



Preliminary Environmental Information Report

Volume 2

Chapter 7: Biodiversity

7 Biodiversity

7.1 Introduction

7.1.1.1 This chapter of our Preliminary Environmental Information Report (PEIR) considers the effects from construction and operation of the River Thames Scheme (RTS) ('the project') in relation to biodiversity. Within this chapter we have included topic-specific sections on:

- Legislation, policy and guidance (noting any changes since Environmental Impact Assessment (EIA) scoping);
- Engagement with consultees, including responses to comments received on our RTS EIA Scoping Report;
- The assessment methodology for this topic (again noting any changes or updates since EIA scoping);
- Key environmental considerations and opportunities;
- Primary and tertiary mitigation;
- Our preliminary assessment of effects;
- Secondary mitigation; and
- Future work for this topic of our EIA.

7.1.1.2 For a summary of the key baseline elements associated with biodiversity see Section 5.3.

7.1.1.3 An explanation of the topic study area can be found in Section 7.2.3 of our RTS EIA Scoping Report (Environment Agency and Surrey County Council, October 2022) ('our EIA Scoping Report'). The study area incorporates all habitats and flora that lie within the project boundary for EIA PEIR. The study area includes fauna species and statutory and non-statutory designated nature conservation sites within the project boundary for EIA PEIR and up to a two kilometres buffer or the area within the 1:100 year floodplain (i.e. the area with a one per cent chance of flooding in any given year), whichever is the greater. Where the study area boundary partially covers a potential receptor, that receptor as a whole has been included in the assessment. The study area for biodiversity represents the zone of influence (ZOI) of the project for different ecological receptors likely to experience effects from construction and operation from the RTS.

7.1.1.4 There will be interrelationships related to the potential effects on the biodiversity receptors and other topics. Reference should also be made in particular to the following PEIR chapters: Chapter 6: Air Quality, Chapter 11: Health, Chapter 12: Landscape and Visual Amenity, Chapter 14: Noise and Vibration, Chapter 16: Soils and Land and Chapter 18: Water Environment (in particular the assessment of water dependent habitats under the Water Framework Directive (WFD) Compliance Assessment process).

7.2 Legislation, Policy and Guidance

7.2.1 Legislation

7.2.1.1 A summary of the key legislation, policy and guidance relevant to biodiversity is provided in Appendix M of our RTS EIA Scoping Report. Since the publication of our EIA Scoping Report in October 2022, the National Policy Statement for Water Resources Infrastructure (NPS) has been finalised and was designated in September 2023 (Defra, 2023a). No notable changes to the NPS from the draft NPS (published in 2018) have been identified as relevant to this chapter. Much of the other legislation remains unchanged from our EIA Scoping Report; key changes are described here.

7.2.1.2 The Environment Act 2021 required for legally binding targets in priority areas including biodiversity to be set in Regulations and met in England over a 25-year period. The Act requires for Environmental Improvement Plans to be produced by the Department for Environment, Food and Rural Affairs (Defra) to monitor progress and commit the Government to greater compliance with those targets if insufficient progress is made.

7.2.1.3 The Environmental Targets (Biodiversity) (England) Regulations 2023 were published, as required in the Environment Act 2021. They set the following legally binding target (LBTs) with regard to species abundance and extinction:

- The long-term biodiversity target for species' extinction risk is to reduce the risk of species' extinction by 2042, when compared to the risk of species' extinction in 2022.

- The long-term biodiversity target for the restoration or creation of wildlife-rich habitat is that in excess of 500,000 hectares of a range of wildlife-rich habitats are to be restored or created by 31 December 2042.
- The 2030 species abundance target is that the overall relative species abundance index on the specified date indicates that the decline in the abundance of species has been halted.
- The long-term biodiversity target to reverse the decline of species abundance is that the overall relative species abundance index by 31 December 2042 is;
 - Higher than the overall relative species abundance index for 31 December 2022; and
 - At least 10 per cent higher than the overall relative species abundance index for 31 December 2030 (the specified date for the 2030 species abundance target).

7.3 Engagement

7.3.1 Responses to EIA Scoping

- 7.3.1.1 Table 7.1 summarises the responses to comments received on our EIA Scoping Report following formal submission to the Planning Inspectorate (PINS) including the PINS EIA Scoping Opinion (dated 15 November 2022) ('the PINS Scoping Opinion') and any key comments received from statutory consultees. Full responses to consultee comments on the EIA Scoping Report and our responses to these comments are provided in Appendix 4.1.

Table 7-1: Responses to comment received on our EIA Scoping Report

Consultee or Organisation	Summary of Comment	Project Response
PINS	<p>The Inspectorate considers that there is insufficient evidence provided in the EIA Scoping Report to establish the likely scale and nature of these effects and the specific receptors that could be affected by these changes. The ES should contain an assessment of potential hydromorphological changes caused by capacity changes at weirs on ecological receptors where significant effects are likely to occur.</p>	<p>This comment was made in reference to scoping out the effects from operation on River Thames weir pools associated with capacity improvement works to weirs - paragraph 7.5.2.1 in the EIA Scoping Report, bullet point 1.</p> <p>Since the scoping opinion the Environment Agency Fisheries Technical Specialists have provided further baseline information regarding migratory fish and their supporting habitats in areas adjacent to the gates. Therefore, effects on fish from the proposed capacity improvement works at Molesley, Sunbury and Teddington weirs could occur and will be assessed in the Environmental Statement (ES). Further consultation with Environmental Agency Technical Specialists will be held.</p> <p>We consider that effects on aquatic habitats and other notable and protected species (other than migratory fish) should remain scoped out of the assessment as there is evidence to support that changes to the hydromorphology of the River Thames as a result of the operation of the capacity improvements are within the range of variance of existing flood flow conditions. This evidence is provided within the report 'Capacity Improvement Works Thames Weirs' (GBV, 2018).</p> <p>Further information on hydromorphological effects of the capacity improvement works is</p>

Consultee or Organisation	Summary of Comment	Project Response
		provided in Chapter 18: Water Environment.
PINS	<p>Ancient woodland and veteran trees are not described in the baseline in Scoping Report Section 7.3 and have limited reference in the future baseline section although they are known to be located in the study area. They are also not scoped into the assessment in Scoping Report paragraph 7.4.3.2.</p> <p>The ES should establish the baseline for veteran trees and ancient woodland, including locating these and other Habitats of Principal Importance on a figure, and assess significant effects on these receptors where they are likely to occur.</p>	<p>Description of the known baseline data for ancient woodland is included in our Preliminary Ecological Appraisal (PEA). No veteran trees have been identified in historical surveys for the RTS, however, further tree surveys are proposed for the RTS and there is potential for them to be present.</p> <p>They were not included in the features list in our Scoping Report however, have now been specifically noted in the PEIR as part of the woodland and trees receptors, respectively. Ancient woodland and veteran trees will be included in the scope of the assessment for the ES.</p>
PINS	<p>The Inspectorate disagrees with the proposed screening process set out in EIA Scoping Report paragraph 6.2.3.19</p> <p>Focus should not be solely on Special Areas of Conservation, Special Protection Areas (SPA) and Ramsar sites and sites such as (but not limited to) Sites of Special Scientific Interest, Local Wildlife Sites and National Nature Reserves should be included as receptors.</p> <p>Habitats known to not be sensitive to NOx or nitrogen deposition are proposed to be</p>	<p>The assessment of effects on air quality will look at ecologically sensitive sites within 200m of roads which vehicles connected to the project will use during construction and operation of the RTS. These sites include statutory and non-statutory sites with national and local designations; further details on how we will conduct this assessment are provided in Chapter 6: Air Quality.</p>

