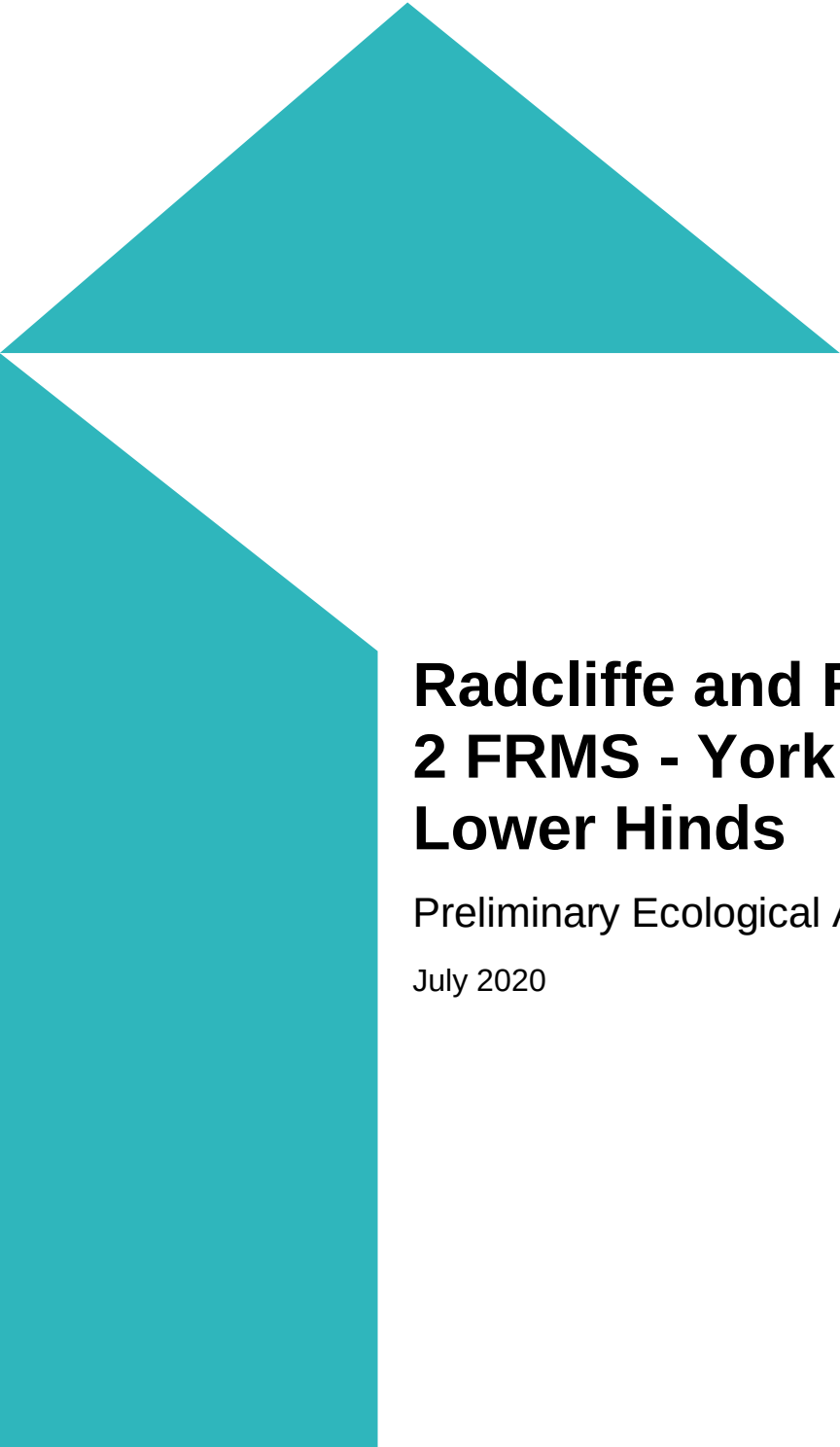




Radcliffe and Redvales Phase 2 FRMS - York Street (PIN) and Lower Hinds

Preliminary Ecological Appraisal Report

July 2020

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Executive summary

Mott MacDonald Limited has been commissioned to undertake a Preliminary Ecological Appraisal (PEA) for the Radcliffe and Redvales Flood Risk Management Scheme (FRMS) Phase 2 (the "Scheme"). This PEA is an addendum to the original scheme-wide PEA that was completed in October 2017 for Phase 1 of the Radcliffe and Redvales FRMS, and to the PEA completed in April 2020 for an additional aspect of the Phase 2 works at Bury Grammar School. The objective of the Scheme, that this PEA covers, is to erect a flood defence wall/embankment at York Street, (referred to as York Street (PIN) as the area is being developed by PIN property developers) and to create a wetland at Lower Hinds.

This PEA report (PEAR) comprises a desk study and extended Phase 1 Habitat Survey completed by suitably qualified ecologists on 9th July 2020. The aims of this report are to identify ecological features present in the survey area, any potential ecological constraints for the Scheme, recommend further ecological surveys and provide details of high level mitigation and enhancements likely to be required.

One local designated site, Hollins Vale Local Nature Reserve (LNR) has been identified 1.4km east of the York Street (PIN) Scheme footprint. Due to the localised nature of the works and distance from the Scheme footprint to the LNR, no adverse effects on the designated site are anticipated.

Thirteen non-statutory designed sites, all of which are Sites of Biological Importance (SBI), were identified within 2.0km of the Scheme footprints. The nearest to York Street (PIN) is Swan Lodge SBI which borders the Scheme footprint to the west. The closest to Lower Hinds is Lower Hinds SBI which borders the Scheme footprint to the north. Due to the distance of the works from these designations it is likely the SBIs will experience indirect impacts (noise, air, light pollution) during the construction phase.

The survey areas (the Scheme footprints) comprise a variety of habitats which include broad-leaved woodland, dense scrub, tall ruderal, poor semi-improved grassland, scattered trees and bare ground. Extensive coverage of invasive non-native flora species were noted within both survey areas. Giant hogweed *Heracleum mantegazzianum*, Indian balsam *Impatiens glandulifera*, Japanese knotweed *Fallopia japonica*, giant knotweed *Fallopia sachalinensis* and variegated yellow archangel *Lamiastrum galeobdolon subsp. argentatum* were identified within the York Street (PIN) Scheme footprint. Giant hogweed, Indian balsam and Japanese knotweed were identified within the Lower Hinds Scheme footprint.

Species records indicate that birds, bats, otter *Lutra lutra*, badger *Meles meles*, west European hedgehog *Erinaceus europaeus*, brown hare *Lepus europaeus*, great crested newt *Triturus cristatus*, common toad *Bufo bufo*, common lizard *Zootoca vivipara*, brown trout *Salmo trutta* and notable invertebrates are located within 2.0km of the Scheme footprints. The habitats identified within the York Street (PIN) survey area were assessed as having potential to support birds, bats, badger, west European hedgehog, great crested newt and common toad. The habitats identified within the Lower Hinds survey area were assessed as having potential to support birds, bats, otter, water vole, badger, west European hedgehog, brown hare, common toad, reptiles and invertebrates.

In the absence of mitigation, any proposed works could impact these habitats and species if they are present. Recommendations are detailed within this report in the form of construction

safeguards and, where necessary, further species and habitat specific surveys, to inform further assessment and mitigation design.

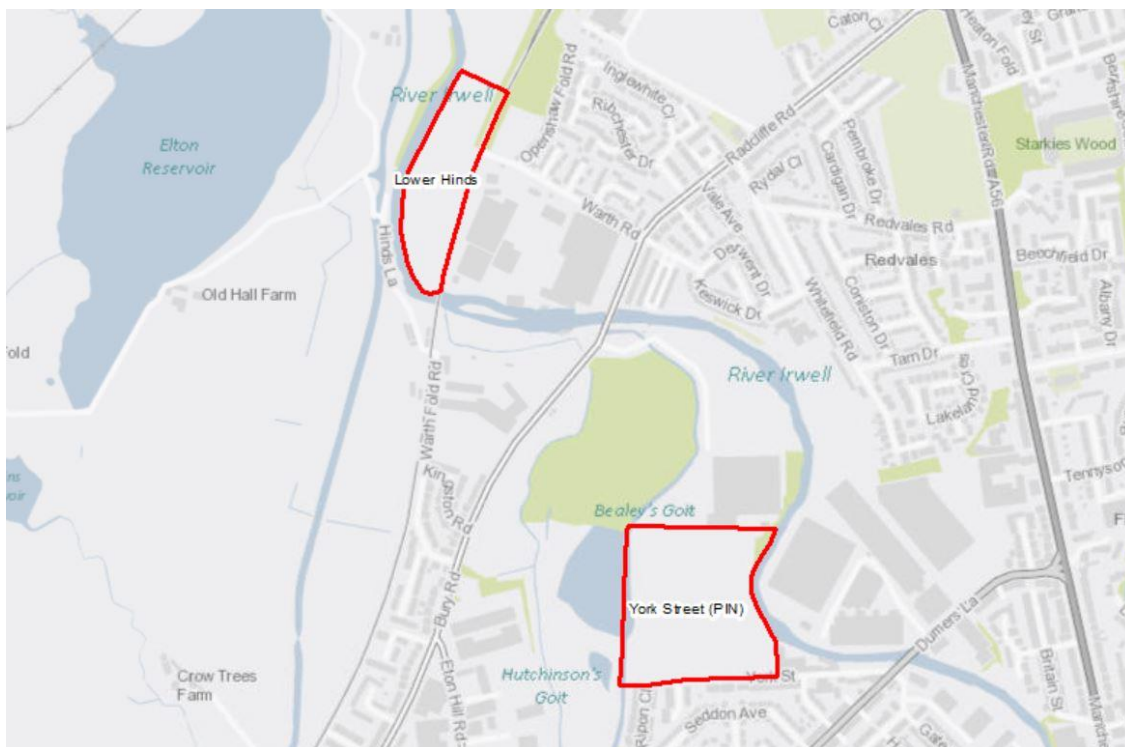
1 Introduction

1.1 Project Background

BMMJV (a joint venture between BAM Nuttall and Mott MacDonald) has been commissioned under Lot 4 of the Water and Environmental Management (WEM) framework to deliver Phase 2 of the Radcliffe and Redvales Flood Risk Management Scheme (FRMS) on behalf of the Environment Agency. The objective of the Radcliffe and Redvales FRMS is to prevent and protect the residents of Radcliffe and Redvales from flooding events.

The Phase 2 works have been extended to include two additional areas of proposed development. Proposed works at York Street (PIN) comprise the installation of a flood defence wall/embankment flanking the River Irwell, along the eastern extent of the Scheme footprint. Proposed works at Lower Hinds comprise the creation on a wetland and recreational area. These two Scheme components are the survey areas referred to in this document.

Figure 1.1: Proposed Scheme component footprints



Source: OS data © Crown Copyright and database right 2019

1.2 Site Description

The survey areas are situated on the southern outskirts of Bury, a built up, urban area north of Manchester. Surrounding land use at the York Street (PIN) component footprint comprises an open area of grassland and waterbodies to the west, the River Irwell to the east and areas of industrial buildings and residential estates to the north and south.

The Lower Hinds component footprint is situated between the River Irwell, to the west, and a railway line to the east. Surrounding land use comprises industrial estates and residential houses to the east and large areas of open grassland and farmland to the west.

1.3 Proposed Development

The proposed development at York Street (PIN) is to build a flood defence wall/embankment flanking the River Irwell, along the eastern extent of the study area. The aim of this flood defence is to protect a new housing development, which is being built within the bare ground of the study area, from flooding. The design of the flood defence is yet to be finalised.

