



Preliminary Ecological Appraisal
Hammersmith Temporary Ferry

For

Beckett Rankine

Project No.: VBRP115/002/001

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Summary and Main Recommendations

1.1 Summary

- 1.1.1 This Preliminary Ecological Appraisal (PEA) has been prepared by Thomson Environmental Consultants on behalf of Beckett Rankine, in support of full planning applications for a Temporary Ferry crossing on the River Thames between Hammersmith (to the north) and Barnes (to the south). The proposed temporary ferry crossing will be located to the east of the existing Hammersmith Bridge (Figure 1) and will comprise two piers, one on either side of the river. Earlier plans for a temporary bridge have been replaced by a scheme for a temporary ferry.
- 1.1.2 The baseline for the PEA draws on ecological data from reports prepared for a previous planning application for the temporary bridge scheme comprising a PEA, and bat and wintering bird surveys. An aquatic ecology desk assessment was previously undertaken in support of this temporary ferry scheme. The data has previously been reviewed by Thomson Environmental Consultants and is considered to be robust as a baseline for the temporary scheme.
- 1.1.3 Four statutory and twenty five non-statutory designated sites of importance to nature conservation were identified within 2km of the Site. Records for a range of protected species were returned from the data search, including eight species of bat and 185 species of bird. The reach of the River Thames within 2km of the site supports a number of protected marine mammal, fish, and benthic invertebrate species including grey and harbour seal, European smelt and the two-lipped door snail. A number of invasive and non-native species also occur in the Thames including Chinese mitten crab.
- 1.1.4 The Phase 1 habitat survey recorded 7 habitat types, including intertidal mudflat, shingle, running water and scattered broadleaved trees. No potential bat roosts were recorded in trees or structures within the study area. Bat activity surveys recorded foraging and commuting common pipistrelle, soprano pipistrelle and occasional noctule. 6 bat species were recorded during static detector surveys. Wintering bird surveys recorded 29 species over 5 monthly visits, including two Birds of Conservation Concern (BOCC) Red list species.
- 1.1.5 No direct or indirect impacts are anticipated on statutory sites. There will be temporary landtake from the River Thames and Tidal Tributaries Site of Metropolitan Importance for Nature Conservation. Due to the installation of piers and dredging. There will be minor changes in water quality in the River Thames due to the resuspension of silt during the dredging and piling operations. No loss of trees or shrubs from the banks of the River Thames and as such impacts on terrestrial habitats are lower than for the previous temporary bridge scheme. There is potential for disturbance to bats from lighting. However, the lighting plan has been designed with the aim of minimising impacts on bats, and is in accordance with guidance issued by the Environment Agency. Low impact vibro-piling will be used to install the piers, in order to minimise impacts on fish and wintering birds. Additional mitigation measures recommended for the temporary bridge scheme have been incorporated into the design, including a pre-commencement survey for two-lipped door snail.

1.2 Recommendations

- 1.2.1 Although low noise methods will be used to install the piles, it is recommended that construction and decommissioning of the piles avoids the smelt spawning period of April and March.

2. Introduction

2.1 Introduction

2.1.1 This Preliminary Ecological Appraisal (PEA) has been prepared by Thomson Environmental Consultants on behalf of Beckett Rankine, in support of full planning applications for a Temporary Ferry crossing on the River Thames between Hammersmith (to the north) and Barnes (to the south). The ferry crossing will lie to the east of the Grade II* listed Hammersmith Bridge which is closed to road traffic.

2.2 Development Background

2.2.1 Hammersmith Bridge provides a major link between Barnes and Hammersmith. It was closed to road traffic indefinitely in April 2019 when it was found to contain faults that may lead to a catastrophic collapse. The hot weather in August 2020 caused a deterioration to key parts of the suspension structure and an increased risk to public safety and the bridge had to be closed to pedestrians and river traffic passing underneath. There is consequently a need for a temporary crossing for pedestrian and cyclists in this location. Earlier plans for a temporary bridge are now no longer being taken forward, and have been replaced by a scheme for a temporary ferry.

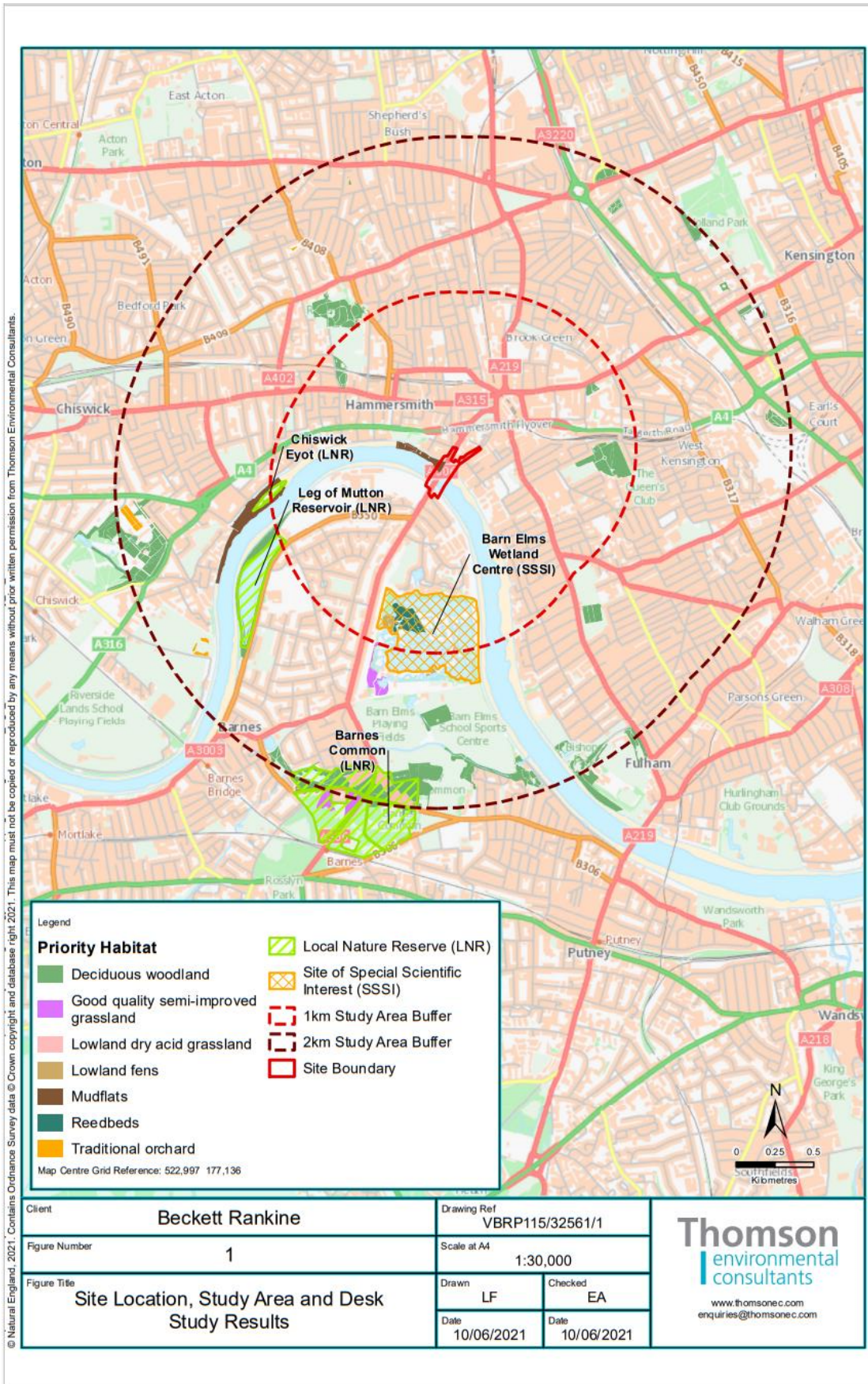
2.3 Scheme Design

2.3.1 The proposed temporary ferry crossing will be located to the east of the existing Hammersmith Bridge (Figure 1) and will comprise two piers, one on either side of the river (Figure 2.1). Hammersmith Pier on the north bank will land at the end of Queen Caroline Street, whilst Barnes Pier will land on the Thames towpath on the south bank. Hammersmith Pier comprises two segments with the first extending approximately 10m into the channel perpendicular to the bank and the second extending off the end of the first approximately 150m downstream. Barnes Pier is a single span extending approximately 50m into the channel perpendicular to the bank.

2.3.2 Both the Hammersmith Pier and Barnes Pier which make up the Hammersmith temporary Ferry service are to be temporary installations for a up to 3 years. The design of each structure has therefore been completed with ease of removal as a key criterion.

2.3.3 The Hammersmith pier will comprise a modular floating walkway spanning between the flood defence wall and a second- hand barge, modified for use as a pier. The walkway will be restrained by temporary tubular piles of up to 0.5 m in diameter. The required piling is to be minimised to avoid major impacts and disturbance to the river environment. The pier is skewed downstream to facilitate passage of large vessels beneath Hammersmith Bridge.

2.3.4 The Barnes Temporary Pier is formed from the old Savoy pier, itself a temporary structure, which will be repurposed for this development. The pier will be modified such that is restrained by a pair of spud legs rather than its current radial arms to minimise the impact on the foreshore. Two new temporary piles of around 1 m diameter will be installed restraining the pier of dimensions approximately 40 m long and 10 m wide. Access to the pier is by an aluminium linkspan, connecting to the landside towpath.



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- 2.3.5 Approximately 120 m³ of sediment is to be levelled by plough dredging in and around the area of the Hammersmith Temporary Pier to allow vessels to come alongside at low tide. The location of the proposed dredged area is illustrated in Figure 2.2.

Figure 2-1: Proposed temporary Hammersmith ferry location (from HR Wallingford Hammersmith Temporary Ferry - Aquatic Ecology Desk Assessment)

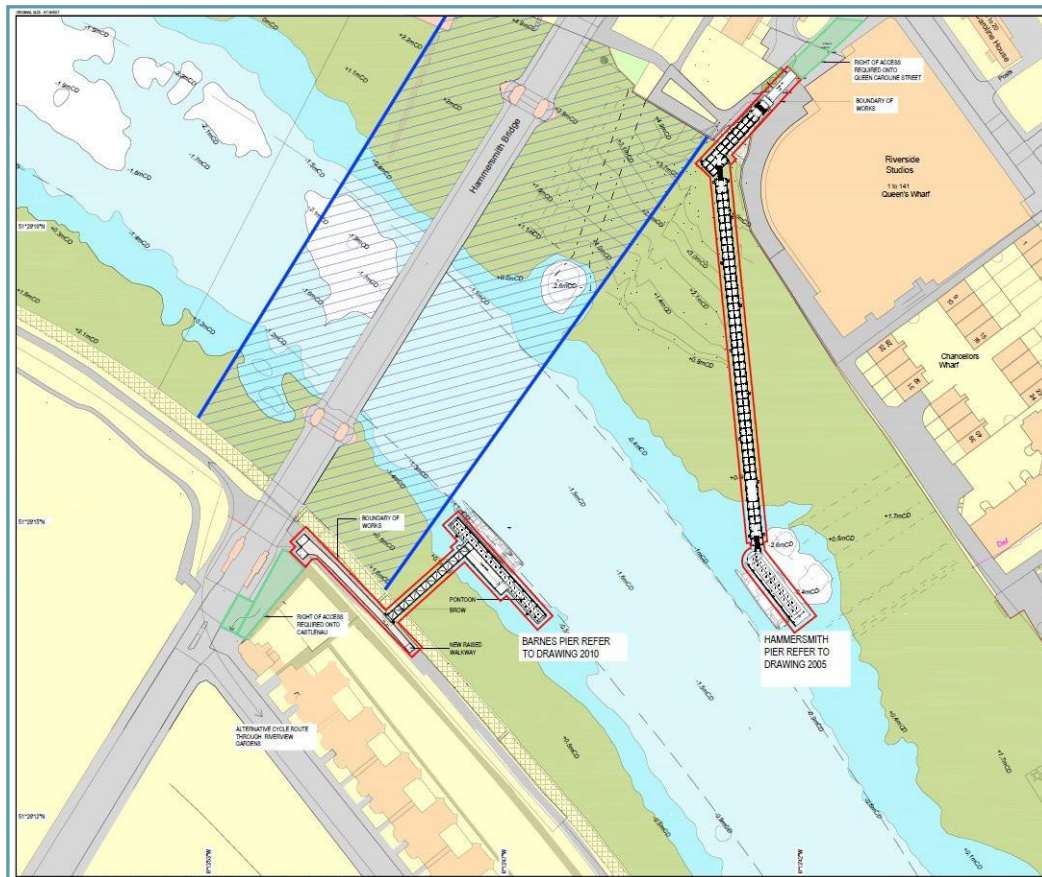
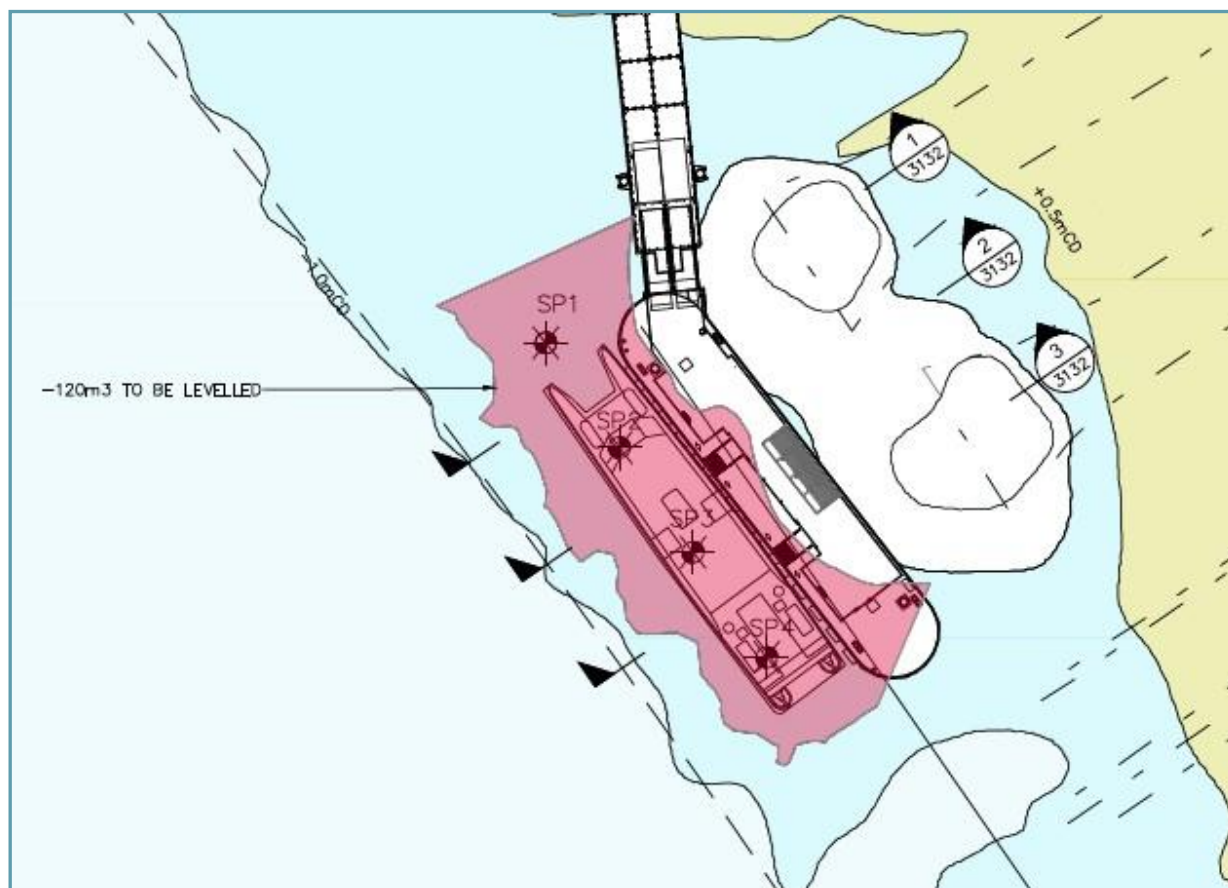


Figure 2.2 Area of river bed to be dredged. (from HR Wallingford Hammersmith Temporary Ferry - Aquatic Ecology Desk Assessment)



2.4 Incorporated mitigation

- 2.4.1 Mitigation measures recommended in the PEA for the previous temporary bridge scheme have been incorporated into the design of the temporary ferry piers so as to provide mitigation by design. In particular the ferry piers have been located so as to avoid the need for any tree felling or pruning. This measure minimises the risk of disturbance to breeding birds, and potentially roosting bats.
- 2.4.2 Piling into the foreshore is proposed but the pile diameters have been minimised so as to enable the piles to be installed by vibration instead of impact driving which will minimise noise and disturbance.
- 2.4.3 The walkways will incorporate low level lighting which minimises spill into the river. A Lighting Strategy for the scheme is included with the planning application. In summary, the lighting will comprise small LED units fixed onto the handrails of the piers and landside access walkways at 4m intervals. The proposals will give an average luminance of 30lux, with maximum light spillage beyond the pontoons and walkways generally not exceeding 2lux in accordance with Environment Agency guidelines.

- 2.4.4 A Construction Environmental Management Plan (CEMP) has been produced to ensure environmental considerations are taken into account during construction works so as to minimise impacts. The CEMP is enclosed with the planning application.
- 2.4.5 A pre-commencement survey to check for two-lipped door snails prior to any vegetation clearance will be undertaken. To minimise disturbance of the snails the need for clearance of vegetation has been minimised, and where possible avoided altogether, in the design.
- 2.4.6 The proposals described above are hereafter referred to collectively as the development.

2.5 Ecology Background

- 2.5.1 The baseline for the PEA draws on ecological data from reports prepared for a previous planning application for the temporary bridge scheme (Table 2.1), as well as for the current temporary ferry scheme. A Phase 1 habitat surveys was undertaken by Pell Frischmann in October 2019 in support of the temporary bridge scheme. Based on the findings of the survey, recommendations were made for additional bat and wintering bird surveys. A desk based assessment of aquatic ecology receptors was also recommended and was subsequently commissioned by Transport for London from HR Wallingford for the temporary ferry scheme.
- 2.5.2 The methods for the bat and wintering bird surveys are summarised in Sections 3.4 and 3.5 respectively. Data sources for the aquatic ecology desk study are presented in Section 2.6.
- 2.5.3 This data has previously been reviewed by Thomson Environmental Consultants and is considered to be robust as a baseline for the temporary scheme. This is because it is based on surveys undertaken within the past two years, and up to date desk study requests obtained from Greenspace Information for Greater London (GIGL).
- 2.5.4 The areas covered by the bat and walkover surveys for the temporary bridge scheme cover the pier footings for the ferry and therefore the results of these surveys are considered to provide an adequate baseline for the ferry scheme.

Table 2-1: Reports used as sources of baseline data

Report	Date
Hammersmith Temporary Pedestrian and Cycle Bridge. Planning Application. Preliminary Ecological Appraisal. Prepared on behalf of Transport for London by Pell Frischmann. Report Reference: 102963-PEF-BAS-ZZZ-REP-EN-00004.	July 2020
Hammersmith Temporary Ferry Ecological Report. Prepared by Beckett Rankine on behalf of Uber Boat by Thames Clippers. Report reference: 2048-BRL-02-XX-RP-C-1500.	May 2021

Report	Date
Hammersmith Temporary Pedestrian and Cycle Bridge. Planning Application. Bat Survey Report. Prepared on behalf of Transport for London by Pell Frischmann. Report Reference: 102963-PEF-BAS-ZZZ-REP-EN- 012	October 2020
Hammersmith Temporary Ferry. Aquatic Ecology Desk Assessment. Prepared by HR Wallingford. Report reference: DER6480-RT003-R01-00.	May 2021.

2.6 The Brief and Objectives

2.6.1 Beckett Rankine on behalf of Uber Boat by Thames Clipper have submitted a planning application to LB Hammersmith and Fulham and LB Richmond upon Thames. Thomson Environmental Consultants have been commissioned to prepare a Preliminary Ecological Appraisal (PEA) for the scheme.

2.6.2 The PEA includes the following elements:

- Records of designated sites and protected species held by GiGL;
- Results of an extended Phase 1 habitat survey of the temporary bridge site, which incorporates the area that would be occupied by the footings for the temporary ferry piers.;
- Results of a bat and wintering bird surveys undertaken in response to recommendations in the PEA ;
- Summary of information presented in an aquatic ecology desk study prepared to support the planning application for the temporary ferry scheme.
- A combined report giving the methods and results of the surveys undertaken, an initial impact assessment and any recommendations, including opportunities for biodiversity enhancement; and
- Provide a digitised map of the survey results.

2.7 Study Area

2.7.1 The study area for the PEA incorporates terrestrial and aquatic ecology receptors with potential to be impacted by the temporary ferry scheme. The Phase 1 habitat survey undertaken in support of the PEA for temporary bridge scheme (Figure 3.1) covered an area which includes the land-based footprint of both the Hammersmith Pier and the Barnes Pier. The pontoon for the Hammersmith Pier will extend approximately 150m downstream of the area covered by the Phase 1 survey for the temporary bridge scheme. However, given that this is floating infrastructure within the channel it is not considered to affect the validity of the survey as baseline for this PEA.

- 2.7.2 The bat and wintering bird surveys for the temporary bridge scheme was based on a study area which extends approximately 300m and 200m downstream of Hammersmith Bridge respectively (Figure 3.2 and Figure 6). The survey areas for the walkover survey the bat survey and the wintering bird survey is therefore considered adequate for the ferry scheme.
- 2.7.3 The aquatic ecology desk study incorporates an area within 2km of the temporary ferry scheme (Figure 1).

2.8 Limitations

- 2.8.1 The surveys were undertaken by a third party and therefore have not been subject to Thomson Environmental Consultants' in house quality control system. However, the surveys adhere to approved methodologies and were undertaken by a qualified ecologist during the appropriate seasonal window.
- 2.8.2 The species data collated during the desk study is mainly derived from records submitted by members of the public and ad hoc surveys undertaken by volunteers. Therefore, it should not be taken as a definitive list of the protected species and other species of conservation concern that occur in the local area.
- 2.8.3 This report is based on the development boundary and layout shown on Figure 2.3. Subsequent changes to either may result in a requirement to reassess the potential impacts of the development and the requirements for avoidance, mitigation and enhancement.

