reserve.	0.5-1.9km	WCA1, BRd [RSPB], S41, UKBAP
Black Swan <i>Cygnus atratus</i>	17	2011-2012	Moore reserve.	1.6-2km	INNS, WCA9
Black-necked Grebe <i>Podiceps nigricollis</i>	15 (17)	2006-2014	Moore reserve	1.1-1.6km	LBAP, WCA1, BAm [RSPB]
Black-tailed Godwit <i>Limosa limosa</i>	6 (14)	2014-2014	Penketh & Cuedley (Gatewarth Phase 111). Moore reserve.	0.5-1.1km	WCA1, BRd [RSPB], S41
Brambling <i>Fringilla montifringilla</i>	18 (19)	2006-2014	Moore reserve	1.3-1.9km	WCA1
Bullfinch <i>Pyrrhula pyrrhula</i>	147 (185)	2006-2015	Penketh & Cuedley (Gatewarth Phase 111). Moore reserve.	0.1-2km	LBAP, BAm [RSPB], S41
Canada Goose <i>Branta canadensis</i>	230 (3502)	2006-2017		0.1-2km	INNS, WCA9
Cetti's Warbler <i>Cettia cetti</i>	3	2010-2015		0.1-1.5km	WCA1
Cuckoo <i>Cuculus canorus</i>	9	2007-2011	Penketh & Cuedley	1-1.9km	BRd [RSPB], S41, UKBAP
Curlew <i>Numenius arquata</i>	18 (44)	2006-2015	Upper Moss Side Farm, Richmond Bank Moore reserve	0.9-1.9km	BAm [RSPB], S41, UKBAP
Dark-bellied Brent Goose <i>Branta bernicla</i> subsp. <i>bernicla</i>	1	2009-2009		1.2-1.2km	BRd [RSPB], S41, UKBAP
Dunlin <i>Calidris alpina</i>	4 (7)	2007-2012	Moore Nature Reserve	1.1-1.6km	BRd [RSPB]
Duncock <i>Prunella modularis</i>	726 (882)	2006-2017	Penketh & Cuedley.	0.1-2km	BAm [RSPB], S41

Species	Number of records	Date	Detail	Distance from site (km)	Protection ⁵
			3 Sandringham Drive.		
Fieldfare Turdus pilaris	29 (105)	2006-2015	Moore Nature Reserve.	0.2-1.9km	WCA1, BRd [RSPB]
Goldeneye Bucephala clangula	53 (62)	2006-2015		0.5-1.9km	WCA1, BAm [RSPB]
Grasshopper Warbler Locustella naevia	20 (29)	2007-2015	Moore Nature Reserve.	0.7-1.9km	BRd [RSPB], S41, UKBAP
Green Sandpiper Tringa ochropus	40 (49)	2006-2014	Lapwing Lane Wildfowl Lake.	0.5-1.9km	WCA1, BAm [RSPB]
Greylag Goose Anser anser	32 (59)	2009-2015	Lapwing Lane Wildfowl Lake.	0.6-1.9km	WCA1, BAm [RSPB]
Herring Gull Larus argentatus	110 (18379)	2006-2015	Moore nature reserve. Warrington dock.	0.5-1.7km	BRd [RSPB]
Hobby Falco subbuteo	5	2006-2014	Moore nature reserve.	0.5-1.9km	WCA1
House Sparrow Passer domesticus	1188 (2200)	2006-2016		0.1-1.8km	LBAP, BRd [RSPB], S41, UKBAP
Kingfisher Alcedo atthis	117	2006-2016	Moore Nature Reserve	0-2km	WCA1, BAm [RSPB]
Lapwing Vanellus vanellus	71 (2194)	2006-2015	Richmond Bank	0-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Lesser Spotted Woodpecker Dendrocopos minor	50	2006-2015		0.5-2km	BRd [RSPB], S41
Little Ringed Plover Charadrius dubius	21 (29)	2007-2015	Moore nature reserve	0.9-1.6km	WCA1
Marsh Tit Poecile palustris	5	2006-2010	Memorial Alders	1.5-1.9km	BRd [RSPB], S41
Mediterranean Gull Larus melanocephalus	32 (39)	2006-2014	Richmond Bank	1.1-1.6km	WCA1, BAm [RSPB]
Merlin Falco columbarius	1	2014-2014		2-2km	WCA1, BAm [RSPB]
Peregrine Falco peregrinus	25	2006-2014	Penketh. Community woodland.	0.4-1.8km	WCA1

Species	Number of records	Date	Detail	Distance from site (km)	Protection ⁵
Pintail <i>Anas acuta</i>	3	2006-2011	Lapwing Lane Wildfowl Lake	0.6-1.5km	WCA1, BAm [RSPB]
Red-crested Pochard <i>Netta rufina</i>	2 (3)	2011-2011		1.6-1.9km	WCA9
Redwing <i>Turdus iliacus</i>	124 (600)	2006-2015	Manchester Ship Canal Path	0.5-1.9km	WCA1, BRd [RSPB]
Reed Bunting <i>Emberiza schoeniclus</i>	314 (594)	2006-2015	Gatewarth Phase 111, Upper Moss Side Farm	0.1-2km	LBAP, BAm [RSPB], S41, UKBAP
Ring Ouzel <i>Turdus torquatus</i>	1	2007-2007		1.7-1.7km	BRd [RSPB], S41, UKBAP
Ring-necked Parakeet <i>Psittacula krameri</i>	1	2010-2010		1.5-1.5km	INNS, WCA9
Ruddy Duck <i>Oxyura jamaicensis</i>	19 (24)	2006-2010	Penketh & Cuedley	0.5-2km	INNS, WCA9
Skylark <i>Alauda arvensis</i>	20	2006-2013	Penketh & Cuedley. Upper Moss Side Farm.	0.1-2km	LBAP, BRd [RSPB], S41
Song Thrush <i>Turdus philomelos</i>	365 (403)	2006-2016	St Helens canal, Penketh & Cuedley	0-1.9km	LBAP, BRd [RSPB]
Spotted Flycatcher <i>Muscicapa striata</i>	3	2006-2011	Penketh & Cuedley	1.7-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Starling <i>Sturnus vulgaris</i>	509 (35851)	2006-2015		0.1-1.9km	LBAP, BRd [RSPB], S41
Tree Pipit <i>Anthus trivialis</i>	1	2010-2010		1.1-1.1km	BRd [RSPB], S41, UKBAP
Tree Sparrow <i>Passer montanus</i>	4 (24)	2006-2010	Upper Moss Side Farm	0.7-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Wood Sandpiper <i>Tringa glareola</i>	4	2011-2011		1.1-1.2km	WCA1, BAm [RSPB]
Yellow Wagtail <i>Motacilla flava</i>	5	2010-2013	Penketh & Cuedley	0.5-1.9km	BRd [RSPB], S41
Yellowhammer <i>Emberiza citrinella</i>	3 (4)	2006-2010	Upper Moss Side Farm	0.8-1.5km	LBAP, BRd [RSPB], S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ⁶
PLANTS					
Bluebell Hyacinthoides non-scripta	10	2009-2016	Wood West of the cricket ground , Walton	0.7-1.8km	LBAP, WCA8, IUCN LC
Giant Hogweed Heracleum mantegazzianum	9	2010-2015	CP, Moore NR	0.1-1.7km	INNS, WCA9
Giant Knotweed Fallopia sachalinensis	1	2011	Trans Pennine Trail	0.1km	INNS
Giant-rhubarb Gunnera tinctoria	1	2010	Ornamental Pond, Walton Gardens, Walton, Warrington	1.5km	INNS, WCA9
Himalayan Cotoneaster Cotoneaster simonsii	1	2011	Sankey Valley Park, Great Sankey, Warrington	0.3km	WCA9
Japanese Knotweed Fallopia japonica	35	2007-2016	Banks of Mersey golf driving range	0-1.9km	INNS, WCA9
Japanese Rose Rosa rugosa	5	2007-2015	Sankey Valley Park, Great Sankey, Warrington	0-1.6km	INNS, WCA9
Rhododendron Rhododendron ponticum	7	2010-2016	CP, Walton Hall Park	1-1.8km	INNS, WCA9
Small-leaved Cotoneaster Cotoneaster microphyllus	1	2009	CP, Warrington	1.3km	WCA9

Species	Number of records	Date	Detail	Distance from site (km)	Protection ⁷
BONY FISH					
European Eel Anguilla anguilla	3	2009-2016	Sankel Canal	0.8-1.9km	S41, UKBAP

³ Invasive Non-Native Species (INNS), Wildlife and Countryside Act 1985 (as amended) (WCA8-9), International Union for Conservation of Nature least-concern species (IUCN LC), Local Biodiversity Action Plan (LBAP)[CE,PE]

⁷ Schedule 41 (S41), UK Biodiversity Action Plan (UKBAP)

Species	Number of records	Date	Detail	Distance from site (km)	Protection ⁸
INSECTS					
BUTTERFLIES					
White-letter Hairstreak Satyrium w-album	30 (146)	2011-2014	CP, Moore Nature Reserve	1.3-2km	LBAP, WCA5, IUCN En, S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ⁹
REPTILES AND AMPHIBIANS					
Common Frog Rana temporaria	93 (1720)	2006-2016	CP, 249, Wilderspool Causeway, Warrington	0-2km	WCA5
Common Toad Bufo bufo	29 (19444)	2006-2017	CP, Moore Nature Reserve	0-2km	WCA5, S41, UKBAP
NEWTs					
Great Crested Newt Triturus cristatus	5 (38)	2013-2013	Ponds (various)	1.6-1.9km	LBAP, WCA5, S41, HabRegs2, UKBAP
Smooth Newt Lissotriton vulgaris	3 (7)	2010-2011	In box, western end of restored Arpley landfill	1.6-1.9km	WCA5
REPTILES					
Red-eared Terrapin Trachemys scripta	4	2006-2011	Walton Hall Park & Gardens, Walton	0.1-1.5km	INNS

