Cardiff East Park and Ride, Llanrumney
Environmental Statement
Chapter 5: Ecological Impact Assessment

WSP on behalf of Curtis Hall Ltd

November 2025

Iceni Projects Ltd.
Da Vinci House, 44 Saffron Hill, London, ECN1 8FH
T: 020 3640 8508 **F:** 020 3435 4228 **W:** iceniprojects.com

5. ECOLOGICAL IMPACT ASSESSMENT

Introduction

5.1 This chapter of the ES has been prepared by WSP and presents an assessment of the likely significant effects of the Proposed Development with respect to Ecological Impact Assessment. Mitigation measures are identified, where appropriate, to avoid, reduce or offset any significant adverse effects identified and/or enhance likely beneficial effects. Taking into account the mitigation measures, the nature and significance of the likely residual effects are reported

5.2 This chapter is supported by the following technical appendices:

- **Appendix 5.1**: Preliminary Ecological Appraisal (PEA) Report;
- **Appendix 5.2**: Bat Report;
- **Appendix 5.3**: Otter Survey Report;
- **Appendix 5.4**: Reptile Mitigation Strategy;
- **Appendix 5.5**: Habitats Regulations Assessment (HRA);
- **Appendix 5.6**: Hazel Dormouse Impact Assessment;
- **Appendix 5.7**: Woodland Management Plan (WMP);
- **Appendix 5.8**: Invasive Non-Native Species Survey & Management Plan (ISMP); and
- **Appendix 5.9**: River Rhymney Aquatic Habitat Appraisal.

Competence

5.3 For a summary of the competence of the authors of this chapter, please refer to **Appendix 1.4**.

Legislation and Policy Context

Legislation Context

5.4 The following legislation is relevant to the Proposed Development:

- The Conservation of Habitats and Species Regulations 2017 (as amended) (Habitats Regulations);
- The Wildlife and Countryside Act 1981 (as amended) (WCA);
- Countryside Rights of Way Act 2000;
- The Town and Countryside (Environmental Impact Assessment) (Wales) Regulations 2017;

- The Wild Mammals (Protection) Act 1996;
- The Environment (Wales) Act 2016;
- The Wellbeing of Future Generations (Wales) Act 2015;
- The Natural Environment and Rural Communities Act 2006;
- The Hedgerow Regulations 1997; and
- The Protection of Badgers Act 1992.

National Planning Policy

5.5 The following national planning policy is relevant to the Proposed Development:

- The UK Post-2010 Biodiversity Framework (2011-2020) (JNCC and DEFRA, 2012);
- UK Biodiversity Action Plan (UKBAP)[1];
- Technical Advice Note 5 (TAN5) Nature Conservation and Planning (2009);
- Planning Policy Wales (PPW) (Edition 12) 2024;
- Future Wales: The National Plan 2040;
- Planning Policy Wales – Stepwise approach; and
- Planning Policy Wales – DECCA Framework.

Regional Planning Policy

5.6 The following regional planning policies are relevant to the Proposed Development:

- Cardiff Capital Region Strategic Development Plan (SDP).

Local Planning Policy

5.7 The following local planning policies are relevant to the Proposed Development

- Cardiff Local Biodiversity Action Plan (LBAP); and
- Cardiff Local Development Plan (2006–2026).

Guidance

5.8 The following guidance is relevant to the Proposed Development:

[1] The UK BAP has now been replaced by the UK Post-2010 Biodiversity Framework, however, it contains useful information on how to characterise important species assemblages and habitats which is still relevant.

- Guidelines for Ecological Report Writing – Chartered Institute of Ecology and Environmental Management (CIEEM, 2017[i]);
- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018[ii]);
- British Standard Code of Practice for Biodiversity and Development (BS42020:2013) (British Standards Institute, 2013[iii]); and
- In addition, relevant guidance and methodologies contained within the supporting documents listed in Section 5.2, including the PEA, species-specific survey reports, mitigation strategies, management plans, and the HRA, have been considered where applicable. These collectively provide the technical evidence base underpinning this assessment.

Compliance with Policy

5.9 To ensure compliance with PPW (2024), it is necessary to demonstrate that the Proposed Development will achieve a Net benefit for Biodiversity (NBB) by following both the stepwise approach and the DECCA framework.

The Stepwise Approach

5.10 The stepwise approach, as mentioned in the PPW (2024), entails firstly avoiding, then minimising, mitigating and, as a last resort, compensating for adverse impacts on the environment that occur as part of a development. Therefore, compensation should only be considered as a last resort, where it has been demonstrated clearly that adverse effects on the environment cannot be avoided or fully mitigated. If compensation is necessary, this must be delivered on-site where possible but off-site compensation can be sought if demonstrated that this is not possible.

The DECCA Framework

5.11 PPW (2024) instructs planning authorities to take account, and promote the resilience, of ecosystems when assessing planning applications.

5.12 Natural Resources Wales (NRW) has developed a framework for evaluating ecosystem resilience based on five attributes and properties specified in the Environment (Wales) Act 2016. This is referred to as DECCA and comprises the objectives listed:

- Diversity – maintaining and enhancing diversity at every scale, including genetic, structural, habitat and between-habitat levels. This supports the complexity of ecosystem functions and interactions that deliver services and benefits;
- Extent – incorporating measures which maintain and increase the area of semi-natural habitat/features and linkages between habitats. In general, smaller ecosystems have reduced capacity to adapt, recover or resist disturbance;

- Condition – the condition of an ecosystem is affected by multiple and complex pressures acting both as short term and longer-term types of disturbance. Both direct and wider impacts should be considered, for example avoiding or mitigating pressures such as climate change, pollution, invasive species, land management neglect etc; and
- Connectivity – this refers to the links between and within habitats which may take the form of physical corridors, stepping stones in the landscape, or patches of the same or related vegetation types that together create a network that enables the flow or movement of genes, species and natural resources. Developments should take opportunities to develop functional habitat and ecological networks within and between ecosystems, building on existing connectivity.

5.13 Ecosystem resilience is a product of the above four attributes. Adaptability, recovery and resistance to/from a disturbance are defining features of ecosystem resilience. NRW define ecosystem resilience as “An environment that can respond to pressures by resisting, recovering or adapting to change, and is able to continue to provide natural resources and benefits to people”.

5.14 NRW has a duty to ensure that the environment and natural resources of Wales are sustainably maintained, sustainably enhanced and sustainably used. Article 4 of the Natural Resource Body for Wales (Establishment) Order 2012 (Welsh Government, 2012) sets a general purpose for NRW to pursue the Sustainable Management of Natural Resources (SMNR) in the exercise of its functions. In order to achieve this, NRW applies a set of nine principles: adaptive management, scale, collaboration and engagement, public participation, evidence, multiple benefits, long term (consequences of actions), preventative action, and building resilience.

5.15 The objective of the SMNR is to maintain and enhance the resilience of ecosystems and the benefits they provide and, in so doing, meet the needs of present generations of people without compromising the ability of future generations to meet their need, and contribute to the achievement of the well-being goals of the Well-being of Future Generations Act 2015.

5.16 As per policy guidance, habitat loss will be minimised as far as possible and will be replaced as soon as possible. Trees removed will be replaced at a 3:1 ratio.

5.17 Wildflower creation areas will be incorporated into the design. These areas will be focused on recreating lost habitat on a like-for-like basis. This will include wildflower planting to produce a species rich mosaic which will support a range of species.

5.18 Some retained habitats will be enhanced for biodiversity. This will include the enhancement of ancient woodland habitat with plug planting ancient woodland indicator species, using species-rich seed mixes and managing appropriately to maintain botanical diversity. The benefits will be realised during the operational phase and offset the short-term adverse effects.

Assessment Methodology and Significance Criteria

5.19 This section presents the methodology used to assess the potential effects of the Proposed Development in relation to EcIA.

5.20 The Council's Ecologist was consulted on the overall scheme. Their review provided a detailed response requesting further information and clarification on several ecological aspects of the Proposed Development.