Consultee or Organisation	Summary of Comment	Project Response
	<p>screened out of assessment, however, there are multiple other emissions that have potential to impact habitats such as dust, particulates and ammonia, therefore, sites with potential to be impacted by any changes in air quality should be included in the ES assessment.</p> <p>The exceedance of 1,000 Annual Average Daily Traffic (AADT) does not take into account the vehicle type, speed or cumulative traffic.</p> <p>The ES should use multiple applicable variables (in line with relevant guidance) to inform an assessment of impacts on ecological receptors.</p>	
PINS	<p>The Inspectorate notes that Windsor Great Park is within the 2km buffer from the project boundary, but the designations covering this site have been omitted from the list of sites considered in the assessment. The SAC is also identified within the 2km buffer from the project boundary shown within the HRA Screening Assessment in Appendix N of the Scoping Report. The ES should include these sites in the list of designated sites considered in the assessment, where significant effects are likely to occur.</p>	<p>Great Windsor Park is not within the 2km buffer of the RTS however, it is partially within the extent of the 1 in 100-year flood extent so is within the study area for our PEIR. It has been added to the list of designated sites in Appendix 7.1 and is shown on Figure 5.4.</p> <p>It is considered that any operational effect on Great Windsor Park SAC will be non-significant as described in Table 1.4.</p>

Consultee or Organisation	Summary of Comment	Project Response
PINS	The ES should differentiate between measures required to address significant environmental effects and those proposed to deliver biodiversity net gain. Where biodiversity net gain is relied upon as mitigation, this should be stated in the ES.	These will be clearly distinguished in the ES and supporting Development Consent Order (DCO) documents.
Local Planning Authority (LPA) Project Group	As mentioned in the EIA Scoping Report, the project presents an opportunity to deliver net gains in biodiversity. It is advised that the Applicant differentiates clearly in the ES between design elements/mitigation required to mitigate significant effects to biodiversity receptors, and those required to deliver net gains in biodiversity.	These will be clearly distinguished in the ES and supporting DCO documents.
LPA Project Group	The Future Baseline used to inform the ES should take into account changes brought about through climate change.	This is being considered in our PEIR and ES. The biodiversity baseline text in Chapter 5 of our PEIR has been updated to add climate change to the future baseline and further details on climatic factors are presented within Chapter 9.
LPA Project Group	In reference to Section 7.7 of our EIA Scoping Report: This section suggests that the CIEEM Ecological Impact Assessment (EclA) methodology will be used alongside the assessment methodology used in the wider ES. If this approach is taken, it	EclA methods are set out in Section 7.7 of the Scoping Report. The methods are in line with the Guidelines for Ecological Impact Assessment CIEEM (2018) and only one method will be used. When describing the assessed effect, the significance will be determined as significant (major or moderate effects)

Consultee or Organisation	Summary of Comment	Project Response
	<p>is recommended that the assessment presents the conclusions from both, stating whether effects are significant or not significant at the relevant geographical level of importance.</p>	<p>or not significant (minor or negligible effects) so that effects are comparable with the other topics in the ES. The effect will be characterised within the ES and this will include details of what geographic level of importance the effect will be experienced for that receptor.</p>
<p>Environment Agency Sustainable Places</p>	<p>The environmental impact of the long-term maintenance regime for this scheme needs to be scoped in. Section 7.4.2.1 recognises that dredging or other possible management activities to reinstate the design profile of the flood channel have the potential for adverse effects on water quality due to the mobilisation of sediment and pollutants. However, it is unclear what mitigation has been factored in for this.</p>	<p>The EIA Scoping Report paragraph 7.5.2.1 states that operational general maintenance activities would be scoped out of the assessment due to good practice measures (tertiary mitigation) that would be implemented.</p> <p>In paragraph 7.4.2.1 of the EIA Scoping Report it is confirmed that sediment management activities required to reinstate the design profile of the new channels is within the scope of the assessment.</p> <p>Therefore, there will be no change to the assessment of effects in our ES. In our ES the distinction between what is considered general maintenance and what are management measures of the RTS will be set out so it is clear what effects will be assessed in the EclA.</p>
<p>Environment Agency Sustainable Places</p>	<p>Whilst we understand that the Spelthorne channel is proposed to flow through a significant length of historic landfill, there needs to be justification for the hard engineering as proposed, detailing why other options were ruled out. For example, puddle clay lining instead, setting back the sheet piling, lowering the</p>	<p>Design of in-channel and riparian habitat is ongoing and details will be provided within the project design.</p> <p>Effects from construction on fish are scoped into our EclA and we are currently developing mitigation (including seasonality of construction activities).</p>

Consultee or Organisation	Summary of Comment	Project Response
	<p>concrete bed to enable a natural channel shape and substrate to be achieved. Any sheet piling that is in the vicinity of the river will need to consider the construction impacts of piling on fish spawning and migration, although we welcome the use of non-percussive methods wherever practical. Timing constraints (both for coarse and salmonid species depending on the location) may be required. There is a risk that the current channel designs (both the proposed 'natural' channel, and sheet piled sections) will provide unfavourable habitat owing to its trapezoidal, uniform shape. This may create a legacy of slow flowing, aggrading channels, with limited opportunities for healthy habitats to develop over time.</p>	
Marine Management Organisation (MMO)	<p>The MMO recommends that the ES chapters such as "biodiversity" are separated into subchapters relating to specific receptor groups, for example a section relating specifically to aquatic fauna.</p>	<p>We have taken this advice on board and there will be sub-sections in our ES as per the sub-sections set out in Section 7.6 of our PEIR.</p>
MMO	<p>The MMO acknowledges the planned biodiversity survey for white clawed crayfish <i>Austropotamobius pallipes</i> which are native and protected and agrees with this approach.</p>	<p>Surveys in 2022 found that white clawed crayfish are likely absent from the study area, so there will be no effect on this species from the RTS (GBV, 2022).</p>

Consultee or Organisation	Summary of Comment	Project Response
MMO	The MMO would expect further detailed information on the proposed construction works to be included in the Preliminary Environmental Impact Report (PEIR)/ES, including any in-river piling works and other noise-generating activities. The effects of underwater noise and vibration on sensitive marine receptors (including migratory fish species) should be appropriately considered.	When detailed information on construction is available this will be provided in the ES. It is considered likely that in most cases airborne noise will have a greater impact on human receptors than waterborne noise so will be the focus of the noise and vibration assessment (Chapter 14). An assessment of waterborne noise or vibration on aquatic receptors will be carried out within the biodiversity topic.
Natural England	Consideration for functionally linked land (FLL) impacts in relation to the lakes not designated under the South West London Waterbodies SPA & Ramsar but which are utilised by the same bird populations.	The HRA will consider impacts to functionally linked land (FLL) to the South West London Waterbodies SPA & Ramsar. This is set out in the Habitat Regulations Screening Assessment to Support EIA Scoping and in the Habitat Regulations Hazards Identification and Assessment Scope provided in Appendix 7.7 of the PEIR.
Natural England	Evidence of no potential for (or greatly reduced likelihood of) nutrients entering the designated sites or their FLL (the lakes not in the designation). This is to determine impacts on plant growth or composition in regards to food resources for the Gadwall and Shoveler.	The HRA will consider the potential impacts of increased nutrients entering the South West London Waterbodies SPA & Ramsar sites and their FLL. The assessment proposed will be informed by modelling carried out for WFD assessment and evidence from comparable sites/projects. The Habitat Regulations Hazards Identification and Assessment Scope provided in Appendix 7.7 of this PEIR identifies changes in water quality resulting in habitat change as an operational hazard that will need to be considered.