The proposed development at Lower Hinds is to create a wetland and recreational area. This area is being developed in two parts: environmental and social enhancement and Water Framework Directive (WFD) mitigation measure to offset the impact for the Radcliffe and Redvales Scheme as a whole.

Works within both study areas are programmed to start in October 2020.

1.4 Aims and Objectives of this Report

The aim of this report is to provide a Preliminary Ecological Appraisal of the protected and/or notable habitats and species which occur or have the potential to occur on or near the Scheme footprint and may be impacted by the proposed works. The report follows the 'Guidelines for Preliminary Ecological Appraisal' 2nd Edition (Chartered Institute for Ecology and Environmental Management (CIEEM), 2017). The objectives are to:

- Identify any designated sites for nature conservation and habitats on, near and adjacent to the Scheme;
- Identify any notable and/or protected plant or animal species of conservation value, which may occur on or near the Scheme;
- Provide a habitat map with target notes of ecological features as identified above;
- Undertake a preliminary assessment of the potential impacts on any ecological receptors of conservation value identified on, near or adjacent to the Scheme; and
- Recommend further surveys, mitigation and enhancement measures as appropriate.

1.5 Legislative Policy and Framework

The key legislation regarding nature conservation in England is the Wildlife and Countryside act 1981 (as amended) (WCA). The WCA implements 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). The WCA is complemented by the Conservation of Habitats and Species Regulations 2017 (as amended) (CHSR), which consolidates and updates the Conservation (Natural Habitats etc.) Regulations 1994 and transposes the Council Directive 92/43/EEC (Habitats Directive) into UK law. The Habitat Regulations provide designation and protection to international 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. Together, the WCA and CHSR form the precedent for species and habitat protection in England and Wales. For specific species legislation refer to Appendix A.

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 enhance the

protection to certain habitats and species and places a duty on governments and public bodies/authorities to have regard for nature conservation. The NERC Act 2006 requires public bodies, including local authorities, 'to have regard to the conservation of biodiversity in England' when carrying out their normal functions. Also, under Section 41 of this Act a list of species and habitats of 'principal importance for the purpose of conserving biodiversity' (also known as Section 41 or priority habitats and species) was drawn up which acts as an aid to guide public bodies in implementing their duty.

In addition to legislation, national planning policy puts responsibility on planning authorities to ensure developers assess and mitigate ecological impacts during the planning process. Specifically, in this context, Section 15 of the National Planning Policy Framework 2019 entitled 'Conserving and enhancing the natural environment' which sets out various obligations including protection of habitats and targets for biodiversity enhancement.

In 2019 the Government produced the Environmental Bill Policy Statement which legally requires developers to ensure habitats for wildlife are enhanced, with a 10% increase in habitat for wildlife compared with the pre-development baseline. This means Councils across England will have a duty to ensure that any plans or projects provide biodiversity net gains, as opposed to 'no net loss'. The bill has not yet had Royal Assent but is expected to do by Autumn 2020.

1.6 National Planning Policy

The planning policy and biodiversity strategies which are most relevant to the site are the National Planning Policy Framework (NPPF, 2019); Biodiversity 2020 and Bury Council's Topic Paper 7 Natural Environment. At a local level, habitats and species of value are identified in the Greater Manchester Biodiversity Action Plan (GM BAP).

UK Biodiversity Action Plans have been succeeded by the UK Post-2010 Biodiversity Framework (Joint Nature Conservation Committee (JNCC) and Department for Farming and Rural Affairs (DEFRA), 2012). The framework sets out how the UK would meet the its Biodiversity Strategy. The species and habitats on the UK BAP list were used to draw up the Section 41 species and habitats of the NERC Act (2006).

Biodiversity 2020 (DEFRA, 2011) is a national strategy which sets out the Government's ambition to "halt overall biodiversity loss by 2020, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people." Rather than individual species and habitats, the strategy focusses on whole natural systems and habitat conservation on a larger scale, to enable habitats to support more species.

1.7 Quality Assurance

All staff involved in the production of this report are members of Chartered Institute of Ecology and Environmental Management (CIEEM) and are bound by its code of professional conduct.

All surveys and assessments have been undertaken with reference to the recommendations given in 'BS 42020:2013 Biodiversity: Code of practice for planning and development'.

2 Methods

2.1 Zone of Influence

The current guidelines on ecological impact assessment (EcIA) (CIEEM, 2018) defines the 'Zone of Influence' (Zol) as the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. The extent of the Zol is determined by the nature of the development and the ecological features present. The Zol includes:

- Areas directly within the land take for the proposed development and access;
- Areas which will be temporarily affected during construction;
- Areas likely to be impacted by hydrological disruption; and
- Areas where there is a risk of pollution and noise disturbance during construction and/or operation.

The Zol is variable depending on the ecological receptors affected. Table 2.1 below sets out the Zols applied for this PEA.

Table 2.1: Zone of Influence for this Assessment

Ecological Feature	Zone of Influence
Designated sites	Scheme footprint and a 2.0km buffer
Protected species records	Scheme footprint and a 2.0km buffer
Identification of ponds and ditches	Scheme footprint and a 500m buffer
Priority habitats	Scheme footprint
Extended Phase 1 Habitat Survey	Scheme footprint
Protected species evidence	Scheme footprint

Source: Mott MacDonald, 2020

2.2 Desk Study

A desk study was undertaken in accordance with current guidelines for Preliminary Ecological Appraisal (CIEEM, 2017) to determine the presence of any designated nature conservation sites and protected or notable species within the Zol of the Scheme. International designated sites including: Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar Sites were searched for within a 2.0km radius of the Scheme. Data, excluding species data obtained 10 years prior to the site visit (with the exception of bat roosts, where all records have been assessed), was obtained from Greater Manchester Ecological Unit (GMEU)/ Greater Manchester Local Record Centre (GMLRC), as well as relevant publications, reports, and online databases. These included the Multi-Agency Geographic Information for the Countryside (MAGIC), Joint Nature Conservation Committee (JNCC) and GM BAP.

2.3 Field Survey

A field survey in the form of an extended Phase 1 Habitat Survey of the Scheme was undertaken by Mott MacDonald ecologists on 9th July 2020. All habitats within the survey areas, where accessible, were identified and mapped in compliance with the Handbook for Phase 1 Habitat Survey: A technique for environmental audit (JNCC, 2010), noting dominant flora,

habitat structure and management with target notes made to describe features of interest. Presence/potential presence of legally protected and/or species of importance within the ZOI was assessed based upon the habitat suitability of those habitats recorded. Species specific surveys were not undertaken; rather the potential for the survey area to support each species was assessed. Such preliminary assessments followed methodologies within published guidance, such as the Bat Surveys for Professional Ecologists (Collins, 2016), though no full habitat assessments were carried out at this stage. Additionally, where qualified to do so, features that would likely support protected species were all examined during the survey for evidence of species known to utilise these areas, with any field signs or sightings of such species recorded.

2.4 Limitations

Biological records obtained from third parties and presented in the desk study do not represent a full and complete species list for the area. They are mostly given by individuals on an *ad hoc* basis, often meaning there are areas of deficiency in the data. Ecological surveys are limited to factors which affect the presence of plants and animals, such as time of year, migration patterns and behaviour. With a single site visit it is possible that certain species may have been overlooked or under-recorded during the assessment as optimal survey periods vary from species to species. This PEAR therefore cannot be considered to provide a wholly comprehensive account of the ecological interest of the Scheme area and it should be noted that this report does not constitute an Ecological Impact Assessment. The survey does, however, provide a “snapshot” of the ecological interest present on the day of the survey visit.

Access to the banks of the River Irwell was not possible due to extensive coverage of invasive non-native flora species and the steep gradient of the banks.

3 Desk Study Results

3.1 Introduction

All relevant ecological data received from the desk study exercise has been reviewed, the results of which are summarised below in Sections 3.2, 3.3 and 3.4. Data older than ten years (with the exception of bat roosts, where all records obtained from GMEU/GMLRC have been assessed), has been omitted due to lack of relevance.

3.2 Designated Sites

3.2.1 Statutory Designated Sites

3.2.1.1 International Designated Sites

Reference to the MAGIC website (<http://magic.defra.gov.uk/>) indicates that there are no international designated sites within 2.0km of either the York Street (PIN) or Lower Hinds Scheme footprint.

3.2.1.2 National and Local Designated Sites

Reference to the MAGIC website (<http://magic.defra.gov.uk/>) indicates that there are no national designated sites within 2.0km of the York Street (PIN) or Lower Hinds Scheme footprint. However, there is one local designated site, Hollins Vale Local Nature Reserve (LNR), within 2.0km of the York Street (PIN) Scheme footprint, details can be found in Table 3.1 below. There are no local designated sites within 2.0km of the Lower Hinds Scheme footprint.

Table 3.1: Local designated sites within 2.0km of the York Street (PIN) Scheme footprint

Site Name	Designation	Distance and direction from Scheme footprint (m)	Details
Hollins Vale	Local Nature Reserve	1.4km east of the York Street (PIN) Scheme footprint	Hollins Vale is a farmland reserve with areas of woodland and wetland adding to its wildlife diversity.

Source: MAGiC, 2020

3.2.2 Non-Statutory Designated Sites

Reference to GMEU/GMLRC data indicates that there are 13 non-statutory designated sites within 2.0km of the York Street (PIN) Scheme footprint and 13 non-statutory designated sites within 2.0km of the Lower Hinds Scheme footprint. Table 3.2 and 3.3 below details the sites and distance to the Scheme footprints.

Table 3.2: Non-Statutory Designated Sites within 2.0km of York Street (PIN) Scheme footprint

Site Name	Designation	Distance and direction from Scheme footprint (m)	Details
Swan Lodge	Site of Biological Importance (SBI)	Borders York Street (PIN) Scheme footprint to the west	Designated for open water, running water and aquatic invertebrates.
Manchester, Bolton and Bury Canal (East)	SBI	570m west	Designated for ponds and canal features.
Elton Goyt	SBI	600m west	Designated for grasslands and bird assemblages.
Lower Hinds	SBI	845m north west	Designated for calcareous grassland.
Elton Reservoir	SBI	885m north west	Designated for grasslands and bird assemblages.
Withins Reservoir	SBI	900m west	Designated for open water and grasslands.
Wetland near Radcliffe	SBI	1050m south west	Designated for ponds and small lodges
Daisyfield	SBI	1150m north west	Designated for reedbed, swamp, ponds and small lodges. Additionally, the designation includes grassland, aquatic invertebrates and woodland.
Marl Pits at Black Lane	SBI	1285m west	Designated for ponds, small lodges, habitat mosaics and aquatic invertebrates.
Sailors Brow and Springwater Park	SBI	1325m south	Designated for ponds and small lodges, habitat mosaics and aquatic invertebrates
Hollins Vale	SBI	1400m east	Designated grassland, ponds and small lodges
Townside	SBI	1680m north east	Designated for ponds, small lodges and amphibians.
Parr Brook	SBI	1750m south east	Designated for grassland habitats

Source: GMEU/GMLRC

Table 3.3: Non-Statutory Designated Sites within 2.0km of Lower Hinds Scheme footprint

Site Name	Designation	Distance and direction from Scheme footprint (m)	Details
Lower Hinds	SBI	Borders Scheme footprint to the north	Designated for calcareous grassland.
Manchester, Bolton and Bury Canal (East)	SBI	40m west	Designated for ponds and canal features.

