



## UNIVERSAL DESTINATIONS & EXPERIENCES UK PROJECT

Former Kempston Hardwick Brickworks  
and adjoining land, Bedford

### Environmental Statement Volume 3

## Appendix 6.2 - Aquatic Habitat Scoping Assessment Report

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# 1 INTRODUCTION

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## 1.1 PROJECT BACKGROUND

- 1.1.1 This aquatic habitat scoping assessment report has been prepared in support of the planning proposal for the Proposed Development as described in **Chapter 2: Description of the Proposed Development (Volume 1)** of the Environmental Statement.
- 1.1.2 The Site is located to the southwest of Bedford, Bedfordshire. The Site boundary is shown in **Figure 1: Aquatic Ecology Survey Area of Annex 1: Figures**. The Site equates to 268ha, and is divided into four zones referred to as the Core Zone, Lake Zone, West Gateway Zone, and East Gateway Zone. These Zones are hereafter collectively referred to as ‘the Site’. This assessment focussed on the watercourses and water bodies located in the Core Zone, the Lake Zone, and the West Gateway Zone. There are no water bodies or watercourses located within the East Gateway Zone.

### ECOLOGICAL BACKGROUND

- 1.1.3 The Preliminary Ecological Appraisal (PEA) (**Appendix 6.1: Preliminary Ecological Appraisal Report (Volume 3)**) identified the habitats on Site, including trees, woodland, hedgerows, watercourses, and water bodies, with biodiversity value that may be impacted. The watercourses flowing through, and water bodies on the Site, were deemed to be suitable to support aquatic species.
- 1.1.4 Elstow Brook (Elstow Brook (US Shortstown): GB105033038050), a Water Framework Directive (WFD) designated water body is located within the Site boundary.

## 1.2 SCOPE OF REPORT

- 1.2.1 WSP was commissioned to carry out an aquatic habitat scoping assessment of the watercourses and water bodies located within the Site. The objectives of this report are to:
- Carry out a desk study to review available relevant data and provide a context for the likely conditions of the Site in advance of the field survey;
  - Identify the potential of watercourses and water bodies to support legally protected or otherwise notable aquatic species;
  - Provide recommendations to enable compliance with relevant legislation and planning policy; and
  - Identify the need for avoidance, mitigation, compensation, or enhancement measures.

## 2 METHODS

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### 2.1 DESK STUDY

- 2.1.1 An online desk study was undertaken in April 2024 to review existing ecological baseline information available in the public domain and to obtain any information held by relevant third parties. For the purpose of the desk-based exercise, records were collected from various radii as detailed below, based on hydrological connectivity to the assessed watercourses. Hydrological connectivity was determined using maps and aerial imagery.

#### DESIGNATED SITES

- 2.1.2 An online desk study of information relating to statutory sites within 5km of the Site boundary was undertaken. Information was obtained from Multi Agency Geographical Information for the Countryside (MAGIC) website<sup>1</sup>.

#### WATER FRAMEWORK DIRECTIVE

- 2.1.3 The current WFD status for the catchment was obtained from the Environment Agency's Catchment Data Explorer website<sup>2</sup>.

#### ENVIRONMENT AGENCY RECORDS

- 2.1.4 A search of the Environment Agency's Ecology and Fish Data Explorer was completed to identify any existing aquatic ecology survey data within 10km of the Site<sup>3</sup>.

### 2.2 AQUATIC HABITAT SCOPING ASSESSMENTS

- 2.2.1 Aquatic habitat scoping assessments were carried out by a team of suitably experienced and qualified aquatic ecologists on 04 April 2024. Surveys were conducted along the watercourses and on the waterbodies present within the Site, as presented in **Figure 1: Aquatic Ecology Survey Area of Annex 1: Figures**.
- 2.2.2 The potential for each watercourse and water body to support legally protected or otherwise notable aquatic species was assessed through field observations of various channel and bank characteristics. The characteristics assessed included substrate type and water depth, riparian vegetation, large wood habitat, artificial modifications, and notable features. Photographs were taken to further detail each watercourse and any specific aquatic habitat features.
- 2.2.3 An assessment of each aquatic habitat was made based on professional experience and judgement, which was supplemented by standard sources of guidance on habitat suitability assessments for key

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<sup>1</sup> Department for Environment, Food and Rural Affairs and Natural England (n.d.) *Multi-Agency Geographic Information for the Countryside' (MAGIC) Map*. Available at: <https://magic.defra.gov.uk/> [Accessed: 05 March 2025].

<sup>2</sup> Department for Environment, Food and Rural Affairs and Environment Agency (n.d.) *Catchment Data Explorer*. Available at: <https://environment.data.gov.uk/catchment-planning> [Accessed: 05 March 2025].

<sup>3</sup> Department for Environment, Food and Rural Affairs and Environment Agency (n.d.) *Ecology and Fish Data Explorer*. Available at: <https://environment.data.gov.uk/ecology/explorer/> [Accessed: 05 March 2025].

faunal groups, including salmonid fish<sup>4</sup>, white-clawed crayfish *Austropotamobius pallipes*<sup>5</sup> and European eel *Anguilla anguilla*<sup>6</sup>.

- 2.2.4 Surveyors also noted any pertinent watercourse access details in terms of suitability to carry out further in-channel surveys.