7.3.2 Other Engagement since EIA Scoping

7.3.2.1 Section 7.2.2 of our EIA Scoping Report summarises the stakeholder engagement relevant to the biodiversity topic that was undertaken prior to submission of the EIA Scoping Report.

7.3.2.2 Since EIA Scoping, we have held regular meetings with Natural England throughout the compilation of our PEIR to provide updates on the RTS and to provide an opportunity for discussion on matters; principally South West London Waterbodies SPA, Ramsar and Site of Special Scientific Interest (SSSI); Biodiversity Net Gain, Invasive Non-Native Species and pathogens and species licensing matters.

7.3.2.3 We have continued to hold briefings with the LPA Project Group, the Marine Management Organisation, National Infrastructure Team (NIT), National Permitting Service and Surrey Wildlife Trust to discuss the PEIR findings, our biodiversity surveys and other biodiversity related matters throughout the DCO process.

7.4 Methodology

7.4.1 Introduction

7.4.1.1 This section should be read in conjunction with Chapter 4 'Approach to the Environmental Assessment' which sets out relevant information on the design parameters and information that have informed our PEIR assessment, and how we have approached various aspects of the assessment including:

- The scope of the assessment;
- The methodology (including the approach to defining the baseline environment, topic study areas, and assessment methodology and criteria);
- The approach to mitigation; and
- The approach to cumulative effects.

7.4.1.2 The assessment methodology used for the biodiversity assessment in our PEIR and to be used in our Environmental Statement (ES) is presented in Section 7.7 of our EIA Scoping Report and Chapter 4 of our PEIR.

7.4.2 Ecological Impact Assessment

7.4.2.1 For the PEIR, we have completed an initial, high level Ecological Impact Assessment (EclA) to assess the likely significant effects of the project on statutory and non-statutory nature conservation sites, important habitats and legally or notable species of flora and fauna (both aquatic and terrestrial), arising from the construction and operation of the project which forms the basis for this chapter. For the ES, we will expand this into a full EclA, which will be used to produce the biodiversity chapter of the ES for our EIA.

7.4.2.2 The methodology for the full EclA which will form the biodiversity chapter of the ES is provided in our EIA Scoping Report and Chapter 4 of our PEIR.

7.4.3 Habitats Regulations Assessment (HRA)

7.4.3.1 We are undertaking an HRA in accordance with Planning Inspectorate (PINS) Advice Note Ten (PINS, 2022b) to assess whether the RTS will have a likely significant effect (LSE) on any European sites, and where there is an LSE to assess whether the RTS will have an Adverse Effect on Integrity (AEoI) on any European sites. The HRA will be completed alongside the ES and will inform our EclA.

7.4.3.2 'European sites' is the collective term for Special Areas of Conservation (SACs) and SPAs designated under the Habitats Regulations for the protection of certain species and habitats. They form part of a network of protected sites across the UK known as the 'UK national site network'. It is a matter of UK Government policy that wetlands of international importance designated under the Ramsar Convention (Ramsar sites) are considered in the same way as European sites.

7.4.3.3 We completed an HRA Screening assessment to determine whether the RTS will have an LSE on a European site in support of our EIA Scoping Report and used this to support our consultation with Natural England. The Screening assessment concluded that the RTS will have an LSE on the South West London Waterbodies (SWLW) SPA and Ramsar site.

7.4.3.4 The SWLW SPA and Ramsar sites are spatially identical and are both designated for gadwall *Mareca strepera* over winter and for northern shoveler *Anas clypeata* over winter and when on spring and autumn

migration. Gadwall and shoveler also use other waterbodies within the project boundary for EIA PEIR which support the designated site populations. Those 'supporting' waterbodies have a functional linkage to the SWLW SPA and Ramsar sites and as such need to be considered by the HRA.

7.4.3.5 We will carry out a Statement to inform the Appropriate Assessment to assess whether the RTS will have an AEoI on the SWLW designations. As an initial step in this process, alongside the PEIR, we have identified the hazards associated with the construction and operation of the RTS that could affect the SWLW designations and described these in the Habitats Regulations Hazard Identification and Assessment Scope in Appendix 7.7. A table that identifies which hazards are applicable to each waterbody that will need to be considered in the HRA documentation is presented in Appendix 7.7.

7.4.3.6 Whilst the HRA is a separate standalone process, we will co-ordinate it with the production of the ES.

7.5 Key Environmental Considerations and Opportunities

7.5.1.1 The key considerations with respect to biodiversity are:

- Major development will likely require the delivery of offsite mitigation for biodiversity effects and for delivery of biodiversity net gain. The availability and suitability of land for priority areas for habitat creation, mitigation or enhancement, will be a consideration for developers;
- There are numerous stakeholders within the study area who have biodiversity objectives. These stakeholders and their interests will be a consideration of any major development;
- There is a broad range of protected species and habitats covering a large proportion of the study area. These are sensitive to loss and fragmentation of habitat from land use changes and development;
- The lakes within the study area are stable environments and likely to support a diversity of aquatic life. Influx of water from other waterbodies and other changes to lake processes will affect aquatic species;
- The presence of numerous invasive non-native species (INNS) (and likely aquatic pathogens) within the study area. These are susceptible to further spreading; and

- There is a range of non-designated habitats and species within the study area. These are sensitive to loss and fragmentation of habitat from land use changes and development.

7.5.1.2 The key opportunities with respect to biodiversity are:

- Provision of quality (biodiverse) habitats, contribution to Local nature recovery priorities and the generation of net gain for biodiversity;
- Improvement of connectivity, networks and corridors for biodiversity;
- Enhancement of existing habitats (including low-quality habitats) and provision of new habitats;
- Planting opportunities; native species planting including marginal planting along the water bodies associated with the project;
- Management and removal of INNS; and
- Health and wellbeing benefits to people being able to enjoy nature and have opportunities to interact with local biodiversity as well as other natural capital benefits.