Site Name	Designation	Distance and direction from Scheme footprint (m)	Details
Elton Goyt	SBI	90m west	Designated for grasslands and bird assemblages.
Elton Reservoir	SBI	190m west	Designated for grasslands and bird assemblages
Daisyfield	SBI	230m north west	Designated for reedbed, swamp, ponds and small lodges. Additionally, the designation includes grassland, aquatic invertebrates and woodland.
Swan Lodge	SBI	300m south east	Designated for open water, running water and aquatic invertebrates.
Withins Reservoir	SBI	740m south west	Designated for open water and grasslands.
Marl Pits at Black Lane	SBI	1050m south west	Designated for ponds, small lodges, habitat mosaics and aquatic invertebrates.
Wetland near Radcliffe	SBI	1370m south west	Designated for ponds and small lodges
Townside	SBI	1235m north east	Designated for ponds, small lodges and amphibians.
Barracks Lodge	SBI	1185m north west	Designated for pond and small lodges, aquatic invertebrates and amphibians
Cyrus Ainsworth's nurseries and Parkers Lodge	SBI	1675m north west	Designated for open water
Starling Road Reservoir	SBI	1990m west	Designated for ponds and small lodges as well as grassland habitat

Source: GMEU/GMLRC

3.3 Habitats

Using OS and aerial mapping three ponds and two ditches have been identified within 500m of the York Street (PIN) Scheme footprint. One pond and three ditches have been identified within 500m of the Lower Hinds Scheme footprint.

A search of MAGIC indicates that the following priority habitats listed on Section 41 (S41) of the NERC Act 2006 as being of principal importance for the purpose of conserving biodiversity are present within the Scheme footprints:

York Street (PIN)

- No priority habitats are situated within the Scheme footprint.

Lower Hinds

- Open Mosaic Habitat

3.4 Protected and Notable Species

The information below contains a summary of protected and notable species records found within 2.0km of the Scheme footprints.

3.4.1 Birds

Records of protected and notable birds returned from within 2.0km of the Scheme footprints can be found in Table 3.4 and 3.5 below:

Table 3.4: Records of protected/notable birds within 2.0km of the York Street (PIN) Scheme footprint

Species	No. of Records	Most Recent Record	Schedule 1 of WCA	NERC Section 41	Bird of Conservation Concern
Barn Owl	29	2017	✓		
Bittern	3	2017	✓	✓	Amber
Black Redstart	4	2012	✓		Red
Black-tailed Godwit	8	2017	✓	✓	Red
Bullfinch	171	2018		✓	Amber
Common Scoter	61	2017	✓	✓	Red
Cuckoo	5	2015		✓	Red
Curlew	125	2017		✓	Red
Dunnock	53	2017		✓	Amber
Grasshopper Warbler	65	2017		✓	Red
Hawfinch	1	2017		✓	Red
Hobby	39	2019	✓		
House Sparrow	92	2018		✓	Red
Kingfisher	145	2017	✓		Amber
Lapwing	298	2018		✓	Red
Lesser Redpoll	54	2017		✓	Red
Linnet	113	2017		✓	Red
Little Ringed Plover	244	2017	✓		
Peregrine	115	2017	✓		
Reed Bunting	175	2017		✓	Amber
Ring Ouzel	1	2016		✓	Red
Scaup	44	2017	✓	✓	Red
Skylark	143	2017		✓	Red
Song Thrush	123	2017		✓	Red

Species	No. of Records	Most Recent Record	Schedule 1 of WCA	NERC Section 41	Bird of Conservation Concern
Spotted Flycatcher	112	2017		✓	Red
Starling	125	2017		✓	Red
Tree Pipit	14	2017		✓	Red
Tree Sparrow	5	2017		✓	Red
Twite	1	2010		✓	Red
Willow Tit	96	2017		✓	Red
Wood Warbler	2	2017		✓	Red
Yellow Wagtail	76	2017		✓	Red

Source: GMEU/GMLRC

Table 3.5 Records of protected/notable birds within 2.0km of the Lower Hinds Scheme footprint

Species	No. of Records	Most Recent Record	Schedule 1 of WCA	NERC Section 41	Bird of Conservation Concern
Barn Owl	29	2017	✓		
Bittern	3	2017	✓	✓	Amber
Black Redstart	4	2012	✓		Red
Black-tailed Godwit	8	2017	✓		Red
Bullfinch	170	2018		✓	Amber
Cuckoo	5	2015		✓	Red
Common Scoter	61	2017	✓	✓	Red
Curlew	127	2017		✓	Red
Dunnock	50	2017		✓	Amber
Grasshopper Warbler	65	2017		✓	Red
Hawfinch	1	2017		✓	Red
House Sparrow	98	2018		✓	Red
Hobby	39	2019	✓		
Kingfisher	146	2017	✓		Amber
Lapwing	292	2017		✓	Red
Lesser Redpoll	55	2017		✓	Red
Linnet	109	2017		✓	Red
Little Ringed Plover	243	2017	✓		
Reed Bunting	169	2017		✓	Amber
Ring Ouzel	1	2016		✓	Red
Peregrine	115	2017	✓		

Species	No. of Records	Most Recent Record	Schedule 1 of WCA	NERC Section 41	Bird of Conservation Concern
Scaup	44	2017	✓	✓	Red
Skylark	142	2017		✓	Red
Song Thrush	123	2017		✓	Red
Spotted Flycatcher	112	2017		✓	Red
Starling	118	2017		✓	Red
Tree Pipit	14	2017		✓	Red
Tree Sparrow	5	2017		✓	Red
Twite	1	2010		✓	Red
Willow Tit	96	2017		✓	Red
Wood Warbler	2	2017		✓	Red
Yellow Wagtail	76	2017		✓	Red

Source: GMEU/GMLRC

3.4.2 Bats

There are a total of 226 records of bat signs and 89 bat roosts within 2.0km of the York Street (PIN) Scheme footprint. The closest bat evidence record is of a Brandt's bat *Myotis brandti*, approximately 280m south west of the Scheme recorded in 2018. The closest bat roost (*Pipistrelle sp.*) was recorded in 2008, approximately 35m south, of the Scheme footprint.

There are a total of 236 records of bat evidence and 86 bat roosts within 2.0km of the Lower Hinds Scheme footprint. The closest bat evidence record is of a noctule bat *Nyctalus noctula*, approximately 185m east of the Scheme recorded in 2014. The closest bat roost (*Pipistrelle sp.*) was recorded in 2012, approximately 780m north west, of the Scheme footprint.

Species recorded within 2.0km of both the York Street (PIN) and Lower Hinds Scheme footprint comprise:

- Brandt's bat *Myotis brandti*;
- Brown long-eared bat *Plecotus auritus*;
- Common pipistrelle *Pipistrellus pipistrellus*;
- Daubenton's bat *Myotis daubentonii*;
- Myotis sp. *Myotis Myotis*;
- Nathusius' pipistrelle *Pipistrellus nathusii*;
- Noctule *Nyctalus noctula*;
- Soprano pipistrelle *Pipistrellus pygmaeus*;
- Whiskered bat *Myotis mystacinus*;

3.4.3 Otter

There is one record otter *Lutra lutra* recorded within 2.0km of the York Street (PIN) Scheme footprint. The closest record is approximately 1.8km north, recorded in 2014.

There are two records of otter recorded within 2.0km of the Lower Hinds Scheme footprint. The closest record is approximately 1000m north, recorded in 2014.

3.4.4 Water Vole

There are no records of water vole *Arvicola amphibius* within 2.0km of either of the Scheme footprints.

3.4.5 Badger

There are five badger *Meles meles* records within 2.0km of the York Street (PIN) Scheme footprint. The closest record is approximately 530m south east, recorded in 2012.

There are two records of badger within 2.0km of the Lower Hinds Scheme footprint. The closest record is approximately 735m south west, recorded in 2016.

3.4.6 Other Mammals

There are 29 records of brown hare *Lepus europaeus* within 2.0km of the York Street (PIN) Scheme footprint. The closest record is located within the Scheme footprint and was recorded in 2011.

There 32 records of brown hare within 2.0km of the Lower Hinds Scheme footprint. The closest record is approximately 260m south west of the Scheme footprint and was recorded in 2012.

There are five records of west European hedgehog *Erinaceus europaeu* within 2.0km of the York Street (PIN) Scheme footprint. The closet record is approximately 500m west of the Scheme footprint, recorded in 2011.

There are two records of west European hedgehog within 2.0km of the Lower Hinds Scheme footprint. The closet record is approximately 740m south of the Scheme footprint, recorded in 2011.

3.4.7 Great Crested Newt

There are 14 records of great crested newt *Triturus cristatus* (GCN) within 2.0km of the York Street (PIN) Scheme footprint. The closest record is approximately 1.2km north west of the Scheme footprint and was recorded in 2012.

There are 23 records of GCN within 2.0km of the Lower Hinds Scheme footprint. The closest record is approximately 790m south west of the Scheme footprint and was recorded in 2012.

3.4.8 Other Amphibians

There are 16 records of common toad *Bufo bufo* within 2.0km of the York Street (PIN) Scheme footprint. The closest record is approximately 695m north west of the Scheme footprint recorded in 2017.

There are 18 records of common toad within 2.0km of the Lower Hinds Scheme footprint. The closest record is approximately 85m south west of the Scheme footprint recorded in 2017.

3.4.9 Reptiles

There is one record of common lizard *Zootoca vivipara* within 2.0km of the York Street (PIN) Scheme footprint. The record is approximately 1.7km south of the Scheme footprint and was recorded in 2012.

There are no records of reptiles within 2.0km of the Lower Hinds Scheme footprint.

3.4.10 Bony Fish

There are three records of brown trout *Salmo trutta* within 2.0km of the York Street (PIN) Scheme footprint. The closest record, recorded in 2013, is situated on the River Roch approximately 1.0km south of the Scheme footprint.

There are six records of brown trout within 2.0km of the Lower Hinds Scheme footprint. The closest record, recorded in 2013, is situated on the River Irwell approximately 1.6km north of the Scheme footprint.

3.4.11 Invertebrates

The following notable invertebrates have been recorded within 2.0km of the York Street (PIN) Scheme footprint in the past 10 years:

- Common Carpet *Epirrhoe alternata*;
- Knot Grass *Acronicta rumicis*; and
- Wall *Lasiommata megera*.

The following notable invertebrates have been recorded within 2.0km of the Lower Hinds Scheme footprint in the past 10 years:

- Cinnabar *Tyria jacobaeae*;
- Common Carpet *Epirrhoe alternata*;
- Knot Grass *Acronicta rumicis*; and
- Wall *Lasiommata megera*.

4 Extended Phase 1 Survey Results

4.1 Site Visit

The Phase 1 Habitat plan with an indication of the extent of the field survey is provided in Appendix B with associated Target Notes in Appendix C. Target Notes are referred to as TN1, TN2 etc. on the Phase 1 Habitat plan.

4.2 Habitats

The following habitat types, listed below in order of their JNCC Phase 1 Habitat codes, were noted within the Scheme footprints during the extended Phase 1 survey.

4.2.1 Broad-leaved Woodland (A1.1.1)

York Street (PIN)

A narrow strip of broad-leaved woodland was noted along the western extent of the Scheme footprint, the woodland was semi-mature with all trees in a good condition. Goat willow *Salix caprea* is the dominant canopy species, the understory comprises hawthorn *Crataegus monogyna*, ash *Fraxinus excelsior*, silver birch *Betula pendula*, sessile oak *Quercus petraea*, and rowan *Sorbus aucuparia*. The ground flora comprises herb-Robert *Geranium robertianum*, bramble *Rubus fruticosus* agg. and ash saplings.

