

Trinity Islands, Sites C and D, Manchester, M5 4XP

ECOLOGICAL SURVEY AND ASSESSMENT
(including a Licensed Bat Survey)

October 2021

[ERAP (Consultant Ecologists) Ltd ref: 2020-374]

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Document Control

Survey Type:	Surveyors ¹	Survey Date(s)
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Daylight bat survey	Brian Robinson B.Sc. (Hons) MCIEEM	10 th March 2021
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Revised and issued	Amy Sharples B.Sc. (Hons) M.Sc. ACIEEM	25 th May 2021
Report issued to	Renaker Build Ltd	
Version Number	2: Site C area updated 14 th October 2021	
¹ Licence reference number		
Bats		
Brian Robinson Natural England Class Survey Licence (bats, Level 2) Registration Number 2015-13161-CLS-CLS		

SUMMARY

Introduction and Scope

- i. This ecological survey and assessment presents the ecological, biodiversity and nature conservation status of the land at Trinity Islands, Sites C and D, Manchester, M5 4XP. The assessment was requested in connection with proposals to develop the sites for residential purposes.
- ii. This report presents the results of a desktop study, extended Phase 1 Habitat Survey and a licensed bat survey carried out in March 2021. The scope of survey undertaken is appropriate to identify potential ecological constraints, the remit of mitigation required and opportunities for biodiversity associated with the development proposals.
- iii. The sites comprise asphalt car parks with very locally frequent colonising ruderal herbs, and localised areas of unmanaged grassland, tall-herb vegetation, scrub and tall-herb vegetation colonising the bankside wall of the canalised and adjacent River Irwell. The site-side abutments and spans of the bridges located at the underpass adjacent to the sites were additionally surveyed for completeness.

Results of Survey and Assessment

- iv. The proposals will have no adverse effect on statutory or non-statutory designated sites for nature conservation.
- v. The sites contain only common and widespread plant species. None of the habitats within the sites are of significant interest in terms of their plant species composition. None of the habitats present are representative of semi-natural habitat. No Priority Habitats are present.
- vi. The River Irwell, located adjacent to the north-western boundaries of both sites is of importance in terms of its suitability for use as a wildlife corridor; recommendations to protect River Irwell and maintain its value as an wildlife corridor are presented at **Section 5.1** of this report.
- vii. Invasive species listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), namely Giant Hogweed and Indian Balsam, were detected at the boundary vegetation. Guidance on the control and management of these species is presented at **Section 5.3**.

Recommendations

- viii. The recommendations in **Section 5.0** outline all the mandatory measures and additional actions to be applied to ensure compliance with wildlife legislation, the National Planning Policy Framework (NPPF) and best practice.
- ix. The proposals will secure an opportunity to implement beneficial measures such as habitat creation that will safeguard habitats for wildlife such as birds and bats, with the aim of providing a net gain in biodiversity in accordance with the principles of the NPPF.

Conclusion

- x. It is concluded that the proposals are feasible and acceptable in accordance with ecological considerations and relevant planning policy. Development at the sites will provide an opportunity to secure ecological enhancement for wildlife associated with residential development.

1.0 INTRODUCTION

1.1 Background and Rationale

- 1.1.1 ERAP (Consultant Ecologists) Ltd was commissioned by Renaker Build Ltd to carry out an ecological assessment of land at Trinity Islands, Sites C and D, Manchester (hereafter referred to as the 'sites'). The Ordnance Survey (OS) grid reference at the centre of the sites is SJ 8278 9769. An aerial image of the sites and their surrounding habitats is appended at **Figure 1** (source image: ESRI World Imagery).
- 1.1.2 The assessment was requested in connection with a planning application to develop the sites for residential purposes.

1.2 Scope of Works

- 1.2.1 The scope of ecological works undertaken in March 2021 comprised:
- A desktop study and data search for known ecological information at the sites and the local area;
 - An Extended Phase 1 Habitat Survey and assessment;
 - Assessment of the ecological value of the habitats within the sites with the use of the National Vegetation Classification (NVC) and the Ratcliffe criteria, as presented in *A Nature Conservation Review* (Ratcliffe, 1977);
 - Survey and assessment of all habitats for relevant statutorily protected species¹ and other wildlife including badger (*Meles meles*), water vole (*Arvicola amphibius*), otter (*Lutra lutra*), bird species and reptiles;
 - A licensed daylight bat survey of the underpasses of the road bridge and pedestrian footbridge which bisect the sites;
 - The identification of any potential ecological constraints on the proposals and the specification of the scope of mitigation and ecological enhancement required in accordance with wildlife legislation, planning policy guidance and other relevant guidance; and
 - The identification of any further surveys or precautionary actions that may be required prior to the commencement of any development activities.

2.0 METHOD OF SURVEY

2.1 Desktop Study and Data Search

- 2.1.1 The following sources of information and ecological records were consulted:
- MAGiC: A web-based interactive map which brings together geographic information on key environmental schemes and designations, including details of statutory nature conservation sites;
 - Environment Agency Main River Map (Environment Agency, 2018);
 - Greater Manchester Local Record Centre (GMLRC); and
 - Greater Manchester Biodiversity Action Plan (BAP).

¹ In accordance with *Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and Their Impact on the Planning System* (Ministry of Housing, Communities & Local Government, 2005) developers should not be required to undertake surveys for protected species unless there is reasonable likelihood of the species being present and affected by the development. In this instance (for example) there are no ponds within 500 metres of the sites; there has therefore been no requirement to consider great crested newt (*Triturus cristatus*) as part of this assessment.

2.2 Vegetation and Habitats

- 2.2.1 An Extended Phase 1 Habitat Survey of the sites was carried out by Brian Robinson B.Sc. (Hons) MCIEEM and Amy Sharples B.Sc. (Hons) M.Sc. ACIEEM on 10th March 2021. The weather was overcast with scattered showers, a moderate breeze (Beaufort scale 4) and an air temperature of 6°C. The time of year was favourable for the ecological survey.
- 2.2.2 A habitat and vegetation map was produced for the sites and the immediate surrounding area at a scale of 1:1,500 (refer to **Figure 2**). The mapping is based on the Joint Nature Conservation Committee Phase 1 Habitat Survey methodology (JNCC, 2010) with minor adjustments to illustrate and examine the habitats with greater precision.
- 2.2.3 The plant species within each site boundary were determined with estimates of the distribution, ground cover, abundance and constancy of individual species. The estimation of abundance was based on the DAFOR system, where D = Dominant, A = Abundant, F = Frequent, O = Occasional and R = Rare, this being a widely used and accepted system employed by ecological surveyors. The terms L = Locally and V = Very were additionally used to describe the plant species distributions with greater precision.
- 2.2.4 Stands of vegetation and habitats were described and evaluated using the National Vegetation Classification (NVC). The NVC provides a systematic and comprehensive analysis of British vegetation and is a reliable framework for nature conservation and land-use planning.
- 2.2.5 Searches were made for uncommon, rare and statutorily protected plant species, those species listed as protected in the *Wildlife and Countryside Act 1981* (as amended) and species which are indicators of important and uncommon plant communities. Plant nomenclature follows *New Flora of the British Isles 3rd Edition* (Stace, 2010).
- 2.2.6 Searches were carried out for the presence of invasive species, including those listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), including Japanese Knotweed (*Fallopia japonica*), Indian Balsam (*Impatiens glandulifera*) and Giant Hogweed (*Heracleum mantegazzianum*).