7.6 Primary and Tertiary Mitigation

7.6.1 Primary Mitigation

7.6.1.1 We propose the following primary mitigation in relation to biodiversity effects.

- Apply mitigation hierarchy for habitat and species, for example firstly avoiding negative project activities on biodiversity receptors through design or minimising them e.g. selecting areas of lower ecological value for construction over those with higher ecological value, allowing the more ecologically valuable sites to be available for enhancement – the last step in the mitigation hierarchy and which is additional to those measures to address effects of the project;
- Habitat creation, mitigation or enhancement for other effects on habitats or species to mitigate for a range of potential effects, such as disturbance, severance or loss of existing habitats;
- Provision of fish passes on water level control structures on the flood channel to allow for fish passage and reduce negative effects upon populations;
- The provision and management of an augmented flow along the flood channel when not in operation during flooding to prevent water stagnation in the flood channel (including lakes), provide continued

sediment and nutrient transport, reduce the risk of algal blooms and eutrophication and assist in the movement of fish through the system;

- Enhancement of habitats immediately downstream of three weirs on the River Thames (at Penton Hook, Chertsey and Shepperton). Implementation of these enhancements will be subject to the EIA confirming effects on these habitats from diverting water along the flood channel and will be able to be delivered within the Project Boundary for EIA PEIR;
- Infill of connection between Manor Lake and Fleet Lake to limit nutrient inputs to Manor Lake from the flood channel that may otherwise affect the ecology of Manor Lake;
- Alteration of water level control structure from St Ann's Lake to Abbey Lake to divert floodwater and limit nutrient inputs from the flood channel that may otherwise affect the ecology of St Ann's Lake;
- Avoidance of work within Thorpe Hay Meadow Site SSSI to prevent disturbance to protected unimproved grassland habitat at this site; and
- Undertake ongoing silt monitoring and maintenance of the flood channel to restore the design profile and therefore reduce effects upon hydromorphology and associated effects on aquatic biodiversity.

7.6.2 Tertiary Mitigation

7.6.2.1 We propose the following tertiary mitigation in relation to biodiversity effects.

7.6.2.2 Standard construction practices in relation to ecology, for example, mitigation measures in accordance with CIRIA C762 environmental good practice on site. This is likely to include measures such as (this is not an exhaustive list):

- Fencing off of protected habitats and/or species that are present on site to prevent access and exclude direct construction effects;
- Buffer zones around certain habitats/species to ensure suitable protection zones are observed;
- Appointing an Ecological Clerk of Works (EcCoW) to provide advice and perform compliance checks and watching briefs throughout construction;

- Clearance of site vegetation should be carried out between September and February, where possible, to avoid disruption to nesting birds. If this is not possible, clearance of vegetation could be permitted after the EcCoW confirms that no nesting birds are present. If reptile hibernation habitat is identified, clearance of site vegetation and removal of the habitat will be completed outside of the winter months, where possible; and
- If protected habitats or species are discovered, work to cease and the EcCoW to be contacted to agree next steps.

7.6.2.3 Standard construction practices and management plans in line with legislation and guidance:

- Air Quality standard practice techniques and Air Quality Management Plan (see Chapter 6); this will reduce the quantity of dust and emissions from construction thereby reducing effects on ecological receptors.
- Handling of Soils (see Chapter 16); this will control the amount of silts generated by construction; reducing run-off to aquatic habitats.
- Construction Travel Plan, Operational Travel Plan, Traffic Management Plan and Construction Logistics Plan (see Chapter 17). The management of traffic and travel corridors will limit the emissions generated from vehicles and ensure they are located away from sensitive habitats and species.
- Construction Surface Water Management Plan (see Chapter 18); this will outline the measures necessary to control the movement of surface water across the construction areas reducing the likelihood of contamination (i.e. from fuel oils) or localised flooding onto sensitive habitats.
- Application of the Waste Hierarchy and Waste & Materials Management (see Chapter 13); reducing waste and controlling materials used will lead to less risk of contamination and degradation of ecological receptors.
- Best Practicable Means Noise and Vibration mitigation (see Chapter 14); noise and vibration risk affecting species (i.e. bats) so control of these will reduce the magnitude of effect on those receptors.
- Hydro(geo)logical Risk Assessment (see Chapter 18); this will identify risks to aquatic ecological receptors so that appropriate avoidance or mitigation measures can be identified.

- Site Waste Management Plan (SWMP) (see Chapter 13), including measures for example to avoid placement in sensitive ecological areas where feasible.
- Standard construction practices in relation to waste and materials management: for further details see the tertiary mitigation section of Chapter 13: Materials and Waste. In particular, for the purposes of this PEIR assessment, environmental permits for waste have been relied upon as mitigation in relation to potential spread of contaminants, with the assumption that these are in place and will address any risk of effects to ecological receptors such as protected sites.

7.6.2.4 A Terrestrial INNS Management Plan to limit negative effects upon native habitats and species (note that Aquatic INNS Management will be bespoke to the RTS and is therefore listed as secondary mitigation). Measures within this plan could include (this is not an exhaustive list):

- Eradicate and/or control INNS before commencement of construction;
- Marking out areas of terrestrial INNS with a buffer to avoid access and spread;
- Strict biosecurity measures for all contractors (e.g. Check-Clean-Dry procedure), equipment and PPE to avoid spread of INNS and pathogens (both terrestrial and aquatic); and
- Periodic monitoring for spread of INNS and implementation of ongoing treatment to avoid colonisation or spread.

7.6.2.5 Artificial lighting to be restricted and positioned to control light spill onto ecological receptors (see Chapter 12).

7.7 Preliminary Assessment of Likely Significant Effects

7.7.1 Introduction

7.7.1.1 Our PEIR adopts a precautionary approach. Assessments reported within this chapter are a preliminary assessment of potential likely significant environmental effects based on the design parameters set out in Chapter 2. This precautionary approach has been taken for our PEIR as there is some information on the project that is currently incomplete and the parameters within Chapter 2 are high level and account for a range of

uses and allowance for design development within a boundary that could possibly be refined once this work has been completed. For example, some designs, construction and mitigation details (and therefore also land requirements) or baseline information is still required from further surveys, assessments and/or consultation feedback.

- 7.7.1.2 In making a determination of likely significant effects, we have considered the sensitivity of receptors (a receptor being a feature of the environment that responds to change) and the potential magnitude (i.e. size) of change caused by the RTS. The methodology for defining sensitivity and magnitude varies by topic and is defined in the topic sections of our Scoping Report.
- 7.7.1.3 We are committed to including mitigation measures as necessary to address likely significant negative environmental effects as far as reasonably practicable. Both primary and tertiary mitigation are considered to form part of the RTS; those applicable to this topic are set out in Section 7.6. Several of these mitigation measures are still being developed, and therefore as a precaution, the preliminary assessment of effects for our PEIR does not assume full achievement of these in considering if a project effect is likely to be significant (Appendix 4.2 identifies the implementation status of primary and tertiary mitigation for the PEIR assessment). Furthermore, the potential likely significant effects reported within our PEIR have been assessed prior to the implementation of secondary mitigation measures, those applicable to this topic are set out in Section 7.7.2. These secondary mitigation measures are the subject of further development; and given they are still being developed, are not able to be applied to develop a 'residual' effects assessment.
- 7.7.1.4 Our PEIR is based on the latest design and construction parameters and baseline information. As such the findings of the preliminary environmental appraisal presented within our PEIR will be subject to change as the design progresses, as mitigation is further developed or information from further studies becomes available, such as ongoing species surveys to identify species present and their distribution across the site and what mitigation will be appropriate to mitigate loss and fragmentation of habitats. The final assessment of effects undertaken as part of our EIA and reported within the ES will be based on the latest information available at that time.

