11. Ecology and Nature Conservation

11.1 Introduction

11.1.1 This Chapter, which has been prepared by Waterman, considers the potential ecology and nature conservation impacts arising from the Scheme with Phase 1A (North) in place (hereafter referred to as the 'Development'). This Chapter is provided pursuant to the s.73 ES and sets out where the previous assessment remains valid and where detailed design information allows the significance of environmental impacts already identified to be refined. Work undertaken to discharge the relevant Planning Conditions of the 2014 Permission is also addressed in this Chapter.

11.1.2 A brief summary of any significant changes to relevant policy, legislation and guidance published since preparation of the s.73 ES is provided. A review has been undertaken of the detailed design, as defined in **Chapter 2**, to identify elements of the Phase 1A (North) detailed design of relevance to the ecological assessment, and a summary of this is provided.

11.1.3 The approach to the assessment methodology is set out, and a summary of recent consultation is provided. A review of the baseline information presented in the s.73 ES has been undertaken to confirm where this remains valid and updated data are presented where relevant, including a Phase 1 Habitat survey and bat survey undertaken in 2014. Any new or different potential ecology and nature conservation impacts arising from the Development from those identified in the s.73 ES are described. Likewise, any new or different mitigation measures from those identified in the s.73 ES are presented where considered necessary, and residual impacts following the application of mitigation are described.

11.1.4 This Chapter is supported by **Appendix 11.1: Updated Ecological Appraisal (Phase 1 Habitat Survey)**, **Appendix 11.2: Bat Survey Report for Phase 1A (North)** and **Appendix 11.3**: **Record of Consultation** and **Figures 11.1 to 11.8**.

11.2 Policy, Legislation and Guidance

11.2.1 There have been no significant changes to policy, legislation or guidance since the s.73 ES was prepared which have a material effect on the approach to or findings of the assessment. A review of relevant material published or amended since October 2013 is set out below for reference.

- **Revised Early Minor Alterations (REMA) to the London Plan**[i], (October 2013) amended Paragraph 7.60 supporting Policy 7.19 to take into account specific regional Biodiversity Action Plan (BAP) habitat targets for priority habitats by 2020. The restoration work proposed for the River Brent to create Brent Riverside Park contributes to the 'River and Streams' and 'Reed bed' target priority habitats in Table 7.3 of the REMA.
- On 15 January 2014, the Mayor published **Draft Further Alterations to the London Plan**[ii] **(FALP)** for consultation. The Draft FALP makes made changes to policy 2.18 to clarify the contribution that green infrastructure can make for biodiversity.
- The Mayor of London's **Sustainable Design and Construction Supplementary Planning Guidance**[iii] was published in April 2014 and relates to specific London Plan policies (5.3 and 7.19) on retaining and enhancing biodiversity in section 2.8 Nature Conservation and Biodiversity.

11.3 Relevant Phase 1A (North) RMA Details

Infrastructure

11.3.1 The Phase 1A (North) Infrastructure RMA have been reviewed to identify those elements of relevance to the assessment which include:

- **Primary and secondary routes:** detailed layout of new roads and junctions which were previously assessed in outline. Landscaping plans have been produced for marginal land adjacent to the proposed highways infrastructure including attenuation areas and landscaping to provide ground stabilisation, aesthetic and ecological value as illustrated in **Figure 11.2**;
- **Engineering works:** details of the alteration and diversion of the River Brent (also see Open Spaces section below); and
- **Bridge structures**: the replacement Templehof Bridge (A406) (B1), new River Brent bridges, Living Bridge (B7) and a new pedestrian and cycle bridge at the M1 junction (B6). The details of each bridge structure are known therefore the associated impacts in terms of habitat loss and shading have been reviewed. The Living Bridge includes landscape planting although is not intended as a key part of the Development's overall biodiversity strategy. It does however make provision for biodiversity benefit along the route and seeks to provide a link between the habitats to the north and south; Brent Riverside Park and Claremont Park and Clitterhouse Playing Fields SLINC. Groups of evergreen and deciduous tree planting along the bridge as well as a hedges and strong tree lined avenues on the Southern Approach to the Living Bridge all contribute to the tree cover in the area. In addition, continuous bands of native and wildlife-friendly species are proposed along the bridge which aim to provide habitat and overwintering resources for birds and invertebrates (**Figure 11.3**).

Temporary Landscaping

11.3.2 Detailed design for temporary landscaping is being developed as part of the construction programming and phasing of the Development to ameliorate impacts from construction dust and to mitigate the removal of habitat for invertebrates and foraging bird species during construction. The detailed design plans for temporary landscaping will be provided under Condition 1.8 for submission and discharge by LBB prior to commencement of construction works and is therefore not considered in this Chapter.

Open Space

11.3.3 The public open spaces included in Phase 1A (North) RMA are listed below. These have been previously assessed in the s.73 ES in outline, however detailed design and biodiversity strategies are now available which require allow consideration particularly in respect to ecological impacts and enhancements:

- **Claremont Park** – the landscape planting seeks to build upon and reinforce the existing native, and partially wooded character of the existing open space area. Native species will be used predominantly, with clear stem trees planted in wildflower areas, and shaded grass areas. In quieter areas, log piles will be left to encourage wildlife and bird boxes installed to larger existing trees to be retained. New attractive diverse wildflower areas will provide foraging habitat for birds, bats and invertebrates such as bees and butterflies (**Figure 2.15**).