## 2.3 NOTES AND LIMITATIONS

- 2.3.1 Every effort has been made to provide a comprehensive description of the aquatic habitats located within the Site; however, the following specific limitations apply to this assessment:

- A period of heavy rainfall preceded the survey, and as such, the watercourses had elevated turbidity levels during the survey. However, the assessment made in this report is considered to be valid and will be corroborated by data from further species specific surveys;
- The aquatic habitat scoping survey was conducted outside the optimum survey season for macrophytes, thus it is likely that the macrophyte communities were under-represented within these surveys. However, the assessment made in this report is considered to be valid and will be corroborated by data from macrophyte surveys (**Appendix 6.8: Macrophyte Survey Report (Volume 3)**);
- Ecological survey data is typically valid for 18 months to three years unless otherwise specified, for example if conditions are likely to change more quickly due to ecological processes or anticipated changes in management<sup>7</sup>. However, as the aquatic habitats surveyed are unlikely to have experienced significant changes in condition, desk study data older than this are considered to still be valid for the purposes of informing preliminary mitigation measures; and
- Records held by local biological record centres and local recording groups are generally collected on a voluntary basis. Therefore, the absence of records does not demonstrate the absence of species, it may simply indicate a gap in recording coverage.

<sup>4</sup> Hendry, K. and Cragg-Hine, D. (1997) *Restoration of riverine salmon habitats, A Guidance Manual*. Bristol, England: Environment Agency.

<sup>5</sup> Peay, S. (2003) *Monitoring the white-clawed crayfish Austropotamobius pallipes, Conserving Natura 2000 Rivers Monitoring Series No. 1*. Peterborough, England: English Nature.

<sup>6</sup> Tesch, F-W. (2003) *The Eel*. England: Wiley.

<sup>7</sup> Chartered Institute of Ecology and Environmental Management (2019) *On the lifespan of ecological reports and surveys*. Available at: <https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf> [Accessed: 05 March 2025].

## 3 RESULTS

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### 3.1 DESK STUDY

#### DESIGNATED SITES

- 3.1.1 No statutory designated sites with aquatic features as primary reasons for their designation were identified within 5km of the Site boundary.

#### WATER FRAMEWORK DIRECTIVE (WFD)

- 3.1.2 Elstow Brook (US Shortstown) water body (GB105033038050) is a WFD-designated water body (Environment Agency, 2024a) located within the Site boundary.
- 3.1.3 The 2022 WFD ecological status of this water body was Moderate overall. In 2022, the fish element was classified as Poor, and the invertebrate element was classified as Good. The macrophytes and phytobenthos combined element achieved Moderate status, with the macrophytes sub element classified as Poor and the phytobenthos sub elements classified as Moderate.
- 3.1.4 The 2022 WFD physico-chemical status of this water body was classified as Good overall. Ammonia, dissolved oxygen, temperature, and pH were classified as High, whilst phosphate was classified as Good.
- 3.1.5 The reason for the fish element not achieving Good status is listed as physical modification from land drainage. The reasons for the macrophytes and phytobenthos combined element not achieving Good status are physical modification from land drainage, diffuse source pollution from poor soil management and contaminated land.

#### ENVIRONMENT AGENCY FISH SURVEY DATA

- 3.1.6 No information from the last 10 years was available for fish communities within Elstow Brook, in the Site boundary. However, a search of the Environment Agency's Ecology and Fish Data Explorer<sup>3</sup> returned data from Environment Agency catch depletion electric fishing surveys in Elstow Brook, approximately 1.2km downstream of the proposed bridge crossing point of Elstow Brook (NGR TL 02424 45035), on 24 March 2011.
- 3.1.7 A total of seven fish species were recorded in the survey, with the most abundant species recorded being spined loach *Cobitis taenia*. The detailed results of this survey are reported below in **Table 3-1**.



**Table 3-1 – Environment Agency Fish Survey Data from Elstow Brook (NGR TL 02424 45035) Conducted on 24 March 2011.**

Common Name	Latin Name	Number of Individuals
Spined loach*	<i>Cobitis taenia</i>	32
European bullhead*	<i>Cottus gobio</i>	28
Stone loach	<i>Barbatula barbatula</i>	21
Roach	<i>Rutilus rutilus</i>	10
Gudgeon	<i>Gobio gobio</i>	5
Perch	<i>Perca fluviatilis</i>	2
Roach x common bream hybrid	<i>Rutilus rutilus x Abramis brama</i>	1
<b>Total</b>		<b>99</b>

Note: Species marked with an \* are legally protected species

- 3.1.8 Spined loach and European bullhead *Cottus gobio* are both listed under *Annex II* of *The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019*<sup>8</sup>, where they are a designated feature of a Special Area of Conservation (SAC).
- 3.1.9 No invasive non-native species (INNS) nor any other fish species of conservation interest were recorded in the survey.
- 3.1.10 In order to capture more recent data, the desk study search was extended, returning data from Environment Agency catch depletion electric fishing surveys in the River Great Ouse, of which Elstow Brook is a tributary. The most recent survey was carried out at a monitoring location (NGR TL 05550 47527) on the River Great Ouse approximately 5.8km downstream of the proposed crossing point of Elstow Brook, on 10 August 2021.
- 3.1.11 A total of nine fish species were captured in the survey. The most abundant species recorded was chub *Leuciscus cephalus*. The detailed results of this survey are reported below in **Table 3-2**.