2.3 Animal Life

Badger

- 2.3.1 The survey area for badger covered the sites (as annotated on **Figure 2**) and extended to accessible land within a radius of 50 metres from each site boundary. Private land was excluded from the survey.
- 2.3.2 The survey was conducted in accordance with guidance presented within *Badgers and Development* (Natural England, 2007) and *Badgers: surveys and mitigation for development projects* (Natural England, 2015).
- 2.3.3 The following signs of badger activity were searched for:
- Sett entrances, e.g. entrances that are normally 25 to 35cm in diameter and shaped like a 'D' on its side;
 - Large spoil heaps outside sett entrances;
 - Bedding outside sett entrances;
 - Badger footprints;
 - Badger paths;
 - Latrines;
 - Badger hairs on fences or bushes;
 - Scratching posts; and
 - Signs of digging for food.

- 2.3.4 Habitats within and surrounding the sites were assessed in terms of their suitability for use by foraging and sheltering badger in accordance with their known habitat preferences as detailed in current guidance and *Badger* (Roper, 2010).

Bat Species

Daylight Survey

Survey Personnel

- 2.3.5 The sites were assessed for their suitability to support roosting bats by Brian Robinson, Natural England Class Survey Licence WML CL18 (Bat Survey Level 2), Registration Number 2015-13161-CLS-CLS. In addition the suitability of the underpasses of the road bridge and pedestrian footbridges which bisect the sites were assessed.
- 2.3.6 The surveyor's qualifications and experience meet the criteria as defined in the *Technical Guidance Series Competencies for Species Survey: Bats* (CIEEM, 2013).

Underpasses to Road and Pedestrian Foot Bridges

- 2.3.7 The survey was carried out in accordance with standard methodology including the *Bat Mitigation Guidelines* (Mitchell-Jones, 2004), the *Bat Workers' Manual 3rd Edition* (Mitchell-Jones & Mcleish, 2004) and *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)* (Collins, J. (ed), 2016).
- 2.3.8 An inspection of the external surfaces, walls and underside of the bridges at the underpass was carried out to find potential bat roosting habitat or accesses into internal areas where roosts may be present. Searches for evidence of bat presence in the form of droppings, urine stains, feeding signs, grease marks and other evidence were also carried out.
- 2.3.9 A list of equipment used is detailed at **Table 2.1**, below:

Table 2.1: Survey Equipment used during Daylight Bat Survey

Ladders
LED Lenser P14 torch
Canon Ixus digital camera
8x20 binoculars

- 2.3.10 The suitability of the underpass has been assessed in accordance with Table 4.1 of *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*, (Collins, J. (ed), 2016), taking into account any presence of gaps suitable for access by bats, features suitable for use by roosting bats within the building (including crevice dwelling species and species which can roost in the open in roof voids), and the suitability of the surrounding habitats for use by foraging and commuting bats.

Trees

- 2.3.11 A preliminary assessment of the trees within the sites was conducted to assess their suitability for use by roosting bats, and to inform whether further surveys or precautionary measures were required.
- 2.3.12 Trees were assessed from the ground using binoculars and a high-powered torch. Each tree was searched for the presence of the following features:

Woodpecker holes, rot holes, hazard beams, other vertical or horizontal cracks or splits in stems and branches, partially decayed platey bark, knot holes, man-made holes, tear-outs, cankers in which cavities have developed, other hollows or cavities, including butt-rots, double-leaders forming compression forks with included bark, gaps between overlapping stems or branches, partially detached Ivy (Hedera helix) with stem diameters in excess of 50mm and bat, bird or dormouse (Muscardinus avellanarius) boxes.

2.3.13 Terms used to describe any features present follow (where possible) those outlined and described in *Bat Tree Habitat Key, 2nd Edition* (Andrews, H (ed), 2013) and *Bat Roosts in Trees: A Guide to Identification and Assessment for Tree-care and Ecology Professionals* (BTHK, 2018).

2.3.14 The requirement for further presence / absence surveys at each tree was then considered.

Habitat Assessment for Commuting / Foraging Bats

2.3.15 Habitats within and adjacent to the sites were assessed for their value and suitability for commuting and foraging bats in accordance with Table 4.1 of *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*, (Collins, J. (ed), 2016). Reference has been made to the categories and descriptions / examples, presented at **Table 2.2**, below.

Table 2.2: Consideration of Suitability of Foraging and Commuting Habitat for Bats

Suitability	Commuting Habitat	Foraging Habitat
Negligible	Negligible habitat features on site likely to be used by commuting bats.	Negligible habitat features on site likely to be used by foraging bats.
Low	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated i.e. not very well connected to the surrounding landscape by other habitat.	Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree or patch of scrub.
Moderate	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.	Habitat that is linked to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	Continuous, high-quality habitat that is well connected to the wider landscape and is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. Habitats close to and connected to known roosts.	High-quality habitat that is well-connected to the wider landscape and is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Habitats close to and connected to known roosts.

Bird Species

2.3.16 Bird species observed and heard during the survey were recorded.

2.3.17 Habitats throughout the sites and in the immediate surrounding area were assessed for their value to roosting, feeding and nesting birds, as indicated by the amount of shelter, feeding value, woody vegetation structure and species diversity of tree and shrub species in the sites.

Water Vole and Otter

2.3.18 The approximately 300 metres long section of the River Irwell which lies adjacent to the north-western site boundaries was assessed in terms of its suitability for use by water vole and otter (*Lutra lutra*). The banks of the river were walked to determine the suitability of the section of the river for foraging and sheltering water vole and otter. No access was possible to the sections of river to the north-east and south-west of the sites.

2.4 Survey and Reporting Limitations

2.4.1 Both banks of the River Irwell are canalised, fenced, and could not be checked directly for field signs of water vole or otter, however it is considered that a habitat assessment and assessment of likely impact of the proposed development are sufficient to determine the likely presence or absence of either species, and the likely impacts of the proposed development on either.

2.4.2 Otherwise, the whole of sites was accessible and the survey was conducted under suitable conditions.

- 2.4.3 The survey was completed outside the bat active season, when any field signs of bats may have weathered from the external elevations of the underpasses. Daylight bat inspections can be completed at any time of year, however and it is considered that a reliable assessment of the likely presence or absence of bats has been possible.
- 2.4.4 No significant survey limitations were experienced.
- 2.4.5 No photograph of the River Irwell was taken during the survey, and a photograph of the river taken adjacent to the sites in 2016 has been provided for completeness. It is confirmed that the river remains as presented in the 2016 photograph.
- 2.4.6 All measurements within this report are approximate only, and have been either measured (using QField) or estimated whilst on site or calculated using mapping software (QGIS) or internet-based mapping services such as MAGiC and Google Earth.

2.5 Evaluation Methods

- 2.5.1 The habitats, vegetation and animal life were evaluated with reference to standard nature conservation criteria as described in *A Nature Conservation Review* (Ratcliffe, 1977) and *Guidelines for the Selection of Biological SSSIs* (Bainbridge, et al., 2013). These are size (extent), diversity, naturalness, rarity, fragility, typicality, recorded history, position in an ecological or geographical unit, potential value and intrinsic appeal.
- 2.5.2 Habitats have been assessed to determine whether they meet those described in *UK Biodiversity Action Plan: Priority Habitat Descriptions* (Maddock, A (ed), 2008); these lists are used to help draw up the statutory lists of Priority Habitats, as required under Section 41 of the *Natural Environment and Rural Communities (NERC) Act 2006*. Where suitable, the ecological value of the habitats present has been assessed using the terms outlined in *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2018).
- 2.5.3 Government advice on wildlife, as set out in the *National Planning Policy Framework* (Ministry of Housing, Communities and Local Government, 2019) and associated government circulars has been taken into consideration. Legislation relating to protected species, such as those listed under Schedules 1, 5, 6 and 8 of the *Wildlife and Countryside Act 1981* (as amended) and *The Conservation of Habitats and Species Regulations 2017*, is referenced where applicable, and any impacts to protected species are evaluated in accordance with current guidance.
- 2.5.4 The presence of any Priority Species, as listed under Section 41 of the *Natural Environment and Rural Communities (NERC) Act 2006* is noted, and habitats are assessed in terms of their suitability and value for these species. The presence of habitats and/or species listed by the Greater Manchester Biodiversity Action Plans has been taken into account in the evaluation of the sites.