- **Clitterhouse Playing Fields Improvements Part 1** – The biodiversity strategy (**Figure 11.4**) detailed in the Design Development Report which accompanies the Phase 1A (North) RMAs details that existing trees will be retained along the eastern and southern boundaries, unless removal is advised for arboricultural reasons and predominantly native tree species are proposed to reinforce tree planting to tree edges. Fruit and flower bearing trees will provide a valuable food resource for bees and other wildlife.. Attractive diverse wildflower areas adjacent to the edge of the tree and scrub belt and the Clitterhouse stream along the eastern edge will provide foraging habitat for birds, bats and invertebrates such as bees and butterflies. Bird and bat boxes will be mounted onto existing trees and buildings to provide habitats for London Biodiversity Action Plan Priority Species such as house sparrow and common pipistrelle. Small log piles will be sited in less disturbed areas to provide habitat for invertebrates within the existing tree line using any dead wood from tree removal and ongoing maintenance. The detailed proposals for Clitterhouse Farm include the retention and re-use of this building which was previously assumed to be removed in the s.73 ES.
- **Central Brent Riverside Park** – this nature park would be created around the new alignment of the River Brent and includes 'River Brent Nature Park 5' beneath the 'Western Roundabout'. The biodiversity strategy aims to achieve a significant re-naturalisation of the river channel, with geomorphology recreating natural flows, riparian planting providing habitat for local flora and fauna and the creation of a new nature park. Native marginal and channel planting alongside riparian corridor planting will create habitat for foraging invertebrates, birds and bats (**Figure 11.5**). Ecological enhancement measures which have been incorporated into the detailed design of the Central Brent Riverside Park include bat boxes positioned under River Bridges 3 and 6, bird boxes positioned on River Bridges 2, 3, 4, 5 and 6 and log piles for invertebrates will be provided along the river bank within Nature Park 5 and along the southern bank at internals.

Plots 53 and 54

11.3.4 The planting and biodiversity strategy in Plots 53 and 54 has been developed to maximise the opportunity for habitat creation and species diversity with a focus on native species. A number of native semi-mature trees are proposed with associated woodland under storey planting along the eastern boundary. Creating a good structure of trees alongside the remaining areas of existing trees and hedgerow will provide habitat for foraging birds, bats and invertebrates (**Figure 11.6**). In addition, bat and bird boxes will be mounted on the existing trees and buildings.

11.3.5 There are no significant differences in the proposals from that considered in the s.73 ES for the habitat types and uses of the Phase 1A (North) open / public spaces.

11.3.6 Landscape and Ecological Management Plans (LEMP) are being prepared in line with condition 27.9 to ensure the protection, establishment and enhancement of ecological features for each of the open / public spaces proposed in Phase 1A (North).

11.3.7 Tree Loss and Retention Plans have been confirmed for Phase 1A (North), guided by an updated tree conditions survey and the detailed design element (**Appendix 2.1**).

11.4 Assessment Methodology

11.4.1 Waterman has carried out a review of the existing ecological baseline presented in the s.73 ES and RES 2009 and has undertaken an updated Extended Phase 1 Habitat Survey for the Site in Summer 2014 (included at **Appendix 11.1**). This Habitat Survey was completed to inform the detailed design and validate the findings of the original 2006 Extended Phase 1 Habitat Survey (Thomson Ecology), the results of which were subsequently validated via updated bat and walkover surveys with an updated desk study undertaken by Ecology Consultancy (2011) and ERM (2013)) respectively. The data search of ecological records presented in the s.73 ES was also updated by Waterman in 2014 the approach to which is presented in **Appendix 11.1.**

11.4.2 The survey was undertaken in line with the Joint Nature Conservancy Council (JNCC, 2010[iv]) standard 'Phase 1' survey technique, which assessed and recorded the habitats present, the presence of /or potential for protected species. The Report also compares the current ecological baseline with that presented within the s.73 ES.

11.4.3 In accordance with the s.73 ES Ecology and Nature Conservation Chapter, the study area for ecological surveys is defined by the planning application boundary as shown in **Figure 1.2,** whilst the assessment includes sites of ecological value within a site radius of 2km.

11.4.4 All buildings and trees on the Site were assessed during the updated Extended Phase 1 Habitat Survey for their potential to support roosting bat species, therefore updating the 2006 survey for bat roost potential assessment. Those trees and buildings that may be demolished / affected by the Phase 1A (North) RMAs demolition and construction phase, were re-assessed for the presence of roosting bats. Any trees with bat roost potential were subject to further inspection comprising climbing surveys by ecologists with bat licences and following this, any structures (trees and buildings) with remaining bat roost potential were subject to appropriate dawn and dusk surveys during the activity season (May - September). **Appendix 11.2** presents the detailed methodology and findings of the bat survey**.**

11.4.5 No further protected species surveys for other species were considered necessary to be updated from those presented in the s.73 ES. **Table 11.1** summarises the ecology survey work undertaken on the Site to date as part of the EIA. Further details of these surveys can be found in the s.73 ES, unless otherwise stated. This summary also includes work undertaken by Waterman in 2014, which was not included in the s.73 ES.

11.4.6 A number of surveys in **Table 11.1** (otter, water vole, river corridor survey, reptile and terrestrial macro-invertebrates) were considered to remain valid from the s.73 ES and were therefore not updated based on the review of all previous survey data for the Site and the findings of the Extended Phase 1 Habitat Survey 2014. The scope of the ecological surveys was agreed through consultation with LBB and their advisors, Capita.

Table 11.1: Ecology Surveys Summary

Survey Type	Date of Survey	Author
Extended Phase 1 habitat survey	2006 2013 2014	Thomson Ecology (TE) Environmental Resources Management (ERM) Waterman EED (WEED) (findings presented in **Appendix 11.1**)
Desk Study	2006	TE
Great crested newts (HSI and presence / absence)	2000 2001 2006 2014	ERM ERM TE WEED (findings presented in **Appendix 11.1**)
Badgers	2006 2014	TE WEED (findings presented in **Appendix 11.1**)
Bats (ground based inspections and activity surveys)	2006 2011 2014	TE The Ecology Consultancy (TEC) WEED (findings presented in **Appendix 11.2**)
Breeding birds	2006	TE
Reptiles	2006	TE
Terrestrial macro-invertebrates	2006	TE
Aquatic macro-invertebrate survey of Clitterhouse Brook	2014	Ahern Ecology (AE)[v] (included in Appendix B of **Appendix 11.1**)
River Corridor Survey	2006	TE
Otter	2006	TE
Water vole	2006	TE