5.21 The scope of this EcIA is informed by both existing and updated ecological documents, as outlined in Section 5.2. The woodland strategy and dormouse mitigation strategy originate from the extant planning permission, while the reptile mitigation strategy was prepared following the granting of that permission to discharge relevant planning conditions. All other ecological reports have been updated to reflect the Proposed Development and current best practice.

Consultation

5.22 **Table 5.1** presents a summary of the comments raised in discussions with the Council and other relevant consultees.

Table 5.1 Summary of Comments Raised

Consultee	Comment	Response
County Ecologist	Call with County Ecologist	Email response suggesting enhancements and mitigation, and repeat survey requirements.

Study Area and Scope

Study Area

5.23 The study area for this EcIA encompasses the application boundary and the wider area considered relevant to assess potential ecological effects arising from the Proposed Development. The spatial scope reflects standard good practice and is consistent with the PEA (**Appendix 5.1**). It includes:

- 'The Site' within the Proposed Development boundary;
- Records of legally protected and notable species (from the South East Wales Biodiversity Records Centre ((SEWBReC) within 2 km;
- International and European statutory designated sites (Special Area of Conservation (SAC), Special Protection Area (SPA), and Ramsar)) within 10 km, extended to 30 km to include designated sites supporting bat populations, consulted from freely downloadable datasets (available from Natural Resources Wales (NRW)). Consideration was also given to any designated sites that might be hydrologically connected and located beyond 10 km hydrological connectivity;

- Nationally and locally designated sites[2] within 2 km of the Site, consulted from freely downloadable datasets (available from NRW);
- Records of non-statutory designated sites (from SEWBReC) within 1km of the Site;
- Priority Habitats[3] and AWI[4] sites within 1 km, consulted from freely downloadable datasets (available from NRW); and
- Waterbodies and ponds within 500 m of the Site were identified using open source 1:25,000 Ordnance Survey mapping.

5.24 For the purposes of the assessment, the baseline is informed by survey data collected within the past two years (2024/25), supplemented by desk-based records from SEWBReC covering up to the past ten years. The assessment assumes a construction period of up to four years, commencing in 2026, with a completed development year of 2029/30.

Scope

5.25 The following aspects are not considered in the ES because potential effects on these receptors are not likely to be significant:

- Water vole *Arvicola terrestris*.

Assessment Methodology

Impact Areas

5.26 The EcIA has been undertaken in accordance with the Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018[ii]). The assessment follows a structured approach to identify and evaluate potential effects of the Proposed Development on ecological features.

5.27 The process involved:

- Collating and reviewing existing baseline information from the PEA and supporting protected species reports;

[2] Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR).

[3] Priority Habitats as listed under Section 7 of the Environment (Wales) Act 2016. Inventories of Priority Habitats have been prepared by a variety of organisations and at a national (NRW priority habitat inventory) and local scale (e.g. by local records centres). In some instances, these are primarily based on aerial photograph analysis rather than field survey.

[4] The ancient woodland inventory in Wales lists areas over two hectares in size which have been continuously wooded since at least 1600.

- Identifying and valuing Important Ecological Features (IEFs) based on their conservation status at international, national, regional, and local levels;
- Predicting potential direct, indirect, and cumulative impacts during construction and operation;
- Considering embedded mitigation measures already incorporated within the design, such as good construction practice and pollution prevention;
- Identifying any additional targeted avoidance, mitigation, compensation, or enhancement measures required; and
- Assessing residual effects and determining their significance.

5.28 It is impractical and inappropriate for an ecological assessment to consider every species and habitat that may be affected. The assessment therefore follows CIEEM guidance by reviewing ecological features within the Zone of Influence (ZoI) to identify those that could, in principle, experience significant effects. Features of County value or above, or those subject to specific legal protection, were treated as potential IEFs for the purposes of this screening step. Features assessed as being of Local value were not identified as IEFs at this stage. However, they remain fully considered within the assessment to ensure compliance with wildlife legislation and the application of proportionate, good-practice mitigation. Features of Site or Negligible value were scoped out of the significance evaluation.

5.29 This approach enables the assessment to focus on features where significant effects may reasonably occur, while ensuring that all other ecological features recorded in the baseline continue to inform the assessment and associated mitigation.

5.30 The assessment applies professional ecological judgement in line with CIEEM guidance, taking into account the nature, magnitude, duration, timing, and reversibility of potential effects. Quantitative modelling has not been required, as the evaluation is based on existing ecological survey data, mitigation strategies, and licence commitments relevant to the extant permission and revised proposals.

Significance Criteria

5.31 The scale attributed to each effect has been determined based on the sensitivity of the receptor and magnitude of impact arising as a result of the Proposed Development. Professional judgement and experience have been drawn upon to assess the scale and significance.

Receptors and Receptor Sensitivity

5.32 The sensitivity of each receptor was evaluated as being high, medium, low or negligible based on a review of the baseline position of each receptor and its performance against benchmark areas. The receptors and the definition of sensitivity of a receptor (high, medium, low) is based on a scale set out in **Table 5.1**.

Table 5.2 Ecological Receptor Value and Sensitivity[5]

Sensitivity	Description
High	Receptor of high ecological importance, supporting rare, declining, or irreplaceable habitats or species, or large and functionally critical populations; highly sensitive to change.
Medium	Receptor of moderate ecological importance, supporting locally significant species, habitats with limited resilience, or moderate habitat diversity; some recovery possible.
Low	Receptor of local ecological importance with common or widespread habitats or species; generally tolerant or capable of recovery following disturbance.
Very Low	Receptor with limited ecological value (e.g. modified or degraded habitats, common species) and high resilience to change.

Magnitude of Impact

5.33 The magnitude of impact to a receptor has been determined by considering the estimated deviation from baseline conditions both before, and, if required, after mitigation. The scale used for determining the magnitude of an impact has been based on **Table 5.3**.

Table 5.3 Magnitude[6] of Impact Description

Impact Magnitude	Description
High	Major, long-term or irreversible change resulting in a complete or near-complete alteration of a habitat, population, or key ecological function (either positive or negative).
Medium	Noticeable change to a habitat, population, or ecological process; effects are potentially recoverable over time but may substantially alter ecological integrity in the short to medium term (positive or negative).
Low	Small-scale or short-term alteration in habitat quality, species abundance, or ecological function, with limited influence on overall structure or performance; recovery expected (positive or negative).
Very Low	Minimal or imperceptible change compared with baseline conditions; no measurable ecological consequence.

Assessing Significance

5.34 **Table 5.4** provide a matrix for determining the significance of an effect based on the sensitivity of the receptor and the magnitude of impact.

[5] Sensitivity has been informed by the ecological importance of features in accordance with CIEEM (2018) Section 4.6, considering rarity, diversity, resilience, and habitat function.

[6] Magnitude represents the scale or degree of ecological change relative to baseline conditions, considering factors such as extent, duration, reversibility, and timing in accordance with CIEEM (2018) Section 5.9.

Table 5.4 Significance of Effect Matrix

Receptor Sensitivity	Magnitude of Impact			
	High	Medium	Low	Very Low
High	Major Beneficial / Adverse	Major Beneficial / Adverse	Moderate Beneficial / Adverse	Minor Beneficial / Adverse
Medium	Major Beneficial / Adverse	Moderate Beneficial / Adverse	Minor Beneficial / Adverse	Negligible
Low	Moderate Beneficial / Adverse	Minor Beneficial / Adverse	Negligible	Negligible
Very Low	Minor Beneficial / Adverse	Negligible	Negligible	Negligible

5.35 Effects classified as major or moderate are considered 'significant'. Effects classified as minor are considered non-significant, while those classified as negligible are regarded as the effects that are so minimal that they are inappreciable, with no measurable or noticeable impact on the receptor. Due to their limited scale, such effects cannot act cumulatively with other effects to become significant.

Limitations and Assumptions

5.36 Every effort has been made to ensure that this EcIA is based on the best available information. The assessment draws on a suite of recent and historic ecological reports, including the PEA, protected species surveys, mitigation strategies, and management plans prepared for the Site. The following limitations are noted:

- The EcIA relies on existing ecological survey data, some of which were collected for the previously consented scheme. Ecological data are typically considered valid for up to two years unless site conditions or management have changed substantially.
- Records held by local biological record centres and local recording groups are generally collected on a voluntary basis; therefore, an absence of records does not necessarily demonstrate an absence of species, it may simply indicate a gap in recording coverage.
- Certain habitats, such as dense woodland areas, were not fully accessible during PEA walkover; however, these were reviewed using aerial imagery and adjacent observations, which are considered sufficient to confirm habitat types and extents.
- Invasive Non-native Plant Species (INNS) were recorded where observed during surveys, but full distribution mapping of all INNS was beyond the scope of the commission.