3.0 SURVEY RESULTS

3.1 Desktop Study and Data Search

Designated Sites for Nature Conservation

Statutory Designated Sites for Nature Conservation and SSSI Impact Risk Zones

- 3.1.1 The sites do not hold any statutory or non-statutory designation for nature conservation.
- 3.1.2 The sites lie within a Site of Special Scientific Interest (SSSI) Impact Risk Zone for Rochdale Canal Special Area of Conservation (SAC) and SSSI. The SSSI Impact Risk Zone requires the Local Planning Authority to consult with Natural England on likely risks from the following development categories (Ordnance Survey, 2021):

- Air pollution: Livestock and poultry units with floorspace greater than 500m² and slurry lagoons greater than 4000m².
- Combustion: General combustion processes greater than 50 megawatt energy input including energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis / gasification, anaerobic digestion, sewage treatment works and other incineration / combustion.

Non-statutory Designated Sites for Nature Conservation

- 3.1.3 The sites lie within 2 kilometres of three Sites of Biological Importance (SBIs). These locally designated sites comprise the River Irwell SBI, located 1.2 kilometres to the north-west of the sites, and the Rochdale Canal, Stott's Lane – Ducie Street Basin SBI, and Ashton Canal (West) SBI, both of which lie 1.5 kilometres to the east of the sites.
- 3.1.4 The presence of locally designated sites within 2 kilometres of the sites is considered further at **Section 4.1**, below.

Main River Designation

- 3.1.5 Both sites lie adjacent to the River Irwell. The section of the River Irwell which lies adjacent to the sites is not identified as a main river on the Environment Agency Main River Map (Environment Agency, 2018).

Priority Habitats Inventory

- 3.1.6 The Priority Habitats Inventory² was checked via MAGiC Map. No Priority Habitats are listed for the sites or the area directly adjacent to the sites on the Priority Habitats Inventory.

Protected and Notable Species

- 3.1.7 The following records of protected and notable species adjacent to the site boundaries are held by GMEU:
- a. Two records of dunnock (*Prunella modularis*), a Priority Species;
 - b. Kingfisher (*Alcedo atthis*), listed under Schedule 1 of the *Wildlife and Countryside Act 1981* (as amended) adjacent to the north-western site boundary (associated with the River Irwell).
 - c. *Pipistrelle* species and common pipistrelle (*Pipistrellus pipistrellus*), both European Protected Species and GMBAP Priority species. Two records (one per species) of roosts are noted for the approximate middle of the eastern boundary of Site C. Note that this area currently supports hard standing; no buildings or trees capable of supporting a bat roost are present at this location and it is considered that the records are historic; and
 - d. Soprano pipistrelle (*Pipistrellus pygmaeus*) EPS, PS and GMBAP, one record of bat activity adjacent to the north-western site boundary (associated with the River Irwell).
- 3.1.8 Further records of protected and notable species for a 1 kilometre radius of the sites are summarised at **Table 3.1** below.

² A spatial dataset that describes the geographic extent and location of Natural Environment and Rural Communities Act (2006) Section 41 habitats of principal importance.

Table 3.1: Records of Protected Species Within a 1 Kilometre Radius of the Sites

Taxon Group	Species Name and Designations ¹ and Notes
Bird	PS Bullfinch (<i>Pyrrhula pyrrhula</i>), dunnoek (<i>Prunella modularis</i>), herring gull (<i>Larus argentatus</i>), house sparrow (<i>Passer domesticus</i>), lapwing (<i>Vanellus vanellus</i>), linnet (<i>Linaria cannabina</i>), skylark (<i>Alauda arvensis</i>), song thrush (<i>Turdus philomelos</i>) and starling (<i>Sturnus vulgaris</i>) WCAs1 & GMBAP Black redstart (<i>Phoenicurus ochrurus</i>) WCAs1 Kingfisher (<i>Alcedo atthis</i>), little ringed plover (<i>Charadrius dubius</i>) and peregrine (<i>Falco peregrinus</i>)
Insect	PS moth species (unnamed). 5 records, the closest of which is 70 metres north of the site.
Terrestrial mammal	Hedgehog (<i>Erinaceus europaeus</i>) PS. One record 875 metres south of the site. Otter (<i>Lutra lutra</i>) EPS, WCAs5 & PS. One record 795 metres north-west of the site. Bat species EPS, WCAs5 & GMBAP. One record of bat activity 800 metres south of the site. Pipistrelle species EPS, WCAs5 & GMBAP. One record of a roost and 4 records of bat activity. The closest roost (apart from the one named above) is 200 metres to the south of the site. Common pipistrelle (<i>Pipistrelle pipistrelle</i>) WCAs5, PS & GMBAP. 12 records of roosts and 34 records of bat activity. The closest record of a roost (apart from the one named above) is 45 metres north of the site. Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>) EPS, PS, WCAs5 & GMBAP. One record of a roost and 3 records of bat activity. The closest record of a roost is 45 metres north of the site. Daubenton's bat (<i>Myotis daubentonii</i>) EPS, WCAs5 & GMBAP. One record of a roost 80 metres to the north-east boundary of Site C. Brown long-eared bat (<i>Plecotus auritus</i>) EPS, WCAs5, PS & GMBAP. One record of bat activity 750 metres north-east of the site.
¹Key to Designation Codes: EPS = European Protected Species under the <i>Conservation of Habitats and Species Regulations 2017</i>. WCAs1 = Species receives full protection under Schedule 1 of the <i>Wildlife and Countryside Act 1981</i> (as amended). WCAs5 = Species receives full protection under Schedule 5 of the <i>Wildlife and Countryside Act 1981</i> (as amended). PS = Priority Species listed under Section 41 of the NERC Act 2006 GMBAP = Species listed on the Great Manchester Biodiversity Action Plan	

- 3.1.9 The presence of these protected and notable species within the wider area has been taken into account throughout this report.

3.2 Vegetation and Habitats

General Description

- 3.2.1 Both sites are located within an urban area of Manchester, and are chiefly composed of hard standing. The sites are separated by the A6042 road. Areas of unmanaged grassland are located within Site C, and an area of scrub vegetation is present at the southern end of Site D. Both sites are adjacent to the River Irwell at their north-western boundaries, and are otherwise surrounded by roads and hard standing at each boundary.
- 3.2.2 The two sites are described in detail below. Refer to **Figure 1** for all habitat descriptions. Photographs are appended at **Table 8.3**.

Site C

Overview of Site C

- 3.2.3 The approximately 0.89 hectare site is located in an urban area and comprises an asphalt car park with very locally frequent colonising ruderal herbs, and localised areas of unmanaged grassland and tall-herb and scrub vegetation, young trees, scrub and tall-herb vegetation.
- 3.2.4 The north-western site boundary is defined by the River Irwell, beyond which lies the A6042 and a railway bridge. The north-eastern site boundary is defined by the railway bridge, beyond which lies further asphalt

hard standing, a second railway bridge, Princes Bridge and further car parking. The south-eastern site boundary is defined by Water Street, beyond which lies further buildings and roads. The south-western site boundary is defined by the A6042, beyond which lies an asphalt car park, at which site offices associated with building activity have been recently erected.

- 3.2.5 A plant species list is appended at **Table 8.1**.

Hard Standing

- 3.2.6 Refer to **Photos 1** and **2**. The hard standing at the site is composed of asphalt, with very locally frequent colonising herbs principally found at the interfaces between the asphalt and the mortared brick walls at the site's gateway and walkways.
- 3.2.7 The colonising ruderal herbs are characterised by very locally frequent Butterfly-bush (*Buddleja davidii*), Dandelion (*Taraxacum officinale*), Herb-Robert (*Geranium robertianum*), Mugwort (*Artemisia vulgaris*), and rare occurrences of Broad-leaved Dock (*Rumex obtusifolius*) and Common Nettle (*Urtica dioica*).
- 3.2.8 None of the plant species present are constant or attain a percentage cover of 1% or greater. The vegetation is not characteristic of any NVC community.