**Table 3-2 – Environment Agency Fish Survey Data from the River Great Ouse (NGR TL 05550 47527) Conducted on 10 August 2021.**

Common Name	Latin Name	Number of Individuals
Chub	<i>Leuciscus cephalus</i>	10
Gudgeon	<i>Gobio gobio</i>	6
Dace	<i>Leuciscus leuciscus</i>	4

<sup>8</sup> HM Government (2019) *The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019*. Available at: <https://www.legislation.gov.uk/ukdsi/2019/9780111176573> [Accessed: 24 March 2025].

Common Name	Latin Name	Number of Individuals
Roach	<i>Rutilus rutilus</i>	4
Minnow	<i>Phoxinus phoxinus</i>	4
Stone loach	<i>Barbatula barbatula</i>	4
Perch	<i>Perca fluviatilis</i>	2
Spined loach*	<i>Cobitis taenia</i>	1
European bullhead*	<i>Cottus gobio</i>	1
<b>Total</b>		<b>36</b>

Note: Species marked with an \* are legally protected species

- 3.1.12 Two species of conservation interest; spined loach, and European bullhead, were again recorded in the survey.
- 3.1.13 The presence of spined loach in both the Elstow Brook and River Great Ouse is important to note as in the UK, spined loach distribution is restricted. The species occurs in only five river catchments (Trent, Welland, Witham, Nene, and Great Ouse) and their associated watercourses.

### ENVIRONMENT AGENCY AQUATIC MACROINVERTEBRATE SURVEY DATA

- 3.1.14 A search of the Environment Agency's Ecology and Fish Data Explorer<sup>3</sup> returned data from Environment Agency aquatic macroinvertebrate surveys on Elstow Brook (NGR TL 02489 45099), approximately 1.3km downstream of the proposed bridge crossing of Elstow Brook. Results from the most recent surveys carried out in spring and autumn 2014 are detailed in **Table 3-3**.

**Table 3-3 – Environment Agency Biological Metrics For Samples Collected from Elstow Brook (NGR TL 02489 45099) During Spring and Autumn 2014.**

Date	WHPT-ASPT (TL2)	WHPT-NTAXA (TL2)	LIFE (TL5)	PSI (TL5)	CCI (TL5)
08 March 2014	4.84	28	6.53	18.33	7.93
10 November 2014	4.94	23	6.59	19.51	7.75

- 3.1.15 The Whalley, Hawkes, Paisley, and Trigg (WHPT) index is used to describe ecological water quality, including organic pollution<sup>9</sup>. The WHPT Average Score Per Taxon (ASPT) results from 2014 were 4.84 and 4.94 indicating both pollution tolerant and intolerant taxa were present at this location. The WHPT number of taxa (NTAXA) results from 2014 indicate the presence of a moderate diversity of aquatic macroinvertebrate scoring taxa in both spring and autumn.
- 3.1.16 The overall Lotic-invertebrate Index for Flow Evaluation (LIFE) scores in 2014 for this location were 6.53 and 6.59, which are indicative of flowing to slow/sluggish flowing water. Taxa including Oligochaeta and Chironomidae are not used in the calculation of LIFE scores as there is no clear relationship between flow and their abundance at this level of taxonomic resolution<sup>10</sup>.
- 3.1.17 The Proportion of Sediment-sensitive Invertebrates (PSI) metric is a proxy for the quantity of fine sediment at a site. The PSI scores calculated from the aquatic macroinvertebrate community present classify Elstow Brook at this monitoring location as Heavily Sedimented in both spring and autumn 2014<sup>11</sup>.
- 3.1.18 The Community Conservation Index (CCI) uses species level analysis to estimate the conservation value of the invertebrate community at a sample site. The CCI scores classify the aquatic macroinvertebrate communities at this monitoring location as having Moderate conservation value in both spring and autumn 2014<sup>12</sup>.
- 3.1.19 One INNS, the New Zealand mud snail *Potamopyrgus antipodarum*, was recorded in both spring and autumn 2014. No legally protected or otherwise notable species were recorded in either survey.

## ENVIRONMENT AGENCY MACROPHYTE SURVEY DATA

- 3.1.20 A search of the Environment Agency's Ecology and Fish Data Explorer<sup>3</sup> did not return any records of Environment Agency macrophyte surveys conducted in Elstow Brook within the Site boundary.

## 3.2 AQUATIC HABITAT SCOPING ASSESSMENTS

### Elstow Brook

- 3.2.1 Elstow Brook, a tributary of the River Great Ouse, crosses through the West Gateway Zone, flowing under Manor Road, and then follows the line of Marston Vale Railway Line along the western boundary of the Lake Zone. The total length of the watercourse within the Site is approximately 1.9km (see **Figure 1: Aquatic Ecology Survey Area of Annex 1: Figures**).

<sup>9</sup> Water Framework Directive UK Technical Advisory Group (2021) *Invertebrates (General Degradation): Whalley, Hawkes, Paisley, and Trigg (WHPT) metric in River Invertebrate Classification Tool (RICT)*. Available at: <https://wfd.uk.org/sites/default/files/River%20Invertebrates%20WHPT%20UKTAG%20Method%20Statement%20-%20Updated%20May%202021.pdf> [Accessed: 05 March 2025].