Figure 2.3: Development boundary and layout plan

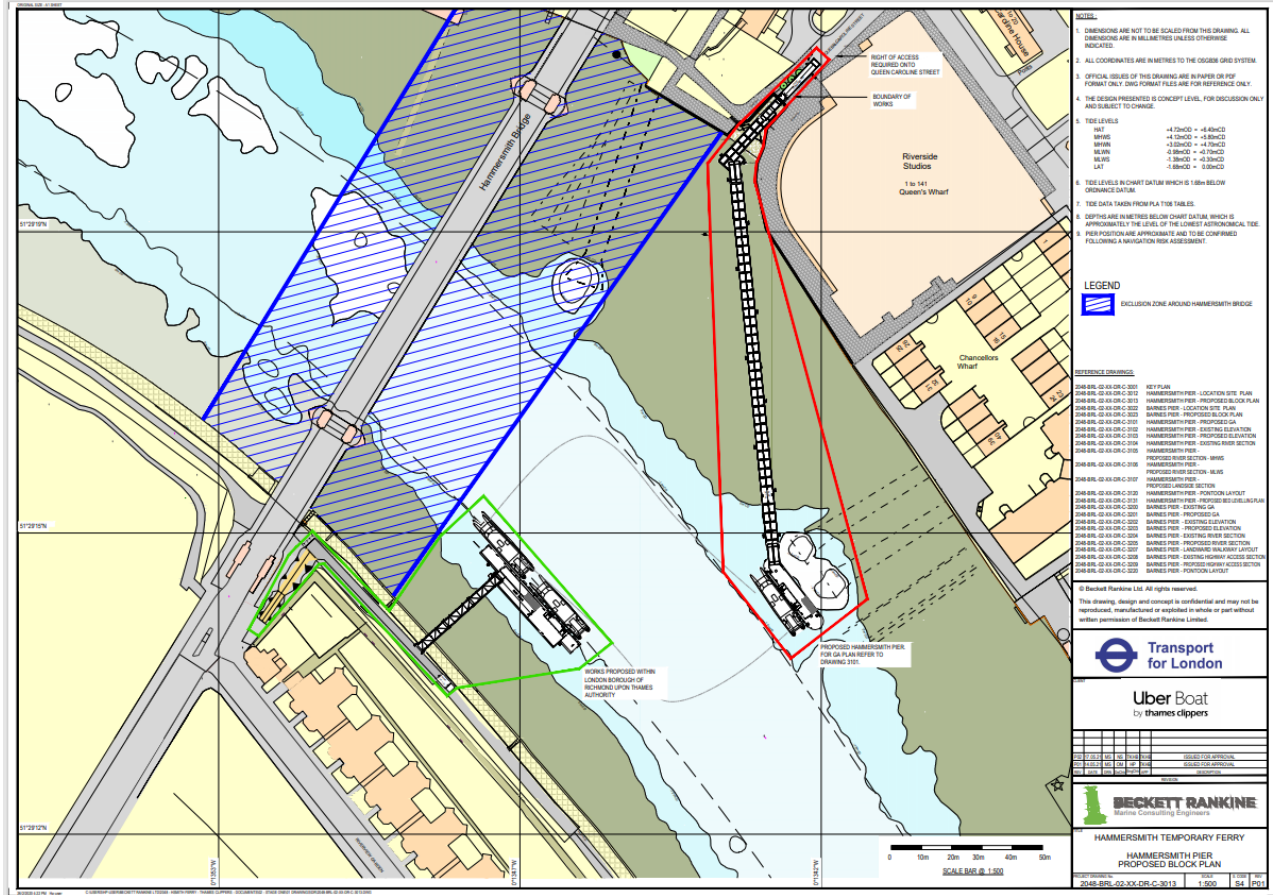
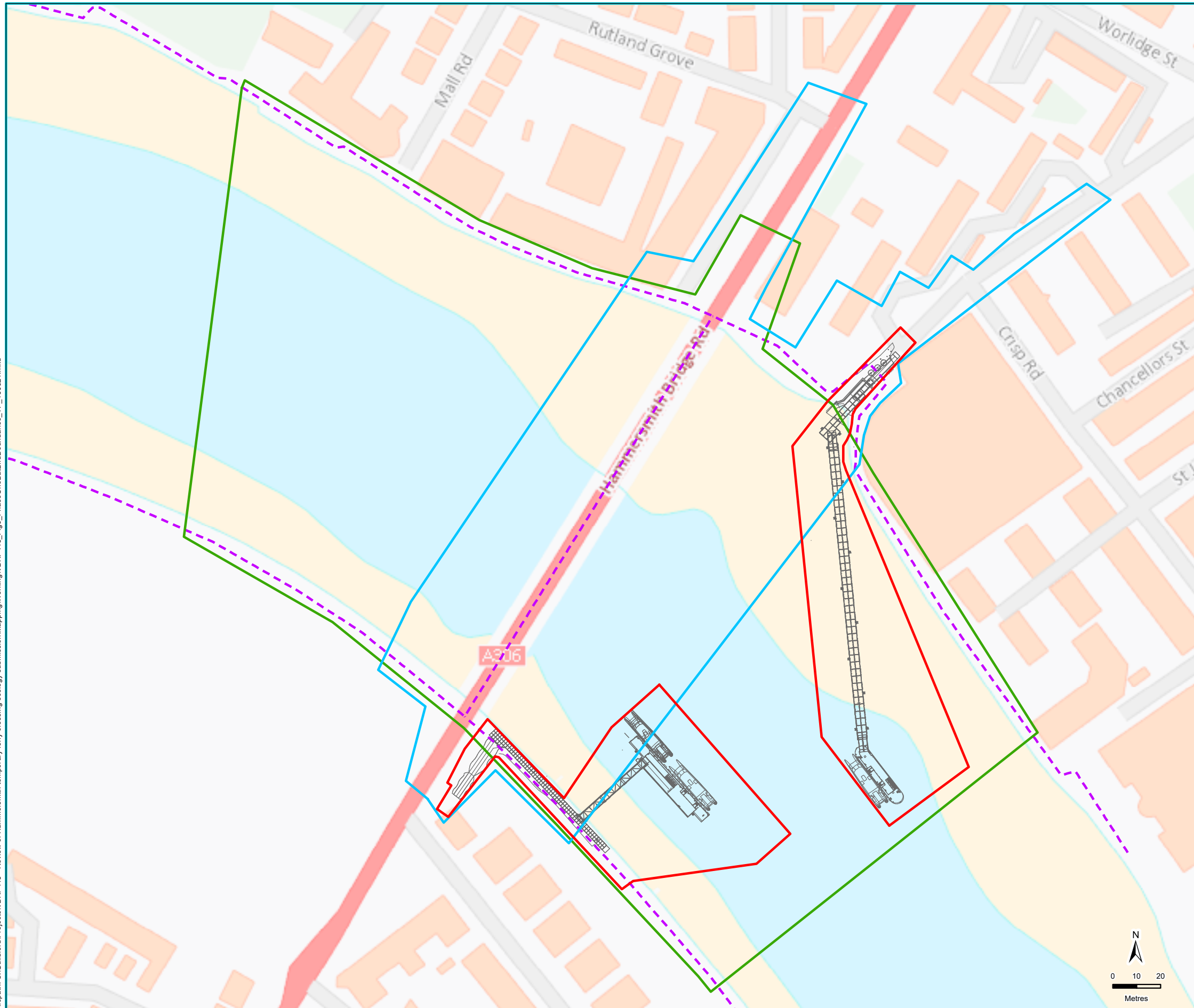


Figure 6: Boundaries of Phase One, Bats & Wintering Bird Survey Areas used to inform PEA for Temporary Ferry Crossing Scheme



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Legend

- - - Bat Activity Survey Transect Route
- Phase One Survey Area
- Wintering Bird Survey Area
- Temporary Ferry Crossing Scheme Boundary

Hammersmith Temporary Ferry scheme boundary incorporated within aquatic ecology desk study.

Bat, phase one and wintering bird surveys undertaken by Pell Frischmann; aquatic ecology desk study undertaken by HR Wallingford.

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Phase One, Bats & Wintering Bird Survey Areas used to inform PEA for Temporary Ferry Crossing Scheme

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3. Methodology

3.1.1 The following section outlines the methods used for the desk study and field work undertaken by Pell Frischmann to support the PEA and the bat survey for the temporary bridge scheme. It also outlines the methods used for the aquatic ecology desk study for the Temporary Ferry scheme.

3.2 Desk Study

3.2.1 The desk study undertaken by Pell Frischmann for the temporary bridge scheme PEA (Pell Frischmann, 2020) included a data search for records of designated sites and protected species from a 2km radius of the site. Data sources are listed in Table 3.1.

Table 3-1: Desk study data sources

Information	Data source
Statutory and non-statutory designated sites	Multi-Agency Geographic Information for the Countryside (MAGIC) Greenspace information for Greater London (GiGL)
Protected and notable species	National Biodiversity Network (NBN) Greenspace information for Greater London (GiGL)

3.3 Phase 1 Habitat Survey

3.3.1 A Phase 1 habitat survey (JNCC, 2010) was undertaken by Pell Frischmann on 31st October 2019. Phase 1 habitat survey is a standard technique for rapidly obtaining baseline ecological information over a large area of land. It is primarily a mapping technique and uses a standard set of habitat definitions for classifying areas of land on the basis of the vegetation present. For this survey, the technique was modified (or extended) to provide more detail over a smaller area, and give further consideration to fauna (IEA, 1995). The standard habitat definitions were used with an additional category of coarse grassland for unmanaged, secondary grasslands that are species poor.

3.3.2 The study area for the walkover survey is presented in Figure 3.1 below.

Figure 3-1: Phase 1 habitat survey area (from Hammersmith Temporary Pedestrian and Cycle Bridge PEA. Pell Frischmann (2020))



3.3.3 The dominant and readily identified species of higher plant species from each habitat area or type within the survey area were recorded and their abundance was assessed on the DAFOR scale:

- D Dominant
- A Abundant
- F Frequent
- O Occasional
- R Rare

3.3.4 These scores represent the abundance within the defined area only and do not reflect national or regional abundances. Plant species nomenclature follows Stace (2010).

3.3.5 Target notes were made for any features which were too small to map or are of particular ecological interest.

3.3.6 The survey also aimed to record any evidence of protected species (including nesting birds) and invasive species.

3.4 Bat Surveys

- 3.4.1 Bat surveys were undertaken by Pell Frischmann between April and September 2020. The area encompassed by the bat surveys includes the study area for the temporary ferry crossing and has therefore been included in the baseline for this PEA.
- 3.4.2 The surveys comprised:
- Preliminary bat roost assessment of buildings and trees;
 - Activity transect and static bat detector surveys;
 - Emergence surveys from the existing Hammersmith Bridge structure.
- 3.4.3 Surveys were undertaken in accordance with good practice guidance¹.
- 3.4.4 As the habitat present within the Site was assessed to provide a low to moderate foraging habitat quality for bats, one transect survey per month during 2020 summer season was undertaken, one of which included a combined dusk and dawn survey within the same 24 hour period. The transect route is illustrated in Figure 3.2.
- 3.4.5 Static bat detectors were also deployed within the Site at a suitable location for five consecutive nights during each survey month. There was found to be a lack of suitable structures to attach static bat detectors to, although this was not considered to be a significant constraint to the survey.
- 3.4.6 One dusk emergence survey was undertaken for the Hammersmith Bridge on the 4th May 2020, with an additional survey of the northern abutments only on 18th June 2020.
- 3.4.7 The survey report is presented in full in Appendix 2.

¹ Bat Conservation Trust (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* 3rd edition

Figure 3-2: Bat activity survey transect route (from Hammersmith Temporary Pedestrian and Cycle Bridge. Planning Application. Bat Survey. Pell Frischmann. 2020)



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3.5 Wintering Bird Survey

- 3.5.1 Wintering bird surveys were undertaken by Pell Frischmann between October 2019 and February 2020 in order to establish wintering bird assemblages within the study area for the temporary bridge scheme.
- 3.5.2 Surveys were undertaken in accordance with the Wetland Bird Survey (WeBS) (Gilbert *et al.* 1998) standard methodology in which birds are recorded on a monthly basis from set vantage points at low tide. No specific constraints were noted on the survey method.
- 3.5.3 Desk study records of wintering birds within a 2km radius of the site were sought from NBN.
- 3.5.4 An assessment of the impacts of the scheme on wintering birds was undertaken in accordance with guidance on ecological impact assessment published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018).

3.6 Aquatic ecology desk assessment

- 3.6.1 An aquatic ecology desk assessment was undertaken by HR Wallingford for the temporary ferry scheme in May 2021. The scope of the assessment included marine mammals, fish, breeding and wintering birds, benthic invertebrates and invasive species.
- 3.6.2 Records for the aquatic ecology desk study undertaken by HR Wallingford (2021) were also obtained for an area within 2km of the footprint of the temporary ferry scheme. The desk-based search included obtaining readily available data from the following organisations and from various available projects in the vicinity of the Hammersmith Bridge planned works:
- Environment Agency - Migratory and freshwater fish monitoring surveys (EA, 2021);
 - National Biodiversity Network (NBN) - Species atlas (<https://nbn.org.uk/>);
 - Various Thames guidance documents produced by, or for the Zoological Society of London (ZSL) HR Wallingford 2016; ZSL, 2016 and ZSL, 2018);
 - Fulham Football ground Environmental Statement (WSP, 2017); and,
 - Half tide weir removal ecological survey (APEM, 2015).
- 3.6.3 A high-level assessment of impacts on aquatic ecology receptors during the construction, operational and decommissioning stage of the project was undertaken based on CIEEM guidance (CIEEM, 2018).

4. Desk Study Results

4.1 Statutory Designated Sites

4.1.1 Four statutory designated sites of importance to nature conservation were identified within 2km of the Site. Details of the sites are summarised in Table 4.1

Barn Elms Wetland Centre Site of Special Scientific Interest (SSSI)

4.1.2 This SSSI is located approximately 650m to the south of the Site and is designated due to a mosaic of wetland habitat which support nationally important wintering birds including shoveler (*Anas clypeata*) and a number of other breeding birds associated with lowland waters. Most of this SSSI consists of standing open water, grazing marsh and reedbed, with some carr woodland, scrub and mesotrophic woodland. Breeding birds recorded here regularly include little grebe (*Tachybaptus ruficollis*), great crested grebe (*Podiceps cristatus*), grey heron (*Ardea cinerea*), mute swan (*Cygnus alor*), gadwall (*Anas strepera*), pochard (*Aythya farina*), tufted duck (*Aythya fuligula*), little ringed plover (*Charadrius dubius*), redshank (*Tringa tetanus*), common tern (*Sterna hirundo*), sedge warbler (*Acrocephalus schoenobaenus*), reed warbler (*Acrocephalus scirpaceus*) and reed bunting (*Emberiza schoeniclus*).

Chiswick Eyot Local Nature Reserve (LNR)

4.1.3 This LNR is located approximately 940m to the west of the Site and is a small island within the Thames beside the Chiswick Mall. The island used to be larger but has slipped away due to erosion and is covered in trees including willow saplings and reeds. Regular volunteer days include bank stabilisation and scrub removal.

Lonsdale Road Reservoir (Leg of Mutton Reservoir) Local Nature Reserve

4.1.4 This LNR is located approximately 1km to the south-west of the Site and is a disused reservoir covering 8.2 hectares. The site supports a number of breeding bird including the nationally scarce pochard (*Aythya ferina*), and a number of wintering wildfowl. Other species present include bats and great crested newt (*Triturus cristatus*), and aquatic plants that are rare in London including bogbean (*Menyanthes trifoliata*) and frogbit (*Hydrocharis morsus ranae*).

Barnes Common Local Nature Reserve

4.1.5 This LNR is located approximately 1.8km to the south of the Site and contains a range of habitats including acid grassland, acid scrub, woodland and neutral grassland. Barnes Old Burial Ground is contained within the common and the entire reserve is considered of educational value.

SSSI Impact Risk Zone

4.1.6 The Site is situated within a SSSI Impact Risk Zone for Barn Elms Wetland Centre SSSI. Consultation with Natural England will be required for any transport proposal including road, rail and by water (excluding routine maintenance).

4.2 Non-Statutory Designations

4.2.1 Twenty-five non-statutory designated Sites of Importance to Nature Conservation (SINC) have been identified within 2km of the Site and summarised below in Table 4.1. These sites are split into 3 tiers of importance:

- Sites of Metropolitan Importance;
- Sites of Borough Importance (Grade I & II); and
- Sites of Local Importance.

Table 4-1: Non-statutory sites for nature conservation

Site Designation	Tier	Distance to site (km)
Site of Importance to Nature Conservation		
River Thames and Tidal Tributaries	Site of Metropolitan Grade Importance	Within the site
Furnivall Gardens	Site of Metropolitan Grade Importance	0.3
Disused track bed west of Hammersmith station	Site of Borough Grade Importance (Grade I)	0.665
Ravenscourt Park	Site of Borough Grade Importance (Grade II)	0.895
Margravine Cemetery	Site of Local Importance	0.94
London Wetland Centre	Site of Metropolitan Grade Importance	1
Leg o'mutton	Site of Borough Grade Importance (Grade I)	1
St Paul's Green	Site of Local Importance	1
Fulham Cemetery	Site of Local Importance	1.1
Loris Road Community Garden	Site of Local Importance	1.2
Barn Elms Playing Fields	Site of Borough Grade Importance (Grade II)	1.3
Catnor Park	Site of Local Importance	1.5
Normand Park	Site of Local Importance	1.5
Fulham Palace, Bishops Park and All Saints Churchyard	Site of Borough Grade Importance (Grade I)	1.6
West London Line in Brompton	Site of Borough Grade Importance (Grade I)	1.6
Putney Lower Common	Site of Borough Grade Importance (Grade I)	1.6
Beverley Brook in Wandsworth	Site of Borough Grade Importance (Grade II)	1.6
Godolphin Road Community Garden	Site of Borough Grade Importance (Grade I)	1.6
Shepherds Bush Green	Site of Local Importance	1.6

Site Designation	Tier	Distance to site (km)
Beverley Brook from Richmond Park to the River Thames	Site of Borough Grade Importance (Grade II)	1.7
Chiswick House Grounds	Site of Borough Grade Importance (Grade I)	1.7
Barnes Common	Site of Metropolitan Grade Importance	1.8
Piccadilly and District Lines in Ealing	Site of Borough Grade Importance (Grade II)	1.8
Wendell Park	Site of Local Importance	1.9
Barnes Green Pond	Site of Local Importance	1.9

Ancient Woodland outside designated sites

- 4.2.2 There are no records for areas of Ancient Semi Natural or Replanted Ancient Woodland (ASNW/PAWS) within a 2km search radius of the Site.

4.3 Protected Species

- 4.3.1 Records of protected and notable species which have been identified within a boundary of the Site have been provided by NBN and GiGL.

European protected species Mammals

- 4.3.2 NBN has returned records for bats species including brown long-eared bat, (*Plecotus auratus*), common pipistrelle, (*Pipistrellus pipistrellus*), Nathusius's pipistrelle, (*Pipistrellus nathusii*), noctule, (*Nyctalus noctule*), serotine, (*Eptesicus serotinus*), soprano pipistrelle, (*Pipistrellus pygmaeus*) within 2km of the Site.
- 4.3.3 GiGL returned records for bat species including brown long-eared bats, common pipistrelle, Nathusius's pipistrelle, noctule, serotine, soprano pipistrelle, Daubenton's bat (*Myotis daubentonii*) and lesser noctule (*Nyctalus leisleri*) within a 2km search radius of the Site.

Other protected species

Amphibians

- 4.3.4 NBN has returned records for common frog, (*Rana temporaria*), common toad, (*Bufo bufo*), palmate newt, (*Lissotriton helveticus*), and smooth newt, (*Lissotriton vulgaris*) within 2km of the Site.
- 4.3.5 GiGL returned 94 records for common frog, and 14 records for common toad within a 2km search radius of the Site. The closest common frog was found approximately 136m to the south of the Site and the nearest common toad was found approximately 768m to the north of the Site.

Birds

- 4.3.6 NBN have returned over 130,000 records for birds covering 181 species within a 2km search radius of the Site. GiGL returned records for 85 notable bird species within a 2km search radius of the Site.

Fish, Bivalve and Gastropods

- 4.3.7 NBN returned records for bullhead (*Cottus gobio*) and European eel (*Anguilla anguilla*). The European eel is a UK Biodiversity Action Plan priority fish species. GiGL did not return any records for fish, bivalves or gastropods.

Mammals

- 4.3.8 NBN returned records for Eurasian badger (*Meles meles*) and West European hedgehog (*Erinaceus europaeus*) within 2km of the Site.
- 4.3.9 GiGL returned 144 records for European water vole (*Arvicola amphibious*), 109 records for European hedgehogs, and one European badger within a 2km search radius of the Site. The closest water vole, hedgehog and badger were found approximately 870m to the south west, 130m to the south west and 1.03km to the south of the Site respectively.
- 4.3.10 GiGL returned records for grey seal (*Halichoerus grypus*) approximately 195m to the east of the Site in 2004, and common seal (*Phoca vitulina*) approximately 190m to the east in 2005.

Reptiles

- 4.3.11 NBN returned records for common lizard, (*Zootoca vivipara*), grass snake, (*Natrix natrix*) and slow worm, (*Anguis fragilis*) within 2km of the Site.
- 4.3.12 GiGL returned 26 records for common lizards, 8 records for slow worms and 5 records for grass snakes within a 2km search radius of the Site. The closest common lizard, slow worm and grass snakes were found approximately 620m to the south west, 1.03km to the south and 950m to the south of the Site respectively.

Invasive Species

- 4.3.13 The NBN search has returned records for invasive non-native species Chinese mitten crab (*Eriocheir sinensis*), zebra mussel (*Dreissena polymorpha*) to the west of the Site and marsh frog (*Pelophylax ridibundus*).
- 4.3.14 GiGL returned records of Chinese mitten crab, Japanese knotweed, (*Fallopia japonica*), giant hogweed (*Heracleum mantegazzianum*), and New Zealand pigmyweed, (*Crassula helmsii*). The closest Chinese mitten crab was found 1km to the west of the Site. Invasive plant species Japanese knotweed, giant hogweed and New Zealand pigmyweed were found approximately 1.10km to the north east, 1.05km to the south east and 1.10km to the south of the Site respectively.

Tree Preservation Orders and Conservation Areas

- 4.3.15 Information obtained from the Hammersmith and Fulham Council Planning Department and the Richmond and Wandsworth Council Trees and Park Department indicates that there are Conservation Areas within the Site and immediately adjacent. There are no known tree preservation orders within the Site boundary.