Unmanaged Grassland and Tall-herb Vegetation

- 3.2.9 The unmanaged grassland and tall-herb vegetation is characterised by locally abundant Common Nettle (*Urtica dioica*) very locally frequent Red Fescue (*Festuca rubra*), Yorkshire-fog (*Holcus lanatus*), Yarrow (*Achillea millefolium*) and Cock's-foot (*Dactylis glomerata*).
- 3.2.10 The vegetation is not characteristic of an NVC community.

Tall-herb and Scrub Vegetation at the North-eastern Corner of the Site

- 3.2.11 A small (approximately 7 metres long, 2 metres wide) area of tall-herb and scrub vegetation is present at the north-western site boundary, and is characterised by locally abundant Common Nettle and Butterfly-bush (*Buddleja davidii*) with frequent and locally abundant Dogwood (*Cornus sanguinea*).
- 3.2.12 The vegetation is not characteristic of an NVC community.

Site D

Overview of Site D

- 3.2.13 The approximately 0.89 hectare site is located in an urban area and comprises an asphalt car park with very locally frequent colonising ruderal herbs and a small area of scrub vegetation at its southern end. Young trees and shrubs have colonised the bankside wall at a canalised section of the River Irwell, which lies immediately adjacent to the western site boundary.
- 3.2.14 The western and northern site boundaries are defined by the River Irwell, beyond which lies an area of scrubland, Wilburn Street and buildings. The eastern site boundary is defined by fencing, beyond which lies the A6042 and further hard standing. The southern site boundary is defined by a wall, beyond which lies Regent Road and further areas of hard standing.
- 3.2.15 A plant species list is appended at **Table 8.2**.

Hard Standing with Colonising Ruderal Herbs

- 3.2.16 Refer to **Photos 3** and **4**. The hard standing at the site is composed of asphalt and concrete with very locally frequent colonising herbs.

- 3.2.17 The colonising ruderal herbs are characterised by very locally frequent Butterfly-bush, Ribwort Plantain (*Plantago lanceolata*), Dandelion, Common Ragwort (*Senecio jacobaea*), Oxford Ragwort (*Senecio squalidus*), Mugwort (*Artemisia vulgaris*) and Yarrow.
- 3.2.18 The vegetation is not characteristic of any NVC community.
- 3.2.19 The mortared brick wall located at the southern site boundary is colonised by locally frequent Butterfly-bush and Dandelion. The vegetation is not characteristic of any NVC community.

Scrub Vegetation

- 3.2.20 Refer to **Photo 5**. A small (approximately 6 metres long and wide) area of young trees and scrub vegetation is present at the south-western corner of the site. The vegetation is characterised by frequent and locally abundant Rowan (*Sorbus aucuparia*), Goat Willow (*Salix caprea*), Sycamore (*Acer pseudoplatanus*) and Ash (*Fraxinus excelsior*) with an understorey of frequent Common Nettle, Herb-Robert, Common Ragwort (*Senecio jacobaea*), False Oat-grass (*Arrhenatherum elatius*), Yorkshire-fog and Bramble (*Rubus fruticosus* agg.).
- 3.2.21 The vegetation is not characteristic of any NVC Community.

Invasive Plant Species (Both Sites)

- 3.2.22 As illustrated on **Figure 2**, Giant Hogweed (*Heracleum mantegazzianum*) and Indian Balsam are present at the eastern bank of the River Irwell to the north of the site, and Small-leaved Cotoneaster (*Cotoneaster microphyllus*) is present at both Sites C and D. The potential for invasive species to colonise the sites during the construction and operational phases of the proposed development of the sites must be considered. The plant species are listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended); it is an offence to spread or cause the spread of these species in the wild.
- 3.2.23 It is understood from conversation with the Network Rail contractors present at the site during the survey that control of both Indian Balsam and Giant Hogweed plants is currently being undertaken (namely herbicide application).
- 3.2.24 Further guidance is described in **Section 4.3**.

Habitats Adjacent to Both Sites: River Irwell

- 3.2.25 Refer to **Photos 6**. The section of the River Irwell which lies immediately adjacent to the north-western site boundary of Sites C and D is canalised along its length by mortared brick walls which are approximately 3 metres high (from the water mark at the time of the survey) and set at an angle of 90°.
- 3.2.26 The water channel is approximately 30 metres wide and supports a southerly flow. The River did not support any observable aquatic or emergent vegetation along the section which lies adjacent to the site.
- 3.2.27 The walls at Site C support locally abundant colonising scrub and tall-herb vegetation characterised by frequent and locally abundant Giant Hogweed, Dogwood, Butterfly-bush and very locally frequent Perforate St. John's-wort (*Hypericum perforatum*) and Yarrow.
- 3.2.28 The walls at Site D support locally abundant colonising scrub and tall-herb vegetation characterised by frequent and locally abundant Hawthorn (*Crataegus monogyna*), Elder (*Sambucus nigra*), Butterfly-bush, Rowan, Sycamore and Goat Willow with an understorey of locally abundant Bracken (*Pteridium aquilinum*), Bramble, Rosebay Willowherb (*Chamerion angustifolium*), Great Willowherb (*Epilobium hirsutum*) and Common Nettle.
- 3.2.29 The vegetation is not characteristic of any NVC community.

3.3 Animal Life

Badger

- 3.3.1 The habitats within and surrounding the sites are wholly unsuitable for use by badger. No signs of badger were detected within the sites. The presence of badger is reasonably discounted.

Bat Species

Daylight Survey: Underpass

- 3.3.2 Refer to **Photos 7 to 9**. Both the road bridge and pedestrian footpath are constructed in a similar fashion, with abutments of mortared brick and stone with supports. Both spans are composed of metal arches and decks supported by concrete slabs.
- 3.3.3 No gaps suitable for access by bats were noted at the underside of the road bridge. A shallow (approximately 0.1 metres deep) 0.2 metres wide gap is present between the cladding at the guard rails of the bridge; no bats or signs of bats were detected along this gap, which is considered to be sub-optimal for use by roosting bats due to its exposed nature.
- 3.3.4 No bats or signs of bats were detected at either the underpass to the road bridge or the pedestrian footbridge. The presence of roosting bats is reasonably discounted.

Trees

- 3.3.5 None of the trees within or adjacent to either site are suitable for use by roosting bats. None support any features suitable for use by roosting bats. The presence of roosting bats within the site is reasonably discounted.

Habitat Assessment for Commuting and Foraging Bats

- 3.3.6 The habitats within the sites are of poor suitability for use by foraging or commuting bats. The hard standing habitats will support no invertebrate prey.
- 3.3.7 The River Irwell is suitable for use by both foraging and commuting bats, and may act as a wildlife corridor for bats through the surrounding urban landscape. This is considered further at **Section 5.1**, below.

Bird Species

- 3.3.8 No birds were detected within the site during the walkover survey of March 2021.
- 3.3.9 The young trees and scrub vegetation at the boundaries of the sites is suitable for use by passerine (perching) bird species; measures for the protection of nesting birds are presented at **Section 5.3**, below.

Water Vole and Otter

- 3.3.10 The canalised section of the River Irwell supports no emergent or aquatic vegetation suitable for use by sheltering or foraging water vole, and the mortared brick bankside walls are unlikely to provide suitable access for sheltering and burrowing water voles.
- 3.3.11 The sides of the River do not support any suitable locations for otter holts or areas to shelter. The heavily disturbed habitats at either bank are such that it is considered the section of River which lies adjacent to the sites is of poor suitability for use by otter, and the presence of otters is reasonably discounted from the sites.