<sup>10</sup> Extence, C.A., Balbi, D.M. and Chadd, R.P. (1999) 'River flow indexing using British benthic macroinvertebrates: a framework for setting hydroecological objectives', *Regulated Rivers: Research and Management*, 15(6), pp. 543-574. Available at: <https://onlinelibrary.wiley.com/doi/abs/10.1002/%28sici%291099-1646%28199911%12%2915%3A6%3C545%3A%3Aaid-rrr561%3E3.0.co%3B2-w> [Accessed: 05 March 2025].

<sup>11</sup> Extence, C.A., Chadd, R., England, J., Wood, P.J. and Taylor, E. (2011) 'The assessment of fine sediment accumulation in rivers using macro-invertebrate community response', *River Research and Applications*, 29(1), pp. 17-55. Available at: <https://onlinelibrary.wiley.com/doi/abs/10.1002/rra.1569> [Accessed: 05 March 2025].

<sup>12</sup> Chadd, R. and Extence, C. (2004) 'The Conservation of freshwater macroinvertebrate populations: a community-based classification scheme', *Aquatic Conservation: Marine and Freshwater Ecosystems*, 14(6), pp. 597-624. Available at: <https://onlinelibrary.wiley.com/doi/abs/10.1002/aqc.630> [Accessed: 05 March 2025].

- 3.2.2 Elstow Brook was on average 2m in width. The water depth could not be accurately assessed due to the turbidity of the watercourse. The water level was likely higher than normal due to a period of heavy rain preceding the survey. The channel substrate was not visible at the time of survey.
- 3.2.3 Within the upstream reach, the surrounding land use is tilled arable land. At the downstream reach, the watercourse runs alongside the Marston Vale Railway Line, with the railway line on the left-hand bank top. The surrounding land use along the right-hand bank top is a mixture of hardstanding and scrub vegetation, becoming tilled arable land further downstream.
- 3.2.4 The upstream reach of Elstow Brook displayed minor sinuosity, however, it is evident that the channel has been re-shaped over time. The banks of the watercourse showed evidence of being re-profiled. The bank faces were dominated by terrestrial short grass, with patches of scrub vegetation and isolated trees. Emergent marginal vegetation, particularly common reed *Phragmites australis* was present along much of the watercourse.
- 3.2.5 Where Elstow Brook runs along the western boundary of the Lake Zone, the watercourse has been artificially straightened, with steep artificial banks. The bank faces were dominated by overgrown and overhanging riparian scrub vegetation, which limited the view of the channel bed. Small trees were present on the left-hand bank top.
- 3.2.6 Site photographs are displayed in **Annex 3**.

#### **‘Core Zone’ Watercourse**

- 3.2.7 This is an ordinary watercourse located within the Core Zone, flowing in an approximate south to north direction towards Manor Road. The length of the watercourse within the Site boundary is 1.5km (see **Figure 1: Aquatic Ecology Survey Area of Annex 1: Figures**).
- 3.2.8 The watercourse was on average approximately 1.5m in width. A period of heavy rainfall preceded the survey, and as such, the watercourse had elevated turbidity levels during the survey. Consequently, the water depth could not be accurately assessed, and the channel substrate was not visible. However, given the agricultural setting and the turbidity of the watercourse, it is assumed that the channel substrate is predominantly silt. The water was still with no perceptible flow observed during the survey.
- 3.2.9 The right bank top consisted of a complex vegetation structure, with a hedgerow present along much of the 1.5km reach. The predominant surrounding land use was tilled arable land, however, towards the upstream end of the watercourse, the land use on the right-hand bank becomes deciduous woodland. The watercourse diverges into two channels at approximately NGR TL 02789 43722, with the left-hand channel flowing through the woodland area.
- 3.2.10 In-channel submerged and emergent macrophyte species were present throughout the watercourse, covering an estimated 5% of the 1.5km length of watercourse. The species observed during the aquatic habitat scoping assessment included the emergent common reed, iris *Iris* sp. and fool’s watercress *Apium nodiflorum*, and the submerged water-crowfoot *Ranunculus* sp.
- 3.2.11 The aquatic habitat within the watercourse exhibited diversity with varied riparian shading, areas with wood debris and detritus, and patches of macrophyte growth.
- 3.2.12 A pipe outfall, likely to carry field drainage, was observed at NGR TL 02721 43508. Additionally, several footbridges and a culvert (located at NGR TL 02736 43976) were observed.

- 3.2.13 Photographs taken during the survey showing a cross section of the aquatic habitats assessed are provided in **Annex 3**.

**‘Lake Zone’ Lakes**

- 3.2.14 Four lakes located within the Lake Zone were assessed. All lakes were deep in nature, with no shallow lake margins. Emergent vegetation, predominantly common reed, was present around all lake margins, with extensive reedbeds present around the margins of the three northern lakes (Lake 2, Lake 3a, and Lake 3b). Additionally, riparian scrub vegetation and small trees were present on the banksides of Lake 1 (central NGR TL 03080 45027) (see **Figure 1: Aquatic Ecology Survey Area of Annex 1: Figures**).
- 3.2.15 A small, open channel and pipe culvert (located at approximately NGR TL 03093 44935), connect Lake 1 to Kempston Hardwick Pit. Emergent vegetation, including common reed, reedmace *Typha* sp., water mint *Mentha aquatica*, sedge *Carex* sp., and rushes *Juncus* sp., were present within the open channel joining the two lakes.
- 3.2.16 An outflow ditch from Lake 1 (located at NGR TL 02975 45081) flows into Elstow Brook. The ditch was a straightened, artificial watercourse, with overgrown riparian scrub vegetation present on the bank faces and bank tops.
- 3.2.17 Site photographs are displayed in **Annex 3**.