7.7.2 Potential Likely Significant Effects

Construction

7.7.2.1 Our preliminary assessment of likely significant environmental effects has identified the potential for the following significant effects from construction in relation to biodiversity:

Designated Nature Conservation Sites

7.7.2.2 A summary of statutory and non-statutory designated sites for nature conservation is provided in Appendix 7.1.

7.7.2.3 Temporary and/or permanent negative effects on the South West London Waterbodies SPA and Ramsar site resulting from:

- the creation of flow control structures, priority areas for habitat creation, mitigation or enhancement, and areas of enhanced public connection potentially causing the spread of INNS and a reduction in water quality from sediment mobilisation. This would affect the habitat quality of qualifying species.
- the loss and fragmentation of habitat, noise, vibration and changes in air quality causing displacement of species resulting from construction activities.
- nutrient deposition from road traffic due to construction.

7.7.2.4 Temporary negative effects to the terrestrial and aquatic habitats and/or species associated with Wraysbury Reservoir SSSI (part of SWLW SPA and Ramsar site) resulting from noise, vibration, lighting and changes in air quality from construction traffic as a result of the creation of priority areas for habitat creation, mitigation or enhancement adjacent to the site.

7.7.2.5 Temporary and/or permanent negative effects to habitats and/or species of Thorpe Park No. 1 Gravel Pit SSSI (part of SWLW SPA and Ramsar) resulting from habitat loss, INNS spread and changes in water quality as a result of creation of the Runnymede Channel and flow control structures. Potential temporary negative effects to the SSSI habitats and species from changes in air quality, noise, vibration, and lighting from construction activities. Potential temporary negative effects of nutrient deposition from construction road traffic.

- 7.7.2.6 Temporary negative effects to Thorpe Hay Meadow SSSI and Dumsey Meadows SSSI habitats and/or species resulting from disturbance or displacement from noise, vibration, lighting, increased nutrient deposition and changes in air quality resulting from construction activities. These effects are likely to result from the construction activities needed to create the green open spaces and the Runnymede Channel which are adjacent to Thorpe Hay Meadow SSSI and from the construction access route around Dumsey Meadow SSSI.
- 7.7.2.7 Temporary negative effects to Wraysbury & Hythe End Gravel Pits SSSI (part of SWLW SPA and Ramsar site) habitats and/or species from disturbance or displacement from noise, vibration, lighting and changes in air quality from construction activities from areas of habitat creation, enhancement or mitigation.
- 7.7.2.8 Temporary negative effects to Bushy Park and Home Park SSSIs habitats and species resulting from the works at Moseley Weir potentially causing changes in air quality from construction activities.
- 7.7.2.9 Temporary negative effects to Ham Lands LNR habitats and/or species as a result of compounds and construction works at Teddington Weir through habitat loss, spread of INNS, lighting, noise and vibration, and changes in air quality from construction activities.

Non-Statutory Designated Nature Conservation Sites

- 7.7.2.10 Temporary and/or permanent negative effects to the River Thames (and towpath) – Spelthorne Local Wildlife Site (LWS) and the River Thames and the Tidal Tributaries LWS resulting from creation of the new channels, the fish passes at Beasley's Ait and Chertsey weirs, and fish passes and capacity improvement works at the Sunbury, Molesey and Teddington weirs, and bed lowering downstream of Desborough Cut.
- 7.7.2.11 Potential permanent and/or temporary negative effects are likely on habitats and/or species of the above LWSs as a result of vegetation clearance, the spread of INNS and changes in water quality, hydromorphology, and flow regime/sediment processes within the LWSs. Potential temporary negative effects from noise and vibration and changes in air quality are also likely to occur to LWS habitats and species as a result of the construction activities.

- 7.7.2.12 Temporary and/or permanent negative effects to Ham Lands LWS habitats and/or species as a result of compounds and construction works at Teddington Weir through spread of INNS, lighting, noise and vibration and air quality changes from construction activities for the weir.
- 7.7.2.13 Temporary and/or permanent negative effects to the following Sites of Nature Conservation Interest (SNCI) (which are supporting waterbodies to SWLW SPA and Ramsar) as a result of construction of the Runnymede Channel, flow control structures, creation of blue and green open spaces, and areas for enhanced public connection, resulting in vegetation clearance, spread of INNS, changes in water quality, hydromorphology, residence time or sediment processes. Also, potential temporary negative effects to SNCI habitats and species resulting from lighting, noise and vibration, changes in air quality from increased traffic movements and nutrient deposition from road traffic resulting from compounds and materials storage sites:
- Abbey Lake Complex;
 - Chertsey Bourne at Abbey Lake Complex;
 - Ferris Meadows;
 - Littleton Lake;
 - Sheepwalk Lake;
 - Shepperton Quarry; and
 - Wraysbury Reservoir.
- 7.7.2.14 The Spelthorne Channel that will run through the corner of the Charlton Quarry SNCI and creation of green open spaces and areas of enhanced public connection could result in temporary and/or permanent negative effects to the habitats and/or species from flow changes, sediment distribution, change in flooding regime, water quality changes and INNS/pathogen spread, habitat loss and direct injury/death of species.
- 7.7.2.15 Temporary negative effects to the Charlton Quarry SNCI habitats and species from construction, compounds and materials processing sites, including disturbance and displacement resulting from noise, vibration, lighting, changes in air quality and nutrient deposition from construction road traffic.
- 7.7.2.16 Temporary and/or permanent negative effects on the habitats and/or species of Desborough Island SNCI and Laleham Burway Golf Course

SNCI due to creation of priority areas for habitat creation, mitigation or enhancement, areas of enhanced public connection, new landforms and, at Desborough Island SNCI, new pedestrian/cycle bridges crossing the River Thames at Chertsey and Desborough potentially resulting in habitat loss, and severance and fragmentation of habitats. Temporary negative likely effects include disturbance and displacement of SNCI species resulting from noise, vibration, lighting and changes in air quality from those construction activities. In addition, there is potential temporary negative effect to Laleham Burway Golf Course SNCI from nutrient deposition from road traffic due to construction.

- 7.7.2.17 Temporary and/or permanent negative effects from all project components to the River Thames – Runnymede SNCI and the construction of Molesey and Sunbury weirs and bed lowering to the River Thames – Elmbridge SNCI potentially causing spread of INNS, changes in water quality, hydromorphology, flow regime or sediment processes, disturbance to riverbed/banks and damage to/loss of riparian habitats. Potential temporary negative effects to SNCI habitats and species are likely to result from noise, vibration, lighting, and changes in air quality from those construction activities.