4.0 EVALUATION AND ASSESSMENT

4.1 Introduction and Description of Proposals

- 4.1.1 At the time of writing a proposals plan was not available for the sites.
- 4.1.2 **Section 4.2** provides an assessment of any impacts of the proposed development on the designated sites for nature conservation present in the wider area. The ecological value of habitats within the sites is evaluated at **Section 4.3**, and protected and notable species are considered at **Section 4.4**.

4.2 Designated Sites for Nature Conservation

- 4.2.1 Provided the measures to protect the River Irwell outlined at **Section 5.2** below are adhered to it is considered reasonably unlikely that the proposed development at the sites will have any effect on designated sites for nature conservation present in the in the wider area.

4.3 Vegetation and Habitats

- 4.3.1 The sites contain only common and widespread plant species. None of the habitats within the sites are of significant interest in terms of their plant species composition. None of the habitats present are representative of semi-natural habitat. The NVC communities present are typical of the geographical area and conditions present. No Priority Habitats are present.
- 4.3.2 The River Irwell adjacent to the north-western boundaries of the sites is of importance in terms of its suitability for use as a wildlife corridor; recommendations to protect River Irwell and maintain its value as a wildlife corridor are presented at **Section 5.2**.
- 4.3.3 Invasive species listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), namely Indian Balsam, Small-leaved Cotoneaster and Giant Hogweed, were detected at the site boundary associated within the River Irwell. It is an offence to cause the spread of these species in the wild. The proposed development of the sites represents an opportunity to control the spread of these species; guidance on the control and management of both species is described at **Section 5.3**.

4.4 Protected Species and Other Wildlife

- 4.4.1 No protected or notable animal species were detected within the sites. The young trees and shrubs at the boundaries of the sites are suitable for use by nesting birds, otherwise neither site supports any habitats suitable for use by protected species. Measures for the protection of nesting birds are presented at **Section 5.5**.

5.0 RECOMMENDATIONS AND ECOLOGICAL ENHANCEMENT

5.1 Introduction

- 5.1.1 These recommendations aim to ensure that the development is implemented in accordance with relevant wildlife legislation, Natural England guidance, the principles of the National Planning Policy Framework (NPPF), local planning policy and best practice.
- 5.1.2 In accordance with Chapter 15, paragraph 175 point 'd' of the NPPF, when determining planning applications, local planning authorities should encourage opportunities to incorporate biodiversity improvements in and around developments, especially where this can secure measurable net gains for biodiversity.
- 5.1.3 Where possible, opportunities to enhance the ecological interest and habitat connectivity and seek biodiversity gain through appropriate landscape planting and habitat creation have been identified.

- 5.1.4 All recommendations are appropriate to the geographical area, the habitats in the wider area, the wildlife present in the local area (and likely to use the sites post-construction) and take into consideration the end use of the sites as a residential development.

5.2 Protection of Existing Vegetation and Recommendations in Relation to Site Layouts

Protection of Trees and Shrubs

- 5.2.1 During the construction phase, temporary protective demarcation fencing will be used to protect the trees and scrub to be retained. The fencing must extend outside the canopy of the retained trees and must remain in position until all areas have been developed to ensure protection is provided throughout the construction phase.
- 5.2.2 The fencing will be in accordance with BS5837:2012 *Trees in Relation to Design, Demolition and Construction: Recommendations* (BSI, 2012).

Protection of River Irwell

- 5.2.3 In the absence of updated guidance, the following Pollution Prevention Guidelines (PPG) will be adhered to at any works near the River Irwell:
- a. PPG1: Basic good environmental practices (Environment Agency, 2013);
 - b. PPG5: Works in, near or over watercourses (Environment Agency, 2014);
 - c. PPG6: Construction and demolition sites (Environment Agency, 2012); and
 - d. PPG7: Operating refuelling sites (Environment Agency, 2011).

5.3 Invasive Plant Species

- 5.3.1 It is an offence under the *Wildlife and Countryside Act 1981* (as amended) to cause the spread of Indian Balsam, Small-leaved Cotoneaster and Giant Hogweed in the wild.
- 5.3.2 It is recommended that a specialist contractor is employed for the eradication of Giant Hogweed and Small-leaved Cotoneaster and the control of Indian Balsam at the sites, and that this is completed under a suitable Invasive Species Management Plan.

5.4 Bats

Lighting

- 5.4.1 Paragraph 180, bullet point 'c' in Chapter 15 (conserving and enhancing the natural environment) of the NPPF states that development should:

'limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.'

Construction Phase

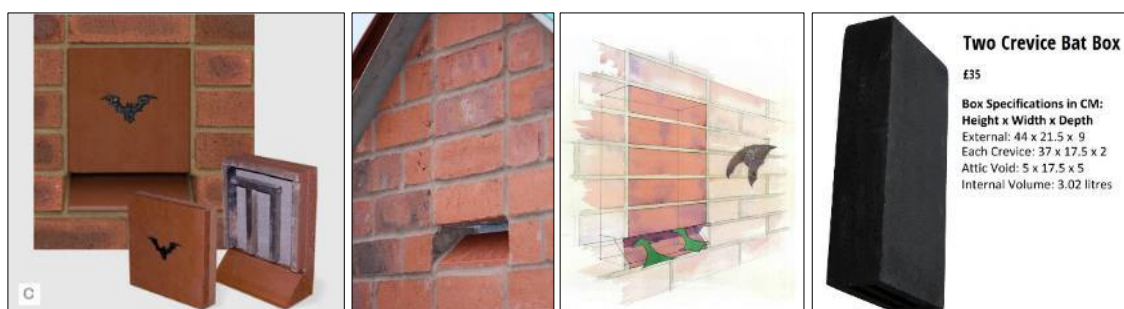
- 5.4.2 Any lighting to be used at the sites during construction should be directional and screened where possible, this specification should be included within a Construction Environment Management Plan (CEMP), or similar.

Development Lighting Design

- 5.4.3 The lighting scheme to be implemented at the developed sites must involve the use of appropriate products and screening, where necessary, to ensure no excessive artificial lighting shines over the River Irwell, areas of ecological enhancement and any landscape planting, as lighting overspill may deter use by wildlife such as foraging bats.
- 5.4.4 The lighting scheme will be designed with reference to current guidance, namely:
- Guidance Note 8: Bats and Artificial Lighting in the UK* (Institution of Lighting Professionals & Bat Conservation Trust, 2018); and
 - Bats and lighting: Overview of current evidence and mitigation guidance* (Stone, 2014).

Enhancing Habitats for Roosting Bats

- 5.4.5 It is recommended that the development incorporates the installation of two bat access panels (per site) at the new buildings³. Where feasible the bat access panels will be installed facing onto the River Irwell.
- 5.4.6 The bat access panels should be sited at least 4 metres above ground level, ideally facing or close to areas of landscape planting or facing onto the River Irwell. The access panels should not be positioned over windows or doorways where bat droppings may become a nuisance. Once the development layout has been finalised, an ecologist should advise on appropriate positions for the bat access panels. Suitable bat access panels are available from NHBS Ecology (www.nhbs.com) or Wild Care (www.wildcare.co.uk) and are presented at **Insert 1**, below:



Insert 1: Examples of integrated bat access panels and an externally mounted box⁴

5.5 Birds

Protection

- 5.5.1 All wild birds are protected under the *Wildlife and Countryside Act 1981* (as amended) while they are breeding. It is advised that any works such as vegetation clearance that will affect habitats suitable for use by nesting birds are scheduled to commence outside the bird nesting season. Commencement of works in the nesting season must be informed by a pre-works nesting bird survey, carried out by a suitably

³ Whilst the sites are not currently suitable for use by roosting bats, evidence shows that common pipistrelle can hibernate within large buildings such as apartment blocks within urban areas (Korsten, et al., 2016). Due to the type of building likely to be developed at the sites, it is considered that bat access panels installed at the upper floors of the proposed buildings may provide suitable features for use by roosting bats (including hibernating common pipistrelle), despite the lack of favourable surrounding foraging and commuting habitats within the wider area.