## 4 DISCUSSION

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### 4.1 AQUATIC HABITAT

- 4.1.1 Elstow Brook, the Core Zone watercourse, and the lakes located in the Lake Zone, were all assessed as providing suitable habitat for a range of aquatic species.
- 4.1.2 The aquatic habitat scoping assessment identified features such as overhanging bank vegetation and woody debris, within Elstow Brook and the watercourse in the Core Zone that may provide refugia for aquatic species.

### 4.2 FISH

- 4.2.1 The desk study produced results of Environment Agency fish surveys in Elstow Brook, approximately 1.2km downstream of the proposed crossing of Elstow Brook. Additionally, the desk study area was extended to capture more recent data from Environment Agency fish surveys conducted in the River Great Ouse, approximately 5.8km downstream of the proposed crossing of Elstow Brook.
- 4.2.2 The fish community at the Environment Agency monitoring location within Elstow Brook was dominated by spined loach and European bullhead, with coarse fish species also present.
- 4.2.3 The fish community at the Environment Agency monitoring location within the River Great Ouse was dominated by coarse fish species. Three culverts are present along Elstow Brook before its confluence with the River Great Ouse<sup>13</sup>.
- 4.2.4 Two species of conservation interest were recorded in both Environment Agency surveys, spined loach, and European bullhead. Both species would likely also be present within the vicinity of the proposed bridge crossing of Elstow Brook.
- 4.2.5 During the aquatic habitat scoping survey, Elstow Brook was assessed as not providing suitable spawning habitat for salmonid species.
- 4.2.6 No desk study information was available for the Core Zone watercourse. During the aquatic habitat scoping survey, the surveyed reach of this watercourse within the Site boundary was assessed as providing limited suitable habitat for fish species of conservation interest. Due to the lack of coarse substrate and limited refugia such as undercut banks and tree roots, it is likely this watercourse would support predominantly minor species, such as minnow *Phoxinus phoxinus* and three-spined stickleback *Gasterosteus aculeatus*.
- 4.2.7 There was no desk study information available relating to the fish communities within the assessed lakes. However, it has been assessed that all four lakes likely provide suitable habitat for a range of fish species.

### 4.3 AQUATIC MACROINVERTEBRATES

- 4.3.1 The desk study returned no records of legally protected or otherwise notable aquatic macroinvertebrate species within Elstow Brook. One INNS, the New Zealand mud snail was

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<sup>13</sup> The Rivers Trust (2021) *River Obstacles*. Available at: <https://heriverstrust.hub.arcgis.com/> [Accessed: 05 March 2025].

recorded in the Environment Agency surveys conducted within Elstow Brook downstream of the Site boundary.

- 4.3.2 During the aquatic habitat scoping assessment, features such as marginal emergent macrophytes and overhanging riparian vegetation were noted, and Elstow Brook was assessed as providing suitable habitat for aquatic macroinvertebrate species.
- 4.3.3 No desk study information was available for the watercourse within the Core Zone. During the aquatic habitat scoping survey, the surveyed reach of the watercourse within the Site boundary was assessed as providing limited suitable habitat, such as woody debris, in-channel macrophytes and shading provided by riparian vegetation, to support aquatic macroinvertebrate communities.
- 4.3.4 There was no desk study information available relating to the aquatic macroinvertebrate communities within the lakes. However, it has been assessed that all four lakes likely provide suitable habitat for a range of aquatic macroinvertebrate species.

## **4.4 MACROPHYTES**

- 4.4.1 No desk study information was available for Elstow Brook within the Site boundary. However, during the aquatic habitat scoping assessment, some emergent macrophyte species including common reed were recorded along the margins of Elstow Brook. Due to the higher water levels and increased turbidity of the watercourse, submerged macrophyte species were not visible.
- 4.4.2 It was assessed that Elstow Brook likely supports a macrophyte community of moderate diversity. Where the watercourse runs along the western boundary of the Lake Zone, the macrophyte community is likely to be of lower diversity due to heavy shading provided by overgrown riparian vegetation and bank top trees.
- 4.4.3 No desk study information was available for the watercourse within the Core Zone. However, during the aquatic habitat scoping assessment, several emergent and submerged macrophyte species were observed. Of particular note was the presence of water-crowfoot.
- 4.4.4 There was no desk study information available relating to the macrophyte communities within the assessed lakes. Common reed was observed along all lake margins during the aquatic habitat scoping survey. It was assessed that the lakes likely provide suitable habitat for macrophyte species.
- 4.4.5 It must be noted that the aquatic habitat scoping survey was conducted outside the optimum survey season for macrophytes, thus it is likely that the macrophyte communities were under-represented within these surveys.