Notable Habitats

- 7.7.2.18 Notable habitats locations are provided in the Preliminary Ecological Appraisal (PEA) provided in Appendix 7.2. The PEA covers the areas within the project boundary for EIA PEIR.
- 7.7.2.19 Temporary and/or permanent negative effects from construction to lakes and watercourses (including Mead Lake Ditch) are likely as a result of all project components including dewatering, potentially causing INNS spread, changes to water quality, hydromorphology, flow regime or sediment processes, and damage to/loss of riparian habitats including sections of the River Thames bypassed by the RTS.
- 7.7.2.20 Temporary and/or permanent negative effects on open mosaic habitat on previously developed land, hedgerows, ponds and reedbeds as a result of all project components due to the vegetation clearance, habitat severance/fragmentation/loss, changes in water quality and INNS spread.
- 7.7.2.21 Temporary and/or permanent negative effects on woodlands, trees and neutral grassland habitat as a result of all project components including

required vegetation clearance, leading to habitat severance/fragmentation/loss.

Protected and Notable Species

- 7.7.2.22 Protected and notable species surveys have taken place since our EIA Scoping Report, the results of which are provided in the following appendices: Appendix 7.3: Terrestrial and Aquatics Invasive and Non-Native Species (INNS) Report; Appendix 7.4: Great Crested Newt Survey Report 2023; Appendix 7.5: Macrophyte and Macroinvertebrate 2021 and 2022 Surveys Report; Appendix 7.6: Non-breeding Bird Survey Baseline Report 2022/23 and Appendix 7.8: Reptile Survey Report.
- 7.7.2.23 Temporary and/or permanent negative effects as a result of all project components to the following species, including direct injury/death, loss of roosts and abandonment of young, reduction in availability of suitable sheltering, foraging or commuting habitat, and habitat severance/fragmentation. Potential temporary negative effects from construction include disturbance and displacement due to noise, vibration, lighting, and the movement of vessels:
- Otter *Lutra lutra*;
 - Bats;
 - Badger *Meles meles*;
 - Schedule 1 birds;
 - Non-Schedule 1 birds;
 - Amphibians;
 - Invertebrates (aquatic and terrestrial species);
 - Reptiles (grass snake *Natrix helvetica*, slow worm *Anguis fragilis* and common lizard *Zootoca vivipara*);
 - Water vole *Arvicola amphibius* (if found to be present); and
 - Notable plant species.
- 7.7.2.24 Temporary and/or permanent negative effects on fish and eel *Anguilla anguilla*, as a result of bed lowering downstream of Desborough cut, the construction of flow control structures and fish passes at Sunbury, Teddington, Beasley Ait, Molesey and Chertsey weirs, the creation of blue open space, bridges, temporary wharfs and pedestrian/cycle bridges. Potential likely significant effects identified result from disturbance (e.g. disruption of spawning/migration), injury/death from pathogen exposure

and treatment, spread/treatment of INNS, impingement and entrainment, changes in water quality, hydromorphology, flow regime, sediment and habitat damage/severance/loss. Temporary negative effects from construction are likely from noise, vibration, lighting and movement of vessels.

Operation

- 7.7.2.25 Our preliminary assessment of likely significant environmental effects has identified the potential for the following significant effects from operation in relation to biodiversity:

Statutory Designated Nature Conservation Sites

- 7.7.2.26 Providing enhanced public connection along the embankment that borders St Ann's Lake could result in increased permanent sensory disturbance and displacement to the qualifying bird species of the South West London Waterbodies SPA and Ramsar Site (excluding supporting sites) and therefore have a negative effect. The habitats and species of the SPA and Ramsar Site may also be negatively affected by nutrient deposition from increased road traffic travelling to the new green open spaces.
- 7.7.2.27 Potential permanent negative effects to Thorpe Park No.1 Gravel Pit SSSI (part of SWLW SPA and Ramsar site) from disturbance to sites and species due to increased public access. There are potential permanent positive effects of reduced flood risk to the nearby contaminated sites which could benefit the SSSI through reduced exposure to contaminants. The habitats and species of the SSSI may also be negatively affected by nutrient deposition from road traffic due to the enhanced public connection.
- 7.7.2.28 At Thorpe Hay Meadow SSSI, nutrient deposition from road traffic due to the operational project components of the RTS may lead to potential negative effects on the SSSI. The RTS is expected to lower groundwater levels at Thorpe Hay Meadow SSSI, this has the potential to improve drainage in spring and reduce the incidence of flooding from the Mead Lake Ditch and the River Thames but it also has the potential for permanent loss in groundwater supply to the SSSI. There is also the potential for a permanent positive effects on the SSSI from the reduced flood risk to nearby contaminated sites which could benefit the SSSI

through reduced exposure to contaminants. While the biggest effect on the site's condition is currently thought to be management, all potential significant effects will be assessed in the EclA.

- 7.7.2.29 Change in frequency, groundwater levels and the depth of flooding from the operation of RTS could lead to permanent changes in habitat quality of Dumsey Meadow SSSI, Staines Moor SSSI, Wraysbury & Hythe End Gravel Pits SSSI (part of SWLW SPA and Ramsar site), and Langham Pond SSSI. There is potential for permanent positive effects of reduced flood risk to contaminated sites, which could benefit the SSSIs through reduced exposure to contaminants. Potential permanent effects could result from increased nutrient deposition from road traffic due to operational project components.

Non-Statutory Designated Nature Conservation Sites

- 7.7.2.30 Potential permanent negative effects on Ferris Meadows SNCI, Littleton Lake SNCI, Sheepwalk Lake SNCI and Shepperton Quarry SNCI (supporting waterbodies to SWLW SPA and Ramsar site) from the operation of the Spelthorne Channel, which will run through these SNCIs, including flow changes, sediment distribution, the spread of INNS/pathogens, disturbance and water quality changes. There will be a permanent positive effect from the design due to habitat enhancement, for example through provision of marginal habitat.
- 7.7.2.31 Potential negative permanent effects on the above SNCIs plus Wraysbury Reservoir SNCI, Abbey Lake SNCI, Chertsey Bourne SNCI, Laleham Burway Golf Course SNCI and Charlton Quarry SNCI could result from increased nutrient deposition from increased vehicle movements to operational project components, in particular to the new green open spaces.
- 7.7.2.32 Permanent positive effects from net gain in biodiversity via provision of enhanced or new habitats at Wraysbury Reservoir SNCI (part of SWLW SPA and Ramsar site). Permanent negative effects from changes in flooding patterns altering the habitats present. Negative permanent effects could result from increased nutrient deposition from increased vehicle movements in operation.
- 7.7.2.33 Permanent negative effects from the Runnymede Channel running through Abbey Lake Complex SNCI and Chertsey Bourne at Abbey Lake

Complex SNCI, which are supporting waterbodies to SWLW SPA and Ramsar site. These could include flow changes, sediment distribution, the spread of INNS/pathogens, increased disturbance and water quality changes. Negative permanent effects could result from increased nutrient deposition from increased vehicle movements in operation. There will be a permanent positive effect from the design due to habitat enhancement, for example through provision of marginal habitat.