Image 4.1: Strip of broad-leaved woodland along western extent of Scheme footprint



Source: Mott MacDonald

Lower Hinds

Broad-leaved woodland is situated at the northern and western extent of the Scheme footprint. The canopy is dominated by mature goat and crack-willow *Salix fragilis*. The understorey is in poor condition and comprises sparse hawthorn, ash, wild cherry *Prunus avium* and horse-chestnut *Aesculus hippocastanum*. Ground flora within the woodland comprises herb-robert,

creeping buttercup *Ranunculus repens*, wood avens *Geum urbanum*, broad buckler-fern *Dryopteris dilatata*, creeping soft-grass *Holcus mollis*, common nettle *Urtica dioica*, ash saplings, Indian balsam *Impatiens glandulifera*, false oat-grass *Arrhenatherum elatius*, bramble, hogweed *Heracleum sphondylium*, smooth meadow grass *Poa pratensis*, selfheal *Prunella vulgaris*, common ragwort *Senecio jacobaea* and remote sedge *Carex remota*. Also, giant hogweed *Heracleum mantegazzianum* dominates the ground flora within the woodland on the western extent, adjacent to the River Irwell.

Image 4.2: Broad-leaved woodland at northern extent of Scheme footprint



Source: Mott MacDonald

Image 4.3: Broad-leaved woodland along western extent of Scheme footprint and adjacent to the River Irwell



Source: Mott MacDonald

4.2.2 Dense Scrub (A2.1)

York Street PIN

A small area of dense scrub was noted along the woodland edge. The dense scrub comprised bramble, spear thistle *Cirsium vulgare* and Indian balsam.

Lower Hinds

Multiple areas of dense scrub were recorded within the Lower Hinds Scheme footprint. Dense scrub was noted along the railway embankment, within the area of hardstanding, within the poor semi-improved grassland and along the fence line to the west and through the centre of the Scheme footprint. Species within the scrub habitat include; goat willow, lady's mantle *Alchemilla vulgaris* agg., silver birch saplings, bramble, giant hogweed, Indian balsam and hedge bindweed *Calystegia sepium*.

Image 4.4: Example of dense scrub along railway embankment



Source: Mott MacDonald

Image 4.5 Dense scrub along fence line through centre of Scheme footprint



Source: Mott MacDonald

4.2.3 Broad-leaved Scattered Trees (A3.1)

York Street PIN

There is a line of broad-leaved scattered trees comprising elder *Sambucus nigra* and sycamore *Acer pseudoplatanus* along the southern fence and extent of the Scheme footprint. Scattered trees in the north eastern extent of the Scheme footprint comprise sycamore, ash, crack willow and poplar sp. *Populus sp.* The line of trees along the eastern extent of the Scheme footprint, adjacent to the River Irwell, comprise wild cherry, elder, sycamore, goat willow, silver birch, hawthorn and whitebeam *Sorbus aria*. All the trees are young to semi-mature and are generally in a good condition.

Image 4.6: Broad-leaved scattered trees within north eastern extent of Scheme footprint



Source: Mott MacDonald

Lower Hinds

Broad-leaved scattered trees were noted along the railway embankment and to the southern extent of the Scheme, situated within tall ruderals and the grassland. Scattered trees across the Scheme footprint include sycamore, goat willow, silver birch and crack willow.

Image 4.7 Example of broad-leaved scattered trees along railway embankment



Source: Mott MacDonald

4.2.4 Coniferous Scattered Trees (A3.2)

York Street (PIN)

A line of Leyland cypress *Cupressus macrocarpa* x *Xanthocyparis nootkatensis* = *X Cuprocyparis leylandii* is situated along the southern fence and extent of the Scheme footprint.

Image 4.8: Coniferous scattered trees along southern extent of Scheme footprint.



Source: Mott MacDonald

Lower Hinds

No coniferous trees were recorded within the Lower Hinds Scheme footprint.

4.2.5 Marshy Grassland (B5)

York Street (PIN)

No marshy grassland was recorded within the York Street (PIN) Scheme footprint.

Lower Hinds

Two areas of marshy grassland were recorded within the Lower Hinds Scheme footprint. The area of marshy grassland to the north of the fence which intersects the Scheme footprint comprised; sharp rush *Juncus acutus*, soft-rush *Juncus effusus* and common water-crowfoot *Ranunculus aquatilis*. The area of marshy grassland to the south of the Scheme footprint comprises soft rush, amphibious bistort *Persicaria amphibia* and bottle sedge *Carex rostrata*.

Image 4.9: Marshy grassland (northern area)



Source: Mott MacDonald

Image 4.10: Marshy grassland (southern area)



Source: Mott MacDonald

4.2.6 Poor Semi-improved Grassland (B6)

York Street (PIN)

A narrow strip of poor semi-improved grassland was recorded along the eastern extent of the Scheme footprint adjacent to the River Irwell. The species comprised; greater burdock *Arctium lappa*, hogweed, fat hen *Chenopodium album*, perennial rye grass *Lolium perenne*, ribwort plantain *Plantago lanceolata*, mare's-tail *Hippuris vulgaris*, Japanese knotweed *Fallopia japonica*, red campion *Silene dioica*, cock's foot *Dactylis glomerata*, annual meadow grass *Poa annua*, hemp-agrimony *Eupatorium cannabinum*, common evening-primrose *Oenothera biennis*, rosebay willow herb *Chamerion angustifolium*, common ragwort, false oat-grass *Arrhenatherum elatius*, giant hogweed, Indian balsam, butterfly-bush *Buddleja davidii* and broad-leaved dock *Rumex obtusifolius*.

Image 4.11: Narrow strip of poor semi-improved grassland along eastern extent of Scheme footprint



Source: Mott MacDonald

Lower Hinds

The southern extent of the Scheme footprint is dominated by poor semi-improved grassland. The grassland appears to be used for recreational biking activity due to the tracks of bare ground within the grassland. An area of poor semi-improved grassland was also noted at the north eastern extent of the Scheme footprint, also, the grassland to the north comprised piles of tree mulch (TN1). Species composition of the poor semi-improved grassland across the Scheme footprint includes; lady's mantle, bramble, creeping buttercup, herb-Robert, red fescue *Festuca rubra*, rosebay willow herb, Indian balsam, Yorkshire-fog *Holcus lanatus*, goat willow saplings, ribwort plantain, annual meadow grass, creeping thistle *Cirsium arvense*, meadow buttercup *Ranunculus acris*, common ragwort, selfheal, sharp rush, colt's foot *Tussilago farfara*, hop trefoil *Trifolium campestre*, white clover *Trifolium repens*, lesser stitchwort *Stellaria graminea*, false oat-grass, common sorrel *Rumex acetosa* subsp. *Acetosa*, common mouse-ear *Cerastium fontanum*, common bent *Agrostis capillaris*, perennial rye grass, common couch *Elytrigia repens*, rough meadow-grass *Poa trivialis* and smooth meadow-grass.

Image 4.12: Semi-improved grassland within southern extent of the Scheme footprint



Source: Mott MacDonald

4.2.7 Tall Ruderal (C3.1)

York Street (PIN)

Tall ruderal was noted at the top of the River Irwell embankment, at the north eastern extent of the Scheme footprint, and along the woodland edge to the west and south west of the Scheme footprint. Species within the tall ruderal across the Scheme footprint include; meadow crane's-bill *Geranium pratense*, Indian balsam, variegated yellow archangel *Lamium galeobdolon* subsp. *argentatum*, rosebay willow herb, bramble, hedge bindweed, pendulous sedge *Carex pendula*, common ragwort, soft rush, sharp rush, creeping thistle and giant knotweed.

Image 4.13: Tall ruderal along woodland edge to the west and south west of Scheme footprint



Source: Mott MacDonald

Lower Hinds

Tall ruderal was noted along the bottom of the railway embankment encroaching the areas of poor semi-improved grassland and along the River Irwell embankments. Species composition of the tall ruderal includes; common nettle, Indian balsam, hogweed, creeping buttercup, rosebay willowherb, giant hogweed, creeping thistle and Japanese knotweed.

Image 4.14: Tall ruderal along bottom of railway embankment



Source: Mott MacDonald

4.2.8 Standing Water (G1)

York Street (PIN)

A ditch holding standing water was identified along the western extent of the Scheme footprint within the broad-leaved woodland. The water was shallow, and the ditch had dried in some areas. Due to recent heavy rainfall pools of standing water have accumulated on the bare ground within the Scheme footprint.

Image 4.15: Ditch holding shallow water along western extent of Scheme footprint



Source: Mott MacDonald

Image 4.16: Pools of standing water across bare ground due to recent heavy rainfall



Source: Mott MacDonald

Lower Hinds

Due to recent heavy rainfall a pool of standing water (TN2) has accumulated on the bare ground and hardstanding within the Scheme footprint.

Image 4.17: Pool of standing water within Scheme footprint due to recent heavy rainfall



Source: Mott MacDonald

4.2.9 Ephemeral/short perennial (J1.3)

York Street (PIN)

An area of ephemeral/short perennial was noted along the north west and northern extent of the Scheme footprint. This area comprised; Japanese knotweed, broad-leaved willowherb *Epilobium montanum*, ribbed melilot *Melilotus officinalis*, blunt-flowered rush *Juncus subnodulosus*, soft rush, pendulous sedge, amphibious bistort, tufted vetch *Vicia cracca*, red clover *Trifolium pratense*, hemp agrimony, common nettle, common figwort *Scrophularia nodosa* and Indian balsam.

Image 4.18: Ephemeral/short perennial along northern extent of Scheme footprint



Source: Mott MacDonald

Lower Hinds

No ephemeral/short perennial was identified within the Lower Hinds Scheme footprint.

4.2.10 Fence (J2.3.4)

York Street (PIN)

Palisade fencing is present along the southern and northern boundary of the Scheme footprint.

Lower Hinds

Palisade fencing is present along the north, north west and through the centre of the Scheme footprint. Security fencing is present along the bottom of the railway embankment on the eastern extent of the Scheme footprint.

4.2.11 Buildings and Infrastructure (J3.6)

York Street (PIN)

Temporary site cabins comprising of prefabricated and corrugated metal have recently been erected in the south eastern extent of the Scheme footprint.

Lower Hinds

No buildings are present within the Scheme footprint. An underpass beneath the railway line (TN3) is situated on the eastern extent of the Scheme footprint. A railway bridge (TN4) over the River Irwell is situated at the south eastern extent of the Scheme footprint.

Image 4.19: Underpass beneath railway line



Source: Mott MacDonald

Image 4.20: Bridge over the River Irwell at south eastern extent of the Scheme footprint



Source: Mott MacDonald

4.2.12 Bare Ground (J4)

York Street (PIN)

Implementable consent to build a new housing development on this Site was approved in October 2015. As a result, works to erect the new estate have begun, and the majority of the Scheme footprint has been stripped of all vegetation and comprises bare ground and piles of building materials and rubble.

Image 4.21: Example of bare ground across the Scheme footprint



Source: Mott MacDonald

Lower Hinds

An area of bare ground is present within the north eastern extent of the Scheme footprint. As mentioned in section 4.2.6 tracks of bare ground are present within the poor semi-improved grassland. It is assumed this is due to recreational biking activity.