- The extended Phase 1 Habitat survey was carried out over two consecutive days from 24 to 25 August. As such, only a selection of all species that occur within the Site may have been recorded due to seasonality and/or random chance. However, through use of desk study information to supplement Site survey data, it is considered that an accurate assessment of the Site's potential for protected species or those of conservation concern was possible and this has not affected the overall conclusions of the appraisal.
- Survey effort for automated static detector surveys, Nighttime Bat Walkovers (NBWs), and the Ground-Level Tree Assessment (GLTA) was undertaken in line with current best practice (Collins, 2023) and is considered sufficient to characterise bat activity and identify trees with potential roosting features. However, as bats are highly mobile and may use different roosts seasonally, it remains possible that individual bats or flightlines were not detected during the survey period.
- One static detector (Static 1) experienced a technical fault in July and did not record. This is not considered a significant limitation, as the remaining static detectors recorded five nights of data in September and complete datasets were obtained for Static 1 for all other months. Overall, this provided sufficient information to enable a robust assessment of bat activity across the site.
- During reptile surveys undertaken by Delta-Simons in 2021 (Delta-Simons, 2021), two refugia were lost form the Site during the survey. The survey did not cover the entire Site and excluded some habitats potentially suitable for reptiles. An update reptile survey was completed by WSP between May and July 2024. A positive result was returned from one location on Site; an adult female slow worm Anguis fragilis. It was possible to concluded from this result the Site is likely to support 'Low' numbers of common reptiles (Froglife, 19992).
- Dormouse surveys were undertaken only within the northern extent of the Site, as the Site's boundary was extended to include additional land to the south mid-way through the survey period. Due to high levels of anthropogenic disturbance in the southern area, it was considered unsafe to deploy monitoring equipment there because of the risk of tampering or theft. This limitation is not considered to invalidate the surveys, as habitats within the southern extent were judged to be a continuation of those in the north.

Baseline Conditions

Establishing Baseline Conditions

5.37 Baseline ecological conditions have been established through a review of existing ecological information prepared to inform both the extant planning permission and the revised development proposals. Data sources include the PEA, species-specific survey reports (including bats, otter *Lutra lutra*, dormouse *Muscardinus avellanarius*, badger *Meles meles* and reptiles), the Dormouse Impact Assessment and associated mitigation documentation, Reptile Mitigation Strategy, HRA, WMP, and the River Rhymney Aquatic Habitat Appraisal.

5.38 These documents collectively provide the most up-to-date and comprehensive description of habitats, species, and ecological features relevant to the Site. Together, this information provides an evidence-based understanding of the existing ecological baseline against which potential impacts of the Proposed Development have been assessed. Full details of survey methods and results are provided within the supporting technical appendices (Appendices 5.1-5.9).

Baseline Conditions

5.39 The Site is situated in the eastern part of Cardiff, specifically within the Pentwyn area at its upper eastern boundary. It is positioned between the residential neighbourhood of Pentwyn and the suburb of Llanrumney. The A48 road forms the western boundary of the Site, while the eastern boundary is defined by the Rhymney River.

Statutory Designated and Non-statutory Designated Sites

5.40 The desk study identified four International and European sites within 10 km of the Site, which were the Severn Estuary Special Area for Conservation (SAC), Special Protection Area (SPA) and Ramsar, and Cardiff Beech Woods SAC. The search area was extended to 30 km for designated bat sites and further where hydrological connectivity warranted inclusion for fish and aquatic receptors. Three additional International/European designated sites were identified within the extended search area, which were Mendip Limestone Grasslands SAC, North Somerset and Mendip Bats SAC, and Wye Valley and Forest of Dean Bat Sites SAC. These sites are of International Importance. Full details of these sites, including distances, features of interest, and sensitivities, are provided in **Appendix 5.5**.

5.41 One nationally statutory designated site, Gwent Levels – Rumney and Peterstone Sites of Special Scientific Interest (SSSI), and one local statutory designated site, Howardian Local Nature Reserves (LNR) were identified within 2 km.

5.42 Within 1km of the Site, 9 non-statutory designation sites were identified, including one Site of Importance for Nature Conservation (SINC), the Rhynmey River SINC, located on Site, and two being within 200m of the Site, which were Llanedeyrn Woodlands Complex SINC and Coed-y-Cwar SINC. These designations are considered to be of Local Importance, reflecting their contribution to ecological connectivity in the wider landscape. Full details are provided in **Appendix 5.1**.

Habitats

5.43 The Site supports a mosaic of habitats including semi-natural broadleaved woodland, dense scrub, scattered scrub, broadleaved parkland / scattered trees, watercourse and poor semi-improved grassland. Within the central area, a hardstanding car park and distinct pathways and access routes are present, with hardstanding footpaths also running through the southern and eastern extents. Several informal paths cross the Site. These habitats are of Local Importance, providing foraging

and commuting opportunities for a range of fauna. Full habitat descriptions are presented in **Appendix 5.1**.

5.44 Two parcels of Ancient Semi Natural Woodland (ASNW) also fall within the Site. Parcels of ASNW were also identified within 50m of the Proposed Development. These are irreplaceable habitats of National Importance due to their age, structure and biodiversity value.

Protected and Notable Species

5.45 The Site was assessed to be suitable for bats, birds, otter, reptiles, badger, dormouse, hedgehog, great crested newt (GCN) *Triturus cristatus*, amphibians (excluding GCN), invertebrates, and INNS.

Bats

5.46 A total of 15 trees within the Site were identified as having potential roost features (PRFs), including one being potentially suitable for multiple bats or maternity colony. Woodland edges, scrub, grassland margins, and the river corridor were identified as key features for bat activity. Static detector and transect data confirmed regular use of the Site by commuting and foraging bats, with species diversity typical of the local landscape. The habitats on Site are considered to be of Local Importance for commuting and foraging bats. Survey details and bat activity data are provided in **Appendix 5.2**.

Birds

5.47 During the Phase 1 Habitat Survey, a kingfisher *Alcedo atthis* was observed commuting along the river, confirming the river as a commuting route for riparian species. The linear woodland, scrub, scattered trees, and grassland habitats within the Site provide suitable nesting and foraging opportunities for a range of common and widespread bird species. Given the presence of suitable breeding and foraging habitats, the birds are considered to be of Local Importance. The kingfisher, as a Schedule 1 WCA (as amended) species, increases the sensitivity of the riparian corridor but does not elevate the overall bird species' value above the Local level.

Otter

5.48 Suitable resting, foraging, and commuting habitat for otter is present along the Rhymney River that runs adjacent to the Site. No direct evidence (spraints, footprints, or holts) was recorded, although the habitat is likely to be used intermittently for commuting and foraging. Potential resting suitability is low and no holts were identified. The Rhymney River SINC itself is known to support otter and suitable prey species such as brown trout *Salmo trutta*. While resting suitability is low and no breeding sites were identified, transient use by commuting individuals cannot be ruled out. Overall, otter presence within the Site is assessed as low and of Local Importance. Full otter survey details are presented in **Appendix 5.3**.

Reptiles

5.49 A single slow worm was recorded within the Proposed Development's footprint. Although no other species were confirmed, the Site's grassland, scrub, and edge habitats offer suitable conditions for a low reptile population. Reptiles are therefore considered of Local Importance. Survey data and constraints are detailed in **Appendix 5.4**.

Badger

5.50 Evidence of foraging, commuting, and sett-building was recorded within the Survey Area, confirming badger presence. Two outlier setts were identified, one located on the Site and the other situated within 30m of the Site, both showing intermittent use based on evidence of one having spoil heap and claw marks, and the other having fresh loose spoil, footprints and badger hairs. Given the confirmed but limited activity and the availability of suitable habitat in form of grassland, scrub, and woodland habitat, badgers are considered of Local Importance. Survey information is detailed in **Appendix 5.1**.