11.4.7 The full ecological assessment methodology is included in **Appendix 11.1**.

11.4.8 A review has been undertaken of detailed design and landscaping proposals relating to the Phase 1A (North) RMAs as well as other relevant reports available since the s.73 ES was prepared. These include:

- Detailed landscape drawings and Design Development Reports for all areas which form part of the Phase 1A (North) RMAs;
- Temporary Bus Station and Bus Stops detail and drawings;
- Tree Survey and Constraints Plan (2014);
- Tree retention drawings for all areas which form part of the Phase 1A (North) RMAs;

- Aquatic macro-invertebrate survey of Clitterhouse Brook (Ahern Ecology, 2014);
- Fish and aquatic invertebrate record data, obtained from the Environment Agency in 2014;
- Survey of Schedule 9 Listed Invasive Species (Elliot Environmental, July 2014);
- River Brent Shading Study (**Appendix 17B.2**);
- Landscape and Ecological Management Plans for open / public spaces which form part of the Phase 1A (North) RMAs**.**

11.4.9 The above details have been reviewed to identify whether the further baseline information is relevant to the assessment and to determine whether the impacts reported in the s.73 ES remain valid or whether impacts are likely to arise which were not identified (or identifiable) at the outline stage.

11.4.10 The significance criteria for the habitat and species evaluations used in this Chapter are the same as those used in the s.73 ES and are based on published guidance from the Institute of Ecology and Environmental Management[vi] (CIEEM, now Chartered). These criteria are detailed in paragraphs 11.4.11 and 11.4.12 below.

11.4.11 The value of specific ecological receptors is assigned using a geographic frame of reference, i.e. international value being most important, then national, regional, county (metropolitan), district, local and lastly, within the boundary of the Site only. A negligible value is assigned where the habitat offers no value to wildlife.

11.4.12 Value judgments are based on various characteristics that can be used to identify ecological resources or features likely to be important in terms of biodiversity. These include site designations (such as SSSIs), or for undesignated features, the size, conservation status (locally, nationally or internationally), and the quality of the ecological resource. In terms of the latter, 'quality' can refer to habitats (for instance if they are particularly diverse, or a good example of a specific habitat type), other features (such as wildlife corridors or mosaics of habitats) or species populations or assemblages.

Limitations and Constraints

11.4.13 There were limitations to full visual access during the Phase 1 Habitat Survey to the external facades of all the buildings and trees on the Site, as it was not always possible to see areas due to vantage points either being too low at ground level or off-Site. Sufficient access was however available to make an accurate professional judgment on the level of bat roost potential of buildings and trees.

11.4.14 Access was not available to the entire Site due to health and safety issues, including land associated with trackside working on active Network Rail land. Where possible this land was viewed and assessed from adjacent habitats. Overall, it is considered that the habitats within Phase 1A (North) were adequately accessed and assessed for the purpose of this assessment.

11.5 Consultation

11.5.1 In its comments on the draft EIA Scoping Report, LBB commented that the proposed retention of Clitterhouse Farm Buildings is a positive impact as existing bat roosts will be retained. A review

of the detailed design with regard to this amendment to the 2014 Permission is provided within this Chapter.

11.5.2 In addition, the River Brent Shading Study, Tree Retention and Loss Plans, Survey of Schedule 9 listed invasive species and landscaping proposals of the Phase 1A (North) elements have been reviewed and are addressed within this Chapter.

11.5.3 An Ecology Briefing Note was provided to LBB and subsequently agreed on 10th July 2014 to confirm the findings of the baseline data review and to agree the scope of further ecological survey work in relation to the Phase 1A (North) RMAs. Relevant correspondence is included at Appendix C of **Appendix 11.1**.

11.5.4 During the detailed design process for the landscape and ecological enhancement proposals, Natural England (NE) and the London Wildlife Trust (LWT) were both consulted, see **Appendix 11.3**. A meeting was held at Waterman's London office with both NE and the LWT where the details of the Phase 1A (North) RMAs and associated landscape and ecological measures were described. Both NE and LWT were broadly in agreement with the ecological enhancement measures proposed, however measures to ensure the establishment of the proposed habitats and to mitigate for the potential for these areas to suffer high recreational pressure was requested to be included. This issue is addressed further by the LEMPs, which are required by Planning Condition 27.9 of the 2014 Permission.

11.5.5 Various comments were made in the final EIA scoping opinion on ecology and a response to each of these is provided in **Table 4.1**. The comments raised are addressed in this Chapter, as appropriate. It should be noted that aquatic ecology surveys were not undertaken as part of the scope of works.

11.6 Baseline Conditions

11.6.1 The baseline information presented in the s.73 ES Ecology and Nature Conservation Chapter has been reviewed and its validity is largely confirmed. Commentary on the newly available data from 2014 surveys and data searches is provided below.

11.6.2 The 2014 desk study provided no records for the Site, however a number of protected and / or notable species were recorded within 2km of a central point within the Site, including a number of bat and bird species, such as common pipistrelle Pipistrellus pipistrellus. A number of invasive species were also recorded within 2km of a central point within the Site, such as giant hogweed Heracleum mantegazzianum and Japanese knotweed Fallopia japonica.An 'aquatic ecology' desk study was undertaken including obtaining protected and notable species records information being obtained from the Environment Agency for fish and aquatic invertebrate data recorded data from 2005 - 2013 for various sample points along the River Brent (ranging from 3km – 18km from the Site boundary). The data recorded no aquatic invertebrates that were above Least Concern on the IUCN Red List of Threatened Speciesvii or were Natural Environment Research Council (NERC) Section 41 Species of Principal Importance (SoPI) or London Biodiversity Action Plan (BAP). As such, it was not deemed necessary to conduct an aquatic ecology survey in this area of the River Brent due to its low ecological value.

11.6.3 Only one SoPI was recorded on two occasions in 2010 (10km and 15km downstream from the 2014 Permission boundary); European eel *Anguilla anguilla*. The distance from Site, low number

of records and proximity of the record locations close to the Thames (as opposed to close to the Site), means that the habitat on the Site is not considered to be suitable for this species and therefore European eels are not considered further in this Chapter.