⁴ Left to right: IBstock Enclosed Bat Box 'c' (left); Habibat Bat Access Panels (centre left and centre right) and Greenwood's Ecohabitat's two crevice bat box (right). Products with a brick face are illustrated, however the Habibat bat access panels can be supplied unfaced to enable the additional of matching material.

experienced ecologist. The bird breeding season typically extends between March to August inclusive (Natural England, 2015).

- 5.5.2 If breeding birds are detected the ecologist will issue guidance in relation to the protection of the nesting birds in conjunction with the scheduled works. This may involve cordoning off an area of the sites until the young birds have fledged.

Enhancing Habitats for Nesting Birds

General and Swift Bird Boxes

- 5.5.3 The installation of two general bird nest boxes and two swift nest boxes (per site) is recommended at the proposed new buildings.
- 5.5.4 The boxes will not be positioned over windows or doorways where droppings may become a nuisance. RSPB advice states that boxes should ideally be sited facing north to east, to avoid exposure to direct sunlight, which may cause overheating of chicks in the nest. Suitable bird nest boxes are available from NHBS Ecology (www.nhbs.com) or Wild Care (www.wildcare.co.uk) and an example is presented at **Insert 2**:



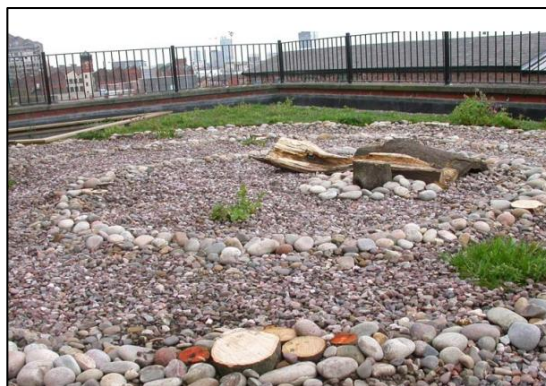
Insert 2: Schwegler 1MR Avianex and swift nest box

Black Redstart

- 5.5.5 If flat roofs are proposed at the new development at the sites, the opportunity to create suitable habitats for use by black redstart (*Phoenicurus ochruros*), a GMBAP Priority Species, should be taken.
- 5.5.6 The species action plan states that '*Records held from 1992 to 2007 show that black redstarts have bred or attempted to breed within the Piccadilly Basin area of central Greater Manchester every year except 2003. The total city population is unknown, but may be as low as 2 to 3 pairs.*' (Greater Manchester Biodiversity Project, 2008).
- 5.5.7 The inclusion of feeding and nesting habitat onto any proposed areas of flat roof at the proposed development will enhance the ecological value of the sites.

Habitat for Feeding Black Redstart

- 5.5.8 To boost the availability of invertebrate food for black redstart it is recommended that a section of the roof is covered with a mixed sized aggregate to a varied depth of between 0.05 and 0.2 metres.
- 5.5.9 The aggregate pieces should range in size from 0.10 to 0.15 metres diameter. The aggregate must cover a minimum area of 30m² to be effective.
- 5.5.10 **Insert 3** shows an example of a more extensive aggregate covered roof as an example. The aggregate will be colonised by small plants and will attract invertebrates for foraging black redstart and their young.



Insert 3: Example of aggregate placed on city roof for the attraction of Black Redstart

Installation of Two Black Redstart Boxes

5.5.11 Two Schwegler 2HW nest boxes will be installed on a north-facing wall within the roofing area. These nest boxes are recommended in the GMBAP for black redstart.

5.5.12 The model of box is shown at **Insert 4**, below.



Insert 4: Suitable bird boxes for black redstart

5.5.13 Suitable boxes can be purchased from www.nhbs.com.

Management and Maintenance

5.5.14 The black redstart nest boxes are to be checked annually in September/October. Old nest material and other debris will be removed and any damaged or fallen boxes to be repaired/reinstated.

5.6 Landscape Planting

5.6.1 It is recommended that the landscape planting within the sites is composed from native species and species known to be of value for the attraction of wildlife.

5.6.2 It is recommended that trees which support blossom and fruit which will attract insects are incorporated into the landscape planting. Suitable species are presented at **Table 5.1**, below.

Table 5.1: Suitable Native Species for Tree and Shrub Planting

Scientific Name	Common Name	Scientific Name	Common Name
<i>Acer campestre</i>	Field Maple	<i>Prunus spinosa</i>	Blackthorn
<i>Corylus avellana</i>	Hazel	<i>Rosa arvensis</i>	Field Rose
<i>Crataegus monogyna</i>	Hawthorn	<i>Rosa canina</i>	Dog-rose
<i>Ilex aquifolium</i>	Holly	<i>Sambucus nigra</i>	Elder
<i>Malus sylvestris</i>	Crab Apple	<i>Sorbus aucuparia</i>	Rowan
<i>Prunus avium</i>	Wild Cherry	<i>Ulmus glabra</i>	Wych Elm
<i>Prunus padus</i>	Bird Cherry	<i>Viburnum opulus</i>	Gelder Rose

- 5.6.3 The understorey and ground cover planting design should be prepared to optimise the attraction of invertebrates such as feeding bumblebees and butterflies. Where possible the use of native species should be maximised but where necessary non-native species known to be attractive to invertebrates should be used.
- 5.6.4 Planting schemes that include flowering species such as *Viburnum*, *Ceanothus*, *Hebe*, *Lavandula*, *Lonicera*, *Potentilla*, *Rosmarinus* and *Vinca* can maximise opportunities for feeding invertebrates and for the attraction of foraging bats and birds.
- 5.6.5 For further plants suitable for the attraction of pollinators please refer to the *Perfect for Pollinators Plant List* (Royal Horticultural Society, 2012). It is recommended that the selection of plant species at the sites ensures that a variety of flowering species are available throughout the year.

6.0 CONCLUSION

- 6.1 This ecological assessment has demonstrated that development at the sites is feasible and acceptable in accordance with ecological considerations and the National Planning Policy Framework.
- 6.1.2 It is possible to implement reasonable actions for the protection and long-term conservation of fauna such as commuting/foraging bats and birds associated with the habitats surrounding the sites.
- 6.1.3 Development at the sites will provide an opportunity to secure ecological enhancement for fauna typically associated with urban areas such as breeding birds and roosting bats.