Table 4-2 : Species records derived from the desk study

Common Name	Scientific Name	HSR ² Sch 2 or 5	WCA ³ Sch1, 5 or 8	National Priority Species ⁴	Local priority/ BAP species	BoCC ⁵ / Other ⁶	Red Data Book	Grid Ref.	Distance from site	Source
Arctic Skua	<i>Stercorarius parasiticus</i>					Red				GiGL
Avocet	<i>Recurvirostra avosetta</i>		✓							GiGL
Bewick's Swan	<i>Cygnus columbianus</i>		✓							GiGL
Bittern	<i>Botaurus stellaris</i>		✓							GiGL
Black redstart	<i>Phoenicurus ochruros</i>		✓			Red				GiGL
Black tern	<i>Chlidonias niger</i>		✓							GiGL
Black-necked grebe	<i>Podiceps nigricollis</i>		✓			Red				GiGL
Black-tailed godwit	<i>Limosa limosa</i>		✓			Red				GiGL
Blue-headed wagtail	<i>Motacilla flava subsp. Flava</i>					Red				GiGL
Bluethroat	<i>Luscinia svecica</i>					Red				GiGL

² Conservation of Habitats and Species Regulations 2010, as amended

³ Wildlife and Countryside Act 1981, as amended

⁴ Species of Principal Importance within the relevant country of the United Kingdom

⁵ Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man

⁶ Other to include nationally scarce species and species listed on Annex II of the Habitats Directive

Common Name	Scientific Name	HSR ² Sch 2 or 5	WCA ³ Sch1, 5 or 8	National Priority Species ⁴	Local priority/ BAP species	BoCC ⁵ / Other ⁶	Red Data Book	Grid Ref.	Distance from site	Source
Brambling	<i>Fringilla montifringilla</i>		✓							GiGL
Common crossbill	<i>Loxia curvirostra</i>		✓							GiGL
Common scoter	<i>Melanitta nigra</i>		✓			Red				GiGL
Cuckoo	<i>Cuculus canorus</i>					Red				GiGL
Curlew	<i>Numenius arquata</i>					Red				GiGL
Fieldfare	<i>Turdus pilaris</i>		✓			Red				GiGL
Firecrest	<i>Regulus ignicapilla</i>		✓							GiGL
Garganey	<i>Anas querquedula</i>		✓							GiGL
Grasshopper warbler	<i>Locustella naevia</i>					Red				GiGL
Great nortner diver	<i>Gavia immer</i>		✓							GiGL
Green sandpiper	<i>Tringa ochropus</i>		✓							GiGL
Greenshank	<i>Tringa nebularia</i>		✓							GiGL
Grey partridge	<i>Perdix perdix</i>					Red				GiGL
Grey Wagtail	<i>Motacilla cinerea</i>					Red				GiGL
Grey-headed wagtail	<i>Motacilla flava subsp. Thunbergi</i>					Red				GiGL
Hen Harrier	<i>Circus cyaneus</i>		✓			Red				GiGL
Herring gull	<i>Larus argentatus</i>					Red				GiGL
Honey buzzard	<i>Pernis apivorus</i>		✓							GiGL

Common Name	Scientific Name	HSR ² Sch 2 or 5	WCA ³ Sch1, 5 or 8	National Priority Species ⁴	Local priority/ BAP species	BoCC ⁵ / Other ⁶	Red Data Book	Grid Ref.	Distance from site	Source
House sparrow	<i>Passer domesticus</i>					Red				GiGL
Kingfisher	<i>Alcedo atthis</i>		✓							GiGL
Kittiwake	<i>Rissa tridactyla</i>					Red				GiGL
Lapland bunting	<i>Calcaeus lapponicus</i>		✓							GiGL
Lapwing	<i>Vanellus vanellus</i>					Red				GiGL
Leach's Petrel	<i>Oceanodroma leucorhoa</i>		✓							GiGL
Lesser redpoll	<i>Carduelis cabaret</i>					Red				GiGL
Lesser spotted woodpecker	<i>Dendrocopos minor</i>					Red				GiGL
Linnet	<i>Linaria cannabina</i>					Red				GiGL
Little gull	<i>Hydrocoloeus minutus</i>		✓							GiGL
Little ringer plover	<i>Charadrius dubius</i>		✓							GiGL
Little tern	<i>Sternula albifrons</i>		✓							GiGL
Marsh Harrier	<i>Circus aeruginosus</i>		✓							GiGL
Marsh tit	<i>Poecile palustris</i>					Red				GiGL
Mediterranean gull	<i>Larus melanocephalus</i>		✓							GiGL
Merlin	<i>Falco columbarius</i>		✓			Red				GiGL

Common Name	Scientific Name	HSR ² Sch 2 or 5	WCA ³ Sch1, 5 or 8	National Priority Species ⁴	Local priority/ BAP species	BoCC ⁵ / Other ⁶	Red Data Book	Grid Ref.	Distance from site	Source
Mistle thrush	<i>Turdus viscivorus</i>					Red				GiGL
Montagu's Harrier	<i>Circus pygargus</i>		✓							GiGL
Nightingale	<i>Luscinia megahynchos</i>					Red				GiGL
Osprey	<i>Pandion haliaetus</i>		✓							GiGL
Pied flycatcher	<i>Ficedula hypoleuca</i>					Red				GiGL
Pochard	<i>Aythya farina</i>					Red				GiGL
Red kite	<i>Milvus milvus</i>		✓							GiGL
Red-backed grebe	<i>Podiceps grisegena</i>					Red				GiGL
Red-backed shrike	<i>Lanius collurio</i>		✓			Red				GiGL
Red-throated diver	<i>Gavia stellate</i>		✓							GiGL
Redwing	<i>Turdus iliacus</i>		✓			Red				GiGL
Ring ouzel	<i>Turdus torquatus</i>					Red				GiGL
Ringed plover	<i>Charadrius hiaticula</i>					Red				GiGL
Ruff	<i>Calidris pugnax</i>		✓			Red				GiGL
Scaup	<i>Aythya marila</i>		✓			Red				GiGL
Serin	<i>Serinus serinus</i>					Red				GiGL
Shag	<i>Phalacrocorax aristotelis</i>					Red				GiGL

Common Name	Scientific Name	HSR ² Sch 2 or 5	WCA ³ Sch1, 5 or 8	National Priority Species ⁴	Local priority/ BAP species	BoCC ⁵ / Other ⁶	Red Data Book	Grid Ref.	Distance from site	Source
Shore lark	<i>Eremophila alpestris</i>		✓							GiGL
Skylark	<i>Alauda arvensis</i>					Red				GiGL
Slavonian Grebe	<i>Podiceps auratus</i>		✓			Red				GiGL
Snow bunting	<i>Plectrophenax nivalis</i>		✓							GiGL
Song thrush	<i>Turdus philomelos</i>					Red				GiGL
Spanish wagtail	<i>Motacilla flava subsp. iberiae</i>					Red				GiGL
Spoonbill	<i>Platalea leucorodia</i>		✓							GiGL
Spotted crane	<i>Porzana porzana</i>		✓							GiGL
Spotted flycatcher	<i>Muscicapa striata</i>					Red				GiGL
Starling	<i>Sturnus vulgaris</i>					Red				GiGL
Stone-curlew	<i>Burhinus oedicanus</i>		✓							GiGL
Temminck's stint	<i>Calidris temminckii</i>		✓							GiGL
Tree pipit	<i>Anthus trivialis</i>					Red				GiGL
Tree sparrow	<i>Passer montanus</i>					Red				GiGL
Turtle dove	<i>Streptopelia turtur</i>					Red				GiGL
Twite	<i>Linaria flavirostris</i>					Red				GiGL

Common Name	Scientific Name	HSR ² Sch 2 or 5	WCA ³ Sch1, 5 or 8	National Priority Species ⁴	Local priority/ BAP species	BoCC ⁵ / Other ⁶	Red Data Book	Grid Ref.	Distance from site	Source
Whimbrel	<i>Numenius phaeopus</i>		✓			Red				GiGL
Whinchat	<i>Saxicola rubetra</i>					Red				GiGL
White-fronted Goose	<i>Anser albifrons</i>					Red				GiGL
Whooper Swan	<i>Cygnus cygnus</i>		✓							GiGL
Wood sandpiper	<i>Tringa glareola</i>		✓							GiGL
Wood warbler	<i>Phylloscopus sibilatrix</i>					Red				GiGL
Woodcock	<i>Scolopax rusticola</i>					Red				GiGL
Yellow wagtail	<i>Motacilla flava</i>					Red				GiGL
Yellowhammer	<i>Emberiza citrinella</i>					Red				GiGL
Mammals (Bats)										
Brown long-eared bat	<i>Plecotus auratus</i>	✓	✓	✓	✓					GiGL
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	✓	✓	✓	✓					GiGL
Nathusius's Pipistrelle	<i>Pipistrellus nathusii</i>									GiGL
Noctule	<i>Nyctalus noctule</i>	✓	✓	✓	✓					GiGL
Serotine	<i>Eptesicus serotinus</i>	✓	✓		✓					GiGL

Common Name	Scientific Name	HSR ² Sch 2 or 5	WCA ³ Sch1, 5 or 8	National Priority Species ⁴	Local priority/ BAP species	BoCC ⁵ / Other ⁶	Red Data Book	Grid Ref.	Distance from site	Source
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	✓	✓	✓	✓					GiGL
Daubenton's	<i>Myotis daubentonii</i>	✓	✓		✓					GiGL
Leisler's	<i>Nyctalus leisleri</i>	✓	✓	✓	✓					GiGL
Mammals (excluding bats)										
Eurasian Badger	<i>Meles meles</i>									GiGL
West European Hedgehog	<i>Erinaceus europaeus</i>			✓	✓					GiGL
European Water Vole	<i>Arvicola amphibious</i>	✓		✓	✓					GiGL
Marine Mammals										
Grey Seal	<i>Halichoerus grypus</i>	✓	✓				Seals act			
Common Seal	<i>Phoca vitulina</i>	✓	✓	✓						
Fish										
Bullhead	<i>Cottus gobio</i>									
European Eel	<i>Anguilla Anguilla</i>				✓		Eels Regulations 2009			
Amphibians										
Common Frog	<i>Rana temporaria</i>	✓								
Common Toad	<i>Bufo bufo</i>			✓	✓					

Common Name	Scientific Name	HSR ² Sch 2 or 5	WCA ³ Sch1, 5 or 8	National Priority Species ⁴	Local priority/ BAP species	BoCC ⁵ / Other ⁶	Red Data Book	Grid Ref.	Distance from site	Source
Palmate Newt	<i>Lissotriton helveticus</i>		✓							
Smooth Newt	<i>Lissotriton vulgaris</i>		✓							
Reptiles										
Common Lizard	<i>Zootoca vivipara</i>		✓							
Grass Snake	<i>Natrix natrix</i>		✓							
Slow Worm	<i>Anguis fragilis</i>		✓							

5. Field Survey results

5.1 Phase 1 habitat survey

Habitats and Flora

5.1.1 The following Phase 1 habitat types were identified in the survey undertaken by Pell Frischmann for the temporary bridge schem:

- Intertidal mud flat;
- Shingle;
- Running water;
- Scattered broadleaved trees
- Ephemeral vegetation
- Amenity grassland;
- Hardstanding and structures;

5.1.2 A summary of these habitat types is presented in Table 4.1. Their distribution and extent in the study area is given on Figure 4.1.

Table 5-1: Summary of Phase 1 habitat survey findings

Habitat type	Phase 1 code	Description
Scattered broadleaved trees	A3.1	<ul style="list-style-type: none"> • Present to the north and south of the Hammersmith Bridge abutments. • 9 species recorded including London plane (<i>Platanus x hispanica</i>), hybrid black poplar (<i>Populus x canadensis</i>) and horse chestnut (<i>Aesculus hippocastanum</i>). • Mature London plane trees to the south of Hammersmith Bridge on the boundary between the Thames path and properties to the south considered to have roosting potential for bats.
Running water	G2	<ul style="list-style-type: none"> • Tidal River Thames flowing from west to east • Important habitat for wintering birds, fish, benthic invertebrates and marine mammals
Intertidal mud flat	H1.1	<ul style="list-style-type: none"> • UK Priority habitat • Recorded at low tide between northern and southern banks of River Thames

Habitat type	Phase 1 code	Description
		<ul style="list-style-type: none"> Valuable habitat for fish and wintering birds
Shingle	H1.2	<ul style="list-style-type: none"> Occupies zone between mudflat and river wall Supports scattered dock (<i>Rumex</i> sp) plants
Amenity grassland	J1.2	<ul style="list-style-type: none"> Dominated by perennial rye-grass (<i>Lolium perenne</i>) and daisy (<i>Bellis perennis</i>). Present within the gardens and car parking areas of the Queen Caroline Estate.
Scattered scrub and ephemeral vegetation	A2.2 and J1.3	<ul style="list-style-type: none"> 5 ephemeral/ruderal species recorded on margins of Thames path which runs east/west through the site. Considered to be of low value for protected species as fragmented and isolated.
Hardstanding and structures	J4 and J3.6	<ul style="list-style-type: none"> Hammersmith Bridge lies within the study area. The structure is used for perching and potentially nesting by starling and feral pigeon. Ring-necked parakeet also noted. Small bin stores within the car park of the Queen Caroline Estate with green roofs

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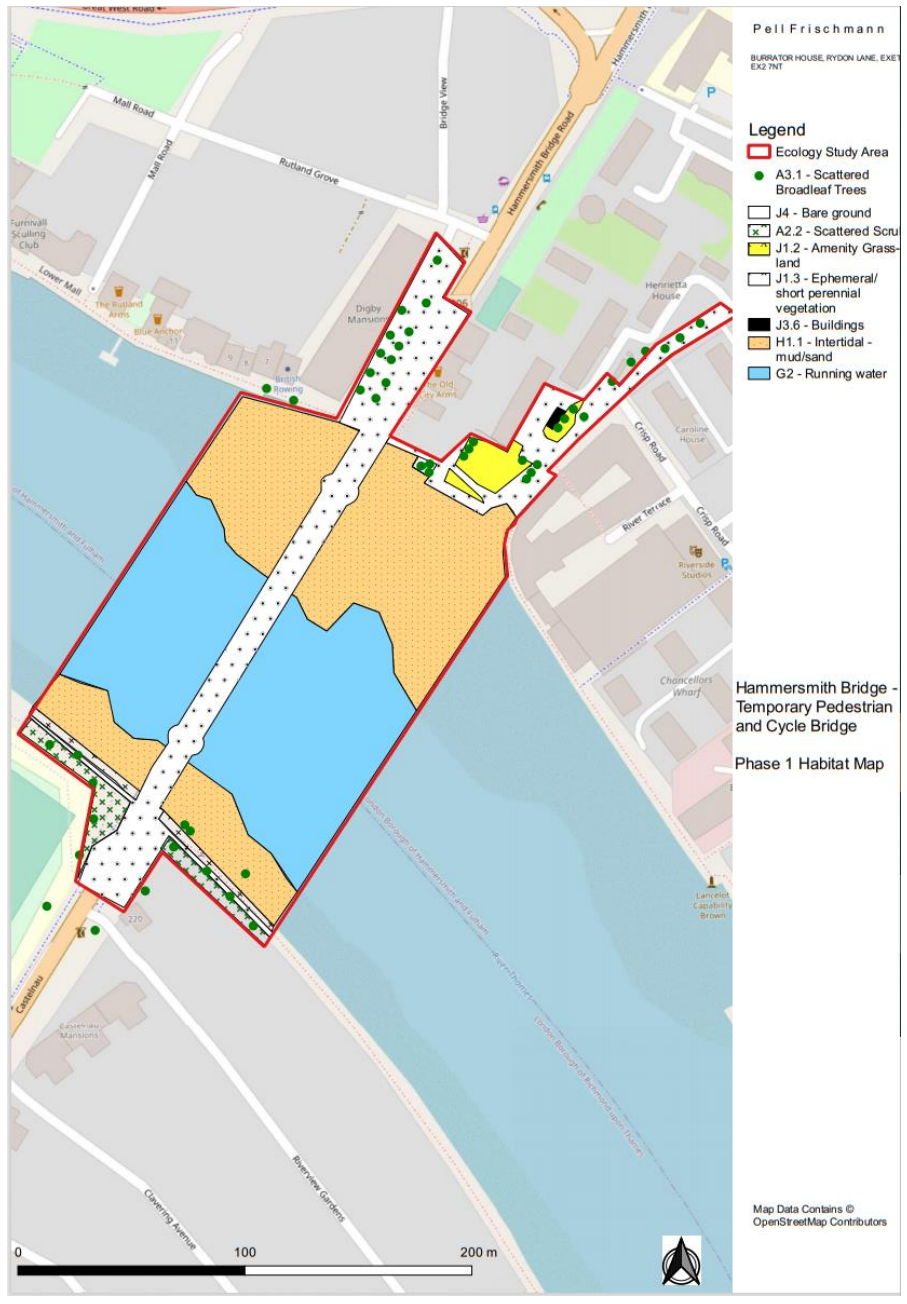


Figure 5-1: Phase 1 habitat map (from Pell Frischmann. Hammersmith Temporary Pedestrian and Cycle Bridge). Planning Application. Preliminary Ecological Appraisal. July 2020. Report Ref: 102963-PEF-BAS-ZZZ-REP-EN-00004)

Fauna

- 5.1.3 Mature trees and structures within the survey area were highlighted in the Phase 1 survey as having potential to support roosting bats.
- 5.1.4 A number of breeding bird species were recorded during the survey including feral pigeon, pied wagtail, grey wagtail, and starling. 11 species of wetland bird were recorded including black headed gull, herring gull, teal and moorhen.
- 5.1.5 Recommendations were made for bat and wintering bird surveys which were subsequently undertaken.
- 5.1.6 Other than wetland birds, no aquatic species were recorded during the survey, although the mudflats and slipways were considered to have potential as haul out areas for seal.
- 5.1.7 The two lipped door snail (*Alinda biplicata*), a London BAP species, has been previously recorded approximately 3.8km to the west, near Chiswick Bridge. Potential, although sub-optimal, habitat was considered to be present on the site and therefore precautionary mitigation measures were proposed.
- 5.1.8 No invasive species listed under Schedule 9 of the Wildlife and Countryside Act (1981) were recorded, although Buddleja, a locally invasive species listed on the London Invasive Species Initiative (LISI) was present. Various non-native bird species including ring-necked parakeet were recorded.
- 5.2 Bat survey**
- 5.2.1 The findings of the bat survey are presented in Hammersmith Temporary Pedestrian and Cycle Bridge. Planning Application. Bat Survey (Pell Frischmann, 2020)(Appendix 2 to this report). Key findings of the survey which are relevant to the PEA for the temporary ferry scheme are presented below.
- 5.2.2 The preliminary roost and habitat assessment concluded that there were no roost features associated with the trees to the south or north of Hammersmith Bridge. No roost features were noted in the metalwork of Hammersmith Bridge, although the southern and northern brick abutments were considered to have low and moderate potential respectively due to cavities in the brickwork.
- 5.2.3 Bat activity was primarily limited to foraging and commuting common pipistrelle, with some soprano pipistrelle. Noctule was recorded frequently during the July surveys and one during the August survey. The southern side of the river was considered to be of greater value for light tolerant species such as common pipistrelle than the northern side.
- 5.2.4 A total of 6 species were recorded during the static detector surveys; common and soprano pipistrelle, occasional Nathusius' pipistrelle, noctule, Leisler's and a myotis species considered to be Daubenton's bats due to the waterside location.
- 5.2.5 No bats were recorded emerging from the bridge structure during the two emergent survey visits in May and June 2020.

5.3 Wintering bird survey

- 5.3.1 The findings of the wintering bird survey are presented in Hammersmith Temporary Pedestrian and Cycle Bridge. Wintering Bird Survey Report (Pell Frischmann, 2020) (Appendix 3 to this report). Key findings of the survey which are relevant to the PEA for the temporary ferry scheme are presented below.
- 5.3.2 The desk study returned records of 85 notable bird species within a 2km radius of the site, many of which were recorded in the Barn Elms Wetland Centre SSSI.
- 5.3.3 Twenty nine bird species were recorded during the 5 survey visits undertaken between 31st October 2019 and 11th February 2020. Of these the most abundant species was Black-headed gull *Chroicocephalus ridibundus*, with 250 individuals noted during a single visit on mud-flats in the River Thames at low tide. Feral pigeon was also abundant, with over 120 individuals noted during a single visit.
- 5.3.4 Of the twenty nine species recorded, two are on the British Trust for Ornithology (BTO) red list of Birds of Conservation Concern (BoCC); grey wagtail (*Motacilla cinerea*) and herring gull (*Larus argentatus*). A peak count of 14 herring gull were recorded during one of the survey visits.
- 5.3.5 Seven species are on the British Trust for Ornithology (BTO) amber list of Birds of Conservation Concern (BoCC), including black-headed gull (*Chroicocephalus ridibundus*), common gull (*Larus canus*), dunnock (*Prunella modularis*), great black-backed gull (*Larus marinus*), lesser black-backed gull (*Larus fuscus*), mallard (*Anas platyrhynchos*) and teal (*Anas crecca*).
- 5.3.6 The site was considered to be of District importance for wintering birds based on adapted criteria from Fuller (1980).

5.4 Aquatic Ecology Desk assessment

- 5.4.1 The Aquatic Ecology Desk Assessment is summarised below. The full document is included with the planning application documents⁷.

Statutory and non-statutory sites

- 5.4.2 The statutory and non-statutory sites included in the Aquatic Ecology Desk Assessment (HR Wallingford, 2021) are described in Sections 4.1 and 4.2 of this report. The report includes a description of the nearest Water Framework Directive waterbody; the Thames Upper transitional water body (GB530603911403).

Fish

- 5.4.3 A total of 120 species of fish have been previously recorded in the River Thames. Of these 12 are identified in the report as 'common or protected species' based on guidance from Zoological Society of London (ZSL, 2016). Atlantic salmon (*Salmo salar*), and river lamprey (*Lampetra fluviatilis*) are

⁷ HR Wallingford. Hammersmith Temporary Ferry Crossing. Aquatic Ecology Desk Assessment. May 2021. DER6480-RT003-R01-00

protected under the Annexe III of the Bern Convention, and Annex IV and V of the EU Habitats Directive. Atlantic salmon, European smelt, European eel, river lamprey and brown trout/sea trout are UK BAP species.

- 5.4.4 European smelt spawns in the upper tidal Thames between Teddington Lock and Wandsworth and ZSL advise that no development affecting the subtidal habitat of the predicted spawning ground should be permitted during the months where smelt are likely to spawn: late February, March and April.
- 5.4.5 European eel (*Anguilla anguilla*), a Critically Endangered species on the IUCN Red List is known to pass through the study area during up and downstream migrations by adults and juveniles in autumn and spring respectively.

Marine mammals

- 5.4.6 The tidal Thames supports a number of marine mammals including seals, harbour porpoises, bottlenose dolphins and occasionally whales. Around the project site, pinnipeds are likely to be either grey seal (*Halichoerus grypus*) or harbour seals (*Phoca vitulina*), and cetaceans are likely to be restricted to harbour porpoise (*Phocoena phocoena*).