Image 4.22: Bare ground at north eastern extent of Scheme footprint



Source: Mott MacDonald

Image 4.23: Example of tracks of bare ground within poor semi-improved grassland



Source: Mott MacDonald

4.2.13 Hardstanding (J5)

York Street (PIN)

No hardstanding was identified within the York Street (PIN) Scheme footprint.

Lower Hinds

A large area of hardstanding is present within the northern area of the Scheme footprint.

Image 4.24: Area of hardstanding within northern area of Scheme footprint



Source: Mott MacDonald

4.3 Protected and Notable Species

4.3.1 Birds

Bird species recorded during the field survey at York Street (PIN):

- Herring gull *Larus argentatus*; and
- Sand martin *Riparia riparia*.

Bird species recorded during the field survey at Lower Hinds:

- Cormorant *Phalacrocorax carbo*;
- House sparrow *Passer domesticus*;
- Kestrel *Falco tinnunculus*;
- Magpie *Pica pica*;
- Oystercatcher *Haematopus ostralegus*; and
- Sand martin *Riparia riparia*.

The banks of the River Irwell, broad-leaved woodland, scattered trees, scrub and grassland within both Scheme footprints, provide nesting and foraging opportunities for numerous bird species throughout the year. Species records indicate that Schedule 1, Section 41 and Birds of Conservation Concern have been recorded within 2.0km of the Scheme footprints. Further recommendations for birds are given.

4.3.2 Bats

York Street (PIN)

Broad-leaved woodland, scrub and scattered trees within the Scheme footprint have been assessed as having roosting, foraging and commuting potential for bats. Further recommendations for bats are given.

Lower Hinds

The railway underpass (TN3) and bridge (TN4) have been assessed as having negligible potential for roosting bats.

Broad-leaved woodland, poor-semi improved grassland, scrub and scattered trees within the Scheme footprint have been assessed as having roosting, foraging and commuting potential for bats. Further recommendations for bats are given.

4.3.3 Otter

York Street (PIN)

No evidence of otter was identified during the field survey, due to the highly disturbed nature and levels of noise and activity within the Scheme footprint, it is deemed unsuitable for otter. No further recommendations for otter are given.

Lower Hinds

No evidence of otter was identified during the field survey, however, the embankments of the River Irwell on the western extent of the Scheme footprint have the potential to support otter holt and couch creation. Further recommendations for otter are given.

4.3.4 Water Vole

York Street (PIN)

No evidence of water vole was identified during the field survey, due to the highly disturbed nature and levels of noise and activity within the Scheme footprint it is deemed unsuitable for water vole. No further recommendations for otter are given.

Lower Hinds

No evidence of water vole was identified during the field survey, however, the embankments of the River Irwell on the western extent of the Scheme footprint have the potential to provide suitable habitat for water vole and support water vole burrows. Further recommendations for water vole are given.

4.3.5 Badger

York Street (PIN)

No evidence of badger was identified during the field survey, however, the broad-leaved woodland situated along the west of the Scheme footprint has potential to support badger sett creation. Further recommendations for badger are given.

Lower Hinds

No evidence of badger was identified during the field survey, however, the broad-leaved woodland situated to the north and west of the Scheme footprint has potential to support badger sett creation. The poor semi-improved grassland to the south of the Scheme footprint has potential to be used by badgers for foraging. Further recommendations for badger are given.

4.3.6 Other Mammals

York Street (PIN)

Brown hare have been historically recorded within the Scheme footprint. However, as the Scheme footprint has recently been stripped for the new housing development, no suitable habitat or evidence of brown hare was recorded within the Scheme footprint. No further recommendations for brown hare are given.

No evidence of west European hedgehog was noted during the field survey, however, the patch of dense scrub and the woodland edge along the west of the Scheme footprint provides suitable habitat for west European hedgehog. Further recommendations for west European hedgehog are given.

Lower Hinds

No evidence or signs of brown hare or west European hedgehog were recorded during the field survey, however, grassland and scrub within the Scheme footprint have potential to provide suitable habitat for these species' groups. Further recommendations are given.

4.3.7 Great Crested Newt

York Street (PIN)

Three ponds and two ditches have been identified using OS and aerial mapping within 500m of the York Street (PIN) Scheme footprint. There are no barriers to dispersal between these waterbodies and the Scheme footprint. In addition to this, large piles of building rubble were noted within the Scheme footprint which have potential to provide suitable terrestrial habitat for GCN. Further recommendations for GCN are given.

Lower Hinds

One pond and three ditches have been identified on OS and aerial mapping within 500m of the

Scheme footprint. The River Irwell, to the south and west, acts as a significant barrier to dispersal between these waterbodies and the Scheme footprint. Two depressions, approximately 40m east of the Scheme footprint, adjacent to Milford Drive and Warth Road were noted during the field survey. These depressions are assumed to be Sustainable Urban Drainage Systems (SUDS) from the newly built housing development along Milford Drive. The SUDS were not holding water during the field survey, therefore, are deemed to be unsuitable for GCN. No further recommendations for GCN are given.

4.3.8 Other Amphibians

York Street (PIN)

Dense scrub and piles of building rubble across the Scheme footprint have the potential to provide suitable terrestrial habitat for common toad. Further recommendations for common toad are given.

Lower Hinds

Dense scrub across the Scheme footprint and piles of mulch (TN1) have the potential to provide suitable terrestrial habitat for common toad. Further recommendations for common toad are given.

4.3.9 Reptiles

York Street (PIN)

No evidence of reptiles were recorded during the field survey. As the Scheme footprint has been recently been stripped to bare ground, there is limited suitable habitat for reptiles present within the Scheme footprint. It is therefore deemed very unlikely that reptiles will be present within the Scheme footprint. No further recommendations for reptiles are given.

Lower Hinds

No evidence of reptiles were recorded during the field survey, however, poor semi-improved grassland, scrub and piles of mulch (TN1) present within the Scheme footprint have potential to support reptiles. Further recommendations are given.

4.3.10 Bony fish

No works will be directly undertaken within the River Irwell or any other watercourses. No further recommendations at either Scheme footprint are given for bony fish.

4.3.11 Invertebrates

York Street (PIN)

Due to the Scheme footprint being stripped to mostly bare ground, the poor quality and limited area of the grassland within the Scheme footprint it has been assessed as unsuitable for invertebrates. No recommendations are given.

Lower Hinds

The following invertebrates were recorded within the poor semi-improved grassland to the south of the Scheme footprint during the field survey:

- Meadow brown butterfly *Maniola jurtina*; and
- Small skipper butterfly *Thymelicus sylvestris*.

Poor semi-improved grassland, scrub and scattered trees have been assessed as having potential to support this species group. Further recommendations are given.

4.3.12 Invasive Non-native Flora

Invasive non-native flora species were recorded within both Scheme footprints;

York Street (PIN)

- Japanese knotweed;
- Giant knotweed;
- Giant hogweed;
- Indian balsam; and
- Variegated yellow archangel.

Lower Hinds:

- Japanese knotweed;
- Giant hogweed; and
- Indian balsam.

Further recommendations for invasive non-native flora species at both Scheme footprints are given.

5 Assessment and Recommendations

5.1 Designated Sites

5.1.1 Statutory Designated Sites

Hollins Vale Local Nature Reserve (LNR) is designated for its habitats and flora. The Site is situated approximately 1.4km east of the York Street (PIN) Scheme footprint. Due to the localised nature of the works at York Street (PIN) and the distance from the Scheme footprint to the LNR it is deemed very unlikely that the LNR will be adversely impacted by the Scheme. No further recommendations are given.

5.1.2 Non-Statutory Designated Sites

There are 13 Sites of Biological Importance (SBI) within 2.0km of the York Street (PIN) and Lower Hinds Scheme footprints. The closest SBI to York Street (PIN) is Swan Lodge, which borders the Scheme footprint to the west. There will be no direct impacts upon Swan Lodge from the Scheme, however, it is likely that this Site will receive indirect impacts (noise, light and air pollution) during the construction phase of the Scheme. Further consultation with stakeholders and the local authority is recommended.

Due to the localised nature of the works and distance from the York Street (PIN) Scheme footprint to the remaining 12 SBI's within 2.0km, no further recommendations are given.

The Lower Hinds Scheme footprint borders the Lower Hinds SBI to the north. There will be no direct impacts upon Lower Hinds from the Scheme, however, it is likely that this Site will receive indirect impacts (noise, light and air pollution) during the construction phase of the Scheme. As the Lower Hinds Scheme footprint is being developed as a wetland area, there is potential for the completed works to complement the Lower Hinds SBI. Further consultation with stakeholders and the local authority is recommended.

Due to the localised nature of the works and distance from the Lower Hinds Scheme footprint to the remaining 12 SBI's within 2.0km, no further recommendations are given.

5.2 Habitats

Adverse effects on habitats should be minimised through Scheme design and where permanent loss cannot be avoided, mitigation will be required including compensatory planting, habitat enhancement and/or habitat creation offsite.

The ecological importance of the habitats present on site were assessed against their presence on the Local Biodiversity Action Plans (LBAPs) and on Section 41 of the NERC Act and their ability to support protected or notable species. Should habitats meeting any of these criteria be present and considered likely to be impacted by the proposals, recommendations would be given.

The following list of habitats, which are priority habitats/may qualify as priority habitats listed on Section 41 of the NERC Act (for ease of identification indicated in bold) and Greater Manchester BAP, have been identified within the Scheme footprints during the desk study and field survey.

- **Open mosaic habitat** (Lower Hinds);
- **Lowland mixed deciduous woodland** (York Street (PIN) and Lower Hinds); and

- Marshy grassland (Lower Hinds).

During the field survey no open mosaic habitat was identified within the Lower Hinds Scheme footprint, it is considered that this is a mapping error and is an extension of the Lower Hinds SBI which is immediately north of the Scheme footprint.

5.3 Protected/Notable Species

5.3.1 Birds

The Scheme footprints both contain habitat to support this species group. Construction works could result in the temporary loss of nesting habitat, direct effects on nesting birds and overall reduction in habitat availability for common and notable bird species. In addition to this, the embankments of the River Irwell have been assessed as having potential to support sand martin *Riparia riparia*, which were noted during the field survey, and kingfisher *Alcedo atthis*, listed on Schedule 1 of the WCA.

Due to sightings of sand martin during the field survey, it is recommended that if the works directly impact the riverbanks then a habitat suitability assessment for sand martin is undertaken.

Due to historic records of kingfisher within 2.0km of both Scheme footprints it is recommended that, if the works impact trees which overhang the riverbanks then a habitat suitability assessment is undertaken to determine whether any suitable habitat i.e. perches for kingfisher will be lost during construction. If suitable perches are removed compensation will be required.

Both Scheme footprints comprise open areas of bare ground and pools of water, these areas are suitable nesting habitats for little ringed plover. Historic records of little ringed plover, listed on Schedule 1 of the WCA, have been recorded within 2.0km of both Scheme footprints, they are a ground nesting species and often found on construction sites. It is recommended that if the construction period extends into breeding season (March onwards) that the Scheme footprints are kept active and not left undisturbed for more than a weekend; to avoid little ringed plover nesting within the Scheme footprints. If the Scheme footprints are left dormant and suitable for little ringed plover, areas of bare ground and pools of water, for more than 5 days after March, then a suitably experienced ornithologist should check the site prior to works recommencing.

In order to minimise the impacts on birds during construction the following recommendations are made:

- Avoid and minimise as much as possible vegetation/scrub and tree clearance for the Scheme. These habitats support numerous bird species for foraging and nesting.