Dormouse

5.51 Dormouse presence was previously confirmed under the extant planning permission. This record remains valid under current guidance, as it falls within the five-year threshold (Wells et al., 2025[iv]). The Site and surrounding woodland continue to provide suitable scrub and woodland habitat supporting dormouse populations. Dormice are therefore assumed to remain present and are of County Importance. Survey findings and rationale are presented in **Appendix 5.6**.

Hedgehog

5.52 The Site supports suitable habitat for foraging and commuting hedgehog *Erinaceus europaeus* in the form of connected woodland edges, scrub, and grassland, which link into the wider parkland and urban green space network. As a Priority Species in accordance with Section 7 of the Environment (Wales) Act 2016, hedgehog presence is of Local Importance, reflecting both its conservation status and the availability of similar habitats in the surrounding landscape.

GCN

5.53 No ponds were recorded within the Site. A waterbody was present within 500m of the Site (Pentwyn Lakes). The A48 road and River Rhymney forms a considerable barrier to the dispersal of GCN to the Site. The Pentwyn Lakes waterbody is unlikely to support GCN as it is stocked with fish and used as a fishing late. The Site is considered unsuitable for GCN, and the species is not regarded as a constraint to the Proposed Development.

Amphibians (excluding GCN)

5.54 During the Phase 1 habitat survey, one common toad *Bufo bufo* was recorded on Site. The linear woodland, scrub, and grassland habitats within the Site offer suitable foraging and hibernation opportunities for common amphibians. No waterbodies were recorded within the Site. These features

indicate limited breeding potential on-site but possible use of terrestrial habitats by mobile individuals. The amphibian species are therefore considered to be of Local Importance.

Invertebrates

5.55 The woodland, scrub, and grassland habitats that make up the majority of the Site provide suitable resources for common and widespread invertebrates. However, no habitats of specific or exceptional value for rare or specialist invertebrate species were identified. The invertebrates within the Site are assessed as being of Local Importance.

Aquatic and Riverine Features

5.56 The proposed bridge construction area does not support suitable spawning habitat for fish or aquatic invertebrates, though the river provides connectivity to the wider catchment. No aquatic species of conservation concern were identified. Given the limited extent of suitable habitat, these features are assessed as being of Local Importance. Supporting information is included in **Appendix 5.9**.

INNS

5.57 Japanese knotweed *Fallopia japonica* and Himalayan balsam *Impatiens glandulifera* were recorded as abundant across parts of the Site during the PEA. Their presence contributes to the overall assessment of habitat quality and management considerations associated with the Site.

Receptors

5.58 A list of existing and future receptors is included in **Table 5.5**.

Table 5.5 Existing and Future Sensitive Receptors

Receptor	Sensitivity
Existing Receptors	
Severn Estuary SAC, SPA and Ramsar, Cardiff Beech Woods SAC, Mendip Limestone Grasslands SAC, North Somerset and Mendip Bats SAC, and Wye Valley and Forest of Dean Bat Sites SAC	High
Gwent Levels – Rumney and Peterstone SSSI, and Howardian LNR	High
Rhymney River SINC, Llanedeyrn Woodlands Complex SINC, and Coed-y-Cwar SINC	High
ASNW	High
Natural habitats on site – semi-natural broadleaved woodland, dense scrub, scattered scrub, broadleaved parkland / scattered trees and poor semi-improved grassland	Medium
Bats	High
Birds	Medium

Receptor	Sensitivity
Existing Receptors	
Otter	Medium
Reptiles	Medium
Badger	Medium
Dormouse	High
Hedgehog	Medium (due to low numbers and declining population)
GCN	Very low
Amphibians (excluding GCN)	Low
Invertebrates	Low
Aquatic and Riverine Features	Medium
INNS	N/A
Future Receptors	
Severn Estuary SAC, SPA and Ramsar, and Cardiff Beech Woods SAC	High
Gwent Levels – Rumney and Peterstone SSSI, and Howardian LNR	High
Rhymney River SINC, Llanedeyrn Woodlands Complex SINC, and Coed-y-Cwar SINC	High
ASNW	High
Natural habitats on site – semi-natural broadleaved woodland, dense scrub, scattered scrub, broadleaved parkland / scattered trees and poor semi-improved grassland	Medium
Bats	High
Birds	Medium
Otter	Medium
Reptiles	Medium
Badger	Medium
Dormouse	High
Hedgehog	Medium
GCN	Very low
Amphibians (excluding GCN)	Low
Invertebrates	Low
Aquatic and Riverine Features	Medium
INNS	N/A

Future Baseline

5.59 In the absence of the Proposed Development, the Site and surrounding area would be expected to remain largely in their current condition, subject to natural ecological processes and limited external influence from surrounding transport and developed infrastructure located beyond the Rhymney River and A48 road. Over the next 5 -10 years, habitats within the Site would likely continue to mature and gradually succeed, with scrub encroaching into areas of semi-improved grassland and woodland canopy cover slowly increasing.

5.60 Woodland edges and scrub habitats would remain suitable for locally common bird species, small mammals such as hedgehog, and foraging and commuting bats. Amphibians and reptiles would continue to use available mosaic habitats, and invertebrates associated with the existing habitat diversity would continue to be present on the Site.

5.61 The dormouse population confirmed is assumed to remain present within suitable woodland habitats, with no change in overall habitat connectivity in the absence of the Proposed Development. The Rhymney River and associated riparian habitats would continue to provide foraging and commuting opportunities for otter and support aquatic species.

5.62 INNS, including Japanese knotweed and Himalayan balsam, would be expected to persist and spread further in the absence of targeted control measures.

Assessment of Effects (Construction and Operational)

Environmental Design and Management

5.63 The assessment of potential ecological effects has taken into account mitigation and management measures developed as part of the design of the Proposed Development. The Construction Environmental Management Plan (CEMP) has been prepared to support the implementation of the Proposed Development in line with current best practice.

5.64 The industry best practice measures are considered embedded mitigation, meaning that impacts avoided or reduced by their implementation are reflected in the initial assessment of potential effects. Any further measures required to address residual effects beyond those already embedded will be considered separately in subsequent sections of the EcIA.

Effects During Construction

Statutory Designated Sites – International and European

5.65 For International/European designated sites, the HRA identified a likely significant effect (LSE) on fish qualifying features (salmon Salmo salar, sea trout S. trutta, and eel Anguilla anguilla) of the Severn Estuary Ramsar due to temporary in-channel noise and vibration from the bridge works.

These effects have been assessed separately through the HRA process and are therefore not repeated here.

Statutory Designated Sites – National and Local

5.66 The Gwent Levels – Rumney and Peterstone SSSI, and Howardian LNR are located distances exceeding 1.5 km form the Proposed Development. Due to their considerable separation from the Site, there is minimal likelihood of these designated sites experiencing any direct or indirect impacts arising from the Proposed Development. Consequently, the potential effects on both sites are assessed as negligible.

Non-Statutory Designated Sites

5.67 The Rhymney River SINC lies adjacent to the Site and will be retained without direct physical disturbance. There is potential of water quality impact on this SINC. There will also be very minimal vegetation clearance required for bridge works, however, the extent of this clearance is anticipated to be extremely limited and is not considered significant when evaluated in the context of the overall Rhymney River SINC area. The minimal nature of the works ensures that any ecological impact remains negligible, with the integrity of the wider SINC habitat retained throughout the development process. Llanedeyrn Woodlands Complex SINC, and Coed-y-Cwar SINC are over 50m and 100m respectively. Based on the nature, size and type of works, it is unlikely that there will be any impact of any of these two sites. Given the considerable separation of both sites from the construction area, and taking into account the nature, scale, and type of the works involved, it is considered highly unlikely that either site will experience any direct or indirect impacts. Given that there is no pathway of risk due to embedded CEMP measures, including 15m buffer zones, silt control, and pollution prevention (fuel storage and chemical handling restrictions), effects are assessed as negligible.