Benthic ecology

- 5.4.7 The upper tidal Thames supports a number of protected invertebrate species including the two-lipped door snail (*Balea biplicata*), the swollen spire snail (*Mercuria confuse*) and the German hairy snail (*Pseudotrichia rubiginosa*). Additional IUCN red data list species include the duck mussel (*Anodonta anatine*), the swollen river mussel (*Unio tumidus*) and the nationally scarce crustacean shrimp (*Corophium lacustre*), which is thought to be locally common in the Thames. The tidal River Thames is also known to support populations of the tentacled lagoon worm (*Alkmaria romijni*), protected under the Wildlife and Countryside Act, 1981.
- 5.4.8 The aquatic ecology desk assessment includes a review of reports from survey undertaken close to the study area at Fulham football club (WSP, 2017) and the Wandall half tide weir (AEPM, 2015). None of these species were recorded. The site is considered likely to support an assemblage of benthic invertebrates comprising commonly occurring estuarine species. However, a precautionary approach has been adopted in assuming that the two-lipped door snail could be present.

Invasive aquatic species

- 5.4.9 In addition to the invasive bird and plant species noted in paragraph 5.1.8, the invasive non-native crustacean, Chinese mitten crab (*Eriocheir sinensis*), the New Zealand mud snail (*Potamopyrgus antipodarum*), and the Asian clam (*Corbicula fluminea*) are established in the tidal Thames.

6. Legal and Planning Policy Context

6.1 Legislation

6.1.1 The following legislation is relevant to the PEA:

- The Wildlife and Countryside Act (WCA) 1981 (as amended by the Countryside and Rights of Way (CRoW) Act 2000);
- The Conservation of Habitats and Species Regulations 2017, as amended (Habitats Regulations, 2017);
- The Natural Environment and Rural Communities Act (NERC) 2006;
- The Water Framework Directive or WFD ('Directive 2000/60/EC of the European Parliament)
- The Marine and Coastal Access Act 2009 (MCAA) which established Marine Conservation Zones;
- Salmon and Freshwater Fisheries Act, 1975; and,
- The EU Eels Regulations, 2007 (Council Regulation EC) establishing measures for the recovery of the stock of European eel, transposed into UK law through The Eels (England & Wales) Regulations, 2009.

6.2 National and local planning policy

6.2.1 National Planning Policy Framework (NPPF) (adopted March 2019). Paragraphs 170 to 177 set out the Government's policies on protection of biodiversity through the planning system

6.2.2 **The London Plan** (March 2016). Chapter 7 of the London Plan relates to the Environment and includes specific policies relating to the Tidal Thames. The London Plan is being updated and the Consultation Draft of the New London Plan was published in December 2017. Policy SI 17 relates to protecting and enhancing London's waterways includes biodiversity. The current 2016 Plan is still the adopted Development Plan,

6.2.3 **Hammersmith and Fulham Local Plan**. Adopted 2018. Replaces the Core Strategy 2011 and Development Management Local Plan 2013.

6.2.4 Policy OS4 addresses Nature Conservation and states that areas of green corridors will be protected from development that would likely cause harm to their ecological (habitats and species) value. In these areas, development will only be granted if the proposed development would provide qualitative gain for the local community and provision is made for the replacement of nature conservation in equal or greater value;

6.2.5 Policy OS5 states that the borough will enhance biodiversity through the 'greening of streets and public realm' and planting as part of new development; and

6.2.6 Policy CC2 states that design and construction measures in major developments will conserve and promote biodiversity and the natural environment.

6.2.7 **London Borough of Richmond Upon Thames Local Plan (2018)** covers Green Infrastructure and Biodiversity:

- Policy LP12 addresses Green Infrastructure and the importance of maintaining and enhancing the integrity of green spaces and features as part of the wider green network;
- Policy LP15 addresses biodiversity and states that the council will protect and enhance the biodiversity within the borough, including sites designated for their nature conservation value and the biodiversity within adjacent habitats. Enhancement measures to biodiversity and ensuring that new biodiversity features or habitats should be considered to connect to the wider environment existing networks; and
- Policy LP16 addresses trees, woodland and landscape and states that the council will require the '*protection of existing trees and the provision of news trees, shrubs and other vegetation of landscape significance*'.

6.3 Other policy

6.3.1 **UK Post 2010 Biodiversity Framework.** Aim is to 'halt overall biodiversity loss, support healthy well-functioning ecosystems, and establish coherent ecological networks with more and better places for nature for the benefit of wildlife and people'.

6.3.2 **Mayor's Biodiversity Strategy** (Greater London Authority, 2015): The Mayor's Biodiversity Strategy was published in 2002, and partly updated in 2015, to provide the framework to protect and enhance London's natural environment.

6.3.3 **London Borough of Richmond upon Thames Biodiversity Action Plan.** Covers 11 species and 9 habitats considered to be a priority for biodiversity conservation in the Borough, including broadleaved woodland, and the tidal Thames. The tidal Thames plan includes the banks, towpaths and other riverside pathways and associated flood channels, as well as the main channel of the Thames. Issues affecting the river include sea level rise linked to climate change, result in increased flooding and loss of foreshore habitat; water quality, litter and invasive species.

6.3.4 **Tidal Thames Encroachment Policy for Tidal Rivers and Estuaries** (EA, 2000). States that, 'except in exceptional circumstances, the Environment Agency will resist works on the Thames that cause encroachment where these may lead to loss or damage to river habitats The Agency welcome those aspects of development that lead to enhanced opportunities for fisheries and other ecology.

7. Preliminary Impact Assessment

7.1 Introduction

7.1.1 This section presents a preliminary assessment of the impacts of the scheme on ecological receptors. Impacts are considered at the construction, operation and de-commissioning stage of the project and the potential pathways for an effect to occur is considered for each of the receptor groups described in section 6 above.

7.1.2 There is the potential for the following temporary impacts, based on the scheme described in Section 2.3:

- Loss of habitat during construction due to the installation of pier footings;
- Disturbance of habitat during construction due to the operation of machinery to install the piers and dredging to allow vessels to come alongside at the Hammersmith Temporary Pier;
- Changes to water quality during construction due to plough dredging;
- Increases in noise and vibration during construction;
- Changes to the hydraulic regime of the river during operation due to the introduction of floating walkways;
- Disturbance to the river during operation due to increased vessel movements;
- Shading of habitat beneath pontoons and walkways during operation; and
- Increases in lighting of the bed and banks of the river during operation due to illumination of the walkways.

7.1.3 Ecological effects on each of the receptor groups are considered below.

7.2 Designated Sites

7.2.1 There will be no direct or indirect impacts on statutory sites. Given that the nearest site is Barn Elms Wetland Centre SSSI is 2km away there are no effect pathways through which an impact on this site could occur.

7.2.2 Direct impacts are anticipated on the River Thames and Tidal Tributaries SMINC. There will be temporary loss of habitat beneath the footings of the temporary piers on both the north and south bank of the River Thames, although this will be less than 10m² in total.

7.2.3 Plough dredging of an area adjacent to Hammersmith Temporary Pier will result in disturbance of approximately 120m³ of sediment. This will cause a temporary alteration in the benthic sediment from the location where the sediment is moved from. There will also be disturbance to sediment in the areas where plant (a crawler crane on spud legs) is used to install the temporary piers. The impact of disturbance is short term, and will only last during the construction of the piles.

7.2.4 There will be minor changes in water quality in the River Thames due to the resuspension of silt during the dredging and piling operations. However, the Thames is a turbid river with high volumes of silt carried on each tide. The increases in suspended sediment will be temporary and are unlikely to increase background levels significantly.

7.2.5 No direct or indirect impacts are anticipated on any of the other non-statutory sites described in Table 4.1.

7.3 Habitats

- 7.3.1 There will be a temporary loss of approximately 10m² of intertidal mudflat; a UK Priority, and London BAP Habitat. This represents a very minor loss in the context of the overall area of intertidal mudflat on the River Thames.
- 7.3.2 There will be no loss of trees or shrubs from the banks of the River Thames in order to install the piers. Temporary loss of amenity grassland habitat adjacent to the Thames path on the south side may occur due to improvements to access in the approaches to the pier. For example, there will be some re-grading of the access on the south side onto Castlenau. This impact is considered to be minimal and reversible.
- 7.3.3 No additional impacts on terrestrial habitats are anticipated during the operation of the scheme. Ferry users would be confined to the walkways and so no new disturbance to habitats would occur.

7.4 Bats

- 7.4.1 No impacts on roosting bats are anticipated. The introduction of low level lighting on the raised walkways has the potential to cause disturbance to foraging and commuting bats. However, the lighting plan has been designed with the aim of minimising impacts on bats, and is in accordance with guidance issued by the Environment Agency (Section 2.4).
- 7.4.2 There will be an increase in human disturbance on the river bank from users of the ferry, although they will be confined to the walkway and in the context of background levels of disturbance in a highly urbanised environment this is unlikely to increase levels of disturbance to bats.

7.5 Wintering Birds

- 7.5.1 Birds foraging on the intertidal mudflats will experience increased levels of disturbance during construction of the piers. This includes 2 BoCC Red list species (herring gull and grey wagtail) and seven Amber list species. Low impact vibro-piling will be used to install the piers, which will reduce sudden increase in noise levels which tends to startle birds. The river is currently subject to high levels of disturbance from vessels and recreational users, and birds are considered to have a high tolerance to disturbance.

7.6 Marine Mammals

- 7.6.1 Seals (grey and harbour; paragraph 5.4.6) are considered to be the only marine mammal species likely to be present in the vicinity of the site. Temporary loss of intertidal mudflat due to the installation of the temporary piers is not expected to reduce habitat availability significantly, particularly given that seals do not seem to routinely use this stretch of foreshore.
- 7.6.2 Disturbance due to construction activity is likely to temporarily deter seals from using the mudflats in the vicinity of the site, although construction activity will be confined to daylight hours, and so the intertidal habitat will be available as a haul out during the night.

7.7 Fish

- 7.7.1 The subtidal habitat in this reach of the River Thames may be used for spawning by European smelt, and the river is a migratory corridor for European eel (paragraphs 5.4.3 to 5.4.5). There will be no loss of subtidal habitat.
- 7.7.2 Piling and dredging have the potential to cause disturbance to fish communities from noise and vibration. Impacts range from minor behavioural disturbance, such as avoidance, at low noise levels to physical injury and mortality at high levels. The piles will be installed using vibro-piling methods which emit lower levels of noise than percussive or impact piling. This is considered to be adequate to mitigate for impacts on migratory and resident fish species.

7.8 Benthic Invertebrates

- 7.8.1 There will be direct loss of benthic invertebrates within the footprint of the piers, and in the area that will be dredged around the Hammersmith pier. Although no surveys have been undertaken, the desk study data returned no records of rare or endangered benthic invertebrates in the vicinity of the scheme. The two lipped door-snail, a London BAP species, is known to occur (normally in habitat above the strand line) in the upper reaches of the Thames and so mitigation for the species in the form of a pre-commencement check has been incorporated into the scheme.

7.9 Invasive Aquatic Species

- 7.9.1 The invasive invertebrate species Chinese mitten crab, Asiatic clam and New Zealand mud snail are all present in this stretch of the River Thames. The movement of plant equipment, including dredgers and piling rigs, has the potential to cause the spread of these invasive species. However, given that they are considered to be ubiquitous in the River Thames, the scheme is not considered likely to contribute significantly to their spread. The CEMP will include standard measures to minimise the risk of spread of invasive species.

8. Potential Further Ecological Considerations

- 8.1.1 The potential further ecological considerations section sets out our assessment of the potential of the site to support protected species and other species of conservation concern which were not recorded during the extended Phase 1 habitat survey.
- 8.1.2 Additional surveys for wintering birds and bats, and an aquatic ecology desk study, were undertaken in response to recommendations from the Pell Frischmann PEA for the temporary bridge crossing. Given that these studies covered the study area for the temporary ferry scheme, no additional surveys are considered necessary.
- 8.1.3 The scheme lies within a stretch of the river which may support spawning habitat for European smelt. Although low noise methods will be used to install the piles, it is recommended that construction and decommissioning of the piles avoids the smelt spawning period of April and March.

9. Conclusions

- 9.1.1 This PEA presents the baseline and preliminary impact assessment for a temporary ferry scheme at Hammersmith Bridge. The baseline draws upon studies undertaken in support of an earlier temporary bridge scheme which would occupy a similar footprint. The pontoon for the ferry scheme would extend approximately 100 to 150m further downstream than the study area for the ecological surveys for the bridge scheme. However, this extension is within the river channel and only comprises floating infrastructure. There would be no new landtake outside the areas covered by the baseline surveys.
- 9.1.2 The assessment identifies potential impacts and likely ecological effects during the construction and operation of the scheme. Measures to reduce and mitigate impacts have been incorporated into the design of the scheme (Section 2.4), and includes the use of low-level lighting to mitigate for disturbance impacts on bats; low noise piling methods to minimise impacts on fish and marine mammals; and a pre-commencement check for two-lipped door snail, a London BAP species. A recommendation has been included in this report for piling to be undertaken outside the spawning season for European smelt.
- 9.1.3 Based on the findings of this preliminary assessment, the scheme is considered to be in compliance with national and local policy. Trees on the banks of the River Thames will be safeguarded in compliance with LB Richmond upon Thames policy LP16, and wildflower planting on the margins of the Thames path delivers benefits in accordance with policy LP15. Although the scheme will represent temporary encroachment on the Thames foreshore, the scheme is a river related use, which is accepted within the Tidal Thames Encroachment policy (paragraph 6.3.4).

10. References

- 10.1.1 CIEEM Sources of Survey Methods (<http://www.cieem.net/sources-of-survey-methods-sosm->),
- 10.1.2 Crosher, I, Gold, S., Max Heaver, Heydon, M., L Moore, L., Panks, S., Scott, S., Stone, D. & White, N. 2019. The Biodiversity Metric 2.0: Auditing and accounting for biodiversity value: technical supplement (Beta version, July 2019). Natural England
- 10.1.3 CIEEM (2017) Guidelines for Preliminary Ecological Appraisal. 2nd Edition. Chartered Institute of Ecology and Environmental Management, Winchester, England.
- 10.1.4 Institute of Environmental Assessment (1995) Guidelines for Baseline Ecological Assessment. E & FN Spon, London, England.
- 10.1.5 JNCC (2010) Handbook for Phase 1 habitat survey: A technique for environmental audit. Joint Nature Conservancy Committee, Peterborough, England.
- 10.1.6 Stace, C. (2019) New Flora of the British Isles (fourth edition). Cambridge University Press, Cambridge, England.

Appendix 1 Assessment Methodology

10.2 Legal and Planning Policy Context

10.2.1 The relevant legal and policy context is identified as follows:

Features

Designated Sites

10.2.2 The location of the site is compared to the distribution of sites with a statutory or non-statutory nature conservation designation using information derived from the desk study. Consideration is given to designated sites that could be affected directly or indirectly by the proposed development.

Habitats outside Designated Sites

10.2.3 The habitats known to occur on the site are compared to those which receive some protection, in law or policy, outside of designated sites. These include hedgerows, uncultivated land and semi-natural areas; national priority habitats and local priority habitats listed as requiring action in Local Biodiversity Action Plans.

Ancient Woodland

10.2.4 The ancient woodland inventory is checked to determine whether any known ancient woodland occurs either on the site or nearby.

Protected Species

10.2.5 The species known to occur on the site as a result of the desk study and Phase 1 habitat survey are compared to those listed in nature conservation legislation i.e. the Wildlife and Countryside Act 1981, as amended and the Conservation of Habitats and Species Regulations 2010 as amended.

10.2.6 In addition, the species known to occur on the site as a result of the desk study and Phase 1 habitat survey are compared to those listed in animal welfare legislation, i.e. the Badgers Act 1992 and the Wild Mammals (Protection) Act 1996.

Priority Species

10.2.7 The species known to occur on the site are compared to those listed as priority species in the relevant country or those requiring action in Local Biodiversity Action Plans.

Other Species of Conservation Concern

- 10.2.8 The species known to occur on the site are compared with other nature conservation listings, such as red data books.

Invasive Plant Species

- 10.2.9 The species of plant present on the site are compared to those listed in the Wildlife and Countryside Act.

Relevant Legislation and Policy

- 10.2.10 If any of the above are found to occur on or near the site and are likely to be affected by the development in any way, the relevant legislation and planning policy (including national, regional, county and borough policies) is listed and summarised in the table.

10.3 Nature Conservation Value

CIEEM Geographic Scale

- 10.3.1 The value of the designated sites, habitats and species populations present on the site are then determined on a geographic scale (based on Institute of Ecology and Environmental Management, 2006). The scale is as follows:

- International and European
- National
- Regional
- Metropolitan, County, vice-county or other local authority-wide area
- Local
- Negligible

- 10.3.2 In arriving at a level of value for an ecological receptor, the criteria set out below are used.

Designated Sites

- 10.3.3 The highest level of site designated on the basis that an assessment of intrinsic nature conservation has already been carried out using the same or similar criteria as that given below for habitats and species.

Habitats

- 10.3.4 The table below sets out the criteria used for evaluating habitats. The criteria are based on Ratcliffe (1977), Annex III of the Habitats Directive and a review of criteria used for the designation of Local sites, many of which are reiterated in CIEEM (2016).

- 10.3.5 Each habitat identified during the survey is evaluated against these criteria. Reference is made to published lists of habitats of conservation concern to help establish the degree to which a

habitat is rare or threatened, however, presence on such a list is not a criteria used in the evaluation.

Level	Criteria	Explanation
Primary	Size	Semi-natural habitats tend to be highly fragmented and the value of the habitat usually increases with its size, because large areas of a habitat will generally support more species and, being more resilient to external influences, is more likely to retain its value in the future.
	Proportion of total	Areas of a habitat that represents a large proportion of the total with a given geographic area are generally of higher nature conservation value than areas of a habitat that are a small proportion of the total for a given geographic area.
	Diversity	The diversity of species in a habitat is mainly influenced by habitat type, size, structure, age and management. The diversity of species supported by a given habitat strongly influences its value with habitats showing high species diversity generally being of higher value than a habitat of the same type with low species diversity. However, it is recognised that some habitats naturally have low species diversity.
	Naturalness/ Quality	Truly natural habitats, unmodified by man, are rare in Britain, and nature conservation deals largely with semi-natural habitats. Those semi-natural habitats that exhibit a level of quality marked by a lack of features which indicate gross or recent human modification are generally more highly valued than highly and recently modified habitats.
	Rarity	Rare semi-natural habitats are of higher value for their own sake and because they are likely to support rare and uncommon species. The general principle is that the rarer the habitat, the greater the value for nature conservation. Rarity is related to the frequency of occurrence at all geographic levels on the IEEM scale.
	Fragility	Fragility reflects the degree of sensitivity of habitats, communities and species to environmental change. Because of their vulnerability, fragile habitats are generally of higher nature conservation value than those that are more resilient to change.

Level	Criteria	Explanation
	Level of threat	A habitat which is undergoing a rapid decline in either extent or quality is assigned a higher value than a habitat which is more stable.
Secondary	Recorded History	The extent to which a site has been used for scientific study and research is a factor of some importance, with those sites having a long recorded history being of more value than others.
	Position	Habitats that have an ecological link with adjacent areas of important semi-natural habitat may have more value than is apparent when considering the habitat in isolation.
	Potential	Certain sites could, through appropriate management or natural change, develop a greater nature conservation interest. Potential value is assessed separately from current value.
	Intrinsic Appeal	Some habitats are of greater appeal than others, which can be taken into account when arriving at a level of value.
	Re-creatability	Some habitats can be readily re-created, such as ponds, while others, such as ancient woodland can not. The degree to which a habitat can be re-created can influence its value, with those more readily re-created being of lower value than those that are hard or impossible to re-create.
	Amenity	Some areas of habitat are more important to local people than others. This may be a function of accessibility in rural areas or scarcity in urban areas, but habitats used and valued by local people may have more value than is apparent when considering more biological factors.

Species

- 10.3.6 The table below sets out the criteria used for evaluating the populations of species present on the site. The criteria are again based on Ratcliffe (1977) and Annex III of the Habitats Directive and also the IUCN criteria categories and criteria.
- 10.3.7 Populations of a species recorded during the survey are assessed against the following criteria. Where further investigation is required to establish population size, an estimate is made based on the likely maximum that the habitat can support, to provide a preliminary indication of nature conservation value. As with habitats, reference is made to published lists of species of conservation concern to help establish the degree to which a species is rare or threatened, however, presence on such a list is not a criteria used in the evaluation.

Level	Criteria	Explanation
Primary	Rarity	A population of a species that is rare in a given area is important because the loss of, or damage to, the population may threaten the survival of the species in that area. This criterion may be extended to include distinct races of a species, as well as the species itself. Endemic and near endemic species have a special status as, by definition, they are globally rare even though they may be relatively common where they occur.
	Proportion of total	A population of a species that represents a significant proportion of the total population in a given area could be more important than smaller populations because the loss of a large population is particularly likely to threaten the survival of the species in that area. Large populations also tend to be more robust and may provide a source for the colonisation of other sites.
	Level of threat	A population of a species which is undergoing a rapid decline is assigned a higher value than a population of a species which is more stable. In determining the level of threat, reference is made to the criteria published by the IUCN.
	Native Status	Non-native species, especially recent introductions, are generally regarded as having low or negligible nature conservation value, even if they are rare or threatened in the UK. The presence of some non-native species may even detract from the conservation status of the site. However, certain ancient introductions are given higher status, particularly rare arable weeds, than other introduced plant species.
Secondary	History of Presence	Long-established populations of species which depend on long periods of traditional management, require long established habitats or are otherwise known to have been present at a particular site for many years may be assigned higher values than newly established populations or populations of species which readily colonise new sites.
	Importance for fauna	Some species of plants provide an important resource for fauna, either in terms of the general diversity of species or numbers of individuals supported, or in providing a particular resource to a specialist, dependent species of fauna. Such plants may be assigned higher value than others even if they are just as common and widespread.

Level	Criteria	Explanation
	Links to other populations/ degree of fragmentation	Small populations of a species may be of more importance because than is apparent from the population size because they form a link or potential link to other populations of the same species, and reduce the negative effects of isolation.
	Cultural interest/aesthetic appeal	Some species of plant could be important to local people either because there is a cultural connection e.g. wild daffodil in Wales or because they have aesthetic appeal e.g. bee orchid. Populations of such species may be more highly valued than others that are similarly abundant.
	Economic	Some species of plant could be important to local people because they provide an economic benefit e.g. by encouraging tourism or use as a commercial crop.

Use of Primary and Secondary Criteria

10.3.8 The primary criteria are considered at each geographic scale so that, for example, a small population of a native species that is rare in the county but relatively common in the region and stable could be considered important at the county level. Once a rough level of value is derived from the primary criteria, the secondary criteria are considered and may lead to a slight increase or decrease in the level of value assigned to a given population.

10.4 Preliminary Impact Assessment

10.4.1 Consideration is given to whether and how the development could affect each of the features identified during the desk study and Phase 1 survey. The assessment is very much a preliminary exercise, designed to inform early stages in the development process, for example, site selection, development design, masterplanning and avoidance, mitigation and compensation measures that may be required. Re-appraisal of the impacts will be required if there are design changes and when further information is obtained in later stages of the assessment process.