11.6.4 The Extended Phase 1 habitat survey recorded that there were no significant differences from the habitats recorded in the s.73 ES as summarised in **Table 11.2** below. The two main differences were:

- Plantation coniferous woodland was recorded in the Mapledown School grounds in the updated Extended Phase 1 Habitat Survey in 2014, it is a small area of semi-mature coniferous trees with value within the boundary of the Site.
- The scattered introduced shrub on the Site has increased in cover since the s.73 ES and therefore now provides a value to invertebrates, which gives it a value within the Site boundary.

11.6.5 **Table 11.2** summarises the importance of ecological receptors, as reported in the s.73 ES, and any changes, as identified through the updated desk-based data search and Extended Phase 1 Habitat Survey of the Site. Receptors considered to be of negligible value in the s.73 ES and Phase 1A (North) assessment are not presented in **Table 11.2**. **Figure 11.1** presents the Phase 1 Habitat Survey findings.

Table 11.2: Summary of Ecological Receptors Assessment Values

Ecological Receptor	Geographical Scale of Importance: 2013 S.73 ES	Geographical Scale of Importance: Ecological Appraisal 2014	Reason for change (if any)
Clarefield Park SLINC	Local	Local	N/A
Clitterhouse Playing Fields SLINC	Local	Local	N/A
Buildings	Within the Site Boundary	Within the Site Boundary	N/A
Scattered Broadleaved trees	Local	Local	N/A
Plantation broadleaved woodland	Local	Local	N/A
Plantation coniferous woodland	n/a	Within Site Boundary Only	Not previously recorded on Site
Running Water / Rivers and Streams	Within Site Boundary Only	Within Site Boundary Only	N/A
Standing Water / Ponds	Local	Local	N/A
Amenity grassland	Local	Local	N/A
Semi-improved grassland	Local	Local	N/A
Dense scrub	Local	Local	N/A
Scattered Scrub	Local	Local	N/A
Tall ruderal	Local	Local	N/A

Ecological Receptor	Geographical Scale of Importance: 2013 S.73 ES	Geographical Scale of Importance: Ecological Appraisal 2014	Reason for change (if any)
Ephemeral / short perennial vegetation	Local	Local	N/A
Introduced shrub	Local	Local	N/A
Scattered introduced shrub	Negligible	Within Site Boundary Only	More widespread now - good invertebrate foraging habitat
Bats	Local	Local	N/A
Birds	Local	Local	N/A
Amphibians	Local	Local	N/A

11.6.6 The Bat Survey Report (**Appendix 11.2**) detailed the results of bat survey work on the Site and within Phase 1A (North) which recorded a roost of common pipistrelle bats in the Clitterhouse Farm building (B4 on Figure 1 **Appendix 11.2**) and a number of trees with bat roost potential (Phase 1A (North) and in the Site), see **Figure 11.7**.

11.6.7 The Survey of Schedule 9 Listed Invasive Species[viii] provides a detailed survey of invasive weed species under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), which contains measures for preventing the establishment of non-native species which may be detrimental to native wildlife. The survey was required by a Planning Condition attached to the 2014 Permission and found of areas of Japanese knotweed *Fallopia japonica* across the Site, with a number of stands along the existing River Brent channel and within Clitterhouse Playing Fields close to Clitterhouse Farm.

11.7 Assessment and Mitigation

11.7.1 This Section considers the potential impacts of the Development with the Phase 1A (North) proposals in place, in light of the detailed design information.

Construction

Potential Impacts

11.7.2 *Effects on Designated Sites* - The nature of construction of the River Brent alteration works and other works have not altered since that presented in the s.73 ES and therefore the assessment remains valid, i.e. no significant effects are expected. Generic mitigation measures in line with Environment Agency best practice Pollution Prevention Guidelines (PPGs) are included in the draft Code of Construction Practice (CoCP) which accompanied the s.73 ES and will be updated following detailed design with further mitigation measures, if required and Construction Environmental Management Plans (CEMP) produced in line with pre-commencement conditions.

11.7.3 The operation of the temporary bus station and bus stops at Plot 114 and Plot 113 respectively, was not assessed previously in the s.73 ES in respect of potential impacts on the Brent Reservoir

SSSI. Given the nature of the operations which would be similar to the current use of a car park the potential impacts on the SSSI would be **negligible**.

11.7.4 *Direct Mortality and Injury of Protected Species* - The Clitterhouse Farm Buildings within Clitterhouse Playing Fields are known to support a bat roost, as discussed in **Appendix 11.2**. The s.73 ES (para 11.6.5) identified that demolition of the Clitterhouse Farm Buildings could lead to the direct mortality or injury of bats, should they be using the building at the time of the demolition works. All demolition works to the Farm Buildings were therefore to be undertaken in accordance with a Natural England Licence. The loss of the bat roost was identified as a 'local adverse impact' in Table 22.2 of the s.73 ES. Further development of the design for the Clitterhouse Playing Fields means that Clitterhouse Farm buildings would be now retained and used for storage/community uses, therefore differing from the former proposals to remove the farm buildings. However the works to the roof as part of the refurbishment would still see a temporary loss of this bat roost and it is therefore considered that the temporary impact on the roost of the refurbishment works would remain minor adverse.

11.7.5 The Tree Retention and Loss Plans were reviewed for each component of the Phase 1A (North) RMAs (presented in **Appendix 2.1** alongside the structures survey for bat roost potential to ascertain which bat roost potential tree may be impacted by Phase 1A (North). Trees that were to be impacted with bat roost potential then underwent further survey by Waterman in 2014 (as detailed in **Appendix 11.2**). Subsequently a small number of trees have been identified for felling under the supervision of a bat licensed ecologist (further survey) using precautionary sensitive felling techniques (as detailed in **Appendix 11.2).** The Bat Survey Report (**Appendix 11.2**) also made recommendations for further survey and mitigation / ecological enhancement measures, where appropriate.