## 5 RECOMMENDATIONS AND CONCLUSIONS

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### 5.1 FURTHER SURVEY RECOMMENDATIONS

- 5.1.1 As the desk study evidence of fish communities present within the Site is limited, particularly within the Core Zone watercourse, it is recommended that fish surveys are undertaken on Elstow Brook and the Core Zone watercourse. These surveys should be conducted to assess the diversity of fish communities present, determine the presence and/or likely absence of species of conservation interest, and to further inform recommended mitigation measures. It is also recommended that fish surveys are conducted within each of the lakes within the Lake Zone in order to determine the presence of any fish species.
- 5.1.2 Due to a lack of desk study evidence of the aquatic macroinvertebrate communities present within the Site, particularly within the Core Zone watercourse, it is recommended that aquatic macroinvertebrate surveys are undertaken to determine the presence and/or likely absence of species of conservation interest or INNS. On Elstow Brook and the Core Zone watercourse it is recommended that these surveys are completed in two seasons (once in spring and once in autumn) in order to allow for seasonal variation comparison and enable indicative WFD classifications to be made for the invertebrate quality element on Elstow Brook. It is also recommended that aquatic macroinvertebrate surveys are conducted within each of the lakes within the Lake Zone in order to understand the composition of any aquatic macroinvertebrate community present.
- 5.1.3 Due to a lack of desk study information and due to the presence of macrophytes recorded within the initial habitat scoping assessment, it is recommended that macrophyte surveys are conducted along 100m stretches of Elstow Brook and the Core Zone watercourse. Additionally, macrophyte surveys should be conducted within the four lakes located within the Lake Zone, to assess the diversity of macrophyte communities within these water bodies and to further assess the potential impacts on them.
- 5.1.4 Further details of the fish, aquatic macroinvertebrate, and macrophyte communities within the Site are outlined in **Appendix 6.17: Aquatic Ecology Survey Report (Volume 3)** and **Appendix 6.8: Macrophyte Survey Report (Volume 3)**, subsequently prepared following the completion of species-specific surveys in 2024.

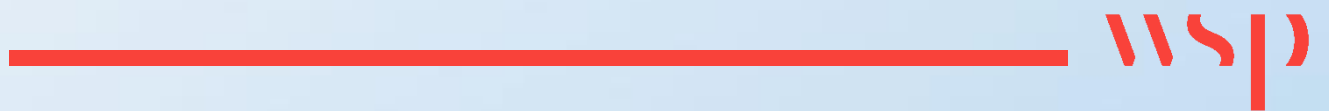
### 5.2 CONCLUSIONS

- 5.2.1 This aquatic habitat scoping assessment report is based on a desk study and aquatic habitat scoping assessments undertaken in April 2024, to assess the aquatic ecological constraints within the Site. The Site has several aquatic habitat features that would likely support aquatic species of conservation interest.
- 5.2.2 Aquatic habitats with biodiversity value on-Site that may be impacted by the Proposed Development include watercourses and waterbodies. These habitats could support a range of aquatic species of conservation interest. An EcIA has been completed to assess the potential effects of the Proposed Development upon aquatic habitats and species present within them, and outline mitigation measures to address these predicted effects and is provided in **Chapter 6: Ecology and Nature Conservation (Volume 1)**.



# Annex 1

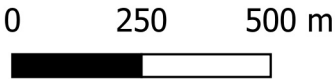
## FIGURES







- Key
- Site boundary
  - Watercourses
  - Lakes



Client:  
Universal Destinations & Experiences

Project:  
Universal Destinations & Experiences  
UK Project

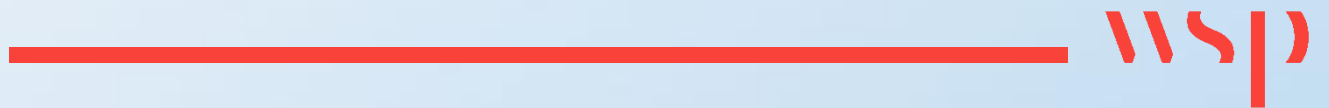
Title:  
Figure 1 - Aquatic Ecology Survey  
Area

Drawing No:	70116516-Appendix 6-2-Figure 1	Drawn:	LB
Date:	16/05/2025	Checked:	LM
Scale:	1:15,308	Approved:	VD



# Annex 2

## **RELEVANT LEGISLATION AND POLICY**



This report has been compiled with reference to following relevant wildlife legislation and planning policy. Full details of all relevant legislation and policy are provided in **Appendix 3.1: Legislation, Policy and Guidance for all ES Technical Topics (Volume 3)**.

### ***Salmon and Freshwater Fisheries Act 1975***

This Act<sup>14</sup> covers regulation of fisheries in England and Wales and includes legislation that covers the introduction of polluting effluents, the obstruction of fish passage (screens, dams, weirs, culverts etc) illegal means of fishing, permitted times of legal fishing and fishing licencing (which covers electric fishing).

Under this act any person who causes or knowingly permits to flow, or puts or knowingly permits to be put, into any waters containing fish or into any tributaries of waters containing fish, any liquid or solid matter to such an extent as to cause the waters to be poisonous or injurious to fish or the spawning grounds, spawn, or food of fish, shall be guilty of an offence.

The act also requires that fish passes are installed on new and rebuilt barriers that affect waters frequented by salmon or migratory trout. In the future, it is likely that fish passage facilities will need to be designed to accommodate all fish species and life stages, with nature-like bypass channels being the most appropriate solution currently available.

### ***Natural Environment and Rural Communities (NERC) Act 2006***

Species and Habitats of Principal Importance in England and Wales are listed under *Section 41* and *Section 42* respectively of the *NERC Act*<sup>15</sup>. The *Section 41* and *42* lists detail species that are of principal importance for the conservation of biodiversity in England and Wales and should be used to guide decision-makers such as local and regional authorities when implementing their duty to have regard for the conservation of biodiversity in the exercise of their normal functions – as required under *Section 40* of the *NERC Act 2006*.