10.5 Identification of Potential Further Ecological Issues

10.5.1 Further ecological issues are those which cannot be resolved during preliminary ecological appraisal for any reason, including the following:

- The development is near a designated site and consultation with the relevant regulator is required in order to determine whether further assessment is required;

- Suitable habitat is present on or near the site for a protected species/species of conservation concern and specialist survey techniques are required for their detection;
 - Suitable habitat is present on or near the site for a protected species/species of conservation concern and the extended Phase 1 habitat survey was not undertaken at a suitable time of year for their detection;
 - A protected species/species of conservation concern was found on or near the site but further information on population size or distribution is required in order to resolve any legal and planning policy issues (such as obtaining licences) or make a reliable assessment of nature conservation value.
- 10.5.2 Discussion of issues raised by 3rd parties, e.g. reports of protected species from the site by local people, may also be discussed under this heading.
- 10.5.3 The desk study is used as a guide to the protected species/species of conservation in the local area, however, the list is not taken to be exhaustive and it is borne in mind that some species may longer occur in the locality.
- 10.5.4 No attempt is made to evaluate the importance of the site for species not yet confirmed to be on or near the site, nor to discuss the implications for the development if the species were to be found on the site.

Appendix 2: Hammersmith Temporary Pedestrian and Cycle Bridge. Planning Application. Survey Report (Pell Frischmann, 2020)

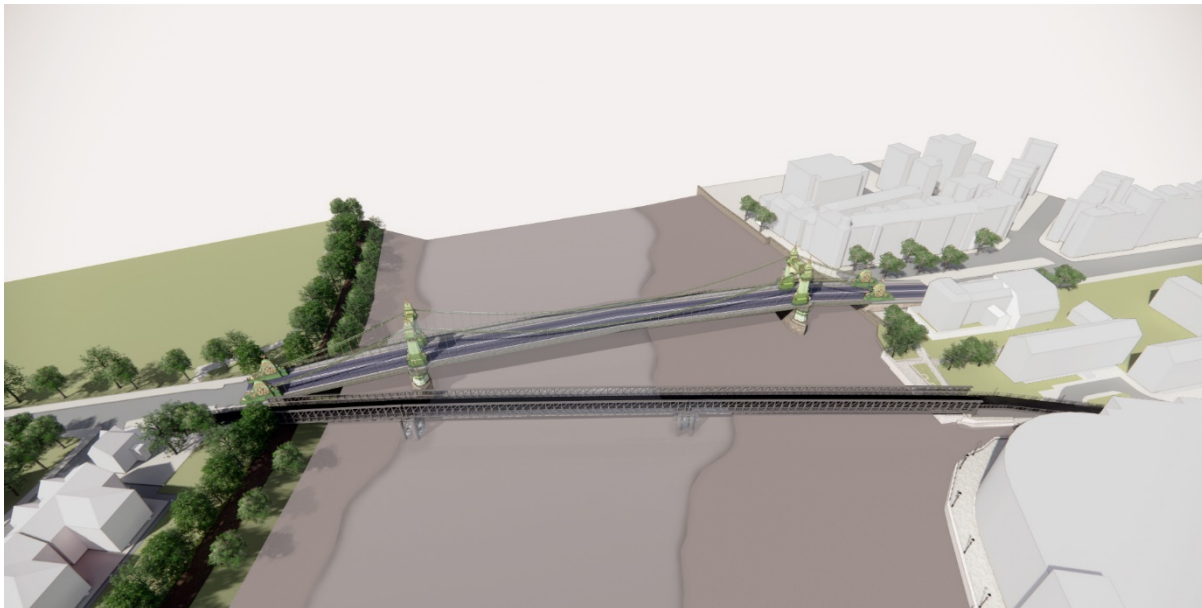


**Transport
for London**

Hammersmith Temporary Pedestrian and Cycle Bridge

Planning Application

Bat Survey Report



P e l l F r i s c h m a n n

Date: October 2020

Report Ref: 102963-PEF-BAS-ZZZ-REP-EN-00012

Revision Record					
Rev	Description	Date	Originator	Checker	Approver
P01	Draft Issue	27/05/2020	C Gilby	S Humphreys	S Camarao
P02	Draft Issue	29/05/2020	C Gilby	S Humphreys	S Camarao
P03	Additional surveys	08/10/2020	C Gilby	J Grant	S Camarao

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Appendix A Scheme Design

Appendix B Bat Survey Maps

1 Introduction

1.1 Introduction

This Bat Survey Report has been prepared by Pell Frischmann on behalf of Transport for London (TfL), in support of full planning applications for a Temporary Pedestrian and Cycle Bridge spanning the River Thames between Hammersmith (to the north) and Barnes (to the south). This Temporary Bridge will lie to the east of the Grade II* listed Hammersmith Bridge which is closed to road traffic.

1.2 Background

Hammersmith Bridge was closed to road traffic indefinitely in April 2019, as it was found to have critical faults which required an immediate reduction in its live loading to prevent a catastrophic collapse.

Hammersmith Bridge provides a major link between Richmond and Hammersmith and beyond. For people living south of the River Thames it provides access to London Underground services at Hammersmith station. Until its closure four bus routes provided regular services across the bridge. Alternative crossing points are a significant distance away with Chiswick and Putney Bridges both being approximately 4km to the west and east respectively.

Whilst Hammersmith Bridge remains open for pedestrians and cyclists the numbers have significantly increased with the termination of bus routes either end of the bridge. This situation is the subject of regular safety reviews which could result in the bridge being completely closed should the safety of users be compromised by a deterioration in the condition of the structure. There is consequently a need for a temporary crossing for pedestrian and cyclists in this location.

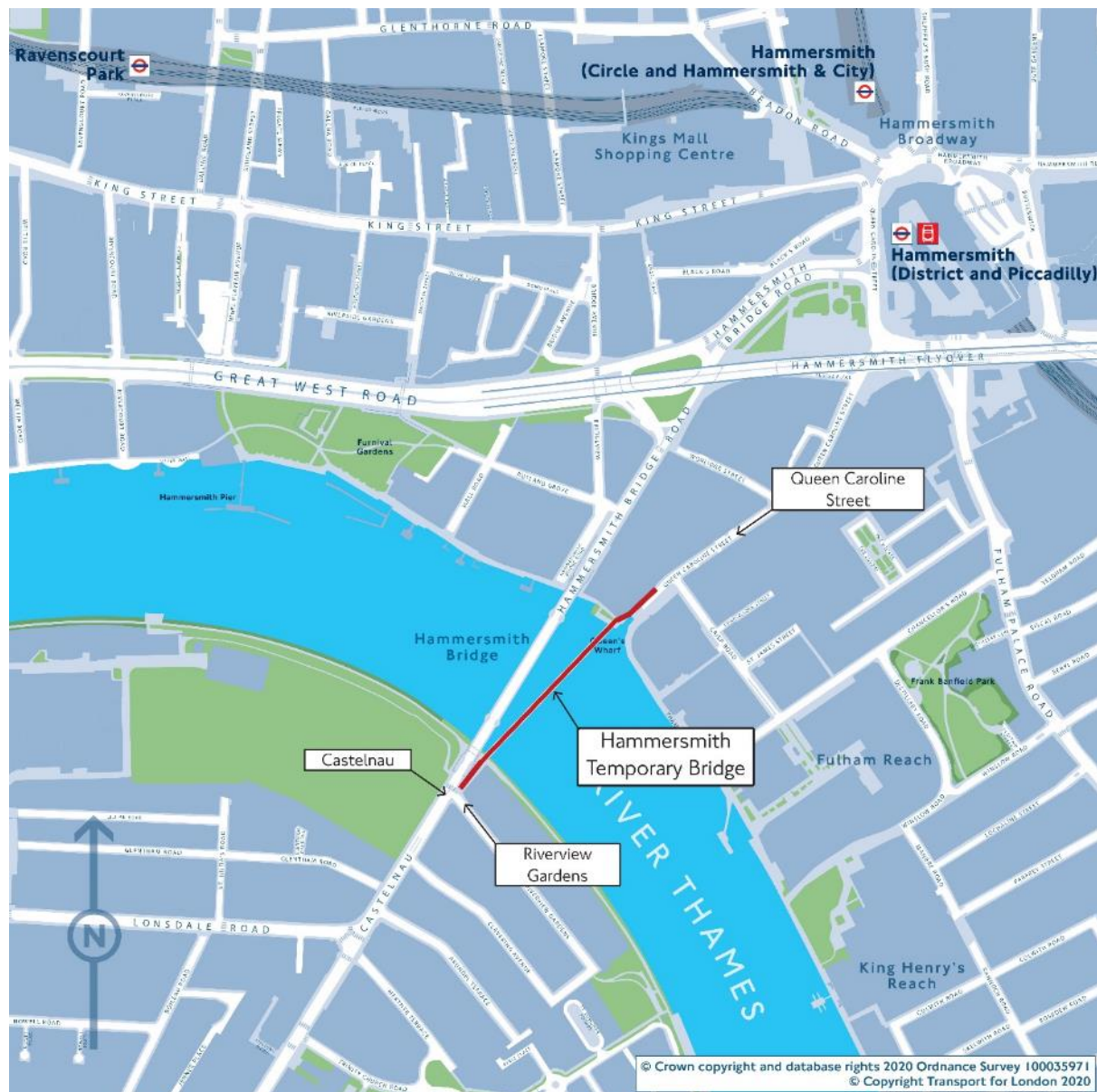
The objectives for this project are:

- To enable pedestrians and cyclists to be able to cross the River Thames safely during the restoration of the Hammersmith Bridge;
- To maintain connectivity across the River Thames in the vicinity of Hammersmith Bridge to allow uninterrupted crossing for pedestrians and cyclists until the restoration of the Hammersmith Bridge is complete; and
- To facilitate the efficient delivery of the restoration of Hammersmith Bridge.

1.3 The Scheme

The scheme comprises a Temporary Bridge (anticipated to be in place up to five years) to facilitate cycling and pedestrian movements across the River Thames between Hammersmith and Barnes (Richmond) whilst the Grade II* listed Hammersmith Bridge is closed. The Temporary Bridge will be removed upon the completion of the major repairs required to enable the Hammersmith Bridge to be fully reopened.

Figure 1 Location of proposed Temporary Bridge in context of surrounding environment



The construction of a Temporary Bridge supports the National Planning Policy Framework, the Mayor's Transport Strategy and London Plan, and at a local level the London Boroughs of Hammersmith and Fulham and Richmond's connectivity and movement policies, by providing a safe and usable structure for pedestrians and cyclists thus retaining cross river connections while the main bridge is closed and repaired.

The provision of a Temporary Bridge for the duration of the Hammersmith Bridge restoration supports the healthy streets approach by providing a safe, quiet, separated route for pedestrians and cyclists that is easy to use and designed with the needs of all users in mind.

1.4 Proposed Design

The proposed Temporary Bridge is a three-span modular steel structure supported on two piers in the River Thames (one within the LB of Richmond upon Thames and the other LB Hammersmith and Fulham) and two abutments (one on each side of the river). The total length of the Temporary Bridge will be approximately 290m (inclusive of ramps). The bridge will be segregated for cyclists and pedestrians, with lanes to be a minimum of 3m and 2m respectively.

Ramps will form the landing of the bridge on the north and south sides of the River Thames. The ramps will be constructed from fabricated structural steel on reinforced concrete pad foundations and compacted fill within a retaining wall structure. The grade of each ramp will be less than 1:20 or 5%.

The bridge deck will be constructed from the north side utilising a worksite extending from the River Thames over the southern end of Queen Caroline Street together with access, parking, servicing and landscaped areas of the Queen Caroline Estate. Following the construction of the abutments and river piers, the bridge deck will be pushed across the river towards the south side in sections and lowered into its final position on the piers and abutments.

Once the Temporary Bridge and ramps are complete, they will be tied into the existing pedestrian and cycle network to provide a seamless connection for pedestrians and cyclists. Seating will be provided at both ends of the Temporary Bridge. A temporary hard and soft landscaping scheme will be provided. The Thames Towpaths on both the north and south of the River Thames will be temporarily diverted during works but reopened during the operation of the temporary bridge.

Figure 2 Birds eye view of Hammersmith Bridge and proposed Temporary Bridge



As the bridge is to be temporary, all the elements are designed to be quickly installed and removed once the Hammersmith Bridge is refurbished and re-opened. Superstructure elements will be fully removed, including the bridge deck, abutments, ramps and pier structures. Most

substructure works will be fully removed with only the river piles and abutment piled foundations terminated below ground level, protected and covered.

The carriageway, crossovers, footways, Thames Paths and street furniture affected by the works will be reinstated (unless otherwise agreed with the boroughs). Hard and soft landscaping will be reinstated in accordance with a Landscape Design Strategy. Details of the strategy can be found in the Design and Access Statement that forms part of this application.

1.5 Scope of Works

The requirement for the bat surveys arose due to plans for the construction of a Temporary Pedestrian and Cycle Bridge across the River Thames adjacent to the existing Hammersmith Bridge and recommendations made in the Preliminary Ecological Appraisal (PEA) (report ref 102963-PEF-BAS-ZZZ-REP-EN-00004).

The scope of these surveys was to identify:

- The presence of commuting and foraging bats in the vicinity of the Site: and
- the potential for roosting bats within the existing Hammersmith Bridge.

All UK bat species are afforded full protection under European and British law which makes it an offence to deliberately kill or injure individuals, damage their breeding or resting places, and/or obstruct access to their breeding or resting places.

Sufficient ecological information is required to inform the site design and the proposed works. Reports will enable the project to satisfy current UK and European legal wildlife requirements, as well as national and local planning regulations. All public bodies have statutory obligations under the Natural Environment and Rural Communities Act 2006 to conserve and enhance biodiversity.

2 Legislation

Bats are a European Protected Species under the EC Habitats Directive. In England and Wales all bat species are fully protected under The Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981 (as amended).

Under this legislation, it is illegal to:

- intentionally or deliberately* kill, injure or capture (or take) bats;
- deliberately disturb bats (whether in a roost or not);
- recklessly disturb roosting bats or obstruct access to their roosts;
- damage or destroy bat roosts;
- possess or transport a bat or any part of a bat, unless acquired legally; and/or
- sell or exchange bats, or parts of bats.

* In a court, 'deliberately' will probably be interpreted as someone who, although not intending to capture/injure or kill a bat, performed the relevant action, being sufficiently informed and aware of the consequence which his/her action will most likely have.

Some bat species are also included on the S41 list of UK Biodiversity Action Plan species. Under the Natural Environment and Rural Communities (NERC) Act 2006, local authorities must consider the conservation of these species in planning decisions.

In many cases, it should be possible to avoid harming the bats or damaging/blocking access to their habitat. If this cannot be avoided, a mitigation licence will need to be granted from Natural England prior to works commencing. Planning Permission will need to be granted prior to this application.

3 Assessment Methodology

3.1 Preliminary Roost Assessment of Bridge, Trees and Buildings

Hammersmith bridge and the surrounding buildings and trees to be impacted by the proposals were assessed for their potential to support roosting bats in line with Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition (BCT, 2016). An assessment of the habitats within the vicinity of Hammersmith bridge for foraging bats was also made.

All structures and trees within the Site were surveyed from ground level for potential roosting features (PRFs).

Bats can use trees to rest, give birth, raise young and/or hibernate. Bat roosts may be found in the following features –

- Woodpecker holes, natural cracks and rot holes in trunks and branches;
- Frost cracks;
- Trunk and branch splits;
- Hollow sections of trunk and branches;
- Loose bark;
- Cavities beneath old root buttresses and coppice stools;
- Dense epicormic growth; and
- Dense ivy cover.

Trees were surveyed from ground level using binoculars to assess the presence of any of the above features. All trees to be removed during construction of the temporary footbridge were considered to be of negligible value to roosting bats and included 8 scattered trees on the northern side of the river.

3.2 Activity Transect Surveys and Static Detector Surveys

The methodology for the bat activity surveys followed that described in the Bat Conservation Trust Good Practice Guidelines (3rd Ed 2016) for transect surveys. As the habitat present within the Site was assessed to provide a low to moderate foraging habitat quality for bats, one transect survey per month season during 2020 summer season was completed, one of which included a combined dusk and dawn survey within the same 24 hour period.

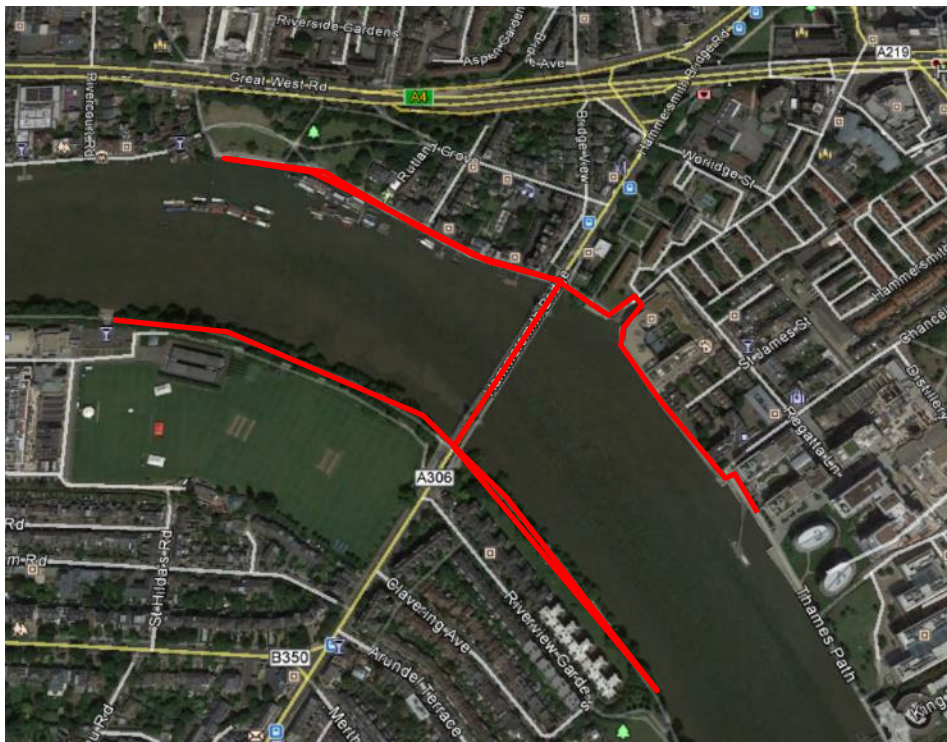
Surveys were completed between April and September 2020. An October survey was not undertaken in 2020.

This methodology involved identifying a suitable transect route which covered the habitats and features that have been identified from the habitat assessment as potentially providing suitable foraging and commuting habitat for bats. For this Site, one transect route was identified to cover these habitats. The transect route was approximately 2km long and covered both the bridge and lengths of both riverbanks during each of the survey visits for 2-3hours per survey in line with BCT guidelines. The location and extent of the transect are shown in Figure 3.

Surveyors were equipped with echometer touch and Android devices with recording capability and also Duet Batbox detectors.

To further comply with the Bat Conservation Trust Good Practice Guidelines (3rd Ed., 2016), static bat detectors were also deployed within the Site at a suitable location for five consecutive nights during each survey month.

Figure 3 Transect route surveyed.



Google Earth Imagery - License Number JCPMB2ZBMMAWBHP

3.3 Bridge Emergence Surveys

Emergence surveys were completed to determine if bats were using the existing Hammersmith Bridge structure for roosting.

One dusk emergence survey was undertaken for the Hammersmith Bridge on the 4th May 2020, with an additional survey of the northern abutments only on 18th June 2020. The dusk emergence survey involved:

- Experienced surveyors watching from pre-determined strategic locations for bats emerging from or returning to any potential access points, in particular the gaps in the roof or soffit boxes;
- the dusk survey beginning 15 minutes before sunset and continuing for 90 minutes thereafter; and
- surveyors carrying hand-held bat detectors and recording devices to capture any bat calls heard. The detectors used on these surveys included Bat Loggers, Echo Meter Touch Pro2 and Batbox Duets.

3.4 Surveyors

Bat activity surveys were led by C. Gilby (NE licence number 2020-46068-CLS-CLS).

The emergence surveys of Hammersmith Bridge were completed by experienced ecologists from Pell Frischmann and Ramm Sanderson Ltd on behalf of Pell Frischmann.

3.5 Accurate Lifespan of Ecological Data

The majority of ecological data remains valid for only short periods due to the inherently transient nature of the subject. The survey results contained in this report are considered accurate for approximately 2 years, notwithstanding any considerable changes to the site conditions.

It should also be noted that bats are highly mobile species and will move throughout the landscape using multiple available habitats/roost spaces. Therefore, bats may be found in suitable roosting spaces during any part of the year.

3.6 Ecological Survey Constraints and Limitations

The location of static bat recorders was constrained by the lack of suitable structures to safely attach them to on the northern embankment. In general, the static detectors were located alongside areas of optimum habitat and therefore it is not considered that any notable species would have been missed during the surveys.

Following the relaxation of Covid-19 restrictions, the pubs along the northern riverbank were open from the July survey onwards. This created a higher level of human noise disturbance throughout the survey than was observed during the April, May or June surveys when these pubs were closed. This is considered to be representative of the usual levels of social gatherings and is not considered to have created any notable changes in survey results. Therefore, it is not considered that any notable bat species would have been missed during the surveys.

Due to the closure of the bridge in mid-August (following the August bat survey) for health and safety reasons relating to the structural integrity of the bridge, for the September survey two transects were walked – one on the northern bank and one on the southern bank of the river. The route was as shown in Figure 3 but the bridge was unable to be crossed.

4 Results

4.1 Desk Study

The National Biodiversity Network (NBN) returned records for bats species including brown long-eared bat, (*Plecotus auratus*), common pipistrelle, (*Pipistrellus pipistrellus*), Nathusius's pipistrelle, (*Pipistrellus nathusii*), noctule, (*Nyctalus noctule*), serotine, (*Eptesicus serotinus*), soprano pipistrelle, (*Pipistrellus pygmaeus*) within 2km of the Site.

Greenspace Information for greater London (GiGL) returned records for bat species including brown long-eared bats, common pipistrelle, Nathusius's pipistrelle, noctule, serotine, soprano pipistrelle, Daubenton's bat (*Myotis daubentonii*) and lesser noctule (*Nyctalus leisleri*) within a 2km search radius of the Site.

A search of the MAGIC Interactive Map returned no European Protected Species Licences granted for bats within 2km of the Site.

4.2 Preliminary Roost Assessment and Habitat Assessment

4.2.1 Foraging Habitat

Tree lines and the linear feature of the River Thames were considered to provide commuting and foraging grounds for bat species. No potential roosting features were directly observed on mature trees to the south of the Hammersmith Bridge, though where ivy was present bat roosting features could have been concealed. No potential roosting features were identified within any of the trees to the north of the Hammersmith Bridge.