Habitats

5.68 A significant proportion of semi-natural broadleaved woodland and associated scrub and grassland will be retained; however, habitat loss will occur where development infrastructure replaces woodland, scrub, and grassland within the development footprint. Medium sensitivity of these habitats and the medium magnitude of permanent loss, and incidental effects from dust, machinery, or pollution leads to a moderate adverse effect.

5.69 ASNW on the Site will be fully retained, with no direct loss of irreplaceable habitat. Given the high sensitivity and very low magnitude of potential edge disturbance from construction activity due to retention and protection measures (e.g., root protection zones, adherence to BS5837:2012), the effect is assessed as minor adverse.

Bats

5.70 Construction will require removal of commuting and foraging habitats, including woodland edges, scrub, and grassland. Works near the river and increased lighting, noise, and vibration can also

cause temporary disturbance. Bats are primarily active during nocturnal periods and are therefore not expected to overlap with construction operating hours. Construction lighting is typically not required to facilitate the Proposed Development during the primary bat activity period, which extends from April to October inclusive. However, there are specific circumstances, such as during late autumn or early spring when daylight hours are reduced but environmental conditions remain favourable for bat activity, where a brief temporal overlap between bat movements and on-site construction works may occur. In these instances, it may be necessary to implement temporary construction lighting to support ongoing works during periods of limited natural light, along with some construction security lighting as well. With mostly no night-time works and with predictable daytime activity controlled through the CEMP measures, construction noise does not present a mechanism for disturbance to foraging, commuting or roosting activity.

5.71 One individual tree (Tree 8 (T8)) with potential roost features will require removal. T9 to T13 may be indirectly affected by vibrations from piling during bridge construction. Although works are expected to avoid the main bat activity period where practicable, lighting during the construction phase could cause local disturbance. Given the high sensitivity of bats and the medium magnitude of habitat and disturbance effects, the overall effect is assessed as major adverse. Protection of retained corridor under CEMP will reduce risk of harm, but habitat loss, tree felling, and some disturbance from lighting will still occur, and therefore effect is assessed as major adverse.

Birds

5.72 The loss of trees, scrub, and grassland will result in the direct removal of nesting and foraging opportunities for common and locally breeding bird species. Noise and vibration from construction machinery may also discourage nesting in adjacent retained habitat. With the embedded noise controls applied, construction noise will remain predictable, limited to standard daytime hours and without impulsive events. Birds may detect and respond behaviourally to construction activity within nearby habitats, but the controlled noise environment avoids sudden or atypical acoustic disturbance. Any responses are expected to be limited to transient behavioural adjustments rather than sustained disruption. On this basis, and given their medium sensitivity and medium magnitude of effect, the impact is assessed as moderate adverse.

Otter

5.73 A small section of riparian habitat will be affected, and construction near the river could temporarily disturb otters if present. The potential exists for temporary disturbance from lighting and noise or accidental ingress of individuals into open excavations. The embedded CEMP controls prevent sudden or irregular noise peaks and restrict works to daytime. Given the largely nocturnal activity patterns of otters, the potential for disturbance is limited to daytime awareness rather than interference with key behaviours. There is also a potential that individual otters might cross the bridge construction area. Given the River Rhymney SINC is being retained and protected, the medium

sensitivity of the receptor and low magnitude of potential disturbance, the effect is assessed as minor adverse.

Reptiles

5.74 Vegetation clearance will result in the loss of suitable foraging and refuge habitat, and there is a potential for direct killing or injury of individuals. Embedded CEMP measures, including phased clearance and ecological supervision, will help manage risk but cannot prevent habitat loss. Reptiles might be impacted due to construction noise. Reptiles have low sensitivity to airborne noise. With the embedded CEMP measures preventing abrupt or atypical noise peaks, construction noise is not expected to influence reptile behaviour or habitat use within retained areas. Given the medium sensitivity of reptiles and the medium magnitude of habitat loss, the effect is assessed as moderate adverse.

Badger

5.75 The on-site outlier sett and foraging activity indicate a moderate sensitivity receptor. While direct sett damage is unlikely, foraging badgers may be at risk of accidental injury during construction. There is risk of some disturbance from construction noise, vibration and lighting. Badgers foraging in retained habitats may be aware of daytime construction activity. Embedded measures with the CEMP will ensure noise outputs are maintained at predictable levels and occur only during daytime. The potential for disturbance is therefore limited to short-term awareness responses rather than prolonged behavioural displacement. There would also be some loss of potential commuting and foraging habitat of badgers, and risk of potential disturbance to commuting and foraging badgers from lighting. Given the medium sensitivity of the species and low magnitude of potential effects, the impact is assessed as minor adverse.

Dormouse

5.76 Some suitable dormouse habitat will be lost, particularly along woodland and scrub corridors. This represents a reduction in habitat extent and potential connectivity. There is also potential of disturbance from lighting. Given the high sensitivity of dormouse populations and the medium magnitude of habitat loss, the effect is assessed as major adverse.

Hedgehog

5.77 Construction activity poses a risk of accidental killing or injury during vegetation clearance and ground works, as well as habitat loss. There is also potential of disturbance from noise, vibration and lighting. Hedgehogs are active predominantly during night-time hours and therefore do not overlap with the construction period. With works limited to the daytime and noise outputs controlled, construction noise does not create a pathway for disturbance to this species. Given their medium sensitivity and medium magnitude of potential effects, the impact is assessed as moderate adverse.

GCN

5.78 No suitable ponds occur within 500 m of the Site, and dispersal to the waterbody recorded within 500 m of the Site is constrained by the A48 and the Rhymney River, both acting as major barriers. The species is therefore not considered a constraint, and no effects are predicted.

Amphibians (excluding GCN)

5.79 Amphibians may utilise woodland and scrub for hibernation and grassland for foraging. Although no waterbodies are present within the Site, the terrestrial habitat loss and risk of incidental mortality during clearance could occur. Given the low sensitivity of the receptor and low magnitude of effect, the impact is assessed as negligible.

Invertebrates

5.80 The woodland, scrub, and grassland mosaic supports common and widespread invertebrates. Habitat loss will marginally reduce available resources, but the community is expected to recolonise retained areas. CEMP measures to manage dust and protect retained vegetation will help maintain local habitat quality. Given low sensitivity and low magnitude, the effect is negligible.

Aquatic and Riverine Features

5.81 Aquatic species will utilise the River Rhymney, adjacent to the Site. Construction could cause sedimentation or pollution if runoff enters the River Rhymney SINC. Aquatic species might be disturbed by construction noise. While aquatic species may be more sensitive to vibration, the embedded construction controls in CEMP, including restricted piling hours, equipment maintenance and avoidance of impulsive noise, limit the potential for perceptible substrate-borne disturbance. Noise itself is not anticipated to influence aquatic fauna behaviour. With the embedded CEMP controls, including silt fencing, sediment traps, fuel storage restrictions, and 15 m buffer zones, impacts are highly unlikely. Fuel storage and chemical handling restrictions further reduce the risk potential. Given medium sensitivity of aquatic features, the very low magnitude of potential effect leads to negligible significance.

5.82 There is a potential for impacts on migratory species listed under Annex II, however, these considerations are addressed in detail within the HRA.

INNS

5.83 Two INNS (Himalayan balsam and Japanese knotweed) were recorded. While they will be managed through standard site practice, these species may still have the potential to spread during vegetation clearance or earthworks. Although sensitivity is considered N/A for these as receptors, INNS can have significant effect on biodiversity if they spread.

Effects Once the Proposed Development is Operational

5.84 During operation, external lighting (including security lighting) could affect nocturnal species such as bats, dormice, badger, hedgehog, and otter. The lighting strategy embedded within the design incorporates directional, low-spill, warm-spectrum fittings and maintains boundary lux levels of about 1, equivalent to natural moonlight. The medium magnitude of potential disturbance to high sensitivity receptors leads to a major adverse effect for bats and dormice, and a moderate adverse effect for other nocturnal species.

5.85 The data centre will be air-cooled, producing low and steady sound levels not anticipated to cause disturbance to ecological receptors. Therefore, the magnitude of noise impact is extremely low, and effects are negligible for all the receptors.