7.0 REFERENCES

- Andrews, H (ed), 2013. *Bat Tree Habitat Key, 3rd Edition*. Bridgewater: AEcol Ltd.
- Bainbridge, I. et al., 2013. *Guidelines for the Selection of Biological SSSIs*. Peterborough: Joint Nature Conservancy Council.
- BSI, 2012. *Trees in relation to design, demolition and construction. Recommendations*. London: BSI Standards Limited.
- BTHK, 2018. *Bat Roosts in Trees - A Guide to Identification and Assessment for Tree-Care and Ecology Professionals*, Exeter: Pelagic Publishing.
- Chanin, P., 2003. *Ecology of the European Otter. Conserving Natura 2000 Rivers, Ecology Series 10*. Peterborough: English Nature.
- Chanin, P., 2003. *Monitoring the Otter Lutra lutra. Conserving Natura 2000 Rivers Monitoring Series No 10*, Peterborough: English Nature.
- CIEEM, 2013. *Technical Guidance Series Competencies for Species: Bats*. Winchester: Chartered Institute of Ecology and Environmental Management.
- CIEEM, 2018. *Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*, Winchester: Chartered Institute of Ecology and Environmental Management.
- Collins, J. (ed), 2016. *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*. London: The Bat Conservation Trust.
- Dean, M., Strachan, R., Gow, D. & Andrews, R., 2016. *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series) Eds. Fiona Mathews and Paul Chanin*, London: The Mammal Society.
- Edwards, J., Knight, M. & Crosher, I. E., 2020. *National Habitat Network Maps V2*, Peterborough: Natural England.
- Environment Agency, 2011. *Operating Refuelling Sites, PPG7: Prevent Pollution*. [Online]
Available at: <https://www.gov.uk/government/publications/operating-refuelling-sites-ppg7-prevent-pollution>
- Environment Agency, 2012. *Construction and Demolition Sites, PPG6: Prevent Pollution*. [Online]
Available at: <https://www.gov.uk/government/publications/construction-and-demolition-sites-ppg6-prevent-pollution>
- Environment Agency, 2013. *Basic Good Environmental Practices, PPG1: Prevent Pollution*. [Online]
Available at: <https://www.gov.uk/government/publications/basic-good-environmental-practices-ppg1-prevent-pollution>
- Environment Agency, 2014. *Works in, near or over watercourses, PPG5: Prevent Pollution*. [Online]
Available at: <https://www.gov.uk/government/publications/works-in-near-or-over-watercourses-ppg5-prevent-pollution>
- Environment Agency, 2018. *Main River Map*. [Online]
Available at: <https://www.arcgis.com/apps/webappviewer/index.html?id=17cd53dfc524433980cc333726a56386>
[Accessed 03 March 2021].
- Great Britain, 1981. *Wildlife and Countryside Act*. London: H.M.S.O.
- Great Britain, 2006. *Natural Environment and Rural Communities Act*. London: H.M.S.O.
- Great Britain, 2017. *The Conservation of Habitats and Species Regulations*. London: H.M.S.O.
- Greater Manchester Biodiversity Project, 2008. *Make Room for Black Redstarts: A Species Action Plan for Greater Manchester*, Manchester: Greater Manchester Biodiversity Project.
- Institution of Lighting Professionals & Bat Conservation Trust, 2018. *Guidance Note 8: Bats and Artificial Lighting in the UK*. [Online]
Available at: <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>
[Accessed 04 March 2021].
- JNCC, 2010. *Handbook for Phase 1 Habitat Survey: A technique for Environmental Audit*. Peterborough: NCC.
- Korsten, E. et al., 2016. Swarm and switch: on the trail of the hibernating common pipistrelle. *Bat News*, No. 110 (Summer 2016), pp. 80-10.
- Maddock, A (ed), 2008. *UK Biodiversity Action Plan: Priority Habitat Descriptions*. [Online]
Available at: <http://jncc.defra.gov.uk/page-5718>
- Marchant, J., 1983. *Common Birds Census Instructions*. Tring: BTO.

Ministry of Housing, Communities & Local Government, 2005. *Circular 06/05: Biodiversity and Geological Conservation - Statutory Obligations and Their Impact Within The Planning System*, London: Office of the Deputy Prime Minister.

Ministry of Housing, Communities and Local Government, 2019. *National Planning Policy Framework*. London: H.M.S.O.

Mitchell-Jones, A., 2004. *Bat Mitigation Guidelines*. Peterborough: English Nature.

Mitchell-Jones, A. J. & Mcleish, A. P., 2004. *Bat Workers' Manual, 3rd Edition*. Peterborough: Joint Nature Conservation Committee.

Natural England, 2007. *Badgers and Development*, Peterborough: Natural England.

Natural England, 2014. *Otters: surveys and mitigation for development projects*. [Online]
Available at: <https://www.gov.uk/guidance/otters-protection-surveys-and-licences>
[Accessed 03 March 2021].

Natural England, 2015. *Badgers: Surveys and mitigation for development projects*. [Online]
Available at: <https://www.gov.uk/guidance/badgers-surveys-and-mitigation-for-development-projects>
[Accessed 3 March 2021].

Natural England, 2015. *Wild birds: surveys and mitigation for development projects*. [Online]
Available at: <https://www.gov.uk/guidance/wild-birds-surveys-and-mitigation-for-development-projects>
[Accessed 04 March 2021].

Ordnance Survey, 2021. *Site Check Report Centroid Grid Ref: SJ82769780*. [Online]
Available at: <http://magic.defra.gov.uk/magicmap.aspx>
[Accessed 26 April 2021].

Ratcliffe, D. A., 1977. *A Nature Conservation Review*. Cambridge: Cambridge University Press.

Roper, T., 2010. *Badger (Collins New Naturalist Library, Book 114)*. Glasgow: Harper Collins.

Royal Horticultural Society, 2012. *Perfect for Pollinators, Garden Plants*. [Online]
Available at: <https://www.rhs.org.uk/science/conservation-biodiversity/wildlife/encourage-wildlife-to-your-garden/plants-for-pollinators>

Stace, C. A., 2010. *New Flora of the British Isles 3rd Edition*. Cambridge: Cambridge University Press.

Stone, E. L., 2014. *Bats and Lighting: Overview of current evidence and mitigation guidance*. Bristol: University of Bristol.

Strachan, R., Moorhouse, T. & Gelling, M., 2011. *Water Vole Conservation Handbook 3rd Edition*. Oxford: The Wildlife Conservation Research Unit.

8.0 APPENDIX: TABLES AND FIGURES

8.1 Plant Species Lists and Photographs

Table 8.1: Plant Species List for Site C

Scientific Name	Common Name	DAFOR ¹	Cover
	Ornamental species	VLF	<1%
<i>Achillea millefolium</i>	Yarrow	VLF	<1%
<i>Artemisia vulgaris</i>	Mugwort	VLF	<1%
<i>Buddleja davidii</i>	Butterfly-bush	LA	10%
<i>Cardamine flexuosa</i>	Wavy Bitter-cress	VLF	<1%
<i>Cerastium fontanum</i>	Common Mouse-ear	VLF	<1%
<i>Conyza canadensis</i>	Canadian Fleabane	VLF	<1%
<i>Cornus sanguinea</i>	Dogwood	VLF/VLA	3%
<i>Cotoneaster microphyllus</i>	Small-leaved Cotoneaster	VLF	<1%
<i>Dactylis glomerata</i>	Cock's-foot	VLF	<1%
<i>Euphorbia peplus</i>	Petty Spurge	VLF	<1%
<i>Festuca rubra</i>	Red Fescue	VLF	<1%
<i>Heracleum mantegazzianum</i>	Giant Hogweed	VLF	2%
<i>Hypericum perforatum</i>	Perforate St John's-wort	VLF	<1%
<i>Reseda luteola</i>	Weld	VLF	<1%
<i>Rumex obtusifolius</i>	Broad-leaved Dock	R	<1%
<i>Salix fragilis</i>	Crack-willow	VLF	<1%
<i>Sedum</i> sp.	Stonecrop species	VLF	<1%
<i>Senecio vulgaris</i>	Groundsel	VLF	<1%
<i>Sisymbrium officinale</i>	Hedge Mustard	VLF	<1%
<i>Tanacetum parthenium</i>	Feverfew	VLF	<1%
<i>Taraxacum officinale</i> agg.	Dandelion	VLF	<1%
<i>Urtica dioica</i>	Common Nettle	VLA	5%
¹ Key to DAFOR: D=Dominant, A=Abundant, F=Frequent, O=Occasional, R=Rare, V=Very, L=Local and *denotes a constant species			