General recommendations for vegetation clearance during the construction period are provided below:

- All clearance works should be undertaken outside of nesting season. This is considered to be from March to August inclusive; however can vary depending on the species and/or seasonal conditions;
- Where vegetation cannot be removed outside of nesting season, pre-clearance checks (not more than 48 hours before clearance) must be undertaken by an experienced ecologist to identify if any birds are nesting within or close to the vegetation due to be removed. If a bird nest is found, it must be left in-situ and protected from works; no works can be undertaken in

that area until the young birds have fledged from the nest site. This may take up to 6 weeks depending on the species;

- All construction related lighting should be designed and fitted to minimise any adverse impacts on the retained vegetation. Such measures include the use of hoods/cowls and directing lighting away from features such as trees and scrub; and
- All construction works should be restricted where possible to daylight hours to prevent any adverse impacts on roosting birds at dusk and dawn.

5.3.2 Bats

Linear features at both Scheme footprints; the River Irwell and woodland edges and the railway embankment at Lower Hinds have the potential to support commuting and foraging bats. It is recommended that as much semi-natural habitat as possible is retained across both Scheme footprints. The Lower Hinds Scheme footprint has the potential to be enhance suitable foraging habitat for bats upon completion of the wetland.

Scattered trees and woodland within the Scheme footprints have the potential to support bat roosts. It is therefore recommended that if tree clearance is required within either Scheme footprint, preliminary roost assessments for bats are undertaken, prior to works commencing.

In terms of lighting, the following general recommendations should be followed:

- During construction, if night work is essential this should avoid unnecessary disturbance by ensuring that the height of lighting columns are as low as possible;
- Lighting hoods/cowls and shields should be utilised to focus light into the working areas and away from the surrounding environment (particularly any linear features); and
- Consideration should be given to timing of lighting and specifications of lighting during construction of the Scheme to reduce potential effects (in line with best practice guidance from Bat Conservation Trust and the Institute for Lighting Professionals, 2018).

5.3.3 Otter

Applicable to the Lower Hinds Scheme footprint only; dedicated otter presence/likely absence surveys are recommended to identify any use of the River Irwell by otters. Disturbance to the banks could adversely affect this species and individuals could be affected during construction should they stray onto the site. Species specific surveys will inform mitigation that can be incorporated into the design. It is recommended that some areas of the riverbank are inaccessible to the public to allow otter and other wildlife to be undisturbed.

The following general recommendations should be applied to prevent any potential impacts on otter during the construction period:

- A site-specific toolbox talk should be given to all site staff prior to works commencing;
- Additional measures should be implemented to negate possible impacts including standard good practice to avoid accidental spillages;
- If night work is essential this should avoid unnecessary disturbance by ensuring that the height of lighting columns are as low as possible. Lighting hoods/cowls and shields should be utilised to focus light into the working areas and away from the surrounding environment; and;
- Minimise sediment run-off which might negatively impact on otter habitat.

5.3.4 Water Vole

Applicable to the Lower Hinds Scheme footprint only; the banks of the River Irwell have potential to support water vole. If construction works are required within 10m of the crest of the riverbank, further surveys in the form of dedicated water vole presence/likely absence surveys are recommended to identify any use of the River Irwell by this species. Species specific surveys will inform mitigation that can be incorporated into the design. If water vole are present the design should incorporate enhancements for water vole and ensure that the banks within the river are suitably protected from disturbance by dogs.

The following general recommendations should be applied during the construction period to prevent any potential impacts on water vole:

- A site-specific toolbox talk should be given to all site staff prior to works commencing;
- Additional measures should be implemented to negate possible impacts including standard good practice to avoid accidental spillages;
- If night work is essential this should avoid unnecessary disturbance by ensuring that the height of lighting columns are as low as possible.
- Lighting hoods/cowls and shields should be utilised to focus light into the working areas and away from the surrounding environment; and;
- Minimise sediment run-off which might negatively impact on water vole habitat.

5.3.5 Badger

Both Scheme footprints contains suitable habitat for badger sett creation and foraging. Any removal of woodland, scrub, excavations or construction activities may impact this species. It is recommended that a pre-works badger check is undertaken in any areas which require the removal of vegetation to ensure that no new setts have been excavated within or adjacent to the Scheme footprints. Extensive vegetation clearance, or excavation works in the vicinity of a badger sett may require a Natural England licence, usually requiring the sett to be closed before works commence. Licences are usually only granted between July and November inclusive. Further mitigation may be required dependant on the results of the pre-works badger check.

The following general construction safeguards should be followed to ensure badgers are not affected during construction works, in the event that they are present:

- Excavations should be fenced off and/or covered to avoid animals becoming trapped. A mammal ladder should be erected to allow any animals that may become trapped to escape;
- All excavations should be checked each morning to ensure no badgers or other animals have become trapped overnight; and
- If a badger is found within an excavation, then a qualified ecologist should be contacted immediately to advise;
- Soil storage - consideration should be given to where spoil is stored, if likely to be stored for a long period of time then consideration for badger proof fencing should be taken; and
- No equipment should be stored within suitable badger habitats

5.3.6 Other Mammals

Habitats within the Lower Hinds Scheme footprint are suitable to support brown hare and habitats within both Scheme footprints are suitable to support west European hedgehog. Any excavations or construction activities required may affect these species' whilst the loss of grassland, scrub and woodland may impact the habitat available for use by such species.

The following general construction safeguards should be followed to ensure brown hare are not affected during construction works:

- Excavations should be fenced off and/or covered to avoid animals becoming trapped. A mammal ladder should be erected to allow any animals that may become trapped to escape; and
- Any waste from construction activities such as netting should be kept off the ground to avoid entanglement.

The following general construction safeguards should be followed to ensure west European hedgehog are not affected during construction works:

- Scrub clearance during the hibernation period, November to March, should be avoided;
- Excavations should be fenced off and/or covered to avoid animals becoming trapped. A mammal ladder should be erected to allow any animals that may become trapped to escape; and
- Any waste from construction activities such as netting should be kept off the ground to avoid entanglement.

5.3.7 Great Crested Newt

Applicable to the York Street (PIN) Scheme footprint only; three ponds and two ditches have been identified within the ZoI for GCN. In addition to this, piles of building rubble within the Scheme footprint may provide suitable terrestrial habitat for GCN. It is recommended that habitat suitability index surveys (HSI) for GCN are undertaken on the waterbodies within the ZoI. If the waterbodies are deemed suitable for GCN, following the HSI surveys further recommendations will be given.

All piles of building rubble within the Scheme footprint should be dismantled by an ecologist outside of winter months.

5.3.8 Other Amphibians

Dense scrub within both Scheme footprints has potential to provide suitable terrestrial habitat for common toad. It is recommended that removal of dense scrub is avoided and minimised. If removal of dense scrub is required, this should be undertaken using a two-phased vegetation clearance methodology.

It is recommended that permanent pools are incorporated into the wetland design at Lower Hinds for common toad.

5.3.9 Reptiles

Applicable to the Lower Hinds Scheme footprint only; suitable habitat for reptiles was identified within the Scheme footprint. Due to the limited suitable habitat for reptiles within the surrounding areas, if reptiles are present within the Scheme footprint this may result in the displacement of a large and localised population. Therefore, discussions on reptiles and mitigation during construction is recommended. Recommendations will depend on how the works are going to be phased, and the duration.

5.3.10 Invertebrates

Applicable to the Lower Hinds Scheme footprint only; suitable habitat for invertebrates was identified within the Scheme footprint. It is recommended that as much as possible, grassland, vegetation/scrub clearance is avoided/minimised to safeguard invertebrates. The Lower Hinds

Scheme footprint has the potential to be enhance suitable habitat for invertebrates upon completion of the wetland.

5.3.11 Invasive Non-native Flora

Extensive coverage of invasive non-native flora was identified within both Scheme footprints. To prevent the spread of these invasive non-native species an Invasive Species Management Plan (ISMP) should be produced and implemented during the works.

6 Conclusions

6.1 Conclusion

A Preliminary Ecological Appraisal was undertaken to assess the potential impact of the erection of a flood defence wall/embankment at York Street (PIN) and the creation of a wetland at Lower Hinds. It is anticipated that the wetland creation, within the Lower Hinds Scheme footprint, will enhance suitable habitat for a range of species. There is scope to further enhance this area for fauna and flora through ecological input into the design. Consultation with an ecologist is recommended to incorporate further enhancements.

The scope of this report is to identify constraints and provide recommendations for further survey, along with high-level mitigation measures based on the current information known about the Scheme. On this basis, Table 6.1 below sets out recommendations considered appropriate for this Scheme.

Table 6.1: Summary of Recommendations

Ecological Feature	Location	Relevant Legislation/Policy	Recommendation(s)
Statutory Designated Sites	Swan Lodge SBI and Lower Hinds SBI		Consultation with statutory consultees and the Local Authority
Habitats	Throughout both Scheme footprints	Section 41 NERC Act 2006 and GM BAP	Avoid and minimise as much as possible grassland, vegetation/scrub and tree clearance for the Scheme.
Habitats	Lower Hinds Scheme footprint		- Consultation with an ecologist to input into the design and incorporate ecological enhancements. Recommendations could include: - Areas which are barriered off from the public to discourage entering and disturbing wildlife; - Board walks for the public to ensure they keep to certain paths only; - Scrapes for wildfowl; - Permanent pools for amphibians; - Bat boxes; - Artificial sand martin banks; - Beetle banks;
Priority Habitats	Lowland deciduous woodland within both Scheme footprints and marshy grassland with Lower Hinds	Section 41 NERC Act 2006 and GM BAP	Avoid and minimise as much as possible direct impacts upon these habitats
Protected/Notable Species			
Birds	Embankments of the River Irwell, woodland, grassland, scrub and tall ruderal within both Scheme footprints	All breeding birds are protected under the Wildlife and Countryside Act 1981 (as amended)	- If the works directly impact the riverbanks then a habitat suitability assessment for sand martin should be undertaken. - If the works impact trees which overhang the riverbanks then a habitat

Ecological Feature	Location	Relevant Legislation/Policy	Recommendation(s)
			suitability assessment for kingfisher should be undertaken to determine whether any suitable habitat i.e. perches for kingfisher will be lost during construction. If suitable perches are removed compensation will be required - It is recommended that if the construction period extends into breeding season (March onwards) that the Scheme footprints are kept active and not left undisturbed for more than a weekend; to avoid little ringed plover (schedule 1 species) nesting within the Scheme footprints. If the Scheme footprints are left dormant and suitable for little ringed plover, areas of bare ground and pools of water, for more than 5 days after March, then a suitably experienced ornithologist should check the site prior to works recommencing. - Avoid and minimise as much as possible vegetation/scrub and tree clearance for the Scheme. These habitats support numerous bird species for foraging and nesting. General recommendations for vegetation clearance during the construction period are provided below: - All clearance works should be undertaken outside of nesting season. This is considered to be from March to August inclusive; however can vary depending on the species and/or seasonal conditions; - Where vegetation cannot be removed outside of nesting season, pre-clearance checks (not more than 48 hours before clearance) must be undertaken by an experienced ecologist to identify if any birds are nesting within or close to the vegetation due to be removed. If a bird nest is found, it must be left in-situ and protected from works; no works can be undertaken in that area until the young birds have fledged from the nest site. This may take up to 6 weeks depending on the species; - All construction related lighting should be designed and fitted to minimise any adverse impacts on the retained vegetation. Such measures include the use of hoods/cowls and directing lighting away from features such as trees and scrub; and - All construction works should be restricted where possible to daylight