D.3 Orange Route

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹⁰
MAMMALS					
Badger					

⁸ Schedule 41 (S41), UK Biodiversity Action Plan (UKBAP)

⁹ European Protected Species (EPS), Wildlife and Countryside Act 1985 (as amended) (WCA5), Schedule 41 (S41), UK Biodiversity Action Plan (UKBAP), Local Biodiversity Action Plan (LBAP)[CE,PE]

¹⁰ European Protected Species (EPS), Habitats Directive (HDir), Wildlife and Countryside Act 1985 (as amended) (WCA5), Schedule 42 (S42), UK Biodiversity Action Plan (UKBAP), Bern, Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), Red Data List 1 [UK] (RD1), Red Data List 2 [UK] (RD2), International Union for Conservation of Nature least-concern species (IUCN LC), Local Biodiversity Action Plan (LBAP) [CE,PE]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹⁰
Eurasian Badger <i>Meles meles</i>	287 (305)	2007-2016		0-2km	BAct
Bat					
Brown Long-eared Bat <i>Plecotus auritus</i>	1	2013		0.7km	LBAP, WCA5, S41, HabRegs2, UKBAP
Common Pipistrelle <i>Pipistrellus pipistrellus</i>	17 (91)	2008-2015	Chapel Brow Farm, Great Sankey	0.1-2km	WCA5, S41, HabRegs2
Daubenton's Bat <i>Myotis daubentonii</i>	5	2006-2013		0.6-1.8km	LBAP, WCA5, S41, HabRegs2
Noctule Bat <i>Nyctalus noctula</i>	6 (9)	2010-2015	Grasslands (S), Moore NR	0.4-1.9km	LBAP, WCA5, S41, HabRegs2, UKBAP
Pipistrelle <i>Pipistrellus pipistrellus</i>	25 (92)	2006-2013		0.1-2km	LBAP, WCA5, HabRegs2
Soprano Pipistrelle <i>Pipistrellus pygmaeus</i>	8 (15)	2009-2015	Eastford rd	0-1.8km	LBAP, WCA5, S41, HabRegs2, UKBAP
Unidentified Bat <i>Myotis</i>	1	2014-2014	Chapel Brow Farm, Liverpool Road	1.1-1.1km	WCA5, S41, HabRegs2
Bats Chiroptera	1	2011-2011	CP, 245, Wilderspool causeway	1.1-1.1km	WCA5, S41, HabRegs2
Hares					
Brown Hare <i>Lepus europaeus</i>	6 (9)	2007-2015	Moore NR	0.8-1.6km	LBAP, S41, UKBAP
Misc					
American Mink <i>Neovision vison</i>	7	2008-2014	Under Chester Rd swing bridge	0.2-1.9km	INNS, WCA9
Bank Vole <i>Myodes glareolus</i>	10 (24)	2008-2014	Manchester Ship Canal path from Warrington Dock to London Bridge	0.4-2km	
European Water Vole <i>Arvicola amphibius</i>	5	2008-2009	Moore Nature Reserve	0.6-2km	LBAP, WCA5, S41, UKBAP
Weasel <i>Mustela nivalis</i>	4	2006-2015	Wood West of the cricket ground, Walton, Warrington	0.3-1.8km	

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹⁰
West European Hedgehog <i>Erinaceus europaeus</i>	35	2006-2016	CP, A562, Penketh Road	0-2km	S41, UKBAP
Otters					
European Otter <i>Lutra lutra</i>	8 (15)	2012-2017	CP, under the railway bridge by the Sankey Canal	0.9-1.3km	LBAP, WCA5, S41, HabRegs2, UKBAP
Squirrels					
Eurasian Red Squirrel <i>Sciurus vulgaris</i>	1	2016	CP, Walton Lea Cottage, Walton	0.7km	WCA5, S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹¹
BIRDS					
Barn Owl <i>Tyto alba</i>	6 (8)	2009-2015	Penketh & Cuedley.	0.7-1.8km	LBAP, WCA1, BAm [RSPB], WCA9
Barnacle Goose <i>Branta leucopsis</i>	1	2012-2012		1.6-1.6km	BAm [RSPB], WCA9
Bittern <i>Botaurus stellaris</i>	56 (66)	2006-2013	Moore reserve.	0.4-1.8km	WCA1, BRd [RSPB], S41, UKBAP
Black Swan <i>Cygnus atratus</i>	17	2011-2012	Moore reserve.	1.6-2km	INNS, WCA9
Black Tern <i>Chlidonias niger</i>	1 (2)	2010-2010	Latchford West.	1.5-1.5km	WCA1, BAm [RSPB]
Black-necked Grebe <i>Podiceps nigricollis</i>	15 (17)	2006-2014	Moore reserve	1.1-1.6km	LBAP, WCA1, BAm [RSPB]
Black-tailed Godwit <i>Limosa limosa</i>	6 (14)	2014-2014	Penketh & Cuedley (Gatewarth Phase 111). Moore reserve.	0.4-1.1km	WCA1, BRd [RSPB], S41
Brambling <i>Fringilla montifringilla</i>	23 (25)	2006-2014	Moore reserve	1.3-2km	WCA1
Bullfinch <i>Pyrrhula pyrrhula</i>	161 (201)	2006-2015	Penketh & Cuedley (Gatewarth Phase 111).	0.1-2km	LBAP, BAm [RSPB], S41

¹¹ European Protected Species (EPS), Habitats Directive (HDi), Wildlife and Countryside Act 1985 (as amended) (WCA5), Schedule 42 (S42), UK Biodiversity Action Plan (UKBAP), Bern, Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), Red Data List 1 [UK] (RD1), Red Data List 2 [UK] (RD2), Local Biodiversity Action Plan (LBAP)[CE,PE]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹¹
			Moore reserve.		
Canada Goose <i>Branta canadensis</i>	255 (4190)	2006-2017		0.4-2km	INNS, WCA9
Cetti's Warbler <i>Cettia cetti</i>	3	2010-2015		0.1-1.4km	WCA1
Cuckoo <i>Cuculus canorus</i>	11	2007-2012	Penketh & Cuedley	0.9-1.9km	BRd [RSPB], S41, UKBAP
Curlew <i>Numenius arquata</i>	23 (89)	2006-2015	Upper Moss Side Farm, Richmond Bank Moore reserve	0.8-1.9km	BAm [RSPB], S41, UKBAP
Dark-bellied Brent Goose <i>Branta bernicla</i> subsp. <i>bernicla</i>	1	2009-2009		1.4-1.4km	BRd [RSPB], S41, UKBAP
Dunlin <i>Calidris alpina</i>	5 (11)	2007-2012	Moore Nature Reserve	1.1-1.9km	BRd [RSPB]
Dunnock <i>Prunella modularis</i>	735 (894)	2006-2017	Penketh & Cuedley. 3 Sandringham Drive.	0.1-2km	BAm [RSPB], S41
Fieldfare <i>Turdus pilaris</i>	36 (121)	2006-2015	Moore Nature Reserve.	0.1-1.9km	WCA1, BRd [RSPB]
Goldeneye <i>Bucephala clangula</i>	53 (62)	2006-2015		0.4-1.8km	WCA1, BAm [RSPB]
Grasshopper Warbler <i>Locustella naevia</i>	25 (35)	2007-2015	Moore Nature Reserve.	0.7-1.9km	BRd [RSPB], S41, UKBAP
Green Sandpiper <i>Tringa ochropus</i>	41 (50)	2006-2014	Lapwing Lane Wildfowl Lake.	0.4-1.9km	WCA1, BAm [RSPB]
Greylag Goose <i>Anser anser</i>	34 (62)	2009-2015	Lapwing Lane Wildfowl Lake.	0.5-2km	WCA1, BAm [RSPB]
Herring Gull <i>Larus argentatus</i>	111 (18479)	2006-2015	Moore nature reserve. Warrington dock.	0.5-1.7km	BRd [RSPB]
Hobby <i>Falco subbuteo</i>	6	2006-2014	Moore nature reserve.	0.4-1.9km	WCA1
House Sparrow <i>Passer domesticus</i>	1188 (2203)	2006-2016		0.1-1.9km	LBAP, BRd [RSPB], S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹¹
Kingfisher <i>Alcedo atthis</i>	119	2006-2016	Moore Nature Reserve	0-2km	WCA1, BAm [RSPB]
Lapwing <i>Vanellus vanellus</i>	89 (3639)	2006-2015	Richmond Bank	0.1-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Lesser Spotted Woodpecker <i>Dendrocopos minor</i>	77	2006-2015		0.4-2km	BRd [RSPB], S41
Little Ringed Plover <i>Charadrius dubius</i>	21 (29)	2007-2015	Moore nature reserve	0.7-1.6km	WCA1
Marsh Tit <i>Poecile palustris</i>	5	2006-2010	Memorial Alders	1.4-1.9km	BRd [RSPB], S41
Mediterranean Gull <i>Larus melanocephalus</i>	32 (39)	2006-2014	Richmond Bank	1-1.6km	WCA1, BAm [RSPB]
Merlin <i>Falco columbarius</i>	1	2014-2014		1.8-1.8km	WCA1, BAm [RSPB]
Peregrine Falco <i>Falco peregrinus</i>	28	2006-2015	Penketh. Community woodland.	0.2-1.9km	WCA1
Pintail <i>Anas acuta</i>	3	2006-2011	Lapwing Lane Wildfowl Lake	0.5-1.4km	WCA1, BAm [RSPB]
Red-crested Pochard <i>Netta rufina</i>	2 (3)	2011-2011		1.6-1.8km	WCA9
Redwing <i>Turdus iliacus</i>	139 (788)	2006-2015	Manchester Ship Canal Path	0.1-2km	WCA1, BRd [RSPB]
Reed Bunting <i>Emberiza schoeniclus</i>	335 (619)	2006-2015	Gatewarth Phase 111, Upper Moss Side Farm	0-2km	LBAP, BAm [RSPB], S41, UKBAP
Ring Ouzel <i>Turdus torquatus</i>	1	2007-2007		1.6-1.6km	BRd [RSPB], S41, UKBAP
Ring-necked Parakeet <i>Psittacula krameri</i>	1	2010-2010		1.4-1.4km	INNS, WCA9
Ruddy Duck <i>Oxyura jamaicensis</i>	19 (24)	2006-2010	Penketh & Cuedley	0.4-1.9km	INNS, WCA9
Skylark <i>Alauda arvensis</i>	25 (32)	2006-2015	Penketh & Cuedley. Upper Moss Side Farm.	0.3-2km	LBAP, BRd [RSPB], S41
Song Thrush <i>Turdus philomelos</i>	378 (417)	2006-2016	St Helens canal, Penketh & Cuedley	0-2km	LBAP, BRd [RSPB]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹¹
Spotted Flycatcher <i>Muscicapa striata</i>	3	2006-2011	Penketh & Cuedley	1.2-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Starling <i>Sturnus vulgaris</i>	515 (35802)	2006-2015		0.1-2km	LBAP, BRd [RSPB], S41
Tree Pipit <i>Anthus trivialis</i>	1	2010-2010		1.1-1.1km	BRd [RSPB], S41, UKBAP
Tree Sparrow <i>Passer montanus</i>	4 (24)	2006-2010	Upper Moss Side Farm	1-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Wood Sandpiper <i>Tringa glareola</i>	4	2011-2011		1.1-1.2km	WCA1, BAm [RSPB]
Yellow Wagtail <i>Motacilla flava</i>	5	2010-2013	Penketh & Cuedley	0.4-1.9km	BRd [RSPB], S41
Yellowhammer <i>Emberiza citrinella</i>	3 (4)	2006-2010	Upper Moss Side Farm	0.8-1.4km	LBAP, BRd [RSPB], S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹²
PLANTS					
Bluebell <i>Hyacinthoides non-scripta</i>	9	2009-2015	Manchester Ship Canal Path	0.3-1.9km	LBAP, WCA8, IUCN LC
Giant Hogweed <i>Heracleum mantegazzianum</i>	9	2010-2015	Bewsey & Whitecross - CP	0.1-1.1km	INNS, WCA9
Giant Knotweed <i>Fallopia sachalinensis</i>	1	2011	Trans penine trail	0km	INNS
Giant-rhubarb <i>Gunnera tinctoria</i>	1	2010	Ornamental Pond, Walton Gardens	0.7km	INNS, WCA9
Himalayan Cotoneaster <i>Cotoneaster simonsii</i>	1	2011	Sankey Valley Park	0km	WCA9
Japanese Knotweed <i>Fallopia japonica</i>	31	2007-2016	Sankey Valley Park	0-1.9km	INNS, WCA9