11.7.6 In the relation to the Temporary Bus Stops at Plot 113, the proposed works would see the removal of the s small number of semi-mature trees and introduced shrub. Any clearance of trees /shrubs would be undertaken outside the breeding bird season (that is September to February) to ensure that national and local planning policy and legislation is adhered to in relation to these species. The potential impact on birds from any loss of the vegetation is not therefore considered to be significant.

11.7.7 *Disturbance* - Following a review of the detailed design and updated baseline information, disturbance effects are considered to remain valid.

11.7.8 In relation to the Temporary Bus Station at Plot 114 construction works and operation may cause light spill onto adjacent habitats, in particular the mature pollarded trees along the northern boundary and the river corridor beyond. The dense scrub fringing the southern boundary of the Temporary Bus Station site is already heavily lit. Light spill from the facility would be controlled through the CEMP during construction and detailed lighting design (to be submitted under planning condition) to ensure that as far as possible light levels do not exceed what is currently present, so that any commuting and foraging bats using the river corridor would not suffer increased disturbance.

11.7.9 *Habitat Loss* - The s.73 ES identified a negative impacts of up to local significance associated with habitat damage and loss outside the river corridor in the short term. The impacts from disruption to habitat along the existing River Brent corridor were identified as negligible. These impacts remains valid taking into account the detailed Phase 1A (North) proposals. The tree

retention and loss plans show that the majority of mature trees will be retained on the Site and that trees to be lost are predominantly poor condition and / or show signs of disease. Tree plans have also been cross-referenced against the bat roost potential surveys to ensure that suitable surveys and working methods are recommended to maintain bats conservation status across the Site and within Phase 1A (North).

11.7.10 Construction of the Temporary Bus Stops at Plot 113 will require removal of a small number of trees (4) along the northern boundary of the plot. These were previously assumed to be retained in the 2014 Permission, although in ecological terms their loss will be **negligible.** The Temporary Bus Station at Plot 114 will not require any tree removal for construction.

11.7.11 *Invertebrates* - The s.73 ES states that to ensure the "*successful implantation of the green and brown roofs for invertebrates, additional surveys will be undertaken to inform the detailed design*". However, given the highly urbanised nature of the Site, it is not considered necessary to repeat the invertebrate surveys and instead the NERC and LBAP species lists as well as species identified in previous surveys would be used to tailor the requirements for the green / brown roofs. The Design Development Report for Plots 53 and 54 states that all roofs will be green roofs to attenuate surface water run off and encourage biodiversity.

11.7.12 *Pollution* – Impacts remain valid as detailed design does not alter risk of pollution incidents.

11.7.13 *Invasive Species* – No significant impacts were identified in the s.73 ES in respect of invasive species. This conclusion remains valid provided that management methods and controls are implemented as set out in the Schedule 9 Invasive Species Report.

11.7.14 In summary, the assessment of construction ecology and nature conservation impacts presented in the s.73 ES Ecology and Nature Conservation Chapter is considered to remain valid taking into account the detailed design of the Phase 1A (North) RMAs.

Mitigation

11.7.15 Mitigation measures for construction identified in the s.73 ES are considered to remain valid, namely:

- Code of Construction Practice (CoCP);
- Construction Environmental Management Plans (CEMPs);
- Timing of works (clearance and demolition);
- Phasing of works (see para 11.7.4 on Temporary Works);
- Protection of trees; and
- Invasive species eradiation and method statements.

11.7.16 As a result of further landscaping information and arboricultural surveys which have been carried out for the Phase 1A (North) RMAs, the following mitigation measures details are now (or will be available):

Designated Sites, Habitat Damage, Loss and Creation, Habitat Fragmentation and Isolation and Pollution and Other Indirect Impacts

- A phased approach will be taken to construction where some areas are left temporarily whilst newly created habitats in the proposed open spaces have time to mature. Details

for this temporary landscaping are being developed to ameliorate impacts from construction dust, mitigate the removal of habitat for invertebrates and foraging bird species. The detailed design plans for temporary landscaping will be provided with the Temporary Works RMA or via Condition 1.8A for Phase 1A (North).

Protection of Trees

- The Arboricultural Method Statement as provided to discharge Pre-RMA Planning Condition 27.2 of the 2014 Permission, provides further detail on mitigation in respect of those trees to be retained within the Site. For example, if services have to be installed across a Root Protection Area (RPA), that works must be undertaken in accordance the guidance of the National Joint Utilities Group Guidance Note 4 "*Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees*"[ix] and in relation to hard surfaces installation, the design will comply with the principles of the Arboricultural Advisory Information Services (AAIS) Practice Note 12 "*Through the Trees to Development*"[x].

Residual Impacts

11.7.17 The loss of a single bat roost at Clitterhouse Farm Buildings was identified in Table 22.2 of the s.73 ES as a **local adverse impact**. These buildings would now be retained within the Development and whilst it is considered this would be beneficial in the longer term, a short term, temporary minor adverse impact will still arise as the refurbishment works are likely to directly affect the roof and therefore roost.

11.7.18 No other new or different residual construction impacts have been identified from those presented in the s.73 ES, therefore the conclusion that there would be 'no significant impacts' with mitigation in place as recorded in Table 22.2 of the s.73 ES for the receptors discussed above remains valid.

Operation

Potential Impacts

11.7.19 The detailed design and landscaping proposals for Phase 1A (North) have provided clarification to the elements of the habitats within the Development. The RMAs include details of landscape features to be retained and removed under Pre-RMA Planning Condition 27.1 of the 2014 Permission and habitat enhancement measures associated with landscaping to discharge Planning Condition 27.4. A review of the impacts presented in the s.73 ES in light of this detailed design information follows:

Impacts on Designated Sites

11.7.20 Impacts on designated sites including the Brent Reservoir SSSI remain not significant as the proposed alterations to the River Brent have not changed significantly from those s.73.