Ecological Feature	Location	Relevant Legislation/Policy	Recommendation(s)
			hours to prevent any adverse impacts on roosting birds at dusk and dawn.
Bats	Woodland and scattered trees within both Scheme footprints		• Retain as much semi-natural habitat as possible; • If works to trees is required a preliminary roost assessment (PRA) for bats should be undertaken in line with the BCT guidelines (Collins, 2016) to establish the risk of bat roosts being present; additional emergence surveys may be required depending on the results of this survey. General recommendations for lighting during construction are advised: • During construction, if night work is essential this should avoid unnecessary disturbance by ensuring that the height of lighting columns are as low as possible; • Lighting hoods/cowls and shields should be utilised to focus light into the working areas and away from the surrounding environment (particularly any linear features); and • Consideration should be given to timing of lighting and specifications of lighting during construction the Scheme to reduce potential effects (in line with best practice guidance from Bat Conservation Trust and the Institute for Lighting Professionals, 2018).
Otter	Banks of the River Irwell at Lower Hinds Scheme footprint only		• Dedicated presence/likely absence survey for otter. • It is recommended that the design includes some areas of the riverbank that are inaccessible to the public to allow otter and other wildlife to be undisturbed. The following general construction safeguards should be followed to ensure otter are not affected during construction works, in the event that they are present: • A site-specific toolbox talk should be given to all site staff prior to works commencing; • Additional measures should be implemented to negate possible impacts including standard good practice to avoid accidental spillages; • If night work is essential this should avoid unnecessary disturbance by ensuring that the height of lighting columns are as low as possible. Lighting hoods/cowls and shields should be utilised to focus light into the

Ecological Feature	Location	Relevant Legislation/Policy	Recommendation(s)
			working areas and away from the surrounding environment; and; Minimise sediment run-off which might negatively impact on otter habitat.
Water Vole	Banks of the River Irwell at Lower Hinds Scheme footprint only		- Dedicated presence/likely absence survey for water vole. - If water vole are present the design should incorporate enhancements for water vole and ensure that the banks within the river are suitably protected from disturbance by dogs. The following general construction safeguards should be followed to ensure water vole are not affected during construction works, in the event that they are present: - A site-specific toolbox talk should be given to all site staff prior to works commencing; - Additional measures should be implemented to negate possible impacts including standard good practice to avoid accidental spillages; - If night work is essential this should avoid unnecessary disturbance by ensuring that the height of lighting columns are as low as possible. Lighting hoods/cowls and shields should be utilised to focus light into the working areas and away from the surrounding environment; and; - Minimise sediment run-off which might negatively impact on water vole habitat.
Badger	Woodland and scrub within both Scheme footprints	Badger Act 1992	- Pre-works badger check is to be undertaken in any areas which require the removal of vegetation to ensure that no new setts have been excavated within or adjacent to the Scheme footprints. Extensive vegetation clearance, or excavation works in the vicinity of a badger sett may require a Natural England licence, usually requiring the sett to be closed before works commence. Licences are usually only granted between July and November inclusive. Further mitigation may be required dependant on the results of the pre-works badger check. The following general construction safeguards should be followed to ensure badgers are not affected during construction works, in the event that they are present: - Excavations should be fenced off and/or covered to avoid animals becoming trapped. A mammal ladder

Ecological Feature	Location	Relevant Legislation/Policy	Recommendation(s)
			should be erected to allow any animals that may become trapped to escape; • All excavations should be checked each morning to ensure no badgers or other animals have become trapped overnight; and • If a badger is found within an excavation, then a qualified ecologist should be contacted immediately to advise; • Soil storage – consideration should be given to where spoil is stored, if likely to be stored for a long period of time then consideration for badger proof fencing should be taken; and • No equipment should be stored within suitable badger habitats.
West European hedgehog	Woodland, grassland and scrub within both Scheme footprints	Section 41 NERC Act	• Scrub clearance during the hibernation period, November to March, should be avoided; • Excavations should be fenced off and/or covered to avoid animals becoming trapped. A mammal ladder should be erected to allow any animals that may become trapped to escape; and • Any waste from construction activities such as netting should be kept off the ground to avoid entanglement.
Brown hare	Grassland and scrub within the Lower Hinds Scheme footprint only	Section 41 NERC Act	• Excavations should be fenced off and/or covered to avoid animals becoming trapped. A mammal ladder should be erected to allow any animals that may become trapped to escape; and • Any waste from construction activities such as netting should be kept off the ground to avoid entanglement.
Great Crested Newt	Waterbodies with the York Street (PIN) Zol for GCN and the Scheme footprint.	Conservation of Habitat and Species Regulations 2017 and the Wildlife and Countryside Act 1981 (as amended)	• HSI surveys for GCN are to be undertaken on the waterbodies within the Zol. If the waterbodies are deemed suitable for GCN, following the HSI surveys, further recommendations will be given. • All piles of building rubble within the Scheme footprint should be dismantled by an ecologist outside of Winter months.
Common toad	Dense scrub within both Scheme footprints and piles of mulch at the Lower Hinds Scheme footprint	Section 41 NERC Act 2006	• Avoid and minimise as much as possible scrub clearance for the Scheme • It is recommended that permanent pools are incorporated into the wetland design at Lower Hinds for common toad.

Ecological Feature	Location	Relevant Legislation/Policy	Recommendation(s)
			Vegetation clearance is to be undertaken using a two-phased methodology
Reptiles	Poor semi-improved grassland and scrub within the Lower Hinds Scheme footprint only	S41 NERC Act 2006 Wildlife and Countryside Act 1981 (as amended)	Discussions with an ecologist on reptiles and mitigation during construction is recommended.
Invertebrates	Poor semi-improved grassland, scrub and scattered trees with the Lower Hinds Scheme footprint only	Section 41 NERC Act 2006	Vegetation/scrub clearance is avoided/minimised to safeguard invertebrates.
Invasive non-native flora	Throughout extents of both Scheme footprints	Schedule 9 of the Wildlife and Countryside Act as amended(1981) and Schedule 2 of The Invasive Alien Species (Enforcement and Permitting) Order 2019	An Invasive Species Management Plan (ISMP) should be prepared for the Scheme, if vegetation clearance is undertaken in areas of invasive non-native flora species, prior to construction works.

Source: Mott MacDonald

6.2 Validity of Survey Data and Assessment

In line with CIEEM (2019) guidance on the lifespan of ecological surveys, the Phase 1 Habitat survey results are considered valid for up to 18 months. Following this, the survey data should be reviewed and, if appropriate, updated to ensure any assessment and recommendations remain valid.

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A. Species Specific Legislation

The following information in this Appendix relates to species assessed within this document as being potentially affected by the proposed works and is a summary version of the full legislative text only. The relevant acts referred to in this Appendix should be referred to for the full legislative text.

A.1 Breeding Birds

All breeding birds are protected under the Wildlife and Countryside Act (WCA) 1981 (as amended) which prohibits the intentional killing, injuring or taking of any wild bird (and) the taking, damaging or destroying eggs or of the nest (whilst being built or in use). Schedule 1 bird species are afforded greater protection under the WCA. It is an offence to disturb Schedule 1 birds or the dependants in the vicinity of their nest site.

A.2 Bats

All bat species are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitat and Species Regulations 2017 (as amended). This means it is illegal to intentionally or deliberately kill, injure, disturb or capture these species or damage, destroy or obstruct access to any structure, breeding or resting place used by them.

A.3 Otter

Otter are a European Protected species and are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and the Conservation of Habitats and Species Regulations 2017. It is an offence to:

- Intentionally or deliberately kill;
- Injure or take an otter;
- Intentionally or deliberately damage;
- Destroy or obstruct access to any structure or place used for shelter or protection by an otter; and,
- To intentionally or deliberately disturb an otter while it is occupying a structure or place which it uses for that purpose.

A.4 Water Vole

Water vole are a European Protected species and are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and the Conservation of Habitats and Species Regulations 2017. It is an offence to:

- Intentionally capture, kill or injure water voles;
- Damage, destroy or block access to their places of shelter or protection (on purpose or by not taking enough care);
- Disturb them in a place of shelter or protection (on purpose or by not taking enough care); and,
- Possess, sell, control or transport live or dead water voles or parts of them (not water voles bred in captivity).

A.5 Badger

Badgers and their setts are protected under the Protection of Badgers Act 1992. This makes it an offence to:

- Directly or indirectly kill, injure or take badgers;
- Cruelly ill-treat a badger;
- Dig for badger;
- Intentionally or recklessly damage or destroy a badger sett, or obstruct access to it;
- Cause a dog to enter a badger sett; and,
- Disturb a badger when it is occupying a sett.

A.6 Other Mammals

West European hedgehog, and brown hare are species of principal importance under Section 41 of the NERC Act 2006.

A.7 Great Crested Newt

GCN are fully protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitat and Species Regulations 2017 (as amended). This means that it is an offence to intentionally or recklessly kill, injure or take GCN. In addition, the following are also in breach of the legislation:

- To possess or control any live or dead specimen or anything derived from a GCN; to intentionally or recklessly damage, destroy or obstruct access to any structure or place used as shelter or protection by a GCN;
- to intentionally or recklessly disturb a GCN while it is occupying a structure or place, which it uses for that purpose. The legislation applies to all life stages of great crested newts.

A.8 Common Toad

Common toad is listed as species of principal importance under Section 41 of the NERC Act 2006.

A.9 Reptiles

Reptiles have varying degrees of protection under the Wildlife and Countryside Act 1981 (as amended). The four wide spread species of reptiles that are protected under Schedule 5 are common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, grass snake *Natrix natrix* and adder *Vipera berus*. This means it is prohibited to intentionally kill, injure or trade these species.

A.10 Invertebrates

Several species of invertebrates are listed as species of principal importance under Section 41 of the NERC Act 2006.