³ Invasive Non-Native Species (INNS), Wildlife and Countryside Act 1985 (as amended) (WCA8-9), International Union for Conservation of Nature least-concern species (IUCN LC), Local Biodiversity Action Plan (LBAP)[CE,PE]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹²
Japanese Rose Rosa rugosa	4	2007-2015	Bewsey Farm	0-1.5km	INNS, WCA9
Rhododendron Rhododendron ponticum	6	2010-2016	CP, Walton Hall Park	0.7-2km	INNS, WCA9
Small-leaved Cotoneaster Cotoneaster microphyllus	1	2009	Fairfield & Howley	1.8km	WCA9

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹³
BONY FISH					
European Eel Anguilla anguilla	3	2009-2016	Sankey Canal	0.2-1.8km	S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹⁴
INSECTS					
BUTTERFLIES					
White-letter Hairstreak Satyrium w-album	30 (146)	2011-2014	Penketh & Cuedley - CP, Moore Nature Reserve	1.3-2km	LBAP, WCA5, IUCN En, S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹⁵
REPTILES AND AMPHIBIANS					
Common Frog Rana temporaria	93 (1519)	2006-2016	Runcorn Latchford canal. Wilderspool causeway	0-2km	WCA5
Common Toad Bufo bufo	30 (19444)	2006-2017	Bewsey & Whitecross. Penketh & Cuedley.	0.2-2km	WCA5, S41, UKBAP

¹³ Schedule 41 (S41), UK Biodiversity Action Plan (UKBAP)

¹⁴ Schedule 41 (S41), UK Biodiversity Action Plan (UKBAP)

¹⁵ European Protected Species (EPS), Wildlife and Countryside Act 1985 (as amended) (WCA5), Schedule 41 (S41), UK Biodiversity Action Plan (UKBAP), Local Biodiversity Action Plan (LBAP)[CE,PE]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹⁵
Moore Nature Reserve.					
NEWTS					
Great Crested Newt <i>Triturus cristatus</i>	5 (38)	2013		1.5-1.7km	LBAP, WCA5, S41, HabRegs2, UKBAP
Smooth Newt <i>Lissotriton vulgaris</i>	3 (7)	2010-2011	Pond 6, Fiddlers Ferry Power Station.	1.6-1.8km	WCA5
REPTILES					
Red-eared Terrapin <i>Trachemys scripta</i>	4	2006-2011	St. Helen's Canal, Sankey Valley Park Section	0-1.1km	INNS

D.4 Yellow Route

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹⁶
MAMMALS					
Badger					
Eurasian Badger <i>Meles meles</i>	291 (307)	2007-2016	CP, TPT Runcorn Latchford Canal	0-2km	BAct
Bat					
Brown Long-eared Bat <i>Plecotus auritus</i>	1	2013	Walton Hall	0.7km	LBAP, WCA5, S41, HabRegs2, UKBAP
Common Pipistrelle <i>Pipistrellus pipistrellus</i>	21 (99)	2008-2015	Chapel Brow Farm, Liverpool Road	0.1-1.7km	WCA5, S41, HabRegs2
Daubenton's Bat <i>Myotis daubentonii</i>	4	2009-2013	St. Helen's Canal	0.5-2km	LBAP, WCA5, S41, HabRegs2
Noctule Bat <i>Nyctalus noctula</i>	7 (11)	2010-2015	Grasslands (S), Moore NR	0.4-1.4km	LBAP, WCA5, S41, HabRegs2, UKBAP
Pipistrelle <i>Pipistrellus pipistrellus</i>	22 (84)	2008-2013		0.1-1.9km	LBAP, WCA5, HabRegs2
Soprano Pipistrelle <i>Pipistrellus pygmaeus</i>	8 (17)	2009-2015	Eastford rd, end	0-1.4km	LBAP, WCA5, S41, HabRegs2, UKBAP

¹⁶ European Protected Species (EPS), Habitats Directive (HDir), Wildlife and Countryside Act 1985 (as amended) (WCA5), Schedule 42 (S42), UK Biodiversity Action Plan (UKBAP), Bern, Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), Red Data List 1 [UK] (RD1), Red Data List 2 [UK] (RD2), International Union for Conservation of Nature least-concern species (IUCN LC), Local Biodiversity Action Plan (LBAP) [CE,PE]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹⁶
Unidentified Bat Myotis	1	2014-2014		0.8-0.8km	WCA5, S41, HabRegs2
Bats Chiroptera	1	2011-2011	CP, 245, Wilderspool causeway	1.1-1.1km	WCA5, S41, HabRegs2
Deer					
Roe Deer Capreolus capreolus	1	2009-2009		1.4-1.4km	
Hares					
Brown Hare Lepus europaeus	6 (9)	2007-2015	Moore NR	0.8-1.8km	LBAP, S41, UKBAP
Misc					
American Mink Neovision vison	6	2008-2012	Manchester ship canal, south bank	0.2-0.9km	INNS, WCA9
Bank Vole Myodes glareolus	11 (31)	2008-2014	Manchester Ship Canal path	0.4-1.3km	
European Water Vole Arvicola amphibius	10	2006-2009	Moore Nature Reserve	0.1-2km	LBAP, WCA5, S41, UKBAP
Polecat Mustela putorius	1	2013	Wood West of the cricket ground, Walton	1.6km	LBAP, S41, HabRegs4, UKBAP
West European Hedgehog Erinaceus europaeus	36	2008-2015	CP, A574, Cromwell Avenue	0-1.9km	S41, UKBAP
Otters					
European Otter Lutra lutra	2	2012	CP, under the railway bridge by the Sankey Canal	0.9-1.1km	LBAP, WCA5, S41, HabRegs2, UKBAP
Squirrels					
Eurasian Red Squirrel Sciurus vulgaris	1	2016	CP, Walton Lea Cottage	0.7km	WCA5, S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹⁷
BIRDS					