Bat species records were returned within the desk study, with seven species being identified present within the Barn Elms Wetland Centre to the south-east of the Site.

Based on Bat Conservation Trust Good Practice Guidelines (3rd Ed 2016), the Site has been assessed as of moderate habitat value for commuting and foraging bats.

4.2.2 Roosting Habitat

The Hammersmith Bridge is considered to provide low overall suitability overall for roosting bats. The bridge itself comprises the following –

- Metal work and towers – negligible potential for roosting bats. It is not considered that the metal sections of the bridge provide any suitable bat roosting features such as cracks or crevices
- Brickwork abutments and foundations – low potential for southern abutments, and moderate for the northern abutments. Some gaps in the brickwork of the bridge, with connectivity to linear features including the River Thames and tree lines. There is likely to be less traffic disturbance to these areas of the bridge, however the tides can become very high along this section of the Thames throughout the year and could periodically flood the foundations of the bridge in particular.

The small storage building within the car park of the Queen Caroline Estate on the northern side of the river were inspected for signs of bats. These are the only structures within the Site that are due to be demolished within the scheme. They were constructed of brick and breezeblock with limited suitable roosting features. These storage buildings, utilised for the bins of the neighbouring buildings, were considered to be in regular use with high levels of disturbance; they were therefore considered to be of negligible value for roosting bats.

4.3 Activity Transect Surveys

The bat activity transect surveys were undertaken on the 27th April 2020, 13th May 2020, 17th June 2020, 16th July 2020, 12th and 13th August 2020 and 10th September. Table 1 below table presents the weather conditions during the surveys undertaken. Table 2 - Table 8 details the full activity survey results for each survey completed.

Bat activity and diversity recorded within the Site was low during the surveys, with the majority of calls being foraging and commuting common pipistrelle, with some soprano pipistrelle. Noctule was recorded frequently during the July survey and once during the August survey only.

During the April survey, the first call was recorded at 21.10, almost an hour after sunset on the northern embankment of the River Thames. This was a single pass from a commuting common pipistrelle. Frequent to constant foraging activity was recorded along the tree lined footpaths along the southern embankment of the River Thames from 21.26 with most activity being common pipistrelle, with some soprano pipistrelle calls within gardens and trees to the south-east of the bridge abutments.

The May survey returned a much lower number of calls with the first call again being from a common pipistrelle on the northern side of the River Thames at 21.35 nearly an hour after sunset. Lower number of foraging common and soprano pipistrelle were then recorded on the southern side of the River Thames.

The June survey recorded no calls along the northern side of the River Thames and few calls of common and soprano pipistrelle along the southern footpath. The survey started at sunset with light rain continuing until approximately 10 minutes into the survey.

During the July survey noctule were recorded foraging and commuting along both the northern and southern riverbanks. Other calls were common and soprano pipistrelle in low numbers along the southern riverbank.

The August survey comprised of both a dusk and dawn survey. A single noctule was recorded by the Hammersmith Bridge during the dusk survey; all other calls were common and soprano pipistrelle.

The September survey comprised a dusk activity survey. Only a single common pipistrelle was recorded in the northern bank. Low numbers of common and soprano pipistrelle calls were recorded on the southern riverbank largely foraging calls amongst the trees of the bank.

High levels of light spill are present alongside the existing Hammersmith Bridge. Based on the survey results it is considered that the light tolerant pipistrelle species present are not being

impacted by this light spill. Figure 4 includes photographs that demonstrate the current levels of lighting.

It is therefore considered that the southern side of the River Thames is more valuable for light tolerant species than the northern side, with the matrix of gardens, tree lined footpath and river provided foraging habitat for low numbers of pipistrelle species recorded during each survey.

Table 1 Survey dates and prevailing weather conditions

Date	Weather Conditions
27/04/2020	16 °C, 95% cloud, light breeze with no rain.
13/05/2020	11 °C, 0% cloud, light breeze with no rain
17/06/2020	17 °C, 100% cloud, still, light rain for first 10 minutes of survey only
16/07/2020	22 °C, 95% cloud, still air with no rain
12/08/2020	29 °C, 50% cloud, light air with no rain
13/08/2020	23 °C, 100% cloud, light air with no rain
10/09/2020	22°C, 65% cloud, light air with no rain

Figure 4 Site Survey Photographs



View of the bridge showing existing light spill from the southern riverbank, taken during August 2020 survey

Figure 4 Site Survey Photographs



View of the bridge showing existing light spill from the northern riverbank (taken August 2020)



Light spill along the existing Hammersmith bridge carriageway (taken August 2020)



Light spill alongside the northern bridge abutments (taken August 2020)

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Table 2 Activity Survey Results - (Survey Number 1)

Project/Location	Hammersmith Bridge	Date	27/04/2020		
Lead Surveyor	C Gilby				
Sunset	20.18	Sunrise	N/A		
Survey Start	20.18	Survey End	22.20		
Start Temperature	16°C	End Temperature	12 °C		
Other Weather Conditions	95% cloud, light breeze with no rain.				
Time	Ref No	Species	Level of Activity* (Rare, Occasional Frequent, Constant)	Behaviour (eg foraging, commuting)	Details (eg direction of flight, heard not seen (HNS))
21.10	C	Common Pipistrelle	Rare	Commuting	HNS
21.26	E	Common Pipistrelle	Rare	Foraging	HNS
21.30	E - F	Common Pipistrelle	Occasional	Foraging	HNS
21.32	F	Common Pipistrelle	Frequent	Foraging	Within gardens
21.37	F	Soprano Pipistrelle	Frequent	Foraging	Within gardens
21.43	E	Common Pipistrelle	Occasional	Foraging	Along footpath
21.47	E	Common Pipistrelle	Constant	Foraging	Along footpath
21.47	E	Soprano Pipistrelle	Frequent	Foraging	Along footpath
22.08	E - H	Common Pipistrelle	Rare	Commuting	HNS

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

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Table 3 Activity Survey Results - (Survey Number 2)

Project/Location	Hammersmith Bridge	Date	13/05/2020		
Lead Surveyor	C Gilby				
Sunset	20.43	Sunrise			
Survey Start	20.40	Survey End	22.30		
Start Temperature	11 °C	End Temperature	10 °C		
Other Weather Conditions	0% cloud, light breeze with no rain				
Time	Ref No	Species	Level of Activity* (Rare, Occasional Frequent, Constant)	Behaviour (eg foraging, commuting)	Details (eg direction of flight, heard not seen)
21.35	C	Common Pipistrelle	Frequent	Foraging	Along footpath and edge of river
21.52	F - G	Soprano Pipistrelle	Constant	Foraging	Within gardens
22.15	E - H	Common Pipistrelle	Rare	Commuting	HNS

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

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Table 4 Activity Survey Results - (Survey Number 3)

Project/Location	Hammersmith Bridge	Date	17/06/2020		
Lead Surveyor	C Gilby				
Sunset	21.21	Sunrise			
Survey Start	21.21	Survey End	23.10		
Start Temperature	17 °C	End Temperature	13 °C		
Other Weather Conditions	100% cloud, still, light rain for first 10 minutes of survey only				
Time	Ref No	Species	Level of Activity* (Rare, Occasional Frequent, Constant)	Behaviour (eg foraging, commuting)	Details (eg direction of flight, heard not seen)
22.07	F – G	Soprano Pipistrelle	Rare	Foraging	Within gardens
22.15	H	Soprano Pipistrelle	Constant	Foraging	Foraging over footpath and tree line
22.33	H	Soprano Pipistrelle	Constant	Foraging	Foraging over footpath and tree line
22.51	E	Common Pipistrelle	Rare	Commuting	HNS
22.57	F	Soprano Pipistrelle	Occasional	Foraging	Within gardens
22.57	F	Common Pipistrelle	Rare	Commuting	Within gardens

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

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Table 5 Activity Survey Results - (Survey Number 4)					
Project/Location		Hammersmith Bridge	Date		16/07/2020
Lead Surveyor		C Gilby			
Sunset		21.11	Sunrise		N/A
Survey Start		21.11	Survey End		22.54
Start Temperature		22 °C	End Temperature		22 °C
Other Weather Conditions		95% cloud with still air			
Time	Ref No	Species	Level of Activity* (Rare, Occasional Frequent, Constant)	Behaviour (eg foraging, commuting)	Details (eg direction of flight, heard not seen)
21.56	J	Noctule	Rare	Commuting	HNS
22.08	C	Noctule	Constant	Foraging	HNS – considered likely foraging along the river
22.16	E	Soprano pipistrelle	Rare	Commuting	Single pass flying adjacent to the bridge to the southern bank tree line
22.23	G	Soprano pipistrelle	Rare	Foraging	HNS
22.27	F	Noctule	Rare	Commuting	HNS
22.34	E	Common pipistrelle	Occasional	Foraging	HNS
22.37	E	Noctule	Occasional	Foraging	HNS
22.42	E-H	Common pipistrelle	Rare	Foraging	HNS
22.44	H	Noctule	Rare	Commuting	HNS

22.45	H-I	Common pipistrelle	Occasional	Foraging	HNS
22.46	E	Noctule	Rare	Commuting	HNS

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

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Table 6 Activity Survey Results - (Survey Number 5)					
Project/Location		Hammersmith Bridge	Date		12/08/2020
Lead Surveyor		C Gilby			
Sunset		20.28	Sunrise		N/A
Survey Start		20.28	Survey End		22.31
Start Temperature		29 °C	End Temperature		27 °C
Other Weather Conditions		50% cloud, light air with no rain			
Time	Ref No	Species	Level of Activity* (Rare, Occasional Frequent, Constant)	Behaviour (eg foraging, commuting)	Details (eg direction of flight, heard not seen)
20.54	F – G	Soprano pipistrelle	Rare	Commuting	HNS
21.05	F – G	Common pipistrelle	Constant	Foraging	Over footpath and adjacent gardens
21.14	E	Common pipistrelle	Constant	Foraging	Along footpath
21.18	E - H	Common pipistrelle	Constant	Foraging	Along footpath
21.20	H	Common pipistrelle	Rare		HNS
21.25	E	Common pipistrelle	Rare		HNS
21.25	E	Noctule	Rare		HNS
21.52	E	Common pipistrelle	Rare		HNS
21.54	E – F	Soprano pipistrelle	Rare		HNS
22.00	F	Soprano pipistrelle	Occasional	Foraging	HNS
22.14	H	Soprano pipistrelle	Rare		HNS

22.15	H – I	Soprano pipistrelle	Raer		HNS
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* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

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Table 7 Activity Survey Results - (Survey Number 6)					
Project/Location		Hammersmith Bridge	Date		13/08/2020
Lead Surveyor		C Gilby			
Sunset		N/A	Sunrise		05.43
Survey Start		03.39	Survey End		05.43
Start Temperature		23 °C	End Temperature		21 °C
Other Weather Conditions		100% cloud, light air with no rain			
Time	Ref No	Species	Level of Activity* (Rare, Occasional Frequent, Constant)	Behaviour (eg foraging, commuting)	Details (eg direction of flight, heard not seen)
04.07	F	Common pipistrelle	Rare		HNS
04.18	H – I	Common pipistrelle	Constant	Foraging	2 bats
04.22	H	Common pipistrelle	Constant	Foraging	Along footpath
04.47	E	Common pipistrelle	Rare		HNS
04.49	F	Common pipistrelle	Constant	Foraging	Over footpath and adjacent gardens
04.55	F - E	Common pipistrelle	Occasional	Foraging	HNS
04.57	F – E	Common pipistrelle	Rare		HNS
05.00	E – H	Common pipistrelle	Constant	Foraging	2 bats
05.02	H - I	Soprano pipistrelle	Constant	Foraging	Along footpath
05.05	H – E	Common pipistrelle	Frequent	Foraging	HNS
05.13	H - E	Common pipistrelle	Constant	Foraging	Along footpath

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

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Table 8 Activity Survey Results - (Survey Number 7)

Project/Location	Hammersmith Bridge	Date	10/09/2020		
Lead Surveyor	J Grant				
Sunset	19:26	Sunrise	N/A		
Survey Start	19:26	Survey End	21:26		
Start Temperature	22°C	End Temperature	20°C		
Other Weather Conditions	65% cloud, light air with no rain				
Time	Ref No	Species	Level of Activity* (Rare, Occasional Frequent, Constant)	Behaviour (eg foraging, commuting)	Details (eg direction of flight, heard not seen)
20:04	E-H	Common pipistrelle	Constant	Foraging	Circular forage between trees
20:21	F	Soprano pipistrelle	Frequent	Foraging	Along footpath
20:28	E	Common pipistrelle	Constant	Foraging	Along footpath
20:32	E-H	Common pipistrelle	Constant	Foraging	Circular forage between trees
21:09	H	Common pipistrelle	Constant	Foraging	HNS
21:20	E	Common pipistrelle	Frequent	Foraging	Along footpath

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

4.4 Static Detector Surveys

The results of the static recorder surveys are detailed below in Table 9 and the location plan of static recorders is shown in Appendix B.

Areas of optimal habitat for foraging bats were selected as locations for the static detector monitoring. The location of the static detector was the same during each recording period as it was located in (i) optimal habitat location and (ii) closest to the landing of the Temporary Bridge.

Overall, a total of 6 species were recorded during the static detector surveys; common and soprano pipistrelle, occasional Nathusius' pipistrelle, noctule, Leisler's and a myotis species considered to be Daubenton's bats due to the waterside location.

Table 9 Static recorder Survey Results

Static Recorder Date	Species/activity recorded
April	Common pipistrelle – 55 calls Soprano pipistrelle – 65 calls
May	Common pipistrelle – 377 calls Soprano pipistrelle - 222 calls
June	No data – faulty unit
July	Common pipistrelle – 2 calls Soprano pipistrelle - 5 calls Noctule – 12 calls Leisler's – 5 calls
August	Common pipistrelle – 231 calls Soprano pipistrelle - 51 calls Pipistrelle species – 9 calls Noctule – 5 calls
September	Common pipistrelle – 408 calls Soprano pipistrelle – 134 calls Nathusius pipistrelle – 6 calls Pipistrelle species – 21 calls Noctule – 39 calls Myotis sp. – 3 calls

4.5 Bridge Emergence Surveys

4.5.1 Survey 1 – May dusk emergence survey

The May dusk bat emergence survey of Hammersmith bridge used a team of four ecologists to cover the two bridge abutments, all of which were equipped with EMT bat detectors with recording capabilities. Thermal imaging cameras were also used and positioned to cover each abutment.

The survey commenced at 20:15 with sunset at 20:32. The temperature at the start of the survey was 12°C. with a moderate/strong breeze and very little cloud cover. The breeze dropped by the end of the survey with temperatures staying at 11°C.

No bats emerged from the bridge structure. A single common pipistrelle made a brief foraging pass from east to west and back on the footpath, recorded by the surveyor at the east of the southern abutment, but didn't pass under or close to the bridge itself. No other bat passes were recorded.

4.5.2 Survey 2

The June survey used a team of 2 surveyors to survey the northern abutments of the bridge which were considered to have moderate potential for roosting bats. Surveyors were equipped with EMT bat detectors with recording capabilities. The survey commenced at 21.06 with sunset at 21.21. The temperature at the start of the survey was 17 °C with a light breeze and heavy cloud cover. The temperature at the end of the survey had dropped to 13 °C.

No bats emerged from the bridge abutments and no other activity was recorded during the survey.

5 Likely Impacts and Key Constraints

A total of 8 trees will be removed within the Queen Caroline Estate within the northern section of the Site, and one group of trees growing out of the existing riverbank wall along the southern section of the Site. These trees have all been assessed as negligible potential for roosting bats. Based on the results of the bat activity, static and emergence surveys, it is considered unlikely that the construction and operation of the temporary footbridge will cause any significant impacts on foraging or commuting bats.

The small storage buildings within the Queen Caroline Estate are the only built structure to be removed as part of the scheme. No impacts to roosting bats are considered to be likely due to the negligible suitability of this structure to roosting bats.

No impacts to roosting bats are anticipated from any of the refurbishment works to the Hammersmith Bridge.

The installation of additional lighting could have adverse effects on foraging and commuting bats if the mature trees and dark corridors along the riverbanks are subject to increased light spill. Mitigation options for the lighting scheme of the temporary footbridge have been outlined below to ensure that no major additional light spill is created. However, given the highly urbanised nature of the Site and its surroundings and the low numbers of light tolerant bat species recorded during the surveys, no significant impacts to foraging or commuting bats are considered to be likely from the temporary footbridge.

6 Mitigation for Protected Species

6.1 General Mitigation Measures

The ecological impact hierarchy requires that all steps are taken to avoid adverse impacts to habitats and species. Only where impacts cannot be avoided, steps should be taken to mitigate for any losses within the scheme boundary. In cases where all options for on-site mitigation have been exhausted, offsite compensation measures can be considered.

Under the current proposals there are not anticipated to be any impacts to protected or notable species other than through lighting levels (mitigation for which is set out below). If any protected species, including birds' nests, are found during the works, construction in that area should stop immediately and an ecological specialist should be consulted, in line with UK legislation.

6.2 Lighting Mitigation

To ensure that bats continue to use the commuting and foraging features that are to be retained, in particular along the southern footpath, it is strongly recommended that any lighting used within the scheme is kept to a minimum and is carefully designed in order to prevent light spilling onto important foraging and commuting features.

Artificial lighting has been found to affect the feeding behaviour of bats in two ways; one is the attraction that light from certain types of lamps has to a range of insects; the other is the presence of lit conditions (BCT, 2009). With regard to insects, the increase in insects around certain types of lighting can favour bats which are more tolerant to light (pipistrelle species, noctule, Leisler's Bat and serotine) but is thought to cause adjacent habitats to support fewer insects, potentially resulting in less food for species which are adverse to lighting (myotis, long-eared, barbastelle and horseshoe bats) (BCT, 2009). The presence of lighting in areas where these species forage and commute has also been shown to significantly affect their typical foraging and commuting routes with lighting acting as a barrier for some species which they will not cross (BCT, 2009).

The following considerations should be made within the final scheme, including during construction -

- **Type of lamp (light source)** - The impact on bats can be minimised by the use of low-pressure sodium lamps or high-pressure sodium instead of mercury or metal halide lamps where glass glazing is preferred due to its UV filtration characteristics.
- **Luminaire and light spill accessories** - Lighting should be directed to where it is needed, and light spillage avoided. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only. Planting can also be used as a barrier, or manmade features that are required as part of the works can be positioned so as to form a barrier.
- **Lighting column** - The height of lighting columns in general should be as short as is possible as light at a low level typically reduces the ecological impact. However, there are cases where a taller column will enable light to be directed downwards at a more acute angle and thereby reduce horizontal spill. For pedestrian lighting this can take the

form of low-level lighting that is as directional as possible and below 3 lux at ground level. The acceptable level of lighting may vary dependent upon the surroundings and on the species of bat affected.

- **Predicting where the light cone and light spill will occur** - There are lighting design computer programs that are widely in use which produce an image of the site in question, showing how the area will be affected by light spill when all the factors of the lighting components listed above are taken into consideration. This should be a useful tool to inform the mitigation process.
- **Light levels** - The light should be as low as guidelines permit. If lighting is not needed, then it shouldn't be used.
- **Timing of lighting** - The times during which the lighting is on should be limited to provide some dark periods, particularly during the peak in bat activity (20.00-23.00hrs between April and September).

6.3 Liaison with the Scheme Lighting Design

Liaison with the lighting designers has confirmed that ecology has been accounted for within the scheme design and includes the above considerations where health and safety allow.

Full details of lighting, including lux contour plans, are with the Lighting Design Report (report reference P0206-1001-04).

An extract from the Lighting Design Report (report reference P0206-1001-04) states –

'For the Temporary Bridge, lighting levels have been developed to also satisfy several other requirements including ILP GN01 For the Reduction of Obtrusive Light, and ILP GN08 Bats and Artificial Lighting. Based on the low numbers of light tolerant species recorded during the bat activity surveys, the above mitigation is considered to be sufficient to avoid impacts to foraging and commuting bats present within the Site and zone of influence'.

The lighting report has also produced calculations that provide lux lines to match the requirements of ILP GN08, which details guidance for lighting in the vicinity of bats.

6.4 Roosting Bats

Typically, bat roosting survey data is only valid for 2 years as roosting bats can frequently change roosting locations on a yearly basis and the condition of structures can deteriorate over time. Therefore, if works to the bridge abutments are delayed beyond April 2022, it is recommended that an additional emergence survey is conducted to confirm the continued absence of roosting bats.

In the event that roosting bats are identified during the survey, a European Protected Species Licence (EPSL) will be required from Natural England prior works continuing.

7 Summary

Bat activity, static detector and emergence surveys have been undertaken to fulfil the requirements identified in the Preliminary Ecological Appraisal Reports (report ref PEA 102963-PEF-BAS-ZZZ-REP-EN-00004).

Tree lines and the linear feature of the River Thames are considered to provide commuting and foraging grounds for bat species. Mature trees to the south of the Hammersmith Bridge could also have concealed bat roosting features behind ivy where it is present. No potential roosting features were identified within any of the trees to the north of the Hammersmith Bridge. Trees were surveyed from ground level using binoculars to assess the presence of any of the above features. All trees to be removed during construction of the temporary footbridge are considered to be of negligible value to roosting bats.

The Hammersmith Bridge was considered to provide low suitability overall for roosting bats and comprises of metal work and towers (negligible roosting potential) and brickwork abutments and foundations (low-moderate roosting potential). The surrounding river corridor was considered to have moderate potential for commuting and foraging bats.

A total of three bat species were recorded during the activity and emergence surveys; these were for common pipistrelle, soprano pipistrelle and noctule. Overall, a total of 6 species were recorded during the static detector surveys; common and soprano pipistrelle, occasional Nathusius' pipistrelle, noctule, Leisler's and a myotis species considered to be Daubenton's bats due to the waterside location.

No bats were recorded emerging from the Hammersmith Bridge.

Mitigation recommendations have been made in relation to bats and lighting and liaison with the lighting design team to ensure appropriate mitigation is incorporated into the bridge design.

8 Ecological Report Limitations

The information reported herein is based only, on the interpretation of data collected during the desk study investigations and the site visit. This work pertains specifically to the identification of protected species on the proposed site. Information provided to Pell Frischmann by Greenspace Information for Greater London and other statutory information sources has been accepted as being accurate and valid.

This report has been prepared by Pell Frischmann with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client.

The evaluation and conclusions do not preclude the existence of protected species, which could not reasonably have been revealed by the comprehensive desk studies and site visit. Hence, this report should be used for information purposes only and should not be construed as a comprehensive characterisation of all site habitats.