5.86 There is a potential risk to the environment arising from emergency firewater runoff. In the event of a fire, contaminated water used for firefighting could enter surrounding habitats or river, leading to possible pollution and ecological harm. The high magnitude of potential firewater runoff results in major adverse effects to high and medium sensitive receptors, moderate adverse effects to low sensitive receptors, and minor adverse effects to very low sensitive receptors.

5.87 In the absence of mitigation, if management is lacking, woodland layers may be lost due to competition and overshading, and grassland could become scrubland. This loss of woodland and valuable habitats would significantly reduce the site's biodiversity, resulting in a moderate adverse effect.

Mitigation Measures

Mitigation During Construction

Statutory Designated Sites

5.88 Mitigation measures relevant to Severn Estuary Ramsar have been addressed comprehensively within the accompanying HRA. The HRA has concluded that, with the implementation of the identified mitigation and avoidance measures, the Proposed Development will not result in any Adverse Effect on Site Integrity (AEoI), either alone or in combination with other plans or projects. As these measures are secured through the HRA process, they are not repeated here.

Habitats

5.89 Retained areas of woodland (including ASNW), scrub, and grassland will be protected with tree root protection zones, barriers in accordance with BS5837:2012, and adherence to permissions for trees subject to Tree Protection Orders (TPOs). Dust and pollution controls, including dampening of exposed surfaces, wheel washing, and chemical handling restrictions, will minimise indirect impacts on retained habitats. Where vegetation is removed, phasing will be used to maintain connectivity where possible.

5.90 The 20 m buffer around ancient woodland will be maintained, with native hedgerow planting to discourage access and provide additional edge habitat. A total of 0.45 hectares of new planting will be established on Site, complemented by 4.81 hectares of remedial tree and woody shrub planting on a neighbouring site located to the southwest, across the river. This comprehensive approach ensures both immediate and wider landscape enhancement. These measures, detailed under the WMP (**Appendix 5.7**), reduce previously identified moderate effects for natural habitats to negligible along with compensating for habitat loss.

5.91 A Green Infrastructure and Landscape Ecological Management Plan (GILEMP) will be written for the Proposed Development which will detail ecological and landscape measures to be implemented.

Bats

5.92 Retained trees and habitat corridors along the Rhymney River will be protected. T8, T9, T12 and T13 require further surveys, to be carried out by a qualified and appropriately licensed ecologist to identify the presence or likely absence of roosting bats (**Appendix 5.2**). Should bats be identified during further surveys of T8, T9, T12 and T13 or during pre-work checks of T8 to T13, works will be postponed and NRW will be consulted for licensing. Actions which are prohibited by Schedule 5 of the WCA (as amended), can be made lawful on the approval and granting of a licence from NRW, subject to conditions.

5.93 Construction lighting will follow recognised best practice, including limiting lighting to times when it is required for safety or security, directing all temporary lighting into the Site, using downlighting wherever possible, and selecting luminaires designed to minimise upward and horizontal spill and glare. Beam angles will be kept below 70° and asymmetric beam fittings will be used where practicable. Importantly, no temporary lighting will be directed towards trees with Potential Roost Features, hedgerows, woodland edges or the river corridor. With these measures in place, construction lighting is considered sufficient to avoid disturbance to bats (**Appendix 5.2**). Further enhancement is provided through the installation of bat boxes across suitable retained trees and structures, creating supplementary roosting opportunities that complement retained habitat and the lighting strategy. These features contribute to securing long-term roosting resource within and adjacent to the Site and align with the wider woodland management actions. Together with WMP retention of trees, these measures reduce previously major effects to negligible.

Birds

5.94 Vegetation clearance will avoid the main breeding season (March-August) where practicable. However, some birds can breed at any time of year. Therefore, a pre-works check by an Ecological Clerk of Works (ECoW) should be conducted within the 48 hours prior to beginning of vegetation clearance to ensure nesting birds are absent. If the works cannot be completed outside of the breeding bird season, the risk of encountering active bird nests will be higher. Where works occur during breeding season, they should proceed under a Precautionary Method of Works (PMoW) and

a more detailed pre-works check by an ECoW will be required immediately prior to works commencing to confirm that no nesting birds will be affected by the Proposed Development, and works would then need to proceed within the following 24 hours. Additionally, buffer demarcation will ensure any existing nests are protected. To increase nesting opportunities within retained and newly established habitat, bird boxes of varying designs will be installed on suitable trees and structures across the Site. These features supplement natural nesting resource and form part of the habitat enhancement measures associated with the wider landscape and woodland management proposals. These measures reduce moderate effects to negligible levels.

Otter

5.95 A 15-20 m exclusion buffer will be maintained at the edge of the Site where it bounds the river, within which no activities such as groundworks, storage, lighting or vehicle movements will be permitted. This buffer is intended to protect the riparian corridor, ensuring that disturbance, encroachment and potential pollution risks are minimised. An otter ledge integrated into bridge works to avoid the need for otters to travel onto the road above the bridge and hence prevent incidental harm. No open pits or trenches will be left uncovered or, alternatively, without a mammal ramp overnight. Various lighting measures implemented for bats would also be applicable for otter, ensuring that any potential effect will be reduced to negligible. Where suitable habitats are proposed for direct impact including removal, it is recommended that works are carried out under a PMoW. This should include a pre-works check by a suitably qualified ECoW, which should be carried out immediately prior to any works being undertaken. If otter are found to be present within or close to an area to be affected by the Proposed Development, additional mitigation and consultation with NRW may be required. With these measures in place, minor adverse effects will be well-controlled and potentially reduced to negligible level.

Reptiles

5.96 Retained woodland and dense scrub will be protected, with vegetation clearance implemented under a PMoW and in the presence of an ECoW. Pre-clearance mat deployment, hand searches, and destructive searches prior to topsoil removal will prevent killing or injury. Refugia and glade creation will enhance habitat quality, while rotational cutting and long-term habitat management under the reptile mitigation strategy (**Appendix 5.4**) will maintain suitable conditions for supporting reptiles. As such, previously moderate effects are reduced to negligible.

Badger

5.97 Exclusion zones around the setts should be installed to avoid impacts. Prior to construction, a pre-commencement badger check of the Site will be undertaken to ensure no new setts have been created. Various lighting measures implemented for bats would also be applicable for badger, ensuring that any potential effect will be reduced to negligible. As mentioned above for otters, during the construction, no open pits or trenches will be left uncovered or, alternatively, without a mammal escape ramp overnight. Enhancement of retained habitats, and on-site habitat creation for to

dormouse will also support commuting and foraging badgers. Therefore, minor adverse effect will be reduced to negligible.

Dormouse

5.98 Sensitive design of the development layout will keep the footprint away from key habitats, and retained scrub and woodland will be enhanced through infill planting. New on-site dormouse habitat will be created with additional trees, scrub, and hedgerows. Various lighting measures implemented for bats would also be applicable for dormouse, ensuring that any potential effect will be reduced to negligible. Off-site Dormouse Habitat Planting Area includes habitat creation connected by three dormouse bridges to link retained habitats across the river, further enhancing connectivity. Timing of the planned works will avoid the main dormice mid-summer breeding season (June to August).

5.99 Fifty dormouse nest boxes will be installed within retained woodland on the northern and western parts of the Site and within an Off-site Dormouse Habitat Planting Area and linked via the proposed dormouse bridges. Habitat condition will be monitored annually between May and June from 2026 to 2042, with additional checks during the growing season (April-August) and post-planting maintenance in winter (November-February). Management practices will be reviewed every five years to ensure the habitats remain suitable for dormice, with any updates submitted to NRW as required. Nest boxes will be checked twice per year (May-September) in years 1, 2, 3, 4, 5, 7, 10, and 15. Full details of the methods will be provided in the dormouse European Protected Species Licence (EPSL) application.