¹⁷ European Protected Species (EPS), Habitats Directive (HDi), Wildlife and Countryside Act 1985 (as amended) (WCA5), Schedule 42 (S42), UK Biodiversity Action Plan (UKBAP), Bern, Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), Red Data List 1 [UK] (RD1), Red Data List 2 [UK] (RD2), Local Biodiversity Action Plan (LBAP)[CE,PE]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹⁷
Barn Owl <i>Tyto alba</i>	8 (10)	2009-2015	Penketh & Cuedley.	0.6-1.9km	LBAP, WCA1, BAm [RSPB], WCA9
Barnacle Goose <i>Branta leucopsis</i>	2	2012-2012		0.9-1.4km	BAm [RSPB], WCA9
Bittern <i>Botaurus stellaris</i>	62 (70)	2006-2013	Moore reserve.	0.4-1.9km	WCA1, BRd [RSPB], S41, UKBAP
Black Swan <i>Cygnus atratus</i>	20	2011-2012	Moore reserve.	0.9-1.6km	INNS, WCA9
Black Tern <i>Chlidonias niger</i>	1 (2)	2010-2010	Latchford West.	1.5-1.5km	WCA1, BAm [RSPB]
Black-necked Grebe <i>Podiceps nigricollis</i>	16 (18)	2006-2014	Moore reserve	0.7-1.3km	LBAP, WCA1, BAm [RSPB]
Black-tailed Godwit <i>Limosa limosa</i>	7 (19)	2014-2014	Penketh & Cuedley (Gatewarth Phase 111). Moore reserve.	0.4-1.4km	WCA1, BRd [RSPB], S41
Brambling <i>Fringilla montifringilla</i>	25 (28)	2006-2014	Moore reserve	0.7-1.4km	WCA1
Bullfinch <i>Pyrrhula pyrrhula</i>	199 (242)	2006-2017	Penketh & Cuedley (Gatewarth Phase 111). Moore reserve.	0.1-1.9km	LBAP, BAm [RSPB], S41
Canada Goose <i>Branta canadensis</i>	310 (4397)	2006-2017		0.3-2km	INNS, WCA9
Cetti's Warbler <i>Cettia cetti</i>	4	2010-2015		0.4-1.8km	WCA1
Cuckoo <i>Cuculus canorus</i>	19	2007-2012	Penketh & Cuedley	0.5-1.6km	BRd [RSPB], S41, UKBAP
Curlew <i>Numenius arquata</i>	38 (319)	2006-2015	Upper Moss Side Farm, Richmond Bank Moore reserve	0.3-1.9km	BAm [RSPB], S41, UKBAP
Dark-bellied Brent Goose <i>Branta bernicla</i> subsp. <i>bernicla</i>	1	2009-2009		1.4-1.4km	BRd [RSPB], S41, UKBAP
Dunlin <i>Calidris alpina</i>	5 (11)	2007-2012	Moore Nature Reserve	0.4-1.1km	BRd [RSPB]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹⁷
Dunnoch Prunella modularis	837 (1165)	2006-2017	Penketh & Cuedley. 3 Sandringham Drive.	0-1.9km	BAm [RSPB], S41
Fieldfare Turdus pilaris	52 (842)	2006-2015	Moore Nature Reserve.	0-1.7km	WCA1, BRd [RSPB]
Goldeneye Bucephala clangula	66 (69)	2006-2015		0.4-1.9km	WCA1, BAm [RSPB]
Grasshopper Warbler Locustella naevia	31 (39)	2007-2015	Moore Nature Reserve.	0-1.9km	BRd [RSPB], S41, UKBAP
Green Sandpiper Tringa ochropus	42 (51)	2006-2014	Lapwing Lane Wildfowl Lake.	0.3-1.4km	WCA1, BAm [RSPB]
Greylag Goose Anser anser	61 (99)	2007-2015	Lapwing Lane Wildfowl Lake.	0.3-1.4km	WCA1, BAm [RSPB]
Herring Gull Larus argentatus	127 (18480)	2006-2015	Moore nature reserve. Warrington dock.	0.2-1.9km	BRd [RSPB]
Hobby Falco subbuteo	7	2006-2014	Moore nature reserve.	0.4-1.6km	WCA1
House Sparrow Passer domesticus	1255 (2789)	2006-2015		0-2km	LBAP, BRd [RSPB], S41, UKBAP
Kingfisher Alcedo atthis	133	2006-2016	Moore Nature Reserve	0-1.9km	WCA1, BAm [RSPB]
Lapwing Vanellus vanellus	113 (4155)	2006-2015	Richmond Bank	0.1-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Lesser Spotted Woodpecker Dendrocopos minor	105	2006-2015	Moore Nature Reserve	0.4-1.6km	BRd [RSPB], S41
Little Ringed Plover Charadrius dubius	21 (29)	2007-2015	Moore NR	0.6-0.9km	WCA1
Marsh Tit Poecile palustris	5	2006-2010	Memorial Alders	0.7-1.1km	BRd [RSPB], S41
Mediterranean Gull Larus melanocephalus	33 (39)	2006-2014	Richmond Bank	0.2-1.4km	WCA1, BAm [RSPB]
Merlin Falco columbarius	1	2014-2014		1.1-1.1km	WCA1, BAm [RSPB]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹⁷
Peregrine Falco peregrinus	31	2006-2015	Latchford West - CP, Morley rd	0.2-1.4km	WCA1
Pintail Anas acuta	4	2006-2011	Moore Nature Reserve	0.4-1.3km	WCA1, BAm [RSPB]
Red-crested Pochard Netta rufina	2 (3)	2011-2011		0.9-1.1km	WCA9
Redwing Turdus iliacus	168 (2022)	2006-2015	Manchester Ship Canal Path	0-1.9km	WCA1, BRd [RSPB]
Reed Bunting Emberiza schoeniclus	404 (712)	2006-2017	3 Sandringham Drive	0-1.9km	LBAP, BAm [RSPB], S41, UKBAP
Ring Ouzel Turdus torquatus	1	2007-2007	Penketh & Cuedley - CP	0.8-0.8km	BRd [RSPB], S41, UKBAP
Ring-necked Parakeet Psittacula krameri	1	2010-2010		0.7-0.7km	INNS, WCA9
Ruddy Duck Oxyura jamaicensis	30 (41)	2006-2010	Moore Nature Reserve	0.4-2km	INNS, WCA9
Skylark Alauda arvensis	38 (44)	2006-2015	Marsh Lane Farm	0-1.9km	LBAP, BRd [RSPB], S41
Song Thrush Turdus philomelos	469 (528)	2006-2016	3 Sandringham Drive	0-2km	LBAP, BRd [RSPB]
Spotted Flycatcher Muscicapa striata	3	2006-2011	Long Moss and Wood, Moore, Warrington	0.5-1.1km	LBAP, BRd [RSPB], S41, UKBAP
Starling Sturnus vulgaris	566 (37425)	2006-2015	3 Sandringham Drive	0-1.9km	LBAP, BRd [RSPB], S41
Tree Pipit Anthus trivialis	1	2010-2010		0.7-0.7km	BRd [RSPB], S41, UKBAP
Tree Sparrow Passer montanus	5 (26)	2006-2011	CP, Community woodland	0.7-1.4km	LBAP, BRd [RSPB], S41, UKBAP
Wood Sandpiper Tringa glareola	4	2011-2011		0.7-0.7km	WCA1, BAm [RSPB]
Yellow Wagtail Motacilla flava	6	2010-2015	CP, Grasslands (S), Moore NR	0.4-1.5km	BRd [RSPB], S41
Yellowhammer Emberiza citrinella	23 (24)	2006-2012	Marsh Lane Farm	0-1.9km	LBAP, BRd [RSPB], S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹⁸
PLANTS					
Bluebell Hyacinthoides non-scripta	10	2009-2015	Walton cricket ground	0.3-1.6km	LBAP, WCA8, IUCN LC
False-acacia Robinia pseudoacacia	1	2013	Bewsey & Whitecross - CP, Warrington	1.4km	INNS, WCA9
Giant Hogweed Heracleum mantegazzianum	11	2010-2015	Trans Pennine Trail	0.3-1.9km	INNS, WCA9
Giant Knotweed Fallopia sachalinensis	1	2011	Ornamental Pond, Walton Gardens	0.1km	INNS
Giant-rhubarb Gunnera tinctoria	1	2010	Sankey Valley Park	0.7km	INNS, WCA9
Himalayan Cotoneaster Cotoneaster simonsii	1	2011	Sankey Valley Park	0.7km	WCA9
Japanese Knotweed Fallopia japonica	29	2007-2016	Sankey Valley Park	0.1-1.9km	INNS, WCA9
Japanese Rose Rosa rugosa	3	2007-2015	The Dingle. Warrington. Sankey Valley	0.7-1.4km	INNS, WCA9
Rhododendron Rhododendron ponticum	4	2011-2016	Fairfield & Howley.	0.7-1.8km	INNS, WCA9

Species	Number of records	Date	Detail	Distance from site (km)	Protection ¹⁹
BONY FISH					
European Eel Anguilla anguilla	2	2009	Sankey Canal	0.4-0.7km	S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²⁰
INSECTS					

³ Invasive Non-Native Species (INNS), Wildlife and Countryside Act 1985 (as amended) (WCA8-9), International Union for Conservation of Nature least-concern species (IUCN LC), Local Biodiversity Action Plan (LBAP)[CE,PE]

¹⁹ Schedule 41 (S41), UK Biodiversity Action Plan (UKBAP)