- 7.7.2.34 Permanent negative effects Penton Hook Island SNCI, Chertsey Water Works Well Field SNCI and Ham Lands LWS could result from changes in the extent of flooding once the project is in operation. Potential permanent effects will result from increased nutrient deposition from road traffic due to operational project components.
- 7.7.2.35 Permanent negative effects on Laleham Burway Golf Course SNCI, Charlton Quarry SNCI and Desborough Island SNCI could occur from changes in flooding patterns altering the habitats which are present, increased disturbance to habitats through increased public access and nutrient deposition from road traffic due to the provision of operational project components. There would be permanent positive effects from habitat creation and enhancement to achieve biodiversity net gain.
- 7.7.2.36 Permanent negative effects from all project components leading to changes in flooding patterns altering the habitats present in 43 SNCIs, 35 LWSs and six LNRs that are outside our PEIR Boundary, but within the study area. These are shown in Figure 5.4.

Notable Habitats

- 7.7.2.37 Permanent negative effects on lakes (some part of/supporting SWLW SPA and Ramsar site) and watercourses from the operation of the new channels and flow control structures and blue open space potentially resulting in changes to the flow, nutrient levels and hydromorphology, residence times and INNS/pathogen spread due to flow and navigation in flood channel. Permanent positive effects from improvements to lake and watercourse habitats from reprofiling and from the habitat creation, mitigation or enhancement within the design.
- 7.7.2.38 Permanent positive effects on hedgerows, woodland, neutral grassland, ponds and reedbeds; due to habitat creation and enhancement to achieve biodiversity net gain proposed.

Protected and Notable Species

- 7.7.2.39 Permanent positive effects on otter, badger, bats, reptiles, amphibians, invertebrates (terrestrial and aquatic), water vole (if present), notable plant species and trees (including veteran trees) from habitat creation, mitigation or enhancement within the design.
- 7.7.2.40 Temporary and/or permanent negative effects on Schedule 1 and non-Schedule 1 bird habitats from all project components due to changes in the frequency and depth of floods to supporting habitats, and potential effects resulting from changing lake levels on habitats. It is noted that species present are likely to be able to respond to fluctuations, which will be further considered in the EclA. There is potential for permanent positive effects from habitat improvements for these species through improvements to supporting habitat.
- 7.7.2.41 Permanent negative effects on fish and eel could result from the operation of the new channel and associated infrastructure (including capacity improvements proposed on the downstream weirs: Molesey, Sunbury and Teddington). Effects could result from water quality and flow changes; habitat damage/disturbance and the downstream displacement of species from operational activities; fish mortality within the flood channel and higher levels of predation; diversions/delays/prevention to fish passage; changes in sediment processes within the existing lakes and the River Thames (including the potential for habitat changes in the sections of the River Thames between the intakes and outtakes of the new channels i.e. the depleted reach); the spread/escape of INNS/pathogens and changes in floodplain connectivity. Permanent positive effects on fish and eel from improved fish passage due to installation of fish passes and habitat creation.
- 7.7.2.42 Further details of the potential likely significant effects from construction and operation with respect to receptors, project components and project activities, in relation to biodiversity can be found in Table 1 and 2 in Appendix 7.9.

7.7.3 Potential Likely Non-Significant Effects

- 7.7.3.1 Further details of the effects from construction and operation that are considered to be non-significant, in relation to biodiversity can be found in Table 3 and 4 in Appendix 7.9. Effects that are considered unlikely to be

significant have been identified based on the likely magnitude of the resulting change and the sensitivity of the receptor.

7.7.3.2 Some examples of biodiversity non-significant effects include (this is not an exhaustive list):

- For the receptor 'other terrestrial habitats', the effect from changing terrestrial to aquatic habitats is not considered a significant effect as these are not Habitats of Principal Importance so have a low sensitivity to change.
- Potential permanent positive effects on 'other terrestrial habitats' due to habitat enhancement and net gain in biodiversity proposed within the design of the project. This is not likely to be significant as these habitats are not Habitats of Principal Importance so have a low sensitivity to change.

7.7.4 In-Combination Climate Impact

7.7.4.1 Consideration of 'In-Combination Climate Impact' (ICCI) has been undertaken. The preliminary environmental assessment has considered a future climate scenario and has identified certain potential likely significant environmental effects for this topic which will be exacerbated further by predicted climate change. Further consideration of ICCI will be included in the ES.

7.7.5 Secondary Mitigation

7.7.5.1 In order to reduce the likely significance of effects, the following secondary mitigation is under consideration:

Aquatic INNS Management Plan

7.7.5.2 Measures to reduce negative effects on native aquatic habitats and species could include (this is not an exhaustive list):

- Eradicate and/or control INNS before commencement of construction;
- Strict biosecurity measures for all contractors (e.g., Check-Clean-Dry procedure), equipment and PPE to avoid or limit the spread of INNS and pathogens (both terrestrial and aquatic); and

- Periodic monitoring for spread of INNS and implementation of ongoing treatment to avoid colonisation or spread.

Aquatic Pathogen Management Plan

7.7.5.3 Measures to reduce negative effects on aquatic species could include (this is not an exhaustive list):

- Strict biosecurity measures for all contractors and equipment (e.g. Check-Clean-Dry procedure) to avoid or limit the spread of INNS and pathogens both terrestrial and aquatic; and
- Periodic monitoring for spread of pathogens (via health checks of fish) and implementation of ongoing treatment to avoid colonisation or spread.

SPA / Ramsar mitigation

7.7.5.4 Precise mitigation to reduce negative effects on gadwall and shoveler will be determined by the HRA but might include measures such as seasonal restrictions; buffers; habitat enhancement; construction noise barriers/screens; timed sheet piling; restricted lighting; avoidance of direct impacts.

Investigate Use of Alternative Piling Methods that Reduce Noise and Vibration Where Practicable

7.7.5.5 Further Noise Assessment will identify whether alternative piling methods should be investigated to reduce species disturbance. If considered necessary and practicable, they will form part of the construction design (embedded mitigation). Alternative piling methods could include consideration of:

- Hydraulic jack piling;
- Rotary piling; and
- Hydraulic push piling.

Bat Mitigation

7.7.5.6 Protected Species Licences are likely to be required, and a mitigation method statement will be produced for bats. Measures that are likely to be required to reduce negative effects to bat species could include: restricted

artificial light; piling methods with minimal vibration and noise; timing of works outside key periods; habitat creation/enhancement; compensatory new roosts.

Bird Mitigation

- 7.7.5.7 We will prepare a mitigation method statement for birds. Measures to reduce negative effects could include: restrictions within buffers; timing of works outside of key periods; pre-construction checks; piling methods with minimal vibration/noise; noise barriers/screens; bird nest boxes; habitat creation/enhancement.

Otter Mitigation

- 7.7.5.8 Protected Species Licences are likely to be required, and a mitigation method statement will be produced for otters. Measures that may be required to reduce negative effects could include: artificial holts; restricted artificial light; woodland and dense scrub planting; new road underpasses and dry pipes where access through culverts is severed.

Badger Mitigation

- 7.7.5.9 Protected Species Licences are likely to be required, and a mitigation method statement will be produced for badgers. Measures that may be required to reduce negative effects could include: timing of sett closures to avoid the breeding season; restricted artificial light; installation of road underpasses and dry pipes to provide alternative means of dispersal.

Reptile Mitigation

- 7.7.5.10 We will prepare a mitigation method statement for reptiles. Measures to reduce negative effects could include: compensatory habitat creation (e.g. compost heaps close to water) for grass snakes; enhancement of existing terrestrial habitats; timed vegetation clearance to avoid peak breeding season in accordance with sensitive clearance methods.