11.7.21 The Phase 1A (North) proposals will directly affect the Clitterhouse Playing Fields SLINC. Impacts on the Clitterhouse Playing Fields SLINC were identified as neutral in the s.73. The majority of mature trees within the SLINC will be retained, especially along the southern and eastern boundaries, where only a small number of trees are being removed for arboricultural health and

safety reasons (**Appendix 2.1)**. Other elements of the landscape strategy within the Clitterhouse Playing Fields designed to improve biodiversity include:

- Enhancement of areas of native scrub along the southern and eastern boundaries by introducing areas of new native species planting to increase diversity;
- Creation of diverse wildflower areas adjacent to the edge of the tree and scrub belt to provide foraging habitat for birds, bats and invertebrates such as bees and butterflies;
- Enhancement to the existing Clitterhouse Stream habitat by creating damp grassland areas on the embankments; and
- Installation of a number of bird and bat boxes.

11.7.22 Given the ecological enhancements incorporated into the detailed design, it is considered that the potential impact on the Clitterhouse Playing Fields SLINC would be **minor beneficial** in the long-term rather than neutral as stated in the s.73 ES.

Direct Mortality and Injury of Protected Species

11.7.23 The Phase 1A (North) RMAs do not include any proposals which would affect the outcome of the s.73 ES with regard to direct mortality or injury of protected species.

Disturbance

11.7.24 The Design Development Report for Clitterhouse Playing Fields (Part 1) confirms that lighting is only required for the primary cycle routes and paths as identified by the URS Walking and Cycling Strategy. Based on this, the impacts identified in the s.73 ES are considered to remain valid. Lighting provided within these RMAs is indicative only and may therefore be subject to alteration prior to submission of a detailed lighting strategy prior to commencement of construction.

11.7.25 In order to protect bats foraging, roosting and commuting along the River Brent and in Clitterhouse Playing Fields SLINC, light spill from external artificial lighting into adjacent habitats shall be minimised by use of an appropriate detailed lighting scheme to be agreed with LBB, as per Planning Condition 34.3.

Habitat Damage, Loss and Creation

11.7.26 The s.73 ES did not assess the specific habitat gain / loss figures for habitats within Phase 1A (North) as the detailed design of the landscaping was not available at the outline stage. Based on the detailed landscaping design for Phase 1A (North) now available approximately 27ha will be impacted and approximately 24.5 ha will be created within this first phase of the Development, therefore there will be a net loss of approximately 2.5ha of habitat for Phase 1A (North). However, the habitat to be provided as part of Phase 1A (North) will be far more diverse and beneficial to biodiversity than the existing available habitats. In addition, as defined by the RDSF, there will be an overall increase in public / open space of approximately 9ha for the Development as a whole.

11.7.27 The majority of mature trees within the area of the Site affected by the Phase 1A (North) RMAs will be retained, especially within the Clitterhouse Playing Fields SLINC (**Appendix 2.1**) eastern and southern margins.

11.7.28 The infrastructure works will require the loss of a number of trees to realign and create new roads, however replacement native tree planting is proposed in the detailed design for these areas.

11.7.29 Detailed traffic modelling and highway design has meant that the layout of the Western Roundabout has changed from the Illustrative Masterplan assumed within the s.73 ES and the roundabout now includes an extra flyover within the roundabout as shown on **Figure 2.**. This has resulted in a reduction in the size of Nature Park 5 proposed to be located beneath the roundabout for the Phase 1A (North) RMAs from 0.2ha in the s.73 Application to 0.12ha in the detailed design for this RMA**.** The reduction in size of this Nature Park will be mitigated for by the expansion of Nature Park 4 Phase 1B (North) of the Development. Despite the amendment in the sizing of Nature Park 5, the amount of habitat creation from the proposed riverside nature parks overall (beyond Central Brent Riverside Park) will still provide the same overall areas as indicated in the s.73 Application, therefore the s.73 ES assessment is deemed to remain valid. The planting strategy for Nature Park 5 is provided in **Figure 11.8**.

11.7.30 Plots 53 and 54 necessitate approximately 50% of the hedgerow / scrub belt along Brent Terrace to be removed to facilitate construction of the new residential buildings. Landscaping for Plots 53 and 54 will replace the majority of the removed hedgerow planting, except for those areas required for car park access and to allow for the turning circle at the end of Brent Terrace.

11.7.31 Trees to be retained on Site (**Appendix 2.1**) would be protected in line with Planning Conditions 27.1 and 27.2 of the 2014 Permission and the advice provided to discharge these conditions in the Tree Survey and Constraints Plan[xi] and the Tree Protection Method Statement[xii].

11.7.32 The impacts identified in Table 11.10 of the s.73 ES associated with habitat loss are considered to remain valid and are unaffected by the details of the Phase 1A (North) RMAs.

11.7.33 Native planting and biodiversity enhancements in the open spaces to be included in Phase 1A (North), such as Clitterhouse Playing Fields SLINC and Claremont Park would be managed under Landscape and Ecological Management Plans (LEMPs). These have been prepared by Macgregor Smith in reference to Planning Condition 27.9 of the 2014 Permission which would ensure that habitats are established and maintained to fulfil their role to provide replacement and enhanced invertebrate, bird and bat foraging and sheltering habitat.

Habitats outside the River Corridor

11.7.34 Detailed design of the landscaping provides information on ecological enhancements to be incorporated into the Scheme in Phase 1A (North), including bird and bat boxes and native species planting palettes. The contribution of these enhancements to biodiversity is considered to give rise to a permanent **minor beneficial** impact of local significance in the long-term. This was identified as a minor negative impact in the s.73 ES.

Habitats within the River Corridor

11.7.35 The River Brent will be subject to significant ecological improvement works comprising re-alignment and naturalisation, which in the central section under Phase 1A (North) RMA, includes removing the existing channel, realignment of the new channel (producing a three-stage widened channel), to create a low flow channel set within the staged channel (**Figures 2.9** and **Figure 2.23**). There will also be extensive riparian and marginal vegetation of native planting and the addition of boxes for invertebrates, birds and bats. The realignment of the river channel will create a far improved habitat for the common fish and invertebrate present currently, there should be a rise in the pollutant intolerant species and fish species that feed on them due to an increase in

oxygenation and decrease in water turbidity. The positive impact on nature conservation of up to Borough significance reported in the s.73 ES therefore remains valid.