²⁰ Schedule 41 (S41), UK Biodiversity Action Plan (UKBAP)

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²⁰
BUTTERFLIES					
White-letter Hairstreak Satyrium w-album	30 (146)	2011-2014	Penketh & Cuerdley - CP, Moore Nature Reserve	1.3-2km	LBAP, WCA5, IUCN En, S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²¹
REPTILES AND AMPHIBIANS					
Common Frog Rana temporaria	96 (1653)	2006-2015	Runcorn Latchford canal. Wilderspool causeway	0-1.9km	WCA5
Common Toad Bufo bufo	29 (19442)	2006-2017	Bewsey & Whitecross. Penketh & Cuerdley. Moore Nature Reserve.	0.2-1.4km	WCA5, S41, UKBAP
NEWTs					
Great Crested Newt Triturus cristatus	9 (39)	2013-2014		0.8-1.6km	LBAP, WCA5, S41, HabRegs2, UKBAP
Smooth Newt Lissotriton vulgaris	3 (7)	2010-2011	Pond 6, Fiddlers Ferry Power Station.	0.8-1.1km	WCA5
REPTILES					
Red-eared Terrapin Trachemys scripta	4	2006-2011	St. Helen's Canal, Sankey Valley Park Section	0-0.7km	INNS

D.5 Purple Route

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²²
MAMMALS					
Badger					

²¹ European Protected Species (EPS), Wildlife and Countryside Act 1985 (as amended) (WCA5), Schedule 41 (S41), UK Biodiversity Action Plan (UKBAP), Local Biodiversity Action Plan (LBAP)[CE,PE]

²² European Protected Species (EPS), Habitats Directive (HDir), Wildlife and Countryside Act 1985 (as amended) (WCA5), Schedule 42 (S42), UK Biodiversity Action Plan (UKBAP), Bern, Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), Red Data List 1 [UK] (RD1), Red Data List 2 [UK] (RD2), International Union for Conservation of Nature least-concern species (IUCN LC), Local Biodiversity Action Plan (LBAP) [CE,PE]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²²
Eurasian Badger <i>Meles meles</i>	287 (305)	2007-2016	CP, TPT Runcorn Latchford Canal	0-2km	BAct
Bat					
Brown Long-eared Bat <i>Plecotus auritus</i>	1	2013	Walton Hall	0.7km	LBAP, WCA5, S41, HabRegs2, UKBAP
Common Pipistrelle <i>Pipistrellus pipistrellus</i>	13	2008-2015	Chapel Brow Farm, Liverpool Road	0.1-1.6km	WCA5, S41, HabRegs2
Daubenton's Bat <i>Myotis daubentonii</i>	5	2006-2013	St. Helen's Canal	0.6-1.9km	LBAP, WCA5, S41, HabRegs2
Noctule Bat <i>Nyctalus noctula</i>	6 (9)	2010-2015	Grasslands (S), Moore NR	0.4-1.9km	LBAP, WCA5, S41, HabRegs2, UKBAP
Pipistrelle <i>Pipistrellus pipistrellus</i>	23 (39)	2006-2013		0.1-1.9km	LBAP, WCA5, HabRegs2
Soprano Pipistrelle <i>Pipistrellus pygmaeus</i>	8 (15)	2009-2015	Eastford rd, end	0-1.9km	LBAP, WCA5, S41, HabRegs2, UKBAP
Unidentified Bat <i>Myotis</i>	1	2014-2014		1.4-1.4km	WCA5, S41, HabRegs2
Bats Chiroptera	1	2011-2011	CP, 245, Wilderspool causeway	1.1-1.1km	WCA5, S41, HabRegs2
Hares					
Brown Hare <i>Lepus europaeus</i>	6 (9)	2007-2015	Moore NR	0.8-1.9km	LBAP, S41, UKBAP
Misc					
American Mink <i>Neovison vison</i>	6	2008-2014	Manchester ship canal, south bank	0.2-1.5km	INNS, WCA9
Bank Vole <i>Myodes glareolus</i>	9 (22)	2008-2014	Manchester Ship Canal path	0.4-1.9km	
European Water Vole <i>Arvicola amphibius</i>	5	2008-2014	Moore Nature Reserve	0.6-1.8km	LBAP, WCA5, S41, UKBAP
Weasel <i>Mustela nivalis</i>	4	2006-2015	Wood West of the cricket ground, Walton	0.3-1.8km	
West European Hedgehog <i>Erinaceus europaeus</i>	34	2006-2016	CP, A574, Cromwell Avenue	0-1.9km	S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²²
Otters					
European Otter <i>Lutra lutra</i>	8 (15)	2012-2017	CP, under the railway bridge by the Sankey Canal	0.8-1.1km	LBAP, WCA5, S41, HabRegs2, UKBAP
Squirrels					
Eurasian Red Squirrel <i>Sciurus vulgaris</i>	1	2016	CP, Walton Lea Cottage	0.7-0.7km	WCA5, S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²³
BIRDS					
Barn Owl <i>Tyto alba</i>	3 (4)	2009-2014	In box, north of stream	0.7-1.7km	LBAP, WCA1, BAm [RSPB], WCA9
Barnacle Goose <i>Branta leucopsis</i>	1	2012-2012		1.6-1.6km	BAm [RSPB], WCA9
Bittern <i>Botaurus stellaris</i>	56 (66)	2006-2013	Eastern Reedbed Area, Moore Reserve	0.4-1.9km	WCA1, BRd [RSPB], S41, UKBAP
Black Swan <i>Cygnus atratus</i>	17	2011-2012	Moore nature reserve	1.6-2km	INNS, WCA9
Black Tern <i>Chlidonias niger</i>	1 (2)	2010-2010	Latchford West	1.5-1.5km	WCA1, BAm [RSPB]
Black-necked Grebe <i>Podiceps nigricollis</i>	15 (17)	2006-2014	Birchwood Pool	1.1-1.6km	LBAP, WCA1, BAm [RSPB]
Black-tailed Godwit <i>Limosa limosa</i>	6 (14)	2014-2014		0.4-1.1km	WCA1, BRd [RSPB], S41
Brambling <i>Fringilla montifringilla</i>	18 (19)	2006-2014	Pond Wood. Moore NR	1.3-1.9km	WCA1
Bullfinch <i>Pyrrhula pyrrhula</i>	147 (185)	2006-2015		0.1-2km	LBAP, BAm [RSPB], S41
Canada Goose <i>Branta canadensis</i>	233 (3538)	2006-2017		0.1-2km	INNS, WCA9
Cetti's Warbler <i>Cettia cetti</i>	3	2010-2015	Sankey Canal/ Sankey Bridges	0.1-1.5km	WCA1

²³ European Protected Species (EPS), Habitats Directive (HDi), Wildlife and Countryside Act 1985 (as amended) (WCA5), Schedule 42 (S42), UK Biodiversity Action Plan (UKBAP), Bern, Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), Red Data List 1 [UK] (RD1), Red Data List 2 [UK] (RD2), Local Biodiversity Action Plan (LBAP)[CE,PE]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²³
Cuckoo <i>Cuculus canorus</i>	9	2007-2011	CP, Arpley Landfill Site	0.9-1.9km	BRd [RSPB], S41, UKBAP
Curlew <i>Numenius arquata</i>	18 (44)	2006-2015	Richmond Bank	0.8-1.9km	BAm [RSPB], S41, UKBAP
Dark-bellied Brent Goose <i>Branta bernicla</i> subsp. <i>bernicla</i>	1	2009-2009	Playing field East of Black Bear Park, Warrington	1.4-1.4km	BRd [RSPB], S41, UKBAP
Dunlin <i>Calidris alpina</i>	4 (7)	2007-2012	Moore Nature Reserve	1.1-1.6km	BRd [RSPB]
Dunnock <i>Prunella modularis</i>	727 (883)	2006-2017	3 Sandringham Drive	0.1-2km	BAm [RSPB], S41
Fieldfare <i>Turdus pilaris</i>	30 (106)	2006-2015	Loushers Lane Playing Field	0.1-1.9km	WCA1, BRd [RSPB]
Goldeneye <i>Bucephala clangula</i>	53 (62)	2006-2015	Moore Nature Reserve	0.4-1.9km	WCA1, BAm [RSPB]
Grasshopper Warbler <i>Locustella naevia</i>	20 (29)	2007-2015	CP, Gatewarth Phase 111	0.7-1.9km	BRd [RSPB], S41, UKBAP
Green Sandpiper <i>Tringa ochropus</i>	40 (49)	2006-2014	CP, The Lagoon, Moore NR	0.4-1.9km	WCA1, BAm [RSPB]
Greylag Goose <i>Anser anser</i>	32 (59)	2009-2015	CP, Birchwood Pool, Moore NR	0.5-1.9km	WCA1, BAm [RSPB]
Herring Gull <i>Larus argentatus</i>	110 (18379)	2006-2015	Warrington dock, Warrington	0.5-1.7km	BRd [RSPB]
Hobby <i>Falco subbuteo</i>	5	2006-2014	Alder Wood, Moore Nature Reserve	0.4-1.9km	WCA1
House Sparrow <i>Passer domesticus</i>	1187 (2200)	2006-2016	3 Sandringham Drive	0.1-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Kingfisher <i>Alcedo atthis</i>	117	2006-2016	St. Helen's Canal	0-2km	WCA1, BAm [RSPB]
Lapwing <i>Vanellus vanellus</i>	74 (2199)	2006-2015	CP, Pump House Pool, Moore NR	0.1-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Lesser Spotted Woodpecker <i>Dendrocopos minor</i>	50	2006-2015	Moore Nature Reserve	0.4-2km	BRd [RSPB], S41
Little Ringed Plover <i>Charadrius dubius</i>	21 (29)	2007-2015	Moore NR	0.8-1.6km	WCA1