### ***The Eels (England and Wales) Regulations 2009***

The *Eels (England and Wales) Regulations 2009*<sup>16</sup> implement *Council Regulation (EC) No 1100/2007*<sup>17</sup> of the Council of the European Union, which required Member States to establish measures for the recovery of the stock of European eel. The regulations apply to England and Wales.

They give powers to the regulators (the Environment Agency and Natural Resources Wales) to implement recovery measures in all freshwater and estuarine waters in England and Wales. The aim of the regulations is to achieve 40% escapement of adult eels relative to escapement levels under pristine conditions. The measures, as set out in the legislation, by which this is to be achieved is to

<sup>14</sup> HM Government (1975) *Salmon and Freshwater Fisheries Act 1975*. Available at:

<https://www.legislation.gov.uk/ukpga/1975/51/contents> [Accessed: 24 March 2025].

<sup>15</sup> HM Government (2006) *Natural Environment and Rural Communities Act 2006*. Available at:

<https://www.legislation.gov.uk/ukpga/2006/16/contents> [Accessed: 24 March 2025].

<sup>16</sup> HM Government (2009) *The Eels (England and Wales) Regulations 2009*. Available at:

<https://www.legislation.gov.uk/uksi/2009/3344/contents> [Accessed: 24 March 2025].

<sup>17</sup> Council of the European Union (2007) *Council Regulation (EC) No 1100/2007 of 18 September 2007 establishing measures for the recovery of the stock of European eel*. Available at: <https://eur-lex.europa.eu/eli/reg/2007/1100/oj/eng> [Accessed: 24 March 2025].

reduce fishing pressures, improve access and habitat quality and reduce the impact of impingement and entrainment.

Under the *Regulations*<sup>16</sup>, the regulators can serve notice to companies detailing their legal obligation to screen intakes and outfalls for eel and/or to remove or modify obstructions to eel migration. However, it is possible for companies to be granted with exemptions if the costs of works greatly exceeds the benefits. In such a situation it is likely the regulator will seek a package of more cost-effective, “*alternative measures*”.

## ***The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017***

The purpose of the *WFD*<sup>18</sup> is to establish a framework for the protection of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater and for water all waterbodies (unless artificial or heavily modified) to achieve “*good*” ecological status.

Ecological Status is expressed in terms of five classes (high, good, moderate, poor, or bad). These classes are established on the basis of specific criteria and boundaries defined against biological, physico-chemical and hydromorphological elements. Biological assessment uses numeric measures of communities of plants and animals (for example, fish and rooted plants). Physico-chemical assessment looks at elements such as temperature and the level of nutrients, which support the biology. Hydromorphological quality looks at water flow, sediment composition and movement, continuity (in rivers) and the structure of physical habitat.

The overall Ecological Status of a water body is determined by whichever of these assessments is the poorer. For example, a water body might pass ‘Good Status’ for chemical and physico-chemical assessments but be classed as ‘Moderate Status’ for the biological assessment: In this case it would be classed overall as ‘Moderate Ecological Status’. To achieve the overall aim of good surface water status, the Directive requires that surface waters be of at least Good Ecological Status and Good Chemical Status. To achieve High Status, the Directive requires that the hydromorphological Quality Elements are also in place.

When considering the effect of a development or activity on a waterbody it is a regulatory requirement under the *WFD*<sup>18</sup> to assess if it will cause or contribute to a deterioration in status or jeopardise the waterbody achieving good status in the future.

## ***The Conservation of Habitats and Species Regulations 2017 (as amended) (Habitat Regulations)***

The *Conservation of Habitats and Species Regulations 2017*<sup>19</sup> consolidate the *Conservation of Habitats and Species Regulations 2010*<sup>20</sup> with subsequent amendments. The Regulations transpose

<sup>18</sup> HM Government (2017) *The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017*. Available at: <https://www.legislation.gov.uk/ukxi/2017/407/contents> [Accessed: 24 March 2025].

<sup>19</sup> HM Government (2017) *The Conservation of Habitats and Species Regulations 2017*. Available at: <https://www.legislation.gov.uk/ukxi/2017/1012/contents> [Accessed: 24 March 2025].

<sup>20</sup> HM Government (2010) *The Conservation of Habitats and Species Regulations 2010*. Available at: <https://www.legislation.gov.uk/ukxi/2010/490/contents> [Accessed: 24 March 2025].

*Council Directive 92/43/EEC*<sup>21</sup>, on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive), into national law. The *Regulations* came into force on 30 November 2017 and extend to England and Wales (including the adjacent territorial sea) and to a limited extent in Scotland (reserved matters) and Northern Ireland (excepted matters).

*Defra guidance (2021)*<sup>22</sup> states that Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) in the UK no longer form part of the EU's Natura 2000 ecological network. The *Conservation of Habitats and Species Regulations 2017*<sup>19</sup> have created a national site network on land and at sea, including both the inshore and offshore marine areas in the UK. The national site network includes:

- Existing SACs and SPAs; and
- New SACs and SPAs designated under these Regulations.

Any references to Natura 2000 in the *2017 Regulations*<sup>19</sup> and in guidance now refers to the new national site network.