5.100 Dormice are sensitive to clearance works during the breeding season and hibernation. Therefore, vegetation clearance will be timed with appropriate methodologies to minimise disturbance to dormice. Between November to March vegetation will be cleared to 300mm only, which is outside both the dormouse active season and the main bird breeding season. This will minimise any impacts to hibernating dormice. Vegetation will be cleared to ground level during mid-April to May when dormice have emerged from hibernation and are considered active. Root balls and stumps can be removed during this mid-April to May window. A further clearance window to ground level, after breeding has finished, will take place between mid-September to the end of October. This will reduce any impacts to hibernating dormice. Details are provided in Appendix 5.6. A toolbox talk will be provided to all site contractors to inform them about the presence of dormice on site, outline the protective measures in place, and explain the steps to take if a dormouse is unexpectedly found during work. These measures reduce the previously assessed major adverse effect to negligible.

Hedgehog

5.101 A pre-works check will be undertaken to confirm presence or absence of hedgehogs prior to vegetation clearance. Any individuals found will be moved to safe retained habitats under ecological supervision. Various lighting measures implemented for bats would also be applicable for hedgehog, ensuring that any potential effect will be reduced to negligible. Open excavations will be covered or

fitted with escape ramps overnight to prevent entrapment. The WMP will enhance foraging and shelter opportunities through hedgerow and scrub planting. With these measures in place, effects are considered negligible.

INNS

5.102 Biosecurity measures will prevent spread of Himalayan balsam and Japanese knotweed during construction, following Check, Clean, Dry principles. CEMP measures to avoid the spread of INNS include restrictions on excavation within 7m of an INNS, subject to an ecologist's advice. Soil or material potentially containing seeds or other plant materials from INNS should not be moved or stockpiled without an ecologist's advice. Further measures to reduce the risk of spread will include controlled excavation and removal of INNS affected soil, fencing of infested areas and toolbox talks for all Site personnel (**Appendix 5.8**). These measures minimise potential impacts to negligible.

Mitigation Once the Proposed Development is Operational

5.103 Through habitat infill, selective thinning, and management of INNS, woodland quality will be enhanced. The existing open spaces and their associated ecotones will be carefully maintained through regular mowing and the removal of cuttings. This approach will effectively prevent these areas from reverting to scrub or woodland, thereby safeguarding their ecological value and maintaining habitat diversity. These measures are detailed under the 25 years WMP (**Appendix 5.7**). To ensure effective management of INNS, an ISMP (**Appendix 5.8**) will be implemented, which would be a comprehensive 5-year plan. The ISMP will be subject to regular review to maintain its relevance and effectiveness in response to evolving site conditions and best practice guidance. Specifically, the plan will be formally reviewed and updated annually throughout the five-year period, allowing for timely incorporation of any new issues, regulatory changes, or successful mitigation strategies identified during monitoring or site works to reduce previously identified moderate adverse effect on woodland to negligible.

5.104 Sensitive lighting will be incorporated into the operational design. This will include warm-white spectrum (between 2000-3000 degrees Kelvin), with minimal UV output, zero upward light ratio, and luminaires that will use peak wavelengths above 550 nm to reduce the types of light that are most disruptive to bats and other nocturnal species. Avoidance of the river corridor will involve limiting light spill to 0.1 lux in limited areas, maintaining commuting and foraging routes. Off-site Dormouse Habitat Planting Area and under-bridge scrub planting will further enhance connectivity. The external lighting system will be fully automated, with dimming and switching. In winter, lights will dim to 10% at 16:00 and turn off from 23:30 to 05:30. Motion sensors will activate full brightness only where needed, keeping other areas dark.

5.105 Nightworks shall be avoided where practicable; but where unavoidable, such as security lighting, lighting shall operate only during active works or safety-critical periods. Automatic timers and PIR motion sensors shall control non-essential lighting to minimise the duration of illumination. Where

lighting is required beyond operational hours, dimming protocols will reduce output to 20%, or below, of normal operating levels, if safety allows. Localised low-level task lighting shall be used and directed away from any sensitive habitats. This would minimise the potential effect to negligible. Detail on lighting during operation is detailed in the Lighting Strategy.

5.106 Operational mitigation will be secured to ensure that fire-water generated during an emergency incident is fully contained, treated and managed on-site so that no uncontrolled release can affect ecological receptors. The following measures will be implemented:

- Fire-water capture and containment – A sealed containment and lagoon system will be installed to provide complete capture of all fire-water runoff generated during a credible emergency scenario. The system will include sufficient capacity to accommodate both fire-water and rainfall associated with an extreme storm event. The design will prevent any uncontrolled or untreated release to surrounding habitats, surface waters or groundwater.
- Treatment of collected fire-water – Water collected within the lagoon system will undergo treatment to remove pollutants associated with emergency incidents, including hydrocarbons, suspended solids, battery-related contaminants, metals, nitrogen species and combustion by-products. Treatment will reduce contaminant levels to thresholds suitable for controlled release or, where required, for safe removal off-site.
- Controlled discharge or off-site removal – No discharge will occur unless water quality monitoring confirms that protective thresholds have been achieved. Discharge flow rates will be actively controlled to avoid hydraulic disturbance of the receiving water environment. If treated water does not meet the required standards, it will be removed off-site by a licensed contractor for specialist treatment and disposal.
- Monitoring and operational safeguards – Automated monitoring and fail-safe devices will ensure that discharge cannot occur unless compliance with water-quality thresholds has been verified. Operation and maintenance procedures will ensure that the system continues to function effectively throughout the lifetime of the development.

5.107 These measures will ensure that fire-water generated during emergency incidents is managed to minimise adverse effects on ecological receptors during operation to negligible.

Residual Effects and Monitoring

5.108 The residual effects arising from the Proposed Development are summarised in **Table 5.5** below.

Table 5.6 Summary of Residual Effects

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Construction Effects						
Determined through HRA	Severn Estuary SAC, SPA and Ramsar, Cardiff Beech Woods SAC, Mendip Limestone Grasslands SAC, North Somerset and Mendip Bats SAC, and Wye Valley and Forest of Dean Bat Sites SAC (High)	International	High	Major adverse	Mitigation identified as a result of the Stage 2 (Appropriate Assessment) of HRA	Negligible
Changes to water quality	Rhymney River SINC (High)	Local	Very low	Negligible	Adherence to CEMP.	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Indirect habitat impact from dust and pollution; Damage to tree roots and from accidental access; Spread of INNS	ASNW (High)	National	Very low	Minor adverse	Adherence to the CEMP, including TPOs; Implementation of WMP and ISMP.	Negligible
Habitat loss; Impact from dust and pollution; Damage to habitat structure and tree roots.	Natural habitats on Site – semi-natural broadleaved woodland, dense scrub, scattered scrub, broadleaved parkland / scattered trees and poor semi-improved grassland (Medium)	Local	Medium	Moderate adverse	Adherence to the CEMP, including TPOs; Implementation of WMP and ISMP.	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Habitat loss; Disturbance from lighting, noise and vibration.	Bats (High)	Local	Medium	Major adverse	Additional surveys of T8, T9, T12 and T13; Pre-works checks by an ECoW; Adherence to the CEMP, including TPOs; Implementation of WMP; Installation of bat boxes.	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Habitat loss; Disturbance from noise and vibration.	Birds (Medium)	Local	Medium	Moderate adverse	Pre-works check within 48 hours prior to vegetation clearance (if outside main breeding season); Detailed pre-works check prior to works, with work to proceed within following 24 hours, Adherence to the CEMP, including TPOs; Implementation of WMP; Installation of bird boxes (adherence to the future Green infrastructure and Landscape Ecological Management Plan GILEMP).	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Killing/injury due to falling in open excavations or while crossing bridge construction area; Temporary disturbance from lighting and noise	Otter (Medium)	Local	Low	Minor adverse	Pre-works check to be carried immediately prior to works; Adherence to the PMoW; Adherence to the CEMP; Implementation of WMP; Installation of otter ledges; Adherence to the GILEMP.	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Habitat loss; Direct killing/injury.	Reptiles (Medium)	Local	Medium	Moderate adverse	Vegetation clearance in the presence of an ECoW; Adherence to the PMoW; Pre-clearance mat deployment, hand searches, and destructive searches prior to topsoil removal; Adherence to the CEMP; Implementation of WMP and Reptile Mitigation Strategy.	Negligible
Habitat loss; Direct killing/injury; Disturbance from lighting, noise and vibration.	Badger (Medium)	Local	Low	Minor adverse	Exclusion zones around the setts; Pre-works check; Adherence to the CEMP; Adherence to the PMoW; Implementation of WMP.	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Habitat loss; Direct killing/injury; Disturbance from lighting, noise and vibration.	Dormouse (High)	County	Medium	Moderate adverse	Off-Site Dormouse Habitat Planting Area along with 50 dormouse nest boxes, dormouse bridges, vegetation clearance in accordance with dormouse EPSL; Long term habitat and dormouse monitoring; Adherence to WMP/GILEMP.	Negligible
Accidental killing/injury; Potential habitat loss; Disturbance from lighting, noise and vibration.	Hedgehog (Medium)	Local	Medium	Moderate adverse	Pre-works check; Adherence to the CEMP; Adherence to the PMoW; Adherence to the GILEMP; Implementation of WMP.	Negligible
N/A (not a constraint)	GCN (Very Low)	N/A (not a constraint)	N/A (not a constraint)	N/A (not a constraint)	N/A (not a constraint)	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Incidental mortality	Amphibians (excluding GCN) (Low)	Local	Low	Negligible	Adherence to the PMoW.	Negligible
Habitat loss	Invertebrates (Low)	Local	Low	Negligible	Adherence to the GILEMP (e.g. species rich habitat mosaics to provide a resource for a range of species).	Negligible
Change in water quality	Aquatic and Riverine Features (Medium)	Local	Very low	Negligible	Adherence to the CEMP.	Negligible
Spread of INNS in other habitats	INNS (N/A)	Local	N/A	Moderate adverse	Adherence to the CEMP; Adherence to the PMoW; Implementation of WMP and ISMP.	Negligible
Operational Effects						