Table 8.2: Plant Species List for Site D

Scientific Name	Common Name	DAFOR ¹	Cover
<i>Acer pseudoplatanus</i>	Sycamore	VLF	<1%
<i>Arrhenatherum elatius</i>	False Oat-grass	VLF	<1%
<i>Agrostis stolonifera</i>	Creeping Bent	VLF	<1%
<i>Artemisia vulgaris</i>	Mugwort	VLF	<1%
<i>Bergenia crassifolia</i>	Elephant-ears	VLF	<1%
<i>Buddleja davidii</i>	Butterfly-bush	VLF	<1%
<i>Cerastium fontanum</i>	Common Mouse-ear	VLF	<1%
<i>Chamerion angustifolium</i>	Rosebay Willowherb	VLF	<1%
<i>Cirsium arvense</i>	Creeping Thistle	VLF	<1%
<i>Cotoneaster microphyllus</i>	Small-leaved Cotoneaster	VLF	<1%
<i>Epilobium montanum</i>	Broad-leaved Willowherb	VLF	<1%
<i>Fraxinus excelsior</i>	Ash	VLF	<1%
<i>Geranium mole</i>	Dove's-foot Crane's-bill	VLF	<1%
<i>Geranium robertianum</i>	Herb-Robert	VLF	<1%
<i>Hedera helix</i>	Ivy	VLA	2%
<i>Holcus lanatus</i>	Yorkshire-fog	VLF	5%
<i>Lolium perenne</i>	Perennial Rye-grass	VLF	<1%
<i>Medicago lupulina</i>	Black Medick	VLF	<1%
<i>Narcissus pseudonarcissus</i>	Daffodil	VLF	<1%
<i>Plantago lanceolata</i>	Ribwort Plantain	VLF	<1%
<i>Prunus</i> sp.	Cherry species	VLF	<1%
<i>Pteridium aquilinum</i>	Bracken	VLF	<1%
<i>Reseda luteola</i>	Weld	VLF	<1%
<i>Rubus fruticosus</i> agg.	Bramble	VLF	5%
<i>Rumex obtusifolius</i>	Broad-leaved Dock	VLF	<1%
<i>Senecio jacobaea</i>	Common Ragwort	O/VLF	5%
<i>Senecio squalidus</i>	Oxford Ragwort	VLF	<1%
<i>Senecio vulgaris</i>	Groundsel	VLF	<1%
<i>Sorbus aucuparia</i>	Rowan	VLF	<1%
<i>Taraxacum officinale</i> agg.	Dandelion	VLF	<1%
<i>Trifolium repens</i>	White Clover	VLF	<1%
<i>Urtica dioica</i>	Common Nettle	O/VLF	5%

¹**Key to DAFOR:** D=Dominant, A=Abundant, F=Frequent, O=Occasional, R=Rare, V=Very, L=Local and *denotes a constant species

Table 8.3: Table of Photographs

	
Photo 1: Car park at Site C	Photo 2: Boundary vegetation at Site C
	
Photo 3: Car park at Site D	Photo 4: Boundary vegetation at Site D
	
Photo 5: Trees at south-western area of Site D	Photo 6: River Irwell (taken 2016)



Photo 7: Underpass

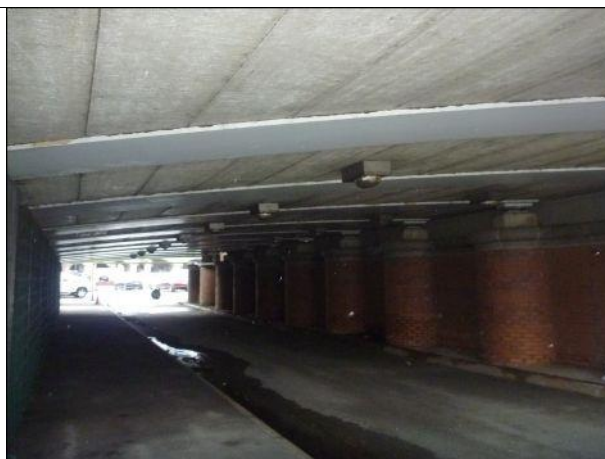


Photo 8: Underpass



Photo 9: Underside of pedestrian footbridge

8.2 Figures

Figure 1: Aerial Image of the Site and its Surrounding Habitats

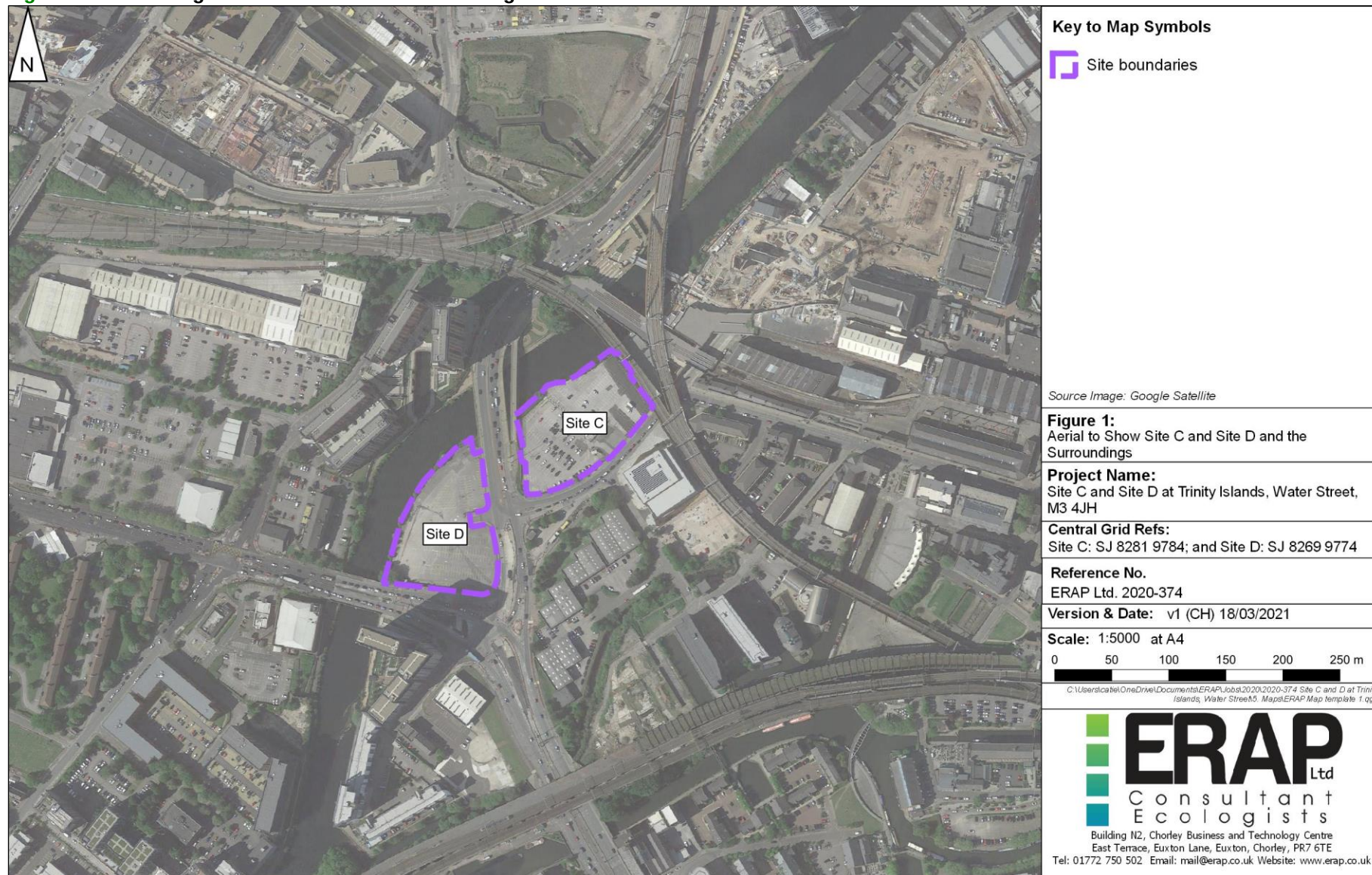


Figure 2: Phase 1 Habitat and Vegetation Map