In addition, this report details only the conditions on site, at the time of reporting. The dynamic nature of the natural environment will result in changes to the surrounding environment as seasons change. No responsibility is taken by Pell Frischmann to the existence of additional species identified on this site at a later date.

This report has been prepared solely for the use of Transport for London and may not be relied upon by other parties without written consent from Pell Frischmann. In addition, it must be understood that this report does not constitute legal advice.

Pell Frischmann disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work.

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Appendix A

Scheme Design

Appendix B

Bat Survey Maps

Appendix 3: Hammersmith Temporary Pedestrian and Cycle Bridge. Wintering Bird Survey Report (Pell Frischmann, 2020).

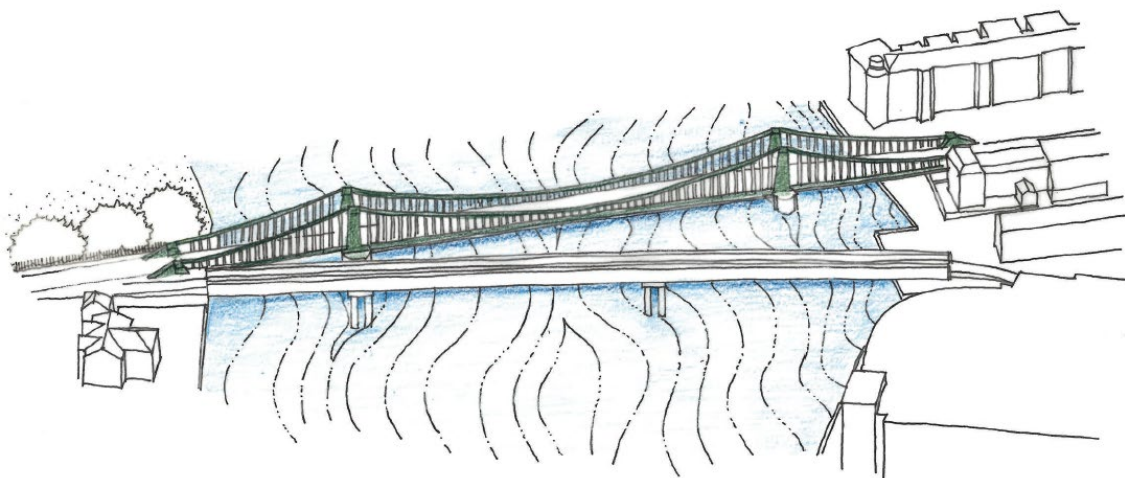


**Transport
for London**

Temporary Pedestrian and Cycle Bridge

Wintering Bird Survey Report

P e l l F r i s c h m a n n



Date: March 2020

Report Ref: 102963-PEF-BAS-ZZZ-REP-EN-00006

Revision Record					
Rev	Description	Date	Originator	Checker	Approver
P01	Initial Issue	03-03-2020	C Gilby / S Pagett	S Camarao	R Madams
P02	Update Following Comment	19-03-2020	C Gilby / S Pagett	S Camarao	R Madams

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Appendices

Appendix A - Description of Structure and General Arrangement

Appendix B Bird Species Codes

Appendix C Wintering Bird Survey Maps

1 Introduction

Pell Frischmann have been commissioned by Transport for London (TfL) to undertake wintering bird surveys to determine the importance of the site for wintering birds, where a Temporary Pedestrian and Cycle Bridge will be constructed adjacent to the existing Hammersmith Bridge, London (hereafter, referred to as the Site).

These surveys have been undertaken to fulfil the protected species survey requirements identified in the Preliminary Ecological Appraisal (PEA) (report ref Mott McDonald 383488AD04 Eco1 2) completed in February 2018 to inform bridge refurbishment works of Hammersmith Bridge, and the subsequent PEA for the Temporary Bridge, undertaken by Pell Frischmann dated February 2020 (report ref. 102963-PEF-BAS-ZZZ-REP-EN-00004).

The Temporary Pedestrian and Cycle Bridge is required as a direct diversion route over the River Thames for pedestrians and cyclists whilst the existing Grade II* listed Hammersmith Bridge is closed due to major refurbishment works. This Temporary Bridge will provide the safest access and most feasible way for pedestrians and cyclists to cross the river.

1.1 Survey Scope

The key objective of the wintering bird surveys was to establish the wintering bird assemblages within the Site. This is vital in informing and determining the design and scale of any mitigation measures that might be proposed and enabling an accurate assessment of the impacts of the proposals on wintering birds. The aims and objectives of surveys were therefore to:

- Determine the species of wintering birds on the site;
- Establish the abundance of these bird species on the Site;
- Establish the typical locations of these bird species within and around the Site; and
- Provide sufficient data to enable a robust assessment of the effects of the proposals to be made within this report.

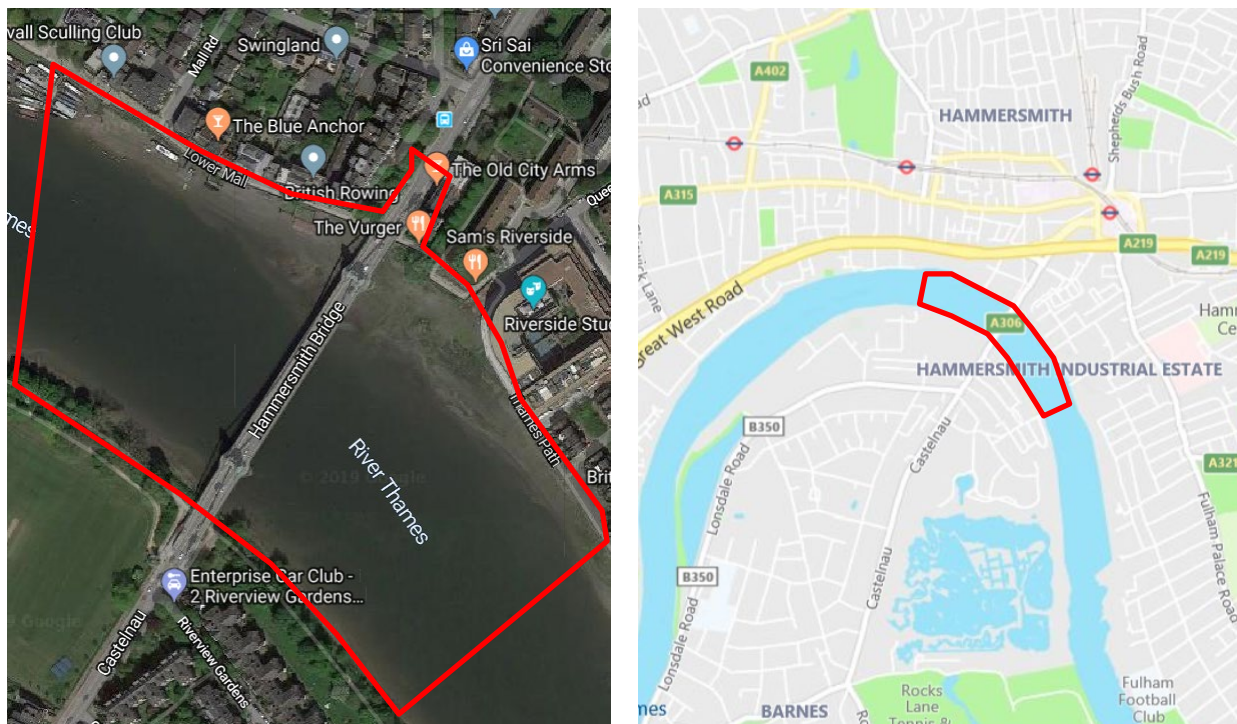
This information was used to identify the following (where appropriate):

- The need for further survey work required to fully assess the impacts associated with development proposals;
- The need for mitigation and/or compensation measures which should be incorporated into the design of the proposed development; and
- Recommendations for enhancement measures above and beyond the need to mitigate adverse effects in order to encourage wintering birds onto the site post development.

1.2 Study Area

The Site has its location centred at Hammersmith Bridge (TQ229780), a Grade II* listed structure across the River Thames, London. The Hammersmith Bridge is approximately 223m in length and links the north and south banks of the river between the London Borough of Hammersmith and Fulham to the north, and the London Borough of Richmond to the south. The wider area is built up and urban, with the River Thames running west to east below the bridge and mudflats present at low tide. The study area consists of the Site as described above and is shown in Figure 1.

Figure 1: Site Location Plan and Study Area for the Wintering Bird Surveys



Google Earth Imagery - License Number JCPMB2ZBMMAWBHP

Ordnance Survey Maps - License Number 100004912

1.3 Proposed Development

The Temporary Bridge will be constructed adjacent to the Hammersmith Bridge and will provide a pedestrian and cycle crossing point over the River Thames whilst refurbishment work is being undertaken to the Hammersmith Bridge.

The need for a Temporary Bridge has been determined due to the significant distance between other pedestrian crossing points at Chiswick Bridge approximately 3.8km to the west and Putney Bridge approximately 3km to the east of the Site.

A detailed description of the structure and design working life is included in Appendix A. The approximate location of the proposed Temporary Bridge is presented in Figure 2.

Figure 2: Approximate location of the footbridge



2 Legislation

The Wildlife and Countryside Act 1981 (as amended) is the principal legislation affording protection to UK wild birds. Under this legislation all birds, their nests and eggs are protected by law and it is an offence, with certain exceptions, to recklessly or intentionally:

- Kill, injure or take any wild bird;
- Take, damage or destroy the nest of any wild bird while in use or being built; and
- Take or destroy the egg of any wild bird.

Species listed on Schedule 1 of the Wildlife and Countryside Act, 1981 (as amended) are specially protected to avoid disturbance of an active nest.

The provisions of the Wild Birds Directive (Council Directive 79/409/EEC), are transposed into national law by means of Part I of the Wildlife and Countryside 1981 as amended and the Habitats Regulations 2010, and equivalent devolved legislation. A wide range of schemes have also been adopted to protect wild birds, including the UK Biodiversity Action Plan, bird monitoring schemes and bird conservation research.

In addition to statutory protection, some bird species are classified according to their conservation status, such as their inclusion on the Red and Amber lists of Birds of Conservation Concern 4 (BoCC) in the UK (Eaton *et al* 2015):

- Red list (high conservation concern) species are those that are Globally Threatened according to IUCN (International Union for Conservation of Nature) criteria; those whose population has declined rapidly (50% or more) in recent years; and those that have declined historically and not shown a substantial recent recovery.
- Amber list (medium conservation concern) species are those with an unfavourable conservation status in Europe; whose population or range has declined moderately (between 25% and 49%) in recent years; whose population has declined historically but made a substantial recent recovery; rare breeders; and those with internationally important or localised populations.
- Green list (low conservation concern) species fulfil none of the above criteria.

Certain species have also been identified as species of principal importance listed in Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

The 'UK Post-2010 Biodiversity Framework' (JNCC & DEFRA, 2012), published in July 2012, also sets out a framework of priorities for UK-level work for the Convention on Biological Diversity, to which the UK is a signatory. Covering the period 2011-2020, this framework replaces the original UK Biodiversity Action Plan (UK BAP, 2004) system and now the work is focussed on the separate countries (England, Scotland, Northern Ireland and Wales). The overall aim remains to protect a number of rare species and habitats and reverse the declines of more widespread but declining species and habitats, and so currently many of the species and habitats in the UK BAP still form the basis of the biodiversity work carried out in the devolved

countries. Furthermore, the Local Biodiversity Action Plans (LBAP) are still in place under this framework.

3 Assessment Methodology

3.1 Desktop Study

Greenspace information for Greater London (GiGL) and the National Biodiversity Network (NBN) database was searched for local records for notable and protected species from 2km of the site boundary within the last 20 years.

Reference was also made to Ordnance Survey maps and aerial photography, which were used to determine the presence of open water and ponds in the area and provide information on land use and habitat connectivity throughout the area.

3.2 Field Survey

The survey methodology deployed was based on the Wetland Bird Survey (WeBS) (Gilbert *et al.* 1998) which is a standard methodology for wintering birds including non-breeding waterfowl. This method involved an extensive search of the Site by observing birds from vantage points on the Hammersmith Bridge.

Observations of bird species (by sight or sound) within the Site were noted on the survey (field) map using standard species and activity recording codes (see Appendix B for Codes and Appendix C for maps of the surveys). Records were also made of any bird species observed on land adjacent to the survey area or flying over the site. Birds in this category would not be included in the assessment, unless it was obvious that they were moving between different parts of the survey area.

Ordnance Survey maps, aerial photography and site plans were used to establish the general transect route for the wintering bird survey. This would cover vantage points and all boundaries within the site. Four surveys were carried out between October and February. Surveys were completed in approximately 3 hours each and began 2 hours before low tide to ensure the mudflats were visible for most of the survey.

Bird surveys were not undertaken in unfavourable conditions such as heavy rain, which may have negatively affected the results.

The surveys were led by Steven Pagett who has extensive experience of various bird survey techniques and holds licences from Natural England (NE) and the British Trust for Ornithology (BTO) for Barn owls and other Schedule 1 bird species that allow detailed survey work that might be considered disturbance for less experienced/qualified surveyors. The dates and weather conditions during these survey visits are detailed below in Table 1.

Table 1: Wintering bird survey dates and weather conditions

Date	Cloud Cover	Rain	Wind	Visibility
31/10/2019	40%	None	Light breeze	Good
20/11/2019	30%	None	Light breeze	Good
03/12/2019	10%	None	None	Good
20/01/2020	0%	None	None	Good
11/02/2020	10%	None	Strong breeze	Good

The conservation value of bird populations has been assessed using two separate approaches: nature conservation value and conservation status. The Chartered Institute of Ecology and Environmental Management (CIEEM) guidance on ecological impact assessment assesses nature conservation value within a geographical context (CIEEM, 2018). To attain each level of value, an ornithological resource or one of the features (species population or assemblage of species) should meet the criteria set out in Table 2 below. In some cases, professional judgement may be required to increase or decrease the allocation of specific value, based upon local knowledge.

Table 2: Definition of Terms Relating to Nature Conservation Value

Nature Conservation Value	Examples of Selection Criteria
International	A species which is part of the cited interest of a Special Protected Area (SPA) and which regularly occurs in internationally or nationally important numbers. A species present in internationally important numbers (>1% of international population).
National	A species which is part of the cited interest of a Site of Special Scientific Interest (SSSI) and which regularly occurs in nationally or regionally important numbers. A nationally important assemblage of breeding or overwintering species. A species present in nationally important numbers (>1% UK population). A rare breeding species (<300 breeding pairs in the UK).
Regional	Species listed as priority species in the UK BAP, which are not covered above, and which regularly occurs in regionally important numbers. Sustainable populations of species that are rare or scarce within a region. Species on the Birds of Conservation Concern (BoCC) Red List and which regularly occurs in regionally important numbers.
County	Species listed as priority species in the UK BAP, which are not covered above, and which regularly occurs in county important numbers. Species present in county important numbers (>0.5% of national population). Sustainable populations of species that are rare or scarce within a county, or listed in a county BAP. A site designated for its county important assemblage of birds. Species on the BoCC Red List and which regularly occur in county important numbers.

Nature Conservation Value	Examples of Selection Criteria
District	<p>Species listed as priority in the UK BAP, which are not covered above, and are rare in the locality or in the relevant Natural Area profile.</p> <p>Species present in numbers just short of county importance.</p> <p>Sustainable populations of species which are rare or scarce within the locality.</p> <p>A site whose designation falls just short for inclusion for its county important assemblage of birds.</p> <p>Other species on the BoCC Red List and which are considered to regularly occur in district important numbers.</p>
Local	<p>Other species of conservation interest (e.g. all other species on the BoCC Red and Amber List and UK BAP which are not covered above) regularly occurring in locally sustainable populations.</p>
Site	<p>All other BoCC Green-listed common and widespread species.</p>

When defining Magnitude of impacts, the CIEEM guidelines state the following “magnitude refers to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population”. The effects of the scheme have been quantified wherever possible.

Magnitude will take into account the extent of the impact over the habitat area, the duration of any activity which will impact on species or habitats, and the reversibility of the impact (i.e. will the impact be temporary or reversible over a given length of time).

The magnitude of impacts will vary according to their timing and frequency. If impacts coincide with critical life stages or seasons (such as the wintering bird season). Impacts can be avoided through constraints in relation to timings of works. Increased site use may also lead to more frequent disturbance to wildlife which will also affect the magnitude of impacts.

Table 3: Typical Descriptors of Impacts

Descriptor	Definition
Extent	The spatial or geographic area over which the impact/effect may occur
Magnitude	The ‘size’, ‘amount’, ‘intensity’ and ‘volume’. Magnitude should be quantified where possible e.g. the amount of habitat loss, percentage change to habitat loss, percentage change to habitat area and percentage decline in species.
Duration	Relation to ecological characteristics (such as a species’ lifecycle) as well as human timeframes. The duration of an activity may differ from the duration of the resulting effect caused by the activity.
Frequency and timing	The number of times an activity occurs will influence the resulting effect. The timings of an activity or change may result in an impact if it coincides with critical life-stages or seasons.
Reversibility	Irreversible effect is one from which recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it. A reversible effect is possible, or which may be counteracted by mitigation.

The significance of an adverse effect or a beneficial result is the product of the magnitude of the effect and the value or the sensitivity of the ecological feature affected. The significance criteria applied to the ecological assessment are detailed in Table 4 below.

Table 4: Likely Significance / Effects Criteria

Significance	Criteria
Large Adverse	<p>The proposal (either on its own or with other proposals) may adversely affect the integrity of the feature, in terms of the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the population levels of species of interest. Loss of favourable conservation status (FCS) of a legally protected species or site. Loss or damage to a population of nationally rare or scarce species.</p> <p>Examples include death of a population, destruction of habitat, prevention of breeding, permanent population isolation and/or destruction of a food supply.</p>
Moderate Adverse	<p>The feature's integrity will not be adversely affected, but the effect on the feature is likely to be significant in terms of its ecological objectives. If, in the light of full information, it cannot be clearly demonstrated that the proposal will not have an adverse effect on integrity, then the impact should be assessed as major adverse. Loss of a key feature of local importance.</p> <p>Examples include reduction in size of a population, reduction in the size of available habitat and/or food supply, and/or restriction of access to further habitats.</p>
Slight Adverse	<p>Temporary disturbance to a site of county value but no permanent damage. A minor impact on legally protected species but no significant habitat loss or reduction in FCS. A minor impact on populations of nationally rare or scarce species or species which are notable at a regional or county level.</p> <p>Examples include small scale reduction in size of a large population, Slight restriction of local population range in an abundant species, disturbance but not destruction of access to further habitats.</p>
Neutral	<p>No effects on sites of international, national or county importance. Temporary disturbance or damage to a small part of features of local importance. Loss of or damage to land of negligible nature conservation value.</p>
Slight Beneficial	<p>A small but clear and measurable gain in general wildlife interest.</p>
Moderate Beneficial	<p>Impacts which provide a net gain for wildlife overall in the form of larger scale new habitats.</p>
Large Beneficial	<p>Impacts which provide an increase in favourable conservation status (FCS) of a legally protected species or site.</p>

3.3 Survey Constraints and Limitations

The survey times were constrained by the tide times to ensure that mudflats were visible. This meant that surveys could not always be carried out at set times each month, or during the early parts of the day. This is not considered to be a constraint to the species surveyed as most would have been present to forage within the mudflats for invertebrates.

During the November survey the western side of the Hammersmith Bridge was closed to pedestrian access and therefore could not be used as a vantage point during the survey. During the January and February surveys the eastern side of the bridge were closed to pedestrian access. Alternative vantage points were used from the riverbank and Thames footpath and therefore this is not considered to be a constraint to the survey.

The River Thames is subject to a considerable amount of recreational disturbance within the Site including dog walkers, rowers and kayaks, and motorboats. Bird species present are assumed to be accustomed to these levels of disturbance and therefore disturbance is not considered to be a constraint to the survey results in this location.

4 Desk Study

NBN have returned over 130,000 records for birds covering 181 species within a 2km search radius of the Site. GiGL returned records for 85 notable bird species within a 2km search radius of the Site as presented below in Table 5.

The proximity of the Site to the Barn Elms Wetland Centre Site of Special Scientific Interest (SSSI) is considered to be a major contributor to these records. This SSSI is designated due to a mosaic of wetland habitat which support nationally important wintering birds including shoveler (*Anas clypeata*) and significant numbers of gadwall (*Anas strepera*). The site also supports 'an outstanding assemblage of regularly breeding birds associated with lowland open waters and their margins' including little grebe (*Tachybaptus ruficollis*), great crested grebe (*Podiceps cristatus*), grey heron (*Ardea cinerea*), mute swan (*Cygnus alor*), gadwall, pochard (*Aythya farina*), tufted duck (*Aythya fuligula*), little ringed plover (*Charadrius dubius*), redshank (*Tringa tetanus*), common tern (*Sterna hirundo*), sedge warbler (*Acrocephalus schoenobaenus*), reed warbler (*Acrocephalus scirpaceus*) and reed bunting (*Emberiza schoeniclus*). Most of this SSSI consists of standing open water, grazing marsh and reedbed, with some carr woodland, scrub and mesotrophic woodland.