11.7.36 A shading study of the River Brent has been undertaken by BMT to discharge Planning Condition 34.4 of the 2014 Permission is summarised in **Chapter 17B: Daylight, Sunlight and Overshadowing** and the full report can be found at **Appendix 17B.2: River Brent Shading Study**. This study was not available at the time of the s.73 ES since the detailed design of the bridges was not available at the outline stage.

11.7.37 An assessment of the impact of the bridge structures which form part of the Phase 1A (North) RMAs and which cross the newly created Central Brent Riverside Park concluded that areas of the river failing the two-hour sunlight criteria (as defined by relevant criteria for shading of outdoor amenity space defined by the Building Research Establishmentxiii') are located in the proximity of bridges. There are therefore a number of areas which will be overshadowed by the bridge structures which form part of the Phase 1A (North) RMAs and would be expected with any similar structure. The newly created habitat which will be shaded here has been designed with shading tolerant plant species. The water quality effects of riparian shading are largely unknown although given the urban nature of the River Brent and its associated water quality it is reasonable to conclude that any impacts would be negligible. The impact on the created River Brent habitat is therefore considered to be **negligible.**

Invertebrates, Amphibians, Birds

11.7.38 An overall impacts identified in the s.73 ES in respect of invertebrates, amphibians and birds remain valid as the Phase 1A (North) RMAs remain consistent with the parameters of the outline planning application in terms of habitat creation, including landscaping and green and brown roofs. Green roofs will be provided within Plots 53 and 54 to provide enhanced ecological biodiversity and additional wildlife habitats this would consist of pre-grown sedum turf with additional plug planting to provide additional species diversity (approximately 1,300m^2).

11.7.39 As set out in the s.73 ES invertebrate habitat lost from Clarefield Park SLINC will be mitigated for in Phase 1A (North) by the inclusion of green roofs included in Plots 53 and 54, which will form part of the 10% requirement of the green/brown roofs for the Scheme as a whole. There will also be the creation of a mosaic of invertebrate habitats within the new Nature Parks. It is not considered that further surveys or turf translocation will be necessary to facilitate the creation of habitat suitable for the small number of notable urban invertebrate species recorded previously.

Bats

11.7.40 The bat surveys undertaken by Waterman identified one bat roost at Clitterhouse Farm buildings (B4), in addition to the bat roost recorded previously in an oak tree (T4) on the eastern boundary of Clitterhouse Playing Fields SLINC (**Figure 11.7**).

11.7.41 The s.73 ES assumed that the roost at Clitterhouse Farm Buildings would be demolished. This is no longer the case, since these buildings would be retained and refurbished as part of the Phase 1A (North) RMAs. The bat roost would however still require mitigation (See Mitigation Measures), as the roof would need to be repaired resulting in the loss of the roost. The loss of the roost would be temporary as the roost would be reinstated in the Farm Buildings.

11.7.42 The s.73 ES states that to compensate for the loss of roost sites in trees and provide additional roosting opportunities for bats, bat boxes or bat bricks will be incorporated on/into trees and buildings in appropriate places, providing at least 3 bat boxes for each tree where bat roosting is lost. The one known tree bat roost in Phase 1A (North) is being retained, however a number of trees with low bat roost potential will be lost and therefore the landscaping design incorporates bat boxes in retained trees within the southern and eastern boundaries of Clitterhouse Playing Fields SLINC.

11.7.43 The detailed landscape design set out in the Phase 1A (North) RMAs would not result in any significant long-term impacts on bats, and therefore the finding of the s.73 ES remains valid.

Invasive species

11.7.44 Invasive species will be controlled and / or removed where recorded on the Site and replaced with native species or species of biodiversity benefit (if non-native) wherever practical. Invasive species will be removed from the Site in line with Planning Condition 27.8 of the 2014 Permission. An updated invasive species survey has already been undertaken and methods for the correct destruction and removal of invasive species on the Site provided[xiv]. No significant impacts have been identified with regard to invasive species.

11.7.45 National Biodiversity Network Gateway have a record of Chinese mitten crab *Eriocheir sinensis* where the River Brent meets the Grand Union Canal in Hanwell (grid ref: TQ 14935 79702) approximately 15km downstream towards the River Thames where the bank form is more naturalised, in 2014[xv]. Chinese mitten crab is an invasive species which species burrows into river banks causing erosion and, in some cases, leading to bank collapse. The section of the River Brent within Phase 1A (North) is currently heavily modified with concrete sides, unsuitable for Chinese mitten crab to inhabit. However the re-naturalised section of the River Brent may create habitat that Chinese mitten crabs could potentially colonise in the future, even though the record is a considerable distance downstream with heavily modified habitat in between. Therefore post-restoration monitoring of the River Brent will include checks for signs of colonisation of the restored reaches by Chinese mitten crab and for the recurrence of invasive flora. Corrective action will be taken if required in accordance with advice at that time.

Mitigation

11.7.46 A number of operational mitigation measures presented in the s.73 ES have now become part of the Phase 1A (North) detailed design (i.e. inherent mitigation built into the detailed design):

- The LEMPs present monitoring to be undertaken to show mitigation and enhancement measures in the detailed design are working and any requirements for replacement planting if it fails, as per Planning Condition 27.7. In addition, the LEMPs will be agreed with LBB before they are accepted, as per Planning Condition 27.9 of the 2014 Permission;
- Bat boxes will be incorporated into the landscaping proposal and the scope agreed with LBB as trees with bat roost potential (but not recorded to have roosts) will be lost, as per Planning Condition 27.5 of the 2014 Permission, and in line with recommendations likely to be made with the Natural England licence for the temporary loss of the roost in Clitterhouse Farm Buildings;

- Plots 53 and 54 would provide green roofs as replacement invertebrate habitat on the Site, alongside the enhanced habitat created within Claremont Park; and
- Plots 53 and 54 and the Clitterhouse Farm buildings will incorporate a number of house sparrow and starling boxes, as per Planning Condition 27.15 of the 2014 Permission. It is however considered that the 600 boxes detailed within the s.73 ES to be disproportionate to the number of each bird species targeted and quality of habitat recorded on the Site in the s.73 ES. Numbers of each type of box will be dictated by suitable box locations on structures and the proximity and type of adjacent habitat as considered appropriate by Waterman and details will be provided to LBB.