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Determined through HRA	Severn Estuary SAC, SPA and Ramsar, and Cardiff Beech Woods SAC (High)	International	High	Major adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release	Negligible
Fire water runoff during emergency event	Rhymney River SINC (High)	Local	High	Major adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release	Negligible
Fire water runoff during emergency event; Ecological succession leading to habitat degradation and reduced biodiversity	ASNW (High)	National	High (due to fire water runoff); Medium	Major adverse (due to fire water runoff); Moderate adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release; Implementation of WMP and dormouse EPSL.	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Fire water runoff during emergency event; Ecological succession leading to habitat degradation and reduced biodiversity	Natural habitats on site – semi-natural broadleaved woodland, dense scrub, scattered scrub, broadleaved parkland / scattered trees and poor semi-improved grassland (Medium)	Local	High (due to fire water runoff); Medium	Major adverse (due to fire water runoff); Moderate adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release; Implementation of WMP, GILEMP, dormouse EPSL and Reptile Mitigation Strategy.	Negligible
Fire water runoff during emergency event; Disturbance due to external lighting	Bats (High)	Local	High (due to fire water runoff); Medium	Major adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release; Implementation of Lighting Strategy.	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Fire water runoff during emergency event	Birds (Medium)	Local	High	Major adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release	Negligible
Fire water runoff during emergency event; Disturbance due to external lighting	Otter (Medium)	Local	High (due to fire water runoff); Medium	Major adverse (due to fire water runoff); Moderate adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release; Implementation of Lighting Strategy.	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Fire water runoff during emergency event	Reptiles (Medium)	Local	High	Major adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release; Sensitive habitat management during operation – adherence to the Reptile Mitigation Strategy.	Negligible
Fire water runoff during emergency event; Disturbance due to external lighting	Badger (Medium)	Local	High (due to fire water runoff); Medium	Major adverse (due to fire water runoff); Moderate adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release; Implementation of Lighting Strategy	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Fire water runoff during emergency event; Disturbance due to external lighting	Dormouse (High)	Local	High (due to fire water runoff); Medium	Major adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release; Implementation of Lighting Strategy; Implementation of WMP and dormouse EPSL.	Negligible
Fire water runoff during emergency event; Disturbance due to external lighting	Hedgehog (Medium)	Local	High (due to fire water runoff); Medium	Major adverse (due to fire water runoff); Moderate adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release; Implementation of Lighting Strategy	Negligible
N/A (not a constraint)	GCN (Very Low)	Local	N/A (not a constraint)	N/A (not a constraint)	N/A (not a constraint)	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Fire water runoff during emergency event	Amphibians (excluding GCN) (Low)	N/A (not a constraint)	High	Major adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release.	Negligible
Fire water runoff during emergency event	Invertebrates (Low)	Local	High	Major adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release.	Negligible
Fire water runoff during emergency event	Aquatic and Riverine Features (Medium)	Local	High	Major adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release.	Negligible
Spread of INNS in other habitats	INNS (N/A)	Local	Medium	Moderate adverse	Adherence to the CEMP; Implementation of WMP and ISMP.	Negligible

Notes: * incorporating environmental design and management, ** incorporating mitigation and monitoring measures

Likely Significant Environmental Effects

5.109 Following implementation of all embedded and additional mitigation, including those measures secured through the CEMP, WMP, GILEMP and species-specific mitigation and compensation, no significant adverse residual effects are predicted on habitats or species receptors.

5.110 The mitigation hierarchy has been successfully applied - avoidance, minimisation, and compensation, ensuring that effects identified during construction and operation are fully addressed. The sensitive design layout, establishment of buffer zones, habitat restoration, and long-term management under the WMP and GILEMP collectively ensure the protection and enhancement of biodiversity features within and around the Site.

5.111 In addition, the on-site and off-site habitat creation and enhancement, including new woodland, scrub, and hedgerow planting, and Off-site Dormouse Habitat Planting Area with connectivity bridges, will result in net ecological gain over the long term. These measures are expected to deliver a permanent improvement in the quality and extent of habitats for dormouse, bats, reptiles, and birds, alongside strengthened ecological connectivity across the wider landscape. Accordingly, post-mitigation effects are assessed as neutral to minor beneficial overall.

Net Benefit for Biodiversity

5.112 To achieve a NBB, removed trees will be replaced at a 3:1 ratio. Enhancement of existing habitats will be undertaken to increase their conservation value. Wildflower seeding will take place in habitats with low species-diversity to promote invertebrate diversity and abundance. These enhancements will incorporate species rich habitat mosaics and tree planting within landscaping, using native species. Ancient woodland ground floral plug planting or seeding will take place within the woodland mosaic, where existing trees are removed or impacted. Installation of invertebrate hotels, and creation of habitat piles to provide refuge for reptiles, amphibians and hedgehog. Habitat management Long-term habitat monitoring of reinstated habitats will ensure that the Project achieves a NBB in the long-term and when the Project is in its operational phase. Preliminary mitigation and enhancement measures are provided in Appendix 5.1.

Summary and Conclusions

5.113 The EcIA has identified and evaluated potential ecological effects associated with the Proposed Development during both the construction and operational phases. A robust suite of embedded design measures and further targeted mitigation has been incorporated, addressing all potential ecological receptors, including habitats, protected species, and designated sites.

5.114 Construction-phase controls under the CEMP, combined with pollution prevention, dust suppression, and lighting management, will effectively minimise short-term impacts. Long-term ecological value

will be secured through the WMP, dormouse EPSL and GILEMP, with species-specific management plans, and ongoing habitat maintenance and monitoring.

5.115 As a result of this integrated approach, no significant adverse ecological effects are anticipated. Instead, through habitat creation, restoration, and long-term management, the Proposed Development is expected to deliver lasting biodiversity enhancements both on-site and within the wider ecological network.

5.116 As the assessment concludes no residual effects on ecological receptors, no cumulative assessment has been undertaken.

References

[i] CIEEM (2017). *Guidelines on Ecological Report Writing*. Chartered Institute of Ecology and Environmental Management, Winchester.
[ii] CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.3*. Chartered Institute of Ecology and Environmental Management, Winchester.
[iii] British Standards Institution (2013). *BS 42020:2013 Biodiversity – Code of practice for planning and development*. British Standards Institution, London.
[iv] Wells, D., Chanin, P. & Gubert, L. (2025) *Hazel Dormouse Mitigation Handbook.* The Mammal Society. ISBN: 978-1-0687982-2-1