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²³
Marsh Tit <i>Poecile palustris</i>	5	2006-2010	Memorial Alders	1.5-1.9km	BRd [RSPB], S41
Mediterranean Gull <i>Larus melanocephalus</i>	32 (39)	2006-2014	Richmond Bank	1.1-1.6km	WCA1, BAm [RSPB]
Merlin <i>Falco columbarius</i>	1	2014-2014		2-2km	WCA1, BAm [RSPB]
Peregrine <i>Falco peregrinus</i>	25	2006-2014	Latchford West - CP, Morley rd	0.2-1.8km	WCA1
Pintail <i>Anas acuta</i>	3	2006-2011	Moore Nature Reserve	0.5-1.5km	WCA1, BAm [RSPB]
Red-crested Pochard <i>Netta rufina</i>	2 (3)	2011-2011		1.6-1.9km	WCA9
Redwing <i>Turdus iliacus</i>	125 (600)	2006-2015	Manchester Ship Canal Path	0.1-1.9km	WCA1, BRd [RSPB]
Reed Bunting <i>Emberiza schoeniclus</i>	314 (594)	2006-2015	3 Sandringham Drive	0.1-2km	LBAP, BAm [RSPB], S41, UKBAP
Ring Ouzel <i>Turdus torquatus</i>	1	2007-2007	Penketh & Cuedley - CP	1.7-1.7km	BRd [RSPB], S41, UKBAP
Ring-necked Parakeet <i>Psittacula krameri</i>	1	2010-2010		1.5-1.5km	INNS, WCA9
Ruddy Duck <i>Oxyura jamaicensis</i>	19 (24)	2006-2010	Moore Nature Reserve	0.4-2km	INNS, WCA9
Skylark <i>Alauda arvensis</i>	20	2006-2013	Marsh Lane Farm	0.3-2km	LBAP, BRd [RSPB], S41
Song Thrush <i>Turdus philomelos</i>	370 (407)	2006-2016	3 Sandringham Drive	0-2km	LBAP, BRd [RSPB]
Spotted Flycatcher <i>Muscicapa striata</i>	3	2006-2011	Long Moss and Wood, Moore, Warrington	1.7-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Starling <i>Sturnus vulgaris</i>	508 (35841)	2006-2015	3 Sandringham Drive	0.1-1.9km	LBAP, BRd [RSPB], S41
Tree Pipit <i>Anthus trivialis</i>	1	2010-2010		1.1-1.1km	BRd [RSPB], S41, UKBAP
Tree Sparrow <i>Passer montanus</i>	4 (24)	2006-2010	CP, Community woodland	1-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Wood Sandpiper	4	2011-2011		1.1-1.2km	WCA1, BAm [RSPB]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²³
Tringa glareola					
Yellow Wagtail Motacilla flava	5	2010-2013	CP, Grasslands (S), Moore NR	0.4-1.9km	BRd [RSPB], S41
Yellowhammer Emberiza citrinella	3 (4)	2006-2010	Marsh Lane Farm	0.8-1.5km	LBAP, BRd [RSPB], S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²⁴
PLANTS					
Bluebell Hyacinthoides non-scripta	11	2009-2016	Manchester Ship Canal Path	0.3-1.8km	LBAP, WCA8, IUCN LC
Giant Hogweed Heracleum mantegazzianum	9	2010-2015	Bewsey & Whitecross - CP	0.1-1.7km	INNS, WCA9
Giant Knotweed Fallopia sachalinensis	1	2011	Trans pennine trail	0km	INNS
Giant-rhubarb Gunnera tinctoria	1	2010	Ornamental Pond, Walton Gardens	0.7km	INNS, WCA9
Himalayan Cotoneaster Cotoneaster simonsii	1	2011	Sankey Valley Park	0.3km	WCA9
Japanese Knotweed Fallopia japonica	35	2007-2016	Sankey Valley Park	0-1.9km	INNS, WCA9
Japanese Rose Rosa rugosa	5	2007-2015	Bewsey Farm	0-1.6km	INNS, WCA9
Rhododendron Rhododendron ponticum	7	2010-2016	CP, Walton Hall Park	0.7-1.8km	INNS, WCA9
Small-leaved Cotoneaster Cotoneaster microphyllus	1	2009	Fairfield & Howley	1.8km	WCA9

³ Invasive Non-Native Species (INNS), Wildlife and Countryside Act 1985 (as amended) (WCA8-9), International Union for Conservation of Nature least-concern species (IUCN LC), Local Biodiversity Action Plan (LBAP)[CE,PE]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²⁵
BONY FISH					
European Eel <i>Anguilla anguilla</i>	3	2009-2016	Sankey canal	0.8-1.9km	S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²⁶
INSECTS					
BUTTERFLIES					
White-letter Hairstreak <i>Satyrium walbum</i>	30 (146)	2011-2014	CP, Moore Nature Reserve	1.3-2km	LBAP, WCA5, IUCN En, S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²⁷
REPTILES AND AMPHIBIANS					
Common Frog <i>Rana temporaria</i>	94 (1720)	2006-2016	CP, 249, Wilderspool Causeway	0-2km	WCA5
Common Toad <i>Bufo bufo</i>	29 (19444)	2006-2017	Moore Nature Reserve	0.2-2km	WCA5, S41, UKBAP
NEWTs					
Great Crested Newt <i>Triturus cristatus</i>	5 (38)	2013-2013	Ponds (various)	1.6-1.9km	LBAP, WCA5, S41, HabRegs2, UKBAP
Smooth Newt <i>Lissotriton vulgaris</i>	3 (7)	2010-2011		1.6-1.9km	WCA5
REPTILES					
Red-eared Terrapin <i>Trachemys scripta</i>	4	2006-2011	St. Helen's Canal. Walton Hall Park & Gardens	0-0.7km	INNS

²⁵ Schedule 41 (S41), UK Biodiversity Action Plan (UKBAP)

²⁶ Schedule 41 (S41), UK Biodiversity Action Plan (UKBAP)

²⁷ European Protected Species (EPS), Wildlife and Countryside Act 1985 (as amended) (WCA5), Schedule 41 (S41), UK Biodiversity Action Plan (UKBAP), Local Biodiversity Action Plan (LBAP)[CE,PE]

D.6 Pink Route

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²⁸
MAMMALS					
Badger					
Eurasian Badger <i>Meles meles</i>	291	2007-2016	Grass verges. Back gardens. Trans-Pennine Trail	0-2km	BAct
Bat					
Bats Chiroptera	1 (1)	2011-2011	CP, 245, Wilderspool causeway	0.8-0.8km	LBAP, S41, UKBAP
Brown Long-eared Bat <i>Plecotus auritus</i>	1	2013	Walton Hall	1.6km	WCA5, S41, HabRegs2
Common Pipistrelle <i>Pipistrellus pipistrellus</i>	12	2008-2015	Chapel Brow Farm, Liverpool Road	0.2-1.6km	WCA5, S41, HabRegs2
Daubenton's Bat <i>Myotis daubentonii</i>	5	2006-2013	St. Helen's Canal	0.6-1.9km	LBAP, WCA5, HabRegs2
Noctule Bat <i>Nyctalus noctula</i>	6 (9)	2010-2015	Grasslands (S), Moore NR	0.5-1.9km	LBAP, WCA5, S41, HabRegs2, UKBAP
Pipistrelle <i>Pipistrellus pipistrellus</i>	22	2006-2012		0.2-1.8km	LBAP, WCA5, HabRegs2
Soprano Pipistrelle <i>Pipistrellus pygmaeus</i>	7 (14)	2009-2015	Eastford rd, end	0.1-1.9km	LBAP, WCA5, S41, HabRegs2, UKBAP
Unidentified Bat <i>Myotis</i>	1	2014-2014		1.4-1.4km	WCA5, S41, HabRegs2
Hares					
Brown Hare <i>Lepus europaeus</i>	6 (9)	2007-2015	Moore NR	0.9-1.8km	LBAP, S41, UKBAP
Misc					
American Mink Neovision vison	6	2008-2014	Manchester ship canal. Runcorn Latchford canal east.	0.4-1.6km	LBAP, WCA5, S41, HabRegs2
Bank Vole <i>Myodes glareolus</i>	9	2008-2014	Middle Moss Wood	0.5-1.9km	LBAP, WCA5, S41, HabRegs2, UKBAP