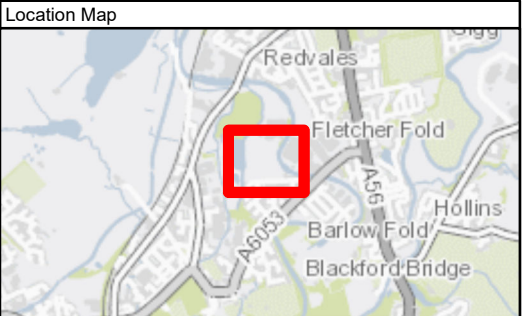
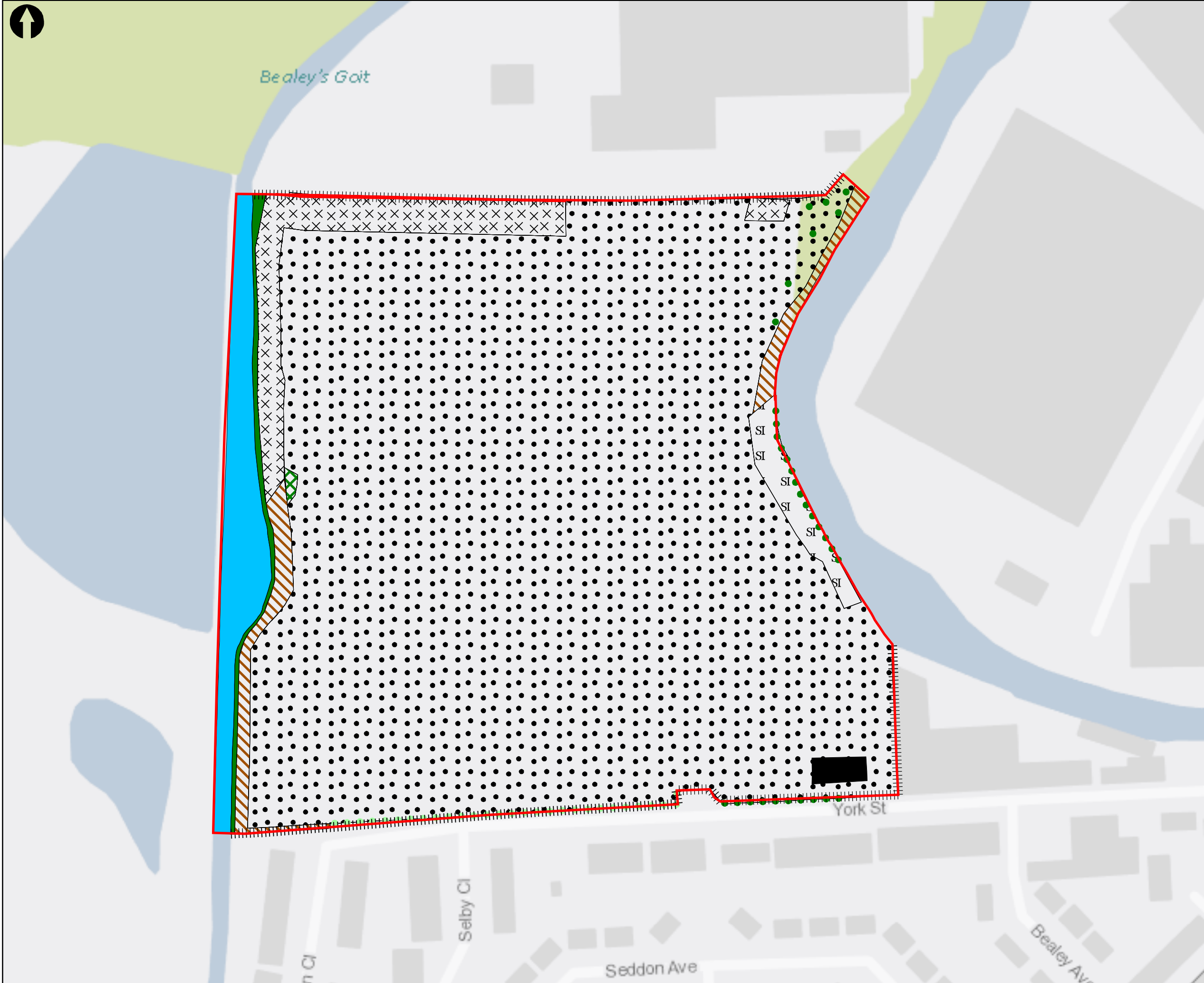
A.11 Invasive Non-native Species

Schedule 9, Section 14 of the Wildlife and Countryside Act (1981, as amended) prohibits the introduction into the wild of any species that is not ordinarily resident in and is not a regular visitor to Great Britain in a wild state, or any species of the 69 plants listed on Schedule 9. Schedule 2 of The Invasive Alien Species (Enforcement and Permitting) Order 2019 aims to prevent and manage the introduction and spread of invasive alien species.

The frequently encountered invasive species within proposed development sites include Japanese knotweed; giant hogweed; Indian balsam; floating pennywort *Hydrocotyle ranunculoides*; New Zealand pygmyweed *Crassula helmsii*; rhododendron *Rhododendron ponticum*; and certain hybrids of the above, some species may be native yet are listed for conservation purposes.

Plant or soil material contaminated by Japanese knotweed that is to be discarded is considered to be a 'controlled waste' under the Environmental Protection Act 1990 (EPA 1990). It is an offence to deposit, treat, keep, or dispose of controlled waste without a licence. Furthermore, knotweed that has been cut down and removed must be received by an authorised person to be disposed of correctly. A licence can be obtained from the Environment Agency (EA). The release or planting of a listed species in the wild can be permitted under a licence granted by the relevant statutory body.

B. Extended Phase 1 Habitat Map



Key to Symbols	
	Scheme footprint
	A3.1 - Broadleaved parkland/scattered trees
	A3.1 - Broadleaved parkland/scattered trees
	A3.2 - Coniferous parkland/scattered trees
	J2.4 - Fence
	A1.1.1 - Broadleaved woodland - semi-natural
	A2.1 - Scrub - dense/continuous
	B6 - Poor semi-improved grassland
	C3.1 - Other tall herb and fern - ruderal
	G1 - Standing water
	J1.3 - Cultivated/disturbed land - ephemeral/short perennial
	J3.6 - Buildings
	J4 - Bare ground

Notes

Phase 1 data; Mott MacDonald, 2020
Service Layer Credits: Contains OS data © Crown Copyright and database right 2019

P1	15/07/20	BG	First issue for comment	RP	JS
Rev	Date	Drawn	Description	Ch'k'd	App'd
			Mott MacDonald House Spring Bank House 33 Stamford Street Altrincham WA14 1ES T +44 (0)161 926 4000 W mottmac.com		

Client

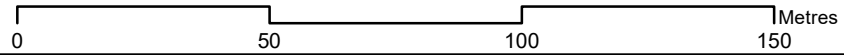
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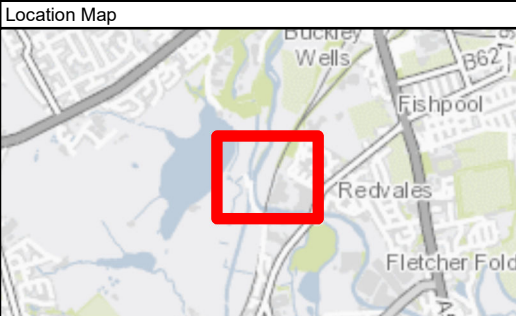
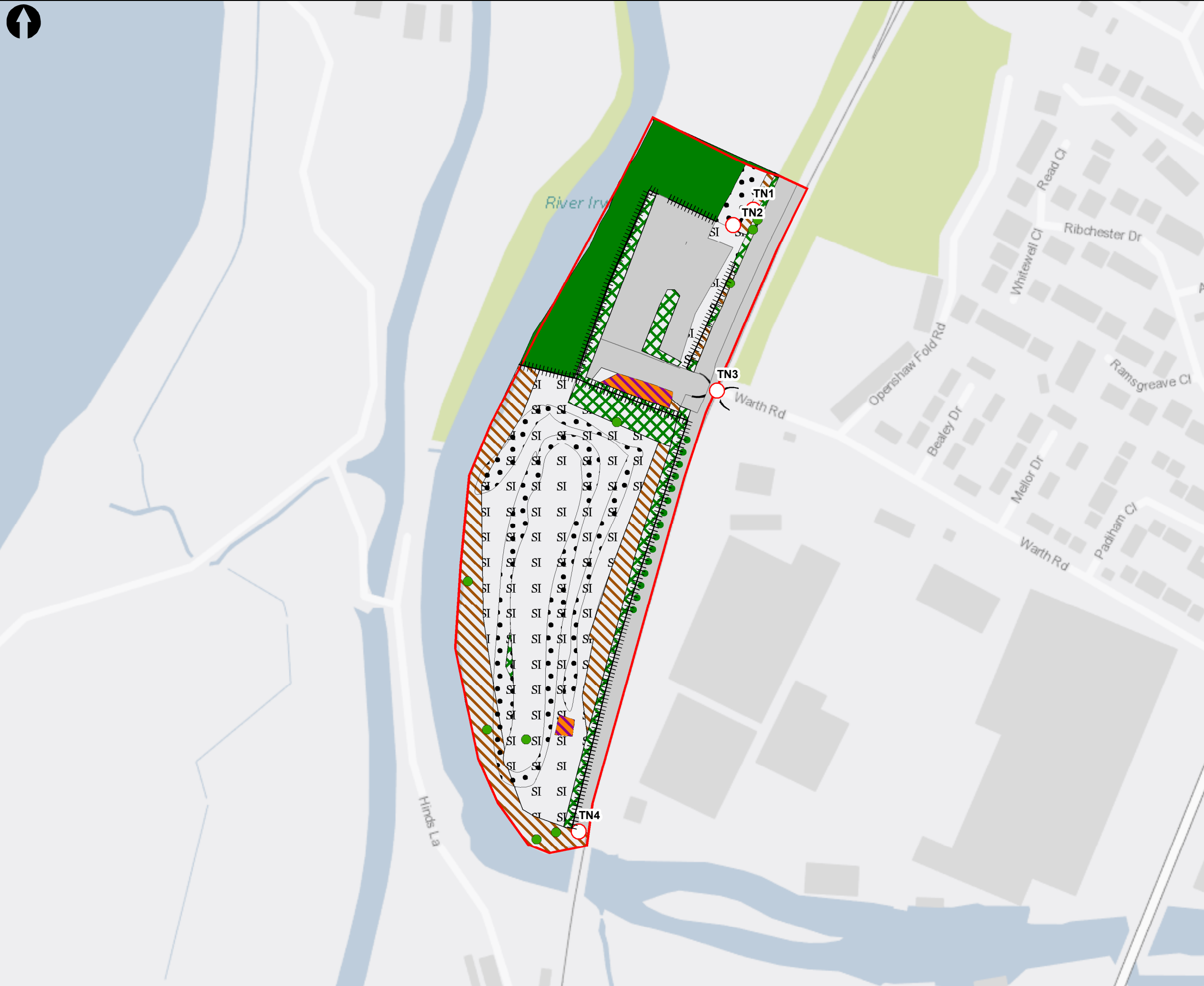
Radcliffe and Redvales FRMS Phase 2
York Street (PIN)
Phase 1 Habitat Map

Designed	B Gray		Check	R Purslow	
Drawn	B Gray		Coordination	L Bagshaw	
GIS Check	S Glover		Approved	J Starling	
Scale at A3	1:1,500	Status	PRE	Rev	P1
				Security	STD

Drawing Number

ENV0000389C-BMM-DZ-4ZZ-MP-EN-0301058





Key to Symbols	
	Scheme footprint
	Target note
	A3.1 - Broadleaved parkland/scattered trees
	A3.1 - Broadleaved parkland/scattered trees
	J2.4 - Fence
	A1.1.1 - Broadleaved woodland - semi-natural
	A2.1 - Scrub - dense/continuous
	B5 - Marsh/marshy grassland
	B6 - Poor semi-improved grassland
	C3.1 - Other tall herb and fern - ruderal
	J3.6 - Buildings and infrastructure
	J4 - Bare ground
	J5 - Hardstanding

Notes

Phase 1 data; Mott MacDonald, 2020
Service Layer Credits: Contains OS data © Crown Copyright and database right 2019

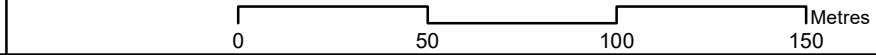
A	15/07/20	BG	First issue for comment	RP	JS
Rev	Date	Drawn	Description	Ch'k'd	App'd
			Mott MacDonald House Spring Bank House 33 Stamford Street Altrincham WA14 1ES T +44 (0)161 926 4000 W mottmac.com		

Client

Title

Radcliffe and Redvales FRMS Phase 2
Lower Hinds
Phase 1 Habitat Map

Designed	B Gray		Check	R Purslow	
Drawn	B Gray		Coordination	L Bagshaw	
GIS Check	S Glover		Approved	J Starling	
Scale at A3	1:2,000	Status	PRE	Rev	P1
		Security			STD



C. Target Notes

Target Note	Description
TN1	Piles of tree mulch
TN2	Pool of standing water
TN3	Underpass beneath the railway
TN4	Railway bridge crossing the River Irwell