11.7.47 The following mitigation measures identified in the s.73 have not been incorporated into the detailed design for Phase 1A (North), as follows:

- To mitigate for the loss of the common frog population in the pond in Clarefield Park SLINC (in the Market Quarter) the s.73 ES set out that one wildlife pond would be created in the new Community Park in Clitterhouse Playing Fields Nature Park. This wildlife pond would be delivered in future phases of the Scheme.

11.7.48 With regard to lighting design the s.73 ES stated "*Potential disturbance of foraging and commuting bats will be reduced by limiting the use of artificial lighting in key bat foraging habitat such* as *along the River Brent (in the Brent Cross East and West development zones) and Clitterhouse Stream (in the PDP), close to trees and hedgerows and over parks. Impacts from essential lighting will be reduced by fitting hoods to carefully direct light only where it is needed or with the use of low-pressure sodium lights. Measures, as described above, to minimise the impacts on bats will be incorporated into the final lighting design*." Details of lighting design would be developed pre-commencement for the River Brent corridor specifically in line Planning Condition 34.3 to minimise disturbance to bats. This is not a pre-RMA condition or RMA requirement.

11.7.49 Following a review of the detailed design and landscaping plans for Phase 1A (North) and in light of the updated baseline, the following mitigation has been identified **in addition** to that provided in the s.73 ES:

- **Protected Species -** The works to the Clitterhouse Farm buildings where there is a known common pipistrelle bat roost now involve refurbishment work rather than the demolition of these buildings. The place where the bats are roosting would be lost as a result of refurbishment, however the roost should now be replaced within the refurbished Farm building (B4) rather than be provided for in adjacent retained trees. Further details would be provided as part of a Natural England licence that will be required for the work.

Residual Impacts

11.7.50 Different residual operational impacts have been identified in light of the updated potential operational impacts and mitigation as provided above:

- **Designated Sites** - Habitats at Clitterhouse Playing Fields SLINC will be upgraded via extensive landscaping proposals and ecological enhancements set out in the detailed design proposals. As such the neutral impact identified in the s.73 ES improves to a permanent **minor beneficial** impact of **local** significance.

- **Habitat Damage, Loss and Creation for Habitats outside the River Corridor** - Detailed design of the landscaping has provided further information on the ecological enhancements to be incorporated into the Scheme in Phase 1A (North), including bird and bat boxes and native species planting palettes. As such the minor negative residual impacts identified in the s.73 ES improve to a permanent **minor beneficial** impact of **local** significance.

11.8 Summary

11.8.1 The following new or different potential impacts, mitigation or residual impacts arising from the Development have been identified in respect of Ecology and Nature Conservation.

Table 11.3: New or Different Potential Impacts, Mitigation and Residual Impacts

Issue	Potential Impacts		Mitigation		Residual Impacts	
	s.73 ES	ES FIR	s.73 ES	ES FIR	s.73 ES	ES FIR
Operation						
Designated Sites	Habitats impacted within Clitterhouse Playing Fields SLINC	Habitats impacted within Clitterhouse Playing Fields SLINC	Landscaping and habitat creation at Clitterhouse Playing Fields SLINC	No further mitigation required although details of lighting strategy to be provided to minimise disturbance.	Neutral	Minor beneficial
Habitat Damage, Loss and Creation outside the River Corridor	Not assessed	Loss of approx. 2.5ha of habitat within Phase 1A (North)	Landscaping and habitat creation	No further mitigation required although further details of lighting strategy to be provided pre-commencement to minimise disturbance in line with Planning Conditions.	Minor negative	Minor beneficial

References

[i] Mayor of London (2013) *Revised Early Minor Alterations to the London*
[ii] Mayor of London (2014) *Draft Further Alterations to the London Plan*
[iii] Mayor of London (2014) *Sustainable Design and Construction Supplementary Planning Guidance*
[iv] JNCC (2010) *Handbook for Phase 1 habitat survey*
[v] Ahern Ecology (2014) *Thames Water. Assessment of the macroinvertebrate community of the Clitterhouse Ditch (Tributary of the Brent) London Borough of Barnet.*
[vi] IEEM (2006) *Guidelines for Ecological Impact Assessment in the United Kingdom*
[vii] IUCN (2014) *The IUCN Red List of Threatened Species. Version 2014.3*. <http://www.iucnredlist.org>. Downloaded on 17 November 2014
[viii] Elcot Environmental (2014) *Survey of schedule 9 listed invasive species*
[ix] National Joint Utilities Group Guidance (2007) Note 4: *Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees.*
[x] Patch D. Holding B. (2006) *Arboricultural Practice Note 12 (APN12), Through the Trees to Development. Arboricultural Advisory and Information Service (AAIS).*
[xi] Macgregor Smith Ltd (2014) *Existing Landscape Mitigation Measures for Planning Condition 27.1*
[xii] Macgregor Smith Ltd (2014) *Tree Protection Method Statement for Planning Condition 27.2*
[xiii] BRE (2011) *Site layout planning for daylight and sunlight: a guide to good practice*
[xiv] Elcot Environmental (2014) *Survey of schedule 9 listed invasive species, Brent Cross, Cricklewood*
[xv] Marine Biological Association - *RISC and ALERT Marine Non-Native Species (Chinese Mitten Crab, Wakame and Carpet Sea Squirt) Records*. <https://data.nbn.org.uk/> Downloaded on 22 December 2014