²⁸ European Protected Species (EPS), Habitats Directive (HDir), Wildlife and Countryside Act 1985 (as amended) (WCA5), Schedule 42 (S42), UK Biodiversity Action Plan (UKBAP), Bern, Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), Red Data List 1 [UK] (RD1), Red Data List 2 [UK] (RD2), International Union for Conservation of Nature least-concern species (IUCN LC), Local Biodiversity Action Plan (LBAP) [CE,PE]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²⁸
European Water Vole <i>Arvicola amphibius</i>	5	2008-2014	St Helens canal.	0.6-1.8km	LBAP, WCA5, S41, UKBAP
Weasel <i>Mustela nivalis</i>	4	2006-2015		0.3-1.8km	
Otters					
European Otter <i>Lutra lutra</i>	8 (15)	2012-2017	CP, under the railway bridge by the Sankey Canal	0.8-1.1km	LBAP, WCA5, S41, HabRegs2, UKBAP
Squirrels					
Eurasian Red Squirrel <i>Sciurus vulgaris</i>	1	2016	Walton Lea Cottage	0.7km	WCA5, S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²⁹
BIRDS					
Barn Owl <i>Tyto alba</i>	5 (7)	2011-2014	Penketh & Cuedley.	0.8-2km	WCA1, BAm [RSPB]
Barnacle Goose <i>Branta leucopsis</i>	1 (1)	2012-2012		1.6-1.6km	WCA1, BAm [RSPB]
Bittern <i>Botaurus stellaris</i>	56	2006-2013	Moore reserve.	0.5-1.9km	WCA1, BAm [RSPB]
Black Swan <i>Cygnus atratus</i>	17 (16)	2011-2012	Moore reserve.	1.6-2km	WCA1, BAm [RSPB]
Black-necked Grebe <i>Podiceps nigricollis</i>	15	2006-2014		1.1-1.6km	WCA1, BAm [RSPB]
Black-tailed Godwit <i>Limosa limosa</i>	6 (14)	2014-2014	Penketh & Cuedley (Gatewarth Phase 111). Moore reserve.	0.5-1.1km	WCA1, BAm [RSPB]
Brambling <i>Fringilla montifringilla</i>	18	2006-2014	Moore reserve	1.3-1.8km	WCA1, BAm [RSPB]
Bullfinch <i>Pyrrhula pyrrhula</i>	147	2006-2015	Penketh & Cuedley (Gatewarth Phase 111).	0.1-1.9km	INNS, WCA9

²⁹ European Protected Species (EPS), Habitats Directive (HDi), Wildlife and Countryside Act 1985 (as amended) (WCA5), Schedule 42 (S42), UK Biodiversity Action Plan (UKBAP), Bern, Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), Red Data List 1 [UK] (RD1), Red Data List 2 [UK] (RD2), Local Biodiversity Action Plan (LBAP)[CE,PE]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²⁹
			Moore reserve.		
Canada Goose <i>Branta canadensis</i>	230 (3502)	2006-2017		0.1-2km	INNS, WCA9
Cetti's Warbler <i>Cettia cetti</i>	3 (2)	2010-2015		0-1.5km	LBAP, BRd [RSPB]
Cuckoo <i>Cuculus canorus</i>	9 (5)	2007-2011	Penketh & Cuedley	1-1.9km	LBAP, BRd [RSPB]
Curlew <i>Numenius arquata</i>	18	2006-2015	Upper Moss Side Farm, Richmond Bank Moore reserve	0.9-1.9km	LBAP, BRd [RSPB]
Dark-bellied Brent Goose <i>Branta bernicla</i> subsp. <i>bernicla</i>	1 (1)	2009-2009		1.2-1.2km	LBAP, BRd [RSPB]
Dunlin <i>Calidris alpina</i>	4 (7)	2007-2012	Moore Nature Reserve	1.1-1.5km	LBAP, BRd [RSPB]
Dunnock <i>Prunella modularis</i>	726 (882)	2006-2017	Penketh & Cuedley. 3 Sandringham Drive.	0.1-2km	LBAP, BRd [RSPB]
Fieldfare <i>Turdus pilaris</i>	29 (105)	2006-2015	Moore Nature Reserve.	0.2-1.8km	LBAP, BRd [RSPB], S41, UKBAP
Goldeneye <i>Bucephala clangula</i>	53 (62)	2006-2015		0.5-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Grasshopper Warbler <i>Locustella naevia</i>	20	2007-2015	Moore Nature Reserve.	0.7-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Green Sandpiper <i>Tringa ochropus</i>	40	2006-2014	Lapwing Lane Wildfowl Lake.	0.5-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Greylag Goose <i>Anser anser</i>	32 (59)	2009-2015	Lapwing Lane Wildfowl Lake.	0.6-1.9km	LBAP, BRd [RSPB], S41, UKBAP
Herring Gull <i>Larus argentatus</i>	110	2006-2015	Moore nature reserve. Warrington dock.	0.5-1.7km	LBAP, BRd [RSPB], S41, UKBAP
Hobby Falco <i>subbuteo</i>	6 (6)	2006-2014	Moore nature reserve.	0.5-2km	LBAP, BRd [RSPB], S41, UKBAP
House Sparrow <i>Passer domesticus</i>	1188	2006-2016		0-1.8km	LBAP, BRd [RSPB], S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²⁹
Kingfisher <i>Alcedo atthis</i>	117 (115)	2006-2016	Moore Nature Reserve	0-2km	BAm [RSPB], S41
Lapwing <i>Vanellus vanellus</i>	71	2006-2015	Richmond Bank	0-1.8km	LBAP, BRd [RSPB], S41
Lesser Spotted Woodpecker <i>Dendrocopos minor</i>	63 (56)	2006-2015		0.5-2km	LBAP, BRd [RSPB], S41
Little Ringed Plover <i>Charadrius dubius</i>	21	2007-2015	Moore nature reserve	0.9-1.6km	LBAP, BRd [RSPB], S41
Marsh Tit <i>Poecile palustris</i>	5	2006-2010	Memorial Alders	1.5-1.9km	LBAP, BRd [RSPB], S41
Mediterranean Gull <i>Larus melanocephalus</i>	32 (39)	2006-2014	Richmond Bank	1.1-1.6km	LBAP, BRd [RSPB], S41
Peregrine Falco <i>peregrinus</i>	25 (22)	2006-2014	Latchford West - CP, Morley rd	0.4-1.8km	LBAP, BRd [RSPB], S41
Pintail <i>Anas acuta</i>	3	2006-2011	Moore Nature Reserve	0.6-1.5km	LBAP, BRd [RSPB], S41
Red-crested Pochard <i>Netta rufina</i>	2 (3)	2011-2011		1.6-1.9km	LBAP, BRd [RSPB], S41
Redwing <i>Turdus iliacus</i>	124	2006-2015	Manchester Ship Canal Path	0.5-1.9km	LBAP, BRd [RSPB], S41
Reed Bunting <i>Emberiza schoeniclus</i>	314	2006-2015	3 Sandringham Drive	0-2km	LBAP, BRd [RSPB], S41
Ring Ouzel <i>Turdus torquatus</i>	1 (1)	2007-2007	Penketh & Cuedley - CP	1.6-1.6km	LBAP, BAm [RSPB], S41
Ring-necked Parakeet <i>Psittacula krameri</i>	1	2010-2010		1.5-1.5km	LBAP, BAm [RSPB], S41
Ruddy Duck <i>Oxyura jamaicensis</i>	19 (24)	2006-2010	Moore Nature Reserve	0.5-1.9km	LBAP, BAm [RSPB], S41
Skylark <i>Alauda arvensis</i>	20	2006-2013	Marsh Lane Farm	0.1-1.9km	LBAP, BAm [RSPB], S41
Song Thrush <i>Turdus philomelos</i>	366 (404)	2006-2016	3 Sandringham Drive	0-2km	LBAP, BAm [RSPB], S41
Spotted Flycatcher <i>Muscicapa striata</i>	3	2006-2011	Long Moss and Wood, Moore, Warrington	1.6-1.9km	WCA1, BAm [RSPB]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ²⁹
Starling <i>Sturnus vulgaris</i>	509 (35851)	2006-2015	3 Sandringham Drive	0-1.9km	WCA1, BAm [RSPB]
Tree Pipit <i>Anthus trivialis</i>	1	2010-2010		1.1-1.1km	BRd [RSPB], S41
Tree Sparrow <i>Passer montanus</i>	4	2006-2010	CP, Community woodland	0.7-1.9km	BRd [RSPB], S41
Wood Sandpiper <i>Tringa glareola</i>	4	2011-2011		1.1-1.2km	BAm [RSPB], WCA9
Yellow Wagtail <i>Motacilla flava</i>	5 (4)	2010-2013	CP, Grasslands (S), Moore NR	0.5-1.8km	INNS, WCA9
Yellowhammer <i>Emberiza citrinella</i>	3	2006-2010	Marsh Lane Farm	0.8-1.5km	WCA1, BAm [RSPB]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ³⁰
PLANTS					
Bluebell <i>Hyacinthoides non-scripta</i>	10	2009-2016	Manchester Ship Canal Path	0.7-1.8km	LBAP, WCA8, IUCN LC
Giant Hogweed <i>Heracleum mantegazzianum</i>	9	2010-2015	Bewsey & Whitecross - CP	0.1-1.6km	INNS, WCA9
Giant Knotweed <i>Fallopia sachalinensis</i>	1	2011	Trans pennine trail	0.1km	INNS, WCA9
Giant-rhubarb <i>Gunnera tinctoria</i>	1	2010	Ornamental Pond, Walton Gardens	1.5km	INNS, WCA9
Himalayan Cotoneaster <i>Cotoneaster simonsii</i>	1	2011	Sankey Valley Park	0.3km	INNS, WCA9
Japanese Knotweed <i>Fallopia japonica</i>	35	2007-2016	Sankey Valley Park	0-1.9km	INNS, WCA9
Japanese Rose <i>Rosa rugosa</i>	5	2007-2015	Bewsey Farm	0-1.6km	INNS, WCA9