Table 5: Birds Identified within the Data Search

Species	Conservation Status
Arctic Skua <i>Stercorarius parasiticus</i>	BoCC Red List
Avocet <i>Recurvirostra avosetta</i>	W&CA Schedule 1 Part 1
Bewick's Swan <i>Cygnus columbianus</i>	W&CA Schedule 1 Part 1
Bittern <i>Botaurus stellaris</i>	W&CA Schedule 1 Part 1
Black redstart <i>Phoenicurus ochruros</i>	BoCC Red List, W&CA Schedule 1 Part 1
Black tern <i>Chlidonias niger</i>	W&CA Schedule 1 Part 1
Black-necked grebe <i>Podiceps nigricollis</i>	BoCC Red List, W&CA Schedule 1 Part 1
Black-tailed godwit <i>Limosa limosa</i>	BoCC Red List, W&CA Schedule 1 Part 1
Blue-headed wagtail <i>Motacilla flava subsp. Flava</i>	BoCC Red List
Bluethroat <i>Luscinia svecica</i>	BoCC Red List
Brambling <i>Fringilla montifringilla</i>	W&CA Schedule 1 Part 1
Common crossbill <i>Loxia curvirostra</i>	W&CA Schedule 1 Part 1
Common scoter <i>Melanitta nigra</i>	BoCC Red List, W&CA Schedule 1 Part 1
Cuckoo <i>Cuculus canorus</i>	BoCC Red List
Curlew <i>Numenius arquata</i>	BoCC Red List
Fieldfare <i>Turdus pilaris</i>	BoCC Red List, W&CA Schedule 1 Part 1
Firecrest <i>Regulus ignicapilla</i>	W&CA Schedule 1 Part 1
Garganey <i>Anas querquedula</i>	W&CA Schedule 1 Part 1
Grasshopper warbler <i>Locustella naevia</i>	BoCC Red List

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Species	Conservation Status
Great northern diver <i>Gavia immer</i>	W&CA Schedule 1 Part 1
Green sandpiper <i>Tringa ochropus</i>	W&CA Schedule 1 Part 1
Greenshank <i>Tringa nebularia</i>	W&CA Schedule 1 Part 1
Grey partridge <i>Perdix perdix</i>	BoCC Red List
Grey Wagtail <i>Motacilla cinerea</i>	BoCC Red List
Grey-headed wagtail <i>Motacilla flava subsp. Thunbergi</i>	BoCC Red List
Hen Harrier <i>Circus cyaneus</i>	BoCC Red List, W&CA Schedule 1 Part 1
Herring gull <i>Larus argentatus</i>	BoCC Red List
Honey buzzard <i>Pernis apivorus</i>	W&CA Schedule 1 Part 1
House sparrow <i>Passer domesticus</i>	BoCC Red List
Kingfisher <i>Alcedo atthis</i>	W&CA Schedule 1 Part 1
Kittiwake <i>Rissa tridactyla</i>	BoCC Red List
Lapland bunting <i>Calcarius lapponicus</i>	W&CA Schedule 1 Part 1
Lapwing <i>Vanellus vanellus</i>	BoCC Red List
Leach's Petrel <i>Oceanodroma leucorhoa</i>	W&CA Schedule 1 Part 1
Lesser redpoll <i>Carduelis cabaret</i>	BoCC Red List
Lesser spotted woodpecker <i>Dendrocopos minor</i>	BoCC Red List
Linnet <i>Linaria cannabina</i>	BoCC Red List
Little gull <i>Hydrocoloeus minutus</i>	W&CA Schedule 1 Part 1
Little ringed plover <i>Charadrius dubius</i>	W&CA Schedule 1 Part 1
Little tern <i>Sternula albifrons</i>	W&CA Schedule 1 Part 1
Marsh Harrier <i>Circus aeruginosus</i>	W&CA Schedule 1 Part 1
Marsh tit <i>Poecile palustris</i>	BoCC Red List
Mediterranean gull <i>Larus melanocephalus</i>	W&CA Schedule 1 Part 1
Merlin <i>Falco columbarius</i>	BoCC Red List, W&CA Schedule 1 Part 1
Mistle thrush <i>Turdus viscivorus</i>	BoCC Red List
Montagu's Harrier <i>Circus pygargus</i>	W&CA Schedule 1 Part 1
Nightingale <i>Luscinia megarhynchos</i>	BoCC Red List
Osprey <i>Pandion haliaetus</i>	W&CA Schedule 1 Part 1
Pied flycatcher <i>Ficedula hypoleuca</i>	BoCC Red List
Pochard <i>Aythya farina</i>	BoCC Red List
Red kite <i>Milvus milvus</i>	W&CA Schedule 1 Part 1
Red-backed grebe <i>Podiceps grisegena</i>	BoCC Red List
Red-backed shrike <i>Lanius collurio</i>	BoCC Red List, W&CA Schedule 1 Part 1

Species	Conservation Status
Red-throated diver <i>Gavia stellate</i>	W&CA Schedule 1 Part 1
Redwing <i>Turdus iliacus</i>	BoCC Red List, WCA Schedule 1 Part 1
Ring ouzel <i>Turdus torquatus</i>	BoCC Red List
Ringed plover <i>Charadrius hiaticula</i>	BoCC Red List
Ruff <i>Calidris pugnax</i>	BoCC Red List, W&CA Schedule 1 Part 1
Scaup <i>Aythya marila</i>	BoCC Red List, W&CA Schedule 1 Part 1
Serin <i>Serinus serinus</i>	BoCC Red List
Shag <i>Phalacrocorax aristotelis</i>	BoCC Red List
Shore lark <i>Eremophila alpestris</i>	W&CA Schedule 1 Part 1
Skylark <i>Alauda arvensis</i>	BoCC Red List
Slavonian Grebe <i>Podiceps auratus</i>	BoCC Red List, W&CA Schedule 1 Part 1
Snow bunting <i>Plectrophenax nivalis</i>	W&CA Schedule 1 Part 1
Song thrush <i>Turdus philomelos</i>	BoCC Red List
Spanish wagtail <i>Motacilla flava subsp. iberiae</i>	BoCC Red List
Spoonbill <i>Platalea leucorodia</i>	W&CA Schedule 1 Part 1
Spotted crane <i>Porzana porzana</i>	W&CA Schedule 1 Part 1
Spotted flycatcher <i>Muscicapa striata</i>	BoCC Red List
Starling <i>Sturnus vulgaris</i>	BoCC Red List
Stone-curlew <i>Burhinus oedicephalus</i>	W&CA Schedule 1 Part 1
Temminck's stint <i>Calidris temminckii</i>	W&CA Schedule 1 Part 1
Tree pipet <i>Anthus trivialis</i>	BoCC Red List
Tree sparrow <i>Passer montanus</i>	BoCC Red List
Turtle dove <i>Streptopelia turtur</i>	BoCC Red List
Twite <i>Linaria flavirostris</i>	BoCC Red List
Whimbrel <i>Numenius phaeopus</i>	BoCC Red List, W&CA Schedule 1 Part 1
Whinchat <i>Saxicola rubetra</i>	BoCC Red List
White-fronted Goose <i>Anser albifrons</i>	BoCC Red List
Whooper Swan <i>Cygnus cygnus</i>	W&CA Schedule 1 Part 1
Wood sandpiper <i>Tringa glareola</i>	W&CA Schedule 1 Part 1
Wood warbler <i>Phylloscopus sibilatrix</i>	BoCC Red List
Woodcock <i>Scolopax rusticola</i>	BoCC Red List
Yellow wagtail <i>Motacilla flava</i>	BoCC Red List
Yellowhammer <i>Emberiza citrinella</i>	BoCC Red List

5 Field Survey Results

This section details the bird observations during the 2019/2020 wintering bird surveys conducted at the Site. Table 6 presents the species recorded within the boundary of the Site and includes the abundance of each species measured as the maximum number of individuals detected on any one survey visit. The number of 'notable' recorded species is also given, i.e. species either appearing on the BoCC Red or Amber Lists; or listed as UK BAP and/or London Biodiversity Action Plan (LBAP). For specific locations see the specific bird drawings detailed in Appendix C.

5.1 Species Recorded

Twenty-nine bird species were observed within the Site during the surveys, of which ten are 'notable' as shown in Table 6. Table 6 also provides abundance of the species recorded on the Site; this represents the maximum number of individuals detected during any one survey visit.

The majority of common and notable species were recorded using the mudflats along the edges of the River Thames at low tide. Passerine species such as robin (*Erithacus rubecula*), blackbird (*Turdus merula*) and goldfinch (*Carduelis carduelis*) were generally recorded singing within adjacent gardens. Ring necked parakeet (*Psittacula krameri*) and feral pigeon (*Columba livia domestica*) are considered to be using the Hammersmith Bridge structure for roosting, and starling were generally also observed perching on the existing bridge in groups.

Table 6: Bird Species, Conservation Status and Abundance recorded during the Wintering Bird Surveys

Species	Conservation Status	Abundance
Blackbird <i>Turdus merula</i>	Green List	1
Black-headed gull <i>Chroicocephalus ridibundus</i>	Amber List	250 +
Blue tit <i>Cyanistes caeruleus</i>	Green List	3
Canada goose <i>Branta canadensis</i>	Not listed - Introduced	38
Carrion crow <i>Corvus corone</i>	Green List	54
Common gull <i>Larus canus</i>	Amber List	2
Coot <i>Fulica atra</i>	Green List	2
Cormorant <i>Phalacrocorax carbo</i>	Green List	21
Dunnock <i>Prunella modularis</i>	Amber List	1
Egyptian Goose <i>Alopochen aegyptiaca</i>	Not Listed - Introduced	4
Feral pigeon <i>Columba livia domestica</i>	Not listed	120 +
Goldfinch <i>Carduelis carduelis</i>	Green List	9
Great Tit <i>Parus major</i>	Green List	2
Great black-backed gull <i>Larus marinus</i>	Amber List	3
Grey heron <i>Ardea cinerea</i>	Green List	3
Grey wagtail <i>Motacilla cinerea</i>	Red List	2
Herring gull <i>Larus argentatus</i>	Red List	14

Species	Conservation Status	Abundance
Lesser black-backed gull <i>Larus fuscus</i>	Amber List	4
Long tailed tit <i>Aegithalos caudatus</i>	Green List	2
Magpie <i>Pica pica</i>	Green List	1
Mallard <i>Anas platyrhynchos</i>	Amber List	75 +
Moorhen <i>Gallinula chloropus</i>	Green List	5
Pied wagtail <i>Motacilla alba yarrellii</i>	Green List	6
Ring necked parakeet <i>Psittacula krameri</i>	Not Listed - Introduced	10
Robin <i>Erithacus rubecula</i>	Green List	2
Starling <i>Sturnus vulgaris</i>	Red List	28
Teal <i>Anas crecca</i>	Amber List	16
Woodpigeon <i>Columba palumbus</i>	Green List	1
Wren <i>Troglodytes troglodytes</i>	Green List	2

5.2 Notable Species

Black-headed gulls were recorded in flocks along the mudflats and occasionally flying over the river when disturbed by recreational activities such as canoe or motorboats. A peak abundance of 250+ individuals were recorded during the surveys.

Mallard were observed using the mudflats for foraging and resting places and were generally observed in groups. A peak count of 75 + individuals were recorded.

Grey wagtail was observed calling and foraging from the mudflats to the west of the bridge. A peak count of 2 individual was recorded during the surveys.

Starling were observed calling from the bridge itself along the suspension chains. In addition, flocks of starlings were regularly observed foraging from the mudflats. A peak abundance of 28 individuals were observed.

Herring gull were observed foraging along the mudflats. A peak count of 14 individuals were counted.

Great black-backed gull was observed foraging within the mudflats to the west of the bridge or flying over the Site and a peak count of 3 individuals were recorded.

Lesser black-backed gull was observed foraging within mudflats to the west of the bridge with a peak count of 4 individuals recorded.

A single juvenile common gull was recorded during the December survey. A peak count of 2 adults were recorded during the February survey, giving a peak count of 2 individuals overall.

Teal were recorded to the east of the bridge on the northern mudflats. A peak count of 16 individuals were recorded within the River Thames.

A single dunnoek was recorded singing during the February survey within the garden to the north of the River Thames.

6 Likely Impacts and Key Constraints

6.1 Evaluation

Based on the criteria in Table 2, the Site supports species listed as priority in the UK BAP and on the Red List that regularly occur in locally sustainable populations in district important numbers, and are particularly scarce within the locality. Therefore, the nature conservation value of the wintering bird population is assessed as being of district value.

To assess the overall wintering bird assemblage, Fuller (1980) describes a method for assessing ornithological interest of sites, whereby the importance is defined by the number of species present as shown in the centre column of Table 7 below.

Table 7: Assessment using the number of bird species

Level of Importance	Number of Bird Species	
	Fuller (1980)	Adapted Criteria
Local	25 – 49	<25
District	-	25 – 49
County	50 – 69	50 – 69
Regional	70 – 84	70 – 84
National	85+	85+

For the purposes of this assessment, Fuller’s geographical levels have been adapted so that Fuller’s ‘Local importance’ is assumed to correspond to District importance as described in the CIEEM Guidelines (CIEEM 2018). An assemblage comprising fewer than 25 species is therefore considered to be of local importance or less. Since the publication of the criteria in 1980, declines have occurred in many farmland bird populations; it is therefore deemed appropriate to recalibrate the categories slightly downwards in this way.

A total of 29 species were recorded using the Site and thus the overall site falls into the **district importance category**. The Site is therefore evaluated as having a district level of importance as a wintering site for the bird assemblage present in the area.

6.2 Potential Construction, Operational and Decommissioning Impacts

Many wintering bird species tend to favour habitat that provides opportunities for sheltering, commuting and/or foraging. The mudflats within the Site represent only a small portion of that habitat available along the River Thames and therefore form a continuation of a wider habitat for foraging wintering birds.

The design of the Temporary Bridge has been designed to avoid pilings being bored into the mudflats and therefore no direct or indirect impacts to foraging habitat are anticipated. In addition, construction works are scheduled to be completed from September – December 2020. However, it should be noted that the majority of species recorded will likely be present year-

round. Foraging species may be temporary disturbed during the works, however there are ample areas of suitable foraging habitat present along the Thames corridor for any temporary displaced species.

The abutments of the Temporary Bridge will be placed on either side of the River Thames, with two piers and two abutments within the river. The construction technique will include drill boring from floating barges to install piles within the. The piling method will use an auger through a tubular casing to drill and removed soil, which will reduce noise and vibration to a minimum comparing with other methods. Most part of structure (including the deck structure) is pre-manufactured that will be quickly assembling on site, and as such reducing construction time. Therefore, disturbance cause by works will be very limited on time.

It is noted that the River Thames is subject to a considerable amount of recreational disturbance within the Site including dog walkers, rowers and kayaks, and motorboats. Bird species present are assumed to be accustomed to these levels of disturbance and therefore disturbance during works is considered to be a temporary impact on a Site scale only and is unlikely to have adverse impacts on the local or district population.

There are no operational impacts considered to be likely from the Temporary Pedestrian and Cycle Bridge.

The decommissioning phase of the bridge can give rise to similar effects as the construction phase, as the removed of structure will required again vehicles movements and works at the Site, however, once again likely impacts due to noise or disturbance on birds will be temporary and restricted to the Site, and it is unlikely to have adverse impacts on the local or district population.

6.3 Impact on Notable Species

The impact on 'notable' species observed within the Site during the surveys are considered likely to be 'Neutral' significance overall.

The impact for the notable species present within the Site are considered to be 'Neutral' for following species: black-headed gulls, mallard, grey wagtail, starling, herring gull, great black - backed gull, lesser black-backed gull, common gull, teal, and dunnock.

The effect was considered as 'Neutral' for all the notable species, because it is assessed that the works will have no impact on the wintering bird population along this section on the River Thames Corridor. For nomadic species recorded in low wintering numbers, species would be able to move into ample areas of suitable wintering habitat along the River Thames Corridor. It is considered that any displacement for the wintering bird species present will be minimal as the wintering population is assessed as already being adjusted to high levels of disturbance.

7 Recommendations, Mitigation and Enhancement Measures

The ecological impact hierarchy requires that all steps are taken to avoid adverse impacts to habitats and species. Only where impacts cannot be avoided, steps should be taken to mitigate for any losses within the scheme boundary. In cases where all options for on-site mitigation have been exhausted, offsite compensation measures can be considered.

A CEMP will be produced setting measures to control potential impacts arising from the construction of the Temporary Bridge. The CEMP will include best practice environment management control during the works and measures to reduce noise, dust emissions, light emissions, and avoid the incident of contaminated run-off and risk of potential river water contamination due to accidental spills and leakages.

All staff and workers on site, including sub-contractors, should be made aware of species and habitat protection issues at site induction talks. Work must stop immediately, and a suitably qualified ecologist should be contacted if any protected species are found onsite.

7.1 Pollution Prevention

All proposed work must strictly be in accordance with all relevant Pollution Prevention Guidelines (PPG) published by the Environment Agency which may include but is not limited to PPG1 (general), PPG5 (works in, near, or liable to affect watercourses) and PPG6 (work at construction & demolition sites). Contingency plans should be drawn up to address chemical spillage, collision, etc. Spill kits should be kept onsite permanently throughout the operational phase with residents given clear instruction on how and when to use them.

7.2 Vegetation Removal

Where required, the removal of any trees or vegetation should occur outside of the nesting bird season (late February to late August). Where this is not possible then all vegetation removal works should be preceded by a survey conducted by a suitably qualified ecologist to check for nesting birds and to advise accordingly on the most appropriate way to proceed. Furthermore, should any active nests (from when the nest is in the process of being built, until all the nestlings have fledged) be discovered during the works, then works to the area around the nest must stop immediately and a suitably qualified ecologist called in to check the nest and advise on the most appropriate way to proceed.

7.3 Nesting

As pied wagtail and grey wagtail were both observed during the survey, it is recommended that Eco Dipper – Wagtail Nest Boxes (Figure 3 and available <https://www.nestbox.co.uk/products/dipper-wagtail-nest-box>) are installed on the existing Hammersmith Bridge. The installation of these next boxes is recommended as measure for habitat enhancement at the Site, and these boxes provide suitable nesting and wintering sheltering habitat for both pied and grey wagtails. The next boxes should be installed in the existing Hammersmith Bridge, once its refurbishment works are completed.

A number of shrub nesting species including wren and dunnock were observed during the wintering bird surveys. It is therefore recommended that a series of roosting pockets are installed within remaining vegetation located adjacent to the Site. These should be installed in areas of remaining vegetation once the refurbishment of Hammersmith Bridge has been completed. Those shown in Figure 4 or similar would provide suitable winter shelter for many species and will also provide nesting habitat for species such as wren and dunnock.

Figure 3: Eco Dipper – Wagtail Nest Boxes



Figure 4: Roosting pockets provide suitable winter shelter for many species



8 Summary

A total of 29 bird species were recorded using the overall site during the 2019/2020 wintering bird surveys. This indicates that the Site has a 'district' level of importance as a site for wintering bird assemblages present in the area.

The proposed development has the potential to impact four BoCC Red List species (grey wagtail, great black-backed gull, herring gull and starling) and 5 BoCC Amber List species (black-headed gull, common gull, mallard, lesser-black backed gull and teal).

The desk study found a number of species of high conservation concern and medium conservation concern that were not observed on Site. It is considered that these species may have been present within the habitats close by, including the Barn Elms Wetland Centre SSSI, but do not occur within the Site. Therefore, it is considered that these species are unlikely to be impacted by the proposed works.

The Site provides suitable habitat for a wide variety of wintering bird species; however, it is considered that these species are unlikely to be impacted by the proposed works. In addition, if the mitigation recommendations included within this report (section 7) are incorporated within the scheme, it is considered likely that the overall wintering bird diversity may have a minor positive impact over the long term.

9 Wintering Bird Survey Report Limitations

The information reported herein is based only on the interpretation of data collected during the protected species survey visits. This work pertains specifically to the identification of protected species on the proposed site. Information provided to Pell Frischmann has been accepted as being accurate and valid.

This report has been prepared by Pell Frischmann with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client.

The evaluation and conclusions do not preclude the existence of other protected species, which could not reasonably have been revealed by the comprehensive desk studies, site visit and protected species surveys. Hence, this report should be used for information purposes only and should not be construed as a comprehensive characterisation of all site habitats.

In addition, this report details only the conditions on site, at the time of reporting. The dynamic nature of the natural environment will result in changes to the surrounding environment as seasons change. No responsibility is taken by Pell Frischmann to the existence of additional species identified on this site at a later date.

This report has been prepared solely for the use of Transport for London and may not be relied upon by other parties without written consent from Pell Frischmann. In addition, it must be understood that this report does not constitute legal advice.

Pell Frischmann disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work.

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Appendix A

Description of Structure and General Arrangement

The proposed Temporary Bridge is a three-span structure with two piers in the river, with a total length of approximately 216m. The north and centre spans are expected to be approximately 85.5m long and the south span is expected to be approximately 45m long (refer to GA Drawing A102963-PEF-BAS-ZZZ-DIA-C-00003, Appendix A).

The south abutment is located near the towpath on the south riverbank and the north abutment is in the green area on the north riverbank at the south west end of Queen Caroline Street. A ramp structure is to be installed at both ends of the Temporary Bridge connecting it to the existing highway network.

The structure type is to be a temporary modular steel bridge. The deck is to be demountable and of half through truss construction comprising structural elements put together to form the outer trusses, and transverse elements supporting a steel deck to carry the pedestrian and cycleway. The effective width of the segregated pedestrian and cycleway is to be a minimum of 5.50m, with an overall deck width of 7.1m, as shown on the GA Drawing (Appendix A). The total weight of the superstructure will not exceed 4.1 tonnes per metre span.

The Temporary Bridge foundations, substructure and superstructure are designed to accommodate potential flooding of the river and breach of flood defence system. The soffit levels of the centre and south span are to match the soffit level of the Hammersmith Bridge, as a minimum, and the soffit level of the north span is to be lowered, so that the ramp decline, connecting to the existing highway, is not too steep.

As the structure is to be temporary, all the substructure elements in the river (including foundations) are designed to be quickly installed and such that it can be decommissioned afterwards, once the Temporary Bridge is no longer needed.

The substructure and foundation within the River Thames (piers 1 and 2) are to comprise an arrangement of four tubular socketed steel piles installed in augured shafts and braced with steel sections as shown on the GA Drawing (Appendix A).

The abutments on land will be of reinforced concrete construction supported on augured reinforced concrete piles.

It should be noted that the whole structure, including foundation elements and ramps, is to be fully removed once Hammersmith Bridge is refurbished and opened for cyclists and pedestrians.

Appendix B

Bird Species Codes

Temporary Pedestrian and Cycle Bridge
Wintering Bird Survey Report
102963-PEF-BAS-ZZZ-REP-EN-00006

Species	BTO Code
Blackbird <i>Turdus merula</i>	B.
Black-headed gull <i>Chroicocephalus ridibundus</i>	BH
Blue tit <i>Cyanistes caeruleus</i>	BT
Canada goose <i>Branta canadensis</i>	CG
Carrion crow <i>Corvus corone</i>	C.
Common gull <i>Larus canus</i>	CM
Coot <i>Fulica atra</i>	Co
Cormorant <i>Phalacrocorax carbo</i>	Ca
Dunnock <i>Prunella modularis</i>	D.
Egyptian Goose <i>Alopochen aegyptiaca</i>	EG
Feral pigeon <i>Columba livia domestica</i>	FP
Goldfinch <i>Carduelis carduelis</i>	GO
Great Tit <i>Parus major</i>	GT
Greater black backed gull <i>Larus marinus</i>	GB
Grey heron <i>Ardea cinerea</i>	H.
Grey wagtail <i>Motacilla cinerea</i>	GL
Herring gull <i>Larus argentatus</i>	HG
Lesser black backed gull <i>Larus fuscus</i>	LB
Long tailed tit <i>Aegithalos caudatus</i>	LT
Magpie <i>Pica pica</i>	MG
Mallard <i>Anas platyrhynchos</i>	Ma
Moorhen <i>Gallinula chloropus</i>	MH
Pied wagtail <i>Motacilla alba yarrellii</i>	PW
Ring necked parakeet <i>Psittacula krameri</i>	RI
Robin <i>Erithacus rubecula</i>	R.
Starling <i>Sturnus vulgaris</i>	SG
Teal <i>Anas crecca</i>	T.
Woodpigeon <i>Columba palumbus</i>	WP
Wren <i>Troglodytes troglodytes</i>	WR

Appendix C

Wintering Bird Survey Maps