Invertebrate Mitigation

- 7.7.5.11 We will prepare a mitigation method statement for invertebrates. Measures to reduce negative effects could include: planting blackthorn scrub/habitat enhancement for hairstreak butterfly *Thecla* sp.; sparsely

vegetated mound avoidance/creation for other terrestrial invertebrates;
design of a range of flows for aquatic invertebrates.

Amphibian Mitigation

- 7.7.5.12 We will prepare a mitigation method statement for amphibians. Mitigation measures to reduce negative effects could include: habitat creation/enhancement; sensitive timing of construction activities; appropriate use of artificial lighting and potentially amphibian exclusion and translocation techniques.

Water Vole Mitigation

- 7.7.5.13 Protected Species Licences may be required if water voles are found, and a mitigation method statement will be produced for water voles. Measures that may be required to reduce negative effects could include: habitat creation/enhancement; sensitive timing of construction activities including lighting; and potentially displacement or exclusion and translocation techniques.

Fish and Eel Mitigation

- 7.7.5.14 We will prepare a mitigation method statement for fish and eel. Mitigation measures to reduce negative effects could include: habitat creation/enhancement; construction methods with minimal vibration and noise used wherever practical (piling method statement); seasonal restrictions for migratory periods; fish rescues; appropriate use of artificial lighting.

7.8 Further Work for the EIA

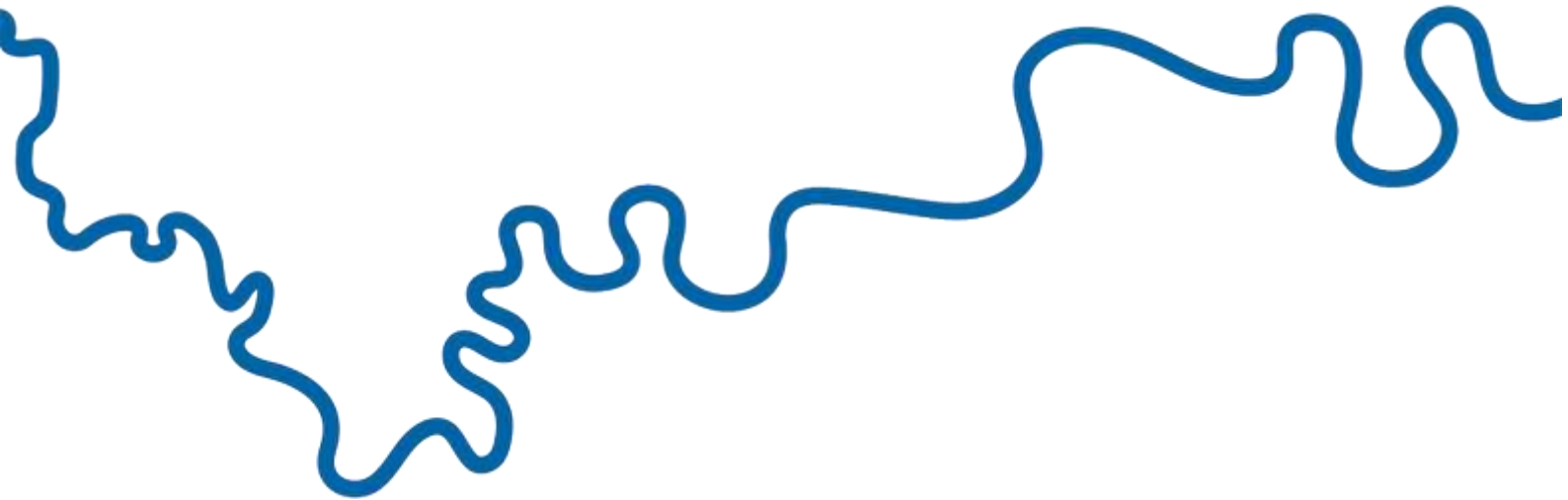
- 7.8.1.1 We will undertake a detailed EclA covering the effects from construction and operation of the project in accordance with the methodology set out in Section 7.4 above, to inform the ES.
- 7.8.1.2 Our assessment will be based on the effects scoped in the assessment as described in Section 7.7.
- 7.8.1.3 The following additional species-specific surveys are to be completed and/or are due to be reported. The outcomes of these surveys (alongside the surveys done to date) will inform the baseline data collection for the EclA:

- National Vegetation Classification surveys of habitats identified in the UK Habitats Classification survey as requiring more detailed classification are ongoing. The locations of the surveys are provided in the PEA (Appendix 7.2).
- Hedgerow surveys of all priority hedgerows recorded within the PEA are ongoing.
- Tree surveys are proposed for the RTS to support the DCO application, these will provide the baseline for any veteran trees likely to be affected by RTS.
- Bat surveys of suspected roost sites, and further assessment of all buildings to be potentially demolished (e.g. at Sheepwalk) for their suitability for bat roosting and surveys to identify key foraging and commuting sites. These surveys are proposed to supplement previous survey work in 2017 (BL Ecology, 2019), 2021 (BL Ecology; 2022) and 2022.
- Invertebrate surveys for stag beetle *Lucanus cervus* and any other notable species within areas of suitable habitat as identified in the PEA (Appendix 7.2) and previous surveys.
- Breeding bird surveys covering the period March to June have been completed, passage birds covering July – October 2023 inclusive are ongoing. These surveys are proposed to supplement previous surveys undertaken in 2021 (AECOM, 2021; APEM, 2021) and 2022 (AECOM, 2022).
- Non-breeding birds/wintering birds survey covering the period October 2023 to March 2024 inclusive. These surveys will supplement the surveys completed from October 2022 to March 2023 inclusive (Appendix 7.6) and data from previous surveys.
- Fish surveys of watercourses and lakes where data is required to understand the nature of effects from RTS is ongoing.
- Further macrophyte surveys will be taken within the lakes where boat access was not available in 2022; as per the recommendations in the Macrophyte and Macroinvertebrate Survey Report 2023 (Appendix 7.5).
- Monitoring for badgers and otter are being considered as part of ongoing surveillance works for these species where suitable habitats have been identified.

7.8.1.4 We will review the HRA Screening assessment following consultation on our PEIR. The final HRA Screening assessment and the Statement to

inform Appropriate Assessment will be reported in the information to be provided to the Competent Authority for the purposes of informing their Appropriate Assessment' with submission of the DCO application for the project.

- 7.8.1.5 We will undertake further assessments to characterise effects on biodiversity from project noise and vibration, lighting, air quality, increased nutrient deposition, contamination, water quality, hydromorphology, flows/residence times and flooding.
- 7.8.1.6 The ES will state the predicted significance of effects, provide further detail of relevant mitigation, and document the subsequent residual effects. We consider that the further development of the project design and mitigation measures which will be reflected in the ES and DCO application, will enable a reduction in the scale of identified negative likely significant effects set out in this chapter.



The River Thames Scheme represents a new landscape-based approach to creating healthier, more resilient and more sustainable communities by reducing the risk of flooding and creating high quality natural environments.