³ Invasive Non-Native Species (INNS), Wildlife and Countryside Act 1985 (as amended) (WCA8-9), International Union for Conservation of Nature least-concern species (IUCN LC), Local Biodiversity Action Plan (LBAP)[CE,PE]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ³⁰
Rhododendron Rhododendron ponticum	7	2010-2016	CP, Walton Hall Park	1-1.8km	INNS, WCA9
Small-leaved Cotoneaster Cotoneaster microphyllus	1	2009	Fairfield & Howley	1.3km	WCA9

Species	Number of records	Date	Detail	Distance from site (km)	Protection ³¹
BONY FISH					
European Eel Anguilla anguilla	3	2009-2016	Sankey Canal	0.7-1.8km	S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ³²
INSECTS					
BUTTERFLIES					
White-letter Hairstreak Satyrium w-album	30 (146)	2011-2014	Penketh & Cuedley - CP, Moore Nature Reserve	1.3-2km	LBAP, WCA5, IUCN En, S41, UKBAP

Species	Number of records	Date	Detail	Distance from site (km)	Protection ³³
REPTILES AND AMPHIBIANS					
Common Frog Rana temporaria	94	2006-2016	CP, 249, Wilderspool Causeway	0-2km	WCA5
Common Toad Bufo bufo	30 (19444)	2006-2017	Moore Nature Reserve	0-2km	WCA5, S41, UKBAP
NEWTS					
Great Crested Newt	5 (38)	2013	Ponds (various)	1.6-1.9km	WCA5

³¹ Schedule 41 (S41), UK Biodiversity Action Plan (UKBAP)

³² Schedule 41 (S41), UK Biodiversity Action Plan (UKBAP)

³³ European Protected Species (EPS), Wildlife and Countryside Act 1985 (as amended) (WCA5), Schedule 41 (S41), UK Biodiversity Action Plan (UKBAP), Local Biodiversity Action Plan (LBAP)[CE,PE]

Species	Number of records	Date	Detail	Distance from site (km)	Protection ³³
Triturus cristatus					
Smooth Newt Lissotriton vulgaris	3 (7)	2010-2011		1.6-1.9km	LBAP, WCA5, S41, HabRegs2, UKBAP
REPTILES					
Red-eared Terrapin Trachemys scripta subsp. elegans	4	2006-2011	St. Helen's Canal. Walton Hall Park & Gardens	0.1-1.5km	INNS

E. Photographs

Figure 2: Scrub in Sankey Valley Park



Source: J. Stephenson

Figure 3: Scrub near Liverpool Road



Source: J. Stephenson

Figure 4: Scrub near Forest way



Source: J. Stephenson

Figure 5: Scrub around railway bridge



Source: J. Stephenson

Figure 6: Scrub along Easfrod Road



Source: A. Crowl

Figure 7: Scrub along Manchester Ship Canal



Source: A. Crowl

Figure 8: Scrub on hill where the Sankey Brook meets the River Mersey



Source: A. Crowl

Figure 9: Scrub along Whittle Brook



Source: A. Crowl

Figure 10: Scrub and semi-improved grassland mosaic along St Helen's Canal



Source: J. Stephenson

Figure 11: Scrub and semi-improved grassland mosaic along Forest Way



Source: J. Stephenson

Figure 12: Parkland trees in Sankey Valley Park



Source: J. Stephenson

Figure 13: Scattered trees along Barnard Street and Forest Way



Source: J. Stephenson

Figure 14: Scattered trees along the footpath leading south from Forest Way



Source: J. Stephenson

Figure 15: Scattered trees at the northern end of Morley Common



Source: A. Crowl

Figure 16: Scattered trees along Runcorn and Catchford Canal



Source: A. Crowl

Figure 17: Scattered trees along Baronet Road



Source: A. Crowl

Figure 18: Sankey Valley Park mixed parkland trees and amenity grassland



Source: J. Stephenson

Figure 19: Semi-improved grassland and scrub mosaic strip near Forest Way



Source: J. Stephenson

Figure 20: Newly seed Improved grassland along Baronet Road



Source: A. Crowl

Figure 21: Poor semi-improved grassland on road verge along Forest Way



Source: J. Stephenson

Figure 22: Poor semi-improved grassland at roundabout on Forest Way



Source: J. Stephenson

Figure 23: Tall ruderal in Sankey Valley Park around pond



Source: J. Stephenson

Figure 24: Tall Ruderal south of Forest Way



Source: J. Stephenson

Figure 25: Tall Ruderal and marginal vegetation along River Mersey south of Forest way



Source: J. Stephenson

Figure 26: Tall Ruderal along River Mersey north of Forest way



Source: J. Stephenson

Figure 27: Tall ruderal along Eastford Road



Source: A. Crowl

Figure 28: Tall ruderal in Morley Common



Source: A. Crowl

Figure 29: Tall ruderal along Eastford Road and railway bridge



Source: A. Crowl

Figure 30: Scrub and tall ruderal mosaic around railway bridge



Source: A. Crowl

Figure 31: Tall ruderal and marshy grassland mosaic near Forest Way



Source: J. Stephenson

Figure 32: Tall ruderal and marshy grassland mosaic south of Forest Way



Source: J. Stephenson

Figure 33: Marginal vegetation along St Helen's Canal



Source: J. Stephenson

Figure 34: Marginal vegetation along Runcorn and Latchford Canal



Source: A. Crowl

Figure 35: St Helen's Canal



Source: A. Crowl

Figure 36: Sankey Brook



Source: A. Crowl

Figure 37: The River Mersey



Source: A. Crowl

Figure 38: Arable fields south of Forest Way



Source: A. Crawl

Figure 39: Amenity grassland along Cromwell Avenue South



Source: J. Stephenson

Figure 40: Amenity grassland south of Old Liverpool Road



Source: J. Stephenson

Figure 41: Amenity grassland at Morley Common



Source: A. Crawl

Figure 42: Ephemeral/short perennial field adjacent to Forest Way



Source: J. Stephenson

Figure 43: Ephemeral/short perennial south of Baronet Road



Source: A. Crawl

Figure 44: Species-poor hedge near Cromwell Avenue South



Source: J. Stephenson

Figure 45: Species-poor hedge along Eastford Road and Morley Common



Source: A. Crowl

Figure 46: Species-poor hedge between Morley Common and residential areas to the south



Source: A. Crowl

Figure 47: Species-poor hedge with trees along Chester Road



Source: A. Crowl

Figure 48: Metal prefabricated building next to Baronet Road



Source: A. Crowl

Figure 49: Small brick building in the south end of the carpark next to Baronet Road



Source: A. Crowl

Figure 50: Carpark south of Baronet Road



Source: A. Crowl

Figure 51: Planted woodland near Gatewarth recycling centre



Source: A. Crowl

Figure 52: Coppicing in planted woodland near Gatewarth recycling centre



Source: A. Crowl

Figure 53: Scrub area in planted woodland near Gatewarth recycling centre



Source: A. Crowl

Figure 54: Tall ruderal are in planted woodland near Gatewarth recycling centre



Source: A. Crowl

Figure 55: Screening trees in playing field along A57



Source: A. Crowl

Figure 56: Ground layer of screening trees in playing field along A57



Source: A. Crowl

Figure 57: Scattered trees to the centre of the playing field along A57



Source: A. Crowl

Figure 58: Scattered trees to the south of the playing field along A57



Source: A. Crowl

Figure 59: Screening trees just south of St Helen's Canal on route Orange



Source: A. Crowl

Figure 60: Semi-improved grassland next to planted woodland near Gatewarth recycling centre



Source: A. Crowl

Figure 61: Semi-improved grassland and tall ruderal mosaic near Sankey Brook



Source: A. Crowl

Figure 62: Marshy grassland near Gatewarth recycling centre



Source: A. Crowl

Figure 63: Tall ruderal around drain and Sankey Brook



Source: A. Crowl

Figure 64: Tall ruderal along St Helen's Canal and screening trees



Source: A. Crowl

Figure 65: Marginal vegetation to the northern edge of St Helen's Canal



Source: A. Crowl

Figure 66: Amenity grassland between Sankey Way and Marina Avenue



Source: A. Crowl

Figure 67: Species-poor hedge along A57



Source: A. Crowl

Figure 68: Species-poor hedge in playing field near Marine Avenue entrance



Source: A. Crowl

Figure 69: Recently felled Species-poor hedge in playing field near Marine Avenue entrance



Source: A. Crowl

Figure 70: Semi-natural woodland along the Whittle Brook



Source: A. Crowl

Figure 71: Tall ruderal along paths with semi-natural woodland



Source: A. Crowl

Figure 72: Scattered trees along Whittle Brook



Source: A. Crowl

Figure 73: Scattered trees within improved grassland adjacent to Whittle Brook



Source: A. Crowl

Figure 74: Semi-improved grassland east of Whittle Brook.



Source: A. Crowl

Figure 75: Semi-improved grassland mosaic where Whittle Brook meets the River Mersey



Source: A. Crowl

Figure 76: Improved grassland, northern field adjacent to A562



Source: A. Crowl

Figure 77: Improved grassland, southern field adjacent to St Helen's Canal



Source: A. Crowl

Figure 78: Tall ruderal along Whittle Brook north section



Source: A. Crowl

Figure 79: Marginal vegetation on St Helen's Canal in the Yellow route.



Source: A. Crowl

Figure 80: Whittle Brook



Source: A. Crowl

Figure 81: Marshy grass along the River Mersey on Yellow route.



Source: A. Crowl

Figure 82: Amenity grassland on access road leading from Lytham Close



Source: A. Crowl

Figure 83: Species poor hedge with trees along A562



Source: A. Crowl

Figure 84: Dry ditch through semi-natural woodland



Source: A. Crowl