Maintaining a coherent network of protected sites with overarching conservation objectives is still required in order to:

- Fulfil the commitment made by government to maintain environmental protections; and
- Continue to meet our international legal obligations, such as the Bern Convention, the Oslo, and Paris Conventions (OSPAR), Bonn and Ramsar Conventions.

It is also a matter of government policy that Ramsar sites are considered in the assessment process, as described in Paragraph 194 of the National Planning Policy Framework<sup>23</sup>.

All species listed under Schedule 2 and Schedule 5 of the *Habitats Regulations*<sup>19</sup> require strict protection and are known as European Protected Species (EPS). Under Regulation 42 of the *Habitats Regulations*, it is unlawful to:

- Deliberately kill, capture, or disturb;
- Deliberately take or destroy the eggs of; and
- Damage or destroy the breeding site/resting place of any species protected under this legislation.

If the Ecologist determines that impacts to an EPS are unavoidable then the works may need to be carried out under a site-specific mitigation licence from Natural England (NE).

Certain EPS are also listed under Annex II of the Habitats Directive and are afforded protection by the establishment of core areas of habitat known as SAC. This means these species are a relevant consideration for assessment.

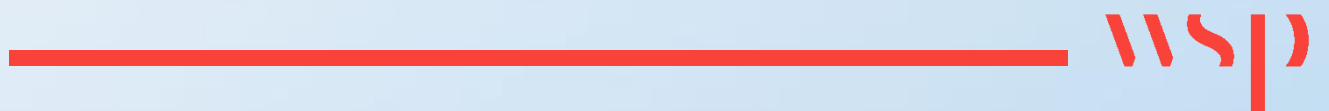
<sup>21</sup> Council of the European Union (1992) *Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora*. Available at: <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:31992L0043> [Accessed: 24 March 2025].

<sup>22</sup> Department for Environment, Food & Rural Affairs (2021) *Policy Paper: Changes to the Habitats Regulations 2017*. Available at: <https://www.gov.uk/government/publications/changes-to-the-habitats-regulations-2017/changes-to-the-habitats-regulations-2017> [Accessed 16 May 2025].

<sup>23</sup> Ministry of Housing, Communities and Local Government (2024) *National Planning Policy Framework*. Available at: <https://assets.publishing.service.gov.uk/media/675abd214cbda57cacd3476e/NPPF-December-2024.pdf> [Accessed: 24 March 2025].

# Annex 3

## **SITE PHOTOGRAPHS**







**Figure 3.1 – Elstow Brook**



**Figure 3.2 – Elstow Brook**



**Figure 3.3 – Elstow Brook in Lake Zone  
Alongside Railway**



**Figure 3.4 – Elstow Brook in Lake Zone  
Alongside Railway**





**Figure 3.5 – Core Zone Watercourse Cross-Channel View**



**Figure 3.6 – Core Zone Watercourse Upstream View**



**Figure 3.7 – Core Zone Watercourse Culvert**



**Figure 3.8 – Core Zone Watercourse Emergent Macrophytes**





**Figure 3.9 – Core Zone Watercourse Emergent Macrophytes**



**Figure 3.10 – Core Zone Watercourse Divergence**



**Figure 3.11 – Core Zone Watercourse Water Crow-Foot**



**Figure 3.12 – Core Zone Watercourse Common Reed**





**Figure 3.13 –Lake 1 Inflow from Eastern Lake**



**Figure 3.14 – Lake 1**



**Figure 3.15 – Lake 2**



**Figure 3.16 – Lakes 3a and 3b**





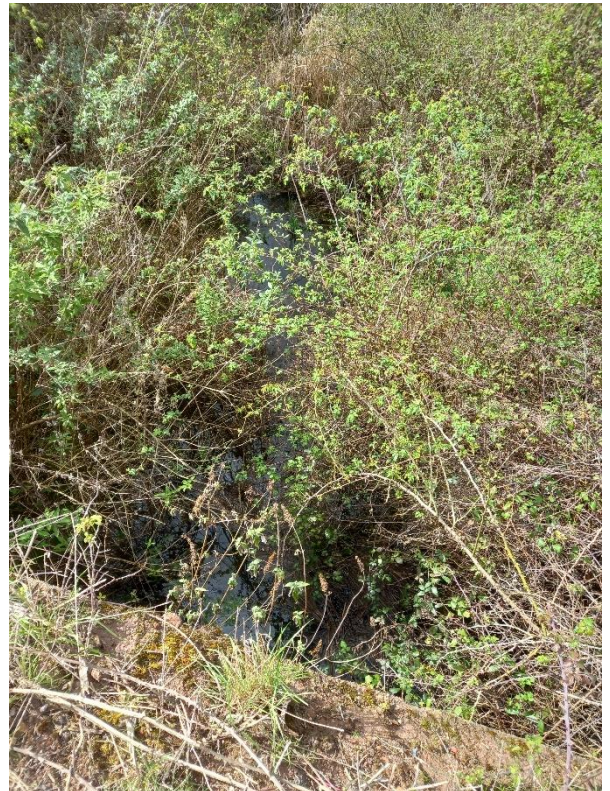
**Figure 3.17 – Lake 3a**



**Figure 3.18 – Lake 3b**



**Figure 3.19 – Lake 3a**



**Figure 3.20 – Outflow Ditch from Lake 1  
Towards Elstow Brook**



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